GENERAL INFORMATION

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

DRAFT

TENTATIVE ANNOTATED AGENDA

Sunday, May 28	
16:00	Registration at Motel Hoornwijck Issue of documents
Monday, May 29	
09:30 - 11:00	Opening session
11:00 - 11:30	Coffee break
11:30 - 12:30	Presentations
12:30 - 13:30	LUNCH (will be held at Building B)
13:30 - 15:00	Presentations
15:00 - 15:30	TEA BREAK
15:30 - 17:00	Presentations Summary main issues
17:15 - 18:15	RECEPTION

Tuesday, May 30

09:00 - 10:30	Presentation and discussion on "Outline of the Extension Component of the Slow Sand Filtration Project" Introduction Working Groups
10:30 - 11:00	COFFEE BREAK
11:00 - 12:30	Plenary: Continuation discussion on on elements extension programme.
12:30 - 13:30	LUNCH
13:30 - 16:30	Working groups (incl. TEA BREAK)
16:30 - 17:00	Plenary Interim reports working groups to be presented to the secretariate Presentation IRC-film "Water:a global care".

Wednesday, May 31

09:00 - 10:30	Plenary discussion on interim reports working groups
10:30 - 11:00	COFFEE BREAK
11:00 - 12:30	Working groups
12:30 - 13:30	LUNCH
13:30 - 15:00	Working groups Reports working groups to be presented to the secretariate
15:00 - 15:30	TEA BREAK
15:30 - 17:00	Plenary discussion on working group reports;recommendations for country programmes

Thursday, June 1

09:00 - 12:30	Review country-extension-programmes (including COFFEE BREAK)
12:30 - 13:15	LUNCH BREAK
13:15	Departure by coach, for excursion ro Amsterdam Waterworks (Treatment plant Leiduin)
18:00	Return to Motel Hoornwijck
20:00	DINNER

Friday, June 2

09:00 - 10:30	Final Discussion on implementation extension programmes of Slow Sand Filtration Project
10:30 - 11:00	COFFEE BREAK
11:00 - 12:30	Presentation and discussion on the literature study on "Extension and Community participation in Water Supply and Sanitation"
12:30 - 13:30	LUNCH BREAK
13:30 - 15:00	Discussion on recommendations and allocations of priorities for literature study on Extension in Comunity participation in Water Supply and Sanitation
15:00 - 15:30	TEA BREAK
15:30 - 17:00	Closing session, including video presentation on "Six years of Governmental information in Environmental Policy in The Netherlands"
17:00	DRINKS

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May 29th - June 2nd, 1978

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ANNOTATED AGENDA

Monday, 29th May

09:30 - 11:00 1. Opening session

1.1 Welcome by Drs. J.M.G. van Damme
Manager IRC.

1.2 Opening address by Dr.Ir. N. Röling,
Department of Extension Education,
Agricultural University, Wageningen,
The Netherlands.

1.3 Introduction on the objectives
of the meeting by Mr. P. Kerkhoven,
Programme Officer IRC.

1.4 Organizational matters:

- Presentation of participants
- Adoption of the agenda
- Announcements

11:00 - 11:30 COFFEE BREAK

11:30 - 12:30 2. Presentations by participants

2.1 Presentation on Extension Component
Slow Sand Filtration Programme in
India by Dr. S.K.Sandhu.

2.2 Presentation on Extension Component
Slow Sand Filtration Programme in
Thailand by Dr. Sombhong Kutranon.

12:30 - 13:30	LUNCH (will be held at the Ministry of Public Health and Environmental Hygiene, Building B, Lunch Room on the top floor).
13:30 - 15:00	2.3 Presentation on Extension Component Slow Sand Filtration Programme in Kenya by Mr. D. Mbai. 2.4 Presentation on Extension Component Slow Sand Filtration Programme in Sudan by Mr. Saeed. 2.5 Presentation on Extension Component Slow Sand Filtration Programme in Ghana by Dr. Nimo.
15:00 - 15:30	TEA BREAK
15:30 - 17:00	2.6 Presentation on Extension Component Slow Sand Filtration Programme in Jamaica by Mr. B. Muir. 2.7 Presentation on Extension Components Slow Sand Filtration Programme in Colombia by Mr. M. Santa Cruz 2.8 Summary of main issues.
17:15 - 18:15	RECEPTION at the National Institute for Water Supply.

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International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th -- June 2nd, 1978

DRAFT

ANNOTATED AGENDA

Tuesday, 30th May

09:00 - 10:30	1. Presentation and discussion on "Outline of the Extension Component of the Slow Sand Filtration Project", by Dr. A.T. White.
10:30 - 11:00	COFFEE BREAK
11:00 - 12:30	2. Continuation discussion
12:30 - 13:30	LUNCH BREAK
13:30 - 17:00	3.+4. Discussion on basic topics community education programmes (including TEA BREAK)

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Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

DRAFT

ANNOTATED AGENDA

Thursday 1st June

09.00 - 10.30	1. Finalization discussion on basic topics. Discussion on reports of Tuesday May 30 and Wednesday May 31.
10.30 - 11.00	COFFEE BREAK
11.00 - 12.30	2. Discussion on community education and participation.
12.30 - 13.15	LUNCH BREAK
13.15	3. Departure of coach to Municipal Waterundertaking in Amsterdam.
14.00 - 17.00	4. Excursion at Municipal Waterundertaking in Amsterdam.
	4.1. Introduction on: - Methods and Techniques for Public Information on Community Water Supply in the Netherlands. - Public Information by the Municipal Waterundertaking, Amsterdam, by Mr. H.W. Dorreboom, Head Public Relations.
	4.2. Presentation of educational material.
	4.3. Discussion.
	4.4. Visit Watertreatment Plant 'Leiduin' and dune-infiltration area.
15.00 - 16.00	5. Departure of coach to The Hague and return to Motel Hoornwijck.
20.00	6. Joint dinner at the Restaurant "In 't Gemeste Schaap".

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SLOW SAND FILTRATION PROJECT

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Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

DRAFT

ANNOTATED AGENDA

Friday 2nd June

09.00 - 10.00	1. Review of report of discussions on Thursday and finalization of discussions on basic topics.
10.00 - 10.30	2. Discussion on outline for programme of activities.
10.30 - 11.00	COFFEE BREAK
11.00 - 12.00	Continuation of discussion on outline
12.00 - 12.30	Presentation and discussion on the literature study on "Extension and Community Participation in Water Supply and Sanitation".
12.30 - 13.30	LUNCH BREAK
13.30 - 14.00	Closing session
14.00 - 14.30	Video presentation on "Six years of Governmental Information in Environmental Policy in The Netherlands".

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SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

LIST OF PARTICIPANTS

Participants

Mr. M. Santacruz	Colombia, Instituto Nacional de Salud
Dr. K.P. Nimo	Ghana, Ministry of Health, National Health Planning Unit
Dr. S.K. Sandhu	India, Central Health Education Bureau
Mr. L. Lawson	Jamaica, National Water Authority
Mr. B. Muir	Jamaica, Ministry of Health, Bureau of Health Education
Mr. A.A. Saeed	Sudan, Ministry of Health, Health Education Department
Dr. Sombhong Kutranon	Thailand, Ministry of Public Health, Health Education Division
Dr. A. Moarefi	World Health Organization, Health Education Department

General Rapporteur

Dr. A.T. White	Institute of Development Studies, Sussex, United Kingdom

Observers

Drs. Ch. van Wijk	Consultant for the IRC Slow Sand Filtration Project, The Netherlands

Secretariate

Ir. P. Kerkhoven	International Reference Centre for Community Water Supply
Ir. E.L.P. Hessing	International Reference Centre for Community Water Supply

Administrative Support

Ms. M. Marchant	International Reference Centre for Community Water Supply

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

IRC 15: SSF 19780427

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), the Netherlands
May 29th - June 3rd, 1978

draft

OBJECTIVES

1. To review and discuss in detail the general working document "Health Extension in Phase II of the Slow Sand Filtration Project".

2. To present the proposals of the various Project Managing Committees for health extension country programmes in the context of the Slow Sand Filtration Project.

3. To agree on a coordinated approach regarding the design, implementation and evaluation of the extension programmes for the Slow Sand Filtration Project.

4. To consult on the integration of the various programmes of work, and to identify priorities for an overall plan of action.

5. To draft guidelines for alternative strategies, towards the application of the concept "Community Participation" in the context of the Slow Sand Filtration Project.

6. To draft guidelines for sanitation education programmes to be implemented in the context of the Slow Sand Filtration Project.

7. To formulate recommendations for further activities and studies in the context of the Health Extension Component Component of the Slow Sand Filtration Project.

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SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

QUESTIONNAIRE

SURNAME : _____

INITIALS, TITLE(S) : _____

FIRST NAME : _____

DISCIPLINE : _____

OFFICIAL POSITION : _____

INSTITUTE : _____

ADDRESS : _____

P.O. BOX : _____

TELEPHONE : _____

TELEPRINTER : _____

CABLE : _____

PERMANENT ADDRESS : _____

_____

ADDITIONAL INFORMATION : _____

Please complete this form and return to the Secretariate.

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SLOW SAND FILTRATION PROJECT

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Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

"DUTCH TREAT DINNER"

The undersigned wishes to participate in the "Dutch Treat Dinner"
(not to exceed approximately f 37,50) at the
Restaurant " 't Gemeste Schaap", Raamstraat 9, The Hague,
on Thursday June 1st, at 20.00 hours.

NAME: _____

Vegetarian menu requested YES/NO

Report Group I.

ASSUMPTION: Contact and consultation have been made between the water agency and the health service agency at the national level.

ACTIVITIES (What)	WHY	COMPONENTS	HOW	WHEN	WHO IS RESPONSIBLE
Establishment of a presence by the health extension agency	To develop contact with the community		Through existing health programmes	Immediately and prior to the establishment of local committee	Local health department
Investigation of water supply situation	To assess extent of problem and potential for improvement		Field work	After request	Water agency
Decision to undertake the water supply	To effect the improvement		By improvements to the system and appropriate health extension services.	Follows 1 and 2	Water Agency
Establishment of local project management committee	Management and coordination of the project at the local level	The man who is responsible for supervision of operation, construction, supervision of health extension agent The representative of the local government agency	Through existing health programmes	At the start of the project	Water Agency responsible for convening meetings
Consultations with the local committee	To establish contact and invite participation		General meeting arranged by existing community organization	after no 4.	The representative of the local government agency.
Election of the community leaders for the local committee	To ensure community participation at all levels		By popular election		

REPORT OF GROUP II

POTENTIAL ACTIVITIES

I. Planning phase
- In order to facilitate proper coordination at various levels and starting from the national level the activities mentioned under checklists 18,19 and 20 will be examined and suitably adapted.
- To evolve broad guideline of programme plan indicating objectives, methodology, evaluative procedures, base line information to be collected, review of existing situation, phasing, resources allocation. etc.

II. Preparatory phase
- To plan for training of concerned staff of collaborating agencies at various levels - district, health centre and village level. The training.
- Activities to be initiated at the village level:
  . Training village level agency workers (all concerned agency workers to be involved)
  . Dialogue with village community
  . Collection of base line data and specific surveys on the lines agreed to in the meeting and making educational diagnosis for the village
  . Selection and training of village leaders
  . Preparation of specific educational plan for the village which is involved in consultation with community members and peripheral agency workers incorporating various approaches and methods. This is to be based on the actual situation in each village.
  . Precurement and preparation of suitable educational aids and materials.
  . Time phasign for the programme activities
  . Designing of recording and recording procedures.
  . Designing plan for coordination and periodic review at villages health centre level.

III. Implementation phase

Implementation of educational plan, with active involvement of the community members after roughly 3 months of planning phase maintaining records and report according to the plan which should help in concurrent evaluation and give leads for periodic and terminal evaluation. Should also provide for modifications if any needed in the plan.

Educational programme after actual water supply has started would focus on assisting the community to actually use the filtered water in the way it is intended to be utilized.

Continue to assist the concerning in acceptance of improved health practices and health services. Active involvement of the plant operator and educator if they happen to be two different persons.

Periodical review by the supervisors from the district level and above.

Health agency staff assisting the village level committee to take up increased responsibilities in programme implementation, review, supervision and evaluation.

IV. Evaluation

Towards last quarter of the last year surveys to be repeated as per plan agreed to during planning phase.

Analysis of survey data, analysis of monthly reports, study of records in relation to various educational activities, positive and negative experiences of agency workers, community leaders etc.

Based on this, to prepare project report for each village indicating the extent to which programme plans could be implemented, degree of increase in knowledge, in relation to technical aspects of water and disease process, change if any in community practices in relation to use of water, environmental sanitation, acceptance of health services etc. based on service records and observations by the agency worker and community members involved in programme implementation.

To prepare comprehensive report for the country based on the reports of each project village.

This report should clearly indicate the lessons learned and guidelines to be followed for future expansion of the project in the country.

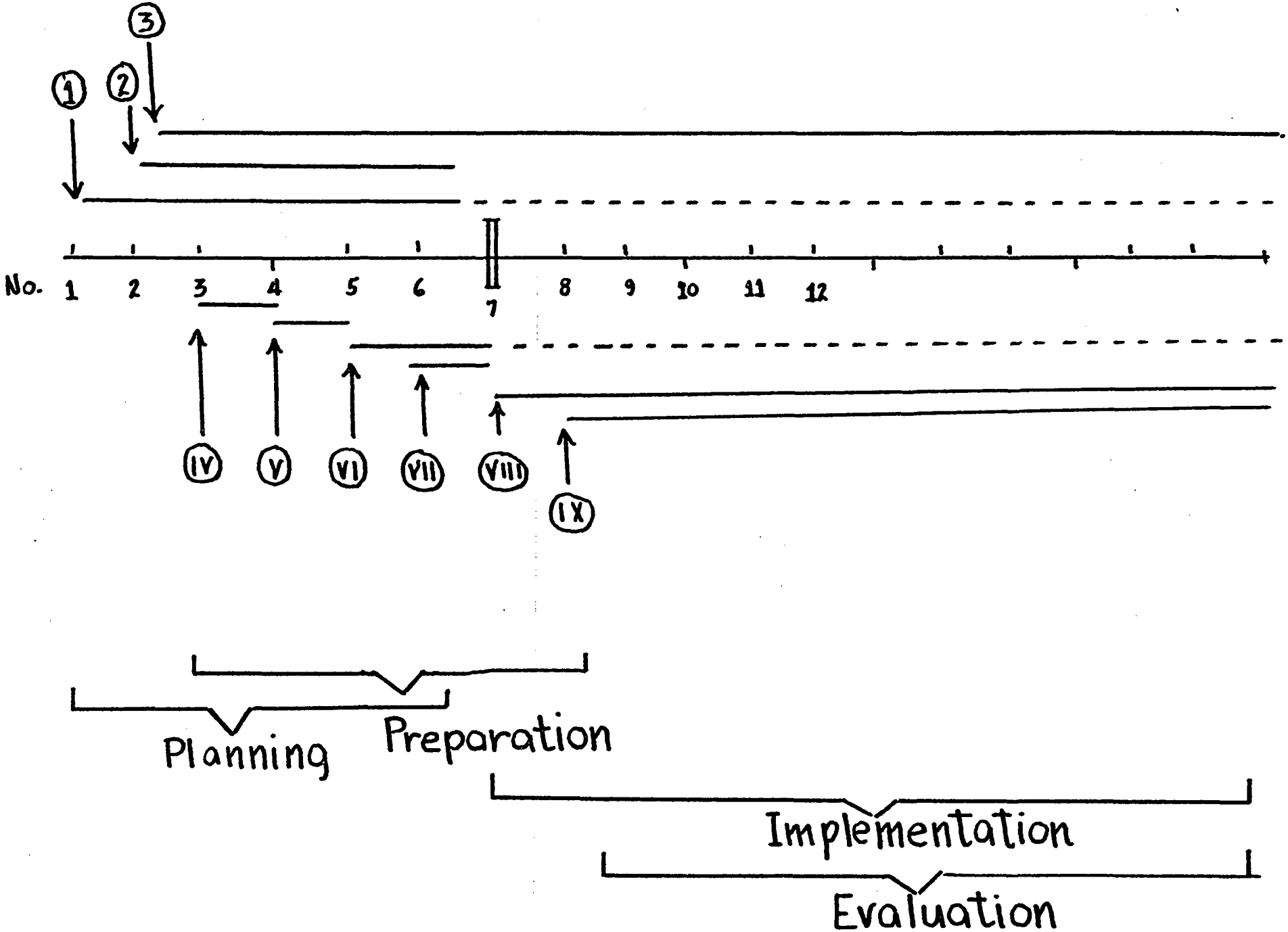
ACTIVITIES AT NATIONAL LEVEL

NATIONAL LEVEL

WHAT	WHO	WHEN	HOW	WHY
1. Appoint co-ordinating committee	H.E. Staff Water Supply Staff Administrative Staff	Beginning time 1st month	Appoint and set criteria for plan	To seek co-ordination
2. Set plan for Health Education and Training	Committee	2nd Month	Review previous data, set criteria and plan	To have an outline of idea
3. Seek for administrative support	Concerning agencies	After plan	Prepare supporting material to help	To help field worker

ACTIVITIES AT VILLAGE LEVEL

WHAT	WHO	WHEN	HOW	WHY
IV. . Orientation of Health Centre Staffs	H.E. Supervisor	3rd Month	Train every Staff about plan.	To know program before start
V. . Selection Training of Community Worker	H.E. Supervisor H. Staff	4th Month		
VI. . Dialogue	H. Personel from H. Centre	5th Month	Community Worker work with people	To know feed back
VII. Review situation and prepare outline of plan.	Planner of H.E. Programme	6th Month	Put everything into account	
VIII. Implementation	All concerned Staff	7th Month	Do as plan	
IX. Record Report & Evaluation	H.E. Supervisor H. Staff	7th Month	Feed back system	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IX
Planning
Preparation
Implementation
Evaluation

SUMMARY OF DISCUSSIONS ON 30th MAY - DRAFT

The meeting reached a consensus that:

1. Community participation is essential for optimizing the benefits of the slow sand filtration project.

1.a. Community participation is essential for community acceptance of the new water supply. It must therefore begin before any steps are taken to install the slow sand filtration system, and be developed in parallel with technical work.
The health agency must therefore be involved from the beginning of the implementation of the project and well before the water supply system is introduced.

1.b. Community participation is also essential for correct use of the water supply. This is a matter of avoiding damage, waste or contamination of the supply (the filter cannot cope with high turbidity, for instance, resulting from farming in the vicinity of the source), and, even more importantly, it is a matter of hygienic use of water and general sanitation.

1.c. So far as maintenance of the supply is concerned, it is dependent only in part on community participation. It must be carried out with the collaboration of the community and the water agency. It was considered generally desirable that the operator should be a community member, but not necessarily appropriate in all circumstances. But there must in any case be collaboration between the operator and the health agency.

1.d. As to the use of communal labour in construction of the water supply sytem, no common approach was taken. While some countries (e.g. Colombia) have adopted self-help labour schemes, others use contracted labour (e.g. India). Some participants indicated that this was an open question which could be explored further.

1.e. Community participation in the sense of maximum use of local labour, particularly unskilled labour, is desirable - but unlikely to require any special decision in most cases. Any opportunities should be taken to use other local resources - skills, materials, organizational capacity.

1.f. As far as possible, community participation should involve consultation with all members of the community. In some cases, it is necessary to work with leaders of higher and of lower strata (where communities are divided in this way), or of other groups.

1.g. To be meaningful, consultation must involve the presentation of alternatives, it must also involve education to enable those consulted to make a reasoned choice. Change must be generated within the community.

2.a. Information on the proposed project, including on all aspects of the terms and conditions, the timing etc. should be made available to the whole community. If leaders are inclined to reserve such information for themselves, as may happen in certain cases, efforts must be made to ensure it reaches others.

2.b. The extension agent (or community worker) must bring to the community information about the need for, and the benefits to be derived from, an improved water supply.

2.c. The extension agent must also bring a knowledge of the process of disease causation in the area of water-related diseases. With some minor amendments to be made, Checklist 3 of the outline was accepted as the basic content of this work. Information on other health-related topics should also be given.

Suggestions and ideas which were raised included:

- The possibility that the extension agent or community worker should be a community member, perhaps the same as the community health worker (most of the participating countries have plans for the training and support of community health workers to bring primary health care to their villages).

- In order to meet health needs, it was suggested that the programme should be integrated with work in other development fields, so that communities can be provided with improvements in other sectors.

SUMMARY OF DISCUSSIONS ON 31ST MAY - DRAFT

The meeting reached a consensus on the following:

1. It is necessary, for the planning of the programme, as well as for evaluating its results, to establish first the community's acceptance of the new water supply and its responsiveness to the encouragement of participation. For this purpose surveys of attitudes to water supply, and of cooperativeness, should be made. Subject to confirmation, the meeting agreed that the methods proposed for carrying out such surveys (Working document I, Pp. 20-23) are appropriate, though the questions asked will vary in different countries, and any questionnaires should be carefully prepared and pre-tested.

2. Particularly in those communities where significant social or economic differences between community members are likely to be found, data should be gathered on the community social structure. The form of enquiry will vary from country to country, but the approaches mentioned in Working Document I, pp. 24-25, and in Working Document II, Appendix I, pp. 2-4, (for India), are noted as possible models.

3. Tests on water quality are desirable for two purposes related to the education component. First, testing of the existing supply in order to demonstrate the need for an improved supply.
Second, testing for contamination between the point of delivery of the new supply and the point of ingestion. The importance to be attached to testing the water will vary, however, according to circumstances: it will be greater, for instance, if the supply is to stand points rather than house connections, and if it is unchlorinated; and logistic feasibility and expense have also to be taken into account.

4. The list of tasks of the community worker, as given in Checklist no. 5 of W.D.-I (pp. 61-2), should be taken as the basis for the country planning of their work (some points in the list, nos. 8 and 9 in particular will not be applicable anywhere).
Some countries may combine the role of the community worker in the present project with that of primary health care worker. If this is done, careful attention should be paid to the relationship between the size of the community and the range of tasks demanded, in order that the workload should correspond with the time they will have available.

5. It is particularly important to emphasize the two-way flow of information in the approach the community work should take.

6. The importance of the supervision of the community worker was emphasized. The general proposals outlined under section 6i of W.D. - I (pp. 48-48) were endorsed by the meeting.

7. Selection, renumeration, supervision and control of the operator should wherever possible and appropriate be a matter for the local community, except for technical supervision which must be a responsibility of the water agency.

8. The content and methods to be adopted in the approach to behaviour change in the community should be decided in consultation between the community worker and a representative group of community members.

9. For behaviour change to take place, the element of facilitation (making the change physically easier) is the most important.

10. The methods of achieving behavioural change mentioned in W.D.I. section 5iii (Pp. 27-36) were generally endorsed. It was agreed that concern with teaching aids should not be allowed to take up to much time or effort to the detriment of other educational methods, since it is face to face communication which is essential.

11. Since the entire purpose of evaluation is to optimize the impact of the activity, and modify any aspect requiring modification, it is desirable that the community should be involved in the process of education.
In all cases evaluation, should, however, include
(i) evaluation of <u>each step</u> of implementation within the prespective of the total programme
(ii) <u>overall</u> evaluation of the process of implementation, including assessment of the degree of two-way communication achieved
(iii) evaluation of the effectiveness of the implementation strategy, in terms of:
a) (as on P.49)
b) (same but omit section in parenthesis)
c) reported and observed practices in relation to sanitation and personal hygiene
b) water purity/contamination at various points between collection and ingestion, in relation to health practices (where feasible)
(iv) evaluation as to whether the community participation in the project has facilitated other developments serves as a spring-board for new activities.

12. Training of the community worker for dialogue is important. At higher levels training is also required, and the need for time for training should be recognized: there should be orientation course for all the men and women involved in the project.

13. Senior project organizers must pay frequent visits to the sites of projects, to familiarize themselves with the conditions and to offer support and informal training to the personnel on site.

14. Whether or not the operators are also given the functions of community worker or health worker, they should be trained to assist in the health education of the community.

SUMMARY OF DISCUSSIONS ON 1ST JUNE - DRAFT

The meeting reached a consensus that:

1. The paper written by Hermione Lovel, "Planning and Education of a Community Extension Programme Health Extension in phase 2 of the slow sand filtration project", with its detailed suggestions, will be very helpful in the preparation of country programmes.

2. A single agency should have full responsibility for health education in the context of the project, but there should be constant dialogue between the health education agency and the water agency, both at higher and lower levels. Coordination is difficult, and one way of providing for it is through joint committees at the highest level. At the level of project implementation in rural areas, the need is not just for regular dialogue but for a fully joint approach.

3. The slow sand filtration project may serve as an opportunity for extending the coordination between agencies.

   Ideas and suggestion which were raised included:

   - the possibility that a unit might be established within water agencies with responsibility for community relations in liason with health education agencies. It should not duplicate the work of the latter, not have a merely general public relations role, but be concerned with the promotion of water supply and use in the context of community development.

POSSIBLE PROGRAMME ACTIVITIES

A. Activities at village level
to be carried out by the community worker(s), with active involvement of the community members and on the basis of an open dialogue.

- mobilization of community development organizations
- set-up of a survey
- organization of group discussions
- demonstrations
- development appropriate (local) information exchange methods
- mobilization communal resources (labour, finance, experiences)
- to establish working relationship with technical staff
- impact and evaluation study
- etc.

B. Support activities at other levels
- organization of interagency collaboration and coordination
- planning (timing and phasing) of simultaneous implementation CD and TE components
- administration and financial aspects
- preparation of educational programme on environmental health and personal hygiene
- logistic arrangements
- instruction community worker
- training local plant operator
- etc.

C. Subject content of information
to be specified in consultation with community and water agency

D. Material available for the compilation of the programmes of activities
- working document by Dr. A.T. White
- presentations by participants
- reports working groups I and II
- document by Miss H. Lovell
- presentations by participants
- reports working groups I and II
- note on development outline of programme (19780601)

On this basis the participants are requested to develop a programme of activities for the promotion of community participation in the Slow Sand Filtration Project; these programmes are to be included in the proposals that will be submitted to the IRC by the PMC of the countries concerned.

Outline of Programme for Community Education and Participation in the Slow Sand Filtration project.

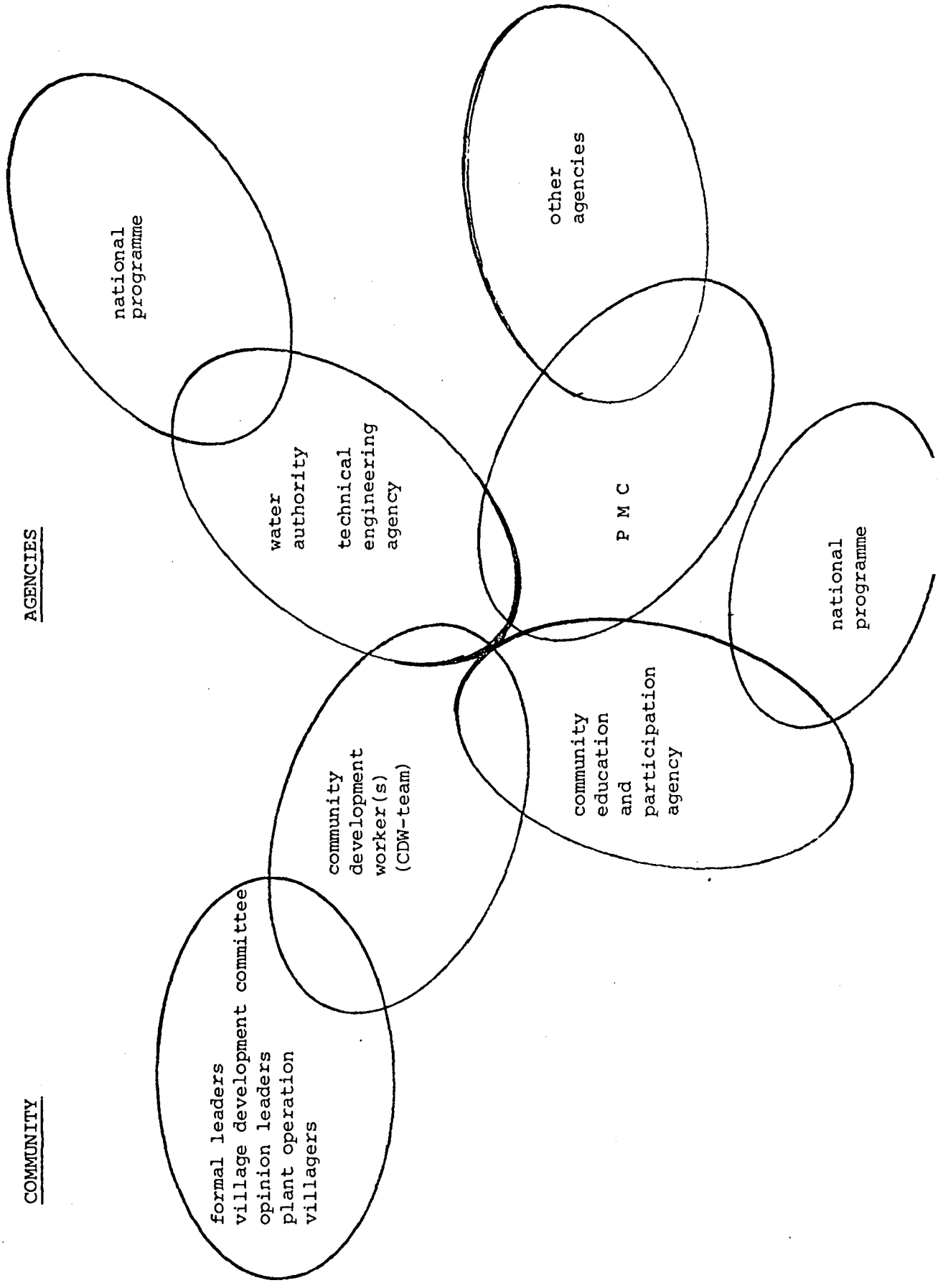
The programme will consist of a series of interrelated activities; with an indication of "why, what, how, when and who" per activity and a bar-chart for the initial period (½ year) and the continuous follow-up (1 year).

A. Activities at village level:
- directed to active participation of the community
- dialogue with the community:
  . exchange of information; transfer of knowledge
  . survey (combined CEP/TE); felt needs, base-line data
  . interlinkage community needs with water project
- information exchange on health- and socio-economic impact, technological aspects and administration and organization of the project; consider carefully what information should flow through each of the available channels: leaders, committee and villagers.
- development community participation in planning, design, construction, operation, maintenance, monitoring, administration, financial aspects, management, etc. of village water supply
- training local plant operators
- development appropriate methods for exchange of information and promotion of participation
- etc.

B. Programme organization and coordination
- coordination at national level
- interagency collaboration (CEP/TE)
- organization infra-structure; lines of authorities (organizational relationships)
- division of tasks and responsibilities
- joint planning CEP/TE Agency and Village Development Committee (VDC)
- timing: simultaneous implementation CEP and TE component (phasing)
- training community development worker (CDW)
- etc.

C. Evaluation

RELATIONSHIPS



who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

LIST OF WORKING DOCUMENTS

Working document I	-	"Outline for the Extension Component of the Slow Sand Filtration Project", by Dr. Alastair White.
Working document II	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in India", by Dr. A.K. Sandhu
Working document III	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in Thailand", by Dr. Sombhong Kutranon
Working document IV	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in Kenya", by Mr. D. Mbai
Working document V	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in Sudan", by Dr. Abdoul Abeda
Working document VI	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in Ghana", by Dr. Nimo
Working document VII	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in Jamaica", by Mr. B. Muir
Working document VIII	-	"Outline for the Extension Programme for the Slow Sand Filtration Project in Colombia", by Mr. M. Santa Cruz
Working document IX	-	Guidance to working groups on "Extension Programmes - Slow Sand Filtration Project".

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SLOW SAND FILTRATION PROJECT

OUTLINE FOR THE EXTENSION COMPONENT

by

DR. ALASTAIR WHITE

Institute of Development Studies
University of Sussex
Falmer, Brighton BN1 9RE
Sussex

March 1978

HEALTH EXTENSION IN PHASE TWO OF THE SLOW SAND FILTRATION PROJECT

Contents

HEALTH EXTENSION IN PHASE TWO OF THE SLOW SAND FILTRATION PROJECT

1. Introduction

The following outline is intended to present some ideas as to what might be considered the objectives of community participation and health education in the slow sand filtration project. It will discuss some of the concepts involved, and set out approaches which might be adopted. It is to be regarded more as a floating of ideas and possibilities than as a set of specific recommendations for action, the more so as circumstances will differ greatly from one country to another.

The recent evidence that more rather than purer water is most important for health improvement, in the current circumstances of the majority of inhabitants of developing countries, underlines the necessity, when purer water is provided, for serious efforts to be made to improve sanitation and hygiene. Otherwise, it is clear, there will be little benefit from purification. The situation appears to be, at least in many places at present, that no demonstrable improvement in health results from the introduction of pure water supplies, because water becomes re-contaminated between the point of supply and the point of ingestion, and because poor sanitation and hygiene allow infection by other routes. It is equally clear that there is a strong need for experimentation with different approaches to the problems of improving sanitation and hygiene, including evaluative analysis of the experiments, since little is known about the conditions for success of different approaches.

No easy formula is likely to be found for improving sanitation and hygiene. It is not just a matter of building latrines, nor is it by any means enough to say that "education" is required, with the assumption that what people should do is known and that if they are told to do it in their own interests, they will. It is now increasingly recognised that dialogue is necessary, but dialogue is not a simple prescription either. There has been a tendency to idealise dialogue and community involvement. The present task is to assess their potential soberly and without ignoring the problems and difficulties.

2. The objectives of the extension programme

The experimental programme in slow sand filtration has the general aim of establishing and demonstrating to what extent it is a useful and valuable technique to be employed in rural water supply in developing countries. The technical virtues of slow sand filtration are known, but they must be realised by the actions of men, women and children in a social environment. The objectives of the extension programme are, (1) operational to facilitate the realization of the technical potential by fostering, as far as possible, a propitious social environment in the experimental communities[1] and by promoting particular actions and behaviour patterns in relation to water; and, (2) predictive to judge the extent to which similar results could be obtained in other places if the programme were extended to a large number of communities so that each one could not receive the same degree of special attention; in the course of fulfilling these primary objectives, it should also be possible, by (3) general learning to gain additional knowledge and experience of different approaches to the promotion of community development in relation to health, and in particular to the promotion of hygiene and sanitation.

A water supply system involving slow sand filtration must be constructed, operated and maintained, and used, and these three phases have different requirements for communication between external agencies and the community where the supply is to be located, in terms of the particular actions to be promoted. Construction will require (at least) a community decision and communal work; operation will require work by one or a few individuals with community support; hygienic use will require changes in personal behaviour by all members of the community. However, a propitious social environment, in terms of the prevalence of positive attitudes towards co-operation in general and the water supply system in particular, will have a

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1. It should not be forgotten that the social environment within the government agencies concerned is equally important: the positive motivation must exist at all levels to make it work.

common influence on all three phases. Thus, a convenient framework for detailing the operational objectives of the extension programme may be to divide them into these four aims:

1a To develop and maintain favourable attitudes throughout the community toward the water supply system being introduced, and toward co-operation to further it;[1] and the enhancement of a co-operative approach to community problems in general.

1b To promote community organisation to co-ordinate community efforts with respect to water supply, possibly including the use of communal labour in construction, and dealing with problems of finance.

1c To teach and supervise one or more operators in the operation and maintenance of the supply system; to settle the question of external and community support for them. One of themain virtues of slow sand filtration is simplicity of operation, but some skills are needed.

1d To ensure that the actions of community members:

i. Promote personal hygiene and sanitation.

ii. Specifically, preserve the purity of water from delivery point to ingestion: use of clean receptacles, etc.

iii. Facilitate easy access to the water supply by others, avoid waste of water and nuisance (mud, etc.) around delivery points, and cause no damage to the water system.

The predictive objective will be met largely, of course, by gauging the degree of success in fulfilling the operational objectives. This implies monitoring of fulfilment, which can be more or less formal. A more formal monitoring would involve measuring in quantitative terms the changes in attitudes toward the water supply, the success in organising communal labour, the efficiency of the operator, and the water-related actions of community members which it has been the operational aim to change. Whether such full-scale quantitative monitoring is considered desirable will depend on:

- its feasibility in terms of manpower resources, etc.
- the degree of confidence which could be placed in what would be largely an exercise in self-assessment by the extension workers

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1. but giving due weight and consideration to negative attitudes which may exist. Under some circumstances, some people may not benefit by the system. When this is so there is the need for it to be recognised and the appropriate action - modification or even abandonment of the project - to be taken.

- a judgement of its predictive value for a different situation in which the extension workers might have less time, less support, and perhaps less motivation or even less training to do the job than they have in the experimental project.

However, it may also be considered that the use of a monitoring instrument, while it may not yield fully reliable results as a predictor of success in an extended programme, is itself a valuable tool in feed-back and supervisory support for the operational objectives, as well as for general learning objectives.

The general learning objective will in the main be met by experience in pursuit of the operational and predictive objectives. Specific provision should be made for recording and communicating to relevant others the gains made in this area, but not separately for making them.

3. The general organisation of the extension programme

Specific forms of organisation of the programme will, of course, depend on the agencies available to perform the function, and their resources. The objectives require activities which have normally been undertaken by health education departments and others which have in some countries been the responsibility of community development or other agencies. It is desirable that just one agency should have responsibility for the extension programme, and that one individual should be responsible for its implementation in a particular community, since its elements must be coordinated to the highest degree and are, in fact, hardly separable in practice.

This implies that if a health education department is designated, and if its personnel have insufficient training and experience in community development, special attention must be given to selecting suitable staff members and preparing them for this part of the work (i.e. for stimulating cooperation and the organisation of construction work). Conversely, if a community development agency is designated, it will be necessary to ensure that the staff have sufficient knowledge of the transmission of water-related disease, and perhaps also of techniques of teaching.

The closest liaison will be necessary with the agency carrying out the technical and financial aspects of the programme (the water authority). At least three areas will need particular attention to ensure a fruitful collaboration between extension agency and water authority: (1) the question of finance: settling the amount and form of the community's obligations, particularly in money though also in materials and labour; (2) coordination of the community's labour in construction - including any community delivery of local materials - with the water authority's input of professional and skilled labour, construction machinery and tools; (3) the training and supervision of the operator.

In view of the need for such close liaison, it may be considered desirable for long-run objectives to create a permanent extension section within the water authority. Whatever solution is adopted, there should of course be as little duplication of functions as possible, e.g. in sanitary education and inspection.

It is, in any case, a question which need only be settled in connection with the expansion of a regular programme for water supply through community participation, rather than in the context of the experimental programme of slow sand filtration. Within the experimental programme, the need is to gain experience with liaison on these questions, to judge the desirability of different forms of organisation.

It is assumed, then, for the experimental programme itself, that an agency such as a health education department will be given the extension task. It is further assumed that a senior member of the department will be in charge of carrying it out, and will assign or have assigned from the department a certain number of staff (extension agents) which will depend on the number and dispersion of the experimental sites. It is essential that the departmen should make available sufficient transport and similar support, and assure adequate solutions to the problems which can cause low morale in rural field work, such as uncertainties over the payment of allowances or concern over accommodation or risks to personal health.

It would seem desirable for one extension agent to be responsible for a very small number - perhaps two or three - experimental sites located in close proximity to one another, with a phasing of activities such that the most intensive period of construction work is not occurring simultaneously at more than one site. If there is only one site in each large geographical area, the extension worker can work full time at this site, or might profitably work also at a comparable place in its vicinity but one without water purification: in this way the benefits of the approaches adopted to health extension could ideally be assessed in isolation from those of SSF and health extension taken together.

Similarly with supervision, a compromise must be made between the desirability of very close supervision, indeed direct involvement of supervisory personnel in each phase of the experimental programme, so that the supervisors become familiar with the problems at first hand, and the need to predict what will happen when such

supervisory support is not so readily at hand. One way of solving this problem would be to vary experimentally the amount of supervisory support given at different sites. Each extension agent should receive close supervisory support at the first site where construction is undertaken, but at other sites the frequency and length of regular visits might be deliberately varied; visits made to solve particular problems could not be varied in this way, but their number and type should be recorded.

4. Conceptualisation of the strategy at community level

We shall consider first how we might describe in greater detail what has to be achieved (the subject content of the extension programme); then examine what is meant, in terms of concrete strategy, by terms like "community participation", "self-reliance" and the like, and discuss the choice of an appropriate strategy of community participation in the present context; finally, we shall turn to the ways in which changing behaviour in relation to sanitation and hygiene might be approached conceptually. This section presents, then, the basis underlying the strategy suggested subsequently in section 5 in more detail.

i. The subject content of the extension programme

The four operational aims enumerated above (as objectives 1a - 1d) provide a framework for the subject content, thus:

a. Development of favourable attitudes toward the SSF programme, and enhancement of cooperation in general.

In some countries this need may be much more pressing than in others, where both the desirability of a pure water supply and the practice of community initiative and self-help are more accepted. But in most places, at least some sections of the population are likely to be skeptical or apathetic. In the enthusiasm to overcome skepticism and apathy there is a danger of exaggerating the virtues of water purification or overlooking sound reasons for skepticism. Keeping this in mind, the subject content implied may be detailed as:

- Creating awareness of the health hazards of a polluted water supply;
- presenting information on likely pollution of the existing supply;
- demonstrating, wherever possible, the pollution of the existing supply;
- stimulating community discussion of costs and benefits of the slow sand filtration system and the improved water supply as a whole;

- gaining an idea of where the costs borne by the community are likely to fall and whether for any section of the community they might outweigh benefits or result in a net gain much lower than for other sections;
- in such a case, endeavouring to ensure that costs are more fairly borne;
- keeping in touch with opinion in all sections of the community, and taking conciliatory or other appropriate action in case of disagreements.

b. Organisation of community inputs, especially communal labour, on the construction of the improved water supply.

In some countries it may be decided that communal labour will not be used for construction. Where it is difficult to coordinate communal labour so that it is available to work at the time that the water authority can allocate scarce skilled manpower and machines, it may be decided that it is cheaper to use paid labour. Before such a decision is taken, however, it is worth while considering, first, whether the presence of an extension agent could not sufficiently improve coordination, and second, whether sufficient account has been taken of the suitability of slow sand filtration systems for labour-intensive construction using predominantly unskilled labour. In another case community authorities may themselves consider paying a contractor for the work, or communal labour may simply not be habitual, with the monetisation of all transactions and the general demand for payment of wages for work done. It may be difficult to organise communal labour in a community divided into social classes with markedly different financial means. In such cases it may be worth while to consider the employment of labour by the community, for a wage (or through a food-for-work scheme), retaining as many as possible of the characteristics of a communal effort. In an extreme case, of course, this will not be possible, and the majority of workers engaged would be labourers from elsewhere (there may be implications for the siting of projects). Where communal labour or some variant of it is possible, however, it involves:

- Allocation of responsibilities to committees and then to individuals
- Establishing a time-table of detailed activities, in co-ordination with the water authority
- Solving practical problems arising during construction phase
- Ensuring that commitments taken on are fulfilled

Ideally, an extension agent should act only as initiator and observer, checking that these things have been done. In order to foster self-reliant capabilities in the future, (s)he should take on as little of the detailed co-ordination work as possible. In practice, a balance will have to be maintained between this goal and the smooth operation of the project, while the extension agent's availability will inevitably lead to active involvement in the day-to-day activities of organisation.

c. Arranging for a community member to be the operator of the water supply system

Slow sand filtration is technically well suited to operation by a community member with only short training. If this solution were not adopted, it would be a major failure - as it would be, of course, if the solution did not work. The arrangement involves:

- Reaching a decision on whether the operator should be a man or a woman, whether more than one person should be trained
- Selection of the individual(s)
- Settling the question of a salary or other form of recompense
- Arranging initial technical training
- Arranging on-the-job training during subsequent operation, especially the first time each kind of job has to be carried out (e.g. first removal of top layer; first replacement of sand)
- Ensuring that any difficulties arising over payment or conditions are solved

d. Health education: eliciting appropriate behaviour over use of water, hygiene, and sanitation

Health education could be conceptualised as fostering "knowledge, attitude, and practice" of the desired behaviour, but such an approach presupposes a one-way communication of a fully pre-determined message, as well as a model of the process

of adoption of behaviour patterns which may not be applicable. Alternatively, it might be conceptualised as "starting from existing knowledge and felt needs, engaging in dialogue, and developing critical consciousness", but there are dangers of over-estimating the relevance (to the particular problem in hand) of indigenous systems and concepts of medicine and disease, of underestimating the importance of simple ignorance about, for instance, the mechanisms of disease transmission, and of vagueness and uncertainty about the directions the dialogue should take.

Here, we shall conceptualise the need as being to:

i. - Build up, in consultation in the community, a detailed knowledge of the ways in which customary behaviour needs to be changed in the areas of water use, hygiene, and sanitation, by bringing together the expert's knowledge of the potential routes of disease transmission, with local persons' knowledge of local circumstances and behavioural habits

ii. - Spread, throughout the community, the knowledge that has been built up, i.e. improve the general understanding of the relevant processes of disease transmission and the ways it could be reduced

iii. - Increase each community member's motivation to reduce disease transmission in the ways suggested by the above discussion and pooling of knowledge

iv. - Facilitate such actions in any way feasible (e.g. by the provision of materials)

The major assumptions involved in this conceptualization are that it is feasible to achieve an improved understanding of disease transmission (the routes, if not the processes involved) in a largely unschooled population, and that improved understanding will motivate more effective changes in behaviour than can be achieved from recommendations or precepts not supported by improved understanding. It is possible that, for some communities at least, these assumptions are misconceived. The possibility may therefore be raised of testing them experimentally by adopting a different approach to health education at one or more of the experimental sites.

ii. Alternative meanings of the notion "community participation"

It has become increasingly clear that some degree of community involvement is essential to the success of water supply projects in rural areas of developing countries, as it is to grass-roots development in other sectors. Amid the general agreement on the desirability of community participation, there is a danger of over-estimating its potential as a technique to solve the problems which have been encountered in the past, for instance the problems of maintenance of the water supply.

In different countries, community participation has taken different forms. In particular, there is a wide variation in the intensity of involvement. Yet terms like "self-help", "self-reliance", even "endogenous development", as well as "participation" and "involvement" are often used almost interchangeably to refer to the different approaches which are adopted. There is therefore a need to clarify what may be meant when one of these terms is used.

The following list of meanings is arranged in approximate order of degree of involvement and can be seen as a kind of scale: the later steps are more difficult to achieve, but if they can be achieved, the potential effect in improving the living conditions in the communities concerned is greater.

Community participation may mean:

1.a. Consultation with community representatives or leaders, to ensure that the programme introduced by the outside agency is adapted to meet the needs of the community and to avoid difficulties in implementation.

1.b. Consultation with other members of the community, or specifically the poor, to ensure that the programme meets their needs.

2. A financial contribution by the community to construction.

3. Self-help projects in which a specific group of beneficiaries contribute labour (perhaps also materials), especially in constructio work; to reduce financial costs. Large input from external agency.

4. Self-help projects in which the whole community collectively contributes labour (perhaps also materials), especially in construction work. There is also a large input from an external agency.

5. The training of one or a few community members to perform specialised tasks (e.g. as village health worker, or operator of a slow sand filtration system of water supply).

6. Mass action: collective work aimed directly at an environmental change of general benefit, e.g. to drain the waste water (distinguished from self-help by the relative unimportance of any input by an external agency).

7. Collective commitment to change in personal behaviour, and collective social pressure for the realisation of such changes, (e.g. construction and use of a latrine, frequent hand-washing with use of soap).

8. Self-reliance in the sense of the autonomous generation within the community of ideas and movements for the improvement of living conditions, as opposed to stimulation by outside agents. But the community may well have recourse to external agencies to help with implementation.

9. Self-reliance in the sense of using only the efforts of the community members themselves, not appealing to outsiders for help.

10. Self-reliance in the sense of using local materials and manpower directly, rather than collecting funds internally in order to purchase goods and services from outside; including increasing local capacities with this kind of self-reliance as a goal.

iii. Choosing a strategy of community participation

The strategy chosen will depend on part on the emphasis given to each of these three goals of community participation:

1) Ensuring that the specific actions are taken which will lead to successful implementation of the water supply project.

2) Fostering the growth of the community's capacity for self-reliant cooperation.

3) Ensuring that the interests of poorer sections of the population, and of women, are served; raising the level of collective self-consciousness among them, weakening their dependence on the more powerful.

The first of these goals implies no more than a 'minimal' strategy, concentrating on meeting in the easiest way the requirements of the job on hand. This will probably mean communicating mainly with a small group of community representatives and individuals active in organising the project, and responding to difficulties as they arise rather than looking for opportunities to expand the scope of participation.[1]

The second goal involves a 'maximal' strategy of actively and imaginatively seeking ways in which more community members can become involved in more ways, understand more fully the reasoning behind what they are asked to do, and participate more fully in making the minor decisions in implementation. It requires more time, effort, and skill on the part of the extension agent. The potential reward is that the community gains in knowledge and skills, and in individual and collective self-confidence; these gains may be more important than the completion of the particular project and outweigh the costs of the greater extension effort. There will be no pre-existing community demand for this approach to be adopted: the impetus must come from a commitment among the external agencies involved. In this respect, one can draw a parallel with preventive health activities as against curative care, for which there is a

1. With this approach, even self-help labour will often be rejected as less practical or economic. The involvement of the community is seen as a means to achieve a water supply rather than an end in itself or a step toward other improvements.

greater demand.

The third goal may raise even more problems and difficulties, for the attempt to involve most actively those sections of the population, the poor and women, where they have been relegated to a subordinate role in the past, will meet with the incomprehension and very likely the hostility of the dominant groups. In some places it will simply be impossible to achieve much in this direction; much more thorough structural reforms will be needed to break the power of the dominant groups before anyone can act against their wishes. But in other cases it is possible for an extension agency to concentrate its efforts on the subordinate groups. In the case of a water supply system, it will not be a question of working exclusively with poorer sections of the population (as it might be with agricultural extension, for instance): the point is only to ensure that the project benefits and activity involve the poor as well as the rich. However, there is a case for trying to work mainly with women, since they are the main carriers and users of water in most communities. The attempt to do so will undoubtedly meet with great problems, since women are generally regarded as incompetent to deal with a 'modern' technology introduced from outside the community, or even to deal with formal relationships with outsiders on behalf of the community. And women, largely, accept exclusion from these roles. A water project may, however, offer a 'handle' for confronting such exclusions, as it can be argued that it is a matter of particular concern to women.

If the purpose were only to ensure the smooth operation of the slow sand filter and water supply, a 'minimal' strategy of community participation would probably be chosen as having the greatest prospect of success in achieving that objective with relatively little administrative effort. Such a 'minimal' strategy would probably include a community contribution to construction, in labour and/or money, but little else.

The difficulties involved in any attempt to achieve a greater range or depth of community participation should certainly not be minimised. However unless it is achieved it is extremely

unlikely that health benefits will flow from the installation of the slow sand filter, to any measurable extent. Health benefits will result only if there is a substantial change in standards of hygiene and sanitation, and such a change is unlikely to be brought about without extensive community participation. An active involvement with the planning, construction and operation of the slow sand filter and water supply will be complementary to the efforts being made to improve hygiene and sanitation, in the sense that the more interest and involvement people have in either area, the more receptive they are likely to be to suggestions that they become involved in the other - at least, one would expect this to be so if the connexion between the two is well understood.

It is important not to over-estimate the extent to which communities can become self-reliant, particularly in so far as knowledge and ideas about what changes are necessary are concerned. Typically, a community's stock of technical knowledge is limited. Community members are aware of this, and reasonably assume that the answer is to bring to the community what exists in larger and more prestigious communities: there is little basis for attempting to solve the community's problems in original and self-reliant ways: outside advice will be necessary to point out how this may be possible, or indeed to teach the necessary knowledge and skills.

It is also important to recognise that internal differences of interest within communities may make the pursuit of common goals very difficult.

iv. The conceptual approach to changing behaviour

It is reasonable to classify the reasons why people may adopt a change in behaviour relevant to health, as follows:

1) they understand, more or less well, the process by which change is likely to have a positive effect. Motivation is directly in terms of the health goal, and is self-directed.

2) They accept authoritative assurances that it will have a good effect for health. The acceptance may be hedged with skepticism, and it may be short-lived.

3) A reference group of persons of higher or similar status adopt the change, so that it is endorsed by group judgment.

4) Informal social rewards and sanctions may play a role: they may seek admiration for innovating in directions others will follow, or fear to incur a low opinion, negative comments, etc. by omitting to do what has become conventional.

5) Formal sanctions (punishments, fines, etc.) are threatened against those who fail to perform the action. This may, of course, apply to children within a family, or others in subordinate positions, while the motivation of the parent can be classified in another category.

These reasons are not, of course, mutually exclusive, and they do shade into one another. But they provide a basis for thinking about the ways in which behaviour can be influenced.

The less publicly visible - more private - the behaviour, the less the latter reasons (3, 4, 5) can apply, and the more emphasis must be put on the development of understanding. This is probably why many programmes aimed at the improvement of sanitation have concentrated on the construction of latrines (visible), neglecting for instance the washing of hands (private).

The use of authoritative assurances (2), which is indicated when the behaviour is highly specific (while the reasoning concerning the need is complex) (e.g. taking a particular medicine), is less useful when the behaviour cannot be specified in such detail (hygiene requires the exercise of judgment, therefore understanding).

A private activity can be turned into a more public one by public discussion or, in particular, by any kind of check-up or evaluation in which people are asked whether they have adopted a certain practice. This makes it impossible to avoid observer bias in an evaluation aiming to compare the effectiveness of different approaches to health education, in so far as the private areas of behaviour are concerned.

Another way in which private behaviour can be made more subject to change through social rewards and sanctions, is by linking it with a visible change. For instance, handwashing is generally a private activity. But increased handwashing may be achieved through a physical change, such as the installation of a tap in a place convenient for washing on return from a latrine, or by encouraging the use - visible for others to see - of a bowl and soap.

In this example there is also, of course, an element of facilitation: any policy to persuade people to change their behaviour should provide, wherever possible, for making it easier for them to do so.

With this conceptual approach, then, the problems of achieving appropriate behaviour in relation to water use, hygiene, and sanitation become:

First, establishing, in consultation with local people, what are the appropriate behavioural changes.

Then, establishing, again in consultation with local people, which of these changes may be susceptible to feasible efforts to:

a - increase understanding by detailed explanation, demonstration, etc.

b - have authoritative statements made (by various authoritative figures, from the extension agent or other health personnel, to community leaders, religious leaders or traditional practitioners, or perhaps by bringing in a cinema van with films, using the authority of a modern medium)

c - have a group of persons adopt the innovation in a publicly visible way, or gain group commitment to do so and follow it through

d - check up by asking people about their behaviour, or otherwise manipulate informal rewards and sanctions

e - impose rules for public behaviour, e.g. acts which cause public nuisance

f - facilitate changes: helping with obtaining materials, mutual aid in construction of latrines, etc. It may well be necessary to start with design of an appropriate latrine for local conditions: cheap to construct, but effective and odourless, etc.

5. Methods and techniques for a strategy of community involvement

i. Initial contact and the putting of proposals

It is assumed that there will be an early meeting with community authorities, at which the plans for the water supply will be put and discussed. It is important that this meeting should leave no doubt about the extent of the water authority's commitment: whatever costs will fall upon the community should be explained then. This implies that the policy on the division of costs has already been decided. It is also necessary that the first meeting should raise, if not decide upon, other basic questions such as the particular form of financing, the use of communal labour in construction, and whether house connections are envisaged for some or all households, or only public standpipes. If the water authority is not to take responsibility for payment of the operator, then this difficult question must be settled.

The extension agent should then begin gathering baseline information (see below) and at the same time make informal contacts in all sections of the community, engaging in dialogue concerning the proposed project, and making sure that the whole population is well informed about the proposal including its benefits and what they will be expected to contribute. At the same time he or she will be making contact with organisations and key individuals (see above: "Elements of a maximal strategy for community participation") and should perhaps[1] gather a group of appropriate persons, formally as a committee on sanitation or perhaps informally (avoiding questions of status rivalry with other committees). This committee or group will be consultative in the first instance: it may or may not take on an active role later. It will be the group in which expert knowledge and local knowledge are pooled to produce ideas on necessary changes in behaviour and how to bring them about. It will probably be best to include a schoolteacher or similar person with formal education, but also to include persons from less advantaged sections of the population and, where possible, women. If it is drawn only from an upper stratum, it is likely in many communities merely to condemn rather than to understand the behaviour of the poorer classes

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1 The alternative is to involve the whole community in this way. This will be more feasible in small villages, but also depends on the enthusiasm which can be generated.

See Checklist No. 3 for starting points for discussion with the group.

ii. Gathering baseline information

There must always be a compromise between the desirability of thorough knowledge about a community before an attempt is made to influence it, and the need to get on with necessary changes. It is not usually practical to take the advice of a prominent anthropologist who says "It is therefore necessary, not only before implementing a scheme, but before creating it, to begin with a careful study of the population on which one wishes to act, to know its culture in all its details and in all sectors...." (Roger Bastide, Applied Anthropology, London: Croom Helm 1973, p.121). Indeed, it can also be argued that knowledge of a community's capacity to change can only be confidently established in the process of introducing change. However, some pitfalls may be avoided by information which allows the anticipation of certain difficulties. In particular, information about whether the changes which seem necessary to the outsider are seen as necessary within the community.

The topics on which baseline information about a community should be gathered, then, are those which are relevant to the acceptance of the programme and to possible constraints upon its implementation; also data on the institutions and organisations which may be enlisted to help with implementation.

On acceptance of the programme

Have community representatives taken an initiative to request improved water? If yes:

(1) Consult with them on whether the SSF system proposed meets with their needs:
   (a) Are they satisfied that it is sufficiently 'modern'?
   (b) Are they satisfied that the commitments, financial and other, that they will be required to make, will not be seen as too big a burden by comparison with a

lower-level improvement which, it should be pointed out, will still meet many health goals?

(2) Consult informally with community members of all strata and both sexes - in some situations this may need to be done by 2 different extension workers - discussing the technical options, their virtues and their requirements, and ascertaining whether a broad consensus already exists or is likely to be formed given existing attitudes. Elicit, in particular, attitudes of poorer strata towards paying a financial contribution and toward performing communal work in the construction phase: would they prefer to be left with more time to work on their own farms or other occupations? Do they fear that the water supply will reach or benefit only the dominant group?

If no request has come on community initiative, but the site has been chosen by project personnel on technical grounds:

(1) Establish level of satisfaction with existing water source(s). A survey is needed to establish satisfaction, in each section of the community, by geographical location, social group, and sex, with each aspect of the existing supply: accessibility, taste, appearance, and whether it is associated with disease(s). (Suggestions for survey questions are given in an Appendix.)

(2) Establish as far as technically feasible the objective level of pollution of the existing supply.

(3) Establish whether there are any features of the manner in which water is drawn from the existing source, such as the social gathering involved, which are valued and which might be lost with a reticulated supply; e.g. women may bathe at a secluded water source, but could not do so at a tap in the village.

On constraints to implementation: cooperativeness:

- What forms does cooperation already take in the community?
- What are the constraints against increased cooperation?

Every community has some interest in making a favourable impression on outsiders. This is especially true of the community authorities and dominant individuals and groups, and is most clearly expressed at formal meetings with outsiders. The more formal the enquiry, the more it is made to community representatives without realistic possibility of cross-checking with others, and the more it is made with other members of the community listening, the more likely the reply will over-estimate the degree of cooperation likely. The following approaches may circumvent the difficulty:

a) Asking not about the potential for cooperation, but about actual projects already carried out. Even here there is a danger of exaggeration, of attributing more to communal cooperation and less to outside help.

b) Establishing rapport with individuals from various groups in the community, including non-dominant groups, and asking them informally and privately about the problems of cooperation. Tact is, of course, essential.

c) Asking disinterested persons who may have objective knowledge on the question, such as schoolteachers who are not indigenous to the community. There is some danger, however, of giving undue weight to a subjective judgment which may not in fact be well founded.

d) Use of projective techniques such as the structured scenario, in which a sample of community members is asked to comment on a hypothetical situation with a theme of cooperation. Examples are given in Appendix.

On relevant features of the social structure

In many countries, the main threat to the success of the programme is likely to come from sharp differences of interest between different sections of the community. For instance, domination by one group may be so extreme that the implementation of the project will necessarily be entirely on that group's terms, with no possibility of developing self-reliant capabilities among other groups whom it would be appropriate to call the "oppressed". In another case, one group may still be powerful and politically dominant, but other groups may be more or less actively disaffected. Although a water supply project may be designed to benefit all sections of the population equally, in such circumstances it will be seen in the community largely in terms of the sectional advantages it may offer - there will be distrust and cooperation will be difficult to organise. The range of possible situations will differ in each country: it may be possible for a typology of half a dozen typical community social structures to be drawn up for each country, in terms of the types of groups or individuals holding power and the basis on which that power rests, the extent of challenge and whether it is factional or class-based, etc. A different way of approaching the fostering of cooperation, even for such a politically-neutral purpose as a water supply project, may need to be developed for each type.[1] A typology might, at least, help the extension agent to formulate a description of the informal social structure in a community where he is working. Such a description should be regarded as necessary baseline information.

The typology might be constructed according to the answers to questions about the communities such as the following:

- Is power effectively concentrated in a single group, or can it be said that any member of the community can, without reprisal, exercise a full voice in community affairs?

- If it is concentrated, is it effectively monopolised by one ethnic group, clan, or caste? Are they in a majority or a

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1 e.g. If there is considerable resentment against the power held by a dominant group, such a group's support for behaviour changes which must be voluntary (private behaviour) may be useless or have a negative effect. The extension agent will have to work more with opinion leaders in each section of the population.

minority?

- If power is concentrated, is it largely on the basis of greater wealth, rather than, say, simply a matter of traditional position or perhaps religious authority?

- Is power based on the threat of physical reprisal if challenged?

- Is there factional conflict? For example are the more influential and wealthier members of the community divided into two or more groups vying for political dominance, each with clients among poorer sections of the population?

- Is there conflict along class lines? For example, is there an open challenge by poorer sections of the community to the political power of the wealthier? If so, has it been successful in terms of taking control of local authority institutions?

- Is power, on the contrary, total? For example, exercised by a large landowner over the community living on his estate?

Sometimes a very large proportion of an area's communities might fall into just one category defined as above, and it will be convenient and useful to make further distinctions, e.g. in an African socity where traditional position remains important, it will be necessary to establish the extent to which the chief's (and elders') authority is disputed by sections of the community, or the weight it carries in face of apathy, even without being openly disputed. Or, where power is highly concentrated and the powerless present no form of challenge, it may be important to establish whether one aspect of the dominance which is exercised is control over the flow of information from the outside. In such a situation, an apparently neutral innovation such as SSF may be perceived as a potential threat by the power-holding group, who may put obstacles in the way of direct contact and dialogue with other sections of the population.

It is necessary, of course, to pay particular attention to those socio-economic divisions which might make some members of the community look on the water project with less favour than others. A checklist might be prepared, with such items as the following:

- Are there any people (men, women, or children) who are currently paid to fetch or cart water for others? If so, their predicament should be discussed both with them and with village representatives (a water carrier might, for instance, have a good claim for consideration as the operator of the new supply).

- Are there people with private wells who sell their water?

- Are there people whose incomes are so low that they will be hard pressed or unwilling to pay the charge envisaged for installation or for subsequent supply? Frequently, the fact is overlooked (by those who expect ready cooperation for communal ends) that an equal contribution or charge represents a greater proportion of a poorer family's income, and therefore a greater real burden - a situation which may well lead to apathy. If the community produces a cash crop, particularly if it is handled through a single buying agency, it may be possible for the cash contributions to come from a fund established by a levy on the cash crop, a form of progressive taxation. An alternative way of solving the problem of apathy, namely to found a self-help water association providing water only to members, would appear to solve it only by ignoring the needs of the poor (though this may not be true in all cases when the full circumstances are taken into account).

- Is there any possibility that the water might be appropriated by the powerful sections of the community just for themselves (e.g. for their farms, not leaving sufficient to reach the homes of poorer people)?

On the points where water pollution currently occurs

In Dr Feacham's companion document, 'Public Health Studies in Phase Two of the Slow Sand Filtration Project', methods of

water analysis are described and an illustration given (Figure 7) of pollution occurring between collection and use. If such data are obtained, they would clearly be most useful in health extension work in the community. However, for this purpose it would be desirable to pinpoint where the pollution occurs more exactly, by taking samples at various sub-stages of the collection and storage process and even, if observer bias can be avoided, in cups or other containers used for drinking. The main problem is one of observer bias, i.e. the likelihood that people will make a special effort to clean their utensils when they know measurements will be taken. The extension agent should pay special attention to minimising such bias if possible, and to noting down when it has clearly not been possible to avoid it.

The differences between the measurements from different households' containers might be a basis for recommending particular practices. But it is essential not to give offence by publicly identifying those whose water vessels are most polluted.

The health education purposes will be best served if people are shown as much as possible how the analysis is carried out. At the least, full explanations should be given from the time of sampling, and the average results should be shown and discussed. At best, it may be possible to arrange for schoolchildren or others to learn the procedures and carry out analyses themselves.

iii. Media and techniques in health and sanitation education

The formation of a consultative group or committee on sanitation in the community, by the extension agent (see 5.i. above), and the discussion by that group of the behavioral changes necessary to improve hygiene and health, would in itself be a concentrated form of health education for the group involved. The extension agent should then invite the same group to discuss the ways in which the rest of the community might be brought to understand the need for the necessary changes, and carry them out.

The group, with the extension worker, will consider and plan the use of some of the following educational methods:

(1) - Group teaching: groups of manageable size assembled for a talk given by the extension agent, supplemented by statements from other authority figures if this is found convenient and desirable.[1] In a small village, groups might be assemblies of all villagers, either called for this purpose alone or taking advantage of another reason for gathering, such as communal labour (addressed during a rest period). Otherwise, groups might be assembled consisting of voluntary organisations such as churches; or within wards of a large village or small town, with an effort made to get together a high proportion of the ward's inhabitants. Cooperation of schoolteachers will be sought for what can be a more thorough teaching of children at school, and active involvement of schoolchildren in all activities.

(2) - Group discussion: similar to above, but with generally smaller groups to encourage more dialogue. Dialogue and discussion are important at every level: people are, for instance, more likely to go on thinking about the subject matter if they have joined in than if they have listened passively, especially to just one speaker. For most people to be able to join in, groups have to be small. It is probably best to use both large and small groups, so that the learning is reinforced. It may be possible to hold meetings of groups of, say, 3 to 6 contiguous households, with all members, men and women, gathering in a central spot.

(3) - Individual teaching and dialogue: the extension agent, and perhaps the members of the informal group collaborating with him (say in groups of two or three persons) might go to individual houses to encourage the adoption of changes. This should be particularly useful as a way of finding out what doubts and difficulties constitute constraints on adoption; it would also be an informal way of bringing some mild pressure to bear - but for this very reason it is important that it should

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1. It is important to avoid disappointing meetings, e.g. promising an outside speaker who does not arrive. It is unrealistic to expect groups to hold meetings at which knowledge acquired by some members is passed on to others.

not be done in such a way as to cause resentment.

(4) - Visits to model sites, e.g. of slow sand filtration in operation in a different village; or of various sanitary improvements such as latrines of a particular design (one, of course, which those to whom it is shown will be able to construct or can afford to buy).

(5) - Practical demonstration of how something can be done, such as making latrine lids from local materials.

(6) - Organisation of a community self-survey. This is, of course, a more ambitious method, but it has proved valuable in widely differing communities as a way of enhancing community concern for health, hygiene and sanitation. With the collaboration of the extension agent, a group or groups within the community draw up a set of questions to ask in each household. School classes might very well be involved. Questions might cover facilities, behaviour, and perhaps beliefs or attitudes in the relevant areas; it might even be considered worth while to try to demonstrate a connection between the adoption of a certain practice and a lower incidence of, say, diarrhoea. However, the aim is educational, not scientific: people should be involved as much as possible in discussing what questions to ask.

Within the teaching or discussion sessions, there will probably be a place for techniques of enlivening presentation, involving people in a more memorable experience, or just aiding explanation, including:

(1) demonstrating the existence of microscopic organisms by use of a microscope. This has been found particularly useful. It may be important to make sure that the nature of the magnification is well understood, perhaps with the use of lenses with intermediate degrees of magnification.

(2) Visual aids including:
2.i. flip charts, useful in making a systematic presentation of points to be remembered;

2.ii. flannelgraphs, which are more adaptable to audience participation. It has been found that there is often considerable enjoyment in moving the figures around to make the characters perform such activities as, for example, washing their hands.

2.iii. Blackboard and chalk, the most adaptable aid for planning an agreed strategy between a number of people present, since alterations can easily be made, but the final result is clearer than in a purely verbal decision.

2.iv. Videotape or film, which carries the authority of 'modern' technology. If they are shown, the impact is increased by follow-up activities, ranging from discussion to a decision to take a practical action. One successful idea following the showing of a videotape on schistosomiasis transmission, in Surinam, was to organise an art contest for children in which they created their own versions of the lesson carried by the videotape.

(3) Performances, e.g. dance-dramas with a message, forms which are locally traditional, perhaps to be done by schoolchildren. Performances might be staged, for instance, in celebrations to mark the start, completion, and opening of the SSF project. There is a general value in using local artistic tradition of whatever forms, and encouraging participation by community members using these forms to recreate the message which is to be reinforced. It may be traditional to tell a story in dance or song, or by a series of painted pictures. Opportunities can be taken to invest these forms with a new content, even within original settings such as festivals. Puppet shows have also been successfully used in conveying health-related messages in village communities.

It is, however, important in the author's view that concern with technical aids should not be allowed to take up much time or effort at any level. It is face to face communication which is essential, and the more attention the extension agent gives to

technical aids, the less will be available for simple communication. The medium, it might be said, can get in the way of the message.[1] This is particularly true of visual aids such as films when the life-style of the characters portrayed differs from that of the community where it is shown - whether it portrays a community with a different cultural tradition or simply one with more financial resources at its disposal. A similar thing can happen even with still, drawn or printed pictures. At the level of planning and management of extension work, concern with the procurement of technical aids can consume time which would be more profitably spent setting up a programme with whatever means are to hand. Even at the level of conceptualising a programme, it may be necessary to resist a temptation to concentrate attention on technical aids, arising perhaps from the fact that this is an area of technical competence of the health educator. At all levels, then, technical aids carry a danger of bias against that "dialogue among equals" which is necessary at community level.

If there is a feeling that the extension agent must appear of high status in order to command respect, and that one expression of high status is modern equipment, it may be possible to meet the need (if a real one) in other ways, such as the provision of good transport for the extension agent; or, perhaps, in a community without electricity, the use of generator-powered electric light for conducting meetings in the evening, thus at the same time attracting a large crowd.

Techniques relevant to particular points which must be conveyed

1. Understanding of the role of water pollution in the causation of sickness:

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1. Microscopes are an exception because they add vivid evidence.

(a) Group teaching and discussion will elaborate on the association which is probably already made by community members between faeces (at least those of others) and the danger of disease, by presenting the facts that:

- living things too small to see which cause particular diseases ("germs") are present in faeces and remain alive when separated from them and carried or washed into streams or other water bodies
- if they are then drunk in the water, they multiply like other living things, only faster, and that is how they can become strong enough to cause disease
- they are in even the faeces of healthy people and babies
- they are completely stopped in the top layer of the slow sand filter (it may not be necessary to explain to everybody that this happens biologically)
- animal faeces are less dangerous because they have largely different diseases, but are still dangerous.

(b) Tactful enquiry will be made as to whether there is any contradiction between these ideas and other ideas which people hold in the community.[1] If such contradictions are found, there are two possible ways of confronting the problem:

(i) to find an argument that there is, after all, no incompatibility. For instance, if water from a stream is identified with, or regarded as a gift of, a deity or spirit of that stream, and hence should not be tampered with by boiling or even filtering as this would upset the deity, it may be expedient to argue that the water is pure when it originates in the stream, but that people unfortunately pollute the stream so that filtering out the pollutants is a way of purifying the stream, and may even be regarded as honouring the deity.

(ii) To oppose the traditional idea. This might be essential if no argument of the former type can be found; it carries, of course, the danger of a

1. It should not be assumed that health education is primarily a question of breaking down traditional views

negative reaction by some or all of the people. It is necessary, then, to ascertain first approximately what proportion of the population might react negatively and to what degree. It may then be desirable to discuss the question with leaders of traditional religion, or indigenous medical practitioners, perhaps gaining their backing for a redefinition of the traditional ideology. Traditional ideas are not necessarily immutable: they evolved in step with group life and were adapted to it.

(c) The results of any tests of the quality of the water should be carefully and fully explained, preferably with demonstration of the methods by which the results were obtained - e.g. demonstrating how cultures of organisms grow in samples taken from the source but not in samples taken from other, purified, water. This is a reason for water analysis to be carried out locally if at all possible.

2. Understanding of the need to protect water from faecal pollution between collection and use:

(a) Practical demonstration of the ways in which water can be contaminated: from unclean containers, from hands or fingers coming in contact with water while carrying containers, etc. At the same time, the extension agent can discuss with people and demonstrate how the same actions of carrying and handling water can be carried out without polluting it, how containers can be cleaned, etc. This should be carefully demonstrated also to children as carriers.

(b) Discussion with the community of the analyses of water quality made not only for samples taken from the source, and stages of supply up to the collection point, but also samples taken from water at each stage from collection to final use (see above, p.27). Samples taken should be labelled and analysed to permit, as far as possible, comparison between households with

different practices and/or comparison between average value before and after efforts have been made to improve the practices. This is a matter of evaluation of the efforts being made, but it can also be used immediately to inform the community members about where pollution is occurring. But note: there may be problems of coordination between the extension agent and those who have the technical job of water quality analysis.

(c) It may be found desirable to make provision, perhaps through a bulk purchase for every household in the community, of water containers of a design which does not lead to pollution but that retains the other advantages for the local population of the containers they currently use. Such a step, however, would need to be preceded by very thorough discussion by the users concerning the merits of different containers, and might be unrealistic (at least without a subsidy) if the suggested containers are expensive relative to local incomes. In some cases it may be possible to consider local craft manufacture or improvisation. Improvised carts may encourage the transport of more water from standpipes to houses, as compared with the direct human carrying which may have been customary or necessary when water was fetched by footpath. This might be a valuable gain, given the importance for health of the quantity of water used. It is an implication of some recent studies that people do not necessarily use more water when it is piped nearer to their houses, unless the supply is brought within the compound, but they might do so if the method of bringing water were changed.

3. Personal hygiene in disease prevention.

(a) Group discussion and dialogue are particularly important as has already been stressed. There are likely to be problems of reticence, or unwillingness to discuss what are seen as 'shameful' topics. Tact is required: the extension agent must broach such topics confidently but must judge when it would cause offence to push further. In group discussions, people should not, on sensitive topics, be asked about their own behaviour, but about what is

generally done.

(b) A doctor practising in the district might be asked if there are any particular aspects of hygiene in the area which require emphasis: there might be points which a doctor is in a good position to observe, but which might not come out in discussions in the community.

(c) The use of soap for washing hands should be emphasised in teaching and discussions. (It is important that soap should be available. If this is a problem, efforts should be made to ensure supplies.)

(d) If construction of latrines is decided upon, it is absolutely essential that the design should be fully discussed among those who will build and use them, otherwise they are likely to be left unused even if constructed. Reasons for non-use include nuisance from odour, and designs using seats where the habitual position for defecation is squatting. Normally, also, a design must be made for local, low-cost, production.

4. Technical aspects of slow sand filtration.

It would be highly desirable if a number of community members, apart from the operator, could gain a good understanding - similar to that the operator needs - of the working of the slow sand filtration system. The operator would not, then, be in a monopolistic position, and there would be likely advantages in terms of the interest taken by the community in the upkeep of the system.

(a) For this purpose the extension agent should gather a group of villagers to whom explanations of the technical details will be given: if possible, first on a visit to a working SSF project elsewhere; and in any case, at appropriate points in the course of construction and initial operation. Explanations should as far as possible be given as a practical demonstration on site.

(b) Technical personnel of the agency should be consulted as to the most likely or frequent causes of damage or misuse of the SSF system, and particular efforts directed at ensuring a full understanding of the requirements of the system on these points.

(c) To the extent that is possible, the community should be consulted on the proposed technology. At the least, the water agency should be open to comments and suggestions, which should be elicited in particular from the group mentioned at (a), and conveyed to the agency by the extension agent.

5. Need to avoid waste of water and nuisance around collection points.

There are two kinds of solution to problems of water waste and of formation of mud puddles, etc.: to persuade people to avoid creating the problem, using the water only in the way intended; and to construct or adapt the physical facilities in such a way that the problem cannot arise (e.g. more elaborate drainage; types of taps which cannot be left running). Which solution, or combination of the two, should be adopted will depend on local circumstances and must be discussed in the community. Allowance should be made for a possible need to provide extra cement or other materials for a modification of the physical lay-out at collection points in the light of experience.

Misuse leading to the creation of such problems may well be a matter of children's behaviour, and it will be appropriate to discuss it with schoolteachers. If children, by active involvement in construction or with other aspects of extension work such as a community self-survey, have been imbued with some commitment toward the water project, they may feel a share of responsibility for it and be less likely to misuse it in their role as water collectors.

iv. Mobilisation of community efforts

There have been a number of difficulties with self-help projects for water supply construction. Sometimes they have been found to entail greater costs for water supply authorities, as well as adding to the administrative burden. Usually, however, the difficulties can be traced to inappropriate ways in which the co-operation with communities has been approached. There has usually been insufficient mutual understanding between project authority

and community. In the present SSF project, there is an opportunity for more extensive communication, leading to improved understanding, through the extension component. The kinds of difficulties which may arise, and which must be tackled primarily by the extension agent, are discussed below.

a) Difficulties arising from excessive expectations or demands for communal labour, or over-enthusiasm. Administrators sometimes fail to appreciate that it may not be in the real interest of poorer people to spend time, effort, or particularly money on an 'improvement' which does not benefit them very much. It may well be too easy, on occasion, to obtain community assent for an undertaking - villagers may be anxious to please an administrator (or even a traditional leader) who has high status and power relative to themselves, and at the time of giving their assent it may be not entirely clear how much they will have to contribute. Quite often it appears that authoritarian methods are employed: a district officer (or a chief, in African countries) may simply tell people to work on a project, or require contributions in cash or kind. It is not surprising if work is then performed grudgingly and poorly. An opposite case occurs when communities press ahead with a project before the administrative agency is ready to make its necessary inputs (there might be a form of competition between communities for the attention of the agency, with the advantage going to the community which does most work first).

These difficulties must be borne in mind and avoided, particularly by the extension agent maintaining continuous contact and dialogue with all sections of the community.

b) Difficulties arising from failures in coordination between agencies and community or within the agencies. There may be long delays for the community waiting for materials to arrive; skilled labour may arrive to find that the community has not yet done the preliminary work required, or that needed materials have not come.

These difficulties must be avoided by making agreements on a timetable of activities carefully and in such a way that the responsibilities of each party are clear, including the dates by which each activity must be completed. Blackboard and chalk will be useful at sessions in which programmes of activity are agreed

among several parties, since publicly writing down each commitment reduces the possibility of misunderstanding. There should be a joint programming meeting in the community at which the technical staff of the water supply agency agree with the community upon:

i. the list of operations to be carried out

ii. who is responsible for each operation (whether agency or community, and which groups or individuals, within each)

iii. start and completion times for each operation

iv. how to keep each other informed on progress and completion of each operation

v. how each operation will be carried out, checking feasibility and looking for possible snags.

It will then be the responsibility of the extension agent to maintain a continuous check on the progress on each side toward the fulfilment of the tasks undertaken, and to take action to avoid serious failures in coordination.

c) Difficulties arising from poor quality of work. Community members will often be unskilled at the tasks involved, such as digging trenches of uniform depth. Yet these tasks are not inherently of any great complexity: it is largely a difficulty of communication, or of supervising a large number of people who are strangers to the supervising foreman. Probably too often the poor quality of work is taken as inevitable, and regular labourers hired to complete (and rectify) work started badly by communal labour. Or communal labour is simply dismissed as too low in quality for the requirements.

These difficulties can usually be overcome by careful explanation of the needs, so long as good communication has been established. This is the task of the extension agent. Often, there are one or two persons within the community who have a particular aptitude for the skills required: their emergence as informal leaders during the relevant stages of the work can be encouraged.

d) Difficulties arising from the need to work on other farming (or other economic) activities. It should always be borne in mind that anyone's willingness to contribute voluntary work will depend on his (or her) relative assessment of its value as compared with the alternative use he could have made of the time. Where farming activity is highly seasonal, communal work should preferably be arranged in the slack season. This applies doubly to water supply when the slack season is also the dry season during which the subjective valuation of water is highest. It may, of course, be difficult for a water supply agency to arrange the deployment of its equipment and skilled personnel during the rainy season if it is heavily dependent on complementary inputs of communal labour which is not forthcoming at that time. However, probably not all work requires complementary communal labour at the same time, and much can be achieved by careful pre-planning of activities well in advance.

There may well be a temptation to use payment or food-for-work as an incentive for local labour during periods of intensive farming activity. There is a danger that the cost in lost agricultural production will outweigh the gains of payment and of early completion of the project, in terms of the real interest of the local population. If the relative advantage is uncertain, the cost of waiting until a slacker period will at least be known. If payment is used in some seasons or for some communities, it may be difficult to avoid making the same payments elsewhere and in all seasons.

e) Some community members may be reluctant to do communal labour because they consider it beneath their status (relatively affluent persons, or educated young men); or it may be considered improper for women to do it.

These problems can only be solved, if at all, by thorough discussion and decisions taken by the community (to give a role to women, or to put pressure on recalcitrant persons). The extension agent can only raise such questions for discussion. The use of administrative authority (the police) to enforce conformity would usually create resentment and work against the general goal of stimulating voluntary participation.

f) Some people, or whole communities, may be reluctant to contribute by reason of previous negative experiences of cooperation with official or other agencies, or distrust of the motives of the agency or its personnel.

The only remedy is, of course, correct behaviour toward community representatives and members: a demeanour which is respectful and not overbearing or superior; honesty; keeping promises, appointments, etc.

g) The most important likely cause of reluctance to work on communal projects is the fear that the benefit will accrue to others. Checklist No. 4 lists some ways in which the project might conceivably lead to a deterioration of the relative position of poorer sections of the community. There are, conversely, other ways in which their relative position might be improved (e.g. removals of forms of monopoly control over water supply), in which case there might be opposition from those whose power is reduced.

There are also dangers that one group or individual may seek to gain an advantage from the installation of the water supply, i.e. from the way in which it is carried out, as opposed to the benefits from the subsequent supply. Ownership of land may provide one such opportunity: the slow sand filtration system must occupy a certain amount of land, and the question will arise as to which land will be used and who has rights (of ownership or usufruct) to that land, whether they will receive compensation, etc. Ideally, land which is common to the whole community will be used. If one group or individual donates the land, it must be clearly established that this does not give them any particular rights over the water supply. The manner in which this is done will vary according to local custom; in some cases it may be necessary that the land should be bought. What must be avoided is the charging of an excessive price.

In some extremely divided "communities", e.g. divided between caste and harijan sub-villages in India, it may be impossible to avoid that the sub-community on whose land the water supply is built considers that it has rights over the water. It may be necessary to provide a separate supply for each sub-village, despite technical and economic considerations.

A second type of opportunity for gaining special advantages from the process of installation is provided by the very need for organisation itself. In a community which is divided between factions, control over the organisation (the water committee or similar body) which is implementing a major improvement can be a highly important political resource, and there may be a sharp struggle to achieve such control. Clearly, there is then a danger that the defeated faction will not cooperate. In communities which are divided between factions, it is the task of the extension agent to seek cooperation by all sections on the water supply project: this will usually mean attempting to ensure that all factions are represented on organisations such as water committees, that all leaders have a role which they regard positively, and that no group feels dominated even if its opponents gain control of the most important positions.[1] This will often be a difficult task: the way in which it can be successfully carried out will vary according to local circumstances (e.g. practice concerning election or choice of committee members),

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1. As previously argued, the strategy for community participation should make optimal use of existing community organisations, though it may be necessary to establish new patterns of organisation in addition.

Thus, it will often be best to work through an existing development committee (or a health committee). If the community is a small one, such a committee will probably not have found as much to do as it has the capacity to handle. The water project will be seen as an example of the kind of activity it was set up for. In a large community, the development committee may delegate functions to a water committee, but even there it would normally be impolitic to set up a separate committee which might create rivalries over the status involved in responsibility for a prestigious project. A special situation may arise, however, where a development committee represents one faction in a divided community. In this case, it may perhaps be possible to take water out of the arena of factional strife by establishing a separate water committee or an autonomous water association (as a voluntary organisation unable to enforce participation but able to exclude non-participants from benefiting from the supply unless they make a contribution).

and the only general rule is not to become identified with one faction, but remain on good relations with all.

The extension agent should, however, attempt to avoid the gaining of any special advantages by any group or individual, and this implies a potential for tension between him (or her) and dominant or powerful groups. He (or she) should be able to count on support from the water authority - i.e. be able to speak for the authority in opposing solutions which give sectional advantage.

h) There may be reluctance that women should work in the construction of the water supply system. It is generally extremely difficult to change patterns of division of labour by sex, and the situation may have to be accepted. However, it is generally desirable that women should be involved as much as possible in all stages of decision-making, construction, and maintenance of the water supply system as they are in its use. Otherwise, this aspect of development will actually reduce the relative range of activities in which women are involved, compared with men, and this could have negative repercussions on their general status and position. At the least, women should be extensively consulted as to the role they might play.

In some circumstances it may be possible and desirable for a water committee to have a majority of women, reflecting the greater interest of women in domestic water, and their greater familiarity with detailed requirements (such questions as facilities for washing clothes).

v. Operation and maintenance

To overcome the gap which usually exists between the technological knowledge and skills existing in a rural community and those which will be required to handle a complex innovation which is introduced, the options are various combinations of: (a) training, to raise the technological level of at least some members of the community; (b) simplifying the innovation so that it can be fully understood; and (c) encapsulating the innovation in self-contained units or "modules", the internal workings of which need not be understood by the users.

Slow sand filtration is a relatively simple technique, well adapted to the attempt to close the gap by training, in such a way that community members understand the principles behind operation and maintenance rather than merely carrying out instructions. Training should, then, lead to an increase in general technical competence which might be carried over into other work. However, the extent to which training can prepare community members to carry out repairs will be small where technical skills in the community are low: the concentration must be on normal operation and preventive maintenance.

Training will, in any case, be practical, and must be carried out on the site of a system in operation. It will probably be most convenient to carry out the initial training by grouping the trainees from the various experimental sites at the first site where construction is completed. One problem is that long periods must elapse between the times when various normal operations are required: it will be necessary either to bring back the trainees on each occasion when a new operation is required at the demonstration site (e.g. the first removal of the top layer),[1] or,perhaps preferably, the professional team might demonstrate each operation of this sort individually in each experimental village at the time it becomes necessary there. It will, in any case, be necessary for professional supervision to be given on these occasions, and a timetable of visits to each site by the professional maintenance team must be worked out. Each visit should be seen primarily as an occasion for further training in preventive maintenance tasks, and if this training goes smoothly it should be possible for the frequency of visits to be reduced. But it is important not to neglect this form of supervision and training. Attention should be paid, in particular, to ensuring that the operator takes adequate account of early signs of trouble, and is able if necessary to summon help, obtain spare parts, or otherwise remedy the situation before there is a breakdown.

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1. Also, replacement of the sand. This is necessary only after a long period of operation, but training is not complete until it is demonstrated too.

It will be useful if technical personnel prepare a list of likely problems with the maintenance and operation of slow sand filters under rural conditions, so that special attention can be paid to these points in training. It may be, for instance, that operators do not appreciate the necessity for the period of ripening of the biological filter before use or re-use, since they may not understand (or give due weight to) the biological process in comparison with the mechanical filtering. By the same token, it is possible that they may be tempted to take short cuts by breaking up the Schmützdecke with rakes when the flow of water is impeded.

One way of guarding against such actions is that the operator should keep records which are inspected. Another is that more than one person in the community is taught the requirements of the system.

As mentioned above (p.10), questions of salary or other recompense for the operator should be settled at the start, before training is given: the operator should know where he or she stands. The job will normally only need to be a part-time one, however, and the possibility arises for it to be combined with related work. Serious consideration may be given to the feasibility of combining the position with that of village health worker. This will depend on the policy of the health authorities toward the training and support of village health workers; there is currently growing recognition of the need for some form of health worker in each community to provide simple preventive and curative care. It may, in fact, be argued that the full advantage of a pure water supply can only be realised if complemented by health services of this sort. A village health worker would, in the first place, be able to continue the work of the extension agent in stimulating sanitation and the hygienic use of water, and it would be appropriate if he or she were also responsible for the water supply. Another consideration is that there may need to be some vigilance over the SSF installation, e.g. to ensure that children and animals are kept away from the tanks; if the installation also houses a community clinic, this might be made easier or it might be made more difficult. Adequate

protection, in the form of fencing or other physical barriers, will probably have to be incorporated in the design in any case.

To avoid damage to the water system as a whole, the design should be discussed in detail with the community. In practice, it will be a task of the extension agent to explain plans and alternatives to the committee or group of persons most actively involved, and through them or directly to the community at large. Some of the particular points to be discussed will be:

a) what form of fencing will be required in view of the likely movements of animals and of children;

b) whether it is necessary or desirable to provide a cattle-trough for animals to drink at, and perhaps a pool for children to swim and play in;

c) whether bathing (shower) facilities should be provided (and if so, the detailed design required for privacy, etc.);

d) whether facilities should be provided for washing clothes (and what design);

e) what use should be made of the excess of water which is not of sufficient purity to be piped as drinking water. Since the slow sand filtration technique calls for large quantities of water to be diverted away, an economic use may be found for this surplus (e.g. to irrigate kitchen gardens: the extension agent may encourage the use of green vegetables for nutritional reasons).

vi. Training of extension agents

If extension agents are drawn from personnel who have previously been involved in more traditional types of health education, it will be necessary to prepare them carefully for the extension role. This means, in particular:

a) training for dialogue and sensitivity to village opinions, rather than the presentation of standard expert views. The extension agent must be able to empathise with the practical possibilities of poor villagers within the constraints of their economic situation. Very often, they have previously learnt ideal health practices taking little account of these constraints. It may be necessary to make a selection of personnel who are more flexible in this respect, i.e. are already better able to empathise and less inclined to condemn behaviour as "ignorant". Training might include one-day visits to various communities where discussions on sanitation and hygiene would be held.

b) Training for stimula ting community involvement. Previous training and experience may relate mainly to changes in individual health-related behaviour. Expertise in "community development" may be called on in most countries to play a part in training.

c) On-site training: at the first experimental site(s), the senior person(s) in charge of the programme should be closely involved,giving advice (informal training) to the extension agents, and themselves experiencing the problems at first hand.

vii. Administrative coordination

The present document will not enter into the details of the administrative requirements of the SSF project as a whole or the extension component. What must be stressed, however, is that extra problems will undoubtedly arise from the fact that decisions will have to be taken (a) in the community, and (b) in the health education department or other agency in charge of the extension component, as well as (c) within the water authority. There will be an unusual requirement for coordination. There may be frictions arising from the independence of the two administrative hierarchies.

There will need, then, to be clear agreement on the assignment of responsibilities between the agencies, and in particular on the ways in which the extension agent can represent the water authority in the discussions at community level: what commitments

he can make and how he can obtain a decision on other matters. For the most important discussions, as previously implied, it will probably be necessary for the water authority to be directly represented at meetings in the communities.

6. Evaluation

Three purposes of evaluation may be distinguished, although they are closely related. The first is the provision of "feed-back" information during the course of the experimental project, in order to correct deficiencies which are detected. The second is to provide lessons for an expanded programme and for other work in the field: the evaluation of the extent to which the experimental project has succeeded in its major aims of improving hygiene and sanitation, with some understanding of which elements of the project design contributed more, and which less, to any success achieved. The third is to assess progress toward other goals, of long-term importance but not so closely related to water use: the fostering of a cooperative approach to solving community problems, the improvement of the status of women, the improvement of the position of the poorer members of the community, etc.

i. Procedures for summing up experience at each step of implementation.

The need is to maintain a continuous monitoring of progress toward each of the goals of the programme. The danger is of setting up an over-elaborate system of record-keeping which gets in the way of the work without providing a sensitive qualitative assessment of progress.

It is therefore suggested that a simple form of qualitative assessment be adopted. It might be done as follows: the senior staff member responsible for the extension programme plans for each community and each month (or perhaps shorter period) which operational objectives and detailed sub-objectives are to be pursued there. The plan is then discussed with the extension agent. (It may be discussed directly with members of the community, but the

plan will in any case provide for discussions with the community, so this is not essential.) The discussions will go into some considerable detail on the methods to be employed to achieve such objective, and the supervisor should take notes on the methods proposed and the difficulties envisaged. The notes should be "written up" by the supervisor, so that what appear at each stage to be the main questions to resolve are drawn out and highlighted. Then, at the end of the month (or earlier periodic contact with the extension agent), progress on each of the objectives is discussed, and the supervisor takes notes of the difficulties which did in fact arise, the solutions adopted and the result. Wherever possible, the supervisor should probe the causes of difficulties and write an account which attempts to explain them. The report evaluating the previous period and the plan for the next can be combined as one document with sections on each objective.

The supervisor may require some written record-keeping or notes to be made by the extension agent, but the onus of writing the qualitative assessment should probably, in most cases, be borne by the more senior person. An alternative is to make a separate individual responsible only for evaluation in the whole country SSF programme; if this is done, special efforts must be made to preserve the close association necessary between evaluation and supervision.

ii. Overall evaluation: drawing lessons for replication

The possibilities for evaluating the overall impact of the SSF project on the health of the population are examined in a companion document.[1] It is generally acknowledged that it is extremely difficult to demonstrate an improvement in the health of a population as resulting from any specific intervention. However, it may be easier to evaluate the extent to which a project achieves its immediate objectives.

In the case of the health extension component of the SSF project, the overall evaluation of the process of construction

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1. Richard Feachem: Publich Health Studies in Phase 2 of the Slow Sand Filtration Project.

and operation and maintenance of the water supply can perhaps rely largely on a final scrutiny and analysis of the data (reports and notes) produced by the procedures described under (i) above, for summing up experience at each stage of implementation. The analysis would probably centre upon (a) a comparison of the difficulties encountered in the different experimental communities, asking which difficulties may be caused by social characteristics of different communities, and (b) each of the particular suggestions, recommendations or proposals which have been put forward at any stage: where were they tried, and with what results?

In addition, full data on costs should be collected and presented together with the above analysis. By "full" data is meant not strict accounting to the last digit, but the inclusion of hidden costs, i.e. those where money did not change hands. Thus, an estimate should be made of man-hours of labour in construction contributed free by a community, the man-hours or man-months devoted to the project by staff members, materials obtained without payment, vehicles used, etc.[1]

The other objective of the health extension, concerning water use and sanitation and hygiene practices, can in part be evaluated in the same way. However, there is also an opportunity to measure:

a) awareness among the population of the facts concerning disease transmission, and the recommendations concerning practices, which are being propagated;

b) acquisition or installation of new equipment related to sanitation (such as latrines or drains, or a bowl placed for washing hands);

c) reported practices in relation to sanitation and hygiene, which might be corroborated by informal observation of some practices;

d) water purity/pollution at various points between collection and ingestion, as discussed above (pp. 26-7, 33-4).

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1. In any replication, costs which on a small scale may have been hidden in other budgets, assume importance as they have to be taken on directly.

Ideally, the evaluation of points a-c should be carried out by an outside investigator. In practice, however, it must be borne in mind, in that case, that the extension agent will have an interest in favourable results. It is a matter for local assessment whether any checks would be possible to identify bias (e.g. part of the evaluation being done directly by the senior team member), and the degree of reliance to be placed on the results.

Ideally, also, the evaluation should take the form of surveys carried out both before the health extension work effectively starts, and at a later stage when the effects may be deemed to have reached a maximum level (and perhaps also other stages in between); and the surveys should cover either the totality of the communities' households or a representative sample of some 100 households in each community. Indeed, a further survey at a later date, several months or even two or three years after the original work, would be valuable to assess long-term changes in practice. If less importance is attached to evaluation, it may nevertheless be possible to obtain some useful data by designing a survey questionnaire to be used only after the extension work (phrasing questions to ask about changes in practices, etc.), or reducing the number of households surveyed.

If, on the other hand, it is desired to make full use of the possibilities of evaluation, it may be considered that the methods employed in the extension work could be deliberately varied from one community to another, either on matters of comparative detail or indeed of overall approach, and the evaluation used to assess which methods appear to have the greatest impact on the variables of awareness, reported practices, and water purity. For reliable results this would need to be done in a large number of communities, but some indications might be obtained even from a relatively small number of cases.

It was mentioned above (p. 29) that the community self-survey might be used as an educational technique. There is some possibility of combining information obtained by this means with that obtained by the survey now under discussion. However, they should probably be treated as two separate exercises with different primary aims.

Finally, it should be pointed out that in drawing lessons from the experimental communities for replication elsewhere, specific consideration should be given to the influences stemming from the special nature of the efforts being made in the experimental conditions, e.g. through greater interest and higher motivation of personnel.

iii. Assessment of project implications for social structure

There is again a choice to be made between a relatively minimal evaluation and a more ambitious one. A minimal evaluation might consist of an assessment by the extension agent and his or her supervisor of the following points:

a) If the project has led to a reduction in the time taken up by water carrying, what have been the main effects? Has it meant that women who previously had to carry water now have more time, or that persons who were paid for carrying water have lost a source of income? If women have more time, does it appear to have been used for leisure (or to reduce the intensity of other work), for economic activities from which they benefit, or for some other task from which they derive no greater reward materially or in status?

b) Has the project led to any negative effects on the relative position of the poor, such as those listed in checklist no. 4 ?

c) Have particular individuals gained in special ways from the project? How? To what extent?

d) Does it appear that the experience of cooperating on the construction, operation and use of the slow sand filter, and in the health education aspects of the project, has led to a greater likelihood of further cooperation on other community projects in the future?

e) Has the participation of women in community organisations (including those exclusive to women and others open to both sexes) been affected one way or the other by the project? In which parts of the implementation of the project have women been active and to what degree?

In a more ambitious evaluation, the aim would be to quantify changes wherever possible, to describe changes in greater detail, and explain them in greater depth. Quantification will involve collection of data before and after implementation of the project (e.g. for point (a) above, time budget data as described in the companion document, D. Curtis: Socio-Economic Studies, p.11; for point (e), data could be gathered on the number of women present at a meeting of each of the community organisations and at open meetings called for project purposes, and the number of interventions in the discussion made by members of each sex could be recorded by an observer). An effort could be made, in particular, to quantify the distribution of costs and economic benefits of the water supply as between community members of varying income or wealth. This will be particularly important if the water is used for economic purposes such as irrigation or stock-rearing and if there are marked differences in income and wealth.

Checklist No. 1.
/ Elements of a 'maximal' strategy for community participation

1 - extended consultations with community authorities
2 - informal dialogue with community members of all strata and both sexes
3 - making appropriate response to difficulties caused by:
  a - lack of interest in improved water supply
  b - lack of customary community cooperation: individualism
  c - factionalism and internal conflict within the community
  d - inappropriateness seen in collective work in communities with wide social differences and in which work is usually paid
  e - fears that the supply will benefit only the powerful
  f - distrust of government agencies
  d - over-enthusiastic initiatives (e.g. in collecting funds or starting work before the water agency is ready to respond)
4 - community-wide committee/self-help water association (to be fostered; founded if absent)
5 - arranging for women's representation/control on a water committee
6 - decision on financial arrangements, to take account of interest of poorer sections
7 - mobilising existing institutions and organisations within the community to play a role in the water project / health education:
  a - institutions representing women or grouping them, from a traditional head of the women to a mother's club
  b - cooperative or self-help associations
  c - church, youth, and other voluntary organisations
  d - the school
8 - mobilising any home-town or school-leaver association, uniting community members resident elsewhere (able to collect financial contributions and to coordinate with official bodies in national/regional capitals)
9 - dialogue at ward level: with representatives of wards if they exist, and open meetings held in wards (open meetings of a size small enough to give ordinary community members confidence to speak freely are important for 2-way communication; in a small community, a community-wide open meeting may be effective, but the larger the community, the more inhibited most people will be, including particularly women)

10 - community self-surveys (useful for getting people involved rather than from the standpoint of gathering reliable data; in particular, survey of morbidity from water- and hygiene-related diseases, but possibly also census-type data other than income, or time-budget or water-use data; school-children easy to involve in surveys, adults less so but worth while if at all possible)

11 - gaining active interest and involvement of key influential persons (must include convincing them to accord importance to the changes required in hygiene as well as in the more prestigious new water system)

12 - gaining support of opinion leaders on questions of health (who may include recognised traditional practitioners but will certainly include persons to whom neighbours and friends turn for advice on health)

13 - visits to other projects of a similar type

14 - using those (e.g. SSF operators) with relevant experience in their own communities, to give advice at the sites of later projects

Checklist No. 2.
/Other external organisations

Different countries will have one or more of the following types of organisation to foster community development. The possibilities for taking advantage of existing organisations of this kind should be explored.

1. The employment of 'community development officers', whose job is to activate communities, encouraging and helping them to undertake development initiatives in all sectors.
2. The use of lower-level staff of sectoral departments (e.g. community health nurses within a health ministry) to encourage community participation for purposes related to that sector.
3. The training of community members, for instance as village health workers, given responsibility to call for community efforts in that sector.
4. The training of village 'leaders' or 'youth leaders' in training centres.
5. Use of the channels of local government administration, to set up community development committees or to give existing representative bodies responsibility for development tasks.
6. Mass mobilisation through the governing party organisation and its local committee in each community.
7. Mass mobilisation through one or more national voluntary organisations sponsored by government, including women's and youth organisations.
8. A radio forum programme, with listeners' groups in rural communities.

In the experimental programme, such organisations might be approached for:

- providing background information on the communities chosen (including, for instance, data on informal aspects of the social structure)
- providing entrée (a channel of introduction to the community)
- providing general advice and assistance in community development.

In a subsequent expanded programme, these existing types of organisation might be called upon to play a bigger role, including for instance the identification of suitable communities as sites for slow sand filtration with community participation, or taking on some of the functions of community mobilisation - even, in some cases, taking it over entirely.

Checklist No.3: disease transmission

The extension worker should bring to the group a knowledge that

1. - of the diseases for which water purification might play some role in reducing incidence, it is the faecal-oral category (diseases transmitted by any faecal-oral route) which is of overwhelming importance in the tropics as a whole (together with schistosomiasis; locally, guinea worm might be important in a particular community).

2. - The faecal-oral category of disease accounts, in all the poor and relatively poor communities of the world, for a very high proportion of infant and child mortality; recent evidence suggests an even greater role for it in triggering off the spiral of worsening nutritional status and infection than was previously realised.

3. - Faecal-oral transmission routes are multiple, and only sometimes involve contamination of water prior to the point of collection. In the present project, since filtration will take care of any such contamination, primary attention must be paid to preventive interventions in those faecal-oral transmission routes which do not involve contamination of water prior to the point of collection.

4. - The number of possible routes is almost infinite, and many are in practice impossible to investigate with any precision; but the attack can be to some degree pinpointed through the exercise of logic and simple local knowledge. The logic reminds the investigator that the multiplicity of routes all lead from A to B - from defecation to ingestion - which implies that an attack concentrated around these two points has a prospect of success in cutting off a large proportion of the transmission: the limiting factor will be the difficulty of this attack - of changing behaviour in these areas - rather than the imprecision of the task.

5. - The local knowledge, primarily of the details of habitual behaviour, can be brought to bear by local people; but delicacy is involved in encouraging frank discussion.

6. - At the point of origin of the faecal-oral transmission routes, the specific matters to consider will probably include:

a. - will the faeces themselves, in the place where they are deposited, possibly start a cycle of infection through:

i) - being directly exposed to other persons or to domestic animals (rather than in a latrine hole, covered, or at good distance from houses, etc.)

ii) - being exposed to flies (inadequately covered latrine or as above)

iii) - being moved or transported (either in the case of systems of disposal of nightsoil, or the way young children's faeces are disposed)

iv) - being washed during rains or floods by water which finds its way to ponds, wells, streams, etc. (but this is the one major route which, as far as drinking is concerned, should be taken care of by water purification)

v) - being washed as above or by irrigation water - water which is waded or bathed in (danger of schistosomiasis)

b. - will soiled latrines (or potties) themselves possibly be the origin of a chain of infection?

c. - what about objects (paper, leaves, corncobs, etc.) used for personal cleansing?

d. - is personal cleansing effectively done? Is the situation frequent that the necessary paper, etc. or water is not available?

e. - is the washing of the hand(s) after defaecation habitual? Is it thorough, with soap? (It seems conceivable that this is as important as the use of a latrine, but it is far less often mentioned.)

f. - what about the disposal of the excreta of babies? If on the ground, is the clearing up thorough? May it leave particles on ground or brushes? If babies' clothes are soiled, how are they washed, where is water thrown?

7. - At the end point of the faecal-oral transmission routes, the specific considerations will probably include the following:

a. - is the washing of hands before preparation of food thorough, with soap?

b. - is there adequate cleaning of receptacles (plates, dishes, cups etc.) used in preparation and eating of food?

c.- Are hands washed before eating? Again, is it thorough, with soap?

d.- Do people put fingers into water containers and cups when taking water?

e.- Is food protected from flies? (And are flies more abundant than they need be, in the sense that breeding grounds which could be eliminated are left?)

Checklist No. 4

Ways in which water supply projects might possibly lead to a worsening of the relative position of the poor

1. Dominant groups might get a subsidised service which the poor do not receive, e.g. individual supply to their homes.

2. Access to the new water supply might be restricted or monopolised. This danger includes cases where the design of the project appears to cover the poor too, but actual flow is limited or diverted, so that only the dominant group benefits, e.g. by use of water for farming purposes, in such quantities that the supply does not reach the homes of the poor.

3. Water used for agricultural or commercial purposes by dominant groups may increase their income in ways which are not available for the poor; this can then lead to changes which worsen not just the relative but also the absolute position of the poor - changes in land tenure and others, such as the discontinuance of arrangements to share food in times of disaster.

4. Removal of an employment opportunity in water carrying.

5. Equal contributions exacted from all inhabitants for the construction or running costs of the water supply may mean a charge which poor families are in no position to afford.

6. Voluntary work demanded at peak times in the agricultural work cycle may lead to substantial loss of production.

7. The power of dominant groups may be increased by patronage available, e.g. in the form of selection of a water supply operator on a salary. At the least, the village-level organisation of the programme, in collaboration with a powerful external agency, will be a political resource in terms of prestige.

Checklist No. 5.

Tasks of extension agent

1. To establish friendly contacts with all sections of community (p.20) and maintain continuous dialogue with all sections throughout the work.

2. To inform all sections of community of intentions of project (p.20), and inform himself/herself of their views.

3. To form an active group of collaborators, or work with the whole village, to discuss behavioural changes needed (p.20)

4. To gather baseline information on attitudes to the SSF supply (pp.21-22).

5. To develop favourable attitudes to the SSF supply through dialogue (pp.8-9).

6. To assess cooperativeness in the community (p.23).

7. To assess questions of power and of individual and group interest relevant to the SSF project (pp.24-26).

8. To develop a strategy for ensuring that costs are fairly borne and benefits fairly shared (pp. 9,26, 40-1).

9. To initiate and oversee the organization of community inputs into construction of the SSF (pp.9-10, 36-42).

10. To liaise with technical personnel in testing water pollution levels, and arrange with them for testing of samples taken at stages following collection (pp.26-7, 33-4)

11. To arrange selection of an operator (p.10), and help teach the operator and a group of other community members the operation and maintenance of SSF. (pp.42-45).

12. To compile, together with collaborating group and/or whole community, a list of ways in which community members' behaviour needs to be changed, and ways in which changes might be made. (p.20. See also Checklist No.3.)

13. To organize group discussion and explain to groups and to individuals the need for changes in behaviour related to health (pp. 18, 28ff)

14. To use practical demonstration wherever possible, e.g. microscope: or show results of testing of water samples (pp. 29, 33); demonstrate hygienic practices.

15. To encourage or organize performances with a health message (p.30).

16. To arrange for any supplies that will facilitate conformity with the hygiene and sanitation practices recommended, e.g. for latrines (pp. 18-19, 34-5).

17. To discuss problems and approaches to their solution with relevant others such as personnel of other organizations reaching the community, and doctors (p. 35, Checklist No.2.).

18. To maintain, throughout, the liaison between the community and the water supply organization.

19. To keep a diary of activities and advise supervisor of problems and what was done about them. (p.48).

APPENDIX

Gathering information on the perception of the community concerning water supplies and concerning possiblities for co-operation.

If any questionnaire, schedule or other instrument is used, it should be tested first by the senior supervisor as a pilot.

Questionnaire forms should preferably be given to the extension agents in cyclostyled or similar forms (rather than just providing a set of questions and a notebook) in order to encourage the filling in of all spaces.

i. Some possible questions for a survey on satisfaction with existing supplies (see p.22).

Please tell me what you think about the water from x source (ask separately for each source habitually used by respondent):

Taste: Does it always taste good for drinking (as plain water)?
(If no, record reason why not, or time when it is not).

Does is always taste good when used for (tea or) other drinks?
(If no, record reason).

Do you use a different source for drinking because of this?
Would you use a different source if you could?

Appearance: Can you see bits of matter in the water at any time of the year?
(If yes) Do you consider this to be a serious problem?

Possible health problems:

Do you consider that drinking this water might make you ill?
Which kind of illness?

Is there anything that gets into the water, or could sometimes get into it, which might make you ill?
What is this thing?
(Possibly give a check-list including: human faeces/ human urine/animal faeces/bird droppings/human spitting/ insects and larvae/decaying vegetable matter/soil).

ii. Measuring co-operativeness by structured scenario.

Possible scenarios to present to a sample of community members (see p. 23).

A piece of land in your village has been brought by a man from the city who has used it for growing /the main local cash crop/. But he dies and has no successors, and it is decided that the land now belongs to the village /or belongs to the nation, but can be used by the village as it sees fit/:

A. Some people say that it should be divided up among all the village members for their individual use.

B. Other people say that it should be farmed co-operatively, each person working one day a week or so on it, and the proceeds divided among those who work.

C. Other people say that it should be farmed co-operatively, but the proceeds should go to a fund for communal improvements.

What do you think?

What would you say would actually happen in your village?

There is a call for communal labour to build a health post. On the appointed day you turn up for the work but several others, including two of your friends do not. One of your friends, you know, failed to come because his //her: ask about friend of same sex as respondent/ child was ill and s/he had taken him to town to get some treatment. The other friend had not turned up for communal work because he had an urgent job to do on his farm.

A. Some people say that both your friends should be fined for not doing his part of the work.

B. Other people say that a person must put the health of his child first, and would fine only the friend who was doing his own work.

C. Other people say that it would lead to endless bickering if some people are fined: better not to fine anyone but appeal to their conscience to come out to work.

What do you think?

What would you say would actually happen in this community?

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

W.D. II

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
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WORKING DOCUMENT II

OUTLINE FOR THE EXTENSION PROGRAMME FOR SLOW SAND FILTRATION PROJECT IN INDIA

by

Dr. A.K. Sandhu
Dr. K.S. Sinha
Mr. P.S. Bawa

HEALTH EDUCATION STRATEGY

FOR

SLOW SAND FILTRATION PROJECT - PHASE II

IN

INDIA

DR(Mrs) S.K. SANDHU

DR.K.S. SINHA

Mr.P.S.BAWA

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HEALTH EDUCATION STRATEGY FOR SLOW SAND FILTRATION PROJECT PHASE II - INDIA

1. INTRODUCTION

1.1 Physical Features

India, covering 2.4 per cent of the earth's land area, supporting 14.3 per cent of the world's population, is one of the most densely populated countries of the world. It stands out significantly among the countries of the southern Asia by its peninsular location.

The formidable Himalayas forms the international boundary in the north. A stretch of about 3,000 km of Arabian sea separates India from north-east Africa in the west, and 400 km of Bay of Bengal separates it from Burma in the east. In the south lies the vast stretch of Indian Ocean down to the Antarctic continent.

India has a total land area of 3,230,483 sq.km. The main land comprises three well-defined regions, the great mountain zone, the Indo-Gangetic plains and southern peninsula. The Indo-Gangetic plains are formed by the basins of three distinct river systems, the Indus, the Ganges and the Brahmaputra. The peninsular plateau is marked off from the Indo-Gangetic plains by a mass of mountain and hill ranges.

The rivers in India may be classified as Himalayan rivers, the Deccan rivers, Coastal rivers and the rivers of the Inland drainage basin. The Himalayan rivers are generally snow-fed and have continuous flow throughout the year. During the monsoons, these rivers discharge maximum amount of water due to heavy rainfall in the Himalayan region and cause frequent floods. The Deccan rivers are generally

rain-fed and therefore fluctuate in volume. The coastal streams specially of west coast are short in range and have limited catchment areas. Most of them are non-perennial. The streams of the inland drainage basin of western Rajasthan are few and far between.

In India rainfall is erratic and unequally distributed It varies from place to place and year to year.

1.2 Demographic Information

According to the 1971 census, India's population was 548 million. The decennial growth rate (1961-71) is 24.8 per cent. The crude birth rate according to 1975 Sample Registration System (SRS), the Registrar General India, is 32.3 per 1000 population; crude death rate 15.9 per 1000 population and infant mortality rate (1971-SRS) is 122 per 1000 population. The expectation of life at birth is around 51.5 years. ~~(1975-SRS)~~ (1976-81 Projections SRS)

Eighty per cent of India's population lives in the 5,75,936 villages and the main occupation is cultivation. India is a good example of unity in diversity. People belonging to different ethnic, cultural and religious groups live in India, having distinctive features governing their life and modes.

1.3 Governmental set-up

India, a union of States, is a sovereign, democratic Republic with the Parliamentary system of government. The Constitution of India is federal in structure with unitary features. The President of India is the constitutional head of the executive of the Central Government, but the executive powers vest in the Council of Ministers, collectively responsible to the Lok Sabha (House of the People), for

which elections are held every five years. Similarly in the constituent States, the Governor occupies the position of the head of the executive but in actuality the Council of Ministers are collectively responsible to the State Legislative Assembly which carries on the executive government. There are 22 States and 9 Union Territories. For the sake of administrative facility, the States & Union Territories have been divided into districts and divisions.

Under the Constitution, the areas of jurisdiction of the Central Government and the State Governments have been clearly demarcated. Defence, Foreign Affairs, Communication, Currency are mong the responsibilities of the Central Government. Health, Agriculture, Education, Police, among others, are the State responsibility.

2. PUBLIC HEALTH

2.1 Health Services

Public Health is primarily the responsibility of the State Governments. The Central Ministry of Health and Family Welfare, however, sponsors and supports major public health programmes to ensure good health of people. In this area, the Central Councils of Health and Family Welfare, a high powered organisation comprising the Ministers of Health from different States and Union Territories advise the Central Ministry on the policies and programmes in the area of health and family welfare.

Important subjects which are dealt with by the Central Ministry are post-graduate medical education, promotion of medical research, port and airport health organisation; international sanitary regulations and India's relations with WHO and other international organisations.

The broad objectives of the health programmes are to control and eradicate communicable diseases and to provide curative and preventive health services with accent on rural areas. This is achieved through a net work of hospitals in urban areas and through the Primary Health Centres in the rural areas.

In the Fifth Plan (1974-79), the aim has been to provide minimum public health facilities integrated with family planning and nutrition for vulnerable groups - children, pregnant women and nursing mothers. The accent is on (i) increasing the accessibility of health services to rural areas, (ii) correcting the regional imbalances in health and medical care facilities, (iii) intensification of measures for the control/eradication of communicable diseases, (iv) qualitative improvement in education and training of health personnel, and (v) development of referral services by providing specialists to the upgraded primary health centres in rural areas and by removing the deficiencies in the district and sub-divisional hospitals.

The Government is providing health services through a well-knit network of 4,465 hospitals and 11,696 dispensaries. There are 5373 primary health centres and 37,931 sub-centres in the rural areas. Efforts are afot to make available health facilities at the door steps of the villagers through the Multi-purpose Workers' Scheme (1974) and the Community Health Workers Scheme (1977).

2.2 Health Problems

The major health problems facing the country are diarrhoeal diseases, malnutrition, Malaria, Tuberculosis, Filaria, Leprosy, Eye diseases, etc. Smallpox has been eradicated from the country.

In countries where environmental hygiene is of a high order, water-borne diseases have almost disappeared, and only sporadic cases occur owing to personal contact or food contamination by carriers. During 1976, in India, 17,492 cases of cholera occurred out of which 861 proved fatal; 14,187 cases of dysentery (2,331 died); 6,66,886 cases of gastro-enteritis (3,409 died); 18,403 cases of Guinea-worm (22 died); 1,13,666 cases of infective hepatitis (1,327 died). Apart from these, other intestinal infections (helminthiasis, typhoid fever, para-typhoid and common diarrhoeas) are also prevalent.

3. WATER SUPPLY

3.1 Organisation

It is said that if safe and wholesome water is made available to every one in plenty, 90 per cent of the water-borne diseases will disappear. The basic purpose of water supply improvement is to provide adequate quantity of safe water for human use, primarily for drinking and culinary purposes and secondarily for bathing, washing etc.

As mentioned earlier, the rainfall vary from State to State. Sources of water are usually wells, more often than not unprotected, rivers, lakes, tanks, ponds, springs etc.

The National Water Supply and Sanitation Programme was launched in 1954 as a part of the health plan to assist the States in urban and rural water supply and sanitation facilities in the country. A Central Public Health and Environmental Engineering Organisation (C.P.H.E.E.O) was set up in 1956 to provide technical advice and guidance to the State Governments in the

preparation and execution of their schemes. The programme and the organisation were transferred to the Union Ministry of Works and Housing in February 1973.

3.2 Problems

A preliminary assessment during Third Five Year Plan revealed that there are about 90,000 villages which have no source of water within a distance of 1.6 km. In some areas water table is very low and water is available only at a depth of 15 m.

By March 1976, an urban population of 107 million (80% of total urban population) living in 1890 towns have been provided with safe water supply and 45.5 million (34 % of urban population) in 217 towns with sewerage facilities. In the rural sector, a population of about 50 million (10 %) have been provided with piped water supply or tube wells benefiting 64,000 villages. During 1977 a provision of Rs.1260 million and Rs.615 million has been made for this programme under the urban and rural sectors. Fifty five additional towns are being brought under the programme in the urban and rural sectors. 55 additional towns would be provided with water supply, 8 with sewerage and 11,000 villages with water supply facilities. Upto February 1977, Rs.10,620 million were invested in the urban and Rs.7,470 million in rural sectors respectively.

In the Fifth Five Year Plan (1974-79), a sum of Rs.5,740 million were allocated for provision of safe water to 80,000 scarcity and problem villages covering 18 per cent (95 million) population.

The allocation for rual water supply, as a percentage of total plan outlay, has increased from 0.8 per cent in the

First Plan to 1.5 per cent in the Fifth Plan. In spite of the nearly four-fold increase in the allocation of funds in the Fifth Plan as against the Fourth Plan, it will neither be possible to cover all the problems and scarcity villages during the current plan, nor will be able to cope with the burden of annual increase in rural population.

3.3 Constraints

The greatest single limiting factor in the development of water supply in general and rural water supply programme in particular has been inadequate financial inputs. Other limiting factors are lack of trained personnel at appropriate levels, inadequate and inappropriate organisational and administrative set ups and inadequate community participation.

Inability of rural bodies like the Panchayats to bear the partial cost of the water scheme is another limiting factor. Thus in rural areas, there is need for simple, reliable and economical methods of water treatment and supply suited to the social and cultural milew of the runal population One such process of water purification is biological filtration commonly known as Slow Sand Filtration.

4. SLOW SAND FILTRATION IN INDIA

4.1 Earliest Efforts

In India water purification by Slow Sand Filtration has been in use since 1865 when the first slow sand filters were installed at Palta near Barrackpore, about 21 km. from Calcutta (West Bengal) to treat raw water from the Hooghly. Then these filters were installed in towns of Uttar Pradesh (Kanpur, Agra, Varanasi, Allahabad & Lucknow). Thus the slow sand filters are not new to urban India. But its use in rural India for small communities is a challenge.

4.2 Location of the Present Plants

The W.H.O International Reference Centre (WHO:IRC) for Community Water Supply, the Hague, the Netherlands, as a part of its world-wide promotional activities in the field of water supply initiated research-cum-demonstration programme of slow sand filtration in six countries. The objectives of the programme is to promote the application of slow sand filtration with special reference to rural water supply in developing countries. The National Environmental Engineering Research Institute (NEERI) Nagpur, is one of the collaborating centres of WHO: IRC to take up the study in India.

The study was taken up by NEERI in January 1976. During the first phase of the programme technical guidelines for the design, construction, operation and maintenance, etc have been worked out. During the second phase (January 1978 to December, 1979) field testing and evaluation of the village demonstration plants is being undertaken in four different States in India, namely, Maharashtra, Andhra Pradesh, Tamil Nadu and Haryana.

The NEERI has involved the Central Health Education Bureau (CHEB), Directorate General of Health Services, for the extension and community participation aspects for the project.

The CHEB is the technical wing of the Directorate General of Health Services, Ministry of Health and Family Welfare. At State level, there are State Health Education Bureaux and at the district level in certain States there are District Health Education Units.

It is necessary to involve the community right from the beginning so that the projects get their acceptance and the people start using the protected water after the completion of the project.

The CHEB has, therefore, been given the responsibility of helping the concerned States in developing suitable health education strategy for the project areas. In Maharashtra the CHEB is helping NEERI directly for developing such a strategy for the village Burjwada, in Kalmeshwar Block, Nagpur. In Andhra Pradesh, Tamil Nadu and Haryana, the CHEB is helping the State Health Education Bureaux and concerned district health organisations to develop appropriate strategies depending upon the local situations.

The project in Maharashtra will be a pilot project and the strategy used in the village Burjwada will be made available to other project areas to adapt it according to local situations

5. HEALTH EDUCATION STRATEGY

5.1 Background

The following health education strategy has been developed taking into account the requirement of the project, time and the local resources available and other situational factors.

The suggested strategy is flexible and is based on the past experience in other health education projects. Arrangement have been made for continuous evaluation and feed-back so that the strategy can be modified or changed according to the needs.

It may be mentioned here that project sites have been selected by the Public Health Engineering Departments and Water Boards depending upon the perennial availability of water and willingness of the community to share the cost, without much difficulty. The health agencies were not consulted

while selecting the site. The concerned health agencies are now being involved to work out the educational programmes relating to participation of the community in educational and service activities.

Provision of safe water supply brings in its wake a number of problems: (1) The people may not take advantage of the available water and use the same when they do not find demonstratable improvement in health status of the community; (2) Water accumulation at supply points takes place leading to mosquito breading and consequent disease problems; (3) The people may not store or handle water properly to prevent its recontamination between supply point and use (4) The people may continue to use other available sources of water which are unsafe.

Such problems as mentioned above have to be taken into account while working out an health education programme in Slow Sand Filtration Project. The people have to be helped to understand these problems and acquire necessary knowledge and efforts should be made to inculcate in them desirable health practices. Here lies the real challenge.

5.2 Objectives

(1) General: The general objectives of the study are:

i) To evolve a methodology of assessing the impact of health education in preparing the community for effective utilisation of improved water supply and its impact on the health status of the community with special reference to Child Population (0-5 years) during the project period (1978-79).

ii) To document, monitor and evaluate all aspects of educational programme relating to water and sanitation with a view to utilising the experience and knowledge in other

projects in India as well as in other developing countries.

(2) Specific

(i) To undertake a study of the concerned community with a view to assess its resources, potentials and educational needs

(ii) To develop suitable educational aids and materials for use in the community.

(iii) To educate the community on the acceptance of improved water supply for drinking purposes.

(iv) To find out the extent to which the community has used the improved water supply for drinking purposes.

(v) To identify the problems (financial and others) faced by the people in utilizing the improved water supply.

(vi) To help people of the project area to acquire adequate knowledge regarding general health, environmental sanitation, selected communicable diseases and availability of health facilities.

(vii) To assess the impact of the entire process of health education and improved water supply on the health of the people.

(viii) To prepare a set of communication aids relating to water, personal hygiene and environmental sanitation which can serve as a model for duplication for rural water supply programmes in other parts of this country as well as abroad.

(ix) To produce a handbook on rural water supply and sanitation based on the experience gained in this project for use by field staff in similar programmes elsewhere.

5.3 Methodology

The whole project is divided into five phases:

. Preparatory Phase;

. Planning Phase;

. Implementation Phase;

. Evaluation Phase; and

. Report Writing Phase.

(1) Preparatory Phase

During the preparatory phase the following steps will be taken:

(i) Orientation of concerned staff: The concerned staff of C.H.E.B, State Health Education Bureaux (SHEB) and District Health Offices will be oriented regarding Slow Sand Filtration Projects, their location, technical aspects and broad outlines of health education aspect of the project through:

(a) Study of project guide-lines

(b) Exchange of information in relation to implementation aspects; and

(c) Three/four-day meeting/workshop at NEERI, Nagpur (Maharashtra) in which concerned staff from NEERI, CHEB, SHEB, District Health Offices, Primary Health Centres and the local leaders from the four selected areas will participate. In this meeting/workshop the participants will be oriented regarding the technical aspects of Slow Sand Filtration and the broad strategy of health education. The participants will be shown actual working of Slow Sand Filtration Plant. This will facilitate uniformity in understanding and approach and coordinated action at different levels both within the State and amongst the State. This activity is being proposed to be organised in July, 1978.

(ii) Advisory Group at State level:

Formation of Advisory Group at State Level to foster

proper cooperation and coordination among the concerned agencies. This group will include:

(a) Director, Health Services of concerned States (Maharashtra/Andhra Pradesh, Tamil Nadu and Haryana).

(b) Director, Central Health Education Bureau, New Delhi.

(c) Chief Public Health Engineers of concerned States.

(d) Incharge of State Health Education Bureau

(iii) Advisory and Planning Group:

Formation of Advisory and Planning Group at district level: In all the four districts, namely Nagpur (Maharashtra) Hyderabad (Andhra Pradesh, Madurai (Tamil Nadu) and Sirsa (Haryana), an Advisory and Planning Group will be formed. The members of the group will be :

(a) Chairman Zila Parishad or equivalent

(b) Chief Medical/District Health Officer.

(c) Representative of State Health Education Bureau;

(d) Concerned Public Health Engineer;

(e) District Health Educator; and

(f) Research Officer, Central Health Education Bureau.

The main function of this group is to make available the resources in their respective organisation for successful implementation of health education programme of the area and coordinate the activities of their respective departments. This group will help in proper planning, implementation and evaluation of health education activities at the area level.

This group will meet frequently in the beginning of the project and thereafter every three months to review the progress of the Health Education project and suggest improvements, if need be.

(iv) Planning and Steering Committee:

At block level, a Planning and Steering Committee will be formed to plan, implement and evaluate the health education activities and document them properly at village level/area level. This Committee will have the following members:

a) Chairman of Block Samiti;

b) Block Development Officer of the concerned Block;

c) Medical Officer Incharge of the concerned Primary Health Centre;

d) Concerned Public Health Engineer responsible for the project ~~subject~~;

e) Health Educator working at the district level;

f) Sanitary Inspector of the Primary Health Centre; and

g) Lady Health Visitor.

The Committee will also coordinate activities of their respective staff at village level and block level.

This Committee will meet frequently in the beginning and at least once in a month during the later period.

(v) Activities at Village/Area Level:

All the activities concerning health education project at the village/area level will be carried out by the health staff of the concerned primary health centre under the supervision of Planning and Steering Committee at the Block Level.

(a) A base line survey to establish the present knowledge, attitude and practices relating to water use, personal hygiene and environmental sanitation in the project villages will be done by the primary health centre staff. They will be given appropriate orientation training. General information regarding the villages will be collected

from the important and well informed members of the community Village information schedule will be used for this purpose (Appendix - 1). The information regarding the individual household will be gathered with the help of 'Family Health Survey Schedule' and 'Family Welfare Schedule' (Appendices II & III). These sample schedules developed by CH.E.B can be adapted by the concerned staff according to local situatic Total health survey will be done in small villages but in large villages secondary data, if available, will be used or sample survey conducted. For an indepth educational diagnosis of the community, the C.H.E.B has prepared a special schedule which will be adapted by the local staff according to local situation (Appendix - IV) .

(b) The data on disease pattern of the project villages will also be collected from the secondary sources. The data collection before the community water supply (treated through Slow Sand Filtration) is made available will serve as the base to be compared with the data after the supply of water.

(c) C.H.E.B will provide the local staff with design for data analysis so as to ensure uniformity in all the project areas.

The data so collected will be analysed, compiled and will be used for planning an effective health education programme for each of the project village.

(2) Planning Phase

1) The basic responsibility of planning a health education programme in the project areas will lie with the Planning & Steering Committee. It is suggested that initial draft of health education plan based on the data of the area

may be prepared by a Working Group consisting of a trained health educator, Medical Officer Incharge, Sanitary Inspecto and Lady Health Visitor. (The plan of operation of Burjwada village will provide guide-lines for other villages). The draft may be finalised after consulting the other members of the Planning & Steering Group. This Plan will then be presented to Advisory & Planning Group at district for their comments and suggestions. Then the plan will be finalised.

ii) The health education plan will include the following:

(a) The problem/problems selected;

(b) Objectives (general & specific);

(c) Resources available which can be utilised for the programme;

(d) Strategy for action - mentioning the specific steps to be taken to achieve the said objectives;

(e) the plan of evaluation - concurrent & terminal. (clearly mentioning the objectives of evaluation; criteria and indicators of success; method/methods of evaluation etc.).

iii) The concerned local staff will be oriented. In such orientation the plan of operation will be discussed thoroughly so that role of each concerned person be understood by him/her.

iv) An integrated set of communications material dealing with water use, personal hygiene and environmental sanitation, control of selected communicable diseases, will be developed with assistance from the State Health Education Bureau. The project funds will be used for this purpose.

v) Special health education programme will be

developed for village schools relating to water use, personal hygiene, environmental sanitation and selected communicable diseases. It is probably more effective, in the long run, to try and mould the younger generation rather than concentrating exclusively on adults, who are slow to change. Special programme would include: development and use of educational materials, inservice training for teachers, demonstration latrine next to school etc.

(3) Implementation Phase

i) The implementation of the programme will be done in two phases. During the first phase, the plan of action will be implemented, each activity will be continuously evaluated and necessary modifications will be done to strengthen the programme. During this phase, local bodies will be actively involved in each activity. The quality of participation of each leader will be observed.

ii) During the second phase, a Health and Welfare Committee for each project village comprising all the local leaders who have actively participated in health education and service activities will be formed. The Committee will hav a chairman from among the local leaders and the health worker will be the member secretary. It will meet every month to review the progress of health education and service activities problems encountered in carrying out these activities and suggest probable solutions for overcoming those problems. Apart from these, the other functions of the community will be

a) To educate local community on different diseases and health aspects of the safe water programme.

b) To arrange for medical facilities for the needy members

c) When the slow sand filtration plants start supplying water to the community, the Committee will be responsible for proper distribution of the water among the different hamlets of the villages, maintenance of the community water stand posts and proper drainage of the waste water.

This committee will act as a link between the community and the various concerned agencies.

(4) Evaluation Phase

During this phase final evaluation will be done against the objectives laid down in the plan of operation. Specific tools will be prepared for evaluation of the impact of education-cum-service programme.

Apart from final evaluation, periodic evaluation will be carried out to assess the results of the health education-cum-service activities so that the programme can be suitably modified.

(5) Report Writing Phase

During this phase, consolidated report of the project will be prepared which will include suggestions for follow-up action.

6. EXPECTED OUTCOMES FROM THE HEALTH EDUCATION PROJECT

6.1 A simple, practical survey form thoroughly field tested, will be available for the district health staff anywhere in the country to collect base-line data from villages relating to attitudes, knowledge and practices required on water use.

6.2 A set of integrated, field-tested communication materials, covering all aspects of rural water supply, which

can serve as a prototype for similar programme anywhere in the country.

6.3 A practical, how-to-do-it manual, based on experience gained in the Slow Sand Filtration Project, describing the methodology to be used in educating the community in the use of safe water.

6.4 How-to-do-it manual on water and environmental sanitation education in village schools, based on experience gained in carrying out such a programme.

APPENDIX I

CENTRAL HEALTH EDUCATION BUREAU
(SLOW SAND FILTERATION PROJECT PHASE II)
VILLAGE INFORMATION SCHEDULE

A. TOPOGRAPHIC CHARACTERISTICS

1. Name of the village

2. Area in square Km.

3. Provision of electricity

4. Approachability (a) Kutcha/Pucca

(b) Whether approachable during rainy season - Yes/No

(c) Remarks, if any

5. Map of the village showing:
a) Geographical boundaries;
b) Administrative boundaries;
c) Sub-Divisions of the village;
d) Important roads and streets;
e) Common meeting places (Chaupals, Baithaks, temples, Baratghars, etc.)
f) Location of school;
g) Community water sources (pond, river, wells, taps, etc.)
h) Community latrines, if any;
i) Houses of the member of panchayat etc.

6. No. of sub-divisions of the village with names of the sub-divisions and no. of families residing.

Name of sub-division	No. of families

B. DEMOGRAPHIC AND SOCIAL CHARACTERISTICS -

1. (a) Total population b) Reference period

i) Male _____ ii) Female _____

iii) Children below 15 years of age _____

iv) Children below 6 years of age _____

c) Total No. of families _____

d) Type of families
i) Joint No. _____
ii) Nuclear No. _____

	1974	1975	1976	1977
2.(a) No.of births during the year -				
(b) No.of deaths during the year (Mention source of information).				

3. Different caste groups (like Rajputs, Jats, Ahirs, Harijan etc.)

(a)	Caste	No.of families

(b) Religion (like Hindu, Muslim, Sikh, Christian, etc.)

Religion	No.of families

4. Occupation — No.of families

(a) Agricultural

i) Land Lords
ii) Cultivators
iii) Labourers

(b) Non-Agricultural

i) Business (specify)

ii) Service (specify- Civil, Defence, Police, Private, etc.) — No.of families

iii) Labour

5. Literacy	Read & write	Primary & below	Middle & below	Highschool & below	Above High school	Total
No.of literate persons(if available)						
No.of those who could be involved in welfare activities (if available)						

6. General economic status of the community members:

7. Leadership:

(a) Names of Panchayat member | Caste | Profession

(ii) Days of the month when Panchayat meets:

(iii) (a) Funds available with the Panchayat

(b) Estimated annual revenues

(iv) Nature of activities on which panchayat has been spending money.

(v) General functioning of the Panchayat.

*Whether meets regularly? Yes/No

*At what frequency the Panchayat meets in a month 1/2/3/4 specify.

(b) Names of the informal leaders (like leaders who have been defeated in local panchayat elections, caste-leaders, numberdars, social workers, religious leaders, retired govt. servants-civil, defence, police - and other influential persons including the local banks agent and innovator) - those who are always willing to adopt new practices and retired school teachers residing in the villages)

Name	Caste	Address	When available (Time

C. GROUP DYNAMICS

Information on the following points may be collected under this head:-

(i) Major influential groups and their inter-connections - Caste groups, occupation groups, neighbourhood groups, playgroups.

(ii) Faction groups and names and addresses of their important leaders:

(iii) News carriers, innovators and their role in introducing changes in the village community.

(iv) Integrating factors of the community like common-interest, security, respect etc.

(v) Disintegrating factors like personal and caste rivalaries.

(vi) Accepted role of the local organisations in mobilizing resources for health programmes.

(vii) Influence of outside organisations and leaders on the community in respect of health and welfare programme.

d) Names of local teachers and their addresses:

e) Names of local 'dais' and their addresses:

f) Name and address of the village chowkidar:

g) (i) Names of the nearest post office

(ii) Its distance from the village_____km.

(iii) Name of the postmaster _____

(iv) Frequency of delivery of post in the village

(v) Name of the postman visiting the village:

h) Name of governmental agencies under whose jurisdiction this village come:-

Name	Address	Distance from village
i) Primary Health Centre/Sub-centre		
ii) Community Development		
iii) Revenue department		
iv) Block Education Officer		

i) Any other health welfare agency working in the village. Please give the name and nature of their functions:-

7) Names of the Health, Development and Revenue staff visiting the village:-

Name	Headquarter	Frequency of visit per month.
V.L.W.		
B.H.W.		
S.I.		
H.I.		
Vaccinator		
A.N.M.		
L.H.V.		
Patwari		
Gram Sachive		
Others		

8. Welfare organisations in the village (like welfare Association, Youth club, Mahila Mandal, Balwari, Drama, Club, Bhajan Mandli)

Name of the organisation	Office bearers/members

9. Educational Institutions

(a) Educational Instt. in the village.

Educational Instt. in the village.	No.of teachers	No.of students	Distance from the village.

(b) Nearest institution for further education like middle school, high school, college.

Institution	Distance from the village

(c) Information about the local schools:-

Provisionof : (i) Urinals Yes/No.

(ii) Latrine Yes/No Type of latrines Dry/Hard flushe

(iii) Whether water available in or near the latrine and urinals Yes/No

If yes give brief description_____

(iv) Sources of drinking water: Well/tape/river/hand pump/other.

(v) Quality of water for each source: Hard/soft.

(vi) How water is stored in the school (like in pitches/buckets/other utensils.

(vii) Whether it is covered? Yes/No

If yes how?

(viii) How water is taken out from the vessel when it is stored?

(ix) Mode of drinking water by the students (with hands/glass/same glass etc).

(x) Whether dust bins are provided in the school? Yes/No

(xi) Whether electricity is available in the school? Yes/No.

(xii) Any other concerned information:

10. Channels of Communication:

(a) Major communicators (like persons who give the news, innovators etc.)

(b) Communication Media:-

(i) News paper Language Circulation

(ii) Radios/Transistors(indicate approximate No.)_____

(iii)Others (Specify) -

(iv) Traditional channels (like 'nonyadi', Nautanki, Katha Mandli, Drama and song parties,etc

Please mention frequency of each such channel being used in the village.

(v) Common meeting places including shops (Baithaks, Chaupal, schooltemple, Baretghars,etc.).

(vi) Community fairs and festivals:

(vii) Nearest market - mention name and distance from the village.

11. Environmental Sanitation:

(a) Sources of water being used by the community for drinking, bathing, washing, for animals (like ponds, rivers, shallow-wells, deep wells, tube wells, taps etc.) Give information about No.of sources of each type and for the purposes these are being used, their sanitary condition and quality of water from each source. Whether chlorination of drinking water is done? If so, how often, method being used for chlorination and who does the chlorination, mode of drawing water, its transportation and storage in general. Any other relevant informations-

(b) Methods of waste water disposal from individual house and from streets.

(c) Methods of garbadge and refuse disposal used by individual family and the community.

(d) Methods used for disposal of animal dung by individual family and the community in general:

(e) Methods used for disposal of human-excreta(sanitary latrine, open field defecation, dry latrine).

C. 1. Previous experiences of the people regarding the welfare programmes in general and health programmes in specific:-

2. Community attitude towards:

(a) Government programmes	Favourable/neutral/ unfavourable
(b) Social welfare programmes	-do-
(c) Community organisation	-do-
(d) Local leadership	-do-
(e) community and national uplift	-do-
(f) personal and family uplift.	-do-

3- Factors in favour and against the past health programme (Please mention them clearly)

4. Status of village in respect of various health programmes run by the Primary Health Centre(data should be collected regarding the village only)

1.Malaria	1976	1977(upto Sept.)
(a) No. of blood slides collected		
i) by active agencies		
ii) by passive agencies		

	1976	1977 (upto Sept.)
(b) No.of cases given presumpetive treatment.		
i) by active agencies.		
ii) by passive agencies.		
(c) No.of positive case defected.		
(d) No.of positive cases given radial treatment.		
(e) No.of deaths.		

2. Smallpox

a) No.of primary vaccination given.

b) No.of re-vaccination done.

3. M.C.H.

a) No.of pregnant mothers registered by ANM/LHV.

b) No.of pregnant women given tatanus toxoid.
   i) first dose
   ii) second dose

c) No.of average ante-natal visits made by ANM/LHV per ante-natal case.

d) No.of the delivery conducted by Trained staff(trained dai, ANM, LHV, doctor).

e) No.of post natal visits made, on average, by ANM/LHV per post natal case.

f) No.of children given primary vaccination.

g) No.of children given DPT
   (i) 1st dose
   (ii) 2nd dose
   (iii) 3rd dose

4. Family Welfare:

(a) No.of eligible couple

(b) No.of vasectomies performed.

(i) No.of tubectomies performed.

(ii) No.of IUD inserted.

	1976	1977(upto Sept.)

iv) No.of regular user of 'Nirodh' registered. (the regular user is one who has drawn Nirodhs at least three time in the year).

C. No.of dissatisfied cases of sterilization and IUD at present with their names and addresses and nature of complaints.

d) Any other programme being run in the village and relevant information on above pattern may be given.

e) Names and address on medical practitioner available in the villages, visiting village, around the village (Allopaths, Vaids, Hakims, Homeopath).

Name & qualifications	system	address

(F) Health statistics of the village

(a) Epidemics:

Diseases	1974 cases-deaths	1975 cases-deaths	1976 cases-deaths.	Source of information.

(b) Prevalence of waterborne diseases in the village during the last three years:

Diseases	1974 cases-deaths	1975 cases-deaths	1976 cases-deaths	Source of information.

C. Any other significant information regarding the village which may be useful.

Note: The above mentioned information may be collected through:-

a) Enquiry from influential persons of the village

(Panchayat members, numbardars, caste leaders, school teachers, retired personnel, village chowkidars and the worker of various organisations working in the villages etc.)

b) Records and reports available with the concerned persons of these agencies (P.H.C. sub-centres, hospital, dispensary, block development office, Naib Tehsildar/Tehsildar office etc.

c) Any other known source.

General Remarks

Signature _____

Date _____

APPENDIX XII

CENTRAL HEALTH EDUCATION BUREAU
(Slow Sand Filtration Project Phase II)

FAMILY HEALTH SURVEY SCHEDULE

1. Name of the interviewer_____ 2. Name of the village_____ 3. Date_____

4. a) House No._____ b) House Hold No._____ 5. Name of Head of Family _____

6. Total income of the family per month Rs._____

7. a) Name of the respondent_____ b) Sex_____ c) Age_____ d) Education_____
e) Religion_____ f) Caste_____

8. a) Type of family Joint Nuclear b) Details about the members of the family

S.No.	Name	*Relation to the head.	Age	Sex	Education.	Occupation	Immunization status PV	MV	BCG	DPT 1	DPT 2	DPT 3	Health status	Remarks
													***	****

* Use these abbreviations: Son = S, Daughter= D, Son-in-Law= S-in-L, Daughter in Law = D-in-L.
** Inquire only about the children below 6 yrs. of age.
*** Please mention here any permanent desability or chronic illness of the member after putting the serial No.
**** Any important information which have not recorded, mention here.

II. Present Health status

1. If any member of your family suffering from any sickness at present? Yes/No.
   a) If yes please provide the following information:

Name of the patients	Since when	Disease	Signs and Symptoms	*Treatment being given	By whom since when	Remarks
1.						
2.						
3.						

2. Where you and members of your family go for treatment when sick?

PHC/Sub Centre/Hospital/Private Practitioner (Please specify)_____

a) If private practitioner please note down his name and address

b) Why are you not utilising services provided by the Govt.(Please note down the reasons)
   (Only put this question if the family is not utilizing the PHC/Sub Centre/Hospital Services)

* Please specify of indigenous treatment is given otherwise write allopathy, Homeopathy, Vadic, Unani, etc.)

XVI. Nutrition

1. Do you give special diet to:

If yes provide this information

Group	Special diet given	Reasons for giving the diet if any
a) Pregnant mothers Yes/No		
b) Lactating mothers Yes/No		
c) Infants during weaning yes/No		
d) Children between 1 year & 5 years of age. Yes/No		
e) During illness Yes/No		
f) Old people		

4 A) Do you grow vegetable? Yes/No
If yes where & what?

4 b) Observe if there is space for cultivating a kitchen garden_____

IV. Environmental Sanitation

1. House:

a) Type of house - Kachha/Pacca/Kachha-Pacca (Please encircle the right answer)

b) No.of rooms _____ c) Whether ventilated: No.of rooms

i) Ventilated_____

ii) Not ventilated_____

d) If ventilated, please observe and record type of ventilation in each room (Cross ventilated, one side ventilated, No.of window and ventilators etc.)

e) Please observe and record whether animal shed is within the house or outside the house

i) If within the house, is it separate and away from room? Yes/No.

2. Water

a) From where do you bring the water:

i) for drinking: (Encircle the water source)

Perrenal well/hand pump/ tube well/tape/community well

community well/handpump/tubewell/tape

River/pond

Any other (Specify)_____

Quantity of water brought daily_____

(in bucket, pitcher, litres etc.)

No.of times water is brought daily_____

How do you store the water for drinking_____

How do you cover it?_____

How the water is taken out from the storing vessel for drinking?
(Observe if water is covered and a drew is there)

ii) For bathing
(encircle the water source) Personal well/handpump/tubewell/tape

community well/handpump/tubewell/tape/

River/pond

Any other (Specify)_____

Quantity of water brought daily_____

No.of times water is brought _____

iii) For washing: Personal well/handpump/tubewell/tape

Community well/handpump/tubewell/tape/

River/pond Any one(Specify)_____

Quantity of water brought daily_____

No.of times water is brought daily_____

b) General remarks about the sources of water from where the water is brought?

c) Where do you and your family members take bath?
(If outside please specify the place)

Hand/foot pump

i) Adult male

ii) Adult female _____ House/outside

iii) Children House/Outside

d) Where do you and your family members wash their clothes
(If outside please specify the place)

i) Male House/Outside

ii) Female House/Outside

3) Disposal of waste water:

a) How the waste water is disposed? (Please observe and record)

4. Disposal of solid waste:

a) Where do you throw your: (Please observe & record)

i) refuge and garbage

ii) Cow dung etc.

b) Where do you and your family members go for defecation?

i) Adult males Open/Latrine

ii) Adult Females Open/Latrine

iii) Children male Open/Latrine

iv) Female child Open/Latrine

v) If there is latrine observe whether it is a dry/hand flushed latrine

vi) Please note the sanitation of the Latrine?
(Whether clean, flies are there, smell etc.)

vi) Observe the source of water used for ablution.

vii) How do you and your family members clean themself after defecation (with water or otherwise)

viii) Do you and your family member wash their hands after defecation?

Adult Yes/No

Children Yes/No

If yes, with what (Earth, ash, soap etc.) (Specify)

Adult_____

Children_____

(Please mention the source of water being used for washing hands)

5. There is a scheme for providing filtered water through taps to individual families. The individual family has to spend some money for pipe line and tap to bring the water in the house. Do you like to have filtered water?

Yes/No

If no, please give reasons: _____

_____

APPENDIX-III

CENTRAL HEALTH EDUCATION BUREAU
(SLOW SAND FILTRATION PROJECT PHASE II)

FAMILY WELFARE:

(Fill up this proforma for every eligible couple in the family separately. The information must be had from husband or wife)

1. Name of the respondent

2. Name of the husband/wife.

3. No.of total children born

4. No.of the living children

5. Age of the last child

6. Whether wife is pregnant at present? (if yes how old is the pregnancy?) Yes/No

7. Where was the last child born? Home/P.H.C./Hospital/Other (Specify)
If in home who conducted the delivery? Specify (Indigenous Dai/ Trained staff/Other(Specify)

8. Did mother took tetanus Toxoide during the last pregnancy? If yes (Please mark) 1st 2nd Yes/No

(The interviewer should verify this information from secondary data)

9. Do you or your spouse practice any methods or contraception? Yes/No

a)(i)If yes, which methods(specify)

(ii) Are you satisfied with the method? Yes/No

iii)If no please give reasons

b) If no why not. Please mention the reasons

10. Do you know the places where facilities for family welfare are available. Please specify

11. Remarks:

Investigator:

APPENDIX IV

CENTRAL HEALTH EDUCATION BUREAU
(SLOW SAND FILTERATION PROJECT PHASE II)

SCHEDULE FOR EDUCATIONAL DIAGNOSIS OF THE COMMUNITY

Date_____

1. House No._____ 2. Name of the respondent_____ Age_____

Sex_____ & Edu_____ Caste_____

3. What are the signs and symptoms, causes, mode of spread, treatment and prevention of the following diseases:-

S.No.	Disease	Signs & symptoms	Causes	Mode of spread	*Treatment	Prevention	Remarks
a)	Diarrhoea						
b)	Dysentry						
c)	Cholera						
d)	Worms Infestation (Specify)						
e)	Typhoid						
f)	Whooping cough						
g)	Tetanus						
h)	Diphtheria						

* Please specify if some indigenous treatment is given otherwise mentions the system - Allopathy, Homeopathy, Hikmat, Unani, Ayurveda etc.

S.No.	Disease	Signs & symptoms	Causes	Mode of spread	Treatment	Prevention	Remarks
1.	2.	3.	4.	5.	6.	7.	8.
i)	T.B.						
j)	Sore eye						
k)	Trachoma						
l)	Cataract						
m)	Itching						
n)	Boils						
o)	Malaria						
p)	Filaria						
q)	Any other						

4. NUTRITION

a) What are the food items which help in infant to grow healthier which may be given to infant while weaning?

b) What are food articles which help the child (Below 6 years) to grow healthier?

c) What special food should be given, if any, to a pregnant mother so that health of the mothers improves?

d) What food should be given to a lactating mother so that both mother and the infant grow healthier?

e) What food should be given in sickness to:-

i) an infant _____

ii) a child _____

iii) an adult _____

iv) an old person _____

TEXT ON SLIDES SHOWN DURING THE PRESENTATION HELD BY Dr. S.K. Sandhu

OBJECTIVES

- General
- Specific

METHODOLOGY

- Preparatory phase
- Planning phase
- Implementation phase
- Evaluation phase
- Report writing phase

Preparatory phase

- Orientation of concerned staff
- Advisory group (state level)
- Advisory & planning group (district level)
- Planning & steering committee (block level)
- Establishing the base-line

Planning phase

- Develop a plan of operation
- Orientation of concerned local staff
- Development of an integral set of communication material
- Health education plan for local schools.

Implementation phase

- Orientation pf local leaders
- Carrying our of health educational service activities
- Formation of village health and welfare committee

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

W.D. - IV

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

WORKING DOCUMENT IV

OUTLINE FOR THE EXTENSION PROGRAMME FOR THE SLOW SAND FILTRATION PROJECT IN KENYA

by

Mr. D. Mbai

COMMUNITY HEALTH EDUCATION COMPONENT

O N

SLOW SAND FILTRATION OF COMMUNITY WATER SUPPLY.

by:

D. MBAI
Chief Health Officer (Health Education)
Ministry of Health,
Republic of Kenya.

Prepared for Presentation to a meeting on Slow Sand Filtration organized by WHO International Reference Centre at HAGUE Holland. 29th May, to 3rd June, 1978.

COMMUNITY HEALTH EDUCATION COMPONENT

ON

SLOW SAND FILTRATION OF COMMUNITY WATER SUPPLY.

1. INTRODUCTION:

"No Water No Life" is a statement of fact. It is also true to say that water which is contaminated or polluted with disease organisms can pose a threat to the human life. It is therefore evident that water which is essential in supporting life can also be responsible for life destruction when it is polluted. Contaminated water is a good medium for transmitting waterborne diseases such as Typhoid, Dysenteries, Diarrhoea, Bilharzia and Cholera.

Human beings are mainly responsible for contaminating the water they use for drinking and domestic purposes. They contaminate water by putting dirty matter into the water source or by contaminating the catchment areas. Sometimes the villagers residing in a catchment area may 'help' themselves in the bush - thus contaminating the area. When it rains all the surface washings in the catchment area are carried into the rivers or dams.

Over-grazing, cultivation and tree felling has removed grass and bush which is normally responsible for natural filtration of surface water. Community is therefore left with no alternative other than resulting to artificial ways and means of making its water wholesome. Hence the need for Slow Sand Filtration. Water filtration should therefore be seen as a process whereby the community is making effort to remove contamination from water and make it suitable for human consumption and domestic use so as to improve the health and social-economic status and standards of the community.

2. STATEMENT OF THE PROBLEMS:

People have been mainly responsible for contamination of their own water through their own actions. There are certain behaviours of individuals or the community which are responsible for water contamination.

Lack of knowledge on the dangers posed by unwholesome water is another problem. Other problems exist as a result of Social-economic status and also lack of technical know-how in solving the problems.

3. STATEMENT OF OBJECTIVES:

The purpose of the community Health Education component of Slow Sand Filtration project is to ensure that at the end of the educational activities the community will be able to:-

3.1 Develop an understanding of the dangers posed by contaminated or polluted water and be able to take positive decisions and actions by providing Slow Sand Filtration Plants.

3.2. Develop an understanding of the waterborne diseases and the role played by Slow Sand Filtration Plant in the prevention of these diseases.

3.3. Develop an understanding and motivation so as to make Slow Sand Filtration Plant a valued community asset.

3.4. Develop a climate conducive to exchanges of experiences among themselves and also with technical personnel, in order to solve the water problems,

3.5. Develop an "Harambee" spirit conducive to contributing towards the Slow Sand Filtration Project in a form of labour and other necessary inputs.

4. COMMUNITY HEALTH EDUCATION:

4.1. Community Diagnosis:

First and foremost it will be necessary to carry out community diagnosis systematically. In diagnostic process, the Health Educators or Extension Agents would equip themselves with relevant information which would enable them to carry out effective community health education.

The type of community diagnosis should include:

- Identification of the community basic needs, particularly those needs which are related to water. In carrying out

- education activities on Slow Sand Filtration, the Educators should link the expressed community needs with the water project.
- Health Status of the community shall be diagnosed taking into account the common waterborne diseases in the area. The community shall be encouraged to state their views on these diseases with a view to finding out whether they understand any relationship of the diseases of water.
- Finding out the community cultural and beliefs connected with water and its utilization. Information will be sought about health habits towards water utilization and the extend to which water is valued.
- Social-economic activities of the area will be identified.
- Information will be sought on the way the community is structured and organized in terms of women organization, the role of men in the provision of water supply, opinion leadership and the young people's role in the water supply project.

4.2. COMMUNITY PARTICIPATION

The educational programmes shall be implemented with particular emphasis on community participation. It is not only a question of involving the community but there must be a popular participation. Development of climate favourable to free exchange of experiences among the community themselves and also between the community and extension agents. Sometimes Extension Agents or educators make efforts to tell the community what to do without realizing that the community has also alot to tell the extension agents.

It is important for educators to be conscious of the fact that although he is equiped with technical know-how, which he is anxious to impart to the community - similarly the members of the community are 'saturated' with their know-how (beliefs, habits, historical and geographical background information)

which the educator may be very ignorant about. Therefore the community and educator should be prepared to learn from one another. The extension agent or educator should train himself to be an "Active Listener". His major role should be to guide the discussions so that useful innovative ideas may not be allowed to scatter and perhaps be forgotten.

Opinion leaders should be involved right from the beginning. More information on Slow Sand Filtration shall be provided to this target group. The more knowledge they will get about Slow Sand Filtration the more they will be able to communicate it to the community.

5. MULTI-MEDIA EDUCATIONAL STRATEGIES:

The approaches to be adopted in Slow Sand Filtration project will include those communication channels (media) which are appropriate to the project. The construction of the messages or topics to be discussed will highlight the benefits which will be acquired as a result of Slow Sand Filtration, emphasis will be made so that Slow Sand Filtration is seen in the context of improvement of health and social-economic development.

The following communication channels (media) will be used in exchanging knowledge and experiences with the community in the project area.

5.1. BARAZAS:

A series of Barazas will be held to cover most of the people in the project area. The purpose of the barazas will be to introduce the project to the community. These will 'sentitize' the community and encourage dialogue to start taking place. Barazas will be addressed by the Health Educators and Technical Personnel. The Technical Personnel will be able to explain technical details as may be required by the community.

5.2. RADIO:

Interviews will be conducted in the project area so as to have the views of the leaders and the community members expressed.

"Baraza" - This is a gathering where development projects and any other

5.2. The interviews will be broadcast from the Voice of Kenya Broadcasting Station. These interviews will serve the purpose of explaining to the community the expressed wishes of their leaders. The community will tend to identify themselves from the Radio news about their own locality and their own project. Moreover these type of interviews have 'motivating' effect on the leaders and they tend to create sense of commitment.

5.3. NEWSPAPERS:

The press will be invited to cover some of the activities of the project. This type of coverage will be intended to provide knowledge to those members of the community who might have not been reached by the initial messages through "Barazas and Radio.

5.4. FOLK MEDIA:

Traditional songs and drama shall be conducted explaining the importance of Slow Sand Filtration Project as a means to promoting good health and prevention of waterborne diseases. Emphasis will be made on the project being a community asset.

5.5. SMALL GROUPS MEETINGS:

These are considered important because they can thrash out details about Slow Sand Filtration Project and obtain group commitment through social reinforcement.

5.5.1. WATER COMMITTEE GROUP:

Discussions shall be held with the committee responsible for the Slow Sand Filtration Project. In these discussions motivational and technical knowledge will be exchanged.

5.5.2. WOMEN GROUPS

Discussions will be held with women groups on Slow Sand Filtration. These groups are particularly important because in Kenya women are responsible for fetching water from various source and take it to homes for storage - and then be used for domestic purposes and human consumption. Women are concerned about the

quality of water. That is why they travel long distances to a spring water source rather than drawing water in a nearby river, where water is muddy.

5.5.3 COMMUNITY LEADERS GROUP:

Discussions and exchange of knowledge with the opinion leaders of the community will be held. The composition of this group will include formal leaders such as party members, councillors, chiefs, teachers, leaders of women organizations and also informal leaders who are identified to have strong inclinations to provision of water. Leaders should be conversant with SSF project so as to give their support.

5.5.4. LISTENING/DISCUSSION GROUP - UTILIZING CASSETTE RECORDED MESSAGES:

Messages on SSF will be recorded so that it can be used by groups in the project area. These recorded messages will be aimed at provoking discussions. A local health worker or community Development worker shall act as a resource person, and lead the discussions. It may be necessary to train some members of the community so as to take charge of discussion leaderships.

5.5.5. SCHOOL TEACHERS/PUPILS:

Discussions shall be held with school teachers and pupils to highlight the importance of the Slow Sand Filteration and the role the teachers and pupils should play in the implementation of the project, its operation and maintenance. The teachers and pupils should be made to understand that they are part and parcel of the community where the schools are situated and what goes on there affect their own health and welfare. Teachers and pupils understand 'germ theory'. That is to say connection between diseases, germs and water.

5.5.6 HEALTH WORKERS/OTHER EXTENSION WORKERS:

Health and Extension workers in the project area shall be taught elements of the technical aspect of the Slow Sand Water Filtration and the methodoligies they should adopt in their motivation activities. Sometime it is taken for granted that all extension workers are equiped with know-how to carry out planned activities. In some cases this type of assumption turn out to be untrue. The objectives of the project must be clearly understood by the extension workers so that

5.5.7. MOBILE CINEMA SERVICE:

Films and Slides on Slow Sand Water Filtration shall be shown to the community and the small groups in the project area. Waterborne diseases films shall be shown. Waterborne diseases in the project area shall be identified and discussed.

5.5.8 THE INTEGRATED-INTERAGENCY PLANNING COMMITTEE:

The motivation approach planned for the project will be discussed by the main committee so that each agency may be able to identify the role it will play in the project implementation. This is considered important in that there is always a component of motivation in every aspect of development project. What is more the project management committee should have a thorough understanding of motivation aspect of the programme so that the committee may be able to monitor the effectiveness of all components of the project implementation and utilization.

5.5.9. EDUCATIONAL MATERIALS:

The project community health education component shall be supported with educational materials. Posters will be developed on Slow Sand Filtration as well as waterborne diseases. These posters will be displayed at strategic conspicuous places where they can be seen and read by the literate population in the project area. Handouts will, also be developed to be issued to literate population of people in the project area.

The Printed educational materials will be developed in the languages spoken by the community in the project sites.

6. CONSTRAINTS:

It must be emphasized right from the start of the project planning and implementation that the technical aspect of the Slow Sand Filtration must be carefully carried out. It would be disastrous if the project failed to fulfil the community's expectations. If by any chance the Slow Sand Filtration failed to function properly, that would destroy the motivation created and credibility of those who introduced the idea.

Technical personnel must take pains to ensure that all aspects of planning and construction are taken care of to the minute details. Community Health Education does not take place in vacuum, It takes place to meet some felt or real needs (benefits). Failure to meet the needs or benefits negates the motivation.

7. E V A L U A T I O N:

There shall be continuous, intermittent and terminal evaluation. The measurement scales for the evaluation process shall be developed after community diagnosis and when all the relevant factors to be observed at the end of project implementation, have been identified.

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who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

W.D. VI

SLOW SAND FILTRATION PROJECT

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WORKING DOCUMENT VI

OUTLINE FOR THE EXTENSION PROGRAMME FOR SLOW SAND FILTRATION PROJECT IN GHANA

by

Dr. K.P. Nimo

National Health Planning Unit
Ministry of Health
P.O. Box M-44
Accra.

PRIMARY HEALTH CARE - AN INTEGRATED APPROACH TO MAKING COMMUNITIES HEALTHY IN GHANA

BY DR. K.P. NIMO

INTRODUCTION

Ghana, a former British colony, lies along the coast of West Africa. It has an estimated population of 10 million (1975) and covers an area of 238,477 sq. km (92,000 sq.miles). It has as its neighbours to the West Ivory Coast, to the north Upper Volta, to the east the Republic of Togo. It is divided into 9 administrative regions, each with its own administrative head, responsible to the Central Government.

The structure of the population is such that 20% is under the age of 5 years and 49.5% is under 15 years. About 30% of the population live in Urban areas (urban areas are population settlements of 5,000 or more people).

Summary of Primary Health Care paper

In spite of huge infusions of resources (both facilities and highly trained health professionals) in recent years, there has been little improvement in the general health status of the nation in the last 15 years. In fact, certain communicable diseases have been increasing over the past 10 years.

The basic problem is that the present system, based on passive service delivery points (hospitals, health centres, and health posts) is not doing the job. 70% of Ghanaians presently are unable to make use of this static health system. The Primary Health Care Concept proposes an activating supplement to this system particularly designed to reach the people of the rural areas and urban shanty towns. The proposal is based on the premise that healthy living is an integral part of the total social and community development and that effective health measures require the active involvement of the people themselves at the family and community level.

The base for the 3-tier system would be community health workers (Level 'A') selected and compensated by the community itself, but trained by the Ministry of Health in primary preventive and promotive procedures and simple, first-level curative measures with emphasis on pregnancy management, child health promotion, environmental sanitation, and mobilisation for health-related community projects.

The second level (Level 'B') would provide for community health nurse/midwifes with additional training in curative procedures where principle responsibilities would include the technical supervision of the village health workers, all routine immunization (to be performed at Level 'A'), and care of patients referred from Level 'A'.

The District (Level 'C') would be the key level for management of the entire system.

A District Management Team consisting of the District Medical Officer, District Public Health Nurse, District Health Administrator, and District Health Inspector would work in direct relation with the District Chief Executive in order to assure an integrated approach to total community development.

The specific goal of this Primary Health Care System is to maximize the total healthy life of the Ghanaian people with the following targets to be achieved by 1990: (1) 80% coverage of the population by introduction of the system to all villages of population 200 or more, and (2) effective attack on the disease problems that contribute 80% of the unnecessary death and disability afflicting Ghanaians.

The cost to achieve these goals is moderate and well within Ghana's means. The major costs will be in the training and re-training programmes and in the necessary logistical support system for providing transport for supervision and supplies to the rural areas. The cost of not instituting the Primary Health Care System will be the continuing high level of unnecessary death and disability of the Ghanaian people.

5 Year Development Plan For Water 75/76 - 79/80

The Ghana Water and Sewerage Corporation (GWSC) has drawn up a Five-Year Development Plan which has been incorporated in the National Five-Year Development Plan.

"The objective of the GWSC is to increase the percentage of the population served with portable water from 38 to about 50 percent during the planned period.

The plan was based on the assumption that the Government would continue to allocate annually some 6% of its annual budget for the provision of portable water supplies in an effort to reduce the number of persons infected by water-borne and water related diseases and to reduce associated medical treatment costs and loss of productivity.

The specific objectives of the plan include among other

- to supply portable water to rural communities.

The MOH has also come out with a Primary Health Care paper which aims at intergrating the various agencies like Agriculture, Education, Social Welfare and Water and Sewerage Corporation at the community level. It is hoped that if this is done properly, water-borne and water-related diseases will be reduced to a minimum.

With respect to the Slow-Sand Filtration approach the first phase which has already been completed was jointly undertaken by the GWSC and the Environmental Quality Division of the Civil Engineering Department of the University of Science and Technology (UST). This involved Pilot Plant Studies of Owabi near Kumasi to determine the technical criteria for design of slow-sand filtration plants.

...../3

For the second phase a committee, comprising GWSC, MOH, Ministry of Economic Planning, Department of Social Welfare and Community Development; Department of Sociology - University of Ghana and the Department of Civil Engineering - UST.

It is intended to construct two demonstration plants, one around Lake Bosumtwi in the Ashanti Region and the other in Brong-Ahafo. These plants will have a capacity of 0.05 - 1.0 million gallons a day which should be adequate for populations between 2000 - 5000.

We are not actually in the doing stage because our whole development plan is behind schedule.

I am thus here to learn from those of you who are actually in the doing stage of the Phase II. This I hope will help us when we come to implement the phase II in Ghana.

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

SLOW SAND FILTRATION PROJECT

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WORKING DOCUMENT VII

OUTLINE FOR THE EXTENSION PROGRAMME FOR THE SLOW SAND FILTRATION PROJECT IN JAMAICA

by

Mr. B. Muir

THE SLOW SAND FILTRATION PROJECT
INTERNATIONAL MEETING ON THE
HEALTH EXTENSION COMPONENT
VOORBURG, (THE HAGUE), THE NETHERLANDS
MAY 29th - JUNE 3rd, 1977

A Health Education Submission on the Proposed Jamaican Slow Sand Filtration Rural Water Supplies Health Extension Project.

By: (Mr.) B. L. Muir, M.R.S.H.
Postgraduate Diploma Community Health (Health Education) U.W.I., Mona Jamaica.
(Representative of the Ministry of Health and Environmental Control, Kingston. Ja. W. I.)

1. Within the relatively short period of time that I have been selected as the representative of my Ministry to attend this conference, I have been pondering various aspects that are considered crucial to the formulation, planning, execution and evaluation of an health education programme in relation to the Slow Sand Filtration Health Extension Programme that will fit into our Jamaican situation.

What I shall attempt to present cannot be considered a comprehensive treatment of the subject but rather a selective presentation.

2. It appears obvious to me, that any such programme proposals must:

(a) Be consistent with the official national health plans, goals, and priorities of the Ministry of Health and Environmental Control.

(b) Be consistent with the felt health needs of the people of the immediate communities and peripheral areas of the geographic locations in which the Slow Sand Filtration Project will be located and operated.

.../2

This implies the need for the collection, tabulation, and analyses of a fairly wide range of socio-cultural, socio-economic, phycho-social, and some health and population data (as examples) and the effective utilization of these data in the programme.

(a) It appears to our (Jamaican) delegation that various approaches towards these data collection will revolve around:-

(a) The use of Formal Surveys

(b) From Records of Historical Research

(c) Health data that may be obtained through informal interviews with local health workers

(d) Socio-cultural data which may be obtained from various social and agricultural extension workers and from formal and informal leaders of the identified communities.

These are but examples of some of the local community agents and forces that must be involved in the programme and right from the start (phase by phase).

3. The Health Education Philosophy of the Health Education Services of the Jamaican Ministry of Health and Environmental Control is similiar to the well known W.H.O. definition; and the author also fully subscribe to this definition:

"The focus of health education is on people and on action. In general its aims are to encourage people to adopt and sustain healthful life practices, to use judiciously and misely the health services available to them;

.../3

and to make their own decisions, both individually and collectively to improve their health status and environment".

4. It appears desirable at this point, to set out clearly the current official policy framework within which the Health Education Services in Jamaica is operated by a "Bureau Of Health Education".

"Health Education is a component of every health programme and is essential for the achievement of programme goals and objectives. The overall responsibility for spearheading the development and implementation of Health Education rests with the Bureau of Health Education. Within this overall design, the programme is tailored and executed at community level under the Medical Officer (Health), using local health education expertise, to meet the specific community needs. The work of all social, welfare and community agencies and leaders has health education implications and their involvement is an integral part of health education operations.

The overall objectives of the education services to meet the goals of the various Primary Health Care programmes are to:

(1) Increase the level of health consciousness and understanding within the communities and encourage within the citizens the development of a sense of responsibility for their own actions in regard to their health and the health of their communities.

(2) Develop educational programmes aimed at stimulating maximum use of health facilities and resources and cooperation in health programmes.

..../4

(3) Train health personnel in health communications including Team Work and Human Relations.

(4) Accelerate the formation of Health Committees, in conjunction with Community Councils where feasible, and devise innovations aimed at increasing community participation in health programmes.

(5) Stimulate and conduct studies and research related to factors which influence health behaviour in the individual communities and the development of new educational approaches and materials.

(6) Promote a greater degree of involvement on the part of field officers or other health related agencies and Ministries in order to achieve a multiplier effect in other related programmes. Secure those visual aids and other educational and training materials which are need for health programmes."

It is within these policies framework that the Jamaican Health Education Services will seek to formulate, plan, execute and evaluate the proposed Slow Sand Filtration Health Extension Programme in collaboration with the National Water Authority, the Environmental Control Division, and all other agencies which might be concerned.

5. The Management proposals for the Slow Sand Filtration Health Extension programme for Jamaica has been discussed in the Principal Project Document; and the membership thereof are already documented.

What remains to be done later on, is the setting up of the Local Management Committee for each of the Slow Sand Filtration areas as are proposed.

.../5

Both in the administrative and operational contexts, at least two formal agencies must necessarily be involved in the Project,

(a) The Parish Council of St. James and its Roads and Works and Health Departments, in respect of the Endeavour/Camrose/Project.

(b) The Parish Council of Clarendon, and their Roads and Works and Health Departments in respect of the Peace River Project.

(c) The key administrative technical and professional personnel involved in each of these parishes having legal jurisdiction for the health of the parishes, including water supplies sanitation monitoring and distribution.

(d) There is also the question of the Area Health Administrations under which these parishes fall (geographically).

6. Comprehensive Guidelines on Planning, Implementation and Evaluation of Health Education . (W,H,O. Regional Office for South East Asia, New Delhi, India, April 1969.)

The author gives much consideration to the academic merits of the use of these basic guidelines, and few selective excerpts are here quoted:

"Health Education cannot be planned in general terms or in a Vacuum. It is planned in connection with a specific

.../6

health programme or health service. Therefore it is essential for the planners to know the health service or programme well".

It is also conceded that "while selection of the health problem is an administrative decision, the health education service should provide information relevant to the selection.

It seems imperative to now have a critical look at sections (1) and (2) of these guidelines.

(1) "The Health Programme

(a) What is the health programme in which health education is to be planned?

(b) What health problem is the programme expected to help in solving?

(c) What were the conditions in selecting the problem which the programme is intended to solve?

(d) How is the health problem seen by health experts/ administrators?"

The scientific answers to all these questions must first be found before any meaningful health education programme can properly be formulated. A tremendous amount of fact - findings is therefore needed to be done.

At present the only relatively clear-cut answer (available from our National Health Plan) is that for section 1 (a) - namely, that the health programme relates to the water supplies segment of the Environmental Health aspects under our developing system of primary Health Care.

.../7

(2) The Nature and Scope of the Problem

(a) What are the epidemiological considerations?

(1) Magnitude (size, severity, seriousness)

(2) Population group affected

(3) Geographical distribution and

(4) Seasonal distribution"

7. The author, recognises the far reaching health education interventions and implication involved in the challenges of the assignment.

Learning about your Slow Sand Filtration Projects and experiences in the other countries is a process being rapidly pursued. You might understand that a review of your "BIBLIOGRAPHY ON EXTENSION AND COMMUNITY PARTICIPATION IN WATER SUPPLY AND SANITATION" has been of invaluable assistance to me.

Already I am convinced that the basic scientific ideas, concepts and expressed or implied goals can be made applicable to our National Health Plan's philosophies and aspirations, and be also rendered in consonance with the Jamaican socio-cultural - economic situations.

For the sake of brevity, I must admit that I have suffered much from "SELECTIVE PERCEPTION" in attempting to indicate the crucial constraints (scientific, administrative, socio-cultural - economic etc.) which appears to dictate that at this time, no formal health education programme can be properly developed until,

(a) the needed planning data, are gathered analysed and interpreted;

(b) there is conscious and deliberate involvement of the other formal agencies/organizations concerned,

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(c) and finaly, the involvement of the particular communities which the projects are expected to serve, in terms of their felt health needs.

It is however, intended to document and submit a tentative conceptual programme outline limited to suggested programme goals; programme objectives and indicating the health education methods which might best be used in our Jamaican situation.

These tentative proposals will follow shortly in this paper.

8. Currently Available Health Extension Opportunities in Jamaica

It would seem fitting to share with you the existence of certain on-going health education programmes with which the water supplies education aspects of the proposed programme could be incorporated.

(a) A national family planning and population programme.

(b) A national nutrition education programme

(c) An accellerated agricultural food crops Production Programme.

(d) Health Education in the area of water-bourne diseases (as part of our communicable diseases education programmes)

These are mentioned as they particularly relate to some of the ideas and concepts documented in your "BIBLIGRAPHY" and also because they are of prime national interest considerations in Jamaica today.

9. The Suggested Programme Goals

1. To achieve the greatest possible well being of the people through social change, greater self-reliance in the community,

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better (community) organization, a better deal for the poor and (b) improved standard of living, health, nutrition, income and leisure.

2. That the health status of the community be enhanced through the utilization of improved quantity and quality of potable domestic water supply, good sanitation practices, and personal hygiene.

10. The suggested ultimate (Long Term) Programme Objectives

(a) That by 1980 (or within two years from the commencement of the Slow Sand Filtration project), the communities will have chlorinated piped supplies of water available to them.

(b) That by 1980 (or within two years from the commencement of the Slow Sand Filtration Project), the percentage of householders not served by piped potable water, will be reduced by one-half (50%).

(c) That by 1980 (or within two years from the commencement of the Slow Sand Filtration project) 50% of the population not served by water supply, will receive treated (potable) water.

11. The Suggested Intermediate (Short Term) Objectives

(a) That the health administrators/experts concerned with the projects know, understand, be aware of and be interested in and accept the ideas and concept of the Slow Sand Filtration Health Extension Project.

(b) That the team of health and health related workers of the community organizations involved, know, understand, be aware of become interested in, and accept the ideas and concepts of the

.../10

Slow Sand Filtration Health Extension Project.

(c) That the health and health-related workers of the community or organizations be involved in the data-gathering, identification of health problems, and participate in the planning, implementation and evaluation processes of the project.

(d) That the community organization leaders be involved in the data gathering, identification of the health problems, and participate in the planning, implementation and evaluation processes of the project.

(e) That the communities will recognise the value of the immediate advantages of the reduction of time and energy spent in water collection from distant locations, by the availability and use of a more reliable and efficient water supply system.

(f) That the communities recognise the economic value to them of the utilization of a more reliable and efficient water supply system in the development of "kitchen gardens/vegetable gardens (as is encouraged by our national nutrition Education Programme, Jamaica).

12. The Suggested Basic Health Education Methods/media for the Jamaican Programme

1. The use of the community organization method.
2. The mass-media approach -

   Radio - Television - and the printed media.

...11

3. The utilization of the "local media" community channels which might be identified.

4. The group-approach method (might be most heavily relied on)

5. The person - to - person method (of least <u>feasible</u> reliance in operational/resources contexts).

It is our earnest hope and expectation that the objectives of this conference will have been attained to the mutual benefit and satisfaction of all concerned. We look forward to sharing with you in the dynamics of the deliberations amd group excercises that will be involved in the conference proceedings.

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

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WORKING DOCUMENT VIII

OUTLINE FOR THE EXTENSION PROGRAMME FOR THE SLOW SAND FILTRATION PROJECT IN COLOMBIA

by

Mr. M. Santa Cruz

The basic rural sanitation programme in Colombia which mainly deals with the construction of water supplies in the rural communities over 50 and under 2500 inhabitants has been directed by the National Institute of Health since 1969.
This Institute,that is responsible to the Ministry of Public Health, has the antonomy and finds enough to accomplish this programme with success through its Basic Rural Sanitation Division according with the following data as far as water supplies is concerned by December 31st 1977.

communities	number
with service	3756
without service	4052
total	7808

Percentage of communities with service over the total : 48,1%
The total concentrated rural population among the limits taken into account for this programme reaches 4.071.000 inhabitants.

The first criterion to take into account getting a community to solve its water supply problem is to determine the technical and economic feasability. The second major criterion as far as Colombia is concerned is the degree of community participation during and after the construction of each system.
To accomplish this goal the Basic Rural Division has available 112 extension workers (in Colombia thay are called "Promotores de desanollo rural") who do not have a high level of education but a continuous practical training programme with high level instructors.
The experience in Colombia is good. As an example in Putumayo, a region located in the south-east of our country, the active community participation during the construction of the systems as a percentage of the total cost was as follows:

Year	Percentage (community/total)
1973	1,4 %
1974	2,2 %
1975	9,6 %
1976	9,5 %
1977	17,2 %

The continuous education programme for these extension workers started in 1973.

It is important to mention that the community, in a general meeting, signs a contract with the Institute's Director, before any work is commenced, outlining clearly the following items, a) - The financial help (labor, materials, money). b) - The community's committment to administer and maintain the system when it is completed. To this end, two members of the community are elected by popular vote to be members of the administrative body of that particular system and a third member will be provided by the Inistitute; c) - To make plans for re-paying a certain percentage of the government contribution for the project in monthly instalments for a period from 10 to 20 years according to the economic capacity of each community.

In Colombia, there were 1501 of these administrative boards by the end of 1976.

One of the main problems of the basic rural sanitation in our country is that there are a high percentage of sources which provide poor quality water. By experience, treatment plants are very difficult to maintain and operate from the technical and economical point of view mainly because of the size of the communities in the programme.

It can be proved very easily that when the turbidity and color of the water source are acceptable, the slow sand filtration system gives good results in this type of programme. Colombia has some experience on this topic, but it is important that we carry out more research on it and pay more attention to this type of treatment with the benefit of the experiences of the countries which paricipate in this important meeting and the information transfer stimulated and coordinated by the International Reference Center.

We are really grateful for the opportunity to participate on this project.

Mario Santa Cruz
Instituto Nacional de Salud
Colombia

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

W.D. - X

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WORKING DOCUMENT X

DRAFT

TENTATIVE LIST OF BASIC TOPICS AND SUB-TOPICS OF COMMUNITY EDUCATION AND PARTICIPATION PROGRAMMES

SLOW SAND FILTRATION PROJECT

BASIC TOPICS

Programme emphasis

1. Optimal degree of community participation in the three aspects of the programme: introduction of SSF; operation and maintenance; and behaviour change.

2. Dialogue and feedback: balance of community control and external guidance

3. Check on benefit for all sections of community

Implementation strategies (community level activities)

1. The extension agent and his supervision.

2. The role of community authorities, organizations, and ad hoc groups in the programme.

3. The information the extension agents brings to the community.

4. The information needed about the community and existing water supply.

5. Roles of extension agent, technical personnel and community in planning and implementing the new water supply.

6. Roles of operator, community members and technical personnel in operation and maintenance.

7. Methods of achieving behaviour change.

8. Evaluation.

Organizational requirements (higer level activities)

1. Administrative coordination and lines of authority

2. Financial aspects and logistic requirements

3. Training implications

SUB-TOPICS

	Section + Page references in outline
1. Optimal degree of community participation	
A. General goals: Awakening a spirit of cooperation : Stimulating activitiy among disadvantaged groups	4iii pp 14-16
B. Which meanings of "community participation" apply?	pp 12-13
C. Extent of community involvement in planning, design, construction, of the SSF water supply	planning p 20 (1st par design p 45 4 1b pp 9-10 and (5.iv.a p 37)
D. Involvement of community members in operation and maintenance	4.i.c. p.10 5.v pp 42 -44
E. Community involvement in discussing and bringing about behaviour change	4.i.v. pp 17-19
2. Dialogue and feedback: balance of community control and external guidance	
A. The extension agent as guide and stimulator of dialogue	Esp. pp 9-11
B. The importance of the knowledge and the views of community members	throughout
3. Ensuring the benefit of all sections of the community	
A. The poorer sections	p 9, p 26, pp 40-42, + checklist 4, p 60
B. Women	4iii p 15, - 42

IMPLEMENTATION STRATEGIES (community level activities)

1. The extension agent and his supervision

A. Full time in community? For how long?	3 p 6
B. Capacity to perform tasks	checklist 5, p 61
C. Supervision	6i pp 47-48

2. The role community authorities, organizations, ad hoc groups

A. The responsibilities of community authorities in control and financial aspects of the water supply	
B. The mobilization of existing organizations	Checklist, nos 7-9 (+ checklist 2)
C. The formation of ad hoc groups of community members	5i p 20

3. The information the extension agent brings to the community

A. On the intentions of the project (terms+conditions + timing etc.)	4.i a-c p 8-10
B. On the need for improved water supply	pp 32-33
C. On disease transmission	checklist 3 pp 57-59
D. Technical information on the water supply system	pp 35-36

4. Information needed about the community + the existing water supply

A. Survey on acceptance of the programme, attituted to water supply	5 .ii p 21 + appendix p. 63
B. Survey on cooperatives	5.11 p 23 + app. p 64
C. Survey on community power structure	5.11 pp 24-26
D. Survey on point where pollution occurs	5.11 pp 26-27

5. Roles in planning and construction of water supply

A. Mobilizing communal labour	5.iv pp 36 - 42
B. Liaison with technical personnel	5.vii pp 46 - 47
C. Community financial contributions to installation	3 p 5

6. Roles in operation and maintenance

A. One or more village persons as operators	4.ic	p 10
B. Should the operator also be a village health worker?		p 44
C. Remuneration of operator		p 10
D. Supervision of operator and regular maintenance		pp 42 - 43

7. Methods of achieving behavioural change

A. Consultative group or while community decision on content and methods	p 20
B. Group + individual teaching and discussions	p 28
C. Demonstration (microscope?)	p 29,33
D. Community sef-survey	p 29
E. Visual aids (see also Hermione Lovell's paper 3.2.3 pp 40-43)	pp 29-30
F. Use of local art forms, e.g. drama	p 30
G. Making it physically easier for people to change behaviour	p 19 p 34,36

8. Evaluation

A. Methods to sum up experience to improve implementation	pp 47-48
B. Evaluation of health impace (too difficult?)	p 48
C. Evaluation of intermediate goals (knowledge, practices)	p 49
D. How much effort to put into detailed evaluation?	p 50
E. Evaluation of implications for social structure	pp 51-52

ORGANISATIONAL REQUIREMENTS (non-village level activities)

1. Administrative coordination and lines of authority	HL Ch.4 pp 60ff
A. Allocation of responsibilities by department	Checklist 18,19, 20
B. Day-by-day liaison between extension agent, technical personnel, and central direction	AW 5vii pp 46-47 HL 4.3 pp 75-77
C. Provision for detailed programming of tasks and activities	HL Checklist 18
2. Financial aspects and logistic requirements	
A. Financing of the project and recording of costs	HL 4.4. pp 78 - 82 Checklists 24-26 AW 6ii p 49
B. Supplies: any problems expected?	HL 4.5 pp 83-85
3. Training implications	
A. Agency staff especially extension agents	AW 5vi pp 45-46
B. Villagers as operators (also as village health workers?)	AW 5v p 43-44 HL 4.8.2. pp 97-100
C. Village authorities, committee members etc. (esp. to oversee operators and control water supply)	

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

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LIST OF BACKGROUND PAPERS

Background paper I - Preliminary draft bibliography on "Extension and Community Participation in Community Water Supply and Sanitation" - Part I: Literature Review, by Drs. Chr. van Wijk-Sybesma

Background paper II - Preliminary draft bibliography on "Extension and Community Participation in Community Water Supply and Sanitation" Part II: Selected Abstracts, by Drs. Chr. van Wijk-Sybesma.

Background paper III - "Water Supply and Community Choice", by Whyte A. and Burton I. in R. Feachem, M. McGarry, D. Mara (eds.) "Water, Wastes and Health in Hot Climates", London, Wiley and Sons, 1977, 113 - 129.

Background paper IV - "Story of a successful national rural water supply programme in the Dominican Republic - Planar" by Charles S. Pineo, Consultant to the Pan American Health Organization, 1973.

Background paper V - "Water and Community Development". Les Carnets de l'Enfance/Assignment Children, no 34, April-June 1976 a UNICEF publication.

INTRODUCTION ON PRESENTATION OF "EXTENSION AND COMMUNITY PARTICIPATION IN WATER SUPPLY AND SANITATION" by Drs. Ch. van Wijk.

1. Introduction

One of the activities initiated in the second phase of the Slow Sand Filtration project has been the compilation of an annotated bibliography on local participation and health education for community water supply programmes. The literature reviewed should be summarized in a general paper to introduce these two aspects of water supply and sanitation programmes.

2. Materials and Methods

As the interest in social aspects of rural water supply and sanitation programmes is a fairly recent one, the I.R.C. felt that the field of literature should include (1) the diffusion of all kinds of technical innovations, including water supply and sanitation systems and (2) health education, community development and community participation experiences.
Within this framework the material presented at the I.R.C. should be reviewed in addition to literature from Dutch university libraries and other relevant institutes such as the Tropical Institute in Amsterdam. With such a wide scope the compilation of an annotated bibliography is of course a sisyphean task, and timely reflection on the value, form and contents of this type of background work is necessary.

3. Topics of Discussion

3.1 The scope of the bibliography

a. Is there any need for continuing the bibliography within such a wide scope?
b. Should the bibliography be narrowed down to publications on water supply, sanitation and health education.

3.2 Data Collection Material and Methods

a. Should completed and ongoing major water supply and sanitation projects (e.g. those initiated by governments, international agencies like UNICEF and World Bank and private agencies such as Oxfam) be included in the bibliography.
b. What criteria should be applied for the categorization of a programme as a major project?
c. There should be a substantial amount of unpublished material (e.g. on the above mentioned projects) as well as "fugitive"material,(e.g. Latin American publications on promotional and health education programmes for rural water supplies). Would a more systematic approach to individuals and institutes involved in rural water supply and sanitation programmes through a mailing survey and regional searches be advisable?
d. In addition it might be discussed whether it would be useful and feasible, to systematically collect information on country programmes as has been done by Pineo (see background paper Dominican Republic, History of the Rural Water Supply and Sanitation, and the other UNICEF Documents on the reading table) but emphasizing community participation and health education aspects.

3.3 The activities mentioned in the last two points might serve the additional objective of raising agencies' interests in the extension component of water supply programmes.

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

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BACKGROUND PAPER I

Preliminary draft
Bibliography on

EXTENSION AND COMMUNITY PARTICIPATION IN COMMUNITY WATER SUPPLY AND SANITATION

Part I

Literature review

by

Drs. Christine van Wijk - Sybesma

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

IRC : ECP 19780323

Preliminary draft

Bibliography on

EXTENSION AND COMMUNITY PARTICIPATION IN COMMUNITY WATER SUPPLY AND SANITATION

Part I

Literature review

by

Drs. Christine van Wijk - Sybesma

Contents

Introduction

The days when concentrated efforts in one area, like industrialization or family planning, were thought to be the answer to better living conditions in third world countries are long past. Governments have realized that progress will only result from a complex process demanding integrated development efforts in technical, economical, social and political fields and directed at the rural areas where the majority of the population lives. An important aspect of this approach nowadays is making people conscious of the development of the community and promoting their participation in the process.

One of the problems receiving an increasing amount of attention, both nationally and internationally, in this development process, is the easy access to a reliable water supply, providing safe and sufficient water at a convenient distance in rural areas. The International Reference Centre for Community Water Supply was established at The Hague, the Netherlands, in 1968, in close collaboration with the World Health Organization for the purposes of coordinating and stimulating technological research and water supply programmes that are adapted to local circumstances. The introduction of new technologies in rural communities and urban fringe areas, cannot, however, be separated from the social, economic, cultural and political conditions. A survey of literature on the social aspects of rural water supplies was, therefore, carried out from October 1977 to January 1978, on which this paper has been based.

Most of the publications used have been added as a separate bibliography (Part 2 - Abstracts), with rather long annotations, since the paper is primarily

designated for policy makers and technicians who are engaged in the planning and implementation of water supply projects, and who are dealing with, and are interested in, the social side of the matter. It is hoped that by this presentation the bibliography will save time and work for people whose main activities concern other aspects of rural water supplies.

Publications have been collected from very divergent sources, as the interest in the non-technical sides of rural water supplies is fairly recent. Some literature came from the publications of technologists, who, in the course of their work, came in touch with social aspects, other publications concern the adoption of innovations varying from a hydraulic oilpress to family planning. The initial limit applied when searching for literature was 1968, however, due to the snowball effect some earlier publications have been included. A list of selected, but not yet annotated literature has been added in annex 1, with an overview of bibliographies and journals covered up to the present time have been added as annex 2, and a list of key words and institutes and persons contacted for material by the International Reference Centre in annex 3 and 4 respectively.

It was believed that by widening the field of literature to the diffusion of all kinds of technical innovations in developing countries, as well as experiences with community development, health education and community participation, information could be gained which would be very useful for the introduction of improved water supplies in rural communities. Especially the evaluation of agricultural development projects, including rural extension, which is presently going on (Morss et al.,

Lele, Wilson, Saint and Coward) might prove helpful in designing better water supply programmes which not only provide safe water at a convenient distance and assist in the organization, training and supervision of adequate local administration and maintenance systems, but also promote the inherent sanitation practices in the community by including a sanitation extension component.

A bibliography which is placed in such a wide scope can never even be hoped to approach completeness. This is why the majority of its contents have been summarized in a paper, as a state of the art as well as a base for further discussion. The reader is, therefore, invited to send his comments and criticism, and any information about publications he feels would contribute to the solving of the problems of more and cheaper water supplies, which are better maintained and which improve the sanitation conditions and practices in the village.

Extension and Community Participation in Rural Water Supply Programmes: Review of the Literature.

- Safe Water for All by 1990

The easy access to a reliable and safe source of drinking water in all developing countries by 1990 is the target of the next project of the Unicef/WHO Joint Committee on Health Policy (1977b). This is a very ambitious target, as is shown by a WHO survey of 90 developing countries in 1970/1972, which found that of their estimated population of 1.627 million people, 72% lived in rural areas, of which only 12% were considered to have an adequate water supply. (WHO, 1973, Pineo and Subrahmanyam, 1975).
To increase safe water access for rural populations from 12 to 25%, the intermediate goal for 1980, a population exceeding the total population of the United States will have to be served with modern supplies. This figure does not even take into account the population growth for these areas. For the period 1972-1980 this growth is estimated at 32%. In that case, it will be necessary to provide safe water access to five times the population of the United Kingdom in order to only maintain the situation in 1980 equal to that of 1971 (Feachem, 1975).

- Primary Health Care to Community Needs.

Yet bringing water to the village is a logical consequence of the new approach to public health adopted by the World Health Organization. The Central theme of this approach is the Primary Health Care, an integrated complex of prevention, health promotion, curative medicine and

rehabilitation services[1]. This integrated health system should cooperate with traditional health systems, be delivered at the most peripheral level of the national health services, namely, the rural community, and based on their 'actual felt needs' (WHO Regional Expert Committee on Primary Health Care, 1977).

This new approach resulted from the failure of serving a large and ever growing number of people through the institutional health systems that followed the western pattern (Bryant, 1969), and was influenced by the alternative approach by China, Cuba and Tanzania (Akhtar, 1975, New and New, 1975, Rifkin and Kaplinsky, 1973), as well as incidental community participation health projects. (Unicef/WHO Joint Committee on Health Policy, 1977a).

- Relation Water/Health

The two most essentially 'felt needs' in developing countries are food and water (Car, 1976, IAC, 1977 Mujeni 1974). Water is needed first of all as an essential life-giving commodity. In many developing countries women and children spend a great deal of their time in collecting water and firewood from distant places so that food for the family can be prepared. Safe and sufficient water is also important for health reasons. The incidence of water-related diseases such as cholera, typhus, bilharzia and various skin and eye diseases can be lowered by improving the quality of water used for drinking purposes and the quantity of water used for hygienic purposes. Many studies on the impact of modern water supplies on health have already been published (White and Seviour 1974, Saunders and Warford, 1976, White Bradly and White 1972)

1) An example of such an integrated approach has been described by Arole and Arole (1972) while the Unicef brochure A Strategy for basic Services describes the elements of this approach and lists projects in twenty developing countries.

It is questionable, however, if this relation between water and health will be known and whether or not it will be considered important by the local population.

- Different Health Cultures

A totally different health culture may exist, such as the one revealed by cultural anthropologists in Latin America and the Indian subcontinent, which classifies diseases into hot and cold (Logan, 1973, Lozoff et al., 1975, Wellin, 1975), and leads to a completely different interpretation of the relation between health, food, drinks and medicines. Wellin (1975) described the problems of a rural health worker in a Peruvian village when introducing the boiling of drinking water in the 1950's as boiled water was linked with illness.
Sometimes no relation at all may be seen between water and health:"Hindous et Musulmans croient que la plupart des maladies infantils sont dues au esprit ou "Budh". C'est pourquoi les bébés qui souffrent de diarrhées sont soignés avec des amulettes, des charmes et des incantations; souvant les enfants du premier âge ne sont pas amenés en consultation" (Lindenbaum, 1968). This may lead people to construct water supplies and sanitation facilities for reasons other than health, e.g. out of village rivalry or as a status symbol. Kar (1969) quoted Krishna (1967) who reported that many villagers who accepted sanitary latrines were not chiefly motivated by hygienic considerations, but by the fact that latrines were considered to be a status symbol.

") Hindus and Muslims believe that the majority of child diseases are caused by the spirit, or "Budh". this is why babies suffering from diarrhoea are treated with amulets, charms and incantations. Often children of one year old are not brought for consultation.

The opposite may also occur, however. De Winter (1972) mentioned Hopper (1967) who described how, in Malawi, villagers were forced to construct latrines during the colonial days which resulted in a large number of latrines being built, but certainly not in them being used. Moreover, as a result of the approach that was used, latrines were associated in people's mind with the idea of colonial power, rather than with their own health, so that after independence not having a latrine was often considered a sign of political integrity rather than one of poor hygiene. Feliciano and Flavier (1972) gave two examples of Philippine peasants, one of whom was induced to build a latrine because the extension worker convinced him of the danger to his pretty daughter falling prey to snakes if she went into the bushes at night, the other because an American visitor was coming into the village, with the result that only the daughter c.q. visitor were allowed to use the toilet.

- Health Knowledge and Behaviour

Where some ideas about the relation between water - disease do exist, this knowledge may be either incorrect or not detailed enough. The existence of the belief that the rays of the sun have a purifying influence on water may be a constraint to the acceptance of covered storage tanks, filters and containers. Vertinsky et al., (1970), found that traditional health workers in Colombia pointed to "black water" as a source of disease and realized the value of disinfectants, but that their definition of unsanitary conditions was purely sensory, so that they washed their syringes before administering injections in unboiled, though clear looking, water.

Feachem and others (1976) found no differences in the health conditions for villages with and without an improved water supply, when evaluating the water supply situation in Lesotho, and contributed this to reasons of hygiene and nutrition. Neither does the presence of sanitation facilities guarantee their use. Skoda et al (1977) give a 59,9% reported use of latrines (46,2 % of them being of the open type) for adults in 120 villages in Bangladesh, but only 12,8% for children, while remarking that even among the adults it was usually the women who used a latrine.

Heijnen and Conyers (1971) reported that Kreysler (1970) found a sufficiently low number of coliforms at improved water supplies in Ismani, Tanzania, but that the water from the overflow which was also used for drinking water, was very heavily polluted. Coliform counts of water from the supply carried home in debes (kerosine tins) also indicated a significant increase.
The input of health and sanitation [1] information, which was stressed as early as 1958 by Lacroix and Wagner, is, therefore, an essential component of a rural water supply and sanitation programme.

On the other hand, beliefs may be intuitively correct, such as the case of children in Mukaa, Kenya, drawing water from a hole dug in the sand next to a pool in the stream because the mother feels that this water is purer than that from the pool itself (White, Bradley and White, 1972). Such beliefs may be a starting point for discussions on preventive health knowledge and behaviour. Classification of health beliefs and practices in positive,neutral and negative may be helpful.

1) In this paper sanitation has been used in its wider sense of all hygienic conditions affecting health.

Even when knowledge is sufficient, it may fail to result in proper actions for economical, socio-cultural and/or psychological reasons. Are more suitable containers than oil cans, drums etc., available and at what costs? What influence have family and community relations got on innovative behaviour? Will conflicting attitudes and beliefs prevent adoption of better sanitation practices or another water supply? People may favour an easier and more reliable supply, but be suspicious of one built by the government, who may have hidden objectives such as adding contraceptives to the drinking water. Although this is an unrealistic fear it may, nevertheless, be a limiting factor to adoption. Misra (1975) for example, found that such mistrust of government intentions was one of the many constraints to accepting a piped water supply in Uttar Pradesh , India. It is also questionable as to whether or not people think themselves highly susceptible to water borne and washed diseases, and if these diseases are perceived as serious and avoidable (Versinsky et al, 1972, Kar, 1969, Adeniyi, 1972, Ogionwo, 1973). These and many more questions have to be answered before people can be persuaded to change their behaviour.

- Relation Water/Economic Development

Another impact that an improved water supply may have, is on economic circumstances, although direct relationships can hardly be expected, as usually more input will

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be needed than just education and an improved supply. White and Seviour (1974) mention
cations on cost/benefit analysis, many of which reflect the difficulty of calculating economic benefits. Two immediate advantages will be a reduction of time and energy spent in water collection and a more reliable and sufficient supply for small-scale agricultural and industrial ventures such as dairy farming, vegetable gardening and brewing.

White, Bradley and White (1972) at-

tempted to calculate total social costs, covering rates, cash price at source, water carrier price. energy and time spent in carrying and waiting, and health costs.

In the dry season as much as four hours may be needed for water transport (Kebede et al, ca. 1976),while the precentage of daily energy spent on water collection in East Africa varied from 12 to 27% (White,Bradly and White,1972). Both Fenwick (n.d.) and Vierstra (n.d.) noticed an increase in grade cattle after the installation of an improved supply in the area. Indirect economic benefits can result from a reduction of water related diseases and malnutrition due to a lack of vegetables in the dry season. Orihuela (1976) pointed at the conclusion by Atkins and others (1953) that within five years the cost of water supply and excreta disposal facilities would be amortized by the cost reducing effects of a decrease in typhoid fever, diarrhoea and enteritis. Additional programmes will, however, usually be required for the time and water gains to be spent on production activities.

- Relation Water/Social Development

Pacey (1977) even indicated goals for water supply improvement which go further than improved water, health and economic circumstances. A third stage objective should be "to achieve the greatest well-being of the people through (a) social change, greater self-reliance in the community, better organization, better deal for the poor, and (b) improved standard of living, health, nutrition, income and leisure".[1] Warner (1975), attempted to measure such less tangible benefits in a before and after field survey in 14 villages in Tanzania, 7 of

1) An example of such progressive development is the Yatenga Organization for Rural Development Project in Upper Volta, where the construction of dammed basins and wells in addition to natural rainwater pools led to a market gardening project. New inputs for marketing, storage and cooperatives were needed, however. (Oxfam, 1976)

which got an improved supply during the study, but Feachem (1976) criticized the qualitative nature of the variable measured and advised to limit such evaluation studies to economic impacts, such as time-energy savings, and health impacts, like a decrease in water-related diseases.

- Conclusion: Three Components of a Rural Water Supply Programme

Concluding it can be said that if a modern water supply project wants to improve health and living conditions for the rural population, it should have three components: a health and health education component; [1] an economic component, and an actual supply component . The economic component may be thought to be a less immediate objective, but there may be local circumstances necessitating an integrated rural development effort, such as the situation of the Gurage in Ethiopia, where crop diversification was a second essential condition for better health, which in turn called for various agricultural innovations (Kebede et al., n.d.)

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1) As safer water will lead to a decrease in mortality, and thus a higher population growth affecting economic conditions, governments may deem additional inputs in family planning as part of the health educational component necessary.

- Rural Water Supply: Construction

Much effort has already been given to the development of water supplies in developing countries, but as the WHO 1972 survey has shown, the pace of construction is too slow, especially in view of the increasing number of people to be served. The costs of water supplies constructed in analogy of those in western countries are often far too high, as illustrated by a calculation of building costs per capita for a modern water purification system at Cali, Colombia. These would be about $ 20 for the plant and $ 50 for the distribution system. Allowing forty years for the depreciation, the annual cost per capita is $ 1.75. Given the system, the costs of treating the water is about $ 0.50 per person per year, bringing the annual costs of safe water at $ 2.25 per capita, which can be compared to the total expenditure per capita on health for Colombia, at $ 3.50 (Bryant, 1969).

- Intermediate Technology

This makes it clear that alternative and cheaper ways have to be found to speed up the construction of water supplies, but also, that water supply construction efforts should be part of an overall rural development effort, to attain a more balanced growth of the population and the services needed by them.
A third aspect is to find ways of improving maintenance systems, for maintenance is as great a problem as construction. Cairncross et al, (1977), estimated the current disfunctioning of existing water systems at 30%, while Saunders and Warford (1976), found that in two of the twenty-five developing nations visited by them, water supplies were actually failing at a more rapid rate than they were being constructed.

One method for an alternative approach to increase the construction of rural water supplies and to simplify their maintenance is the development of intermediate technologies (Schumacher, 1965). They are adapted to local circumstances and designed for using as many local materials and labour-intensive methods as possible (Carr, 1976). The WHO International Reference Centre for Community Water Supply at The Hague, the Netherlands, has a stimulating and coordinating function in the development of such intermediate technologies, while its counterpart in Switzerland, the International Reference Centre for Wastes Disposal, does the same for waste disposal systems.

- Voluntary Labour

Voluntary labour and community self-help are an important element of these intermediate technologies. They are thought to reduce investments and improve maintenance through the inducement of local pride and a feeling of responsibility towards the improved supply. Sometimes food for work programmes are developed to get the full cooperation of the villagers, an approach advocated by, among others, Saunders and Warford (1976) and Eckholm (1974), the latter stressing additional, task-based cash payments, so that rural unemployment, another pressing problem, may - temporarily - be alleviated and migration to urban slum areas decreased. Pacey (1977) however, warned against increasing the villagers' dependence outside emergency situations, and cited a project in Tigre province, Ethiopia, where villagers wanted food for work when digging their own wells despite a good harvest, because of earlier experiences during a famine. The wells were finally dug with self-help labour and the assistance of one or two full-time employees of the project.

Self-help labour in the construction phase of a water supply project is fairly common, but it is not always the answer to problems of cost reduction and increased production, although it is difficult to measure the exact economical impact and even more difficult to estimate its motivational impact. Both Carruthers and Browne (1977) and Pacey (1977) warned against overrating this aspect. Pacey pointed at the frustration of the local population by an excessive and unrealistic load of work, poor standards of construction and inefficient allocation of the central government inputs of money, skilled personnel, tools and machinery.

- Self-Help Limitations

Pacey (1977) also suggested that there is a limiting relationship between the amount of voluntary labour people will contribute and the benefits they think will emerge. During the construction phase of 'beehive' catchment tanks in Botswana and Swaziland the project became a partial failure because the characteristics of the tanks[1)] led to their situation at the local schools, which did not answer any of the urgently 'felt needs' of the population. Some tanks were never completed also because labour demands were two to three times higher than those for other water tanks. This might have been prevented by community participation during the problem defining and solution decision phases, rather than expecting people to participate only during the construction phase.

In an experiment on the relation between mass media and adoption of health innovations in rural Ecuador, Spector and others (1971) found similar indications of

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1) Insufficient size for a village supply, but too elaborate and costly for the average private use.

a relation between adoption, self-help labour and the perceived advantages of the innovations. Adoption of four health innovations was studied: latrine building, smokeless stove construction, marmelade making and smallpox vaccination. Latrine building, a relatively costly practice, demanding five-men construction teams and with delayed and less observable benefits, was the least popular, while the construction of smokeless stoves, also costly and labour intensive but with immediate and observable benefits, was more popular than marmelade making.

Moreover, there appears to be a "ceiling" for self-help activities, at least temporarily. Spector et al, also failed to find an increased adoption of the investigated health innovations when a combined mass media approach instead of a single one was used; while the three experimental villages showed a great similarity in average total expenditure in money and effort, regardless of which of the innovations they adopted. The authors attribute this to the existence of a saturation point for innovation adoption in a community.

Fenwick (n.d.) noticed a similar reluctance to extend adoption of a rural water supply and sanitation facilities at Zaina , Kenya, with improved floors and fireplaces.

Feachem and others (1976) pointed at the idea of a "once-and-for-all" payment: once a community has contributed towards a government initiated social service, they will consider the government responsible for keeping up this service and, therefore, be less willing to contribute towards recurrent costs of management and maintenance. The authors also noticed the increasing politicization of water projects, a phenomenon which in Kenyan self-help projects even led to the over taxation of the population. Chambers and Belshaw (1973) mentioned the decline of self-help

health education and sanitation, and economic development) of rural water supply programmes as possible. A continuous two-way communication at all levels betweeen the community and the agency or agencies involved in the programme would then be established. Thus it will be easier for the community to identify itself with the resulting health (and economic development) programme, the supply and the administration/ maintenance system, because they were all realized through their own decisions as well as those of the agencies.

Lance and McKenna (1975), on investigating fifty cases of planned or semi-planned attempts to introduce change in developing countries, found that the most effective strategy was "participation" (77%), followed by "placement" or the positioning of suitable individuals in crucial statuses (43%), and "hands-off"or offering new practices which are then left to expand through the client system with no conscious control (40%).
Mora Ramirez and Lopez Orozco (1976) described such multi-level community participation in a national water supply and sanitation campaign in Colombia. In most Latin American and Carribbean countries, which have the longest experience and the best results in rural water supply and sanitation services, "willingness of the community to participate" was the second highest criterium for arranging priorities in providing new supplies, as reported in 1972 WHO survey. In tropical Africa, however, this criterium was mentioned least of all. (Pineo and Subrahmanyam, 1975).
Morfitt et al, (1969), designed a technical/social masterplan for such participatory water supply programmes in Latin America.
An example of a similar approach to the health education component is provided by Ogionwo (1973), who described a comparison of a community involvement approach and

projects as reported by Almy and Mbithi (1972), due to the intervention of over ambitious politicians and administrators, so that new self-help groups began to avoid registration.
Chege et al (1976), reported the same tendency, with a drop in harambee (self-help) group membership of 40% in two and a half years, while church membership rose 40% in the same period, with the hypothesis that credit saving unions started by the church might be one of the reasons.

- Use and Maintenance

Participation in the construction phase is not always so easy to obtain, neither does it guarantee a better maintenance or optimal utilization of the supply. Many of the beehive tanks mentioned before were not maintained after their completion (Pacey, 1977). Even participation in the decision phase as well as the construction phase may not have achieved the desired result. Whyte and Burton (1977) described the construction of a medical post and household latrines in Chipas, southern Mexico, with community participation in the decision and the construction phase as discussed by Miller (1975). After completion and despite universal community commitment, only 59% of the population used the medical post instead of the traditional medicine, and 65% of those who had private latrines actually used them.

- Conclusion: Extended Community Participation

It is, therefore, a matter for consideration as to whether community participation should not be extended to as many phases [1] and components (water supply,

1) problem identification, problem solving, choice and testing of technologies and project design, implementation and maintenance, evaluation.

an individual teaching approach in a health education campaign against cholera, showing the superiority of the former over the latter. Isely and Martin, (1977), described the functioning of local health committees in sanitation projects in Cameroon.

A suggested outline for such a community participation approach in the various phases for two of the components (supply and sanitation education for the community and individual health action) has been added at the back and will be discussed in the following paragraphs.

- Information Input and Output

The existence of sufficient motivation at all community levels is an essential condition for successful community participation for an improved supply and better sanitary and health conditions and behaviour in the village.
Is the present situation perceived as a problem and what is the priority of this problem over other problems? Is this problem equally felt by all members of the community or are there conflicting opinions? Much will depend on the degree of practical knowledge among the villagers about water supply and sanitation conditions and their consequences, ideas about improvements, information about possibilities for better water supply and sanitation facilities, their costs in initiation and continuation and the role of village contributions, and knowledge about possible health and economic impacts. Information input in the village is, therefore, necessary, while at the same time the agencies need an information output from the village to determine its financial and organization ability to contribute to a water supply and health education/sanitation programme, its motivation, attitudes and knowledge levels, as well as present supply conditions and occurrence of water-related diseases.

- Data Collection

Cairncross et al, (1977), Curtis (1977), Dube (1967), Holmes (1964), Kar (1970), Kebede et al, (ca. 1976), Misra (1975) and Morfitt et al, (1969) have suggested or used various categories for data collection in a rural water supply and sanitation programme. Data which could be useful are:- (1) on village composition, (a) geographical divisions, (b) household identification and composition, (c) socio-economic status (literacy/ educational levels, wealth index of property, income and goods), (d) formal/informal leadership,(e)local power hierachy, (f) voluntary organizations such as political and religious associations, farmers', women's and youth groups, etc., (g) marginal groups and families, (h) opinion leaders for the various categories, including those in health matters (e.g. traditional health workers). (i) government and private agencies and structure for agricultural extension, education, community development and health (institutional and education services, such as mother and child care, family planning, nutrition and health inspection), (2) on present supply conditions, such as (a) traditional sources and frequency of use (b)distribution of access, both geographically and socially, (c) water collection by sex, age, volume, time of day, frequency and transport facilities, (d) water collection distance/ time, (e) water quality, quantity and reliability of supplies (technical evaluation), including quality of water at the overflow, (see page 8 at back), (f) water use: volumed used, stored, primary and secondary use, feasibility of a division in consumption and working water, (g) local supply organization, community level management, village participation, administrative capabilities in policy making, planning, financing, programming and implementation; (3) on health conditions and impacts, such as, (a) distribution of diseases, their causes and effects, (b) incidence of water-related diseases (including hospital records), (c) local health, nutrition and hygienic conditions, knowledge and practices, (d) perception of causes, seriousness and

avoidability of water-related diseases, (e) perception of health impact, both direct (on human and cattle health) and indirect (on nutrition through vegetable gardening) of an improved supply. Realistic and unrealistic expections; (4) on economic conditions and impacts, such as, (a) migration and its causes, sources of income (food crops, cash crops, cattle breeding), farm implements, (b) division of labour and decision making responsibilities, (c) estimate of the economic impact of water-related diseases, e.g., through attendance records in local industries, if available, (d) attitudes towards economic conditions, (e) perceptions of the economic impacts of an improved supply (time-saving, to be used for domestic, productive, social or leisure purposes, and improved water quantity and reliability for productive activities, (f) economic feasibility: ability to contribute to water supply development programmes of varying scope, in terms of labour, cash, local materials, organizational capability and professional skills; (5) on attitudes towards old and new supplies, such as, (a) felt needs for a new supply and type preferred, (b) its priority over other felt needs, (c) perception of water problems (pollution, shortage, distance, difficult location, social access), (d) special beliefs or attitudes towards water in general and one or some supplies in particular (influencing the cultural compatibility of a new supply and health education message), (e) competition of old and new source ("Cut-off boundary": how far are people prepared to go for alternative improved source instead of the old one), (f) perception of its impact on sociability and well being, (g) perceived/expected quality, quantity and reliability

of supply, 1) (h) willingness to cooperate within the community and with other communities in water supply projects, extended sanitation projects (water supply, sanitation facilities and health education action programmes) or integrated developmet projects (extension to agricultural and commercial development programmes for example), (j) perceptions of waste water disposal with old and new supplies,

1) including village reactions when supplies fall below standard. White, Bradley and White (1972) reported the existence of various answers to maintenance problems with traditional supplies, from customary laws through the enforcement of maintenance laws by personal comments and small group discussions at the source, and periodic clean-ups on the initiative of concerned households to total avoidance of the supply.

(k) perceptions on change of position and roles of women and children, (m) perception of ease of mastery; (6) on communication and adoption of innovations, such as, (a) the existing communication network (methods, persons and locations), (b) outside contacts, (c) communication capabilities including an inventory of used and potential modern, traditional and local extension media and methods in relation to the expected workload of the project, (d) perceived credibility of sources of information and action (government, various agencies, channels and persons used),(e) type of messages for various groups (language, idiom and style, visual understandability), (f) innovativeness of various groups, (g) history of successful adoption, rejection or discontinuation to previous innovations, (h) labour cooperation and self-help history in relation to the expected workload of the project,

- Learning versus Teaching Approach

Both the information input and the results of the information output could then serve as a spearhead for greater motivation and involvement, besides offering a data base for programme design and programme evaluation. The way in which the information is acquired is very important. Its impact will be stimulated by as high a degree of active involvement

of the audience as is possible in the process of information collection and transfer. Although White, Bradley and White (1972) used a classical interview approach, to investigate domestic water use in East Africa, they could not avoid stirring up local discussions of sources and their quality. The keenness of curiosity and the hopes for improvement even led them to wonder whether they might be doing a disservice by arrousing questions about a supply without offering any direct action by public or private agencies, but they concluded that causing people to think about their supply and widening their consiousness of the range of choices in traditional supplies were already and improvement. Batten (1967), has compared the so-called directive approach (planning and providing for people) and the non-directive approach (the stimulation of a process of self-determination and self-help by contributing any relevant factional information to the community or community development groups, and asking questions to draw their attention to certain problems, without, however, suggesting any specific action or solutions). Holmes (1964), for example, used a discussion and association approach in explaining the relation between flies and disease, through a question and answer game, starting with "Have you got feet?" and leading the discussion via stepping in the excreta of one's cow and thus bringing some of it on the floor of the house, to flies settling on excreta and transferring some of it to human food, ending with "Would you like to eat your cow's excreta?".

Kreysler (1970) reported how discussion of the results of a medical routine examination of school children in a Mayo village, South Tanzania, led to a village initiated and self sustaining nutrition project, while a similar process led to a piped water system in the

village, providing a tap for every - in Tanzania institutionalized - group of ten houses.
It may even be considered to give the enumerator a local counterpart in some of the field investigations e.g. a local female opinion leader when gathering data on water collection and water use. This may also alleviate suspicions of the villagers e.g. that they will be taxed in proportion to the amount of water they use (Cairn-cross et al, 1977). White, Bradley and White (1972) reported how one interviewer had to be widely seen in the company of a subchief before people were comfortable about revealing their water sources to him.
In Peru, a socioeconomic and population survey is carried out by auxiliary promotors selected from the community, paid from the construction funds and supervised by promotors from the central government (Pineo, 1976).

- Methods for Information Diffusion : Mass Media Approach

If a better water supply is to have the desired health impact, diffusion of sanitation knowledge is very important In addition, some knowledge on alternative water supply systems is necessary to create a desire for an improved supply. Mass Media (audio and audiovisual media such as the radio, television, film and slide show, flannel board etc., and printed media such as newspapers, magazines, posters, bulletin boards, handbills etc.), is very suitable for the diffusion of knowledge on a larger scale, for it can reach many people in a short time at relatively low costs. Radio, especially, seemed an ideal medium for reaching illiterate audiences.For a while mass media was considered to be the answer to the diffusion of agricultural, health and family planning knowledge in developing countries.

The usefulness of the major mass media has, however, been overrated. It may contribute to a widening "knowledge gap" between high and low socio-economic status groups (Tichenor et al., 1970), since its physical and psychological accessibility varies, for example, because of the lower number of radios and newspaper subscriptions among the poorer gourps, and the use of a too scientific language. Shingi and Mody (1976) carried out a field experiment on television forum programmes and agricultural ignorance of Indian farmers. One of their findings was that the average farmer did not know the meaning of 58% of the technical terms used in selected programmes, words such as hectare, kilogram, October and percent.

The effectiveness of the mass media may not only be affected by the socioeconomic level of the target groups, it may also vary for target groups with other differences and for different messages. Radio, for example, was found to be more suitable for reaching women at home with general health information and audiovisual media such as film and slide demonstrations for reaching the out-going males and passing on more specific information (Spector et al, 1971).

- Mass Media Alternatives : Local and Traditional Media

Alternatives for the use of conventional mass media have been suggested by Lin and Burt (1975) and Rogers (1972). After investigating mass media and interpersonal communication channels in relation to knowledge and adoption of mass immunization in El Salvador, Lin and Burt emphasized the importance of mass media which reaches a large audience, but is at the same time capable of customizing messages for different groups and categories. They found that what they called 'local media' (radio car announcer, leaflets, school principal, local government officials etc.), reached women with a relatively high social integration and

socio-economic status, but with a low accessibility to the mass media (radio), while the socially marginal groups tended to be exposed to interpersonal channels of the face-to-face type for knowledge and adoption of vaccination.

Rogers advised the use of traditional media with respect to family planning programmes in developing countries. He reported both positive (Benjamin, 1969, Peacock, 1968 and Gumperz, 1964), and negative results, e.g. through forced attendance (Lin, 1965, Gumperz, 1964) from research in this field. Traditional media like local singers (e.g. "cantadores"), song and dance groups (e.g. Bhangara dancers in Punjab, where a "bol", a spoken interval, interrupts the performance at regular times), plays,puppet shows etc., may have the advantage of greater accessibility, higher credibility[1)], greater cultural compatibility[2)], better possibilities for incorporating local circumstances, and last but not least, more opportunities for local participation in the choice, construction and distribution of the medium.

Such advantages may also be associated with the use of modern local media. A community may for example, opt for the use of a water supply and sanitation calendar as part of its education package. This may show pictures of negative and positive water supply and sanitation situations and practices in the village, with photographs of, for example, an improved latrine and its owners, rejectable versus acceptable water storage containers

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1) Rogers (1972) also reported research by Ramos (1966) and Herzog (1967) showing that the degree of government control had a negative influence on the perception to the media as trustowrth and competent by the listeners.

2) i.e. they are more in accordance with the local culture which may make the acceptance of a "foreign" message easier.

of types found or obtainable in the village, village cleaning campaign etc. Participation in the choice of the medium can be followed by participation in the choice of its message content, its production and its distribution, while the selection of prictures may also act as a positive (or negative) sanction on sanitation practices, with the annual publishing adding stimulus for continued change.

An example of involvement of part of the target group in the use of such local mass medium has been the use of a composition by a primary school pupil in England for the production of a musical on dental care, written and staged by pupils from the same school (Heath, 1969). Another way of using a mass media approach based on local circumstances and using modern and traditional media for the extension of water supply and sanitation programmes is suggested by Patnaik (1961). He advised the diffusion of information on successful programmes through the use of a series of slides, traditional verses and traditional story tellers who carry long rolls of hand drawn paintings which are unfolded as the story goes along.
Matango and Mayerle (1971) used West African films on the impact of self-help projects on village life as part of the initiation of water supply projects in north Tanzania. Pre-testing may however be necessary for cross cultural use. Compare also the Pictorial Project Leaflets published by Oxfam.

- Methods for Information Diffusion: Interpersonal Channels

Interpersonal contacts are another way of diffusing information. These contacts are very important when an increase in knowledge has to be followed by new or changed action or behaviour, as in the case of a rural water supply and sanitation programme, where different water practices are needed for an optimum impact. Interpersonal channels have a greater impact than mass media for persuading people to adopt an innovation or innovative behaviour, as well as for confirmation of these changes.

This is one of the reasons why many radio and television campaigns have been extended with forums, small groups who under the leadership of a chairperson listen to the programmes together, and afterwards discuss the contents with the help of further information material received by the leader, who also channels feedback to the programme staff. (Neurath, 1962, Uneso, 1964/1965, Klonglan, 1967, Jain, 1969 a,b, Hall, 1973, Shindy and Mody, 1967). Such a radio forum campaign, reaching about 2 million people, was organized in Tanzania in 1973 on health knowledge and preventive health action, including sanitation, by groups and individuals. Among

activities reported after evaluation visits to 2.131 groups by programme supervisors were the construction, repairing and rebuilding of latrines (20%) and the digging of wells (3%) (Hall and Dodds, 1974). Thus this group approach provided the personal element in the communication process, during the discussion information could be explained by the group leaders and other group members, relating it to their every day life, and group decisions on joint or individual actions were facilitated. These are important elements of a group approach in a water supply and sanitation project, where decisions will have to be taken on construction of a public service, health behaviour in the community (e.g. source pollution and public hygiene) and individual water and hygienic practices in the house.

- Extension Workers

The use of professional extension workers is another way of including the personal element. The system was first developed in the United States where a state agricultural extension service, based on university research and training, was developed to diffuse knowledge and adoption of new agricultural practices among American farmers (Rogers, Eveland and Bean, 1974, 1976). In many developing countries national extension services, aiming at information and behaviour change, now exist in agriculture, literacy community development and health (in particular nutrition and family planning).

- Criticism : The Inequity Effect

Recently, the approach of the extension worker has been subjected to a lot of criticism, especially in the field of agriculture, as it may lead to an increasing gap between high and low socioeconomic groups in the community (Röling et al., 1976, Rogers, 1976, 1975, IAC, 1976, Saint and Coward, 1977, Lele, 1975, Wilson, 1977).

The change agents often concentrate on the categories of those people to whom change comes easily, the so-called innovators and early adopters,[1] whose personality, communication and socioeconomic characteristics such as a high level of literacy/education, a high number of outside contacts and high aspirations, make it easier for them to contact the change agent and be contacted by him, in order to learn about and discuss innovations and innovative techniques. Effective communication is facilitated by the relatively smaller social distance and greater similarity in outlook, values etc., between the extension worker and these clients.

- Reorientation

In order to lower this inequity effect, more attention is presently paid to (1) the identification of potentially late adopters (e.g. groups with a lower socioeconomic status or a marginal position in the community), to (2) the design of special programmes for these categories and (3) to the involvement of people from these groups as voluntary extension workers.

- Identification of Marginal Groups

Belloncle (1974) for example, reported how through simple record keeping techniques, health workers in Niger discovered that they served only 15% of the population with a conventional approach. Röling et al, (1976), who tested agricultural training courses specially designed for less progressive farmers in a field experiment in Kenya, found that the first group of participants selected by the rural extension workers was only slightly less progressive than the average farmer. The second

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1) Rogers (1962) divided adopters into five categories, according to their speed of adoption: innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%)

group was, therefore, selected by the researchers, so that 80% of them were below average innovativeness. Training of extension workers to pay more attention to inequity effects of their strategies, the development of methods to identify the various levels of the target groups and the design of adapted programmes for each group will, therefore, require attention.
A health education research project among American minority groups used projective techniques to measure nutrition attitudes of the respondents to identify different target groups who needed a different communication approach (McCarty and Brenner, 1975).

- Special Programmes

The agricultural programmes designed by Röling and others for the exclusive use with farmers who lagged behind in the adoption of better farm practices, led to a 97% adoption of such practices by the participants of the course, with three times as many adopters in the same year through interpersonal communication by these farmers themselves.
Arango (1973) mentioned an out-of-reach programme of the dental school at Baru, Brazil, which identified late majority dentists in small towns in Sao Paulo province through tracing the diffusion of recent innovations. A pre-packaged course of slides and other education material was then designed to introduce some critically important dental innovation, with which extension workers, dentists themselves, visited these dentists in their offices, demonstrating the new techniques and assisting them in using these techniques for the treatment of their patients.

- Participation of Target Group Representatives

In nutrition education programmes for the urban and rural poor in the USA extensive use has been made of auxiliary education workers from these target groups (Napier and Wharton, 1974). In Canada, Indians and Eskimos were trained as public health educators in their own communities under supervision of the regular public health workers (Martens 1966).

Kar (1969) described the use of the first persuaded vocal resistants to smallpox vaccination in 26 villages in Bihar, India, as additional change agents. These villages were selected on their low vaccination rates in previous campaigns. The use of these additional voluntary extension workers in reaching the other "hard core" villagers led to a 90% adoption of smallpox vaccination instead of the 30% reached in previous campaigns.

- Conclusion: Segmentation, Participation and Intermediaries

The personal element needed in persuading people to adopt all components of a rural water supply programme and to continue these practices[1] thus asks for a differentiated approach for total coverage of the community, with various types of intermediaries for personal contacts with various target groups and with various ways of realizing these contacts[2].

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1) i.e. to contribute to the operation and maintenance of the supply, financially as well as socially (e.g. discouraging damage by children) and to adopt and assimilate public and private hygienic practices.

2) e.g. neighbourhood meetings, associations assemblies, panel discussions, courses in hygiene complete certificate, demonstrations, systematic home visits.

Health educators, sanitary personnel and other extension workers can reach those already interested, and people for whom they have a high credibility while participation of formal leaders (government officials, village chiefs, party officials, councillors, school head master etc.), and leaders of voluntary organizations (local churches and sects, women groups, youth clubs, farmers associations etc.), can reach a second category of inhabitants. In addition there may be opinion leaders in village affairs, sanitation, health and household matters, people whose advice is sought by a number of other people on the acceptance of changes in these fields A special programme for local schools may be developed (Pisharoti, 1975). Special attention should be paid to the identification of marginal groups and intermediaries to reach these groups.

- Participation in Problem Definition : Micro and Macro Levels.

It is important that at the beginning of the information input and output stage as well as at the end of it (analysis and discussion of various survey results), water supply and sanitation problems in the village are defined with the participation of the local population. This may prevent problems such as improving water quality through a modern supply system like a slow sand filter, when the population sees no need for safer water but favours shorter water journey distances (piped supply) or a reliable traditional supply with washing facilities. Also the problem of source pollution may not be recognized by the village, which does not commit itself to any action and may object against losing a traditional gathering place [1].

Holmes (1964) reported the failure of a spring protection and washing place construction programme, initiated and carried out by a health inspector with the funds of the district council. When asked about the lack of maintenance of the facilities, the villagers' answer was that they had not asked for these things to be built, that they did not belong to them, but to the government, so why should they keep them clean?

It should be remembered that goverment policies on water supply improvement may not always correspond with local desires and ideas for increased development. Most governments will have specific criteria for the allocation of scarce funds for modern supplies, either "growth point"strategies, favouring communities with

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1) Although according to White, Bradly and White (1972), East African women prefer to use private rather than communal sources, in contrast to the popular view that a piped supply might deprive women of a highly valued social gathering place.

the highest economic growth potential, or "worst first" strategies, for communities with the greatest need for humanitarian or health reasons, e.g. in semi-arid regions and areas with a high incidence of water borne and - washed diseases, or a combination of both.

Apart from the inherent problem of the relation between water supply development and national equity, there is the question as to whether or not this definition of the situation by the government tallies with that of the local population. Is water supply seen as a problem by them at all, and what is its priority? The population of Kiairia in Central Kenya for example, voted for a modern supply bringing untreated water to the village, but against a subsequent purification system, as they would rather have a cattle dip first (Vierstra, n.d.). If it is a problem, is it universally felt, or only by certain influential groups or individuals in the village? What are the advantages as perceived by the community in comparison to those implied by the government or agencies? Are they only in terms of increased well being (shorter water journey, better tasting water, reliable source etc.), or does the community intend to use water and time gains for economical purposes (intensive agriculture and irrigation, cattle breeding, rural industries etc.)? Is a modern water supply seen as a factor in a better community health situation?

Perceived disadvantages, too, may be important. Kar (1970) emphasized the need to pay attention to the identification of barriers and negative motives which may prevent complete and continued adoption, an approach followed by Misra (1975) in the Banki Piped Water Supply Project in Uttar Pradesh, India. Through interviewing representative members of the various sub-groups in the villages he uncovered general opposition to the scheme based on anticipation of water charges, cultural and

social factors concerning the position of women and upbringing of children, emotional factors and superstitions, supply problems as reliability and waste water disposal, and mistrust of government intentions. Misgivings may also exist about its impact on the power divisions in the village e.g. through its situation and administration (See also pages 41,42 and 27)

Adeniyi (1973) also identified knowledge, attitudinal, physical and economic barriers in a sociological survey on the adoption of "comfort stations" 1) and suggested ways to overcome these constraints.

Sometimes the allocation of an improved rural water supply is based on additional criteria of local initiative such as officially demanding and - partly - financing of an improved supply. Although this may pre-suppose the presence of a community 'felt need' with a high priority, the questions remain. For water may be one of the factors in village inequity as its control means social and economic power (See also page 41 which may lead to semi-compulsory forms of self-help, as reported by Chambers and Belshaw (1973). Cairncross et al., (1977), have, therefore, included the identification of inequity situations in the evaluation of existing water supplies through checklists on water access and use.

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1) Semi-public toilet and washing facilities, constructed in urban fringe areas of Ibadan, Nigeria, by the government with local participation in construction, donations of land, cash and in kind,and maintenance.

An illustration of the relation water - inequity is provided by Chege and other (1976) who found an increase in farm water supplies from 21% in 1970 to 50% in 1973 for the most progressive farmers in Tetu district, Kenya, while for the least progressive these figures were 4% and 10% respectively.

Local initiative in the problem defining stage may also have macro socioeconomical consequences . Lele (1975), in reviewing seventeen rural development programmes in Sub-Saharan Africa, stated that social services (health, water, diet, education) provide a considerable potential for involving, as opposed to merely reaching, rural people. The projects reviewed suggested,however, that there may be a close relationship between the degree of politicization and the willingness and ability of the local people to articulate their demands for social services. While local participation and resource mobilization may provide a means of overcoming the problems of high initial and recurrent costs of many social services, they may also cause regional and national disparities, since more productive areas may be able to generate more resources. Even if this is not the case, and experiences from Kenya as reported by Lele seem to indicate that poorer areas may frequently be more successful in initiating self-help activities, it still remains to be seen as to what extent other variables, such as the degree of community organization,are positively related to community initiative for social services, as was the case with successful local management of community development in Tanzania (see page 52)

To what extremes self-help activities may lead if no proper coordination in the problem defining phase takes place was shown by Chambers and Belshaw (1973) who mentioned the construction of two cattle dips by rival clans within a few yards of each other.

Besides the possibility of causing regional inequity and maldistribution, a criterium of problem definition by the community may also lead to very pressing demands which may not be in accordance with national policies or funds, causing frustration of expectations and decreased credibility of government (or outside) development projects or poorly organized projects. In the Lilongwe Land Development Programme in Malawi local demand for health clinics led to the - unplanned - addition of such facilities to the project. Clinics were constructed with enthusiastic local labour support, but on completion ad hoc temporary and provisional arrangements through missionaries and voluntary organizations had to be made for staffing and running the clinics, since the Malawi government had declared that health policies should remain a low priority in the immediate future (Lele, 1975). In Lesotho 227 villages had already paid subscriptions for an improved water supply, but the average annual construction over the last seven years was only 29 supplies (Feachem et al., 1976).

- Participation in Problem Solving

The choise of a solution to the problems identified by agency and community is closely related to the problem defining phase at local level. Lack of participation in this solution-choosing phase may be the main cause for failure of water supply projects as happened in the case described by Saunders and Warford (1976). The central programme administration of a water supply project in Latin America provided public standposts, while the villagers were expecting housetaps. Consequently, the village standposts fell into disrepair, so that the central administration provided additional construction in some villages, which had, however, a cost raising effect. Increase of costs led in turn to a lowering of the quality standards of the facilities designed for the

project in order to meet the objective of 400 village supplies set by the international donor agency. The failure of the technology provided caused further problems in acceptance of the supplies and payment of water rates by the population.

Vierstra (n.d.) criticized the "selling" of already drafted plans to the community through motivation and health education campaigns. Whyte (1976) and Whyte and Burton (1977) also stressed the importance of community freedom in choosing their own type of water supply, even if this resulted in preferring a traditional type that they already had, as the inhabitants of El Nopal, Mexico, did, when they decided that as long as there was not enough money for individual house connections, they would continue walking to a rather poor and distant well that they had been using so far. The authors pointed out that every solution proposed by an agency which changes traditional water supplies has social consequences.

Water from traditional sources such as the village well or river, is a unifying factor being both a common and an essential interest, as well as a means for social interaction- in some cultures even one of the rarer means for women. At the same time, the existence of authority over water source and distribution system and of water system regulations e.g. the traditional role divisions for water carrying contribute to the social differentiation of the village. Changing the traditional supply will often mean the threatening or alteration of the internal balance of power, while the external relations of the community are also altered, usually towards increased dependency on the national and regional government, and a decreased ability to act independently in relation to other communities (Whyte and Burton 1977).

Internal and external social effects of the introduction of a modern water supply need not, however, necessarily be negative.

Fraser (1963), pointed out that the development dicta not to disturb traditional organizations may actually strengthen resistance to desired innovations. When evaluating a community development project on health, sanitation and other innovation in 44 villages in western Orissa, India, he found that changing patterns of authority facilitated modernization.

In the Kiairia Self-Help Water Project in Central Kenya, previously mentioned on page 31, an influential resident and friend of several water committee members wanted to sell a piece of his property to the project for the situation of a village storage tank, thus reaping a double profit. Mounting community tension was eased and community conflict prevented by the intervention of the water supply agency who argued that the land in question was too low to fulfill technical requirements for water distribution by gravity. The arrangements which were then made by the community for their supply system did affect the internal structure, but towards a greater degree of equity, for its measures[1)] were clearly designed to promote equal distribution of project benefits. The project also led to a greater self sufficiency of the area, with increased cattle breeding. construction of cattle dips and an electrification project, so that the neighbouring areas started similar water projects (Vierstra, n.d.). Local participation and dialogue with the water agency throughout the process, in which this community was even able to take the leading part, thus

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1) no membership for those who failed to contribute labour, no private storage tanks and irrigation, cahs compensations for failure to contribute free labour for those joining after completion of the supply and the same rights and responsibilities for the project initiators, two prominent community members, and the members of the water committee as the rest of the community.

contributed greatly to the positive results of the project [1].

Similar participation in the solving of problems on village and private sanitation facilities and hygienic behaviour may lead to a joint decision on the need for a health education programme and/or a number of village regulations and actions. Such a community discussion of sanitation problems in general and local conditions in particular, can sometimes lead to specific village initiated actions, such as the construction of a public latrine next to the busstop in a Tanzanian village, where people often had to wait for hours for bus transport (Hall and Dodds, 1974). It may also lead to the development of new or different village norms for social behaviour, eg. on cattle and children walking in a water source, bathing and clothes washing, refuse dumping, waste water control etc. The difference will be that such rule and actions will have been chosen by the community itself, rather than having been imposed on by local or even more distant authorities.

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1) Some authors (Kim, 1973, Jonassen 1974, Wilson 1977) even suggest the creation of voluntary associations or additional leadership positions to achieve a pluralistic structure and decrease inequity effects, although the latter warned against a possible negative effect of increased instability through organizing the disaffected, raising expectations beyond fulfilment and resucitation of tribalism, while a too directive involvement of the agency in community organization may cause problems when the new associations have to rely on their own initiative in the long run.

- Participation in Choice and Testing of Technologies

When the solution proposed by the agency is one which has been especially designed for or adapted to local circumstances early participation of the community in the technical design and testing phase may seem rather far-fetched. It should be considered, however, as to whether or not such community involvement right from the start would help in creating an identification of the community with the innovation developed more for them than with them[1)].

Belloncle and Gentil (1967) found that, together with group meetings, local testing of agricultural innovations by community elected volunteers with a discussion of individual performance and the needs for local adaptations in the evaluative meeting of the community and change agency afterwards, had a considerable potential for successful adoption (Lele, 1975).
Such a delegated community try-out may be easier for an individually applied innovation e.g. a new seed variety than for a collectively used innovation, such as a rural water supply. Since, however, the adoption of a supply is a "once-and-for-all" affair with recurrent costs, community involvement should ideally include the design and testing phase of a locally adopted intermediate technology like slow sand filters.

Demonstration visits to the testing site, for example, together with a discussion of the feature of the proposed

1) Holmberg (1952) described how a farmer, experienced in well digging and well informed about local water conditions, and a very prestigious community member, was bypassed by the technical water survey commission and consequently spoke out openly against the project. His opposition was one of the factors in the ultimate failure of the project.

technology in which the agency showed an open ear for community comment and suggestions, might be another possibility for introducing community participation and two-way communication right from the commencement, at as many levels and stages of the project as is possible.
Kreysler (1970), reported a series of practical trials in Mayo village, Tanzania, including bamboo pipes and concrete open channels before the community decided on a piped supply sytem.

In some cases community participation in this phase may even result in useful suggestions for technical or cultural adaptations. Cochrane (1970) described the design of a well by a local handyman in a resettlement project in the Gilbert Islands, which proved to be superior to those proposed by the WHO and less expensive than those developed by the public works department.
Dommen (1975) reported the construction of a bamboo tubewell by an Indian farmer. Shawcross (pers.comm., 1977) mentioned a foot operated shaded handpump for irrigation designed and constructed by another Indian farmer.
A demonstration of a new water-sealed latrine, made from local materials and suitable for self-help construction, whose design was based on an investigation of objections against existing designs, led to suggestions for modifications and improvements by Philippine villagers (Feliciano and Flavier, 1967).

Rogers and Shoemaker (1971) cited the case of latrines in Peru, where medical authorities had become discouraged about treating residents of a remote village for intestinal parasites. Within a few weeks after medical treatment the villagers would be reinfected because of their inadequate sanitation methods. Accordingly, public health officials set about introducing latrines, which

at first, the villagers seemed to welcome. However, the new facilities were seldom used because the villagers were accustomed to defecating whenever and wherever they felt the necessity. Their sphincter muscles, culturally conditioned to squatting position, were incompatible with the use of sit-down latrines. Had the outhouses been designed with the participation of those for whom they were intended, a culturally more compatible design might have been the result.

In Nigeria, Obibuaku (1967) described the failure of the long-term adoption of a hydraulic oilpress by the local women, because it had been designed to be operated by men and because its design also caused the loss of two of the three by-products of the traditional press, which the women had been using or selling for fuel, while profits from the oil itself belonged to the men.

Chandra (1964) reported rejection of smokeless stoves in Natwara village, India, due to their unsuitability for traditional cooking and waterpipe smoking practices.

Culturally defined beliefs, attitudes and practices regarding water , water supplies and sanitation may cause similar problems of compatibility. An example of such a case is the belief that the rays of the sun have a purifying influence on water, which may conflict with the introduction of covered storage tanks and filters. Similarly, Goyder (1977) pointed out that it is useless to install latrine lids if cultural taboos prevent people touching them.

- Participation in Project Design and Implementation

Participation in the local project design is another form of cummunity participation. The situation of the facilities may cause internal problems because of its

socioeconomic effects (compare the Kiairia project on page 42). Similar problems were noted by Pacey (1977) who told how attempts by the local landowner in Tigre province, Ethiopia, to have the proposed village well sited mainly for his own family's advantage were overcome through the joint discussion, inspection and selection of sites by village elders and water agency on criteria of general accessibility and probability of striking water. Again, by Huizer (1976) who reported the boycot of a water supply project in San Luis, El Salvador, because the villagers feared that it would be situated on the principal "hacienda".
A similar case in Peru is described by Bridger and Soissons (1970), where for years people had been demanding that the government would provide wells in the area. Finally the government agreed to provide six wells but no explanation as to what was to happen or how, was

given. The drilling team arrived and started to drill the first well on the most likely site availabe, which happened to be the land of one of the wealthier farmers. The villagers leapt to the conclusion that the wells were only to be dug for the wealthy and forced the drillers to stop and withdraw from the village. The project was abandoned.

The situation of the supply may also cause problems of cultural compatibility. A comparable example is that of a large Swiss road construction firm which had a tender accepted from an Arab country, but had to delay its work for several months because toilet facilities for male and female employees had been built next to each other (Marinoni, pers. comm. 1977).
Goyder (1977) reported a similar case where a sanitation unit had to be turned round because it faced towards Mecca.

Decisions about and organization of self-help activities in the construction phase are another aspect of the project design to be arranged. A choice of community participation in terms of labour, cash or contributions in kind will have to be made by agency and community, depending on a definition of the supply situation as well as the community situation.

In the Lirhembe project, a rural development project in Western Kenya, described by Morss et al., (1975), which led to the construction and effective functioning of various collective facilities, such as a social centre, maize store, milk cooler and cattle dip, the elected

committee of four men and three women decided to have the first objective, a social hall, built with professional rather than self-help labour for quick results, as the community was rather sceptical about the project and self-help in the beginning. The other communal facilities were all constructed with self-help. Voluntary labour asked by the American agency for a village well project in Madagascar generally turned out to be a gang of local prisoners (Ketcham, 1970).

Criteria for contributions in cash, kind and labour will have to be fixed, with possibly the use of variable rates related to socioeconomic status, or the determination of the relative weight of labour and cash contributions, so that labour can partly or wholly replace cash contributions where necessary, and every member of the community can afford to join the scheme. With a surplus of labour and an insufficient amount of cash contributions, the community may decide on obligating its richer members to contribute in cash or kind only. Sanctions for failure to contribute will have to be agreed upon, and community and agency responsibilities for organization and supervision of labour and cash contributions defined.

A third group of decisions to be taken by the community and water, health and development agencies concerns the sanitation and education component of the project. Choices will have to be made on the need for special activities and education programmes, eg. rules on social behaviour: wastage, water pollution by cattle, children etc., cleaning campaigns etc., the various target groups involved, media methods and intermediaries.

A scrap list of media and aids available or feasible could facilitate dialogue and decision.
Holmes (1964) and the New South Wales Department of Health, Devision of Health Education (1972) stressed pre-testing of the various aids.

- Participation in Administration

Another decision which may necessitate early discussion between agency and community is the degree of participation in administration and maintenance. Failure to discuss administrative arrangements before providing a filtered supply in Natwara, India, coupled with existent village rivalries led to dilapidation of the new supply although initial adoption had been high (Chandra, 1964).

Saunders and Warford (1976) advised a decentralised administration if the village population is at a sufficient development level, otherwise a central administration with a local advisory committee to foster community participation.
In this perspective experiences with rural development in Nepal may be interesting, where national taxes have partly been replaced by local taxes, to be used for community development by autonomous village councils (Blackwell, 1969). Goyder (1977) mentioned the use of revolving funds for progressive local development in Kerala, India, leading from a fish cooperative via adult literacy classes for women, and a mother and child clinic to a sanitation education and latrine construction programme.

Wilson (1977) mentioned similar approaches with local autonomous community development structures in Egypt, Tunesia, Ecuador and Bangladesh, which were all characterized by community participation through top-down organization, however, and which either failed due to lack of independent means for the village organization, e.g. in Egypt, or were very expensive because of their very strict supervision e.g. the Pakistan Comilla project.

Donaldson (1976) described the use of community water boards in Latin America, whose members are elected in a campaign organized by the village leaders and who are responsible for the collection of water rates (determined by the agency) and operation and maintenance of the supply. Part of this income is also used for repayments to a central revolving fund for initiation of new water projects in other communities.

Chambers and Belshaw (1973) also commented on the relation between organizational capacity and efficient development administration at the local level, which may lead to more instead of less inequity. They stated that earlier experiences with the Regional Development Fund in Tanzania were that the more prosperous regions (with their more competent staff, better infrastructure and better services) were more effective in spending the fund - be it not always on the most effective of projects, such as the beautifying of a waterfall in order to avoid losing the balance of the fund at the end of the year - while some of the more remote and backward regions lagged and returned large sums unspent. The same may be true for development administration by members of the community, and assistance in community organization may thus be necessary, but with avoidance of a top-down approach.

The effect of community administration with agency supervision is also demonstrated in the Lirhembe project (see page 48), where management of donor contributions was in local hands, although these contributions were paid in four instalments instead of one, each upon evaluation by the donor agency of progress made in the previous period.

Supervision on representation of all community interests may also be necessary to control inequity effects of strong management organization. "In pastoral societies, measures for communal management of grazing and water resources have almost invariably benefitted the large stock-owners to the detriment of the smaller man: dam committees set up in Botswana, to manage new dams, charged a flat rate to all users, regardless of whether or not they brought hundreds of stock or only one or two, in effect excluding the poorer people from the club; similarly when council boreholes, which charged on a pro-rata basis for numbers of stock

watered were handed over to local syndicate management, rates were changed to a flat rate for each stock-owner regardless of the number of stock he watered" (Chambers and Belshaw, 1973).

A flexible management system with a variable degree of local participation for which joint arrangements are made early in the project design process, defining the responsibilities of each party, may act as a way to overcome community opposition based on anticipation of water charges (see Misra page 37), to counteract the "ceiling effect" of self-help activities (see page 16), or to limit local inequity problems.
It may further clarify the position and responsibilities of the various people involved in the supply, sanitation and education programmes. One of the constraints found by Isely and Martin (1977) in a health project in Cameroon was the lack of ministerial recognition of the general health workers responsible for organizing local health committees.

Whyte (1976) and Vierstra (n.d.) therefore suggested the development of a reference catalogue of management systems based on case studies of water supply projects under various social, economic and cultural conditions. One method mentioned by Whyte (1976) is the compilation of a "village book" in each community ranging from structured questions on village population, and water use to personal accounts and pictures of village life. traditional concepts and practices, and the forms that village organization and social interaction take.

- Participation in Operational Maintenance

A very important sector for community involvement in rural water supply is its maintenance. One of the constraints to local and continued interest in supply maintenance is its low saliency as long as the supply is functioning properly. While the installation is usually accompanied by extensive festivities, long speeches by government officials and local leaders, schoolchildren's choirs, traditional dances etc., [1] maintenance is carried out in relative silence. Some special effort in keeping the community aware of the importance of regular maintenance may, therefore, be necessary. In Singapore and the People's Republic of China (Orleans and Suttmeier, 1970), town and village cleaning-up campaigns have been institutionalized, so that the attention of the local population is regularly focussed on the maintenance of their environment. Institutionalization of a regular water supply day in the community may similarly act as a stimulant for recurrent attention for maintenance and community contributions towards this goal.

For the upkeep of sanitation facilities and behaviour, too, provisions should be made in the sanitation education programme. Continued personal contacts are very important for the confirmation of new behaviour until it has become a regular pattern. Singh et al.,

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1) Even offerings have been reported: "Water was so scarce in the area in which the work began that in many instances a cow was slaughtered by the local holy man and blood sprinkled over the drilling machine and ground near the site to ensure good luck. On one such occasion a village could only come up with a calf. When they later complained that the output of the well was too small a crew member told them they should have found a bigger cow" (Ketcham, 1970).

(1972) for example, described how after a while negative rumours were spread during a genetic mosquito control project which needed to be counteracted immediately.

Meanwhile, operation and maintenance of the supply by village workers have to be decided upon as well. Election of candidates for training has to be arranged, choosing between an advisory or decisive role for the village organization (chief and councillors, village committee, village meeting, or other representative body). Division of responsibilities between the community and agency will have to be established (with the agency also fulfilling its commitments, e.g. in keeping up the local stock of spare parts) and supervision of performance must be arranged, so that channels for two-way communication exist and problems can be noted and solved immediately. Twumasi et al., (1977) reported on the general feeling of apathy about breakdown found in a sociocultural study of water usage and water supplies in the three main geographical and cultural areas of Ghana, which in their case was caused by reluctancy in reporting to the right authorities for fear of being disrespectful. Raman (1962) described a system of a travelling supply technician who collected pre-printed complaint cards deposited by community members in complaint boxes kept at shops, schools, union board offices and health centres in the area when supplies broke down. Matango and Mayerle (1971) reported the development of a sixth months' training course in Lushoto, Tanzania, combining supply maintenance with general mechanics instructions so that trainees could run a small workshop in their village at the same time.

Another possibility, depending on the situation of the supply, is to give the use of the direct (fenced) surroundings of the supply to the village operator, to be used for accommodation and agricultural activities, as payment for operation, maintenance and control of the supply.
It may be necessary to train a reserve-operator to have an immediate replacement in case of longer temporarily absence of the operator (eg. for funerals) or a sudden vacancy.

The importance of supervision is demonstrated by an example given by Ketcham (1970). In visiting various wells of a project in Madagascar it was noted that one pumpman trained under the project was not on duty. When the old gentleman, who was getting ready to start the system, was asked where the man was, he replied that he had joined the army three months ago but that they were not to worry for he had taught him everything. Whereupon the old man removed his coat

and donned a suit of overalls which was hanging in the pumphouse. Then, with a flourish, he dusted the top of the fuel tank with an old rag and filled the reservoir. While he was struggling to get the stubborn engine started the Malagasy mechanic asked if he ever bothered to check the oil level. He replied that he looked at it every week or so. Then, with a great show of thoroughness, he removed the fuel sediment bowl, stirred the fluid vigorously with his index finger and then when he had all the dirt particles in suspension, he deftly removed the gas tank lid and dumped the contents of the bowl into it. A considerable amount of time was spent on explaining to the old man the rudiments of proper engine care, but seen the difference in age between the mechanic and the operator it is doubtful as to whether it made any difference, for his one comment after the briefing of the mechanic was "Rubbish".

- Participation in Evaluation

A final sector for community involvement in a rural water supply and sanitation project is its evaluation, both during and after the programme, for its supply, sanitation and health education components. Simple quantitative and qualitative measures can be built into the programme such as the amount of community action, attendance of meetings, house visit records etc. While a series of surveys similar to the ones at the beginning of the project can provide data for final evaluation, care should be taken not to neglect the long-term effects. The degree of community participation possible in this stage will differ

greatly from situation to situation, but attempts at involving the community members in discussion and publicizing of results and maybe even inpart of the actual data collection process as was suggested in the initial data collection (page 25) may offer a learning experience for the community and increase their desire for sustained development action (provided results are not discouraging). Litsios (1977) suggested periodical meetings of the planning system in the form of a workshop to which representatives of the community are invited to discuss progress reports.

- "Social Engineers"

As stated previously, not all communities will have a sufficient level of organization, strong leadership or tradition of village cooperation and self-help to start a water supply and sanitation project on their own. An outside stimulus may be needed to initiate the process just as described.
White (1978) advised that one agency should have responsibility for the extension programme in both aspects considered by him (the actual supply component and the health and sanitation component) and that one individual should be responsible for its implementation. This would mean either selecting and training a health education worker in stimulating and organizing the construction of the supply, or providing additional knowledge on water-related diseases and health education techniques for community development workers.
Pisharotti, (1975) and Ramen, (1977), suggested training in health education for those who are fully or partially engaged in environmental health work: engineers, sanitary inspectors, health service personnel and development workers in other fields.
It is questionable, however, as to whether or not a health educational task can and should be added to an already full and important load of work. With their main tasks concentrated in fields which may only superficially touch health education, such as engineering or agricultural extension, lack of time and interest may prevent such personnel from spending much time and effort on actual health education and community motivation, while the social distance between them and the local population may limit their effectiveness.
This does not mean that they cannot play an important role in such a programme, for example, in demonstration projects or as experts with a high credibility for certain target groups in the community. Dwivedi et al (1973) found that the use of sanitary inspectors in health education

in secondary schools led to a greater increase in health knowledge, attitudes and practices than in the normal health education lessons or the health lessons given by teachers who had followed a one week service training course. Vierstra (n.d.), stressed the use of indigeneous personnel trained in mobilizing communities for the development of rural water supplies. Their task could easily be extended to include the organization of a health and sanitation education programme and the coordination of various professional water supply, health, extension and community development workers as well as community intermediaries and voluntary health workers.

Such "animators" of rural development have been used in various French speaking African countries, such as Niger, Ivory Coast, Cameroon and Madagascar (Bridger and de Soissons, 1970). The "animators" are chosen leaders from tribal groups trained to assist in agricultural, economic, social and technical matters at village level, who in their turn move outward to villages just beyond their own to train others before going back to their villages. Their training as "grass root extension workers" keeps them only one step ahead of the other villagers, thus preventing a widening communication gap. [1] Examples of the use of such animators in water supply projects have been given in articles by Hima (1976) and Funck (1976).

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1) Nicolas (1971), however, had as criticism to this approach that it assumes a degree of understanding of and desire for representation which in fact did not exist, with the result that the animators are regarded by the population as simply another arm of government.

In Latin America, promotors and auxiliary promotors coordinate the organization of community participation in construction and maintenance of rural water supplies. Pineo (1976) reported how promotors employed by the Central Office of the Ministry of Public Health in Peru assist in the formation of local Administrative Committees and the organization of self help labour, and how auxiliary promotors, selected from the community itself and paid from project funds for the duration of the construction period, carry out a socio-economic and population survey.

In the Dominican Republic promotors, who are active during the construction period, are succeeded by commercial agents for supervision of local management, operation and maintenance, providing a continuous evaluative link between the community and the government at zone level.(Pine, 1976/1977)

- Training

The term "social engineers" may not be so appropriate, as it suggests a rather high training level, which would increase the social distance to the local population. Training should be wide rather than deep, covering a large number of subjects, from some technical knowledge on various water supply systems and their requirements in terms of costs (labour, local materials, cash) for construction and maintenance, to health knowledge on water borne and -washed diseases, from social research techniques (participatory observation, surveys) to communication techniques and human relations training [1] (village meetings, small group meetings, teaching and learning approach, construction and use of various communication and health education aids etc.) Training guides and reference catalogues for material and methods in rural water supply and sanitation programmes based on experiences under various conditions will be needed, with maybe even the development of social tool kit when the work is extended to a larger scale.

- Further Fields for Study

Apart from subjects as participation in evaluation and selection and training of water supply and sanitation extension workers, there are other fields which have not or hardly been touched, such as organization of water supply and sanitation programmes at macro level and the operationalization of participatory projects at micro level.

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1) An overview of various existing human relations training treatments has been published by Gibb (1971)

has given a list of factors which could be explored in such a community self-survey.

At a conference of public health workers in the Philippines (USAID, 1964), a description of a fictional community (Bananaville, in Pina District, Coco Province), depicting public health and community problems common to most rural areas in developing countries was used to start a discussion on the identification of community health problems like maleria eradication and environmental sanitation.

Woods (1977) for example emphasized the need for two-way communication in administrating development programmes and offered a guideline on the subject, while Dube (1967) listed ten channels through which communication must flow freely and effectively for a smoothly working development programme.

Several parts of a water supply and sanitation programme will need further study for operationalization. How should community needs be identified, village segmentation be made visible or opinion leaders traced?

Wilson (1977) mentioned several methods to investigate problems felt in the community, from formal surveys by professionals to surveys by village leaders in villages other than their own, the use of projective pictures [1] as applied in the Freire method of adult literacy campaigns and community self surveys.
The last method has been described by van der Lest (1963), who pointed at their sociopedagogic and research function, each imposing their own advantages and limits on the application of this method, and who provided a guideline on its procedures, covering preparation (with survey initiation, aims and sociological exploration, communication with policy makers and community, introduction, selection and invitation of participants), execution (covering the two methods used, group discussions and fieldwork, as well as communication with the community and conclusion (with reporting of results and transition to social action)). Considerations on the role of expert(s) in social research and guidance of social processes and the handling of groups in the three phases mentioned above have been added Litsios (1977)

1) such as the picture of children drawing water from a hole dug in the sand next to a pool in a stream in Mukaa, Kenya. (White, Bradley and White, 1972)

Another field for operationalization is sociological exploration to gain insight into village segmentation, group relationships, including feuds and latent rivalries, communication channels, type and degree of community participation possible under local circumstances etc. There may be a community development officer or other social experts working in the district who may possess the necessary knowledge, and the community surveys may also provide information, otherwise guidelines will have to be developed to obtain this data through various methods, e.g. aireal photography for geographic segmentation, participatory observation, checklists for interviewing authorities and formal leaders, extension workers and other people possessing relevant information about the community, and for conducting group interviews.

An important segment of this exploration is the identification of opinion leaders. Kar (1969) used the guided reputational method i.e. the suggestion of people by a discussion group who had been gathered at the request of field workers to discuss the vaccination problem in the villages and to set up an action programme, and to whom questions were put which stressed three qualities deemed necessary for such leaders (respect, influence, and reliability). People thus identified were later checked on representation of various social groups in the village.
Rogers et al., (1975) used a network analysis to identify communication dyads and cliques in the network of communication flows on family planning, with the aid of sociometric techniques. An overview of the various methods could be a useful tool in the training of extension workers connected with water supply and sanitation projects.

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The agency announces its intention for a social service programme (possibly a water supply)
- based on 'bottom-up' approach for agency and 'learning' approach for community i.e. the agency does not decide alone, but in cooperation with the community and the community reaches its decisions through a definition of its own situation - in a village meeting organized through the formal leaders, and suggests a joint community analysis

(1) identification of community felt needs and priorities

- water
  - (feed- a-c)
  - why
    - health
    - other (feedback from 2d - e)
- other (feed-back from 2)

(2) joint baseline studies serving triple function of providing agency with community data community with insight int own situation through lear ning approach - and (with quant. data) making a scientific process analysi and evaluation possible

- a | water source |
- b | water system |
- c | previous experiments with inno-vation adop-tion and rural deve-lopment |
- d | water supply sanitation Knowledge practices and beliefs
  - village
  - individual
- e | health situation |

(including constraints)

(3) joint baseline data analysis and discussion

(feedback (1))

(4) joint community problem definition

- water/sanitation
- other: contact other agency

5. Joint Community Action Plan

- joint supply component joint choice and commitment (responsibilities, sanctions etc. as discussed in page)
  - evaluation
- joint sanitation education component
  - objectives definition
    - village public hygiene: village action with commitment (responsibilities sanctions) for protection of water supply and village public hygiene
    - individual hygiene: joint joice or educational media and intermediaries for individual sanitation information, and behaviour change as dis cussed on page

joint quantitative/qualitative process evaluation

joint evaluation of health situation

who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 60 42 51, telegr.: worldwater the hague, telex: 33604

B.P. II

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

BACKGROUND PAPER II

Preliminary draft
Bibliography on

EXTENSION AND COMMUNITY PARTICIPATION IN COMMUNITY WATER SUPPLY AND SANITATION

Part II

Selected Abstracts

by

Drs. Christine van Wijk - Sybesma

Contents

ADENIYI, J.D.

Cholera Control: Problems of Beliefs and Attitudes (English, French, German) (Department of Preventive and Social Medicine, University College Hospital, Ibadan, Nigeria).

International Journal of Health Education, 1972, vol. 15: 238-245.

DA: 1971
CO: Nigeria

AN: A survey was carried out in the indigenous districts during an outbreak of a cholera epidemic due to inadequate water supply and sanitation facilities, in Ibadan, Nigeria. Area sampling was used and 250 respondents were interviewed on their beliefs, attitudes, and behaviour toward cholera by public health inspectors who had received a short in-service training for this purpose. Awareness of the cholera outbreak was high, (98.8%) but preventive behaviour low, (49.2% had been vaccinated) with as major reasons given the non-availability of vaccine and time-consuming procedure (48.8%), lack of information about vaccination (21.6%) and lack of belief in vaccination (15.2%). A large majority accepted cholera as an endemic disease (70.8%). Knowledge about its causes was high: over 80% of the respondents knew that cholera is spread by water, flies and unsanitary conditions, but over 30% throught that vaccination provides full protection. A small proportion 14.8% including most of those who had no faith in vaccination, and who held superstitious beliefs about the cause of cholera, said to prefer native medicine to modern for treatment, with an additional 19.6% not knowing which type of medicine to prefer. A series of simplifications for health education are drawn from the result.

KW: preventive health, knowledge, attitudes, beliefs, practices.

ADENIYI, J.D.

Human Waste Disposal Programmes, The Place of Health Education
(

International Journal of Health Education, vol. 16, nr. 3, 1973, pp. 206-213.

DA:
CO: Nigeria

AN: A baseline study in connection with the construction of 3 "comfort stations" (simi public toilet and washing facilities) in urban fringe areas in Ibadan, Nigeria. The stations are built by the government in cooperation with extended family units (compounds) who donate land, contributions in cash or kind and meet maintenance costs.

Two surveys were carried out amoung the comfort station families before the construction of the comfort stations, a medical one on infections of the oral/anal transmission type (not yet completed) and a sociological one on some personal characteristics, sanitation practices, beliefs associated with excreta, attitudes towards latrines and motivation for community participation.

The survey showed knowledge and attitudinal constraints as well as physically and economically felt barriers. The data were not split up according to social characteristics, however. The author gives some suggestions on how to overcome the barriers, including microscope demonstrations, "model" comfort stations visits, cost analysis by participants (including comparisons with higher amounts spent on priorities of lesser importance), support of option leaders and key figures (husband, mother-in-law) and use of local tastes and customs (introduction ceremonies).

KW: sanitation, community participation, attitudes and practices, constraints, health education, media on methods.

ALLAN, D.

Kosovo, an end and a beginning
(Unicef Information Service, Geneva)
Unicef News, 94 (1977) 4, : 18 - 23

94 (1977) 4, : 18-23

DA: 1966 - 1977
CO: Yugoslavia

AN: A pilot project providing integrated basic services in Kosova, an area in Yugoslavia whose conditions closely resembled those in developing countries, was initiated by Unicef in 1966.
The project was the result of a new cooperation between the Federal Ministries of Public Health and Welfare, Education, Labour, the National Mother and Child Health Institute, Republic of Serbia authorities, representatives of the provincial health and education departments and Unicef. Community participation, through local coordinating committees was a key element. Programmes to provide clear water were often a catalyst to further development such as schoolgardens and feeding programmes, home economic courses and health services.

The health service chain consisted of 194 health points staffed by health assistants, 50 health stations staffed by doctors and 22 communal health centres serviced by 8 hospital level medical centres, the Provincial Public Health Institute and the faculties of Kosovo's medical and nursing institutions.

Public health workers (midwives, health visitors for schools and doctors who have specialized in community health) get post-graduate training at the Public Health Institute. They are paid through local social insurance funds and are directly responsible to the community they serve.

In 1978 Kosovo will be one of the sites studied by public health officials from developing countries during a Unicef seminar on primary health care.

KW: primary health care, integrated development, rural water supply, community participation public health, manpower, financing.

AROLE, R.S., AROLE, M.

Comprehensive Rural Health Project, Jamkhed (English)
(Comprehensive Rural Health Project, Jamkhed)

Journal of the Christian Medical Association of India, 74, 4(1972):177-180

DA: 1972
CO: India

AN: A comprehensive rural health project has been set up in the south eastern part of Ahmednajar district, India, to alleviate the lack of medical facilities and to offer an integrated programme of curative, preventive and promotional health work, including a water supply and waste disposal programme, with a large degree of community participation in all activities.

The project areas was selected by contacting various community leaders, including Zilla Parishad leaders, politicians, Panchayat Samiti leaders and schoolteachers by letter, followed by personal visits three months later. The criteria for selection were (1) local awareness of a "felt need" for medical care, (2) invitation by the community, through the village council and the Minister of State for Rural Development, to start a project, (3) willingness of the community to cooperate and participate by (a) donating land, (b) providing rent-free buildings, (c) providing staff housing, and (d) active programme participation, and (4) strategic location with good communication facilities. The community thus selected for the main centre of two districts was Jamkhed. The same criteria were applied to select sub-centres, where auxiliary nurses and paramedical personnel provide primary health care, with additional involvement of indigenous practitioners, schoolteachers and other community leaders.

Activities of the project are (1) under five programmes, with (a) nutrition education given by a basic health worker or an auxiliary nurse with audiovisual aids such as flash cards and flannel graphs, (b) protein-calorie supplementary feeding for which community leaders for which school teachers are responsible under supervision of the local health worker, and (c) mass immuzation, with community leaders responsible for listing the children and collecting at least 80 % of them for vaccination, resulting in an average return of 70 to 90 % ; (2) family walfare programme with (a) antenatal clinics, (b) family planning programme using mass education with film strips and puppet shows and personal contacts by primary health workers ; (3) leprosy control programme which is integrated in such a way that patients are in no way distinguishable as leprosy cases ; (4) mobile multipurpose clinics for villages between subcentres and Jamkhed, on days fixed in cooperation with village leaders, (5) tuberculosis control programme ; (6) school health services including physical examination follow-up and health education by nurses ; (7) diagnostic and curative services in the main centre and (8) general public health measures, including the promotion of toilet facility construction, demonstration of a modified form of soak pits for disposal refuse in Jamkhed and two sub-centres, and construction of wells and percolation tanks for health and irrigation purposes under the provision that the farmer sets two to three acres of irrigated land apart during three years for the production of high protein food for the supplementary feeding programme in the villages.

KW: Integrated rural health care, selection criteria, community participation, rural water supply and sanitation.

BLACKWELL, J.E.

Fundamental Education and Village Development in Nepal (English)
(
Community Development Journal, 4, No.4, 1969, 178-185

DA: 1952 -1963
CO: Nepal

AN: An evaluation is given of the Village Development Project in Nepal, an attempt at overall rural development begun in 1952 and phased out in 1963, when it was replaced by the Panchayat Movement.

The original design of the programme concentrated on agricultural development and foresaw in community participation, in an advisory function through District Improvement Committee, comprising political district heads and outstanding village leaders.

Between 1952 and 1959 a shift of emphasis towards multiple development occurred, with projects in agriculture, literacy and education, infrastructure, preventive health and sanitation. An amount of 7.012 latrines were built and 2.560 tube wells and dug wells constructed. Village workers were trained for multi-purpose development at training centres. In 1962, self-government was added by law to the project, giving authorization, responsibility and financing (through partial replacement of the national tax by a local tax) to the village councils. Although Village Development Programme villages compared favourably with non-Village Development Programme villages (Shrestha, 1963, 1967) the adoption of innovations was below expectation. Explanations given by the author, apart from competition between the two donor-countries, India and USA and weak infrastructure and communication channels, are as follows: (1) absence of "felt needs" due to lack of "rising expectations", (2) distance between highly trained village workers with urban background and the local population, (3) cultural values discouraging initiative from young field work and (4) neglect of training in and use of diffusion techniques.

KW: integrated rural development, community participation, felt needs, financing, evaluation.

BRYANT, J.

Health and the Developing World
(Rockefeller Foundation)

Connell University Press. Ithaca/London, 1969,345 p.

DA: 1964-1967
CO: 21 developing countries, 6 reported in case studies

AN: The problems faced by developing countries (growing economical gap, scarcity of resources, increasing number of people, maldistribution of services, infectuous diseases) have been stated very clearly, illustrated by statistical data and moving personal histories based on field observations in 21 developing countries, carried out by the author and his team members.

Six case studies of health care systems in developing countries in Asia, Africa and Latin America show the need for an entirely new approach, in order to improve the quantity of health care without any loss in the professional quality.

The relatively low priority given to health care in national development programmes by policymakers is discussed in particular with relation to its stimulation of population growth and the uncertainty of its contribution to economic development. The author endorses the view that health development is both an instrument for and a product of overall development, including a lower population growth, and mentions some research on measuring economic impacts.

Management within the health care section of a national development programme is discussed next, in which criticism is aimed at the following: the institutional type of health care, the isolation of health problems from other problems, the profession- and task-oriented roles instead of problem-oriented roles of personnel, and the dilemma professionals/ auxiliaries.

Systems analysis and missions approach are explained and recommended for alternative management methods, e.g. a sanitarian is mentioned as a team member, but his role is not discussed, which would be expected in a community-problem oriented approach, while Myrdal's intuitive approach is advocated to fit health planning into the overall development planning. To implement a new health care approach, the author calls for a different use of local health teams (doctor, nurse, auxiliary, midwife, sanitarian). The teams should be based on specific needs of the communities as a system, implying a team-approach and assessment and re-assessment of needs and programmes. The changing roles of physicians, nurses and auxiliaries have been elaborated, but the role of the sanitarian has been left undiscussed.

Changing roles also call for a changing education, not just adding new elements such as a course in preventive medicine but, by changing professional and educational objectives and perceptions. Elements stressed in alternative training mentods are (1) definition of roles based on actual field situations in each country, (2) deversity of methods to suit diversity of objectives, (3)learning instead of teaching approach, i.e. giving students training responsibilities, (4) teaching and testing of the functioning factor as well as the knowledge factor, i.e. field training, supervision and eveluation, and (5) class- and fieldwork based on teams.

CAIRNCROSS, S.; I. CARRUTHERS; D. CURTIS; R. FEACHEM; D. BRADLEY

Evaluation for Village Water Supply Planning: A Handbook
(Ross Institute of Tropical Hygiene)
1977

DA: -
CO: -

AN: Evaluation of existing rural water supplies in developing countries is emphasized in view of the high proportion of currently disfunctioning systems, estimated at 30%, and the proposed water supply increase to attain the UN target of clean water for all by 1990. Evaluation should answer the following questions: What the present degree is of service, who is supposed to benefit and who actually does, what the impacts are on economy and health in relation to costs, what the causes are of disfunctioning and where and how are improvements possible.

Several evaluation studies have been designed to realize these objectives: (1) distribution of access analysis, both geographical (which villages have access) and social (which groups within the village have access), (2) analysis of water use, (3) analysis of water quality, (4) measurement of economic benefits, (4) measurements of health benefits, (6) technical evaluation of supply system, (7) analysis of the local water supply organization, including village participation patterns and community level management of rural water agency regarding policy making and planning, financing, programming and implementation, and maintenance, and (9) financial analysis.

A remarkable feature of this handbook is the degree of attention paid to a structural evaluation in addition to technical, financial and impact studies. Water supply use and water supply impact are also, however, influenced by factors such as knowledge, attitudes and communication networks. Although the authors mention in their list of evaluation objectives the "indication of areas where complementary units, such as health education and agricultural extension could improve the overall efficiency and effectiveness of rural water investments", no attempt has been made to include an analysis of the role of these services in rural water supply in their evaluation design, notwithstanding the fact that these services have been operating in most developing countries for many years.

Another underlying assumption of the evaluation studies design, is the exclusive use of objective criteria for success, as economic and health benefits while subjective criteria, such as meeting of "felt needs" and stimulating of community self-reliance could be used as alternative or additional yard sticks.

KW: evaluation, equity, organisational structure, community participation, administration, financing, design, costs, water qualtity, water use, economic and health impacts.

CARR, N.M.

Rural Women, Rural Technology, Rural Development (English)
(

Populi, vol 3, nr. 4, 1976, pp 44-50

DA:
CO:

AN: The author emphasizes the use of intermediate or rural technologies, as opposed to "western" and traditional technologies, as its direct and indirect costs are lower, it is more labour intensive, causes less migration and will be more readily integrated into rural communities. From surveys of empirical studies by the author (1976) and Jenkins (1975) it appears that, contrary to expectation, its impact in terms of economic growth is, in many cases, greater than large-scale production.

These new technologies should be diffused toward women rather than men, as the former make up a larger proportion of farmers and distributors of agricultural products in addition to being responsible for home, health and initial education, while being less prepared for this task, since they get less formal education, are hardly ever included in extension services and are taught "Western" home-economic skills as needlecraft, instead of agriculture, management, sanitation etc.

The new technologies should also be women-adapted, as present technologies often increase instead of decrease the women's workload.

Identification of the problem areas for women is therefore needed. Research giving water and fuel collection and food processing as the two tasks said to be most burdensome by African rural women is reported (UNECA, Women of Africa: Today and Tomorrow, Addis Ababa, 1975) and several solutions are discussed.

Finally, some general thoughts on community participation, financing and training are given and research into the attitudes to the community after the introduction of the new technology is emphasized to measure the evaluation by the community, which may have different standards for success for failure than the official ones.

KW: rural development, intermediate technology, women felt needs, community participation, financing and training, evaluation.

CHANDRA, P.

Eastern Antropologist
"Communication of Some New Ideas in a Madhya Pradish Village: A Sociology Study Conducted in a Mixed Village", 17, 3, 1964, 183-214.

Dep. of Sociology, Jabalpur University, Jabalpur, India.

DA: 1961 - 1963
CI: India

AN: A qualitative and quantitative study of the extent to which ten innovations (7 articles of personal use, education, scientific treatment of disease, family planning, smokeless stoves, filtered water, sanitary latrines, decimal coinage, metric system, and awareness of four sociopolitical ideas) were accepted and assimilated by the tribal Gonds and the non-tribal Hindus in a selected village, Natwara, Jabalpur district, India, and the extent to which the rural social structures, values and norms offered resistance to them.

After a description of the geographical, socio-economical and cultural setting of the village, adoption of the various innovations is discussed. Under the scientific treatment of disease, the author describes the continued superstitions and beliefs the evil spirits would be the causes of disease, e.g. the goddess Kali or Durga as the one responsible for smallpox, plague and cholera. This has led to strict rites to ward off evil and to the magical treatment of disease by witch doctors. The author witnessed one such treatment of a malaria case. Local herbs and indigenuous medicine were popular and have some medical value. Some families visited and ayurvedic physician in the nearest town. In 1960 a clinic was donated to the village. Illness in the twelve months preceding the study was reported by 197 persons and all of the 202 families, of whom 41% used medicines from the clinic, while 59 % preferred the indigenuous ones. The 15 occupational and 4 untouchable castes reported the highest use of the health clinic (55,5% and 42,8% resp.) while the two socio-economic extremes had the lowest use. Of the Brahims, only 20,6% used modern medicines on account of their uncertainty about socio-religiously unacceptable ingredients like animals fats, while the triblg Gonds, who made up 37,6% of the village population, 30,2% used modern medicines. Most people rejected the use of modern medicines on socio-cultural grounds. The other categories were not opposed to modern medicines but did not go to the despensary because of the expensive medicines they were often asked to buy.

Smokeless stoves had been introduced into the village as a community development project. The first five stoves were given free of charge as a demonstration project. At the time of the study there were 14 families in the village with smokeless stoves, 10 in the higher castes, one in an occupational caste and three in the untouchable castes. Only three stoves were found to be used, all by the higher castes. The reasons given for rejection by the women were,that they were unsuitable for traditional cooking methods and produced tasteless food, in particularly bread and milk, while the men stated the they interfered with their waterpipe smoking habits for which they used the cowdung from the traditional stoves. Ten families said to be willing to try the stoves,

but had been kept from doing so by their cost. Untouchables and tribal Gonds reported that no one had ever cared to show them the method for operation.

Two reservoirs for filtered water and several village taps had been provided by the authorities, as the water supply conditions were very poor. Washing and bathing took place in the village pond and drinking water (as well as additional water for bathing and washing of clothes and utensils) was drawn from 25 village wells. 80% of the population used uncovered pucca (brick-lined?) wells and 20% used kutcha (mud-lined?) wells originally intended for irrigation only. The village tank was in dilapidated condition, although the village Sarpanch (=) reported that is was cleaned twice a year, while wells were disinfected 3 to 4 times a year. Initial acceptance of the new supply was high, but problems arose with regard to the sharing of filtration costs, as those who lived further away wanted to pay less. The village Panchayat (council), responcible for fixing the watercharges, had not met for over three years due to factionalism caused by intercaste rivalries, especially of the Brahim and non-Brahim groups, so that the Sarpanch felt it advisable not to disturb the peace of the village by calling a meeting.

Another community development project was the construction and use of sanitary latrines. Only the very well-to-do had old-style latrines, the rest of the population used the open field while children used the village streets which lacked drains. Cleaning, done by three families, was insufficient. Acceptance of modern latrines was only 10%, however, with the study showing that 39,4%, 15%, 50% and 50% or the four highest castes refused them because they could afford to hire the service of a sweeper as be fitted their castigeous position. The percent of the occupational and untouchable castes expressed their willingness but said that high costs, non availability of materials and shortage of masons were a constraint. The remaining non-tribal families thought going to the open fields more hygienic. The Gonds were apparently not approached by the authorities and were nearly all ignorant of these latrines.

KW: adoption of innovations, rural water supply, health and sanitation practices and beliefs, social structure.

CHEN, P.C., A.E. MILLER

Lessons from the Chinese Experience: China's Planned Birth Programme and its Transferability (English)
(Ass. Prof. Political Sc. Wayne State Un. Detroit, Res. Ass. Po. Planning Un. of Michigan, Ann Arbor)

Studies in Family Planning, vol. 6 (1975), nr.10, 354-366.

DA: (since 1971)
CO: Peoples Republic of China

AN: The authors describe the organizational system of the People's Republic of China in which public health care and community participation have been institutionalized and integrated on four administrative levels: county, commune, production brigades and production teams. Each level has its own health centre: from county central hospital and commune health centres staffed by college-trained, western-styled medical personnel via cooperative medical stations staffed by male and female "barefoot doctors", the latter doing midwifery and planned birth work, to part-time health aides at village level, responsible for waste disposal, disease control and delivery of contraceptives.

Community participation is institutionalized in planned birth subcommittees at the county and commune levels and small groups for planned birth at brigade and team (village) levels.

Motivational and educational work is conducted by the subcommittees using mass media such as film and slide shows, radio broadcasts, variety shows and lectures by medical personnel as well as political evening school. Interpersonal communication is provided by grassroot level health staff (barefoot doctors etc.),and community members (women's work cadres, committee members and voluntary activists) through home-visits, including other non-target members of the household with a negative attitude towards the programme and through the institutionalized small groups in which virtually all community members are united. Since 1971 group planning of births in these small groups has spread rapidly. Records are kept by participating community members. The health system is financed locally by private and commune/brigade contributions , with the exception of family planning costs which are borne by the state.

Although the authors recognize the influence of the political, economic and social restructuring of the Chinese society, and the type of leadership accompanying it, they make 33 generalisations based on the Chinese planned birth experience because of its design for low-cost mass application in a country with a low income, a largely uneducated rural population and a scarcity of trained personnel. They concern its (1) service and delivery system (low cost services, e.g. through a dual system of local and state financing; local record keeping etc.),(2) personnel and training (use of local para-medical and non-professional part-time personnel; of mobile medical units and a rotational system of urban personnel working in rural areas for training local personnel, etc.), (3) educational and motivational work (use of women; of local experiences for motivating the community such as a comparison of present

and past conditions; example-setting by formal- and opinion leaders; of target groups which include possible sources of constraint, e.g. mothers-in-law; in traditional mass media; of practical, short-term community foals) and (4) social development measures and reinforcements for social change (sharing practical experiences by program leaders from many communities ar conferences; reward-compensation-incentive system; group pressure and group decisions).

KW: public health and family planning, organizational structure, community participation, education and motivation methods, training.

CURTIS, D.

Socio-economic Studies in Phase II of the Slow Sand Filtration Project, A Practical Guide
(Development Administration Group, Birmingham University)

DA:
CO:

AN: A gudieline for socio-economic research accompanying the introduction of a rural technology, slow sand filters, in developing countries. In order to evaluate the importance of the new technology for public health and economic productivity, a general census on socio-economic characteristics and current water provision is recommended, followed by several baseline (before and after) studies on the impact of the improved water supply on (1) water collection and consumption, (2) time-budgets, i.e. utilization of time gained, (3) public health and economic productivity, (4) water use, and (5) relative geographical and social accessibility.

A second series of baseline studies investigates possible constraints in the commutity, such as (1) competition of old and new source or maximum distance acceptable, (2) willingness to pay, (3) perceptions of benefits and (4) water handling i.e. pollution during collection and storage. A set of procedures of data collection and analysis are supplied for every study

A management model must be chosen after the introducation of the new technology, varying from direct community management to direct government administration, in order to ensure a continued functioning of the supply.

Guidelines are given for evaluating existing water supplies on local management, investigating district and regional administrative capabilities for similar projects and identifying central policy, aid and financing for those water supply projects on a national level, including the provision of checklists.

KW: rural water supplies, planning, evaluation, impact, constraint, management structure.

DONALDSON, D.

Rural Water Supply in Latin America: Organizational and Financial Aspects (English; French, Spanish summaries)

Carnets de L'Enfance, 34 (1976): 46-55

DA: 1961-1974
CO: Latin America

AN: Easy access to safe water for rural populations in Latin America has been increased from 7% in 1961 to 26% in 1974. Three types of programmes can be distinguished: (1) "individual source" programmes (protected springs or wells) for dispersed population, (2) "rudimentary aqueduct" programmes (spring/well, storage tank, limited distribution system, e.g. public fountains) for semi-concentrated populations, and (3) "urban" programmes for rural communities of at least 100 houses (patio connections) and the immediate surrounding area. At present stress is on the last programmes.

Common elements of urban programmes are that they (1) focus on concentrated instead of dispersed popluations, (2) make extensive use of technicians to assist a limited number of professional presonnel, (3) use specified criteria as guidelines for selecting target communities, such as communities with (a) the largest population, but not over 2000, and (b) access roads for trucks, which have (c) expressed interest, put in requests and offered financial assistance for construction and operation of a water supply system, (b) are located within a zone of influence of the national or regional development plan, and (e) need no unusual or expensive solution. Further elements are (4) a strong and active community participation in development, construction, administration and financing of the local systems, and (5) the establishment of local water boards, elected in a campaign organized and conducted by the community leaders. The boards as responsible for obtaining local cash and labour contributions, organizing and supervising the construction and operating, administrating and financing the system.

Total investments between 1961 and 1974 amounted to approximately $651 million, of which about 82% has come from national sources. The communities ususally pay 20% of the construction costs (in cash, material and labour), 30% is paid by national and state programmes and 50% is a loan from an international agency. Costs of operation and administration are borne by the community. Financing is often in the form of a revolving fund, with community repayments used for the initiation of new projects. Advantages of such funds are (1) adaptation of repayment schemes to local circumstances (usual rates as 4 to 5% of the minimum monthly salary of the area), (2) acceptance of community financing of social services as a normal procedure by the local population, (3) promotion of effective organization at the local level.

Three areas of administrative responsibilities can be distinguished, (1) at the local level, to (a) provide a financing channel for national counterpart funds, international loans, national grants and local contributions, (b) develop technical and administrative norms and policies, (c) conduct long-range planning (d) supervise the execution of the national plan, (e) Supervise regional programmes, (f) coordinate

construction efforts, (g) exercise overall financial control, (h) provide technical and administrative assistance, (i) provide training, (2) at the regional leval, to (a) supervise programme execution, (b) carry out design, (c) supervise construction, operation and administration and (d) undertake community promotion, and (3) at the local level, (with administration, operation, maintenance and collection of water rates.

In order to increase the output individual systems should be treated as part of a larger framework, using a mass systems - or package approach to construct, operate and administer hundreds of systems. This approach means that a rural programme is broken down into its various elements such as promotion, technical design, financing etc., and a model is developed. The technical design is based on existing maps or aerial photos and standardized design criteria, using pre-designed elements and standardized equipment lists. The materials are assembled in a central yard and sent to the community as a package along with all the necessary tools and items not readily available locally. Professional staff train and supervise volunteer workers at the local level to help stimulate community involvement. These workers carry out developmental and promotional activities according to the coordinated guidelines of the package programme.

At the end of the article 7 areas for additional research are identified, and five other problems are indicated: (1) the sector responsible, public health, public works or social sectors (2) development of local level personnel, (3) revision of criteria for long-term planning, (4) financing of programmes in simi-concentrated and dispersed areas and dispersed areas and (5) data collection, bibliograhpy and cooperation with other agencies.

KW: rural water supply, selection criteria, community participation, administration, financing, package approcah, research.

DWIVEDI, K.N., TIWARI, I.C., MARWAH, S.M.

India, Innovations in Health Education in Rural Schools
(
International Journal of Health Education, 16, (1973) 2: 100-108

DA:
CO: India

AN: Report of a study to measure the impact of a short in-service teachers training course in health education and the coordination of action between school teachers and sanitary officers.

Using a quasi-experimental non-equivalent control group design, a sample of 5 schools was drawn from a list of primary schools in a rural development area in India. One school, chosen at random served as control group, receiving the normal health lessons given in all schools, the teachers of the 4 schools received 1 week training courses, while in 2 schools teachers also received active support from a sanitary inspector of the rural health centre.

Health knowledge, attitudes and partices were measured before and after the health education programme, showing an overall increase in knowledge, attitudes and practives. With respect to the control group these increases were 34, 23 and 17% respectively; for the teachers training course group 51, 34 and 40% respectively and for the group with additional sanitary officer's support 87, 57 and 60% respectively.

The differences between the 3 groups were significant.

No measuring over time was reported however, so that consistency of the changes observed is uncertain.

KW: health education, evaluation, communication channels.

FEACHEM, R.

Lesotho Village Water Supplies: an Ex-post Evaluation (English) (Ross Institute of Tropical Hyginene, London)

London (Ross Instutite of Tropical Hygiene) 1976, 31 p. 11 ann.

DA: 1975-1976
CO: Lesotho

AN: A multi disciplinary evaluation of the present situation of rural water supplies in Lesotho, where the acceptance of self-help as a political principle without any fixed selection criteria has led to applications and cash contributions for supplies from 727 villages with an average annual construction of 29 supplies.

A second investigated problem is the absence of implementation criteria in cash and labour, for which the authors suggest a fixed amount of cash, contributed to by at least 60% of the households, specifications of the roles of village chiefs and committees in the organization of labour, and financial penalties for non-contributors.

Maintenance is seen as incompitable with participation, due to the idea of a "once-and-for-all" payment, and the absence of responsible and technically capable community representatives. Participation in administration is not mentioned.

The present type of village institutions was frequently found to hinder development due to politicisation. New, single-purpose village committees should be selected in open meetings and contributions, and thus benefits, be made optional.

A program to alleviate the present demand is developed, in which, however, village participation is not discussed.

As no differences in health benefits were found between villages with and without an improved water supply, a package approach is suggested, including (1) a piped water supply to within 100 meters of all houses, (2) pit latrine construction, (3) programme of health education directed at specific unhygienic practices, (4) construction of baths and clothes washing facilities, and (5) improvement of curative health services. No information is provided on the present situation of primary health care and health education structures.

Detailed information on which the report was based has been added in annexes. Cross cultural generalizations will be added to the monograph publication.

KW: rural water supply, community participation, social structure, planning, financing, administration, maintenance, package approach.

FELICIANO, G.M., FLAVIER J.M.

Strategy of Change in the Barrio: A Case of Rural Waste Disposal (English) (Philippine Rural Reconstruction Movement)

D. Lerner, W. Schramm (eds.), *Communication and Change in the Developing Countries, East West Center Press, Honolulu,* 1967 279-288.

DA: ca. 1962-1967
CO: The Philippines

AN: A case study on the intruduction of water-selected toilets into a Philippine barrio. Although the use of sanitary toilets had been propagated by government health authorities since the turn of the century, they have not been accepted by the average farmer. Fewer than 37% of all rural homes had some semblance of latrines, while random counts revealed that only 4% had sanitary latrines. Gastro intestinal deseases are one of the five top causes of death and outbreaks of cholera (El Tor) have made the problem acute.

An investigation by the Philippine Rural Reconstruction Movement (PRRM), using field observations and interviews by researchers living among the farmers, revealed the existence of 4 types of objections against the propagated designs: smell, bad appearance, high construction costs and danger of falling through. Based on these objections, in five years a new type of low-cost, water-sealed and safe sanitary latrine was designed and tested, which was easily and quickly constructed mainly from local materials green bamboo, gravel, sand and cement), using a double mould.

The design was based on the attitudes of the farmers, who associated cement with durability, and whose aspiration (as shown in a survey) is to own a concrete house, and to whom the similarity of the latrine to the commercial types and the shaping of the foot-rests to simulate a jet plane had a special appeal.

In order to get this new design adopted, an apparently spontaneous but in fact carefully arranged procedure was developed, starting with the installation of a microscope at the local health centre. After some curiosity had been aroused, a series of stool examinations taken over one month was set into motion by the bario councillor examining a sample of his child's stool on Ascaris eggs, the biggest and most common helmith. The examinations were accompanied by flannelgraph teaching on the life-style of the parasite. A mass meeting was organized by the barrio council, women's association and barrio schoolteacher to announce and explain the findings: 92% positive for all children, which resulted in requests for solutions and the first mention of treatment and prevention possibilities, including the newly designed latrine. A demonstration project (which had already been prearranged) was demanded, and public commitments for labour, local materials and donations of cement were made. The demonstration led to modifications and improvements of the PRRM design by the local people a council

designated deadline for each household to construct a toilet, another demonstration, a programme of construction laid out by the people, and a treatment programme for those infected, with several hundred expelled adult worms of the Ascaris types placed in a huge, propellor agitated container for health education purposes.

This approach led to an average adoption of sanitary toilets of 64.5%, with close to 100% adoption in a number of barrios in the later stages of development. The authors stress the importance of integrating the facet of sanitation improvement with action in the other fields of livelihood, education, and self-government.

Essential factors in the dynamics of the change process noted by the authors are that the promoted change must (1) be an improvement over the old system, (2) be simple, economical and duplicable, (3) be based on practical understanding of the problem (relation health-sanitation) resulting in planning and implementation of problem-solving action, (4) be based on knowledge of the people's psychology, culture and way of life, such as the "hiya-complex", the fear of losing face when not fulfilled a public commitment, (5) be accepted by persons of authority and respect, (6) be achieved by personal rather than mass media approach, as this is the usual way the farmers deal with each other, (7) be worked out as a total approach, relating the problem to income levels, lack of information and need for organization and (8) be accompanied by the use of individualized visual aids, such as the microscope and flannel graph demonstration, the live Ascaris exhibits and the toilet building demonstration used in this project.

KW: rural waste disposal, constraints, design, local testing, adoption process, health education, methods and aids.

FENWICK, K.W.H.

A Progress Report on the Zaina Environmental Sanitation Scheme (English)
(Ex Provincial Medical Officer, Central Province, Nyeri, Kenya -then-)

A Pilot Project in Rural Africa. 52 p. 48 tables 19 app.

DA: 1961-1965
CO: Kenya

AN: A field experiment was carried out to measure the impact of a rural water and sanitation self-help project in Zaina, Kenya, consisting of a modern water supply with farm and school connections, washing and waste disposal facilities in schools, village storage tank, multiple draw-off points and an enclosed laundry unit. Health education was given simultaneously with the construction of demonstration aqua-privies and latrines with concrete slabs.

Before and after the implementation of the programme, surveys were conducted in Zaina and a control village based on the socio-economic status, personal health, housing, nutrition and sanitation, complemented by pathological surveys.

Results showed a greater rate of progress in Zaina as compared to the control area in both health development - especially in the age groups of children - and economic development - especially in dairy farming. It should be noted, however, that the group of landless farmers in Zaina amounted to 30% in 1961, with a survey coverage of 86%, and to 29% in 1965, with a response of less than 70%, while for the control village this data showed 22% in 1961 with a response of 79% and 17% in 1965, with a response of over 90%.

The presence of latrines in Zaina increased from 84% to 96.2% with a reported use rising from 97.5% to 99.2%, while dropping in control area from 94.4% to 91%, with the reported use also dropping from 99.3% to 98.6%. The level of maintenance observed fell sharply in both the experimental and the control village, probably due to a rise in hygienic standards applied by the interviewers.

The author remarks on the lack of enthusiasm for additional projects on latrine, floor and fireplace improvements on top of restricted finances, but mentions the building of a women's social hall and the organization of family planning instruction as by-products.

KW: rural water supply, rural waste disposal, health education, maintenance, progressive development.

FRASER, T.M.

Directed Change in India
(

Ph.D. Columbia University, 1963, 195 p.
Dissertation Abstracts, 27, 6 (1966)

DA: 1958-1960
CO: India

AN: An analysis of a ten year community development project in 44 villages in Western Orissa, India, attempting to bring about changes in agriculture, occupation, health and sanitary aspects of rural life. Ideological conservatism appears to vary, directly with the strength of linkages to other subsystems and inversively with techno-environmental urgency for change.

Social orgainzation varies rather widely in its role in change, joint families tending to be more resistant than nuclear families, while changing patterns of authority facilitated modernization. The upper castes were oriented towards a broader cultural environment, while serving as an elite model for emulation by the lower castes, which makes community development accord more with the former's values and models. The development dicta, not to disturb traditional organization, may actually strengthen resistance to desired innovations by reinforcing conflicting linkages and ramifications.

KW: diffusion of innovations, social organization, felt needs

FUNCK, J.C.

L'Introduction d'un programme d'eau potable à Belhassat(French)
(Introducing a drinking water supply to Belhassat)
(Administrateur National des Programmes Unicef, Algeria)

Carnets de l'Enfance, 34, 1976: 71-78 *(English, French, Spanish, abstract)*

DA:
CO: Algeria

AN: A rural water supply programme significantly improves the health of the local population. It can also bring a community a new awareness of its possibilities for development.

The government of Algeria has undertaken, with the help of Unicef, a campaign to reduce the infant mortality and morbidity rate in the rural areas by providing safe drinking water and improving the level of sanitation.

A series of pilot projects have therefore been launched in varying circumstances to provide a basis for establishing an effective methodology. The underlying principle is popular participation.

The wells of Belhassenat, one of the villages chosen as a point of departure, produced only one or two containers of water every 24 hours. Most of the water had to be carried in water-skins or jerry-cans on donkey back from a spring three kilometres away, on the other side of two wadis where in winter there is a constant danger of flash floods.

An investigation of the water from the spring by the health department proved it to be pure, and its supply abundant, it was agreed, through discussions with the village leaders, that the government would provide pipes, pumps and other material needed, while the villagers would dig the trench for the pipes and insure the water's protection from pollution by removing dunghills and rubbish heaps. Initial scepticism of the villagers disappeared after a technical survey to design the piped supply was conducted. Within two months the water system was installed. During the construction of a collection basin at the source, an eel was discovered in the water, which the villagers believed to improve the water quality by "eating the herbs and tiny animals to keep the water pure". No problems about removal of the fish were however reported. A reservoir was then built, and the project was extended to include two outlying groups of houses, with the improvement of existing wells, construction of another nearby ground water catchment scheme (captage d'une source très porche) and the building of washouses and drinking troughs.

Some attempts to acquire house connections had to be stopped sinde water was considered a communial good in the village, and a private sewer which was constructed by one of the villagers over the water pipes had to be relocated, when noticed by the construction team leader.

Access to an adequate water supply quickly stimulated a series of local initiatives, such as the construction of public showers and latrines, a washhouse, for which the village chief offered part of his garden, and a school. Requests for electricity and a paved road

have also been presented to the local government and the improved living condition have begun to attract back to the village some who had emigrated. No maintenance arrangements have been reported.

The departure of the intervention team to another area met with resistance from the village as the project was not considered completed and their help was wanted for borrowing a tractor from the cooperative and construction of a school cantine.

Not all pilot projects were as successful as the one at Belhassenat, in one project the pump was broken because of internal conflicts, while in another trenches for the pipes have not been dug because the population expects this work to be done by municipal labourers. (Extended journal abstract)

KW: rural water supply, motivation, community participation, progressive development.

GOYDER, C.

Sanitation in the Health and Social Development Projects Supported by Oxfam

(Paper presented at the Conference "Sanitation inDeveloping Countries Today", OXFAM/Ross Institute of Tropical Hygiene, Oxford 5 - 9 July, 1977, (English)

DA:
CA: Developing Countries

AN: An overview has been given of a number of Oxfam sanitation projects in developing countries, covering programmes in
1) rural areas of Zaire, Brazil, Somalia, India and Malawi;
2) institutions in Ethiopia, Zaire, Dominica, Vietnam and Malawi;
3) urban slum areas in Pakistan, Brazil, India, and Bangladesh;
4) disaster programmes in Ethiopia, India, and Bangladesh.

A critical review of some of the programmes emphasizes the need for integration of extension and construction activities. Some of the programmes discussed were limited to the provision of health education, covering sanitation and hygiene, nutrition and in some cases also family planning, while one project consisted of educational mimeshows in six villages.

Contrary to this approach, a rural hospital in Maharashtra, India, combines health educational activities at the hospital with extension work in the villages by a mobile team, supporting sanitation and water supply self-help projects in selected villages. The Vanga Baptist Hospital which trains village auxiliaries for motivational and educational work in selected villages, supervised by mobile teams which contact village elders, organizes public meetings and massive latrine digging, carries out yearly inspection on maintenance accompanied by local stool tests and treatment for worms and intestinal parasites. Training courses for auxiliaries from other hospitals failed, however, due to lack of encouragement from superiors. This problem was solved by organizing seminars for senior medical staff. Present needs are decentralized of supervision and development of training guides in local languages.

Incentives discussed are the provision of plots for settlement of nomads in Somalia provided they built good latrines, and the establishment of revolving funds for local development in Kerala, India, and Brazil. The revolving fund system in Kerala was part of an integrated development project consisting of a fish cooperative, adult literacy classes for women, a mother and child clinic and sanitation education, resulting in a latrine construction programme.

A latrine construction project launched by two Peace Corps volunteers consisted of the rallying of support of the local mayor and village priest, the organization of public meetings for men to discuss the technical aspects of installation and maintenance, and for women on the relation between sanitation and preventive health, followed by home visits, film shows, and the collection of small weekly contributions towards the latrine fund. Pits were dug and lined by groups of families, building materials, and transport were provided by the mayor and the construction was completed by a mason.

In slum and low cost housing projects, an important question was the construction of communal latrines. The author states that early involvement of the people in the planning and implementation of a project may result in better acceptance and use of communal facilities, e.g. by guarding privacy, offering plenty of water taps, providing other facilities such as a public hall for health education and other meetings and a community laundry, and letting families choose their latrine sharing neighbors.

KW: rural sanitation, primary health care, health education, media and methods, community participation, financing, progressive development.

GUMPERZ, J.J.

Religion and Social Communication in Village North India (English)
(University of California, Berkeley)

Journal of Asian Studies, 23 (1964) 89-97.

CO: India
DA: ca. 1962 - 1964
EV:

AN: An anthropological case study was carried out during one and a half years, investigating the local communication network in Khalapur, Northern India. Although possibilities for outside contacts had greatly improved, caste and kinship restrictions limited social interaction. Free discussion and interchange of opinion were most likely to occur in small groups or social nuclei. These nuclei consisted of men of one or more joint agricultural families, who jointly owned and operated a farm, business or company, and who might be of different castes but with roughly similar positions in the hierarchy. No public assembly hall or square accessible to all was found to be used, meetings took place in the private men's houses (chopal,cattle compounds or workshops). Development officers worked from a selected family chopal, and information was gathered through enquiries from members of the social nucleus of their host, who could also invite other villagers to his chopal.

This network of small informal groups depending on person to person oral channels limited the distribution of mass media such as periodical literature, pamphlets, library books and posters to the nuclei in which they were received. Thus the diffusion of innovations was influenced by (1) the nature of the message source, and its position in the social hierarchy, if this source is human, (2) the nucleus or nuclei through which it was channeled into the village and their relative status, and (3) the number of intergroup friendship ties of the mediating nuclei.

One way to overcome these limitations on communication of new ideas was the use of religious performances, by drama troups acting out mythological themes interspersed with songs and music, or by religious lecturers, reading or reciting traditional texts alternated with songs. These performances were held on invitation of a particular family, but in a public place and were attended by members of all castes.

A variety of non-religious messages was also transmitted sucessfully, provided they were connected to the ancient.

If themes were too modern in form as well as contents they were shown to have a negative effect.

An example of the diffusion of modern ideas through such a traditional channel was the use of an Arya Samaj singer who was employed by the Community Developing Block and used Bhajan music for songs about public health and agricultural innovation. His audiences were from all castes, as were the trainees accompanying him, while as a village development worker his own low caste would have been a serious constraint.

KW: adoption of innovations, social structure, communication channels, traditional media and methods.

HALL, B.L.

Revolution in Rural Education: Health Education in Tanzania
(Institute of Adult Studies, University of Dar es Salaam)

Communication Development Journal, vol 9 (1974), No. 2: 133-139

DA: 1972-1973
CO: Tanzania

AN: A description of the organization of a preventive health education programme in Tanzania, using a combined mass-media and interpersonal channels approach. After the exploration and testing of this approach in two pilot studies and one large-scale campaign on political education, in 1969, 1970 and 1971 respectively, the Institute of Adult Studies at the University of Nairobi and the Tanzanian government implemented a second, large-scale campaign, on health education.

The campaign had a double objective. The first being the improvement of public health conditions through the generation of (1) general awareness of preventive health, (2) specific knowledge about malaria, hookworm, dysentry, bilharzia, tuberculosis and water, (3) individual health behaviour and (4) public health group action, and secondly encouraging the maintenance of newly acquired reading skills by the participants of a recent national literacy campaign through the provision of free reading matter in simplified language and large print.

The target group consisted, therefore, of the population of Ujamaa villages due to their greater infection-risk and of the literacy campaign districts, totalling about 1 million adults.

The radio-broadcasts were preceded by an intensive publicity campaign, incliding radio-announcements and publicity programmes, and magazine advertisements, a special supplement to 2 national newspapers, posters, 2 national speeches by the prime minister and 3 special cotton material prints.

The basic elements of the campaign were (1) a national co-ordination committee, consisting of officials from the Institute of Adult Education, the Health Education Unit of the Ministry of Health and Social Welfare, the Directorate of Adult Education of the Ministry of National Education, the National Political Party TANU and the Rural Development Division of the Prime Minister's Office, the venues being from once a month to once a week over a period of 18 months prior to the first broadcast. (2) A series of 12 half-hour weekly radio broadcasts, which were repeated twice plus a accommodate group meeting flexibility and which consisted of 10 minutes of music and messages as group gathering time and 20 minutes of interviews about, and dramatisation of, personal experiences, (3) a set of printed materials and study guides to explain and extend the radio messages, using drawings and photographs, and to provide topics for group discussion, (4) trained study group leaders to organize the radio-broadcast meetings. Selection procedures for these leaders varied from area to area, from the rarer self-organization of groups and election of one of its members, the use of political party cell leaders (the "Ten House Leaders") and self-proposed leader who answered the call from the mass-media to organize their own small group to the more common method of selection by the local adult education coordinators (usually heads of primary schools).

The training was conducted in 3 stages: a central training of 7 seminars was organized for regional literacy agents, supplemented by health education officers and other field workers. These teams organized 70 seminars for district training teams, consisting of adult education officers, rural development officers, Tanu-officials, district medical officers and people from voluntary agencies. The district training teams in their turn trained over 70,000 study group leaders in about 2,000 2-day seminars.

Training courses stressed a group dynamics leadership role, not a traditional teaching role, using mock study groups and actual programme material and instruction for action-motivation. (5) A group leader's manual containing elements of the training course and actual programme information such as times and topics of broadcasts, activities when programmes are not available and places to go for assistance or questions. (6) Supervision by the existing adult education officers network, monitoring progress and problems and providing feedback.

The Swedish International Development Authority (SIDA) sponsored the additional financial input (mainly printing costs).

Evaluation studies have been designed on organizational efficiency, knowledge gains and changes in health behaviour.

The author concludes that this type of campaign has several advantages, namely a wide coverage of people who are not reached by either formal education or traditional adult education, the use of an alternative educational approach stressing participation, the flexibility of messages and learning conditions, and the low costs, to which can be added the combined use of mass media and small group approaches for the maximalization of impact on health knowledge, attitudes and behaviour of the individual, and the extra dimension of group health action.

KW: health education, media and methods, administration, selection, training, financing.

HALL, B.L., T. DODDS.

Voices for Development: The Tanzanian National Radio Study Campaigns
(Visiting Fellow Inst. of Dev. Studies, Un. of Sussex; Ahmadu Bello Un., Zaria, Nigeria).

Inter. Extension College: I.E.C. Broadsheets on Distance Learning, nr. 6
Cambridge, 1974, 51 p. *(English)*.

DA: 1967 - 1973
CO: Tanzania
EV: empirical, "popular" account, descriptive and evaluative study.

AN: An overview of the development of radiostudy campaighns in Tanzania, where information via radio broadcasts is discussed in small study groups guided by trained local leaders, with the aide of study guides and manuals.

Experimental pilot projects in the northern and southern part of the country by two agencies led to two larger radio campaigns, "Uchaguzi ni wako", The Choice is Yours, on the Tanzanian elections of 1970 and "Wataki wa Furada", A time for rejoicing, on the 10th anniversary of Independence.

An analysis of the former included design of the programme, data collection, an ideal-type of a radio group and significant variation and an evaluation of the course, by a survey of 26 selected group leaders, and of the results. Constraints noticed were a.o. the mixing of men and women causing problems in discussions (15%) and too much initiative of the leaders due to lack of background of the members (12%).

A report of the latter includes set-up of the study, objectives and evaluation design, costs and results. The authors conclude that the intended audience, the rural population, was reached by the programme, as 72% of the ca. 20.000 members were farmers, as well as 40% of the group leaders, although women (38%, men 62%) were less in attendance than at the adult education courses of the Ministry of Education (66% versus 33%). Only 17% of the leaders had more than 7 years formal education. Pre- and post knowledge tests of 50 groups resulted in a significant knowledge gain of 11%, showing the effectiveness of radio programmes as a learning method. One of the most expensive items fo the campaign, posters, (40% of total budget) were of negligible value, however, as most of the recruitment was done orally by the organisers of the programmes, adult education officers of various government agencies. Effectivity of the two-stage training programme (in-service training for educational officers who in turn trained local leaders) as measured by rate of return of registration and attendance forms, was good.

In 1973 a national mass-campaign, "Mtu ni Afya", Man is Health, was organised, reachting about 2 million people, which appart from providing information on health and preventive health behaviour and reading material for new literates intended to encourage group and individual preventive health action (see also Hall, 1974, nr..).

Evaluation of the programme consisted of interim evaluation tours and supervisor visits to 2,131 groups, a before-after survey on health knowledge, and a study on 11 health parctices in 8 villages. Among the action results reported by the supervisors were the removal of close vegetation and clearing round the house (28%), digging, repairing and rebuilding of latrines (20%), boiling or filtering water (12%), cleaning areas around water sources (11%), digging rubbish pits (4%), digging wells (3%) and avoiding group use of drinking containers and cigarettes (2,5%). Knowledge gains were measured through a 13-item multiple choice test administered orally by the groupleader at the beginning and end of the course, and showed a significant difference of 20%. Control groups also showed a gain of 15%,

however, but as no complete isolation was possible, the campaign affected them as well; when the most energetic control groups studying materials on their own were removed, there was a significant difference between experimental and control group of 11%. There was also a significant difference between health knowledge of ujamaa and other villages, but with a large range.

The before-after survey of 11 observable health practices of 2.084 inhabitants of 8 villages (presence and use of latrines, pools of stagnant water etc.) resulted in a 15% gain , from a mean score of 3 to 4.5 positive practices, with the largest change from digging latrines and removing vegetation. Long-term effects were not measured however. Problems were the size of the groups, and the even and timely distribution of reading materials. Active participation, measured by supervisors scores of the proportion of members actually contributing to the discussion, was 58%, and could be improved bu stressing smaller groups and a learning instead of a teaching approach. Feedback used largely for administration and evaluation should be institutionalised as a group correspondence course for long-term results. This necessitates even longer preparation time than the 18 months for this campaign.

KW: mass media, preventive health, health knowledge and practices.

HALL, B.L., DODDS, T.

Voices for Development: The Tanzanian National Radio Study Campaigns (English)
(Visiting Fellow Institute of Development Studies, University of Sussex)

International Extension College: I.E.C. Broadsheets on Distance Learning, nr. 6, Cambridge, 1974, 51 p.

DA: 1967-1973
CO: Tanzania

AN: An overview of the development of radio study campaigns in Tanzania, where information broadcasted via radio was discussed in small study groups guided by trained local leaders and with the aid of study guides and manuals.

Experimental pilot projects in the northern and southern part of the country by two agencies led to two larger radio campaigns, "Uchaguzi ni wako", (The Choice is Yours, on the Tanzanian elections of 1970) and "Wakati wa Furaha", "A time for rejoicing", on the 10th anniversary of their independence).

An analysis of the former included the design of the programme, data collection, an ideal-type of a radio group and significant variations, and an evaluation of the course and of the results by means of a survey of 26 selected group leaders. Constraints noticed were among others the mixing of men and women causing problems in discussions in 15% of the case and too much initiative taken by the leaders due to lack of background of the members - 12%.

A report of the latter includes set-up of the study, objectives and evaluation design, costs and results. The authors conclude that the intended audience, the rural population, was reached by the programme, as 72% of the approx. 20,000 members were farmers, as well as 40% of the group leaders, although the attendence of women (38% men 62%) was less than at the adult education courses of the Ministry of Education (66% Versus 33%). Only 17% of the leaders had more than 7 years formal education. Pre- and post knowledge tests of 50 groups resulted in a significant knowledge gain of 11%, showing the effectiveness of radio programmes as a learning method. One of the most expensive items of the campaign were posters, (40% of total budget) which were of negligible value, however, as most of the recruitment was done orally by the organizers of the programmes and adult education officers of various government agencies. The effectivness of the two-stage training programme was high, (in-service training for educational officers who in turn trained local leaders) as measured by the rate of return of the registration and attendance forms.

In 1973 a national mass-campaign, "Mtu ni Afya", (Man is Health), was organized, reaching about 2 million people, which apart from providing information on health and preventive health behaviour and reading material for new literates, intended to encourage group and individual preventive health action. (See previous abstract).

Evaluation of the programme consisted of interim evaluation tours and visits by supervisors to 2,131 groups, a before and after survey on health knowledge, and a study on 11 health practices in 8 villages. Among the action's results reported by the supervisors were, as follows:

The removal of close vegetation and clearing round the house (28%), digging, repairing and rebuilding of latrines (20%), boiling of filtering water (12%), cleaning areas around water sources (11%), digging rubbish pits (4%), digging wells (3%) and avioding group use of drinking containers and cigarettes (2,5%). Knowledge gains were measured through a 13-item multiple choice test administered orally by the group leaders at the beginning and at the end of the course, and showed a significant difference of 20%. Control groups also showed a gain of 15%. As no complete isolation was possible, the campaign affected them as well. When the most energetic control groups studying materials on their own were removed, there was a significant difference between experimental and control group of 11%. There was also a significant difference between health knowledge of Ujamaa and other villages, but with a large range.

The before and after survey of 11 observable health practives of 2,084 inhabitants of 8 villages (presence and use of latrines, pools of stagnant water etc.,) showed a 15% gain, from a mean score of 3 to 4.5 positive practices, with the greatest change in the digging of latrines and the removal of vegetation. Long-term effects were not measured however. Problems were the size of the groups, and the even and timely distribution of reading materials. Active participation, measured by supervisors' scores of the proportion of members actually contributing to the discussion, was 58%, and could be improved by stressing smaller groups and a learning instead of a teaching approach. Feedback used largely for administration and evaluation should be institutionalized as a group correspondence course of long-term results. This necessitates an even longer preparation time than the 18 months for this campaign.

KW: health education, media and methods, constraints, health knowledge and practices, community participation, evaluation.

HIMA, G.

Hydraulique Villageoise et Inventissement Humain au Niger
(Direction de la Promotion Humaine, Ministère du Développement, Niger)
(Rural Water Supply and Human Investment in Niger) (French)

Carnets de l'Enfance, 34, 1976: 79-88 *(English, French, Spanish, abstract)*

DA: 1967 - 1976
CO: Niger

AN: The Government of Niger has adopted as one of its primary objectives the provision of an accessible and adequate supply of drinking water for its population.

For in this country where the tragic effects of the drought are still visible, there are only some 4000 cement-lined wells for 10.000 villages.

Since 1967 the "Wells through Human Investment" division of the OFEDES (Office for Groundwater) and the Department of "Rural Animation" have been carrying out a project to drill modern cement-lined wells in those areas where the population is prepared to furnish a contribution in money or in labour. In 1974 this programme was extended to nomadic regions.

The task of the Department of "Rural Animation" is essential: because of the relationship it has already established with the villages, it is able to lay the groundwork for the project by (1) identifying the needs of the communities with regard to water quantity (number of sources available, water journey distance, number of cattle watered per day) and water quality (degree of source pollution and water transmitted diseases), (2) evaluating their degree of motivation by means of an enquete and an information campaign, (3) informing them of the support expected from them with specifications of labour and local materials needed and (4) organization of the village labour including youth and women, and indentification of work party leaders. Activities were concentrated on during the off-season.

The OFEDES is responsible for the technical aspects it decided on the location of the wells, and provides the basic material, logistic installation of facilities. It also introduces traditional welldiggers to modern techniques to enable them to later provide maintenance for the wells.

The water supply programme has led to the creation of related development projects, (1) vegetable gardening and school gardens, (2) nutrition education by female extension agents, (3) construction of water filters with local materials, together with environmental sanitation education on source pollution and filter use. Motor pumps are considered essential, but low-cost and low-maintenance models have not yet been identified.

Two other projects with high degree of community participation have been the construction of anti-erosion terraces in Tahoua District and the training of traditional midwives in Maradi district.

The population's participation in various development efforts has encouraged the emergence of new forms of organization such as the well administration committee. Integrated development, with production and marketing cooperatives taking change of well-digging, remains a future foal. (Extended journal abstract)

KW: rural water supply, motivation community participation, maintenance, progressive-development administration, extension.

HOLMBERG, A.R.

The Wells that Failed: An Attempt to Establish a Stable Water Supply in Viru Valley, Peru
(

E.H. Spicer, Human Problems in Technological Change: A Casebook, New York: Russell Sage Foundation, 1952: 113-126

DA: 1947
CO: Peru

AN: An ex-post-facto analysis of the failure of a water supply project in Viru Valley, Peru. After repeated requests the government sent a geological commission to the area to select and mark suitable sites for 6 wells from which a piped supply was planned to the village. A sewerage system and improved irrigation system were included as well. The Transitory Board (the local council) agreed to organize community labour for repairing and widening the access road, building trails, removing rocks and digging ditches. Although the timing of the project (in the slack agricultural season) was good, no voluntary labour was forthcoming and the board went into debt to pay for labour to construct the access road. Lack of interest and hostility from the villagers caused the project to be abandonned.

The author attributed this failure to (a) various background factors, such as (1) the existence of conflicting groups in the village (large versus samll landowners and natives from Viru versus "forasteros", or strangers), (2) the changing political situation, with an increasing influence of a new liberal party favouring changes in the land holding system, (3) the introduction of a new institution responsible for municipal affairs, the appointed Transitory Board, meant as a transitory measure to prepare for municipal elections, instead of the former Municipal Council, appointed by the central government,(4) the existence of a status system based on wealth and education but also on the institution of "compadrazco" (being a godfather to as many children as possible) and on serving as a steward of the religious fiesta of the village patron saint, and (5) the influence of a magico-religious value system, with water thought to be controlled by supernatural forces, as represented by the images of catholic saints, which could be influenced by the observance of religious rites like the celebration of feast days of certain saint ("fiestas").

Another factor held responsible is (b) mistakes made in the water supply project, namely (1) lack of consultation of local people, e.g. a local farmer, experienced in well digging and well informed about local water conditions, and a very prestigous community member, who consequently spoke openly against the project, (2) choosing the site for the first well for its probability of yielding an abundant supply and its proximity to the village, while neglecting the fact that it was situated on the land of a large landowner, while other selected sites, situated on public lands would have been preferred by the villagers for the first operation, (3) limitation of contacts to the Transitory Board whose principal members were neither native born nor representative of the real leadership in the village, (4) lack of interest shown by all official and non-official

leaders: Transitory Board, village priest, headmaster, public and lay religious officials, and the spreading of malicious rumours.

The use of a social scientist for preliminary fieldwork for about one month might have revealed the factors likely to lead to success or failure, and (1) more advice from local people, (2) two-way communication with the public, e.g. during an important religious festival when all were gathered in town, (3) siting the first well on neutral land to eliminate suspicion, (4) involvement of informal leaders besides the Transitory Board, and (5) the use of the central institution of the religious fiesta or cult of saints for publicizing and dramatizing scientific technologies, e.g. through religious blessings and precessions might all have contributed to a successful project instead of a failure.

KW: rural water supply and sanitation, community participation, social structure, health beliefs, communication channels, manpower, evaluation.

HOLMES, A.C.

Health Education in Developing Countries (English)
(African Medical and Research Foundation, Kenya)

London: Thomas Nelson and Sons, 1964, 190 pp.

DA:
CO:

AN: An introduction for public health workers, teachers, community development officers, junior government officers and district administration in designing a health education programme. The problem of health is looked at from the side of (1) the community (human beings and animals, housing, public facilities, climate and other geographical aspects), (2) characteristic diseases (kinds of deseases present, number of people affected, geographical distribution, characteristics of community sections affected, seasonal occurence, nature, virulence, endemic/epidemic frequencies) and (3) authority (set up of health authority system, money and staff resources, attitudes to problems of ill-health, policy with regard to priorities). Problems at the human level are that people do not always know causes and effects of diseases, suffer from many different kinds of conditions and illnesses, often in combination, which are frequently caused by customs and habits. Persuasion and cooperation in changing (part of) their lifestyle is therefore necessary.

The legal compulsion approach, follow-the-leader approach and didactic approach are rejected by the author in favour of health education. Various teaching methods, including teaching through similarities and associations, two-character plays, celebrities on tape, discussion groups and conferences are discussed, as well as problems in using pictorial and audiovisual aids, such as understandability, audiovisual distraction, local colour, preferences, perspective, speed and timing. The pre-testing of aids is stressed. Other teaching aids discussed are exhibitions, films, filmstrips, mechanical displays and models (page turner, mirror box, reflector box, running light display), printed materials, manipulated pictures (flannel graph, plastograph and magnetic board), posters, wallcharts and ancillary aids (puppets and games, such as a health version of "snakes and ladders" used in Kenya).

Apart from an increase in health knowledge beliefs and habits will often need to be changed. In order to help people to change their habits, health education should distinguish between positive, negative and neutral habits, establish goals wanted by the people, e.g. taste-oriented rather than health-oriented nutrition, and create new wants, e.g. on basis of prestige or envy.

Planning of a health education programme should be preceded by action from the authorities to put their own house in order, e.g. removal of fly breeding places for a fly eradication campaign.

After investigating problems and establishing priorities, paying attention to what people themselves want to be done, a preliminary survey should be conducted to gain knowledge on (1) resistances and favourable attitudes, (2) differences between individuals, groups and communities in attitudes, level of education, visual understanding and innovativeness, (3) local power structure, opinion leaders, role of the district council, undercurrent rivalries and jealousies, (4) previous health programmes, reactions observed and cooperation received, and (5) distribution of diseases, causes and effects, local conditions. An example of tuberculosis eradication campaign is given. Attention is paid to personal characteristics, training and roles of professional health education workers.

KW: health education, media and methods, plainning, testing, training.

INTERNATIONAAL AGRARISCH CENTRUM (International Agricultural Centre)

De Kleine Boer en de Ontwikkelingssamenwerking
(The small peasant and development cooporation)

Eindrapport van het vooronderzoek, Wageningen: Internationaal Agrarisch Centrum, 1976.

DA: 1974 - 1976
CO: -

AN: Final report on phase I (preliminary research) of a Dutch government project to plan and evaluate development programmes designed especially to reach the rural poor. The project is a result of the growing concern of the policymakers regarding the increasing inequity in developing countries which has been hastened by the conventional rural development programmes, resulting in the more advantaged profitting the most. The project concentrates on overall agricultural development, including social-economical structures and extension, but recognizes its limitations as other essential aspects of an inequity approach such as development administration, health care (nutrition, sanitation) and family structures (e.g. position of women) have not been included. Nevertheless it has elements which may be of interest to other development programmes, being an attempt in the design and evaluation of multi disciplinary inequity programmes.

Inequity is explained as a result of changing community structures caused by the introduction of technical innovations and the incorporation of small communities into larger structures (national communication networks, political and economical institutions e.g. political paries, tax systems, and national services, e.g. health care, education, extension). Those who adapted themselves quickly to these changes usually form a small rural elite with a high social-economical status and authority.

Present development programmes do not often show this, as they are concerned with quantitative figures (total kilometres road constructed, number of latrines built etc.).

A development approach aimed at inequity reduction must design special programmes in which (1) target groups are defined and (2) criteria of development are given. The report lists 26 elements based on the long-term, generally"felt needs" of target groups, on a scale ranging from primary needs of income and health, with food and water heading the list, via security, labour reduction,social relation, and a definition of the situation, to independence and control of environment. Further they should use (3) an overall development approach, which is initiated by (4) an analysis of the local situation, including ecological and social structures, together with the development and implementation of objectives, in which (5) target groups are to paricipate for reasons of continuity. Participation may need to be huided and checked by an anthropologist or sociologist on true representation of community interests by its representatives. The creation of organizational structures may be necessary. Continuous evaluation of the project analysis, objectives and methods (6) must be built into the design, and (7) the relationship with development administration must be defined, so that criteria for inequity development will be an integral

part of the policy.

Some of the points to be considered in planning for inequity decreasing development are (1) the removal of constraints before the introduction of stimuli, (2) the consideration of the risk element for the adopter, (3) a spaced introduction of innovations of a limited scope, and (4) the guaranteed success of the programme.

The report is based on a combined theoretical and case study approach by a multidisciplinary team (social sciences, agronomy, soil science, engineering, and animal husbandry), each of which has added an annex to the main report such as international relations, social structures and agricultural extension. Specific techniques (checklists, development matrix) are still being developed, preliminary lists are published in a separate part of the report.

KW: integrated rural development, inequity, planning.

ISELY, R.B., J.F. MARTIN.

The Village Health Committee: Starting point for Rural Development
(

WHO Chronicle, 31, (1977): 307-315

DA:
CO: Cameroon

AN: A report on a village health committee project in South Central Cameroon, describing the procedure followed in the creation of the committees and evaluating their effects.

To initiate the project, 4 pilot villages were selected. A KAP survey was carried out on health-related knowledge, attitudes and practices among the villagers. Itinerant agents were trained for the extended project. Their task was two fold: they had to carry out a simple survey on socio-economic and health characteristics of the inhabitants and to give a description of the general sanitation and infrasturcture situation in the village and an analysis of the existing communication patterns through informal discussions, while at the same time they had to start the organization of the health committees to keep the villagers from losing heart. The procedure followed was (1) the organization of meetings with certain local leaders for the selection of a health committee, (2) the definition of priority problems and (3) the presentation of problemsolving information, (5) the setting of staged objectives, (6) the assignment of responsibilities and (7) the establishment of a time schedule.

Once the health committee was functioning properly in accordance with certain criteria given (meetings without reminder, initiation, planning and execution of new project by the committee, and demands for outside help) the itinerant agent was then to evaluate the planning and operation activities, to organize information sessions and to develop ledership skills.

Evaluation of the results of the project was conducted by means of an analysis regarding the resulting activities of the Health Committee in 1974 and 1975; the average number of various sanitation provisions constructed per Health committee in the second year did not differ greatly from those constructed in the first year, but there was a substantial inceased in the number of committees (from 11 to 39), (an average of 17 latrines, 4 protected springs, 5 garbage pits and 2 animal enclosures was reported by 11, 9, 6 and 1 committee(s) respectively in 1975, while in 1975 those figures were 16, 4, 4 and 3 per 26, 25, 9 and 9 committees respectively). In the second year however, not all committees were included in the analysis, (information was available on only 27 of the total of 39), but whether this was due to a failure in reporting or in construction is not stated.

Another evaluation method followed was the bacteriological testing of springs which showed a significant difference in water safety in favour of the protected spring.

The catalytic effect of the committees health activities on other development activities is demonstrated by the subsequent establishment of a cooperative in one of the villages.

Finally a number of general constraints are mentioned, such as a lack of local leadership due to migration, lack of local influence due to centralization, of the administration, and social heterogeneity due to colonial policy. Two types of constraints are mentioned in particular, government-originated constraints and attitudinal constraints (prevention belief, problem identification and preventation methods belief). The latter was incorporated in the KAP pilot surveys, and found to be negative for a part of the population in all 4 villages, but no figures or social characteristics are given. One of the conclusions by the authors, that an appropriate evaluation design should be incorporated into the project from the start, is therefore not surprising.

KW: sanitation, community participation, manpower, planning, evaluation, constraints.

KAR, S.B.

A Model for Persuading Resistants for Planned Change (English)
(School of Public Health, University of Michigan, Ann Arbor, USA)

International Journal of Health Education, 12 (1969), 3, 106-117

DA: 1967
CO: India

AN: A research report on a public health campaign aimed at people who resisted a preventive health action of being vaccinated against smallpox. Reasons for resisting vaccination were identified and persuasion techniques were developed.

Communities with a high proportion of resistance were identified by their below-medium vaccination coverage in previous years. 26 villages, representative on account of their population size, major socio-economic characteristics, exposure to public health efforts and distance from a health centre, were selected from those with a high proportion of traditional subgroups, and rated low on a scale of cooperation in health and development programmes by local administrators and public health workers.

No discription of the initial data collection has been given, although the author mentions some of the existing needs of the populations and the relatively low priority of health needs, especially preventive health measures. Voluntary adoption of vaccination was approximately 35%, as was rejection, with the remainder neither rejecting nor adopting voluntarily (undecided?).

The model used to persuade the non-adopters consisted of three phases: mass approach, personalized persuasion approach and macro-action. For the first phase the opinion leaders in each village were identified with the "guided reputational method", i.e. participants of a meeting, initiated by the local health workers to discuss a preventive health action (in this case vaccination, but other action such as disinfection of village wells is also feasible), were asked to identify opinion leaders who are respected, reliable and influential. Those suggested had to be representative of the major subgroups in the community, which was checked at the meeting and through small meetings with the various subgroups at a later stage.

In conjunction with these opinion leaders a mass campaign was set up, with loudspeaker announcements and leaflets circulated by volunteers, a mass meeting, films and discussion, and door-to-door visits. The latter also served to identify individual resistants. Through this campaign another 30-35% of the villagers became adopters, apparently the undecided.

The personalized persuasion approach consisted of (1) the establishment of a face-to-face relationship ("crossing the threshold"), after which (2) the reasons for refusal were asked. These were found to be mainly beliefs about hidden motives for vaccination, personal insusceptibility, absence of serious consequences, ineffectiveness of vaccination and undersirable side effects, as well as negative

interpersonal influences and situational and environmental factors (pregnancy, inauspicious days etc.). About one third of the initial resistors were persuaded by (3) providing relevant information to correct unrealistic expectations about functions of vaccination, e.g. multi-disease immunity, fears of consequences and necessity and timing of re-vaccination. In order to reach the remaining resistors, (4) pragmatization ("to see is to believe") e.g. to counteract fear of side-effects) and (5) emotionalism (fear arousing information to counteract a low perceived threat to self and family, and appeal to parential obligations towards children) was used.

After they made the decision to adopt, emotional reinforcement was given to solve the post-decision conflict, and after the adoption a follow-up was found to be necessary to solve the post-adoption conflict, counteract rumors, increase trust in health workers for future action e.g. by symbolic cure of side-effects with aspirins, and to persuade and vaccinate those not available during the first round.

When 8 to 10 local resistants in the village had adopted vaccination, macro-action was initiated by using these adopters as additional change agents. This had the double function of providing psychological reassurance for the new converts and a channel for their willingness to persuade others in turn, as well as by using them as a catalytic force in the interpersonal persuasion campaign.

The combined approaches led to an overall adoption of smallpox vaccination of 90%, as contrasted to an adoption of 30% in previous campaigns.

Although it lacks an accurate description of the research methods followed, the paper gives an interesting contribution to a new health education approach, by demonstrating the participation of local administrators and field workers in identifying local problems, and of opinion leaders and late adopters as non-professional change agents.

The author stresses the need for further research on this model to test its pragmatic validity.

KW: public health, adoption of innovations, health beliefs and practice, media and methods, leadership, manpower.

KAR, S.B.

Communication Research in Health and Family Planning Programmes in India
(School of Public Health, Department of Health Development, University of Michigan)

International Journal of Health Education, 13, 3 (1970), 94-102

DA:
CO: India

AN: A review of literature in communication, motivation and action research projects for family planning and public health in India. The author notices the following shortcomings: (1) stress on quantitative avaluation, e.g. number of attendants, film shows or publications, and lack of qualitative and process evaluation, (2) adoption seen as solitary variable in measuring effectiveness of communication programmes, with little or no attention to additional and environmental variables, (3) neglect of long term effects, i.e. stability of change, and secondary effects of communication, (4) concentration on positive effects of communication, while negative impacts, such as, misconceptions about consequences, unrealistic expectations and increased anxieties are also possible, and may need special neutralizing action, (5) lack of investigation of differential impacts on various categories, (6) little study of motivational background for adoption of new health practices, e.g. the absence of positive motives, or the existence of conflicting motives, (7) lack of data on perceived credibility of message sources and channels, and (8) traditional, informal and indigeneous communication media still largely untapped resources.

He therefore stresses the importance of more research in three additive fields: (a) the impact of communication programmes in terms of stability, secondary effects and parallel or alternative informal channels, (b) the design of communication programmes for motivation and removal of negative forces, requiring the reversal of the communication process: first interpersonal communication efforts to diagnoze barriers, then development of suitable communication appeals for mass media diffusion, and (c) action research into credible communication sources and channels, with continuous feedback of experiences at the community level.

KW: evaluation, bibliography, public health and family planning, research

KEBEDE, H., D. ABATE, T. FESSEHA.

Improving Village Water Supplies in Ethiopia: A Case Study of the Socio-Economic Implications (English)
(Uneca, Training and Research Centre for Women, Addis Ababa)

United Nations Economic Commission for Africa, ECA/Unicef, Addis Ababa, Undated, approximately 1976, 54 pp

DA: 1976
CO: Ethiopia

AN: A preliminary report of a study of the socio-economic aspects of 10 selected villages in the Gurage region, Ethiopia, involved in a water surface development scheme of the Surface Water Development Unit (SWDU). The objectives of the study were (a) to find reasons for the lack of self-help and coordination in the highland villages participating in the project as compared to the lowland villages, (b) to collect information on existing economic conditions and possibilities for more productive use of water collection time saved, and (c) inviting an integrated rural development effort through the cooperation of various government, and non-government agencies, and local associations.

A brief, preliminary survey was conducted and discussions were held with peasant associations, staff of the local hospital, EPID (a development agency) and the SWDU, resulting in the construction of a mainly open-ended questionnaire, which was then pre-tested in 50 randomly selected households from the ten villages. The actual sample consisted of 205 randomly selected household, 107 in 5 highland villages and 98 in 5 lowland villages. Both husband and wife were interviewed, and joint interviews were found to produce more reliable data in the particular cultural setting. A limited number of opinion surveys were also carried out in households representing extreme and interesting cases or volunteering information, as well as with executive members of the peasant associations, while participatory observation of the village life during the 57 days of field work provided additional information on norms, values, tradition, husband-wife and parent-child relationships.

Survey data were collected on (1) household composition, migration (place, occupation, income, duration) (3) literacy rates, (4) enset (= false banana, the main food crop) yield in 1976 and 1977, (5) percentage of households with additional food or cash crops, (6) ownership of farm implements, (7) beliefs in the effectiveness of farm implements for cultivation of enset and other crops, (8) willingness to adopt a new and improved sets of implements, (9) division of labour, (10) decision making responsibilities, (11) water collection time (12) frequency of collection, (13) perception of water problems (pollution, shortage, distance, difficult location), (14) attitudes towards improving water supplies, (15) priorities of those showing a negative attitude, (16) willingness for inter-village cooperation (a) general development projects and (b) water supply projects, including labour and money commitments, (17) anticipated benefits from an improved supply (clean drinking water, plenty of water for farm, cattle health improvement, human health improvement, time saving, other and none) and (18) expected use of water collection time saved.

No health data were included, but some data were supplied from a health and nutrition survey, carried out in 1974, showing serious malnutrition, especially in the lowlands. Perception of health benefits from an improved supply was relatively low, only 3% of the men and 1% of the women in the highlands mentioned this benefit, against 56% and 44% mentioning clean drinking water as the major advantage, while in the lowlands this data showed 13% and 12% for health benefits and 96% and 90% mentioning time saving as the major advantage.

Comparison of the lowland and highland villages showed a relatively more serious agricultural, health and water supply situation in the lowland villages, explaining their greater "felt need" for improved supplies and a greater willingness to contribute labour.

The authors conclude that an integrated rural development effort is needed, with the cooperation of all government and non-government development agencies and the local associations, to (1) attain a better crop diversification system, through (a) resettlement and land redistribution in the highlands, (b) ox-drawn ploughs, (c) soil conservation and afforestation and (d) agricultural extension services, (2) develop a health and adult education programme, and (3) instigate collective action for development infrastructure (feeder roads, clinics, coop stores).

Short term objectives recommended are (1) a well digging and water purification scheme in the lowlands and spring protection scheme in the highlands, with the training of communal or local maintenance teams, (2) temporary solutions to most acute problems, as pest control, donkey carts for water transport, ox-drawn ploughs and oxen on credit to peasant associations, (3) coordination of all agencies and peasant associations in the region. (4) a series of 3 types of economic surveys, and (5) soil conservation and reafforestation research and action programme.

Long term objectives mentioned are the development of multi-purpose cooperative providing (1) agricultural inputs on credit, (2) storage facilities (3) marketing (4) credit facilities, (5) a training and community centre for adult education, health education, agricultural extension, assemblies and farmer's and women's seminars for initiating group oriented programmes (6) a model farm, and (7) production workshops for artisan training and extended cottage industries.

Strategies advised are (1) group approach to farmer's and women's organizations, (2) "family-as-a-unit" approach, (3) survey of ideas and needs expressed by the people for incorporation in planning, (4) education programmes through assemblies, seminars and discussions with peasant organizations and group organizations, and (5) in-built evaluation system with quarterly or bi-annualy surveys.

KW: rural water supply, economics, felt needs, integrated rural development, planning, attitudes and belief.

KINCAID, D.L., H.J. PARK, K.K. CHUNG, C.C. LEE

Mothers' Clubs and Family Planning in Rural Korea: The Case of Oryu Li
(English)
(

Case Study No. 2, Honolulu: East West Communication Institute, undated (ca. 1975) 73 p.

DA 1968-1973
CO: Korea

AN: A case study of successful community activity to illustrate the use of traditional village organization for women in a national family planning programme in order to make use of existing systems of interpersonal communication and of opinion leadership.

A review of historical village organization and present national organizational structure for family planning and rural development is given. The women's clubleaders are appointed through the government, membership is subject to several criteria literacy functional age group between 20-45, and membership of at lease one other club. An initial monthly donation is given, now in most cases replaced by the club's own savings and credit union, coordination and supervision are through information and guidance officers attached to county health centers. The clubs have their own monthly magazine, featuring the "Club of the Month". A typology of the average womens' clubleaders is given.

One very successful club, in historically one of the poorest villages is analysed. A description is given of (1) the ways applied to solve external and internal constraints and financial problems were solved, (2) the shift from family planning to general community development (agriculture, sanitation, education, small-scale industry) and (3) the relations with the higher organizational structure. A short description of 2 other clubs are added, one being in the least successful category and one of intermediate position.

Conculsions which can be drawn from the case studies concern the possibilities for use of traditional village structure in development programmes, the influence of charismatic leadership, the legitimization of problem solving behaviour by a local organization, the adoption of individual practices through collective group decisions, the importance of personal follow-up for indecisive or opposing members, the essence of independent, member-owned financing and the self-generating effect of a successful minor innovation on overall-development.

KW: rural development, rural women, leadership, community participation, social structure, manpower, financing, progressive development.

KREYSLER, J.

Uhuru na Maji: Health, Water Supply and Selfreliance in Mayo Village (English)
(Max Planck Nutrition Research Institute, Bumbuli, Tanzania)

Journal of Tropical Pediatrics, 16, (1970): 116-123

DA: 1966-1968
CO: Tanzania

AN: Report of self-help community development activities in Mayo village, Usumbura district, South Tanzania. In the summer of 1966 the results of a medical routine examination of all school children were discussed with the elders of Mayo village in a meeting at the school, which lead to a school feeding project, for which a mess hall and a kitchen were built by the villagers. A sale of locally made articles provided money for food, transportation and the cook's salary. The following year the programme was made self sustaining by starting a vegetable garden and chicken farm, with contributions of maize and hens by school-children's family.

On request of a group of mothers a clinic for children under 5 year's old was started next, with a small payment per visit. Unreliable paying habits of mothers varying from 10% to over 50% during the coffee harvesting season, and low attendance in planting and harvesting season have limited the clinics success to such an extent that the village development committee started a campaign to motivate regular payment.

The results of stool examinations in village and school were reported to a meeting of parents and children and revealed high rates of infection with intestinal parasites. This led to information seeking of its causes, and a decision was taken to improve the village surface well. The village decided on the choice of an improved system, including practical trials. Bamboo pipes failed and an estimate of costs of building concrete open channels revealed that they would surpass the costs of a piped system, so the village decided on a piped system after three months. An application to the Ministry of Community Development and National Culture had successful results. The system, providing one tap for every ten houses was built with community labour. The water source was selected by the elders and the siting of the three storage tanks was decided by the villagers. On-the-job training of approximately ten villagers for maintenance and control broke the monopoly previously held by one craftsman.

Improvements which followed the project were the irrigation of a cooperative field by surplus water, extension of brick making, and extension of the project for the distribution of drinking water to the dispensary and four other villages. Further extension in the area did not take place, however, as other village leaders ascribed the achievements to the assistance of Europeans.

During the project a number of objectives were formulated with the 10-House-Chairmen of the village: (1) Planning responsibilities, which which included timing and actual workload for each project, to come from within the village, according to the regulations of the Village Development Committee; (2) Expatriate and Tanzanian experts would play an advisory role in a very informal way; (3) Detailed technical plans would be the

responsibility of experts and the craftsmen of the village; (4) Certain mistakes and failures were unaviodable; (5) Minimal outside help necessitated financial contributions.

KW: progressive community development, rural water supply, community participation, testing, financing, administration, maintenance.

VAN DER LEST, J.C.C.

Community Self Survey: Purpose and Significance, Directions for Application (English)
(North Brabant Social Welfare Foundation)

Working Party on Rural Sociological Proglems, Netherlands, Ministry of Social Work/F.A.O., The Hague/Rome, 1962, 37 pp.

DA:
CO:

AN: Several methods can be applied to secure optimum community involvement in social change programmes, such as (1) regular group interviews with fixed groups in the community, (2) representative committees with adivisory or evaluative functions, (3) data collection, conduction of enquiries etc. by the population and (4) community self survey. The last method differs from the other three in that the choice of the subject, the wording of the problem, the collection, arrangement and interpretation of the data are all done by the population itself (with some expert assistance).

A community self survey has two functions, (1) a socio-pedagogic function, of making people more conscious of their own situation, and (2) a research function, of providing data for social policy planning, although it can only serve as an additional tool to normal social research in the planning process. Other functions may be (3) improved contacts between various people and groups when they discover that they have problems in common, (4) replacement or supplementation of community staff, (5) a better understanding of democracy and (6) acquaintance with the means available to policy makers.

The author cautions against (1) influencing the population in the direction of the action desired by the planning agencies, and (2) failure to follow up the survey by action in the fields identified and channeled through the persons who have introduced and instigated the survey. Such failure may cause frustration, mistrust and apathy in later programmes for social change.

The self-survey process is divided into three phases, (1) preparation, (2) execution and (3) conclusion. Initiation can be either by outsiders (planning agency, community development worker etc.), who should be qualified and perceived as such, or by the joint initiative of a number of formal and informal leaders or organizations and associations. Internal consideration which are part of the preparatory process concern (1) the aims of the survey, varying from (a) getting an already planned action accepted without however revealing the problems and proposed solutions before the survey as the population is hoped to discover these by themselves, to (b) getting a plan of action designed by the people based on survey results, and (c) a change in mentality. They also concern (2) the objects of the survey (concrete problems or general structure analysis. Broad knowledge of the community e.g. on advantages and disadvantages of the survey in the light of existing intergroup relationships and distribution of power is necessary in this stage and sociological exploration on

communication channels, informal and formal leadership, intergroup relationships and power structure may be needed. Outward activities in the preparatory phase are (1) contact with local, regional, secular and spiritual authorities, services and institutions, (2) introduction of the idea of a self survey at one or more meetings with official and unofficial leaders, organizations and groups, either singly or jointly (3) listing potential participants, (4) selection of participants on their representiveness for sex, age, religions, social class, and associations and organizations in the community, as well as their personal characteristics and place within the community's communication network. The number of participants will depend on the number of small groups needed, either one group studying one subject or several groups studying one specific part. Maximum size would be 12-15 members per group. The next steps are (5) approaching the participants personally and inviting them to take part, explaining their position, and the phases of a self survey, (6) organizational arrangements, such as estimated number of meetings, regularity, duration and place, and (7) publicity, using the channels between the participants and their background.

The execution phase consists of (1) group discussions, with training in discussion techniques for chairmen and secretaries and careful avoidance of a group interview approach, (2) fieldwork, with collection of data, conduction of enquiries and observation, (3) continued communication via (a) participants (check), (b) local publicity campaigns and (c) authorities.

Problems of mutual mistrust, lack of frankness, misunderstandings and conflicts, as well as dominance of certain participants may hinder the groups in action.

The conclusion phase consists of (1) a report on the findings of the survey group(s), (2) transition to social action, establishing priorities and designing a concrete scheme of action, whereby the degree of community involvement will depend on local competencies and the degree of delegated central authority, and (3) transfer of the results of the self survey to the community, with (a) systematic publications of the findings in serial form, mentioning the participants, (b) grand closing night for all sections of the community, and (c) discussion of the report in organizations, societies and neighbourhood meetings.

The role of the social science or community development expert, in the background only, consists of the (1) sociological exploration of the community structure and relationships, and (2) comparison of the opportunities and values of a self survey with other social research methods, both during the preparatory stage. During the executive phase expert guidance will be needed on problem and question formulation in research terminology, choosing methods of data collection, teaching simple techniques such as inquiries, interviews and reading statistics, and interpretation of facts and data. In the conclusive stage, expert assistance may be needed in composing the final report, indicating possibilities and priorities for action and passing on results to the authorities.

KW: problem identification, research, community participation, planning and implementation, social structure, manpower.

LANCE, L.M., E.E. McKENNA.

Analysis of Cases Pertaining to the Impact of Western Technology on the Non-Western World (English; English, French, Spanish abstracts) (University of North Carolina, Central Michgan University)

Human Organization, 35, 1 (1975), 87-94

DA:
CO:

AN: Fifty cases of planned or semiplanned attempts to introduce change in the major developing areas of the world is reported in three casebooks of social change (Niehoff, 1966; Paul, 1955 and Spicer, 1967) were analyzed in terms of (a) the objectives of the innovation process, (b) the strategies employed, and (c) the success or failures of the innovations.

Objectives were categorized as (1) mechanical innovations - a total of 4 -: utilization of new material objects such as wagons, wells or latrines, (2) agricultural innovations - 13 -: incorporation of new methods of farming and new styles of organization, (3) therapeutic innovations - 13 -: including cures for illness and ailments such as smallpox, (4) birth control - 2 -: family planning information and techniques, (5) community organization - 8 -: formulated to achieve community mobilization, (6) preventive innovation - 4 -: medicine used for public health and personal hygiene purposes to protect against sickness, (7) education - 1 -: to increase literacy standards, (8) information transfer - 1 -: efforts to convey particular information for example the nature of mental disorder, (9) labor cooperation - 3 -: activities devised to produce changes in group behaviour through some outside programme e.g. the attraction of farm laborers from groups in which this occupation is not a viable alternative, and (10) research innovation: academic programme initiated with respect to a particular community.

The strategies employed were (1) pressure, - 5 -: the utilization or display of some kind of force to accomplish previously established goals, (2) participation, - 9 -: involvement of persons in the decision making process previous to the introduction of actural change, even if it refers initially just to local leadership (3) education, - 12 -: here only in the sense of explicit programmes, (4) utilitarianism, - 9 -: a strategy referring to control over material resources and rewards accessible to the client system when it acts in a way directed by the change agent. (5) placement-positioning of the correct individual(s) in crucial statuses when change is preferred rather than merely supporting local authority, (6) empiricism -promotion on grounds of objective and empirical proof of the value of the innovation for the system, and (7) hands-off, - 5 -: a new practice is offered and left to expand through the client system with no conscious control.

Agricultural and therapeutic innovations were the most popular change goals, representing half of the cases. Participation, education and utilitarianism were the major strategies used (60%). Nearly half of the cases (24), including all cases of nrs. 6-10 were classified as failures and another 5 cases a half-failures, only mechanical innovations were predonomantly successful. The authors point out, however, that the success/failure ratio as reported by Neihoff and Spicer (1:1) differed

greatly from that reported by Paul (1:16), which evokes questions on the selection criteria and randomization of the cases, questions which were ignored or only vaguely considered.

The most effective strategy was participation (77%), followed by placement (43%) and hands-off (40%).

An additional investigation was conducted to determine the reasons for failure, which focussed on the socio-cultural client structure, in future studies to be extended with change agency constraints. Six categories were identified, (1) caste-class social structure - 3 -: (2) political social structure - 8 -, (3) central authority - 5 -, (4) local cultural belief system - 10 -, (5) communication breakdown, - 3 - operationalised as complete disregard for this area, and (6) other - 2 - Cross classification of these categories against strategies and objectives showed that (a) cultural beliefs and political problems were the main explanations of failure; (b) cultural beliefs were particularly significant as an explanation of failure in cases with an educational strategy, and (c) cultural beliefs were particularly significant as an explanation of failure of therapeutic innovations.

Future research on planned organized change needs to determine that the cases studied are even in quality, that there is no misinterpretation of what was actually occurring, and that they are representative, and should provide a theoretical foundation for the selection of significant variables, for which the exchange theory could be a starting point.

KW: adoption of innovations, methods, participation, constraints, evaluation, bibliography.

LIN, N., R.S. BURT.

Roles of Differential Information Channels in the Process of Innovation Diffusion
(Monograph ≠ 001, International Centre for Social Research, Department of Sociology, State University of New York, Albany, 1973

DA: 1972
CO: El Slavador

AN: Two channels to spread information about an innovation and influence Its adoption are mass media and interpersonal contacts. The authors stress the importance of local media as a 3rd channel. By this term they mean those communication media which, while reaching a large audience, are capable of customizing messages for different groups or locales, such as public speakers, missionaries, salesmen etc.

To determine the role of the local media in the adoption process, the impact of a mass immunization campaign in El Salvador, using all three channels, was measured.

Personal interviews were conducted with housewives in all households in five rural communities selected for their limited size, different level of development and date of participation in the campaign for reason of recollection. The social characteristics of the 327 respondents measured were age, socio-economic status through factor analysis, with education, educational status of husband and type of floor as main determinants, access to mass media (radio ownership) and degree of social integration, as indicated by an index composed of sociometric scales of village friendship networks.

The three communication channels identified were based on the respondents' identification of (1) radio and press as mass media, (2) radio car announcer, leaflets, school principal, government official, mayor and teacher as local media, and (3) family, friend, stranger, child or observation of vaccinations as interpersonal channels for the creation of awareness of the immunization campaign.

The adoption process was divided into earliness of awareness, length of decision period and ultimate adoption. Path analysis techniques were used to investigate the relationships, showing that mass media exposure was positively related to mass media access and to earliness of awareness, but unrelated to adoption, that socio-ecomomic status was positively related to social integration, use of local media, and adoption, and that social isolation led to the use of interpersonal communication channels, which meant late awareness and decreased likelihood of adoption.

It must be noted however, that this particular innovation is of the "terminal adoption" type. The influence of local media on continuation of innovation behaviour has still to be determined.

KW: adoption of innovations, preventive health, health practices, media and methods.

MARTENS, E.G.

Culture and Communications - Training Indians and Eskimos as Community Health Workers (English; French summaries)
(Department of National Health and Welfare, Ottawa)

Canadian Journal of Public Health, 57, (1966): 495-503

DA:
CO: Canada

AN: Special training courses for Indian and Eskimo community health workers were set up after one year of preparations (visits, meetings, workshops and conferences with medical services, government and non-government agencies and community leaders). A multi disciplinary committee was set up to outline the programme, and the region with the cooperative administrative climate was selected for a pilot project. A regional planning committee was established for area selection, planning and implementation. The suggested programme was presented for discussion in the communities by means of slides and flannelboard. Selection of health workers was made by asking the Indian chief and councillors and the Eskimo village committee to select four candidates from the applicants in their community. No academic or age standard was required but questions were asked to ascertain personal leadership qualities. The final choice was made by the regional planning committee, and consisted of men and women between 25 and 64 years, with education levels varying from grade I to VIII.

Training took five months, two months of orientation in their home village, with assignments and projects (data collection on resources, services, agencies, health conditions and health attitudes in the village), and three months of formal training in a central location, in the form of a problem-solving, semi-structured workshop. Information was given through short talks, demonstrations and visual aids to the larger group, and was discussed in small informal groups composed of students only. Student committees were set up and classes were as much self governing as possible.

The involvement of different cultural patterns led to several problems which had to be solved in the discussions: racial prejudice and hierarchy, varying degree of time consciousness of participants and adaptibility of staff, varying tribal status of women and acceptance of native languages rather than a universal language, contrary to most participants earlier experiences in schools, and different perceptions of concepts used, such as "surveys" which in the past had often led to expropriation.

After completing the training course the community health workers were officially reintroduced to their communtiy in a community meeting called by the chief on request of the workers, during which showed slides of their three months'training and explained their ideas. The changes attempted first were technical changes such as water supply, maintenance and storage. Programmes where members of the community were involved in a community survey or a cleaning-up campaign led to further involvement in community improvement. Most successful methods were home visits and

small neighbourhood group meetings. Barriers to community changes were the social distance between health worker and community members and traditional suspicion of the white man, his ideas and his assistants. Although support from village leaders, particularly the chief and councillors helped to overcome this constraint, a change in authority caused problems.

Supervision was provided by the local nurse, who was also involved in the orientation, the formal training, and on-the-job training. Problems however were differences in background and experiences, high turn over rate of nurses, prejudice and strictly medical orientation. Success was greatest when the supervisor accepted the community health worker as a community expert rather than a health expert.

KW: health education, manpower, community participation, selection, training, health education methods, supervision.

MATANGO, R.R., D. MAYERLE

Maji na Maendeleo Vijijini: The Experience with Rural Self Help Water Scheme in Lushoto District
(Maendeleo, Lushoto, Tanzania)
in G. Tschannerl, ed., Water Supply, Proceedings of the Conference on Rural Water Supply in East Africa, 5 - 8 April 1971, BRALUP, University of Dar es Salaam, Research Paper no 20, 229-239 (Engl.)
DA: 1971
CO: Tanzania

AN: Interim report of the construction and maintenance programme of 10 shallow wells in Lushoto District, Tanzania. The allocation of funds was based on the directions of the second five-year development plan, nearness to administrative centres and local self-help traditions. Official representatives of the villages (political leaders, councellors, and village and divisional executive officers) were invited to attend an initial meeting at the ward's headquarters, at which the organizational structure and responsibilities were decided upon.

The Divisional Rural Water Supply, elected from those attending the meeting was to be responsible for the allocation of materials and the evaluation of construction activities, with the power of sanctioning substandard village performance by withdrawal and reallocation of materials. This happened in one case. Activities for community awakening, and the organization and supervision of self-help labour, including absentism, were the responsibility of the local committees, to be elected from political leaders, including ten cell leaders (representing every ten households in the village) and village executive officers (ex officio). Additional inputs were official initiation ceremonies by members of the parliament, lectures on the relation water-disease by the mobil training unit leader and the District Health Officer, and mobile van films on water related diseases and the impact of West African self-help projects on village life.

Some constraints experienced in the implementation at various places were: 1) Lack of village organization and leadership; 2) Frustration of expectations on paid labour and depth of groundwater; and 3) Problems in timing of the construction activities; caused by: a) the prolonged fasting for religious reasons (Ramadan); b) the existence of a fixed timetable for other community activities, already amounting to 2 days a week; and c) problems in technical assistance (one mobile technician for all schemes, lack of transport, delays in delivery of materials and varying length of instruction periods needed). Merging the project with the field units of another water supply project, the Lushoto Integrated Development Project eased this last problem somewhat.

For maintenance, a member of the village selected by the inhabitants was trained to carry out simple repairs and was supplied with the necessary tools. No Salary was paid but he was freed from all other common duties. The continuancy was a problem, however, with frequent changes of residence. Therefore, six months' training courses were started in 1970 by the LIDEP, combining water supply maintenance with a basic trade of a regular small workshop in the village.

Institutionalized government assistance for such training and supervision activities and small yearly contributions towards supply maintenance by the village households, to be collected by the responsible body in the village (village Headman, TANU Chairman, V.D.C.) are advised.

The authors advocate the development of a policy for bottom-up local development, with a survey of village resources, funds and skills to avoid over-enthusiasm. They criticize the lack of planning for maintenance, which may make initially cheaper solutions more expensive in the long run, such as petrol operated pumps with lower installation costs than a night storage tank, but with a higher incidence of failure and higher recurrent costs.

Estimated costs, quantity and quality of water supplied, and population served have been given. Preliminary results of an evaluation study of water collection time and volume failed to show any significant improvements in for those living farther than five minutes from the supply, however.

KW: rural water supply, selection criteria, community participation, organizational structure, leadership, planning and implementation, constraints, health education media and methods, maintenance, training.

McCARTHY, R.H., D.J. BRENNER, G.M. QUESADA.

Project Report on a Model for Improving Access to and Utilization of Regional Health Facilities through Health Education-Communication Programmes (English)
(Health Communications Department, School of Medicine, Texas Technical University, Luddock)

Texas Technical University, School of Medicine, Health Communications Department, Lubbock, Texas, October 1975, 382 pp.

DA: 1975
CO: U.S.A.

AN: If health education is to produce an actual behaviour change, information alone is not enough, the communication will have to be designed in the light of the attitudinal and motivational situation (solving subjective constraints, like social class, cultural biases, social and group pressures, perceived group membership, perceived expectations of significant others) and provide facilitating mechanisms for actual behaviour (solving objective constraints, as for instance, lack of money and lack of education.

In order to develop a model for collecting data on which effective health education programmes can be built, 40 in depth interviews on health and pre and neonatal nutrition were carried out with 13 health providers and 27 health consumers. Seventy six respondents in various health worker categories (physician, nurse, referral person, agency administrator, point of entry person) and 90 respondents in consumer categories, (first pregnant, pregnant mother, non-pregnant mother, non-pregnant non-mothers, grandmother and father), the majority of them Black or Mexican American, were asked to answer a questionnaire on current behaviour and sources of health information and health care, and to sort Q-statements and pictures and health and nutrition. Picture sorts were to be in "order of importance to being healthy" to measure social and group pressures (actual sort) and "order of importance to being healthy when rich" to measure real opinions (suppositional sort). Data analysis consisted of a factor analysis of statements and picture Q-sorts, and correlations of actual and suppositional picture factors, and correlations of pairs of actual and suppositional sorts done by the same individual. From the analysis of the factors produced by the statements sorts and suppositional picture sorts, 8 distinct types of attitude clusters, segmenting the respondents, were identified. Two of the categories thus identified were (1) suppositional factor II, a group of Mexican-American females of low soico-economic status, relying on physicians for health care but on relations for information, with whom communication is easy when culturally correct e.g. taking into account the reliance on the family, particularly mothers and grandmothers, and whose crusading spirit makes them suitable candidates for voluntary health workers, and (2) suppcsitional factors IV, people who represented an extremely low income, rural, older minority population, with the greatest tendency to use folkhealers, particularly midwives, relying on relatives for health information and advice and defining quality in terms of quantity (lots of food, lots of health professionals to take care of them).

From the open-ended questionnair data, the authors conclude that the mass media is generally rejected by consumers as sources of specific health information, because they are perceived as less creditable than health workers, and that health workers and consumers differ in their vision of the usefulness of the various mass media, and interpersonal media. Health workers preferred radio and TV over booklets (45.2% and 17.8% respectively), and only 16.5% from them felt that the support of the family and friends was an effective way of producing behaviour change, with 5.8% actually willing to utilize these informal channels. Consumers preferred booklets over TV (69.7% versus 30.3%), 55.3% of them relied on relatives for nutritional advice, while 39.5% mentioned frields on only 3.9% doctors.

The model based on these research data consists of five phases, (1) the establishment of channels between the social and behavioural sciences and the health system, (2) segmentation of consumers types, health workers roles and health system, establish actual and behaviour potential links between system and target groups, (3) analysis of non-health system solutions to health needs, e.g. lay-referral system and using suitable categories like suppositional factor II as voluntary health workers, (4) development of specific communication strategies and materials for specific health workers roles with specific consumer categories, for which the authors suggest a panel composed of consumers representatives of the various identified categories, representatives of the provider categories and traditional health providers as midwives, curanderos, herbalists, and (5) implementation of strategies and quantitive and qualitative evaluation e.g. by pathway analysis and similar Q or other subjective tests.

KW: health practices and attitudes, health education, target group segmentation, man power, the media, target group participation.

MISRA, K.K.

Safe Water in Rural Areas, An Experiment in Promoting Community Participation in India
(

International Journal Health Education, 18, 1 (1975): 53-59

DA:
CO: India

AN: A report on the Banki Piped Water Supply Project, a rural water supply project in 7 villages in Uttar Pradesh started in 1963, which describes the influence of health education and village participation on piped water supply practices.

Data were collected on the socio-economic background and the existing water supply situation, and attitudes toward water supply were measured by interviewing representative members of the various subgroups in the village, indicating general oppostion to the scheme.

A review of the various opinions in given, showing constraints based on anticipation of water charges, quality of traditional versus piped water, cultural and sociological patterns concerning the position of women and education of the children, emotional factors and superstitious supply problems (reliability and waste water disposal) and mistrust of government intentions (family planning!). Favourably reactions based on health and convenience considerations came from more educated and innovative villagers.

Several health surveys were done in the course of the project, with the triple objective of measuring impact of the project, improving its credibility by providing treatment and serving as an educational tool.

The author's report of the educational programme concentrates on message content and information channels. A large number of arguments in favour of adoption are listed, based on the attitude constraints found in the survey, and which can be classified into 4 categories: (1) dissatisfaction with current conditions and motivations for improvement, (2) parallels with other -already adopted- innovations, (3) correct information to counteract misconceptions, and (4) ecomomical aruguments. The channel found to be most effective was the participation of the health educator in the informal evening sittings.

Village participation in the project organisation was realized through the installation of a management committee consisting of a member of each village, selected in consultation with the heads of the panchayats, and responsible for maintenance and management, including the collection of water charges.

Impact of the scheme is shown by a reduction in morbidity of water-borne and -washed diseases, incidence of child diarrhoea and increase in private house connection. No distinctions have however, been made according to socio-economic or other characteristics, to differentiate between adopters and non-adopters.

KW: rural water supply, constraints, health education, media and methods, community participation, administration, maintenance, evaluation.

MORA RAMIREZ, J.; O. LOPEZ OROZCO

Participación comunitaria y saneamiento básico rural en Colombia
(Community participation and rural environment sanitation in Colombia)
(Spanish; English; French summaries)
(Division de Saneamiento Básico Rural Instituto Nacional de Salud
Bogota, Colombia)

Carnets de l'Enfance, 34, (1976): 89-101.

DA: 1974 - 1976
CO: Colombia

AN: A study ot rural communities carried out by the Department of Environmental Sanitation revealed that in 1974, out of 7.100 communities, 4.125, or 58% had no potable water supply and that 6.440, or 91% had no sewerage disposal system. This situation existed in villages ranging from 50 to 2.500 inhabitants.

The government of Colombia therefore launched a national programme with the intention of not only providing the rural population with drinking water and sewerage disposal systems, but also of modifying its attitude by involving it in its own development.

Each community actively participates in the different phases of the programme. During the study phase, the community helps to analyse the health, economic, social and cultural situation and offers suggestions based on its experience. It then participates tin the preparatory tasks and in the construction of the sytems itself by providing land, material and labour, and by collecting funds.

Once the work has been completed, the sytem is turned over to the community. Its administration and maintenance are entrusted to a local potable water committee, which is made up of three members: a president and a treasusrer appointed by the village's general assembly, and a secretary who is a representative of the programme and who is appointed by the chief engineer.

The community provides approximately 20% of the funds needed to cover the costs of the system. The remaining 80% are in part financed by a long term loan, the amount varying according to the reimbursement possibilities of the community (from 40 to 60%). In 1974 The monthly payments or "family fees", from rural communities came to US $ 1.285.000.

The implementation of this national programme should, in the long run, create employment possibilities and increase the value of the land. It should also bring social benefits, such as a growing awareness on the part of the communities of their possibilities for development, and a decrease in the rural exodus. Further benefits should result from the health education which is included in the new programme to improve the living conditions of the rural population.
(Journal abstract)

KW: rural water supply and waste disposal, financing community participation, planning, implementation, management, health education.

MORFITT, R.P.

A non-Conventional Mass Approach to Rural Village Water Projects
Pan American Sanitary Bureau Report to the Pan American Health Organization, May 1969.

DA: -
CO: Latin America

AN: A theoretical framework for a total rural water supply programme in Latin America, highlighting technical aspects (design creteria, design standards and new techniques) as well as community involvement, training multi-discipline staff, administration and finance.

In order to acquire a maximum of community participation the authors first recommend a community analyses by a local surveyor or team based on general huidelines and training material, in order to examine past and current social changes (education, economics, professional skills, health and outside contacts), determine attitudes toward community efforts by analysing earlier development projects, and assess current attitudes toward water. Survey findings should then be evaluated by a committee composed of village leaders and project staff.

Secondly, they recommend the optimal use of the existing local communication system for information and feedback through the selection by the village government of a village communication representative the identification of current information methods, the determination (through comparison of the existing communication capabilities and the information workload composed by the project), and the development of procedures, guidelines, training material and specific messages. The existing communications system is seen as a network of officials and opinionleaders in different fields and communication locations (such as the post office), but methods for making this network visible are missing.

Several information methods are discussed and 4 cost reducing techniques are mentioned: the use of standard type messages, large scale production (per unit reproduction costs decrease with increaing amounts), wide coverage (true costs are production costs devided by number of people reached, so films may be relatively cheap) and design and production at village level on a commercial basis.

Thirdly, they recommend the selection (by the village) of the person(s) responsible for community organization to meet water project needs. He/they should define the minimum requirements of the village organization to participate in a water programme, and evaluate the current utilized and unused capabilities in a meeting with village officials and leaders. Tapping of unused village resources is stressed.

Training of community volunteers (social and technical) should be "progressive" and "delegated", i.e. on the job training and special courses for team leaders. One example of a technical treining course set-up and 3 of community involvement courses(for the community survey leader, community information leader and water system director respectively) are given.

To ensure continuity of projects responsibility of the community, continued employment of the progressively trained volunteers, and continued resources of the Sanitation Programme of the Health Department (inspection, water charges plan, expanse resources, major equipment, annual rural water plant operators, and maintenance personnel training programme) are stressed.

It is stated that the non-conventional approach to the design of Rural Water Systems has been utilized in several successful Mass Rural Water Programmes, but no references to these programmes are given, nor is any testing of the non-conventional approach to community participation mentioned.

KW: rural water supply, package approach, research, social structures, attitudes, communication channels, community participation, administration training, financing, supervision.

CARRUTHERS, I.; D. BROWNE.

The Economics of Community Water Supply

School of Rural Economics and Related Studies, Wye College, University of London; Economic consultant, Box 21690, Nairobi.

R. Feachem, M. McGarry, D. Mara, (eds.) "Water, Wastes and Health in Hot Climates", London: Wiley and Sons,
1977, p. 130 - 161.

DA:
CO:

AN: Allocation of water supplies implies the choice of, or the division between urban areas, rural areas with high economic growth potential and rural areas with humanitarian needs. For each rural area the author stresses the need for the presence or input of additional facilities for economic, health and social benefits. Selection criteria for humanitarian schemes should be the distance, reliability and quality characteristics of existing water supplies, in addition to special priorities like high risks of epidemic disease and severe droughts.
There are also general technical and demographical criteria to be met, as well as evidence of local need and involvement. Low-cost schemes may help to satisfy the cost-per-head criteria,but the development of self help water supply schemes may be less cost reducing than imagined due to inadeqyate planning, technical weaknesses, disorganization of labour, and a once-and-for-all-payment feeling,and they mey lead to deprivation of resources for other water supply schemes or for other vital sectors of the economy.

KW: community water supply, planning, economic and social criteria, participation.

MORSS, E., J.K. HATCH, D.R. MICKELWAIT, G.F. SWEET.

Lirhembe Multi Service Cooperative
(Development Alternatives Ltd.)

In (idem) Strategies for Small Farmer Development, An Empirical Study of Rural Development Projects in The Gambia, Ghana, Lesotho, Nigeria, Bolivia, Colombia, Mexico, Paraguay and Peru, vol. II Case Studies, p. 126-135 West View Press, Boulder, Col., 1976.

DA: 1972-1974
CO: Kenya

AN: Evaluation study of a rural development project in Lirhembe sublocation, Central Division, Kakamega district, Kenya with the object being the construction of a social centre, and the introducation of new agricultural practices. The initial success of this ongoing project is based on (1) social homogeniety of the area, (2) project initiation by the member of parliament, ensuring high local credibility and good communication channels with government officials, (3) strong leadership of MP and local teachers, (4) continuous community involvement through an elected committee of four men and three women with (5) institutionalized two-way communication between leaders, committee and local population, (6) flexible financing by the donor agency with local management of funds on two conditions: phased donations based on visible progress and 100% cooperative membership, and (7) quick success in construction and functioning of the social centre, which was built with hired labour, however, due to the initial skepticism towards the project and towards self-help activities. Communual facilities such as a maize storage, a milk cooler and a cattle dip have now been constructed with self-help. The emergence of independent decision making by village women is noticeable.

KW: rural development, evaluation, community participation, leadership, communication, financing.

MORSS, E.R., J.C. HATCH, D.R. MICKELWAIT, G.F. SWEET

Strategies for Small Farmer Development: an empirical study of rural developments projects. Executive Summary.
(Development Alternatives Inc., Washington)

DA:
CO:

AN: Summary of an evaluation of 36 rural development projects in 11 African and Latin American countries.
Success of the projects was scored on the basis of the cost/income ratio, acquisition of agricultural knowledge, increase of self-help capabilities and chances of self-reliance, combined into an overall-success-score.

The most successful projects were those with good social action, especially during the (critical) implementation phase, expressed as degree of local participation and resource commitment of the local population.

A positive relationship was found between local action and two-way communication, extent of functioning of local organizations under small farmers control, degree of sharing in decision-making responsibilities, testing and extension by local farmers as paraprofessionals (sharing proved more efficient than domination by either participants or management) and - to a lesser degree - crop-specific extension advice. Literacy was only related to resource commitment.

No positive relation was found for cost per participant, number of participants, quality of physical environment (farming conditions), farm units per extension worker, security of landholdings, provision of social services, average size of farm, past experiences in similar projects, increase in knowledge generated by project and project-initiated percentage change in income.

The most successful projects had also either (1) collected data in local areas prior to initiation of the project on (a) existing production, (b) socio-cultural patterns, (c) perception of risks and other constraints to required change, (d) wealth and power structure and (e) local organizational capabilities by means of small sample surveys and open-ended interviews by data collectors integrated in the project staff to ensure the use of their information and to start a two-way communication system, or (2) started by introducing a simple idea (e.g. fertilizer) and developed their knowledge-base during this initial stage.

A negative relationship was found between overall-success and amount of foreign aid in initial stages: large foreign donor projects with over US$ 1m. contributions scored poorly on success, local action and self-reliance components ("balloon effect") because of time constraint (quick results wanted and yearly political decisions on budget), knowledge constraint (small farmer not accepted as source of information e.g. of perceived risks), lack of definition of required changes and their mechanisms, lack of flexibility, lack of built-in, ongoing information and feedback, and success measurement in narrow terms, such as cost/benefit ratio. Developement projects which took time and effort necessary to build in an active and cooperating role for small

farmers were significantly more successful than those projects which followed externally dominated development approaches.

Other components found to be important were (1) technical package development (most seccessful were a synthesis of old and new methods realized through dialogue with the clients) and (2) extension (the overall, traditional extension services by area-based agricultural experts dealing with individual farmers proved to be least effective). Accountability of extension services to a local organization representing the population to be served appears to be most important. Also important were (3) the type of credit given: most effective proved either the use of local organizations, e.g. cooperatives, or group liability as a commitment to the project (group pressure on non-payers), (4) rates were positively correlated with local action, repayment and use of intermediaries, and focus of the project: working through local organizations was most effective in areas with relatively equaldistribution of land and wealth. If this was not the case, restrictions built into the project such as restriction of membership, increasing cost of service and upper limit on levels of services were needed.

Finally, an "organic approach" is suggested: either two years of field study of one or more separate geographic locations by professional rural development specialists and the local staff (incorporated in the project) to determine the needs and constraints and to start a two-way communication system, or the use (occ. creation) of smaller institutions as intermediaries for large donors (such as AID) the initiator of the evaluation study).

KW: evaluation, rural community participation, costs, package approach, extension.

MORSS, E.R., J.K. HATCH, D.R MICKELWAIT, C.F. SWEET.

Vihiga Special Rural Development Programme
(Development Alternatives Ltd.)

In (idem) Strategies for Small Farmer Development, An Empirical Study of Rural Development Projects in The Gambia, Ghana, Kenya, Lesotho, Niegeia, Bolivia, Colombia, Mexico, Paraguay and Peru, vol. II, Case Study, p. 108-115 West View Press, Boulder, Col. 1976

DA: 1970-1974
CO: Kenya

AN: The authors criticize a project of 26 rural development activities in Vihiga division, Kakamega district, Kenya, ranging from family planning to maize and tea credit, and labour intensive road construction, for (1) its lack of community participation, as almost no consultation with local leaders and farmers for identification of "felt needs" and approaches took place, (2) lack of local identification with the project because of strong government/donor participation, (3) use of traditional communication mechanisms (barazas or village meetings) with top down communication to ensure - often forced - selfhelp commitments, (4) centralization of project management, preventing local government workers to meet specific local need, (5) lack of coordination in planning and financing, e.g. introduction of high grade cattle without sufficient cattle dips and without knowledge and acceptance of their usefulness by the local population, and (6) sporadic utilization of base line survey data, and poor timing of survey (2 months before the formal launching of the project with much publicity, raising local expectations).

KW: rural development, evaluation, community participation, communication planning and administration.

MUJENI, A.

Document Voices in the Village (English)
(Institute of Adult Education, Zimbabwe)

African Environment, 1, 3 (1975): 76-89

DA: 1974
CO: Zimbabwe

AN: Group discussions and personal interviews (using questionnaires) with rural women in two villages in Zambabwe, who, participated in the making of an educational film on rural saving clubs, followed by group discussions and group interviews during village women's meetings in 4 villages and 2 chief's courts were used to investigate women's perceived needs and solutions.

Major problems and needs felt by the 258 respondents were (not listed in order of priority), lack of land, better farming methods, better water resources, heavy farm labour due to magration of husbands, schoolfees, agricultural inputs and marketing, home-economics and home-industries, extended formal and vocational training, rural industries, preservation of traditional customs, marriage and family counseling, and health facilities.

Together with the "felt needs" a list is given with solutions, suggested by the women themselves, which, with regard to better water resources were: "More information about obtaining individual or communal boreholes and dams and how to arrange long-term loans for these projects. Beer parties as well as better harvests could gradually pay for the laons".

The author concludes that rural women, especially the married ones, seem keen to take an active part in many fields of rural development, but, in addition to economic constraints in realizing the solutions suggested by them, there are psychological and social constraints such as fear of ridicule and distrust, lack of knowledge about services available, impersonality and modernism of services, and selectivity of extension services.

Observations are made on the greater offectiveness of group interviews in comparison with personal interviews, especially when recorded, and on the women's excitement about their being listened to by a visiting expert as opposed to being taught.

KW: rural women, felt needs, community participation, constraints.

New South Wales Department of Health

Melbourne Division of Health Education, New South Wales Department of Health, Australia (English)

Manual of Health Education, 1972, 132 p.

DA:
CO:

AN: In introduction in health education for professional health workers, which covers sociological and socio-psychological concepts with regard to preventive health, such as culture, social customs, roles and class, health attitudes and processes of change and communication. Planning and evaluation of health education programmes are discussed. Planning should include (1) problem difinition, preliminary data collection and discussions on actions and resources with a few people interested in the problem, followed by (2) more extensive data collection and analysis, (3) discussion of its results with local people, (4) determination of objectives with local participation, (5) identification of constraints which demand cooperation of the individual, cooperation within the community, and outside action, (6) selection of priorities, (7) preparation of a plan of activities, including choice, definition and recording of methods to be used (personal visits, demonstrations, meetings, discussion groups, brochures and pamphlets, press, radio, exhibitions, films slides), as well as timing and delegation of responsibilities.

Social and organizational competencies of the planning leader are stated but no training programmes are mentioned. Local involvement in programme planning by forming an initial formalized group of participants, who have tangible relationships to other groups in the community, is emphasized.

The manual also discusses evaluation, varying from casual every experimental design), as well as pretesting for exposure, attention, interest, motivation, comprehension, understanding of purpose, learning and retention.

The various health education methods elaborated upon are home visits and personal interviews, office management, group dynamics and meetings, speeches and lectures, popular health publications (including their readibility), mass media and audiovisual aids (chalkboards, cartoons, charts, episcopes, filmstrips, slides, flip charts, flannel boards, loop projectors, motion pictures, models, overhead projection, posters, flash cards, tapes).

KW: health education, training, programme planning, media and methods.

OBIBUAKU, L.O.

Socioeconomic Problems in the Adoption Process: Introduction of a Hydraulic Palm Oil Press.
(

Rural Sociology, 32, 4 (1967), 464-468

DA:
CO: Nigeria

AN: Report on the evaluation of a Nigerian government project, the introduction of a modern palm-oil press in a West-Nigerian village. The installation was preceded by a careful information and decision process, lasting for over 2 years, through discussions with the Agricultural Assistant, (the local extension officer), and at the Area Farmers' Meetings, a demonstration trip to an oil-processing plant, and speeches by high-ranking government officials. In the year after its installation a survey was carried out by a University/ Government team, based on the records and experiences of the AA and interviews with village heads and all 75 village woman concerned with oil processing in the village. Although initial adoption had been high (72%), discontinuation in the next year had been considerable: non-adoption had declined from 28% to 16%, but discontinuance had grown to 60%, resulting in a final adoption of 24%.

Knowledge of the press was 100% and most women were convinced of its time saving effects and higher productivity, although no percentages have been given.

The author gives several reasons for the high initial adoption rate in the village: (1) the relatively long awareness-stage, (2) the relative simplicity of the innovation, (3) the low risk factor, as no financial contributions were asked, only labour, (4) the high degree of sociocultural homogeneity of the village, and (5) the support by village leaders and heads of families. The high discontinuance rate is contributed to (1) the lack of women's participation in the decision process, which led to (a) the installation of an oil-press specially designed for men, while oil processing was traditionally a women's job, and resistance existed against a change in this division of labour, (b) the loss of two of the three by-products which were traditionally the reward for the women, giving them some independent means, (c) a stricter time schedule, leading to long delays in the peak season and forcing changes in women's time table, and (d) an increased oil production whose profits, according to local custom, benefitted only the men however, and to (2) the lack of community participation in the operation process: contribution in labour had only been asked for the installation of the plant.

KW: adoption and continuance of collective innovation, community participation, evaluation.

OGIONWO, W.

Socio-psychological Factors in Health Behaviour: An Experimental Study on Methods and Attitude Change.
(

International Journal of Health Education, supplement to vol. 26, nr. 2, (1973): 1-16

DA:
CO: Nigeria

AN: A comparison of the effectiveness of two health education programmes in a cholera campaign in Nigeria, one using an individual approach, and the other, a community involvement approach.

Two rural communities, matched on socio-economic characteristics, were selected and a survey taken at random, was carried out, of which no further description is given.

The individual education approach was used in one community and consisted of fieldworkers' home visits with photographic material on cholera and sanitation behaviour,. In the other community the community involvement approach was used, organized on 3 levels, namely extended family meetings, community association meetings (e.g. women's and religious groups) and general village meetings. All were addressed by the resident filed worker and after a general discussion, a group dicision was taken.

Both communities were exposed to mass media information through radio broadcasts, filmshows and posters.

After the educational program, a vaccination campaign against cholera and health measures demonstrations were organized (food preparation and water boiling) and initial adoption rates were recorded. Two months later a survey was carried out in the two villages to measure the continued adoption of the practices. A decrease of 25% in number of respondents was recorded due to migration.

The initial adoption rates were higher for the community involvement approach than for the individual education approach (75% and 60% respectively), but continued adoption (for practices only, as immunization is a so-called terminal adoption) showed even greater differences (73% versus 45%).

Internal factors which were found to be positively related to adoption were as follows: age under 45, married status, high income, literacy, high scores on "attitudes-towards-ill-health prevention", "concern about becoming ill" and "general adjustment of life" scales, a sense of personal vulnerability, greater knowledge of preventive measures in general and lower fatalism. Adoption was higher, however, for those who reported no previous ill-health experiences than for those who did (66% versus 49%).

External factors found to be positively related to adoption were mass media exposure and social interaction characteristics.

Innovation characteristics were, in general, given a positive evaluation by the adopters, but 11% adopted while having a negative opinion on convenience of adoption.

KW: health education, media and methods, community participation, adoption of innovations, evaluation.

ORLEANS, L.A., R.P. SUTTMEIER.

The Mao Ethic and Environmental Quality
(Library of Congress, Washington)

Science, 170 (1970): 1173-1176

DA:
CO: People's Republic of China

AN: The vastness of the population and the primitive exploitation of nature in China has resulted in a highly degraded natural environment. During the 1950's many highly organized multidisciplinary expeditions, including geographers, geologists, hydraulic engineers, pedologists, foresters, agriculturalists and public health officers surveyed the country's tropical resources. The expeditions were institutionalized by establishing the Committee on Comprehensive Expeditions at the Chinese Academy of Sciences, which was also responsible for the planning of exploitive and curative management.

Research on specific measures for environmental imporvement and responsibility for their implementation was delegated to the Ministry of Public Health, the Ministry of Labour's Institute of Scientific Research on Labour Protection, and other ministries, Division of Research on Labour Sanitation of the Chinese Academy of Medical Sciences and various universities and colleges.

The maoistic policy of frugality and the high priority of better health coupled with the lack of curative facilities led to the organization of periodic national patriotic health campaigns including collection of wastes and litter, pest elimination, and recycling of suitable products e.g. organic material for fertilizer, as well as mass immunization and long range disease control compaigns.

Two examples of cleaning-up campaigns are (1) the "spring patriotic sanitation movement" in 1970, organized by the local revolutionary committees, comprising of the collection of litter and reusable wastes, clearing of local waters, elimination of pests and stressing of public health measures, and (2) the "Shanghai muck-campaign" in 1969, a mass mobilization, of 90,000 industrial and agricultural workers to form dredging and - transportation teams over a period of three months.

Although the authors agree that great achievements have been made in the research and practical work on environmental hygiene, they wonder whether the removal of labour from productive activities for ecological purposes of a sometimes risky nature, e.g. diverting waste waters for irrigation, and the widespread discrediting of experts will not have unfortunate consequences.

KW: environmental research, waste disposal, community and participation, mass campaigns, planning.

PATNAIK, N.

Digging Wells In Barpali, Orissa: An Experience in Rural Reconstruction
(Utkal University, Orissa)
Man in India, 41 (1961): 83 - 99 (Engl.)

DA: 1953 - 1954
CA: India

AN: A case study and evaluation of the construction phase of a project for improved village wells in Barpali, Orissa, India. Initially, 12 wells were to be built through self-help activities with a fixed amount of financial assistance from the state government and an emergency fund for extra costs such as rock blasting, and technical assistance from non-government agency, the Amercian Friends Service Committee. The number of planned wells increased to 19 when some neighboring villages joined the scheme on their own initiative.

A remarkable feature is the variety in arrangements for labor contributions made by the participating villages, such as: 1) the use of the traditional local structure of the six work teams, for which a schedule was prepared every evening in the presence of all villagers, distributing self-help and income generating activities over the six groups; 2) organization of daily work teams by a well-committee, consisting of voluntary and hired labour, with the use of a religious symbol as a mark of assignment to endure a satisfying labour output; 3) cyclic arrangements for free labour from each family; 4) organization of six subgroups of ten labourers electing their own leader. Qualification for leadership were prominent in local theatrical and religious music activities, a mediating role in village conflicts and a reputation of imparity of judgement; 5) hired labour from fixed subscriptions per family; and 6) a food-for-work programme for labourers and their family.

Special factors promoting village participation in the project were: 1) the building up of a reliable water reserve against frequent fires; 2) inter-village competition;and 3) harassment of low caste women at the village tank, while local political conflicts and the bypassing of a politically influential traditional medical practitioner were constraints on the implementation.

The lack of pre-planned policy of administration and implementation in the construction phase and the absence of a dialogue between villagers, project staff and government officials in the early stages of the project led to: 1) misunderstandings about the exact amount of work expected from the villagers, e.g. rock breaking and well-lining as well as digging; 2) uncoordinated construction activities making voluntary labor more costly than work under contract; and 3) confusion about government financial assistance, which was expected to be in cash but was finally given in kind, when (halfway through the project), the villagers were asked to sign an agreement defining the responsibilities of the parties.

The author concludes that 1) the higher costs of voluntary labour when compared with the daily output of workers under contract, were compensated by its social benefits; 2) knowledge of the social composition of the village (the existence and operation of castes, the traditional forms of voluntary organization, the character of local leadership, the points of divisiveness, etc.) is needed for the identification of resources and constraints; 3) transfer of technical knowledge should be a continuous on-the-job-affair; 4) labour responsibilities such as digging to a specified depth, breaking and hauling of stones, and advance stocking of local materials at the site should be agreed upon and a staged outline of the programme be given several times before actual construction is started; 5) village workers or visitors should make sure that the well is a high priority in the village; 6) mistrust of government officials should be overcome by on the job contacts, less formalities and more flexible rules; and 7) information on successful projects should be diffused by:(a) translating it into traditional verse; (b) distributing a set of photographs and slides of the various stages of these projects; and (c) using traditional story-tellers who carry long rolls of hand-drawn paintings which are unfolded as the story goes along.

KW: rural water supply, community participation, motivation, and constraints, planning, communication, media, and methods.

PINEO, C.S.

Bangladesh: History of Rural Water Supply and Sanitation Programs
(WHO, Division of Environmental Health, 13, 2p.)

DA: 1946 - 1976
CA: Bangladesh

AN: A review of the development of tubewell programmes in Bangladesh, which began in 1946/47 when 50.000 tubewells existed of which 12.000 were choked up. Since the mid-1960's, Unicef has been involved in these programmes, resulting in a massive government/Unicef partnership effort since 1972, in which Unicef is providing material equipment and personnel. By the end of 1975, there were 280,000 shallow wells (30,000 out of service), 5,000 deep wells and 5,000 deep-set wells. The average number of people served per tubewell was 334. For 1979, 160,000 new tubewells have been planned in addition to a shallow well programme for primary schools and urban areas not yet served by a piped supply. This should bring the average number of people per well down to 150.

The programme is carried out under the responsibility of the Directorate of Public Health Engineering (DPHE) in the Ministry of Local Government, Rural Development and Cooperatives, with a high degree of decentralization. At the lowest administrative level are the 4,600 Unions. Inhabitants of the 65,000 villages may apply to a Union Site Selection Committee for a tubewell. The village has to deposit 50% of the costs of a shallow well or 25% of a deep well with the Union Chairman and to sign a contract. There is no need for promotion, as the procedure is well known. The Union Site Selection Committee develops a list of needs and its chairman together with the Sub-assistant Engineer from the next level, the Thana, apply to the Executive Engineer at District Level, for their list of requirements. The Executive Engineer consolidates the requests from all the Thanas, passing them up through the Divisional Office to the National Office of the DPHE where allocation on a national basis is determined.

Selection criteria are: 1) the existing distribution of tubewells 2) hydrological suitability 3) density of population 4) at least one improved supply per village.

Construction is by authorized contractors who sign a contract with the DPHE for between 20 and 60 wells. Construction by the villagers themselves was begun under the second Five Year Plan (1960 - 1965) under the Basic Democracies (with the creation of Union Councils) but it was abandoned when the programme was stepped up with Unicef assistance in 1971, reasons were a low rate of construction and low standards due to lack of supervision, which led to choking up problems.

After completion, the village assigns a nearby householder to watch over each tubewell and pump. No water rates have to be paid. Maintenance is carried out by four mechanics per Thana who are supplied with toolkits and routine spare parts. The Union Council pays for the parts used. In the near future, maintenance will become the direct responsibility of the beneficiaries themselves, with the government retaining overall responsibility through the Thanas. The silting-up of the wells remains a problem, but has dropped from 30% in 1970 to 15% in 1975, so that reconstruction can keep up with it.

Some details on financing and training have been given. Health education is included in the three day training courses in 60 centres for the ca. 1600 mechanics of the Thanas, but no information has been given on any organized health education activities in the villages.

A survey in 2400 villages taken at random from most of the country revealed that 65% of the families used tubewell water for drinking purposes, that 61% lived within 250 yards of a tubewell, and 9% over half a mile, and that 83% of the nearest tubewells were operating.

For excreta disposal a national sanitary latrine programme has been initiated with a pilot project in a few villages to test the acceptability of the latrine designed for the programme. The materials are given to the householder who is responsible for the digging, installation and construction of the superstructure. A health educator assists in siting and construction, besides providing information on the need for, advantages of and methods of using and maintenance of the latrines.

KW: rural water, waste disposal, org. structure, planning and evaluation, selection criteria, community participation, health education, maintenance, training.

PINEO, C.S ;

Dominican Republic: History of the Rural Water Supply and Sanitation
(WHO, Division of Environmental Health)
Observations of the Rural Water Supply and Sanitation Programmes in 8 Developing Countries (Draft), Unicef Documents, 1976-1977, Unicef, Geneva, n.d.

DA: 1961 - 1975
CA: Dominican Republic

AN: Estimations in 1961 were that 43% of the urban and 82% of the rural population lacked an adequate water supply. Therefore, the Instituto Nacional de Aguas Potables y Alcantarillados (INAPA) was set up to carry out a national water supply programme. In 1964, a separate program for the rural areas, PLANAR, was initiated to provide house or patio connections for over 850,000 people in 650 villages by 1985. In 1975, 26% of the rural population was served by proper supplies, and by the end of 1976, 272 villages will have been covered.

The Central Office at Santo Domingo is responsible for the planning. coordination, design and studies, purchase of material and equipment, development of standards and manuals and promotion activities. The implementation of the programme is carried out by six (formerly four) zone offices, and is based on community participation in construction, administration, operation, and maintenance. Selection criteria are:1) accessibility to town; 2) concentration of houses 3) availability of satisfactory resources, 4) interest of people in obtaining a supply and cooperating in construction (labour and local materials amounting to ca.10% of its costs), and operation and maintenance (flat rates, which can be adapted to the village financial capacity and administration by a local committee.

When a request of a community has been accepted by INAPA, an administrative committee consisting of a chairman, secretary, treasurer and two members, is elected by the community assisted by a promotor from the Central Office. Engineers and auxiliaries also get training courses in techniques of promotion and health education to supplement the promotors' activities. A contract is signed by the administrative committee and INAPA, specifying the obligations of both parties during the construction, operation, and maintenance phases. The supply is constructed with local voluntary labour and materials, organized by the committee and pervised by the promotor, experts from the zone office and contractors, under continued supervision of the assistant engineer and the promotor, who in their turn are supervised by the zone engineer and occasionally the construction department of the central office.

When the supply approaches completion, a commercial agent based at the zone office takes the place of the promotor for the instruction of the committee on its -dministrative responsibilities, including reports and accounting and for supervision of operation and maintenance. Each commercial agent is responsible for ca.15 systems which he visits monthly on four scheduled routes. His responsibilities are: 1) to credit the books with the treasurer; 2) collect and forward excess money through the local post office to the revolving fund at the zone office; and 3) meet with the administrative committee to discuss problems and matters of

interest; 4) report observations and recommendations to the zone office; and 5) accompany the treasurer or bill collector on homevisits to non-payers in an attempt to improve the disconnection percentage of about 33%. These efforts resulted in a payment of 92% of the bills sent out in the first half of 1975. Anoutstanding feature of the programme is its continued evaluation which has led to among other things, 1) formation of 6 instead of 4 zone offices; 2) addition of commercial agents for post-construction liaison; 3) standardization in designs and forms; 4) grouping of villages and houses to share supplies, administration and house connections for lower costs, ease of inspection, and convenience in contracting and supervision of operation and control; and 5) a personal visit campaign for non-payers instead of suspension.

A special programme for the urban fringe area of Santo Domingo has recently been set-up to reach 1) the outskirts and backstreets of the capital and 2) convince users of deficient systems to contribute towards an operation and maintenance fund. Promotors are employed to organize committee, and storage tanks with public hydrants either connected to the city supply or filled by water tankers have been planned and will be extended with public baths and toilets upon evaluation of the community participation.

A sanitary privy programme from 1971 - 1975 by the Pan American Health Organization and the Environmental Sanitation Division of the Secretaria del Estado de Salud Publica y Asistencia Social, who provided slabs and risers, as well as health education, while the onwers had to dig the hole, install slab and riser and build the protecting shelter, covered 80% of the rural population.

KW: rural water supply and sanitation, org. structure, planning and evaluation, selection criteria, extension, health education, community participation, administration, financing, operation and maintenance, supervision.

PINEO, C.S.

PERU: History of the Rural Water Supply and Sanitation Program.
(WHO, Division of Environmental Health)
Observations of the Rural Water Supply and Sanitation Programmes in 8 Developing Countries (Draft) Unicef Documents, 1976 - 1977, Unicef, Geneva, July 1976, 15 pages, annex (7 p.), (Engl.)

DA: 1961 - 1975
CO: Peru

AN: A national study of rural water supplies and a multi-agency demonstration project started in 1961, led to the formulation of a national rural water supply programme, under which 661 systems in 753 small towns and villages had been built by 1975. These systems are operated and maintained by 681 Administrative Committees.

Responsibility for the planning and implementation of supply programmes lies with the Ministry of Public Health. Its Central Office has six divisions: 1) the Projects Division, - responsible for studies and designs including standard designs which are also based on experiences in operation and maintenance of existing systems; 2) the Promotion Division, employing 8 promotors who assist in forming the local Administrative Committees and supervise auxiliary promotors from the communities; 3) the Works Division, assisting in drawing up contracts between the community and the government; 4) the Supervision of Services Division, which is in charge of the house connection campaign, calculation of water rates, assistance in extensions and repairs, and analysis of returns, and 5) the Water Quality Control Division; 6) the Administrative Unit, responsible for the purchase of equipment and the general administration.

Selection criteria for projects are: a) the interest of the community as indicated by a written request and an offer to provide local labour, material and cash and to assume responsibility for the administration; b) availability of a reliable source and c) a project benefitting the most people at the lowest cost.

Activities at village level include:1) the formation of a local administrative committee and 2) the organization of self-help labour under supervision of the promotor and field engineer, as well as 3) a socio-economic and population survey, carried by auxiliary promotors, who are selected from the community and paid from the project's construction funds. The duties of the promotor for the time of construction only and auxiliary promotor are covered in a manual. On the acceptance of a formal village request (which may take 3 to 4 years), a design and estimate of costs, expected village contributions (10 to 15%) and water rates (based on operation and maintenance costs plus financial capacities of the community, as illustrated in the annex, is made by the Central Office and presented to the community through the administrative committee. After discussion, a contract is signed between the Sanitary Engineering Office of the Ministry of Public Health and the community, defining the responsibilities of both parties. Monthly reports on the construction are sent to the Central Office.

Operation and maintenance are carried out by the Administrative committee under supervision of a health inspector who reviews its account every three to four months, while the Supervision of Services Department of the Central Office may assist on their request. No central supervision is carried out, however. About 50% of the users are behind in paying the rates. It has therefore been suggested to: 1) form an association of administrative committee with annual meetings; and 2) develop a training programme on administration and operation for its members.

KW: rural water supply, evaluation, selection criteria, planning, design, extension administration, operation maintenance, financing, community participation.

PINEO, C.S.

Upper Volta: History of Rural Water Supply and Sanitation Programs, *in Observations of Rural Water Supply and Sanitation Programmes in Eight Developing Countries,* (Draft), Unicef, Documents, 1976-1977 Unicef, January 1977, 9 p. (English)

DA: 1977
CA: Upper Volta

AN: A report on the organizational set-up for rural water supply programmes in Upper Volta, where 94% of the population lives in rural areas. The rural settlement pattern is widely dispersed because the alluvial river plains are avoided for their high incidence of river blindness and sleeping sickness and the traditional dug wells have a low water yield.

To assess water supply needs, 7,425 villages were surveyed for water supply conditions, of which 17% was found to be satisfactorily served, while 2,700 wells in 1500 villages needed to be deepened or protected well. Very few wells were found to be equipped with handpumps for reasons of maintenance.

At the request of the villages, projects are identified by the eleven (11) Regional Offices for Rural Development, who prepared lists of wells for approval at national level. Theoretically, they should also implement, operate, and maintain the approved supplies, but because of lack of staff and funds, this task is carried out by the Directorate of Hydraulics and Rural Equipment (HER) of the Ministry of Agriculture, who is also responsible for design, village studies, fund allocation, programme planning, guidelines, technical inspection of completed wells and records on all wells dug by any agency.

Community participation is limited to construction of dug wells, the villagers being responsible for digging till rock or water bearing layers are reached and providing gravel and sand, and HER assisting with 3 mobile brigade teams for digging and drilling and one mason for training and supervision.

One operation and maintenance brigade answer calls for assistance but funds for spare parts are lacking. The Regional Offices for Rural Development felt that villagers would be willing to pay a small contribution towards maintenance, but this has not been investigated.

At village level there is no responsibility for operation and maintenance apart from one case where a caretaker locked the pump except for certain hours a day.

In the field of excreta disposal, there is very little activity,with one pit latrine project of UNDP and the Project Accès des Femmes àl 'Education, which experienced design and construction problems (cavings-in and destruction of wooden linings by termites, while the high costs of (imported) cement prohibited its use). Arching rings from local stone might be the answer, but necessitates training of the villagers in cutting and shaping.

Estimated costs have been reported. The use of local labour under supervision has made it possible to save more than half the costs of the wells if they had to be built by contract.

KW: rural water supply, waste disposal,original structure, problem identification, community participation, design, financing, supervision, training.

PINEO, C.S., D.V. SUBRAHMANYAM.

Community Water Supply and Excreta Disposal Situation in the Developing Countries, A Commentary (English)

(Consulting Engineer, Washington DC, U.S.A.)
(Sanitary Engineer, Community Water Supply and Sanitation, Division of Envirormental Health), WHO)

WHO, Geneva, 1975, 41 pp

DA: 1971-1972
CO:

AN: An analysis and commentary on some of the salient data of the 1970/1971 WHO survey on water supply and excreta disposal services in developing countries. Questionnaires were returned by 91 and 61 countries respectively. In 25 countries, accounting for over 75% of the population included in the summary, spotchecking on completeness and comparability and additional data collection took place.

Information was gathered on (1) proportion of urban populations supplied by house connections and public standposts, (2) proportion of rural populations with reasonable water supply access, (3) estimate of percentage urban intermittent supply, (4) additional urban and rural population supplied with water annually, (5) water quality control: authorities, standards, surveillance procedures, (6) planning, construction and extension of water supplies, (7) maintenance and operation, (8) reporting, (9) external assistance, (10) unit data on consumption, cost etc., (11) long-term programme, including criteria for priorities in providing new supplies, (12) training, (13) research and development, (14) constraints to progress.

Information on excreta disposal was obtained on similar lines, with additional data on population served by public sewerage systems conventional treatment methods, and oxidation ponds, and percentage not served by sewage treatment of any kind. Part of this information has been summarized in the report:

The present world situation is presented as segmented circels, showing proportion of urban and rural populations in 6 major areas of the developing world served by house connections or adequate access to water and disposal systems, and proportion of populations left to be served.

An example of the correlation between water quality and cholera, in Mulanje district, Malawi, serves as an illustration of the relation water-health. Leakages and intermittent supplies also form health hazards. Estimates of percentage of water unaccounted for in certain cities are as high as 50%. The highest figure for intermittent supply is found in South East Asia with 91%.

There is a positive relationship between economic development as indicated by G.N.P. per capita and basic sanitation. Countries with the lowest G.N.P. have the largest proportion of population still to be served. Burundi, for example, and a G.N.P. of $60-70 and e.g. 98% for Burundi, which had a G.N.P. of $60-70.

Three categories can be distinguished: (a) almost all countries with less than $200 G.N.P. have over half of their population still to be served, (b) of countries with over $200 G.N.P. approximately 60% have over half of their populations still to be served, and (c) all countries with over $500 G.N.P. have at least half of their population served.

Of the 7 counstraints listed in the questionnaire, "insufficiency of internal finance", "lack of trained personnel" and "insufficiency of external assistance" were the three most frequently mentioned, but when scores for each constraint were ordered according to region, "insufficiency of internal finance" was followed by "inappropriateness of financial framework" and "inappropriateness of administrative framework". The authors therefore conclude that there is an interdependence of constraints, such as (1) insufficient consultations with the communities to be served and lack of appraisal of their needs, priorities and capacities to pay, (2) lack of sound financial policies tailored to the specific local needs, (3) inappropriate institutional infrastructures, and (4) lack of trained manpower, leading to partial use of resources allocated and lapse of voted funds at the end of the financial year. They also state that the community water supply and excreta disposal sector cannot be considered without analysing health and socioeconomic development objectives and plans at the same time.

Important factors of successful water supply and excreta disposal project listed by the authors are (1) active community participation during inception, execution, administration and operation of the system, (2) simple technology (e.g. in Kenya) and standardization (e.g. in N.E. Thailand), (3) strong government support (e.g. in the Dominican Republic and Brazil), and (4) proper economics and financing, with (a) incorporation of needs by national planning authorities, (b)sources of external finance, (c) project presentation with comprehensive pre-investment survey with both economic and engineering feasibility studies, (d) local resources like cooperatives, housing banks, lotteries, revolving funds etc., (e) institutional arrangements and economic viability of the project, and (f) financial/technical adaptations to the needs and capacity of the community, with subsidizing of a major part of the construction costs by the state if necessary, but with operation and maintenance the responsibility of the community, requiring special engineering and financial designs.

Data given on criteria applied for provided community water supplies concern (1) scarcity, (2) population size, growth and density, (3) health, (4) agricultural, industrial and other development, (5) social reasons, like uplift of certain areas or sections of populations, (6) cost and (7) willingness to participate. It is remarkable that in the region with the greatest achievements to date, Latin Ameriac and the Carribbean, "health" is the next to lowest priority in terms of frequency of mention, and "willingness of community to participate" was the next to highest priority. In other regions this priority was quite low.

Special mention is made of the "comfort stations" in Ibadan, Nigeria, as a sussessful solution to excreta disposal in congested urban and fringe areas, and a description of its deisgn, construction and maintenance is given.

Finally progress in urban water supplies made in the countries which took part in the 1962 (urban) and 1970 survey is discussed and the prospects for reaching the second United Nations development Decade targets in 1980 are given.

KW: rural/urban water supply, waste disposal, research, health and economic impacts, selection criteria, financing, administration, training, community participation, intermediate technology, evaluation.

PISHAROTE, K.A.

Guide to the Integration of Health Education in Environmental Health Programmes. (English)
(Gandhigram Institute for Rural Health and Family Planning, Madurai Districe, Tamil Nadu, India)

WHO, Geneva, 1975m 81 p.

DA:
CO:

AN: The guide is based on the increasingly accepted notion that, for maximum benefits, environmental health technology has to be supplemented by health education. It's objective is to stimulate and facilitate the integration of the health education component in technical environmental health programmes and in school systems, in developing and developed countries.

The guide starts with an introduction on health education in general, and environmental health education in particular. An overview is given in simple terms of the various factors which play a role in the process of individual behaviour change.

Section one covers the integral planning of environmental health programmes in which the health education component should be included through 13 steps: (1) policy decision at government level, (2) reorientation of environmental health programme planners, (3) survey of available health education resources, (4) invlovement of consumer representatives in policy, administration and operational planning, (5) development of an adequate framework for health education, from policy design to evaluation, (a diagram is presented and discussed), (6) gathering a baseline information on (a)programme, (b) community and (c) various administrative levels, for which a number of topics are suggested, (7) setting of educational objectives, (8) selection of educational approaches (individual family, small group, mass media or community organization), depending on (9) selection of target groups, and (10) particular stage in the decision process (awareness/interest/evaluation/trial/adoption/evaluation).

Various settings for health education are discussed (11), followed by a number of organizational considerations (12), including staffing and role definitions, coordination, example setting, training of community leaders, transport and budget. The final step being (13) the evaluation, following the conceptual model for the formulation of objectives. Indices for evaluation of input, process and output variables have been added.

Section two discusses the training and supervision aspects of a health education programme accompanying environmental health programmes.

The author suggests training for those who are already fully or partly engaged in environmental health work: engineers, sanitary inspectors, health service personnel and development workers in other fields.

A curriculum should be based on a learner-oriented approach and methods should include fieldwork, apart from other methods mentioned. A diagram illustrates the setting up of in-service training courses which fit into the programme system, and the various constraints which can hamper their optimal functioning. Evaluation, objectives, functions, methods and style of supervision conclude this section.

Section three concerns the incorporation of environmental health education in school curricula. The objectives are the development of knowledge and attitudes, as well as personal and school practices. Teachers should have several functions in the programme, including the establishment of family and community relationships, such as Parents/Teachers Associations and school participation in health projects (surveys, voluntary health workers, health information via drama etc.) The curricula should be based on current national and local health problems, stressing practical experiences (schoolgrounds maintenance, visits to construction sites, field work at identifying insect breeding places, in vitro breeding, etc.). Annexes to the guide include instructions for home visits and interviewing, the small group approach, administrative meetings, and a discussion of communication media.

The guide is very detailed, ranging from a high level of abstraction to very practical remarks, no doubt based on personal experiences, such as the need for transport - preferably "sturdy vehicles" - for health education activities beyond office hours and the special attention which should be paid to the sanitary conditions of training course institutions. Its condensed form, however, makes it essentially a working guide for those already well-versed on the topic.

KW: environmental health education, manpower, training, planning.

RAMAN, V.

Health Education in Relation to Water Supply and Sanitation in Rural Areas (English)
(Neeri, Nagpur-20, India)

Journal of the Indian Water Works Association 9, 1, 1977

DA:
CO:

AN: All personnel in environmental engineering should be trained in methods and techniques of health education to persuade the community to participate in rural water supply and sanitation programmes.

The personnel is to identify community leaders, religious leaders, elected representatives, teachers and the village school master. Health education should then be directed at the community leaders who in turn carry out the health education into the community. The various health education methods mentioned are (1) visual aids, (2) live demonstration of sanitary measures, (3) mass communication media (4) two-way communication in (a) personal interviews and home visits, (b) small group discussions (c) panel discussions with literate and educated persons. Target groups for health education are (1) organized groups, such as cooperative societies, village council and social and agricultural agencies, (2) community leaders, religious leaders, elected representatives, teachers and the village school master, (3) village school, (4) housewives.

Eight objectives of health education are mentioned, namely (1) universal community acceptance and use of safe water, (2) promotion and utilization of adequate waste water and excreta disposal methods, (3) satisfactory maintenance and operation of water supplies, (4) imbiding of related personal health habits, (5) increasing knowledge of the relation between water and disease and the prevention and control of disease in water, (6) motivation for universal support and involvement in water supply and sanitation schemes in all phases, (8) establishing a sense of belonging and the concept of self-help for environmental sanitation.

The author stresses the necessity of (1) counteracting wrong information and rumors, (2) collaboration among technical and health personnel to coordinate messages, (3) listening to other felt needs and taking of some initial action, e.g. in road development, (4) gathering knowledge of local customs, habits and beliefs, (5) using a community organization approach, and (6) "why and how" over a "do and don't" approach.

KW: health education, target groups, media and methods, constraints, manpower.

RAMAN, V.S.

Water Supply Programme under Singur Rural Health Unit (English)
(Neeri, Nagpur-20, India)

Swasth Hind, April 1962, 99-104

DA: 1962
CO: India

AN: A description of the maintenance and repair arrangements of the Rural Health Unit and Training Centre in Singur, West Bengal, India, which has run a rural sanitation and water supply programme since 1939. After discussing traditional sources (open shallow wells and ponds), construction of tubewells is explained, with community participation in the construction of a water tight platform with lead-way drain leading to a soak-pit.

Maintenance and repairs are carried out by a travelling tubewell-technician with a responsibility extending to approximately 150 wells. Community participation consists of filling in printed complaint cards with details of location and nature of the defect and depositing them in complaint boxes kept at shops, schools, union board offices and sub- and health centres, where they are collected by the technician.

When water yields are reduced after approximately 5-7 years the community can make an application for resinking the well, which, on inspection of a sanitary engineer, is carried out after the community has paid a deposit for meeting the costs for reconditioning choked strainers. The new site is chosen as close as possible to the old one, but in the event of local disagreements, unanimity on the site has first to be reached. The community further contributes at least four labourers and has to agree on constructing a new platform, for which the Centre provides the cement, but the community takes care of transporting the cement, collecting bricks and sand, and labour costs.

Sanitation habits at the surface have no direct effect on the source, due to the compacting process of the particular type of topsoil around the well, while construction takes place a minimum of 25 feet away from the nearest latrine, thus safeguarding against underground contamination. Most of the contamination taking place is through the top, by using impure water for priming the handpump. Education, of which no details are given, or self-priming pumps are necessary.

Objectives of the Environmental Hygiene Committee Report of the Government of India have been met, (one well per 150 users at no more than 2 furlongs from any house and yielding at least five gallons per HEAD per day), but use of traditional sources for non-drinking purposes is still continued. Criteria for changing these habits are the distance from the household to the source and the ease and the readiness of the tapping, which implies a piped water scheme. Proposals for two schemes have been made.

KW: rural water supply, sanitation, maintenance, community participation, health education, financing.

ROGERS, E.M., J.R. ASCROFT, N.G. ROLING.

Cross-Cultural Generalizations about the diffusion of innovations: Research in Brazil, Nigeria and India. (English)
(Michigan State University)

Paper presented at International Sociological Association's Seventh World Congress of Sociology, Working Group 7 on Modernization, Diffusion and Resistance to Change, Varna, Bulgaria, September 14-19, 1970.

DA: 1965-1968
CO: Brazil, Nigeria, India

AN: Paper describing the first phase of a cross-cultural research project on the diffusion of agricultural, health and family planning innovations. A survey was carried out in 76 villages in Brazil, 71 in Nigeria and 108 in India, selected with the assistance of experienced extension workers and dichotomized into "relatively successful" and "unsuccessful" with respect to the adoption of innovations.

Personal interviews were conducted with change agents and with formal leaders who in turn selected informal leaders sociometrically, to determine which variables were related to successful diffusion.

The first set of variables found to have a positive relationship were village variables, including (a) level of socio-economic development, (b) level of organizational development, (c) degree of system openness and (d) communication integration. Indexes to measure this variable differed by nation, e.g. electric pumps per capita in India and retail stores in Nigeria for level of socio-economic development. In Brazil measurement at village level showed no significant relations, this was probably due to the lack of an independent village system, whose functions were held by the county.

A second group of variables positively related to successful adoption at village level were leadership variables, including (a) leaders' modernization, (b) leaders' consensus on village problems while (c) opinion leadership concentration and (d) socio-economic status concentration showed no consistent relationship.

The third group of variables, concerning the change agent, showed a positive relationship with (a) degree of change agent contact, and (b) degree in which he used a multi-media approach, but no significant relationship was found with (c) personal characteristics of change agents such as age, formal education etc., although a low social distance is an important element if extending developing countries.

KW: adoption of innovations, social structure, leadership, extension.

ROGERS, E.M., J.R. ASCROFT, N.G. ROLING.

Diffusion of Innovations in Brazil, Nigeria and India (English)
(Michigan State University)

Diffusion of Innovations Research Report No. 14, Department of Communication, Michigan State University, East Lansing, 1970, 388 p.

DA: 1965-1968
CO: Brazil, India, Nigeria

AN: Final report on a cross-cultural research project on the diffusion of agricultural, health and family planning innovations. Although health knowledge and practices were part of the innovation study, agricultural innovations take up the greater part of data-collection and analysis, in accordance with the evolution in diffusion research.

The project was set up in three phases: a survey among change agents and village leaders in 76, 71 and 108 villages in Brazil, Nigeria and India respectively, to determine the variable related to diffusion success at village level (see previous extract); a survey of heads of village households to determine the variables related to diffusion success at individual level; and a series of field experiments to test various communication strategies.

Nineteen individual characteristics were found to be related to innovativeness, showing almost identical patterns for agricultural and health innovativeness, although not all variables were investigated for the latter. The number and type of health innovations studied, differed for the three countries, varying from six in India, including safe drinking water, and seven in Nigeria, including latrine construction and water boiling, to one in Brazil.

Innovativeness was found to be related to (1) the social variables of literacy and formal education, level of living, social participation formal organization leadership and opinion-ledership, (2) the communication variables of outside contacts, change agent contract, knowledge and credibility, and mass media exposure, and the modernization variables of educational aspirations and knowledge of innovations.

An essential variable is the amount of change agent contact, which is highly integrated with opinion-leadership in modern villages. Social participation was found to be of varying impact, in Nigeria explaining 22% of the total variance in innovativeness and in India 4%. Newspapers and radio appear to play a greater role in health innovativeness than in agricultural innovativeness, but this may be due to the fact that the change agents were mainly agricultural extension agents, and the utilization of health extension workers may give a different picture.

These results again show that the fastest results in extension are reached by approaching the more advanced villages and groups within these villages, thus creating a problem of inequity, which extension policy makers should take into account when planning rural development projects.

The field experiments were designed to measure the impact of different communication strategies on knowledge, attitudes and adoption of agricultural health and family planning innovations in the three countries.

Various organizational problems, which in turn caused methodological problems, are discussed. The Nigerian experiment, camparing radio forums and leaders involvement, had to be broken off due to the civil war. The Brazil experiment compared the impact of 6 radio forums with 6 community newspapers, using 6 control villages. The Indian experiment compared two radio forums with two literacy-reading classes.

Results indicate that the efficiency of radio forums is much greater than literacy reading classes or community newspapers in terms of costs for receivers and for change agencies, and that a multi-media approach is superior to a mono-medium approach.

KW: adoption of innovations, extension, media and methods

RÖLING, N.G., J. ASCROFT, F.W. CHEGE.

The Diffusion of Innovations and the Issue of Equity in Rural Development
(Wageningen Agricultural University)

Communication Research, 3 no. 2 (1976): 155-170

DA: 1971-1973
CO: Kenya

AN: The authors criticize the traditional diffusion research, the principles of which have - for a number of very understandable reasons - been widely accepted by agricultural extension services in developing countries as the "progressive farmers strategy" which through the mechanisms of continuous flow of innovations, time discrepancy, windfall profits, early adopters' lead, slack resources differences, unequal development services, lack of message differentiation and distortion protection, pro-innovation bias, economical differences and feelings of efficacy leads to an increasing inequity in developing countries.

Alternative approaches are stressed, such as (1) feedback to the development programmes about differential impact, (2) feed forward to the research institutions about differential needs and conditions and (3) the development and testing of replicable prototypes.

A field experiment to accelerate the flow of income generating innovations to less progressive farmers through special training courses is reported. Selection of these less progressive farmers by extension matters resulted in a group of participants who were only slightly less progressive than the average farmer, however, selection of the second group of participants was therefore controlled by the researchers, with the result that 80% of the participants were below average innovativeness. The special training course for least progressive farmers resulted in an adoption of 97% with three times as many adopters in the same year through interpersonal communication.

KW: adoption of innovations, inequity, training.

ROGERS, E.M., H.J. PARK, K.K. CHUNG, S.B. LEE.

"Mothers' Clubs in the Diffusion of Family Planning Ideas in Korean Villages: an Illustration of Network Analysis"
(Mitchigan State University)

Paper presented at the American Association for the Advancement of Science, New York, January 26-31, 1975, 33 p.

DA: 1968-1973
CO: Korea

AN: A communications network analysis of 2 mothers' clubs villages in Korea, the one showing a relatively low family planning adoption rate, (86%, with 18% the lowest registered rate, the other a high adoption rate (57% and maximum registered).

Firstly, an overview is given of the mothers' clubs activities. Originally started to spread family planning practices in rural areas, the clubs are now active in many fields of rural development such as sanitation, nutrition and cooperatives. Its approach is highly successful, for in Korea rural fertility has been declining at a faster rate than urban fertility.

The club has several functions in the dissemination process: it serves as a forum for visiting field workers' meetings, and as an intermediary channel for the field workers' personal messages as well as mass communication messages (through a monthly club magazine), enabling a two-way communication, and it reinforces, through the process of group decisions, and because the leader and some members act as unpaid auxiliary field workers, who, being on average 12 years older than the field worker and member of the community, have a high credibility.

In order to investigate the nature or interpersonal relationships in the community, the authors have used a communications network analysis to explain the difference in adoption rate. Between the 2 villages two other factors, mass media exposure and field worker contact, were (non-network) not related to degree of adoption, nor was interpersonal connectedness i.e. number of actual communication relationships divided by number of possible relationships). The presence of pro-family planning opinion leaders, a higher degree of overlap of the formal womens' organization structure with the village clique structure, a higher in-group homophily among members (i.e. member-member contracts as oposed to member-non member contracts), higher involvement of the informal opinion leaders, higher opinion leadership and adoption by the leader were associated with a higher adoption rate.

The authors mention several research priorities in the field of network analysis, in the same and a larger scale.

KW: family planning, rural development, women community participation, communication network, bibliography, leadership.

SAINT, W.S.; E.W. COWARD

"Agricultural and Behavioural Science: Emerging Orientations"

vol. 197, Aug. 1977: 733 - 737.

DA: -
CO: -

AN: Critical revision of traditional diffusion concepts, in which communication was considered the key variable for the acceptance of innovations by individuals, usually resulting in the identification of the communication barriers, the nature and character of the individuals and their perception values and motivations, and the appropriate communication channels.

The authors attack the stress on the individual of this approach: the technology is supposed to be equally suitable, adaptable and applicable for all individuals in a social system, disregarding their various positions in this system, which often causes an unequal distribution of the innovation, favouring the advantaged.

This criticism is based on some findings from the Green Revolution: the adoption process seemed limited more by technological and institutional factors then by the traditional barriers to communication - and formal communication was not crucial to the diffusion of the innovation. Moreover, the inequality between farmers in particular social settings was increased.

A new approach is therefore being developed concentrating on participation and social equity. This also has consequences for the technology: its variability is stressed, as the relationship between technology and social organization is a mutual one: different social organizations may need different technologies, because social consequences can also be different. The interaction between technology and social organization is recognized in Brazil, where researchers, extension agents and farmers meet to mutually define several target systems and technological packages.

The approach can even be extended to include ecological systems, in which physical aspects are added to the organizational ones, firstly by defining ecological systems, then agro-ecological systems and finally the cultural-economic subsystems.

Some further aspects of the new orientation towards diffusion, mentioned. are (1) the "learn from farmers" approach e.g. the Mexican Puebla project where response to a maize production increase project was limited until it was adapted to the real situation, intercropping of maize and beans, (2) the limiting factors analysis: identification and confrontation of organizational and institutional limitations rather than tackling all possible constraints, (3) analysis of technology development systems, including different organizational systems for generating and disseminating knowledge to determine relative effectiveness of differing organizational arrangements for achieving specific research objectives and (4) the construction of problem-specific typologies, enabling the study of distributional impact of new technologies on different types of farm families.

KW: adoption of innovations, extension, inequity, community participation, package approach.

SAUNDERS, R.J., J.J. WARFORD.

Village Water Supply: Economics and Policy in the Developing World (English)
(World Bank, Energy, Water and Telecommunications Department)

John Hopkins University Press, Baltimore/London, 1967, 279 p.

DA:
CO:

AN: The book is a study of the economic, social, financial and administrative issues, characteristic of village water supply and sanitation programmes, resulting in a series of policy recommendations. It is based on a survey of published and unpublished literature, personal observations in 25 countries and personal communications with international agencies, academic institutions and operations of water supply programmes.

Some social aspects of planning and management which are touched upon, and which illustrate the importance of another approach to rural water supply and sanitation development, are income redistribution as one of the determinants of investment prorities ("worst-first" versus "growth-point" strategies), community enthusiasm and community participation.

The presence of a "felt need" for village water supplies and sanitation systems is stressed as a selection criterium and it should be developed through a water programme promotor and a village water supply committee, if such a desire is absent in high priority areas. The presence of strongly "felt needs" may however, lead to a discrepancy between community expectations and the services provided as illustrated in the case of a 400 village supplies scheme which provided public fountains instead of the desired house connections, and which extended its constructions when community maintenance and contributions failed. However, they were underdesigned, to meet the donor objective of 400 supplies, thus causing further community participation problems and, finally, the abandonment of the scheme. The authors fail to conclude that participation without two way communication cannot be succesful.

Lack of community participation in the maintenance phase is another source of failure: in two of the countries visited systems were actually failing at a more rapid rate than they were being constructed. The authors advise the creation of community maintenance systems with a decentralised adminstration if the village population has a sufficient level of development, otherwise a centralized administration with local advisory committees to foster their participation.

Complementary programmes suggested, but not further developed, are a sanitary education programme, latrine programme, drainage programme and rural electrification programme, or a full package approach for rural development in a growth point strategy.

KW: rural water supply and sanitation, health economic and impacts planning, administration community participation, biblography.

SHINGI , P.M.; S. Mody

"The Communication effects gap: a field experiment on television and agricultural ignorance in India"

Communication Research, vol. 3, 3 - 2 (1976) nr.2, (1976) 171 - 190.

DA: -
CO: India

AN: Previous research has shown that mass media information tends to widen the knowledge gap between the higher and lower strata in society. In order to test this hypothesis for the teleclub TV programmes on agricultural innovations in India, a field experiment was carried out in three teleclub villages in India, with a fourth village without teleclub acting as the control group.

Before the broadcasts, a baseline survey with Hindi questionnaires was carried out to determine personal characteristics and pre-programme knowledge of 80 teleclub members and 23 control group respondents chosen at random. Amount and accuracy of knowledge gains from the broadcasts were tested by repeating the baseline questions to the only 48 teleclub members who had seen one or both programmes.

Analysis of the effect of the TV programmes on knowledge gains showed an information gain of 40%, with 10% of the information not remembered at all, and 50% recalled inaccurately. Knowledge loss was found to be due to (1) a lack of knowledge of technical terms, with content analysis of the messages showing that the average farmer did not understand about 58% of the technical terms used in the programmes, including words such as acre, kilogram, and October, and to (2) viewerfatique, rather than (3) social participation, exposure to radio and number of agricultural implements owned.

The authors draw the conclusion that educational mass media programmes can be effective in closing the knowledge gap between higher and lower stratas when (1) lower knowledge farmers are given access and encouragement to watch TV, (2) technical language is simplified and sources of high credibility and understandability are chosen to present the information, (3) the set-up and presentation make use of the "ceiling effect"(lack of new information) for the high-knowledge farmer and (4) fatique-effect is taken into account when scheduling and designing programmes.

It should be noted, however, that the use of a mass media channel was integrated into a social organization, the village teleclub.

KW: mass media, inequity, evaluation.

SINGH, D., R.S. PATTERSON, M. YASUNO, R. JOLLY.

Genetic Control of Mosequitos, the Importance of an Educational Diagnosis (English; Franch, German summaries)
(W.H.O./Indian Council of Medical Research Unit on the Gentic Control of Mosquitos)

International Journal of Health Education, 15, (1972): 269-274

DA:
CO: India

AN: Studies were undertaken in order to obtain data on community structures, leadership patterns and communication channels in representative rural villages in Delhi State. Their purpose was to develop a health education approach leading to the acceptance of the release of large numbers of sterile male mosquitos for a genetic mosquito control project, in order to avoid a repitition of events of 1962 when similar research had to be abandoned due to the hostility of the villagers.

The data collection consisted of baseline surveys for socio-economic characteristics; sociometric techniques for the identification of informal leaders and a communication channels survey in one of the selected villages, and a randon KAP survey in 6 villages on mosquito problems and preventative action.

Based on the findings, an education strategy was developed for a test release, using interpersonal channels and verbal and visual methods only, (house-to-house visits and meetings with formal and informal village leaders), supplemented by a demonstration of the absence of inconvenience in the programming (non-biting nature of the released mosquitos). During the release, meetings with leaders were continued, and special attention was paid to counteract negative rumours.

KW: health education, communication channels and methods.

SPECTOR, P., A. TORRES, S. LICHTENSTEIN, H.O. PRESTON, J.B. CLARK S.B. SILVERMAN.

Communication Media and Motivation in the Adoption of New Practices: An Experiment in Rural Acuador (English, French, Spanish Abstracts) (International Research Institute, American Institutes for Research, Silver Spring, Maryland, U.S.A.)

Human Organization, 30. 1, (1971): 39-46

DA:
CO: Ecuador

AN: An experiment was conducted in three matched villages in rural Ecuador with three other villages serving as controls, to determine the relative effectiveness of various mass media, (1) raido broadcasts, (2) audio-visual media including films, slides, exhibits, posters, bulletins, lectures, demonstration, and personal discussions, and (3) a combination of both; on the adoption of four innovative practices: the construction of latrines and smoke-less stoves, the preparation of marmelade, and the vaccination against smallpox.

Transistor radios were distributed to all the households in the "radio" and "mixed" town. The campaign consisted to two weeks of general information and seven weeks of motivation and specific instruction programmes. To measure the results, a survey was conducted on adoption, perceived influence of the media, reasons for (non) participation and socio-economic and psychological characteristics of (non) adopters in all experimental households and in a random sample of one third of the control households. Two additional surveys were conducted to measure a long-term influence.

Significantly, more marmelade was prepared and more stoves and latrines were built in the experimental towns, and more households - but not significantly - were vaccinated. Radio broadcasts persuaded more people to participate in stove construction, marmelade preparation and vaccination, but audiovisual methods were more effective in promoting latrine building, which the authors contribute to: (1) the difference in labour division, women preparing marmelade and building stoves, men building latrines, and (2) their differential exposure to mass media, with broadcasts, reaching women at home and audio-visual displays more accessible to the outgoing male, as well as (3) superiority of audiovisual medial in providing specific instructions for relatively complicated and expensive latrines. In addition audiovisual methods had a significantly more lasting influence on the building of stoves. Comparison of the personal characteristics of the adopters and non-adopters show the former to have a higher socio-economic and economic status and higher aspirations for their sons, and to be exposed more to other methods of mass communication, and feel greater dissatisfaction with the status-quo. Clubmembership was positively releted to latrine building, perhaps, due to the necessity of the formation of five-men construction teams, although women had to do the same for stove-building.

The ratio of costs to benefits was important for adoption, the costly latrine-building with delayed benefits was the least popular

innovation, while smokeless stoves were more popular than marmelade for utility and health reasons, although they were nearly six times as expensive in money and time.

The authors conclude that (1) there is a saturation point for the adoption of innovation in a community, as demonstrated by the failure to increasing effectiveness with a combined media approach and similarity of experimental villages in average total expenditure in money and effort, (2) different media have different optimal uses (men-women, information-instruction), and (3) there is an interaction among the characteristics of potential adopters, characteristics of the campaign and inherent characteristics of the recommended practices.

KW: adoption of innovations, media and methods, evaluation, target groups.

STEUART, G.W.

Planning and Evaluation in Health Education
(

International Journal of Health Education, 12, 2 (1969), 65-76

DA:
CO:

AN: Two simplified models of health education are compared. The former is characterized by a one-way communication flow, since man is seen as a rational person with a high health motivation, easily reached as a passive recipient to mass media, lectures and demonstrations, whereby appropriate teaching skills will be sufficient to lead to knowledge and attitude change, resulting finally in a behaviour change.
The latter model values two-way communications, and man is seen as irrational, but with specific knowledge and needs, often with low priority in health needs, especially in preventive health, and a low captivity, except in captive periods, e.g. in school, hospital or occupational settings, while his selectivness and passivness hamper the influence of mass media and lectures on behaviour change, the direct objective of health education.
Acceptance of the second model requires more complex planning and evaluation in health education programmes. A distinction is made on (1) the formulation of objectives and (2) the selection of methods.

The definition of objectives should be based on quantitative research (baseline studies) of problems and target groups.

The choice of methods should be based on quantitative and qualitative research into (a) the power structure and participation potential in the community, (b) current health practices and underlying "felt needs", (c) units of practice, e.g. family, individual, small group, and (d) opinion leaders and social networks. Combinations of non-personal and interpersonal methods for behaviour change should be pre tested and evaluated.

The final unit of evaluation must be the individual act, however, not the effectiveness of various methods or knowledge and attitude change.

Intermediate objectives may be stated for intermediate evaluation e.g. community changes preceding individual changes.

Other aspects to be considered in program planning and evaluation are the separation of programme impacts from other influences in the field, the artificial isolation of health behavour, and the participation of the community in planning, implementation and evaluation, which is especially essential with regard to preventive health.

KW: health education, media and methods, evaluation, research, planning, testing.

TOMIC, B., A. NIKOLIC, V. TOMASEVIC.

Ivanjica: A Community Conquers Health (English, French)
(Institute for Health Education, Belgrade, Yugoslavia)

Supplement to the International Journal of Health Education, 20, 2 (1977)

DA: 1954- 1974
CO: Yugoslavia

AN: A description of a health education in an underdeveloped area of Yugoslavia, which, through (1) the promotion of direct contact between health workers and community, (2) the gaining of support of influential individuals, (3) associating with voluntary groups and associations, and (4) promoting the creation of health committees for each local project, initiated a series of self-help sanitation projects (village water supplies, school sanitation and nutrition). A great part of the paper is dedicated to the case history of the construction of one village water supply, discussing "felt need", community participation and community organization. The project acted as a catalyst to overall rural development.

KW: health education, rural water supply, felt need, community participation, community organization.

TWUMASI, P.A. Y. YANGYUORU, A.F. BANUAKU,

A Sociological Study of Rural Water Use (English)
(

Project report for Ghana Water and Sewerage Corporation, Rural Water Supply and Environmental Health, Lagon, 1977, 124 p.

DA:
CO: Ghana

AN: Report of a study of 6 rural Ghanaian communities on the socio-cultural aspects of water usage and water supplies.

The 6 communities were chosen from the 3 main grographical and cultural areas of Ghana, one with and one without modern water supply per area. One community was replaced by another for lack of cooperation for which no reasons are given.

A stratified at random sample of the households was taken in each village and data collected on some socio-economic characteristics and attitudes and practices regarding water supply. The samples were split up into 2 categories separating children under 15 and adults. Socio-economic characteristics measured for children were sex, education, literacy, income, religion and employment status, however not in all villages. Data regarding water use were purpose and source of water, frequency of use, frequency of bathing and place of bathing. Adults were divided according to sex, age, income, marital status, number of wives, number of persons per household, religion, literacy and education, and questions asked about water usage and attitudes concerned the source of water supply, distance, alternative sources, usual water collector, water storage, purposes, rules, taboos, rituals myths and beliefs of water usage, preferred types of supply and reasons (for modern supply only), community action to safeguard water, knowledge of water-borne diseases, responsibility for supply, wish for modern supply, willingness to contribute and amount, responsibility for construction, suggestions on maintenance and expected changes. Not all these characters and topics were covered in every village however, nor were answer categories consistent.

The data are reported per categorie per village. No overall-tables are given, hampering a detailed comparison of villages with and without a modern water supply and generalisation of results. The 3 villages asked about different types of illnesses for example, show interesting differences. No attention is paid to the reasons why some people still preferred a traditional water-supply.

The main conclusions given are that in 2 areas children were responsible for water collection and in one girls and women, early in the morning and evening, causing "rush hours" at the source and for piped water supply. The traditional and modern water supply users did not differ in water habits and availibility was the main determinant of water use. There was a general feeling of apathy about breakdowns in modern water supplies due to reluctancy in reporting to the right authorities for fear of being disrespectful. Respondents were willing to pay for water use and contribute an initial sum for instalment, preferring standing pipes at a distance of no more than 7 minutes.

Other types of supply were also acceptable. Best local approach was considered the village or town committee. Interesting is the intermediary role of the "queen-mother", apparantly a women's leader. The committee should also have responsibilities of maintenance, cleanliness and reporting dificiencies.

Long-term effects of modern water supply suggested are improvement of public health (and through lower child mortality rates inclrease of family planning needs), stimulus to the "back to the land" movement and possibilities for small scale home industries as soap making and oil processing.

Finally some recommendations on the instalment of rural water supplies are given.

KW: rural water supply, knowledge, attitudes and practices, water use, management, health and economic impacts.

Unicef/WHO Joint Committee on Health Policy

Community involvement in Primary Health Care: A Study of the Process of Community Motivation and Continued Participation.
(

Final Draft, Geneve, 1977. 56 p., 9 Ann., 2 App.

DA:
CO: Botswan, Costa Rica, Indonesia, Mexico, Senegal, Vietnam, Shri Lanka, Western Samoa, Yugoslavia.

AN: A descriptive study of community participation in rural development projects in developing countries/areas based on 9 case studies selected for their variety of ecological, socioeconomic cultural and political background, multi sectorial activities, low cost design, continuity, acceptability and effectiveness. The projects selected were situated in Botswana (education and rural health), Costa Rica (rural health), Indonesia (education, agriculture, water supply and an - unsuccessful - sanitation project), Mexico (nutrition, infrastructure, hydroelectric power, local industry water supply etc.), Senegal (rural health), Vietnam (rural health, Shri Lanka (need identification and problem solving abilities, education, agriculture, public health and community leadership training), Western Samoa (rural health) and Yugoslavia (rural water supply).

For each project a description is given of the demographic and socioeconomic situation, the formal and informal organisational structure, mass media and infrastructure, health status and (government) activities in rural development, followed by an analysis of the patterns of community participation, in which factors are isolated which are thought to have contributed to the success of the project.

All the projects described were characterized by a high level of community organisation, a high degree of cultural and social homogeneity, a long tradition of self-help and development activities, and government (and other) support.

Although entirely descriptive, and without any survey data on characteristic effects etc., the study gives an interesting picture of the various forms community participation can have, and of the structural requirements necessary for a high degree of community participation.

Some of the conclusions drawn from the findings, with reference to the various case studies, are (1) the necessity of a supporting government policy and (2) the strengthening (or creation) of appropriate structures thereby allowing active community involvement varying from village social institutes to polico-religious volunteer groups and women's committees, (3) the administrative decentralisation and regional planning, (4) the mobilization of local resources (leaders, personnel, financing, materials), (5) the identification and incorporation of traditions and traditional structures, (6) the stress on children as beneficiaries as a starting point for further community efforts, (7) the identification of "felt needs" and (8) the creation of awareness of benefits.

KW: primary health care, rural development, community participation, social structure, evaluation, "felt needs" motivation.

U.S.A.I.D., Peace Corps, Division of Volunteer Support

Education in Health (English)
(

DA:
CO:

AN: Report of the Asian Health Conference at Tagaytay, the Philippines, 1962, on the planning of health education programmes. Through questionnaires to the participating countries, four workshop subjects were selected, malaria eradication, school health, maternal and child health and environmental sanitation.

The following topics are discussed: 1) Identification of health and health education needs, health workers, (both professional government and non-government, traditional health workers, other agency personnel, community leaders and members of voluntary organizations), 2) training and responsibilities, followed by the planning of the educational component in a health programme (objectives, data collection, priorities, target groups and communication structure, organization and administration) and 4) the functions of a programme administrator and a health educator.

Case studies of pilot projects, among others on environmental sanitation (rural water supply, excreta disposal and sanitation education), where community participation created through health committees, are simulated.

The two methods for mass information selected and discussed by the participants were: 1) bulletin boards for information within the programme organization and the community, and 2) flanel boards for a mass approach in sanitation education for the two target groups selected, schools and housewives.

Continious evaluation of the health educational component of the programme includes the identification and reporting of constraints found in project workers and target groups by means of attendance and activities reports.

KW: health education, environmental sanitation, planning, community participation, "felt needs", manpower, administration, mass media, evaluation.

VERTINSKY, P.; I. VERTINSKY; G. ZALTMAN.

Health Innovation Diffusion: An integrated Model (English)
(Un. of British Columbia, Vancouver, Canada; idem; Northwestern Un. Evanston, Illinois)

International Journal of Health Education, supplement to 15,1(1972):24p. *(English, French, German).*

DA:
CO:

AN: An information-diffusion model to evaluate the effectiveness of health education, in particular via mass media, in changing individual health behaviour through social-psychological processes. The linear model covers three subsystems, (1) information processes, (2) action-oriented processes, and (3) evaluation and feedback, with feedback loops for the dynamic element. It concentrates on sociopsychological variables influencing the informationg reaching the individual and his decision- abd action taking. Seven selective processes are described which influence information (selective exposure, indirect exposure, selective perception, perception of health, selective attention, reassessment of knowledge, and prior subjective information) and another seven which influence decision making (perceived susceptibility, and seriousness, evaluation of actions and their benefits, control beliefs, time perception, perceived benefits not related to health and evaluation of barriers to action). Some attention is paid to external variables (availability, accessibility, economic and socio-legal constraints).

One of the resulting behaviours nay be preventive action, which is positively related to socio-economic status, perceived susceptibility and perceived seriousness. Personal communications in addition to the use of mass media for information are stressed, showing one of the limitations of the model (although the same socio psychological processes play a role), another being the individual approach, with very few links with the social system.

KW: health education, mass media, evaluation model.

VERTINSKY, I., J. ARANGO, O. ECHEVERRI

Traditional Health Care System: Potentialities for Legitimization and Integration (English)
(

International Journal of Health Education, 13, 4 (1970), 142-148

DA: 1969
CO: Colombia

AN: Report of a study of the University of Valle, Colombia, on the use of traditional health systems in primary health care and health education, as an alternative for the Chinese model. In two zones of an urban fringe area an unspecified number of interviews were carried out with a random sample. Respondents were asked whom they contacted for traditional medical assistance with various diseases. The individuals mentioned were identified as full-time, or casual traditional practitioners and fourteen practitioners were selected from the first group for interviews and personal observations. They could be distinguished into "yerbateros", who rejected modern medicine and did not want any link, and "empiricos" who had already some links with modern medicine (training as auxiliaries, knowledge and terminology) and favoured increasing participation.

The authors see the modern medicine oriented traditional practitioners as an effective channel of health education in addition to various primary health care activities, because they are willing to participate in a loose incorporation with the national health structure, and are able to speak the people's language, functioning as a semantic link between mass media, health campaigns and the community, and to identify "soft" areas for penetration and change in the local health culture. Actual health knowledge of these "empiricos" was found to vary, with a sensory definition of unsanitary conditions (visual and olfactory test for threatening conditions) e.g. using unboiled water for washing syringes, although pointing to "black" water as a source of disease.

KW: health education, traditional health workers, manpower, sanitation knowledge.

VIERSTRA, G.A.

Towards a Fuller Appreciation of Community Involvement (English)
(Department of Social Research, Royal Tropical Institute, Amsterdam)

Amsterdam, Royal Tropical Institute, undated

DA: 1969-1974
CO: Kenya

AN: Local participation in water development projects should not be limited to self-help activities in the construction phase of a supply but cover identification of community priorities, collective dicision making and cooperative action to attain designated goals. An example of gradual mobilization of community involvement for an improved water supply is the Kiaria Self Help Water Project in Central Kenya. The project, extension of the hydro, donated to the local secondary school for the village water supply, was initiated in early 1969 by two community leaders, A committee was formed, including six other men and two women, and the project was discussed in the weekly village meetings, in which initial contributions in both labour and cash, membership fees and monthly maintenance payments were fixed. Some scepticism prevailed, and about 20% of the local households initially joined the project. The membership meeting voted for home standpipes, but against irrigation, private storage tanks and water meters. Problems, due to attempts of an influential villager to influence the siting of the supply extension were solved by technical arguments (insufficient altitude of site). Construction began in August 1969 and membership rose to 40%. Problems in failures to fulfill labour obligations resulted in the dicision of a general meeting to strike the members concerned off the rolls. Construction was completed in July 1970.

Pollution for villages upstream was a problem, but suggestions for quality improvement were rejected in favour of a cattle dip in 1972. In 1973 project members voted for contributions for an additional electric pump to increase water quantity. Membership continued to grow and in 1974 80% of the households had joined, paying an extra sum to compensate for failure to provide free labour. Disconnections due to failure in paying maintenance fees were few. Apart from domestic use, piped water was used for watering domestic animals, and average use was 35 litres per head per day. Due to its muddy appearance, only half of the members used it for drinking water however; many preferred to continue using rainwater or well water for this purpose.

Socio-economic impacts of the improved supply have been an increase in cattle raising including the construction of a cattle dip, an extension of similar water projects to adjacent sections and a project for electrification.

The author concludes that (1) local initiative, (2) commitment to wide responsibility, (3) users participation in project decision making, (4) even distribution of benefits, and (5) gradual mobilization of the community by sustained efforts all contributed to the success of the project. He stresses the influence which the stage of development of the community has on its capacity for successful community invlovement, and advocates the use of "mobilizers" for guiding the community involvement process, when communities lack a "cooperative mind".

Suggestions for a community participation approach are to (1) use personnel trained in mobilizing communities, (2) begin community participation at the earliest possible phase, (3) promote participation by women when culturally possible, (4) accept a high degree of community control over all project acts and decisions in planning, design, construction, operation and maintenance phases which implies using technologies suited to village levels, (5) train members in management administration, maintenance and repair, (6) arrive at a clear definition and division of responsibilities of government and community, (7) carry out a social analysis in addition to the usual technical/health/demographical ones, on a major (regional) scale prior to selection and allocation, in order to classify villages on the degree of probable receptivity to an improved water supply, (8) include action research on the process of community involvement in rural water programmes, and (9) compile a reference catalogue of management systems, based on case studies of water supply projects under various social, economical and cultural conditions.

KW: rural water supply, community participation, planning and implementation, maintenance.

WAGNER, E.G., J.N. LANIOX.

Excreta disposal for rural areas and small communities (English)
(

Geneva, WHO, Monograph series, No. 39, 1958

DA:
CO:

AN: In an introduction to a technical manual on various types of excreta disposal the authors point at the necessity of community participation and health education in order to promote a self-sustaining and expanding rural sanitation programme. The authors suggest a family approach, starting health education with those people who come to a health centre or dispensary for intestinal disorders, and extending to public demonstrations and discussions with visual illustrations based on local situations. When the decision to adopt a latrine has been taken, a simple, economical and culturally acceptable solution using local materials should then be available and constructed with local participation, followed by continued personal contact with health personnel. Two other approaches mentioned are contacting all heads of families simultaneously, or approaching opinion leaders first, so that latrines can become status symbols in the community. The use of compaigns in areas with a lack of organized community services in conjunction with a low economic level, is discouraged.

The planning of an excreta disposal programme includes a section on health education, but no attention is paid to this topic in the planning of courses of sanitary personnel.

KW: rural sanitation, health education, extension, community participation.

WARNER, D.

Evaluation of the Benefits of Rural Water Supply Projects in Tanzanian Villages (English)
Duke University, Durham, N.C.

Journal A.W.W.A., (june 1975), 318 - 321.
(No summeries).

DA: 1968 - 1970
CO: Tanzania

AN: From a study of existing literature and from interviews with government officials, water engineers, university researchers, missionaries and villagers, a list was drawn up of 30 alleged benefits of improved rural water supplies which were then divided into the 6 following categories, (1) health benefits, (2) economic benefits, (3) ujamaa socialism benefits, (4) self-reliance benefits, (5) modernization benefits and (6) education benfits.

A fiels survey was carried out in 15 Tanzanian villages, which had widely barying economic, ethnic and social conditions. The villages also supplied themselves with water in different ways.

A second survey was carried out after 4½ to 7 months in the eight villages which had, meanwhile, improved their water-supply, and in the remaining seven with no change in water conditions. Data were collected through household questionnaires administered at random, field measurement and observation, unstructured interviews with local officials plus supplementary questionnaires and official records.

Results indicated that a total of 87 benefits occurred in the 15 villages, 61 of which were recorded in those with an improved supply.

Health benefits varied the most, while modernization and education benefits were equally divided. In order to relate the impact of the various benefits, thay were classified according to time effect (rapid, intermediate or slow), causality linkage (direct. intermediate or indirect), measurement validity (high, intermediate or low) and occurrence frequency (idem). After determination of benefit priority (for Tanzania short term results without complementary investments) villages could be compared and ranked, resulting in ranks on through six and numbers ten and eleven for the villages with a modern supply, the remaining levels being for the villages without a modern supply. No attempt was made to compare the villages with a modern supply with those that were less successful.

In a reply to the article in the April 1976 issue Richard Feachem criticizes the qualitative nature of the variables measured.

KW: rural water supply, health, economic and social impacts, evaluation.

WELLIN, E.

Water boiling in a Peruvian town

Evaluating the results of a rural hygiene project, in I. Brady, B.Isaac eds., A Reader in Culture Change, vol. 2, Wiley, New York, 1975, pp. 231 - 259.

DA: -
CO: Peru

AN: An anthropological case study to analyse the poor response (5% overall change in sanitation behaviour) to an intensive campaign to introduce water boiling in a small Peruvian community. 36 housewives were studied, of whom 15 were already boiling water, 11 started doing so after the campaign and 10 did not.

A major constraint was the existence of a complex value system of hot and cold distinctions, which linked boiled water with illness. Factors found to be related to acceptance before the campaign were conformity to this value system (8 of those already boiling water were ill' and cosmopoliteness (persuasion by relatives from towns with a modern water supply). During the campaign personalties between housewives with a marginal position in the community and the health visitor and authorization of deviant behaviour by the visiting physician were instrumental for acceptance. Rejection was either due to cultural conservatism or limiting conditions to the realization of a changed attitude, such as fuel scarcity and lack of time caused by a rigid timetable dictated by socioeconomic circumstances.

Other constraining factors were low credibility of the health visitor:an outsider (notwithstanding careful matching) without a clear function or introduction, the same message to all, rich or poor, and a low authority when compared to the occasional visiting physician; lack of interest with male opinion leaders and negative influence of female ones (traditional birth attendants).

The best results were in the middle class group where these constraints were overcome through socioeconomic and cultural homogeneity between health visitor and participants. Reinforcement by lectures form a change agent with a higher authority was also effective in some cases.

Although very limited in scope, this study discusses some common extension problems in developing countries and shows the necessity of differentiation of change agents and message for the various social groups.

KW: health education, health beliefs, constraints, health education methods.

WHO Regional Expert Committee on Primary Health Care.

Primary Health Care
Afro Technical Report Series, no. 3 (English)

WHO Regional Office for Africa, Brazzaville, 1977, 21p.

DA: -
CO: Africa

AN: Report on a multi disciplinary meeting of regional experts on the adoption of the WHO Primary Health Care approach in the African Region. After criticizing the limited approach suggested by the words "primary" and "care" and stressing the development of methods to determine the really "felt needs" of each community and the importance of a dialogue between government and communities to learn each other's objectives and potentials, the concept of PHC was accepted and ten principles were formulated. These principles concern (1) the "felt needs" of the community, (2) integration in the health system, (3) integration into overall community development, (4) dialogue of population and services, (5) reliance on local resources, (6) integration of prevention, health promotion, curative medicine and rehabilitation, (7) trained PHC workers in peripheral areas, (8) national policy, (9) national models and methods, (10) cooperation with traditional health systems.

Two case studies showing different implementation of PHC are followed by a discussion of staffing patterns, activities, facilities community participation, supervision, information, evaluation, training, retraining and research, resulting in a series of recommandations on each topic.

Components of community participation mentioned are (1) decision making, at the village meeting place, through a dialogue between representatives of various ministries and community lesders of the village committees, who are responsible for decisions, (2) implementation through cooperation between regional health team and village subcommittees, and (3) integration at sub-committee level and through plenary discussions.

KW: Primary Health Care, planning, community participation.

WHYTE, A.

Towards a User-Choise Philosophy in Rural Water Supply Programmes
Paper presented at the International Development Research Centre Seminar on Rural Water Supply and Sanitation, Lausanne, 29 May - 1 June , 1973. (Institute for Environmental Studies, University of Toronto).

Carnets de l'Enfance, 34(1976), 28-45 *(English, French, Spanish summ.)*

DA:
CO:
EV: theoretical, scientific account, bibliography.

AN: To increase the success rate of rural water supply projects, a wider range of alternatives in designs of technology as well as management systems should be offered to the community. Flexible packages for water supply systems should consist of (1) standardized components for water extraction, storage and distribution, (2) standardized organizational components to select a complete management system (collection of dues, labour of construction, cash for repairs and replacement, maintenance service, etc.), and (3) integration of rural water and sanitation education into a broader health education and medical care programme.

The author criticizes the single standardized organizational structure (usually an elected water committee) imposed on the community at the outset, and points out that social patterns of water use, management and beliefs already exist for traditional supplies, as illustrated by examples from Mexico and Iran. Adaptation of the modern system to the traditional one should be considered.

Traditional water supply systems are often characterized by (1) the use of different sources for different purposes (drinking, clothes washing, bathing), (2) the existence of varying socio-cultural patterns for water use e.g. communal washing places and hours, water taste preferences, (3) adaptation to the physical environment such as stone and branch dams or bamboo aqueducts, which have a minimum of environmental impact to social consequences, and (4) a variety of traditional organizational structures, which may occur in an area which is otherwise (geographically, socio-culturally and administratively) a natural unit.

An example of such local differences in a homogenous district is the Oaxaca valley in southern Mexico, where traditional water organization varies from none at all to formal structures and rules (elected committees or single water controller, fixed or weighed rates and single or inter-village organization on times, water discharge, rates and rules).

Another important factor is the existence of different styles of decision-making in communities, as illustrated by the "feeling out" of a consensus through individual contacts among nomads in Iran, versus the confrontation of views in public meetings of Mexican villagers.

Suggestions for designing user-choise systems are (1) increase of local involvement in the design process, (2) integration into a broader health programme, (3) creation of new roles associated with water supply such as local water systems mechanics with a general training, so that they can also run a small general repair shop in the village, and (4) the compilation of a catalogue of standardized organization components from which the community can select a complete management system that suits its parti-

cular socio-economic and cultural situation.

A social scientist should be employed (alongside an engineer and a health education/medical expert) to find out (a) the range of existing management practices and social institutions, (b) the strength of their support in the community, and (c) their potential for adaption to modern systems,and to design the organizational components for various aspects of water management, such as collection of dues, labour for construction, cash for repairs and replacement and maintenance service. One mathod would be the compilation of a village book, with quantative and qualitative data.

KW: rural water supply, design of technology and management catalogues, user-choise approach, community participation, water use, health beliefs, health education, professional and local manpower.

WILSON, J.L.

The Theory and Practice of Small Farmer Development
(

Ph.D. Thesis, The Americal University, Washington, 1977, 202p

DA:
CO:

AN: A large, though unspecified number of practical studies on rural development, mainly in agriculture, but a few in education and public health, has been analyzed together with a series of theoretical approaches to the subject, and categorized in a card-system, in order to isolate transferable elements of success. No criteria for the measurement success are however given. The conclusion drawn by the author is that the conventional extension and training approach is only successful with individuals or communities with previous adoption experiences in a more developed situation (e.g. cash crop agriculture) and with the provision of a full package of services. Without such services it is only successful when there is an immediate need or when costs are low enough, or immediate profits high enough, to warrant an assay. In other cases another approach, called problem solving, is needed for successful rural development projects, which is characterized in 7 steps: (1) contact through local leaders, whereby the risk of a take-over of the project by the local power structure for its own objectives can be lowered by follow-up meetings with informal opinion leaders or the whole community, and by expanding the number of leadership positions, (2) data collection on the local situation and problems through formal surveys by professionals, surveys by village leaders in villages other than their own, the Freire-method of community picture discussion and self-surveys by the population, (3) identification, discussion and priority establishment of problems felt by the community. A group decision might even lead to the selection of volunteers to try out a solution on behalf of the group, (4) set-up of local committees, (5) assistance in problem-solving activities of the community, varying from visits to other communities to technical information from research institutes, (6) local supervision of action, and (7) renewal or original commitment (evaluation and reprogramming). The third step is considered essential for an ultimate success. This problem-defining and solving approach is a gradual one, in contrast to the conventional technical package approach, and as such, it can build on existing local problems, existing local knowledge and previous successes or failures, as well as allow for a longer adoption time. Using this approach, the extension agent should (1) try to obtain practical understanding (2) look for parallels with traditional or already fully adopted ways of thought or practices, (3) listen to the local people who may see consequences of a propagated innovation which are negative in their specific situation, and (4) not raise unrealistic expectations.

KW: rural development extension, problem identification, programme design, community participation, leadership, bibliography.

DE WINTER, E.R.

Health Services of a District Hospital in Malawi (English)
(

van Gorkum, Assen, 1972 303 p

DA: 1967-1970
CO: Milawi

AN: A study of the position and functions of a district hospital as a nucleus for community health services, resulting in a community health pilot project, to test the impact of a package approach on rural health (among five clinics, health education, home visits and community development).

Two villages, one to act as a control village, were selected for reasons of their geographical proximity to the hospital only. A baseline study was carried out, consisting of a medical and a sociological survey, the latter limited to the action village and covering socio-economic status, housing, including sanitation facilities, nutrition knowledge and attitudes, and aspirations. Interviews were supplemented by personal observations, e.g. on presence and state of sanitation facilities. The situation in the action village was found to be below that of the control village. The action programme aimed at the improvement of sanitation, housing, nutrition, child care, ante natal care, personal hygiene and inoculation through a comprehensive approach (weekly outpatient and among five clinics 61 health education sessions including lectures, discussions, demonstrations and practical exercises, homecraft lessons, home visits by a health assistent on environmental sanitation, creation of a Health Committee (males) and a Women's Committee). The programme is reported in the form of a diary showing the evolution and practical problems of a field project.

Medical and sociological evaluation studies were carried out in both villages, showing a significant improvement in latrine construction and maintenance and nutrition practices, bringing the inhabitants up to the level of the control village, although it has yet not resulted in a better health status. Comparison between the two villages is hampered by the lack of a pre-measurement of sociological variables in the control village.

KW: comprehensive health experiment, health education, media and methods, evaluation.

WOODS, J.L.

Communication - An Integral Element of Administrating Development Programmes (English)
(UNDP Development Support Communication Service, Bangkok)

Asian Center for Development Administration Workshop on "Administrative Support Planning for Development Projects. Paper. Uncleared Draft.(English).

DA: -
CO: -

AN: Communication in organisational structures has received little attention in developed countries and hardly any in developing countries. The traditional approach was a linear one (Berlo's SMCR model:Source-Message-Channel-Receiver) which concentrated on information, often causing and information overload. The author favours a systems approach, analysing the three-way flow of communication (upward, downward and horizontal) between 7 basic categories: (1) political leaders, (2) planners, (3) administrative support officials, (4) technical subject matter specialists, (5) field cadres, (6) intended benificiaries and (7) international agencies officials. This approach can be used for the analysis and improvement of communication in administrating development programmes. Attention should be paid to the informal channels supplementing formal communication flows.

In order to facilitate the use of various communication chains by administrators of development programs, a guideline is given consisting of 11 steps, (1) definition of activity, (2) identification of decision making centre, (3) identification of key-individuals, (4) determination incoming and outcoming information needed, (5) determination of individual action, (6) selection of messages, (7) selection of communication methods, (8) design of strategy including methods, messages, timing, costs, evaluation criteria etc., (9) pretesting for large, complex communication systems, (10) implementation of strategy and (11) constant guidance and evaluation.

The communication between administrator and project participants will be on several levels: (1) individual, (2) small groups, (3) intra-organization, (4) inter-organization, (5) outside the system, and (6) international organizations. The author mentions several communication methods, used at various levels, but no evaluation is given.

Recommended are (1) action research on the communication processes in development programmes, covering all structural levels, top and bottom, (2) the development of communication training courses for development programme personnel, especially for admininistrators and fieldworkers, (3) the integration of communication training in formal education such as universities or nation training institutes, and (4) government analysis of communication within and between ministries and department and with outside development organizations.

KW: development programmes administration, organizational structure communication flows and channels.

ZALTMAN, G., R. HINGSON, J. ALLWOOD.

The Impact of Education and of Mass Media Exposure on Child Feeding in Costa Rica (English)
(Graduate School of Management, Northwestern University, Evenston, III)

International Journal of Health Education, 13. 3, 1970, 103-112

DA: 1969
CO: Costa Rica

AN: In a preliminary study for mass media nutrition campaign in Latin America, the relation between formal education, mass media exposure and child feeding practices was explored by a survey of a stratified area sample of 322 women with a child of between one and three years old. Open ended questions on child feeding practices were categorized by health personnel into satisfying and unsatifactory practices. A positive relationship was found between formal education and satisfactory child feeding, with the greatest difference between low educational groups on one hand and medium high educational groups on the other hand. The relation between formal education and mass media exposure was also positive, with the strongest association for newspaper exposure. Although both radio and newspaper exposure were high (75% owned a radio and 40% had read a newspaper in that week, while 27% had watched television), they had little direct impact on health practices, however.

To explain this unexpected phenomenon, the authors suggest that health practices may differ from other (e.g. agricultural) modernization practices, or that the relatively higher education status of Costa Rica (only 8% with no schooling at all) may be responsible, while the low prevailence of health and nutrition information in mass media programmes may be the most obvious reason. An additive explanation is suggested by Vertinsky et al. (1970), who sees the language gap between mass media health campaigns and the rural communities as a cause for the relatively low effectiveness of such compaigns. (See extract no).

KW: preventive health, health education, mass media, health practices.

ANNEX 1: List of Keywords used

adoption of innovations, adoption process
attitudes, health attitudes
administration/management

beliefs, health beliefs
bibliography

cholera prevention: see preventive health
community participation
constraints
communication, communication channels, communication networks

design

evaluation
environmental sanitation: see rural sanitation
extension, see also motivation

felt needs, see also problem identification
financing/costs
family planning

health education
health education media/methods/aids

impacts, health impacts, economic impacts
integrated rural development
integrated health care
intermediate technology
implementation
inequity

knowledge, health knowledge

leadership

mass media, see also health education media, and media and methods
management
manpower

motivation, see also extension
mass campaign
maintenance
media and methods, see also mass media, health education media

organizational structure

practices, health practices
package/mass/systems approach
progressive development
public health
primary health care
problem identification, see also felt needs
planning
preventive health

rural water disposal
rural water supply
rural sanitation
rural development
research

sanitation, see rural sanitation
selection, selection criteria
social structure, social organization
supervision

target group
training
testing

women
water quality, water use

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who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (tho hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
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Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

BACKGROUND PAPER III

"WATER SUPPLY AND COMMUNITY CHOICE",
by
Whyte, A. and Burton, I.

in
"Water, Wastes and Health in Hot Climates"
London, Wiley and Sons, 1977, 113 - 129.

7

Water Supply and Community Choice

ANNE WHYTE *and* IAN BURTON

7.1 INTRODUCTION

Water supply is a daily necessity and a key factor in human health and well-being. Yet in 1970 88% of the rural population in developing countries was estimated to be without 'reasonable access to a safe and adequate water supply' (WHO, 1972). In that year, the level of expenditure for the construction of improved supplies to reach another 10·6 million people was about S US 138 million. Of the new systems that have been constructed within the last two decades, probably one-third are not working at all and another 30% are working only intermittently or ineffectively.

Thus the problem of rural water supply in developing countries is one that is crucial, enormous in scale, and not being solved by present strategies and solutions. This picture is supported by the World Health Organization's predictions for 1970–80. Their set target of doubling the percentage of people receiving adequate supplies in rural areas by 1980 (from 12% to 25%) requires that the 1970 rate of expenditure be more than doubled. Despite the ambitiousness of the target, it will mean that the number of people still not adequately served with water in 1980 will actually *increase* because of the increase in rural populations (Table 7.1). Furthermore, on the evidence of progress so far, the targets set for 1980 will not be met (Figure 7.1).

Of the many constraints to progress that can be seen on a global scale among

Table 7.1 Programme for rural water supply in 90 developing countries 1970–80

Type of Supply	1970		1980		Increases 1970–80	
	No.*	%	No.*	%	No.*	%
Access to safe water	140	(12)	357	(25)	217	(155)
Without access to safe supply	1026	(88)	1081	(75)	55	(5)
Total population*	1166	(100)	1438	(100)	272	(23)

*Population in millions.

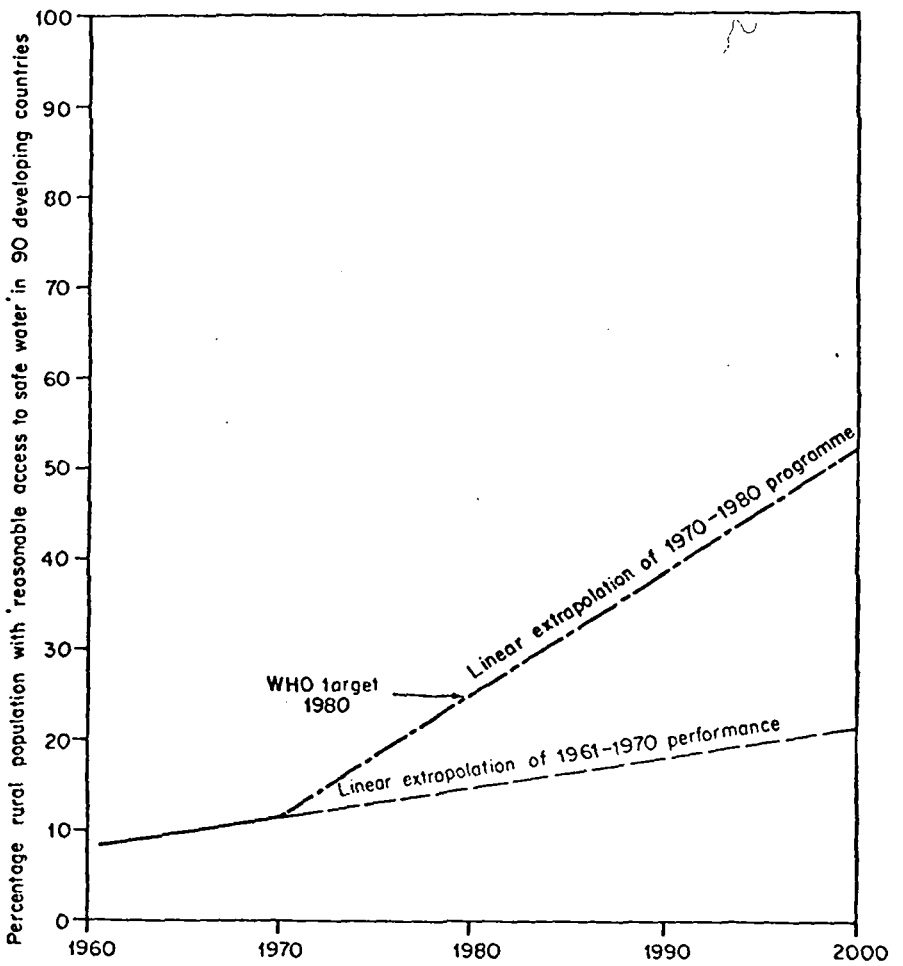

Figure 7.1 Linear extrapolations of rural populations with 'reasonable access to safe water' under 1961–70 performance and 1970–80 programme

the most frequently cited are:

(a) Insufficient national or internal funds;
(b) lack of trained manpower;
(c) weaknesses in the structure and process of national programmes;
(d) insufficient external funds;
(e) difficulties in operation and maintenance of systems;
(f) inadequate legal frameworks;

All these constraints are widespread and are generally recognized as such, so that efforts are now being made to remedy them. More national and international funds are being mobilized for rural water programmes; the training

of manpower is being increased; national water authorities are beginning to restructure, and to some extent decentralize, their bureaucracies, and technical improvements are continually made to make systems more foolproof. But most of the developments outlined above are in the spirit of improving the 'delivery system' to give the consumer a better, more reliable, up-to-date product. There is another way to approach the problem and that is to consider the 'product' from the point of view of the consumer—to see what his needs and aspirations are in relation to water; how they are related to other needs and aspirations; and what type of water scheme and management system will fit in with these perceptions, or indeed can be evolved by the users themselves. The concern thus becomes focused on the user of water rather than the delivery of a water system. This philosophy has been described elsewhere as 'user-choice' (Kirkby, 1973) and it is in the same spirit that this paper examines the rural community as 'user' and suggests ways in which the user-choice approach might be implemented.

Each of the six constraints mentioned above can be mitigated or exacerbated by the attitudes and actions of people in the communities themselves. The best designed hand-pump or water pipe available, can be broken or misused by those who want to do so, or who simply do not care. The purest and most adequate supplies of water can be, and are, abandoned in favour of impure, traditional supplies. The ingenuity and resourcefulness of villagers is not only a matter of training and funding, it is also a function of commitment, price and identity with the water supply system and its objectives. It is rare to see indigenous expressions of beauty and art embellishing new water supply schemes in developing countries, yet these are indicators of where a community's heart is.

Part of the commitment and identity certainly comes about with improved awareness of the health and related benefits that biologically purer water brings. This has been the rationale behind the integration of water supply with health education programmes and the provision of medical facilities, which has been carried out with considerable success in some Latin American countries. But there are two other aspects of community commitment to using, maintaining, and even initiating, rural water schemes which are as important as perception of health benefits. These are:

(a) in selecting between alternative sources of supply, communities and individuals provide their own frame of reference and criteria for calculating sets of trade-offs;
(b) choices 'delivered' to communities are accepted with less commitment than the choices they have made for themselves.

7.2 COMMUNITY FRAMES OF REFERENCE

In bringing an improved water supply to a village, the engineer or water authorities are usually the ones who specify what the range of choice is. Even

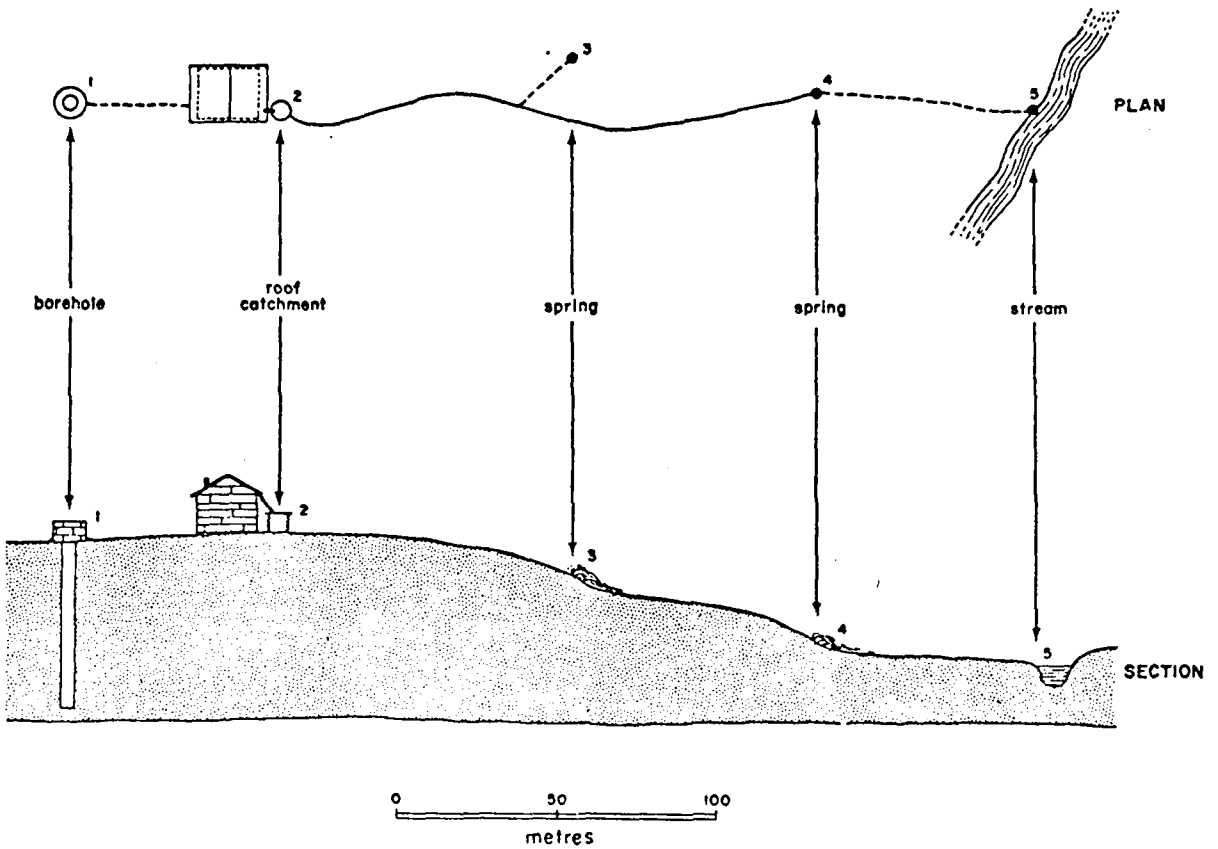

Figure 7.2 Alternative water sources for a sample household in Ganda territory, Uganda (from White, Bradley and White, *Drawers of Water*, published by the University of Chicago Press;)

where only one type of improvement is offered, there is generally the choice between the improved and the old, unimproved supplies. What the engineer cannot do, though he may often wish he could, is to specify the criteria by which alternative supplies are evaluated. He may inject his own criteria, such as degree of bacteriological contamination, but the overall frame of reference, and the weights given to each criterion, remain those of the individuals and communities who are to use the water.

White, Bradley and White (1972) provide a good illustration of contrasting frames of reference between the user and the government official. In their example from the Ganda territory north of Lake Victoria, a household has a choice of five nearby sources consisting of a borehole, a roof catchment system, two springs and a stream (Figure 7.2). These are evaluated by the woman of the household against four main criteria of water quality (including taste), technological feasibility and economics (mainly cost and distance or effort). Less critical but also influential is the consideration of relationships with other people in respect of using a particular source. The user's frame of reference is presented as a 5 × 5 perception matrix in which alternative sources are ranged against criteria in the mind of the user as she makes her decision (Table 7.2(a)). In this case, the more distant of the two springs is selected because it fulfils her quality and technology criteria and avoids the need to cross an irritable neighbour's land (White *et al.*, 1972).

The perception of the government official of the same situation differs mainly in its extension of the range of theoretical choice and in its rating of the alternative sources on quality (Table 7.2(b)). For the government officer, only the borehole and the roof catchment systems are of acceptable quality and the surface water sources fall below. Thus his recommendation would be the borehole (White *et al.*, 1972).

The example provides a model both of the kinds of criteria that are employed in individual choice and the process by which they are linked together. The decision process is seen as an ordered set of bifurcating choices with water quality representing the major watershed on which alternative sources are eliminated or accepted for further consideration. Of those sources that are perceived as acceptable in quality, a judgement regarding cost is made. For those sources meeting minimal levels of cost and quality more refined judgements are made about quality, technique and relationships with other people.

Between the individual user and the water authorities lies another level of choice—that of the community, village or social group. Water authorities are usually dealing directly with a community, or at least its leaders, rather than the individual households, yet so far less attention has been given to alternative supply systems from the point of view of the community as a group.

The frame of reference for communities can be described in terms of a similar perception matrix to those for individual choice. The columns representing criteria for evaluation might be expected to reflect some additional group needs and values; but also, the way the criteria are structured in making a

Table 7.2 Frames of reference for (a) a household user and (b) a government official for evaluating alternative water sources in Ganda territory, Uganda (from White, Bradley and White, *Drawers of Water*, published by the University of Chicago Press; © 1972 The University of Chicago Press)

Table 7.2(a) Perception matrix for a sample household

Theoretical alternatives	Considered as a source	Resource quality	Technology	Economic efficiency	Effect on other people	'Source rating' summary valuation
A_1 Borehole	1	0	×	×	×	0
A_2 Roof	1	1	0	×	×	0
A_3 Spring	1	2	2	2	−2	6
A_4 Spring	1	2	2	2	×	8
A_5 Stream	1	2	2	0	×	0

Table 7.2(b) Perception matrix for one official's view of a sample household

		Perception of alternatives				
Theoretical alternatives	Considered as a source	Resource quality	Technology	Economic efficiency	Effect on other people	'Source Rating' summary valuation
A_1 Borehole	1	2	2	2	1	9
A_2 Roof	1	1	0	0	×	0
A_3 Spring	1	0	×	×	×	0
A_4 Spring	1	0	×	×	×	0
A_5 Stream	1	0	×	×	×	0
A_6 ... 10 (other springs)	1	0	×	×	×	0
A_{11} Possible pipeline	1	1	2	0	×	0

Key ratings: 0—unfavourable; 1—favourable; 2—very favourable; ×—not considered or not mentioned.

decision may be different from the model presented by White, Bradley and White for individual choice in East Africa.

An example of community decision making is given by Iwanska (1971) for a Mazahua Indian village in central Mexico, which will be used here to illustrate the community perception of choice. The author is concerned with the process by which the vague aspirations of the villagers and the more articulate Utopian thinking of the village leaders become translated into practical action in a context where tradition and change are both valued.

As has been traditional among Mazahuas from El Nopal, the leaders started to act only when they knew that everybody in the village wanted to get education for children, to get water or to get electricity. Only then did the leaders organize into a group with the help of a friendly outsider (a rural social worker assigned to El Nopal) and begin to contact the

proper authorities. In the case of the decision on water and electricity, the 'innovators' had to do a lot of exploring, interpreting and refining of the original ideas. This involved discussions with 'tradition maintaining' leaders and many other people in the village as well.

In the case of water, a great deal of discussion took place as well. Soon after the first negotiations with proper authorities in Las Animas were started, it became clear that people from El Nopal could not possibly gather enough money to bring water to individual houses as they wanted to do. It was suggested by these authorities, and supported by the social worker, Maria Victoria, that at first two or three wells should be installed in places easily accessible to various clusters of huts. However, this idea was soon rejected. Mazahuas from El Nopal decided that everybody would have water at once or they would not have any water in El Nopal at all. They would continue walking to a rather poor and distant well which they had been using so far.

But, still another possibility was discussed: the 'wealthier' families might pay to have the water connected with their houses, while the poorer families would wait until they got enough cash. But this alternative was also quickly rejected by people from El Nopal. In spite of the economic familism, people from El Nopal defined water as communal rather than familial. And as in the case of electricity, the decision not to have any water until everybody would have it in his house, involved both deep, traditional Mazahua values and the commitment to the Progress as well. (Iwanska, 1971).

Table 7.3 illustrates the choice situation in a more prosaic form. The four alternative systems discussed (the theoretical range was probably greater) are evaluated according to the same criteria given in Table 7.2 but economic efficiency is separated into 'effort' and 'cash cost', and the socio-political component is expanded to four additional criteria; social equality, progress, social interaction and village autonomy. In the White, Bradley and White model, social aspects are considered of secondary importance while here they are obviously determining factors, with community values for maintaining social equality and behaving as a 'progressive community' being critical to the outcome.

Table 7.3 differs from Table 7.2 in another important respect; it contains unfavourable (zero) ratings which do not negate the possibility of that alternative being selected. In fact, each of the four alternatives discussed by the Mazahua village would score unfavourably on two criteria; compared to the other possibilities, the old well is antithetical to the idea of progress and unacceptably demanding in terms of effort. As so often occurs in choice situations, each alternative is unacceptable in some respects. Thus the process is one of determining which unacceptability, given the hindsight of realizing no choice will fulfil all criteria, can be upgraded into an 'acceptable pass' on most counts.

The model of community choice we are presenting therefore differs from that of White *et al.* (1972) for individual choice. In terms of the perception matrices, the community ratings cannot be multiplied together to give a summary valuation because of the tolerance afforded 'unacceptable' alternatives. More fundamentally, it differs in the nature of the choice process that is implied by the models.

The example of individual choice in East Africa is given as one of ordered,

Table 7.3 Community frame of reference for choice between alternative water supply systems for a Mazahua Indian village in central Mexico

Alternatives	Considered as a source	Resource quality	Technology feasibility	Economics: Effort	Economics: Cash cost	Social equality	Progress	Social interaction	Village autonomy	'Supply rating' summary valuation (additive)
A_1 old well	1	1	2	0	2	2	0	2	2	12
A_2 2–3 new wells	1	1	1	1	1	0	0	1	2	8
A_3 some house connections	1	2	1	1	1	0	1	1	0	8
A_4 all house connections	1	2	1	2	0	2	2	2	0	12

Key ratings: 0 = unfavourable; 1 = favourable; 2 = very favourable.

binary choices in which some criteria have the power of veto while others merely have a voice. The community choice pattern is more anastomosing with ever-varying subsets of criteria being compared within and between themselves. For example, water quality is considered in a subset with social equality and cash cost. Given that they are incompatible goals, the community adheres to its value for water as a communal good and defers its aspiration for better water until it can pay for it. Thus the community has enlarged the context of decision making in the time dimension. The consideration of alternatives on grounds of technological feasibility is not done in isolation from other criteria, particularly those of cash cost and village autonomy. And the value to be assigned to each alternative on technological feasibility is not the same in the two comparisons:

technology versus cash cost
technology versus village autonomy

In El Nopal the decision to reject the advice of the water authorities and the respected village social worker, was an affirmation of the village's autonomy in making its own decisions. The first solution accepted—to continue with the traditional supply—maintained this right. It is likely, however, that the second decision—to have a piped water supply and house connections—would limit village autonomy in the sphere of water resources from that point on. The village would become increasingly dependent on outside bodies for technology and administration and future alternatives.

This comparison of specific examples of individual and community choice leads to more general statements about community decision making:

(1) In community choice there are additional criteria to those of individual choice for evaluating alternatives. These have to do with group (social) values and goals and can be of prime importance.
(2) Community choice is not necessarily, or even generally, a process of ordered, binary choices. The degree to which it approximates such an individual model may well be a measure of the absolute authority of its leader and the individualism of his decisions.

However, the mode of decision-making in most traditional communities is one of seeking out opinion, general discussion and consensus with widespread community participation before the leaders enunciate 'their' decisions. Thus the choices and the trade-offs between conflicting goals become presented as an array rather than an ordered series, and proponents of each particular view actively ensure that their criteria or trade-offs stay within the forms of the debate.

7.3 THE ROLE OF WATER IN THE COMMUNITY

In most cultures and systems of social organization, the way in which water

Ecuadorian villagers discuss plans for a water supply improvement scheme with a visiting engineer (photograph: R. G. Feachem)

is distributed serves to band people together and to underwrite their differences. Water is commonly a driving force to keep the community going as an identifiable group—it provides energy for maintaining social relationships as well as economic productivity. Often it is the human health and economic aspects of water that are considered in new water supply schemes and the social aspects are relegated to 'traditional attitudes, values and beliefs' or, in the language of economists, 'intangibles'. The purpose of this section is to provide some indication of the social role of water in traditional rural communities where water is the basis for a system of social relationships within and between communities.

Water distribution systems and related water rights show great variation both culturally and geographically. This is especially so where water is also used for irrigation. The evidence for the social influence of water on society is so widespread that it led Wittfogel to develop his theory of water control as the basis for early civilizations, especially in oriental society (Wittfogel, 1957). His argument was that water, as an agricultural resource, has properties which direct the social organization of people in certain ways—principally in needing to cooperate in order to build and maintain waterworks, and to have an established political hierarchy to command labour and administer group effort.

What Wittfogel was concerned with, and what most societies are concerned with, is the need to establish rules or ways of making decisions, about who takes water, when, and for how long. The necessity for a system of rules reflects the physical nature of water as a resource: if it is a well or qanat it needs co-operation to build and maintain it. If it is a stream or a canal, it flows from a higher to a lower place so that upstream users always have the physical advantage over downstream users. Social rules can either recognize and enforce this advantage (flowage rights) or can try to even it out (riparian rights), or replace it by establishing an alternative rationale for water control (e.g. kinship rights, communal rights). Rules are least necessary where the source is geographically widespread and plentiful, such as a lake or high water table.

For example, among the Kalinga tribe of the Philippines, downstream or upstream users may only use water with the permission of the *first* user on the stream or canal (Barton, 1949). In Moalan Chiefdom society in the Fijian Islands, the upstream users are the 'owners of water' and are responsible for water distribution and the settling of disputes (Sahlins, 1958). Among the Sanjo tribal society of East Africa, control of water is vested in a council of village elders who can take as much water as they like first and are responsible for distributing the rest (Gray, 1963). As we have seen, among Mexican peasant communities, water is considered as a communal resource and is distributed on the basis of adult membership in the community.

Because water is a vital resource, the way water rights are vested can create and maintain almost any hierarchy for social status and political power that a society wishes. Water control can confer power over others on old people, or literate people, or men, or members of a particular family or village, or on the first settler. The very fact that societies differ in where they place the political

centre of gravity that water control brings, and that their solutions are not usually economically 'optimizing' solutions, is some measure of the value they assign to their social order. When a new water supply system is introduced, it may bring with it not only new water but also a new social order. The change commonly goes in two directions:

(a) altering the balance of power within communities—often from the traditional leaders to the literate and the politically sophisticated;
(b) altering the external relations of the community—usually towards increased dependency on the national and regional government and a decreased ability to act independently in relation to other communities.

Even where water is used only for domestic purposes, it is a force for both social integration and social differentiation. People from within the community meet at the well, spring or borehole; the women may even spend time there washing clothes and chatting. Strangers are either excluded or may use the source only with permission. The community ownership of the source articulates the boundary between in-group and out-group and reinforces it by providing a meeting place and a reason for cooperation.

Communities nevertheless contain differences in status and power, and these can be daily expressed in the use and distribution of water. One woman goes to the well herself while another sends a servant. One household collects water at the source; another lets it be seen that they buy from a water vendor. Most water carriers are women and children: despite the heaviness of the task, it is not man's work. It is not only a question of time and effort, it is also a matter of dignity, appropriate behaviour and social differences.

In their beliefs about water and its use, people emphasize the symbolic nature of water. Superstitious and traditional practices can often be traced back to roots in both the practical experience of human health and well-being and to the need to establish group rules and social conformity. Thus an important role of water in traditional communities is to enable sets of social relationships to be spelled out and reinforced, often on a daily basis. These relationships can change through time but the changes also *take* time. The effect of new water supply schemes—which by charging for water may change a communal resource into a cash commodity, or by installing house connections may transform the village women into isolated housewives—is to make the changes take place overnight. The failure of villages to maintain the new water systems can often be diagnosed as an adherence to their pattern of social relationships to which the new water scheme was insensitive and disruptive.

7.4 COMMUNITY CHOICE

The principle of self-help as a means of harnessing community energy and involvement with development projects is widely employed to some degree in rural water schemes. Donaldson (1972) has outlined the elements of success-

ful self-help programmes, particularly for Latin America. Partly to reduce cost, but also to reduce the chances of the system falling into disrepair and misuse after the engineers have left, local people are involved in the provision of labour, local materials and/or cash. Local officials may also organize labour and the collection of payments and, less commonly, a local man is trained to maintain the system and do simple repairs. As a minimum, most rural water schemes involve local participation in the contribution of cash or labour. Self-help schemes do not necessarily, or even commonly, allow the community much scope in the making of major decisions about the type of system, or combination of systems, the time scale and manner in which water quality and quantity is to be improved, or the way in which it is to be managed. These are still generally decisions that are delivered to the community on a take-it-or-leave-it basis.

At a first level of analysis, the failure of many self-help schemes can be diagnosed as an organizational incapacity on the part of the community to manage the scheme, and as a lack of understanding and commitment on the part of individuals to properly use the scheme. Miller discusses two examples of this lack of individual commitment to community decisions in a village in Chiapas, southern Mexico. The first decision was to build a medical post which involved the village in the provision of labour and local materials with government support for equipment and personnel. The second decision was to build latrines for each household. In both cases a similar decision-making process to that described for El Nopal in central Mexico took place with the addition that in the case of latrines, each man also signed his personal commitment to build one. Participation in a community decision to provide the facilities did not commit individuals to conform as individuals in using them. Only 59% used the medical post instead of traditional cures and only 65% of those who actually had private latrines used them.

The response of some aid agencies has been to play down the contribution that self-help schemes can make. From the point of view of the 'user-choice' approach argued here, one of the difficulties of self-help schemes is that they are not 'self-help' enough. They are still conceived and implemented within the framework of the 'delivery philosophy' and the choices available to the community are in terms of detail rather than fundamentals.

One of the problems with present self-help schemes is that, despite their spirit of local involvement, at the level of a national or regional programme they tend to be organizationally stereotyped on the pattern of cooperatives and elected committees. This organizational standardization is as unlikely to succeed as inflexibility in the technical design of systems. The texture of community organizational and social differences within an area may be very fine, and no single standardized organizational approach will be everywhere appropriate. Along with a Western imposition of technology there has been a somewhat comparable standardized delivery of management systems.

The principle of community choice is a very important one. We have tried to show that any choice between alternative water supply schemes, or any

other development projects, involves the consideration of criteria beyond the direct trade-offs between water quality, cost etc. They involve questions of compatibility with social needs and values, and the degree to which the existing socio-political order will be supported or weakened. A significant element in the last consideration is the question of community autonomy.

When village leaders consider a new water supply, such as a borehole, part of their consideration will be the basic needs and economics of the situation, part will be the effect such an innovation may have upon the social order of the village and their personal positions within it and part will be the effect that decision may have on future decisions. It is a rare, altruistic leader who can willingly make a decision to give up his own decision-making authority. Yet that is often the Hobson's choice that rural water schemes offer communities—to accept a borehole or piped water supply also means an acceptance of an eroded village autonomy—the system will be repaired by external officials and the water controller may well be paid as a government rather than a community official.

Community decision-making styles

In comparing individual and community decision making, the contrast was made between the ordered, binary choice model for the individual, and the multiple-array, discussion-process of the community. Community decision-making styles vary both culturally and geographically—and, as we have argued above, show a considerable range between communities within a local area. In addition to this variation necessitating flexibility in the organizational design of rural water schemes, it also provides for a range of personal commitment to community decisions on the part of individuals and households. Some discussion about community projects among members of the group is common in traditional societies, even where the decisions are 'made' by leaders. The degree of commitment to those decisions by the individuals who will use and maintain the facilities is partly a function of the interaction between

(a) how far the project reflects internally developed aspirations and goals rather than externally generated ones; and
(b) the form the discussion takes and the role played by the leaders.

Group discussions vary in the degree to which they are debated with particular views attached to particular personalities, or a process of anonymous consensus with no individuals explicitly attached to particular opinions. A comparison of tribal nomadic decision-making in Khuzistan, Iran, with the process of peasant decisions in Mexico will illustrate the different discussion styles.

Nomads are making choices in relation to water every few days, that is whenever they move camp (Barth, 1964). All the families in the group are

involved in the decision but at no point is there an assembly of people. Indeed it is very important that an assembly does not occur because it would allow each view to be more equal, it would require opinions to be made explicit and associated with particular individuals and it might give rise to a confrontation of views—all of which are carefully avoided. Instead, as soon as the camp has been pitched, individuals will go and consult with one another in pairs and small groups to discuss the probability of water and pasture in various places. Individuals are careful not to commit themselves to a clear alternative; they will always follow one proposal with the opposite point of view. Rather it is a process of feeling out the consensus. Sometimes no clear common view has emerged after hours of discussion and participants retire to bed not knowing if they will strike camp next morning. The discussions are not entirely structureless for although the camp leader has no means of imposing his opinion on the other tent households, he can influence the decision through his family network. If he believes strongly in a particular choice, he will go to the tents of his sons and other close relatives and let them become aware of his view. They in turn will disseminate his opinion in their discussions with their relatives, and so on through the kinship network. If there is lack of agreement anywhere in the camp it will not be revealed by confrontation but by continued discussion until a consensus is reached. Thus each individual is committed to the group choice and will conform as an individual to that choice. This process is vital to the cohesion and viability of the nomad group.

Decision-making in a Mexican peasant village is based on the very acts which Iranian nomads so carefully avoid: an assembly of people; the confrontation of views; explicit, vigorous argument of opinions; and public commitment by individuals to specific choices before consensus is reached. A government project, for example, will first be discussed informally and formally between the village leaders. Individuals will bring what influence they can to bear on the selection of their favoured choice but there is a common attempt to reach an agreed set of recommendations on the issue to be put before the general assembly of the community (usually consisting of all adult males). One of the leaders describes the issue and the alternatives to the community assembly. He then presents the recommendations of the leadership. If the general assembly provides contradictory views the leaders will argue in defence of their opinions. Usually their views hold sway and a consensus is eventually reached. While individuals participating in the consensus agree with the outcome as a community decision, their degree of commitment to it as far as their individual behaviour is concerned may vary considerably, but in any case it is generally less than that of individuals in the nomadic process, of choice by consensus.

7.5 CONCLUSION: THE DESIGN OF USER-CHOICE SCHEMES

The following main observations have been made in this paper.

(1) A new approach in rural water supply is needed which is capable of a

higher survival rate where it is planted and has the ability to spread of its own accord.
(2) A main vector of diffusion and acceptance is community *choice* as well as community participation.
(3) We do not yet have sufficient understanding of the perception and value frameworks in which communities evaluate alternative schemes.
(4) Where a rural water scheme is not in accord with community dynamics (particularly their values, social relationships and organizational capacity), the response is either to (a) abandon or misuse the water scheme or (b) to develop new social forms or habits (such as buying from water vendors) to restore an equilibrium between water and community.
(5) Community choice is partly a question of *which* option to choose and partly a question of how to maintain the capability to choose in the future.

Our area of ignorance in relation to these observations is very large. It is suggested that the question of community autonomy is important, but it is unknown how communities with a strong sense of autonomy differ from those where dependency on the outside world is already well established. Relatively little is known about the organizational resources of communities within the area of most water supply programmes. The recent socio-economic survey of rural Ethiopia (Institute of Development Research, 1975) illustrates the range of traditional and emerging organizational capacities and community institutions which do exist and might be mobilized for rural development.

The immediate needs for developing a more user-choice oriented approach are:

(1) *Technology*. The development of technology and technical packages of components that are within the decision-making compass of small communities. This may include more appropriate, low-cost technology. It also means technology that is understandable, capable of modification at the local level and can be *seen* to be flexible. Thus the community may have to import the materials but they are sufficiently cognizant of the situation and the design to decide for themselves how much to order.
(2) *Design*. The development of methods to evaluate the perceptions and needs of the community and households, and to understand the dynamics of the community, especially in relation to water, as a normal input into the design stage of projects.
(3) *Management*. The development of management systems which can respond to the inputs from the community evaluations at the design stage. The expected needs for much greater flexibility in management systems (in collecting dues, payments, distributing water, handling disputes and breakdowns, co-opting labour) may well imply the development of packages of management components which can be selected and combined to provide a management system fitted to each individual community or group of communities.

These inputs into the development of an innovative, user-oriented approach to rural water supply can best be achieved by providing the encouragement and practical support needed for water authorities to include research, evaluation and experimentation as an integral and priority part of their programmes. At the same time, we should be wary of the delivery of a 'soc-fix' approach to parallel the 'tech-fix' one. User-choice must allow for the rejection of externally promoted choices.

In hindsight, the decision of El Nopal, the village in Mexico, to keep the old well until they could afford a 100% piped water supply, was probably the best one for the overall, long-term physical and *social* 'health' of the community. It was certainly *their* decision, and one taken against 'expert' advice. But in how many water supply programmes would their voice have been heard? And if they had wanted a stone well-head instead, to both protect and beautify the source, would they have been given any support?

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who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

B.P. IV

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

BACKGROUND PAPER IV

"STORY OF A SUCCESSFUL NATIONAL RURAL WATER SUPPLY PROGRAM IN THE DOMINICAN REPUBLIC

PLANAR"

by

Charles S. Pineo

consultant to the
Pan American Health Organization
1973

STORY OF A SUCCESSFUL
NATIONAL RURAL WATER SUPPLY PROGRAM
IN THE DOMINICAN REPUBLIC
P L A N A R

From time to time an idea is born which is destined to affect the lives of millions of people. Such an idea grew out of the meeting of the Ministers of Foreign Affairs held in Punta del Este, Uruguay in 1961 when goals were set by the Ministers to stimulate, among other things, the provision of community water supply and sewage disposal services in Latin America. For most of the countries these goals represented a terrific challenge. But they also focused the attention of the Governments of the countries of Latin America on problems which, day by day, were becoming more serious. It was estimated that it would cost US$2,900,000,000 during the decade to reach the goals, a sum which appeared astronomical at the time. Yet by 1970 more than US$2,000,000,000 had been allocated for construction of water supply and sewage disposal systems, most of it for community water supply systems, with the following results:

LATIN AMERICA

People Served by Water Supply Systems, 1961 and 1970

	Urban		Rural		Total	
	Number	%	Number	%	Number	%
1961	61,100,000	60	8,000,000	7	69,100,000	33
1970	111,300,000	75	22,400,000	18	133,700,000	48
Increase 1961-1970	50,200,000		14,400,000		64,600,000	

At least 65 million people in Latin America were affected by this idea, nearly twice as many people had water supply services in 1970

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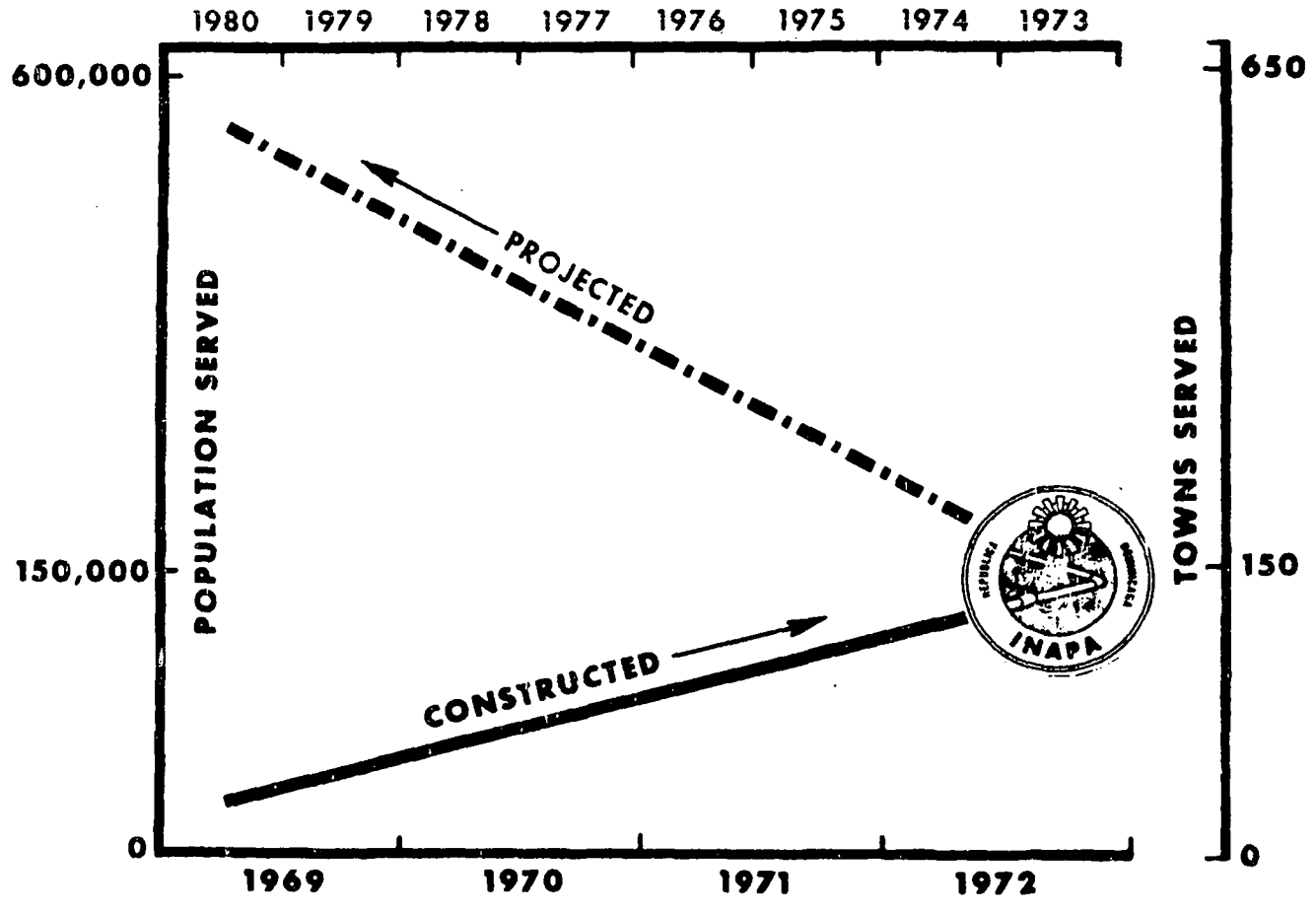
STORY OF A SUCCESSFUL
NATIONAL RURAL COMMUNITY WATER SUPPLY PROGRAM
IN THE DOMINICAN REPUBLIC

PLANAR



25 March - 24 April, 1973

Charles S. Pineo
Consultant to the Pan American Health Organization
Regional Office of the World Health Organization

as had those services in 1961. Living conditions were improved, easier access to better water helped reduce sickness and death caused by lack of this all important necessity.

Naturally, some countries in Latin America were in better conditions than others in 1961 when the goals were set. Consider the case of the Dominican Republic, with an urban population of 867,000 and a rural population of 2,095,000 in 1961 and a total population of 4,136,000 estimated for 1971 (practically reached in 1970, one year earlier). Of the 1961 population, 43% were without water supply services in urban areas and 82% of the population in rural areas lacked these services. The Government of the Dominican Republic was faced by the question of how many people would have to be provided with water supply services to reach the goals of the Charter of Punta del Este. Calculations indicated that these services would have to be provided for 600,000 people in urban areas and 900,000 people in rural areas, a total of 1,500,000 additional people to be served in ten years.

The Dominican Republic examined the problem in 1961 with respect to the goals of the Charter and began to take steps to meet those goals. The Instituto Nacional de Aguas Potables y Alcantarillados (INAPA) was set up by legal decree in August 1962 and started at once to organize to carry out its responsibilities which were broad and far reaching, namely: (a) to plan, carry out studies, construct, administer, operate and maintain water supply and sewage disposal systems; (b) all the water supply and sewage disposal systems in the country were to be turned over to INAPA; and (c) to coordinate other activities related to its responsibilitie

Even before the formation of INAPA considerable work had been carried out on water supply construction in the Dominican Republic. During the period from 1940 to 1950 a number of urban supplies had been installed and turned over to the communities to operate and maintain. A few systems had been installed in rural areas using wind mills to pump water to small elevated tanks which served as roofs for public laundries, toilets and public hydrants where the people could get water to carry to their homes. Very little attention was given to the importance of administering, operating and maintaining these systems so that by 1961 many of them were badly in need of repairs and improvements to meet the needs of a rapidly growing population.

A number of these systems were turned over to INAPA, when it was established, for operation and maintenance with all the problems involved of trying to improve systems to make them self sustaining. Work was started on modernizing the existing systems and constructing new systems.

By 1964 it was realized that, with the work load at that time, it was not possible to devote the necessary time and attention to the water supply needs in the rural areas and this responsibility was transferred to the Secretaría de Salud Pública where it remained for about a year and then was returned to INAPA after a few months in the Secretaría de Recursos Hidraúlicos.

It was during this period of transition that the national plan for rural water supplies was originated and began to take shape. So that, with the return to INAPA in 1965 of the responsibility for the rural water supply program, the stage was set for launching one of the most successful rural community water supply programs in Latin America, possibly in all of the

developing world. The program was known as PLANAR. Plan Nacional de Acueductos Rurales.

Sign identifying a water supply system installed as a part of PLANAR

There was an awareness by the Government of the Dominican Republic of the need for such a plan to help meet the needs of the people in the rural areas; an understanding of the extensive problems involved; an organization available (INAPA) with the technical capability to plan and carry out the program; and, probably most important of all, an enthusiasm for the program which was expanded from the central office to the Zone offices and to the people in the country who now have safe water in their homes where a few years ago they had to carry whatever water might be available long distances to meet their daily needs.

What is PLANAR? The Plan Nacional de Acueductos Rurales is a program which is transforming dreams into realities, not only the dreams of those responsible for assisting in meeting the needs of the people of the Dominican Republic, but which is also helping individuals in small communities to live more comfortably in a more healthy condition with safe water in their homes, thanks to their own efforts.

The program is completely cooperative, starting with the full participation of those to be benefited. Through a committee of people from the community, labor is provided, also local material such as sand, gravel and rock, plus storage space for the materials and the land required for the project.

People from the town bring the necessary material and dig the trenches for the pipe for their own system.

The Government of the Dominican Republic cooperates through funds budgeted for the program, also through the activities of INAPA in its central office, through the four Zone offices and through personnel working directly with the communities. The Pan American Health Organization cooperates by assigning permanent staff to advise on the program during all phases from preliminary studies through designs to the all important matter of administration, operation and maintenance; also through providing scholarships for special training of key personnel and assisting with the organization of special courses for personnel involved in the program. The Inter-American Development Bank has provided the very important stimulus of loans to help carry out the first two phases of the Plan with a third loan under consideration for the third phase. The Agency for International Development, while not directly involved in PLANAR has provided technical assistance and funds for other activities of INAPA. The World Food Program, UNICEF and other international agencies have also cooperated as well as other agencies within the Republic including the Secretaría de Salud Pública, the Liga Municipal and others. The extent of the cooperative effort involved in the program is an indication of the wide spread interest in the program and has helped to make it a success.

What are the Goals of PLANAR ? The goals of PLANAR are to help more than 600,000 people living in 650 towns with populations between 300 and 5000 to help themselves obtain safe water in their homes by the end of the decade and to assist the people in operating and maintaining those systems so that they continue to provide safe water at all times. One of the important goals is to install systems which the people can afford and so make

it possible for them to pay for the operation and maintenance of the systems with a gradual repayment of capital cost making the systems self-supporting without requiring a drain on the national economy. On this basis it will be possible to extend the program to additional towns not included in the original program, to provide similar benefits to additional people in the rural areas.

What has been Accomplished under PLANAR ? Much has been accomplished. Possibly not as much as was optimistically hoped for when the program was just the dream of a few dedicated individuals. But, considering the complexity of the problem, working almost without precedent on may systems at the same time and with many road blocks along the way, a great deal has been accomplished. Today 150,000 people living in 150 towns are benefiting from safe water who did not have this necessity a few years ago. Thousands of people have learned what can be accomplished when they work together for a common cause.

It is estimated that the people of the towns benefited have cooperated with labor, material and property with a value of RD$580,000.* The Government has cooperated directly with the program through special budget items and support of PLANAR through INAPA with a total of RD$1,919,000. The World Food Program has cooperated with food valued at RD$580,300 matched by RD$33,000 provided by the Government. The Inter-American Development Bank has loaned a total of US$6,050,000 for the first two phases of the program of which approximately US$2,847,000 has already been spent. The participation of the Pan American Health Organization has been extensive with a value far beyond the amount of pesos involved. The cooperation of other agencies cannot be evaluated in monetary terms either.

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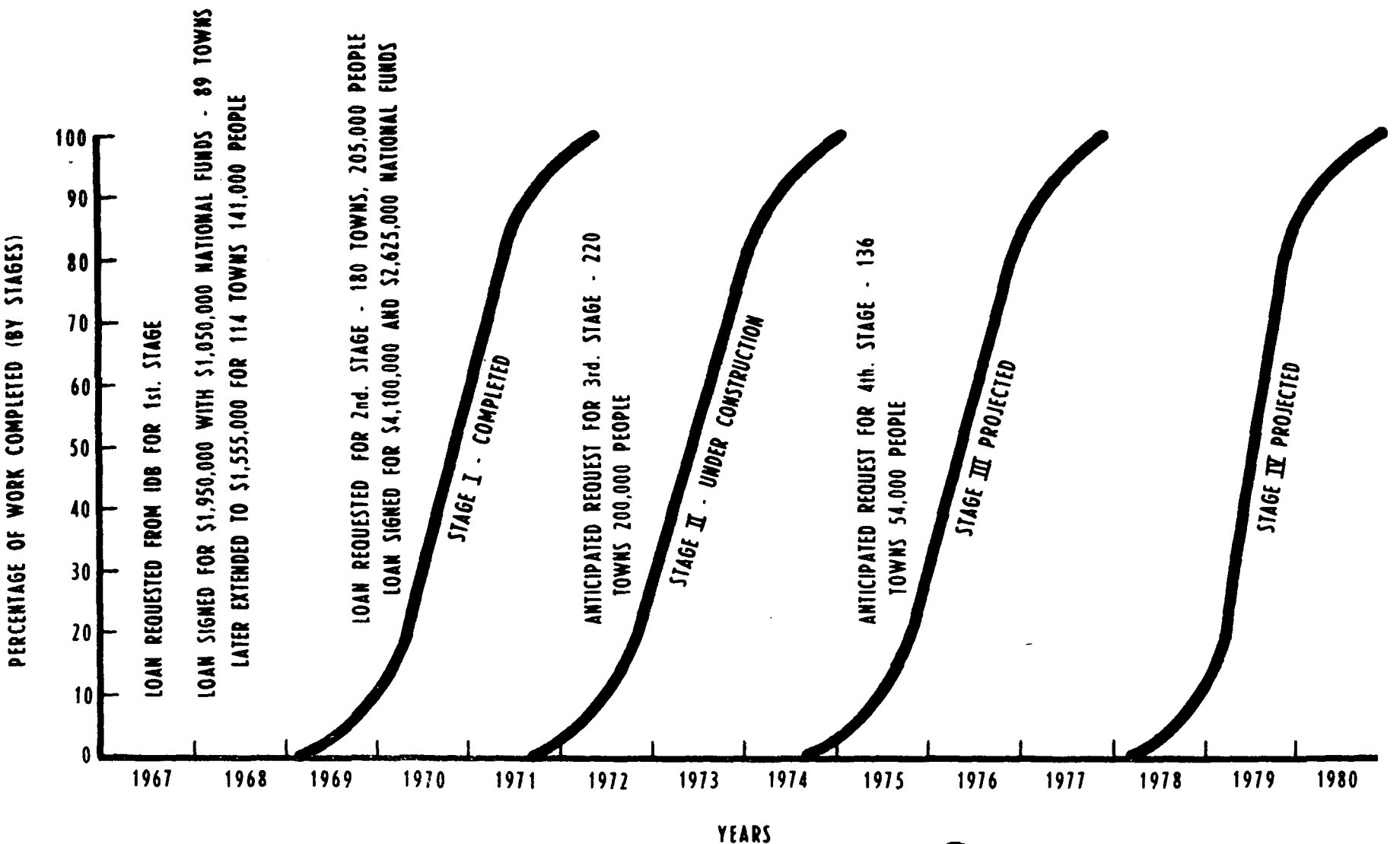
* 1 RD$ = 1 US$

DOMINICAN REPUBLIC

PROGRAM FOR NATIONAL RURAL WATER SUPPLY SYSTEMS

PLANAR



Without PLANAR it is doubtful if any of these resources would have been brought together for the benefit of the people in the rural areas of the Dominican Republic.

What has Contributed to the Success of PLANAR ? Many factors have made possible the extensive progress accomplished to date through PLANAR. No attempt will be made to list the factors in order of importance. The success of the program is the result of a combination of all the factors involved, many of which have been present in one form or another in other programs.

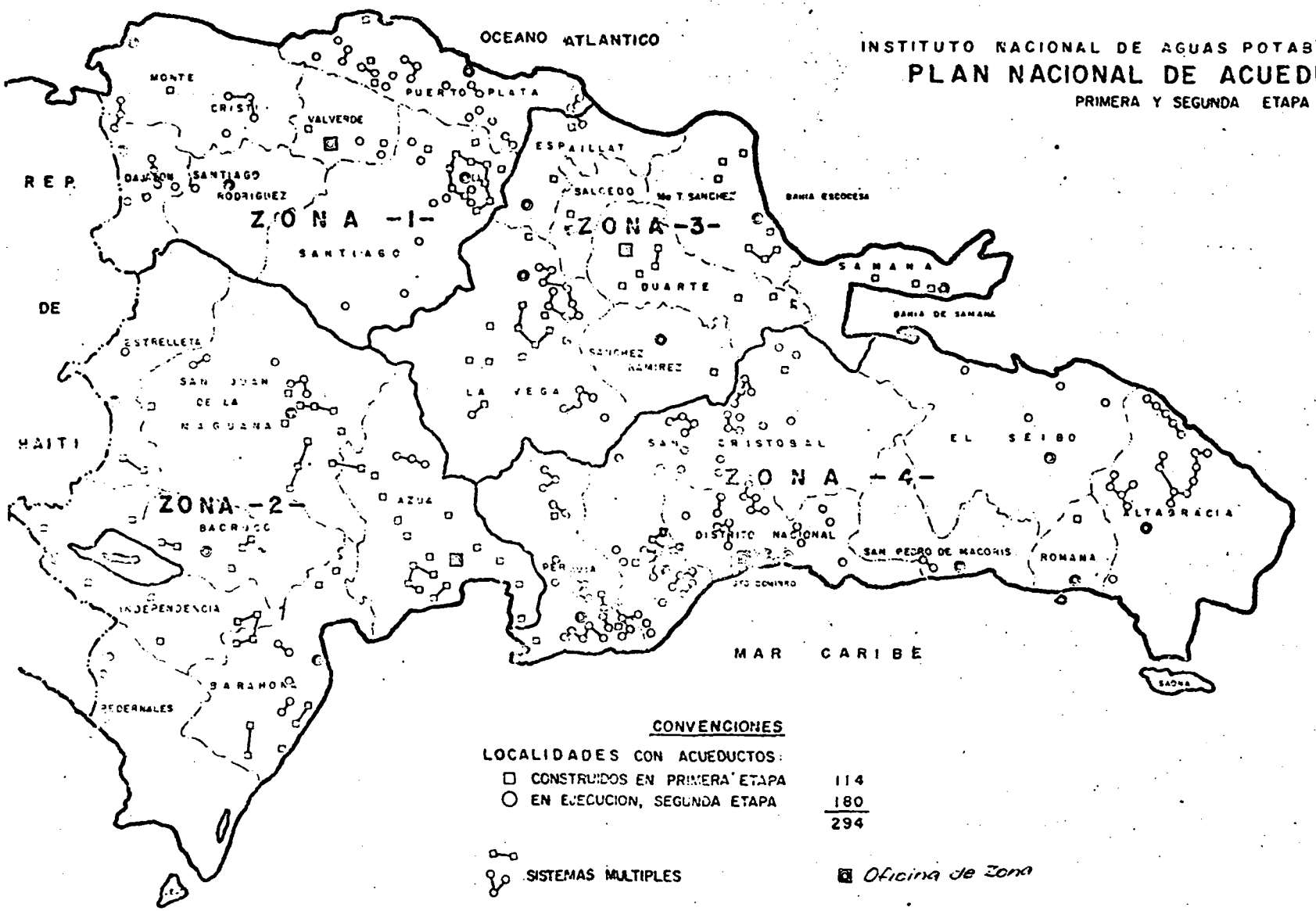
1. The very definite and continuing support of the Government of the Dominican Republic has been one of the key factors which makes the program possible.

2. Without the vision and enthusiasm of the people involved in the program at all levels (national, zone and local) very little could have been accomplished.

3. There has been a continuing preoccupation for the improvement of the administrative structure responsible for carrying out the national rural water supply program. This is evident in the shifts that have been made from one agency to another, also in the organizational changes made within INAPA after the rural program was returned to its responsibility in 1965. INAPA now has three departments, engineering, operations and administration. As each of these departments participate in PLANAR, the designation of a coordinator for the program was found to be necessary and has contributed to the smooth functioning of the program. The coordinator is a member of the Planning Office of INAPA, where overall planning is carried out for all INAPA activities.

4. One of the first steps in the PLANAR program was to identify the problem through a survey of the towns with populations between 300 and 5000 to list them, to determine their population and location. Of the 8745 towns and cities in the Dominican Republic, 2803 were included in the 300 to 5000 population range. As many as possible of those towns were visited by brigades from INAPA to determine: (a) accessibility to the town; (b) concentration of houses; (c) availability of satisfactory water sources; (d) availability of electricity; (e) facilities for communication; (f) availability of construction materials. Based on this survey, 650 towns were selected for the PLANAR program. Then these were divided into four groups for the four phases of the program. For the first phase 89 towns were selected based on their sanitary and socio-economic conditions such as need for a water supply service, condition of existing service if any, interest and type of cooperation offered by the town people. The first group of 89 towns was increased later to 114 towns. The second phase of the program included 180 towns. 220 towns are being considered for the third phase and the remaining 136 will be covered in the fourth phase of PLANAR.

5. It was envisioned from the beginning of PLANAR that full advantage would be taken of the interest and cooperative effort of the people to be benefited by the program. This could be done only through close and continuing contact with the people in the rural towns. A group of promotors was organized by INAPA to maintain this contact and they have contributed very extensively to the success of the program. This group now consists of 16 promotors who work out of the Zone office assisting with the operation and maintenance of the systems after they have been built and turned



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PLAN NACIONAL DE ACUEDUCTOS RURALES

PRIMERA Y SEGUNDA ETAPA

CONVENCIONES

LOCALIDADES CON ACUEDUCTOS:

□ CONSTRUIDOS EN PRIMERA ETAPA	114
○ EN EJECUCION, SEGUNDA ETAPA	180
	294

SISTEMAS MULTIPLES

▣ Oficina de Zona

over to the towns. An additional 20 promotors work directly in the towns assisting in the organization of the Water Supply Committees and helping them during the construction of their water supply systems. This group also serves as the on-the-job supervisors for INAPA during all aspects of construction, under the guidance of the Zone engineers.

The promotors are carefully selected. They must be high school graduates (Bachilleres) and must have had some contact with rural areas with a first hand knowledge of conditions, needs and customs of the people. A number formerly worked as teachers in rural schools. They are given one week of pre-training indoctrination in the central office of INAPA, then three months of in-service training working out of the Zone offices with experienced promotors.

The promotors are trained in all aspects of the program from organizing the community to the correct way to join plastic pipe.

6. The first step for each project is a visit by an engineer and a promotor to the town to make sure that the project is feasible; that the water source is satisfactory to meet the needs of the town and acceptable to the people; that the people are really interested and willing to cooperate not only during the construction but also in the operation and maintenance and by paying for this operation, maintenance and return of the capital investment. Once all this is determined, assistance is given in selecting suggested members for the Water Supply Committee and helping it to organize and function. This is another important step toward the success of the program.

7. Even though the Dominican Republic is small, it was realized early in the PLANAR program that it would be necessary to divide the country into zones. Four Zones were established based on distribution of population and natural features and a Zone Office was organized in each zone. The responsibilities of these offices are specific and include:

a) Program, organize, direct, coordinate and control INAPA activities in the Zone.

b) Collaborate with the Central Office in preparation of plans and programs.

c) Promote, organize and assist the local Water Supply Committees both during construction and later during operation and maintenance.

d) Train and advise the necessary personnel at Zone and local level.

e) Control the taking of water samples and supervise the carrying out of Central Office recommendations based on examinations of those samples.

f) Check collections made for water use and connections, also payments made for operation and maintenance of the system; receive and deposit the money received.

g) Evaluate progress and report monthly to the Central Office.

h) Maintain a small stock of materials needed for repairs of the water supply systems in the Zone.

8. A number of cost and time-saving ideas have been combined in the preparation of studies and designs for the systems being built through PLANAR. Some of them are listed below:

a) Standard designs have been developed for many of the elements of the water supply systems including those for water storage tanks, for both elevated and ground storage, (concrete and masonry), sedimentation tanks and slow sand filters, pump houses and chlorinator houses, house connections and public hydrants.

b) In the preparation of the designs for a system, standard forms are used to facilitate the calculations.

c) Public hydrants are seldom included in systems now being installed as it has been decided to provide only house connection, preferably in the houses or at least in the patio close to the house. Where economy may result, the lines for two adjacent houses are joined together to make a single connection to the distribution line.

d) Plastic pipe (PVC) is used almost exclusively for the rural water supply systems for economy, ease of transportation and installation and freedom from breakage in handling. Three plants for the production of plastic pipe have been set up in

Standard designs are used for the modern storage tank pictured in coparison to the tank and wind mill formerly used. Also shown is one of the slow sand filters built from a standard design.

the Dominican Republic since the initiation of PLANAR. Producers are obliged to furnish proof of the quality of the materials and pipe they supply.

e) A number of adjacent towns are grouped together into a multiple system with a common source, storage tank, and chlorinator for economy not only in first cost but also in operation where only one operator is needed instead of one for each system. It is common to have multiple systems with 4 to 6 towns together and even up to 16. In one Zone there are 5 multiple systems which will provide water service to 45 towns with a total population of nearly 45,000 people.

f) Where possible, protected springs are used with second preference being given to infiltration galleries, deep wells and finally to surface supplies such as rivers or lakes. Gasoline motors are no longer installed, with electric motors being used where electricity can be obtained and where not available then diesel motors are used to operate the pumps.

g) The systems are designed with an absolute minimum of valves and special fittings. Where convenient a tee with a 1/2 inch take-off is used to connect two lengths of pipe together instead of a connecting piece, with the take-off being used for a house connection line.

9. In selecting the towns to be included in each phase of the program, one of the objectives has been to locate as many towns as

possible in Zones 2 and 3 for the first phase and in Zones 1 and 4 for the second phase, also grouping the towns for ease of inspection during construction and for placing in operation when construction is completed.

10. To keep pace with the need for detailed system designs, some of the design work has been contracted with consulting engineering firms supplementing the design work of INAPA staff. This has proven satisfactory using the design criteria established by INAPA, the standard designs of INAPA and under close control of INAPA staff.

11. Attention has been paid to the advantages of working with the best possible mass--a critical mass--for instance a sufficient number of towns are grouped together in inviting bids for construction to make the size of the contract attractive to a contractor without being too large for him to handle. The optimum number seems to be between 30 and 40 for the upper limit. The same thinking has been followed in grouping systems for design by consulting engineering offices.

12. Careful scheduling has been followed in all phases of the program; to have detailed designs prepared well before they are needed; to order materials well in advance of when they are to be used; to schedule organization of the local Water Supply Committees with sufficient anticipation so that they are well established and fully acquainted with their functions; to schedule construction taking into consideration the capabilities of the contractors to carry out the construction and of INAPA staff to supervise the construction; to assure that the materials to be furnished as part of the local contribution has been provided as agreed and that the local labor has carried out its responsibilities.

13. Trainig of staff al all levels has been a key activity which has been kept ahead of the various activities where the staff is to be utilized. Engineers, administrators, technicians have been prepared. Special training has been given the promotors who have in turn helped to organize and train the people who are to cooperate in the local phases of the program. This training has been focused particularly on the preparation: (a) of the members of the local Water Supply Committee in the administrative aspects of their duties including encouraging people to connect the system, prevent waste of water and to pay for the services provided by the system; and (b) of the operators who are to be responsible for the functioning of the systems so that the men will not only be able to operate but also maintain the systems properly.

14. While the local people have played an important part in the preliminary stages and during the construction of their systems, their most important role begins when the system is turned over to them to operate and maintain and to pay for those costs as well as to repay the original cost of capitalization. The promotor assists them throughout all these phases on a continuing basis. The final success of the program depends (a) on the efficient operation and maintenance of each system to provide the service for which it was designed and built; and (b) on the people who benefit from the service paying for it, which they can do as has been well demonstrated by the program so far.

15. The program has been kept dynamic. As new ideas have evolved they have been tested and incorporated into the program. Advantage has been taken of experience attained as the program has advanced. More plastic pipe is being used; more extensive use is made of multiple systems; gasoline engine are no longer included in the designs; more extensive use is being

made of the promotors; the installation of public hydrants is being discontinued; more efficient and effective administrative procedures are being adopted.

16. The World Food Program has played a part in the success of PLANAR programs by providing 2262 tons of food--wheat and corn flour, powdered milk and cooking oil--for use in the program. These foods have been distributed to the workers who have cooperated in the construction of their own systems on the basis of one ration of food per four hours of work. Many workers have worked an eight hour day to obtain the double ration. An unexpected side benefit has been that men from neighboring towns have come to work on a water supply system of another town to get the corresponding ration.

17. With the increased work load brought about by the start of the second stage of the program before construction of the first stage was completed, plus the start of preparation of studies and designs for the third stage, it was realized that, in addition to a close scheduling of the various phases of the program, it would be necessary to set intermediate targets for the various departments and sections involved in PLANAR. These targets are established within the overall goals of INAPA by the several sections working closely with the planning office. Progress is reported quarterly so that bottlenecks may be defined rapidly and steps taken to speed up activities that might slow overall progress. This system of intermediate goals is another effective factor contributing to the success of PLANAR.

18. While the PLANAR program is not located within the Secretaría de Salud Pública, the staff of INAPA is very much aware of the health aspects

of the program and of the need to provide safe water. Every effort is made to locate sources that will be free of contamination, to protect those sources and to keep constant surveillance on the quality of the water being provided through the systems for which INAPA is responsible. INAPA has its own laboratory for carrying out both bacteriological and chemical analyses. Recommendations are made, based on the analyses, and then the corrective work is checked to make sure that it has been effective.

19. Still another factor which is contributing to the success of PLANAR is the use of a Revolving Fund as an integral part of the program. The importance of this factor will become more evident as the program continues. The revolving fund, created by a governmental decree in June 1968, is made up of: (a) national funds budgeted by the Government for the rural water supply program; (b) funds contributed by national and international organizations for that purpose; (c) contributions made by the local communities; and (d) income from the operation of the rural water supply systems. The income from the systems based on a flat rate of RD$1.50 per house connection per month (for one or two faucets without threads--higher for additional faucets or faucets to which a hose may be connected) is divided into two parts: (a) one part is used to pay for operation and regular maintenance of the system; and (b) the other part is divided so that 60% goes to pay additional costs at the Zone level for administering the rural systems in the Zone and the remaining 40% goes to the Revolving Fund (see the flow diagram on the next page).

While some revolving funds have been developed only for the purpose of financing the cost of construction of additional water supply systems,

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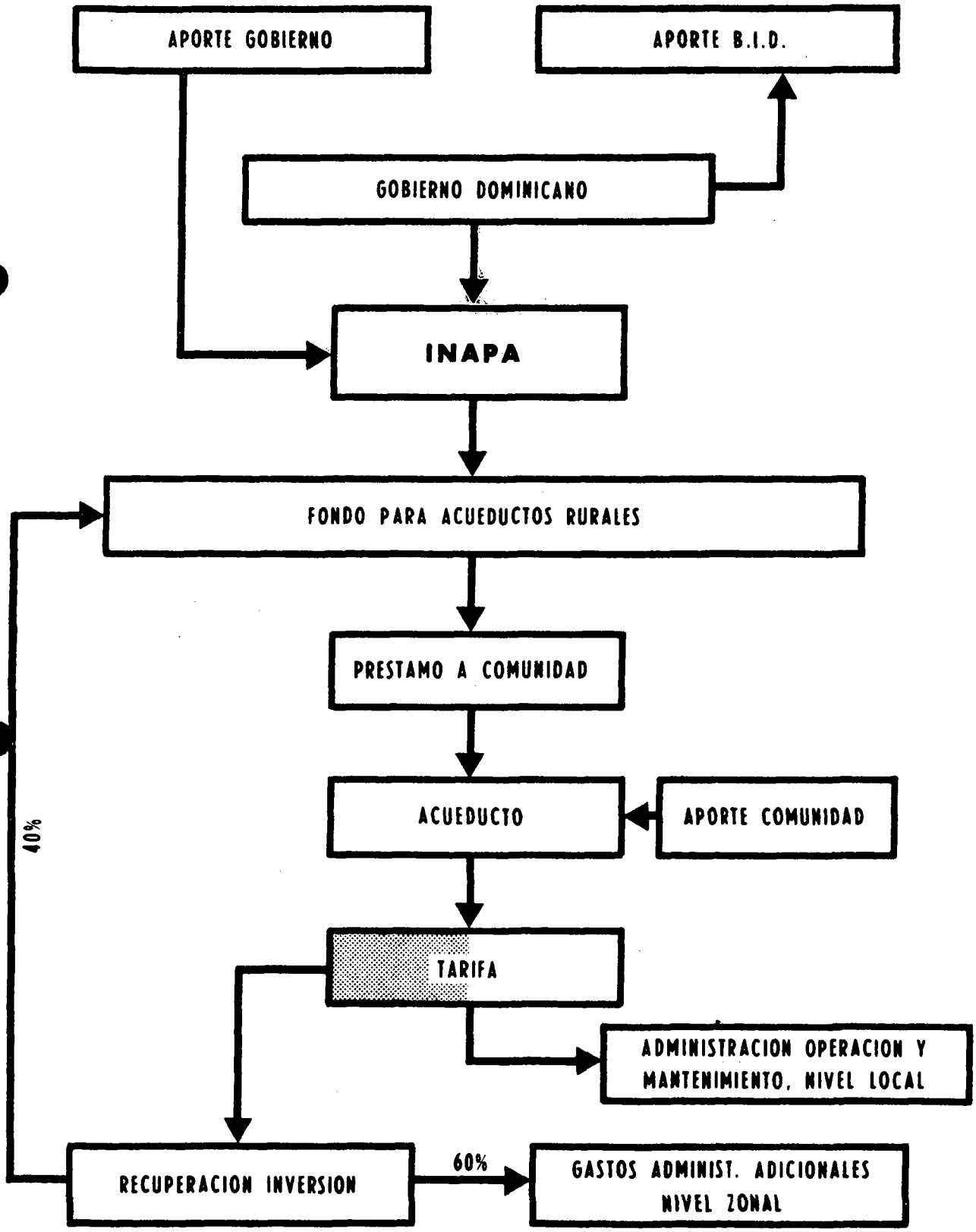
FONDO ROTATORIO DE ACUEDUCTOS RURALES



the Revolving Fund for the rural water supply program in the Dominican Republic, in addition to financing the construction of new systems, may be used also to finance extensions to or replacements for existing systems. This method, while reducing the amount of money available for new construction, does make it possible to maintain the existing systems in satisfactory operating condition.

Lessons which may be Drawn from PLANAR. Some of the many lessons which may be drawn from the more than four years of experience of PLANAR within INAPA are mentioned below, again not necessarily in the order of importance.

a) Complete and continuing Governmental support is essential.

b) Such a program should be handled by an organization that is capable of carrying it out with a well-trained staff of people with vision, initiative and enthusiasm for the program. Within that organization a balance should be maintained so that the rural water supply program does not dominate the other activities of the organization nor be lost in those activities.

c) The program should be kept dynamic, building on experiences that develop as the program advances.

d) Responsibility and authority should be decentralized as much as feasible for efficient administration to bring the responsibility for action as close as possible to where the action is to take place.

e) All sources of cooperation should be investigated, cultivated and their participation should be coordinated to take full advantage of all resources, both financial and in personnel and material to carry out a well planned and scheduled program.

f) The interest of the people to be benefited by the program should be investigated, stimulated and organized to develop the potential for self-help which exists in each locality.

g) Constant and continuing liaison must be maintained with the people of the town by staff which is well acquainted with the problems and needs of the people in the rural areas. The development and use of a group of well-trained promotors throughout the program has contributed much to its success.

h) Supervision at all levels is absolutely necessary. This point cannot be emphasized too much. Without constant supervision the success of the program may be diluted and the anticipated benefits lost.

i) Personnel should be trained for their specific duties, developing needed categories that may not presently exist as was done in the case of the promotors, members for the Water Supply Committees and operators for the systems. Periodic refresher training should be given to be sure that the staff is not bypassing some of its responsibilities.

j) Full advantage should be taken of such tools as the use of: (a) a critical mass to work with the most efficient numbers of an element; (b) scheduling of all phases of a program; and (c) establishing intermediate goals by which to measure progress throughout the life of the program.

k) Designs and techniques should be used which are economical in time, money and material, not only during the original construction

but also for the all-important life time of operation and maintenance.

1) Stimulate the development of the supporting or allied activities such as those resulting because of the PLANAR program, namely: the establishment of three factories for the production of plastic pipe with a fourth now being set up, and the evolution of at least ten consulting engineering offices which are now assisting in the preparation of designs for some of the projects included in the PLANAR program.

The local Water Supply Committee is organized with the help of a promotor from INAPA.

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Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

525 TWENTY-THIRD STREET, N.W., WASHINGTON, D.C. 20037, U.S.A. CABLE ADDRESS: OFSANPAN

IN REPLY REFER TO: DOMINICAN REPUBLIC-2200 TELEPHONE 223-4700

ADDITIONAL COMMENTS ON THE NATIONAL RURAL WATER SUPPLY PLAN OF THE NATIONAL INSTITUTE FOR WATER SUPPLY AND WASTE DISPOSAL OF THE DOMINICAN REPUBLIC

(Supplement to the report Story of a Successful National Rural Water Supply Program in the Dominican Republic - PLANAR)

25 March - 24 April, 1973

Charles S. Pineo
Consultant to the Pan American Health Organization
Regional Office of the World Health Organization

This report is prepared as a supplement to the report entitled Story of a Successful National Rural Water Supply Program in the Dominican Republic - PLANAR - and should be considered together with it. That report was prepared specifically to highlight the elements of the program which have contributed to its success, while the objective of this report is to point out some of the aspects of the program which may be keeping it from achieving the complete success which might be attained.

The comments contained in this report are based on observations of the consultant and do not in any way reflect the opinion of the Pan American Health Organization.

There is no doubt that PLANAR, the National Plan for Rural Water Supply Systems, is properly located within the National Institute for Water Supply and Sewage Disposal Systems, (INAPA) which is charged by governmental decree with the responsibility for all aspects of both urban and rural water supply, sewage and surface water disposal. Moreover PLANAR is fully integrated into the organizational structure of INAPA so that the fullest advantage may be taken of the competent staff and organization of that Institute.

However, with this organization it is most important that a careful balance be maintained between the PLANAR activities and the other activities of INAPA. Since the PLANAR program depends on INAPA for all aspects of engineering, administration, and operation and maintenance, any reduction in these functions which might be brought about by a reduction in INAPA programs other than those of PLANAR could very well restrict the effectiveness of the PLANAR program. This makes it doubly important that INAPA

strengthen its other activities. This might be done by developing an urban national plan including not only water supply but also sewage and surface water disposal programs. It is suggested that the United Nations Special Fund be approached for assistance in preparing feasibility and pre-investment studies for these urban programs. Moreover the national plan should include methods for bringing under INAPA the water supply and sewage disposal systems in the Dominican Republic in accordance with its Ley Organica. This would help to give INAPA the broad base for operation which was envisioned by that law.

This would allow full advantage to be taken of the capabilities of INAPA for designing, constructing and administering both urban and rural systems. By turning full responsibility over to INAPA it would have access to the resources which it needs to carry out effectively the charges placed on it by the Ley Organica. This would make it possible to correct some of the weaknesses which have been observed.

As more systems are constructed as part of PLANAR the problems involved increase in number and complexity. For instance supervisory activities must be expanded to keep up with the increased number of projects under construction and with the systems which must be operated and maintained. More supervisory personnel are needed and more transportation is required to cover the expanding program. If the staff cannot effectively cover the 184 systems now in operation, what will happen when the 650 towns projected under the program have to be operated and maintained? In a very brief visit to just a few systems, examples of lack of maintenance were observed which should have and could have been corrected long ago at little expense. Under

proper supervision this would have been done. It is obvious that more efficient supervision is needed at Zone level by central office personnel to assure needed supervision by Zone personnel at the local level. This is true of engineering activities during construction and of operation and maintenance activities as soon as the systems are placed in service.

The need for spare parts and equipment is already becoming a problem which will become worse as more systems are placed in operation. Efficient service to the people who are paying for the service will depend on capable maintenance crews and availability of material to keep the systems operating. Approximately one third of the cost of the first stage of PLANAR program correspond to the payment for material and equipment used in constructing the 114 systems built during that stage. This amounted to about one million dollars. Provision must be made to repair or replace that material and equipment sooner or later. This means that an adequate supply of spare parts and equipment must be available. Time will indicate the size of stock which may be needed, but in the meantime one percent of the cost of material and equipment installed, while low, might be considered as a workable stock.

Another weakness is the length of time required between the preparation of a list of material, either for construction or for stock, and the time the material actually arrives where it is needed. The many reasons for this delay should be analyzed and methods of shortening the span of time should be sought for those delays which may be under INAPA control. The same applies to the time required to prepare invitation for bids for a construction contract, obtain the bids, award the contract and get the work started.

Steps should be taken at once to improve the collection for water services. (See Table I and II). The flat rate which has been established

TABLE I

DOMINICAN REPUBLIC
STATUS OF RURAL COMMUNITY WATER SUPPLY SYSTEMS
HOUSE CONNECTIONS MADE, IN SERVICE, PAID FOR
DURING DECEMBER 1972

Zone	House Connections					
	Made	In Service		Paid For		
	Number	Number	% of No. Made	Number	% of No. Made	% of No. In Service
I	6,912	5,667	82	4,241	61	75
II	12,362	8,323	67	5,158	42	62
III	5,259	3,346	64	2,348	45	70
IV	5,483	4,248	77	2,377	43	56
Total	30,016	21,584	72	14,124	47	65

TABLE II

RURAL COMMUNITY WATER SUPPLY SYSTEMS
INCOME AND BALANCE AFTER LOCAL EXPENSES
1970, 1971, 1972

Zone	1970			1971			1972		
	Income	Balance	Bal./Inc.	Income	Balance	Bal./Inc.	Income	Balance	Bal./Inc.
I	40,561	17,623	43	77,119	37,101	48	98,170	51,300	52
II	51,934	38,577	74	112,351	69,319	62	104,886	53,825	51
III	35,050	23,165	66	38,718	16,470	43	40,441	16,563	41
IV	4,157	1,413	34	9,349	3,870	41	48,132	27,241	57
Total	131,202	80,778	62	237,537	126,760	53	291,629	148,899	51

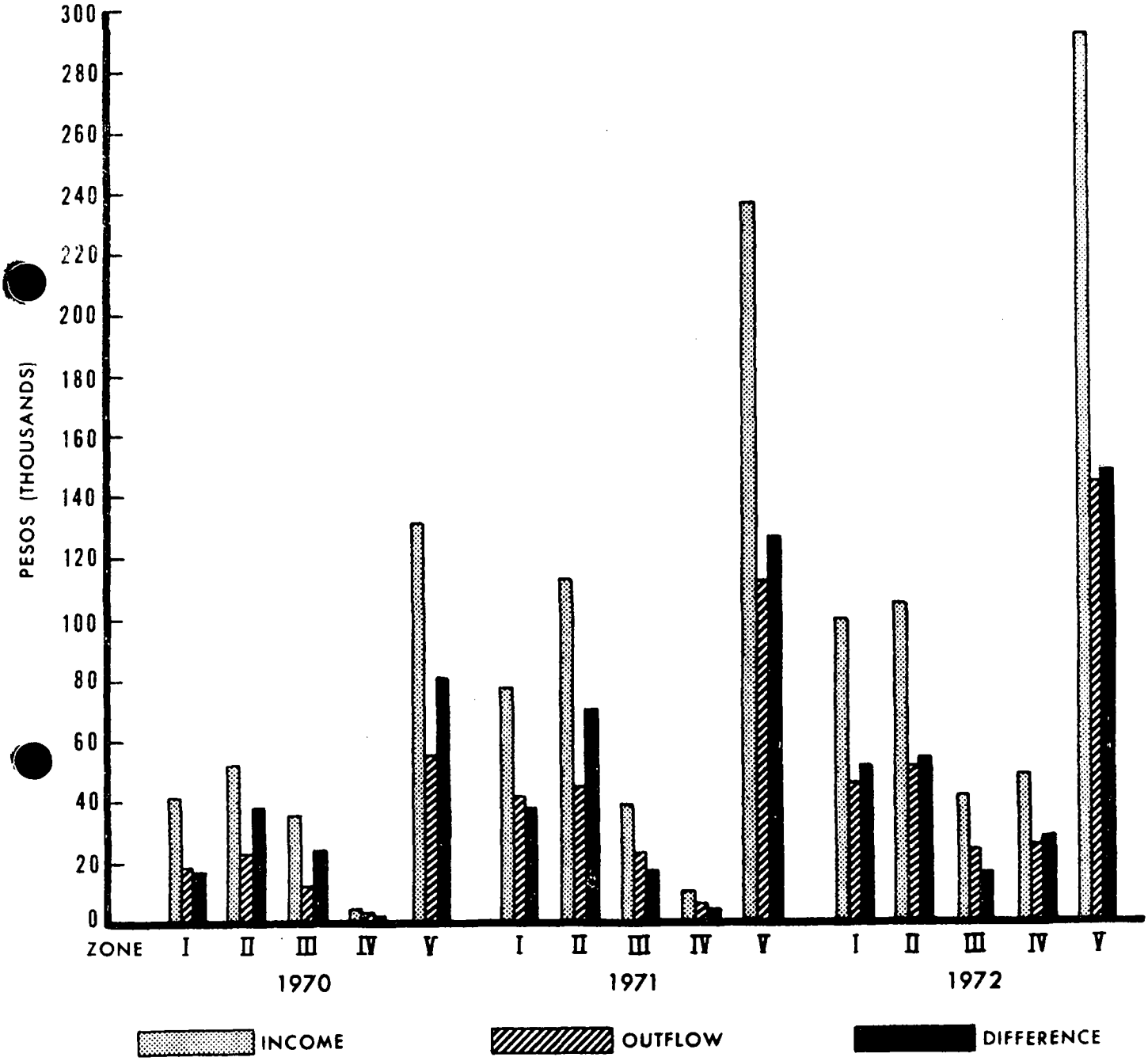
based on socio-economic considerations rather than cost factors has been reduced even lower in some regions of the country. In spite of that, more than one third of the house connections originally installed in one Zone (it is not known what percentage of houses originally had house connections but probably not more than 75%) were not in service at the end of the last reporting period. And of the two-thirds still in service only 62% had paid the water rate for that month. In one town with 73 house connections only 3 had paid for their water service that month. This indicates the need for immediate and drastic action. Some incentive is needed to assure that a higher percentage of the people connect to the water supply system, maintain their connection and keep their water bills paid up to date. With better supervision and more direct action by the promotors the situation might be improved (see Fig. I).

INAPA has taken a significant step in establishing a planning office which should be strengthened to be able to help INAPA develop its full potential. Personnel are needed to carry out the necessary studies, analyze material and prepare the long range plans which are so important for helping INAPA carry out its responsibilities in an effective manner instead of on an ad hoc basis. It is suggested that a close liaison be developed with the national planning office for the mutual benefit of both offices and of the country. Long range plans, or even middle range plans such as PLANAR, can make it possible to meet needs which were once thought too great to even bother about. Consider the number of people in rural areas who are benefiting from PLANAR and consider the cooperation which is making this possible. The accomplishments being attained with PLANAR

PLANAR

FINANCIAL SITUATION

INCOME - OUTFLOW - DIFFERENCE



would have been impossible under the former system of constructing a few systems a year with the small amounts of money which were being made available for the program. And those few systems would soon have become almost useless for lack of efficient operation and maintenance. They would have been a drain on the national economy for operating costs without the cooperation and support of the people receiving the services. Similar achievements could be attained in the urban areas, but first the planning must be carried out and personnel is necessary to do this.

INAPA staff is very conscious of the need to provide safe water as demonstrated by the number of chlorinating apparatus installed even on the rural systems. All surface supplies are chlorinated and even some well supplies when deemed necessary for protection. INAPA also has a well staffed and operated water quality control laboratory which not only examines the water samples but also recommends the action to be taken if the water does not meet water quality standards. It is suggested that the action of this laboratory and of the laboratory of the Secretaría de Salud Pública be coordinated to make the control of water quality even more effective.

Most of the above comments have been directed toward the water supply activities with the exception of the suggestions for long range plans for the urban areas, where mention was made of the need to include plans for sewage disposal. Even though excreta disposal plans are commonly thought of as being basically the responsibility of the public health authorities, it is suggested that INAPA might play a role in meeting the excreta disposal problems in the rural areas, particularly in the towns where water supply systems have been installed as a part of the

PLANAR program. It is suggested that a joint national plan be developed, looking for new solutions to the age old problem of the safe disposal of human excreta. In this day of plastic and the installation of several plastic plants in the Dominican Republic, it is suggested that an attempt be made to develop at least a sanitary riser to replace the unsatisfactory concrete one used almost universally in rural areas. It is suggested that the use of a water seal be included with the plastic riser to eliminate the need of a seat for covering the privy hole. A comparatively small amount of water is necessary to flush this type of privy and would be available where the water seal privies are installed in towns built as part of the PLANAR program.

les carnets de L'ENFANCE
assignment CHILDREN

Background paper no V

Eau et développement communautaire

Water and community development

34 Avril-juin 1976
April-June 1976

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Eau et développement communautaire
Water and community development

Martin Beyer has been Adviser, Drinking Water Programmes, at UNICEF, New York, since 1974. After he received his PH. D. in economic geology from the University of Stockholm, he carried out numerous economic, geological and hydrogeological surveys throughout Latin America, Africa, and Asia. In 1972 he was appointed Deputy Director of the UNICEF Regional Office for the Americas in Santiago, before assuming his present post.

Anne Whyte is presently Associate Professor in Geography and Research Associate at the Institute for Environmental Studies at the University of Toronto. She received her PH. D. at Johns Hopkins University, and is the author of numerous publications, under both Whyte and Kirkby, in fields such as environmental perception and behaviour in relation to natural resources, information flow between groups in resource management, and land and water use in relation to social organization in developing countries.

David Donaldson is Regional Adviser for Rural Water Supplies and Sanitation Programmes at PAHO/WHO, Washington, D. C. After an assignment to build the Managua, Nicaragua, water system, he became Country Engineer with WHO in Lima. In 1968 he was transferred to Washington as Sanitary Engineer, where he worked on the use of the mass approach and revolving funds in rural water supply programmes. He also participated in a project to provide administrative and management advice to 18 water and sewerage agencies in 14 Latin American countries.

Hushang Amir Rafatjah a étudié aux Universités de Téhéran, de Rome et de Minnesota. De 1949 à 1957, en qualité d'ingénieur sanitaire, il dirigea notamment dans son pays divers projets d'éradication du paludisme avant d'entrer en 1957 à l'OMS au Bureau Régional pour la Méditerranée orientale. Depuis 1974, il est à Genève ingénieur sanitaire à la Division de paludisme et autres maladies parasitaires. Il est l'auteur de nombreuses publications techniques dans ce domaine.

Jean-Claude Funck est depuis 1965 administrateur national des programmes de l'UNICEF à Alger. D'abord technicien chimiste à l'Institut national de recherches agronomiques à Alger, il s'est orienté ensuite vers l'éducation et fut instructeur du plan de scolarisation à l'inspection primaire de Bougie, département de Sétif, avant d'entrer à l'UNICEF.

Hima Garba est Inspecteur adjoint à la Direction de la promotion humaine au Ministère du Développement du Niger. Après des études de sociologie aux Universités de Bordeaux, d'Abidjan et de Paris-V-Sorbonne, il a enseigné dans son pays à l'École nationale de santé publique, et à l'Institut pratique pour le développement. Il a été successivement responsable du Bureau des études et de la formation et du Service de l'animation au développement.

Jaime Mora Ramírez estudió en la Universidad Nacional de Bogotá, Colombia. Fue nombrado sucesivamente Ingeniero Jefe de la Sección de Saneamiento e Ingeniería Sanitaria de los Departamentos de Tolima y Boyaca, y del Departamento de Higiene Ambiental de la Escuela de Salud Pública de la Universidad de Antioquía. Desde 1971 es Jefe de la División de Saneamiento Básico Rural del Instituto Nacional de Salud. Es también Catedrático del Departamento de Ingeniería Sanitaria de la Escuela de Minas de la Universidad Nacional de Medellín.

Orlando López Orozco cursó estudios de sociología en la Universidad Nacional de Colombia de Bogotá donde se especializó en Desarrollo Comunal. Desde 1961 presta sus servicios al Gobierno. Después de desempeñar distintos cargos fue ascendido en 1970 a Instructor de Desarrollo de la Comunidad y en 1971 a sociólogo con funciones de Planificador General. En la actualidad es Jefe de la Sección de Promoción Comunitaria de la División de Saneamiento Básico Rural. Es asimismo autor de numerosas publicaciones.

Luis A. Orihuela est depuis 1971 Chef de l'Unité d'approvisionnements publics en eau et hygiène des collectivités à l'OMS. Après des études d'ingénieur sanitaire aux Universités de Lima et de Chapel Hill, USA, il débuta sa carrière en Corée à l'UNKRA. Entré à l'OMS en 1954, il fut d'abord affecté à l'Institut de santé publique et de formation de Gondar en Éthiopie, puis de 1958 à 1963 à Brazzaville en qualité de Conseiller régional en hygiène du milieu, avant son transfert à Genève.

Editorial

La participation populaire, une dimension nouvelle des programmes d'hydraulique rurale

Sans la maîtrise de l'eau, on le sait bien, aucune opération de développement économique n'est possible, qu'il s'agisse d'agriculture, d'élevage ou d'industrie. Mais a-t-on suffisamment accordé d'attention à l'hydraulique dite villageoise, à l'importance de l'eau pour les populations du Tiers-Monde en zone rurale ? L'eau fait défaut à 80 % d'entre elles.

Hier encore, le problème de l'eau était abordé exclusivement sous ses aspects économiques. Assurer dans les pays du Tiers-Monde les quartiers riches des villes en adduction d'eau allait de soi. Installer des barrages, créer des périmètres irrigués en zone rurale, en vue d'accroître le rendement des cultures de rente, constituait une nécessité évidente. Quant à l'approvisionnement en eau potable des villageois eux-mêmes, il a fallu des années pour en saisir l'importance capitale : à première vue, le développement généralisé ne semblait pas en dépendre. Aujourd'hui, les économistes et les ingénieurs en prennent conscience.

Il n'y a guère d'action économique ou sociale en faveur des enfants, des femmes et des jeunes qui puisse entraîner des effets durables si les populations ne disposent pas d'eau potable en quantité et en qualité suffisantes.

Au niveau du village, l'approvisionnement en eau potable permet de libérer les femmes de la corvée d'eau, de protéger la santé et de rendre désormais possible toute une gamme d'opérations de développement qui améliorent les conditions de vie et de survie : hygiène, éducation sanitaire, pisciculture, maraîchage, petit élevage, artisanat...

Lorsque ces programmes d'hydraulique villageoise sont entrepris avec le concours effectif des populations, ils entraînent souvent une conscientisation de la collectivité dans la voie de sa participation à d'autres opérations, qu'il s'agisse d'amélioration de la

nutrition ou de la construction de latrines, de routes ou d'écoles. Fournir de l'eau saine en zones rurales, c'est lever un des obstacles essentiels au développement.

Quelles sont les technologies appropriées ? Quelles sont les formes diverses de participation populaire à des programmes d'hydraulique ? Comment sont-elles organisées ? Quels sont les liens entre l'eau et la maladie ? Voilà quelques-unes des questions auxquelles le présent numéro apporte des éléments de réponse.

Les technologies de l'approvisionnement en eau potable manifestent de grands progrès. Martin Beyer, Conseiller des programmes d'approvisionnement en eau potable de l'UNICEF en esquisse le panorama. Le choix d'une technologie appropriée et adaptée aux circonstances locales ne constitue que l'un des éléments de réussite d'un projet d'hydraulique rurale. Aujourd'hui la participation populaire est également considérée indispensable, tant par les instances d'aide que par les gouvernements. Cette participation recouvre habituellement une contribution en nature et en argent offerte par la communauté villageoise.

Anne Whyte, Professeur à l'Université de Toronto, à partir d'observations sociologiques sur les liens entre les structures sociales villageoises et les systèmes traditionnels existants d'approvisionnement en eau, plaide en faveur d'une participation communautaire accrue : les villageois devraient également avoir leur mot à dire dans le choix du système qui sera installé chez eux, choix qui jusqu'ici relevait souvent des seuls ingénieurs.

Dans une certaine mesure, les différents types d'approvisionnement en eau potable correspondent aussi à la densité de la population desservie. Comment fournir le plus rapidement de l'eau potable au plus grand nombre et au meilleur coût, dans le cadre d'une participation populaire effective ? David Donaldson, Conseiller Régional des programmes d'hydraulique et d'assainissement du PAHO, traite ce problème complexe de planification au niveau continental de l'Amérique latine. La solution adoptée réside dans une stratégie prioritaire en faveur des communautés que les sociologues dénomment « rurbaines ». Cette stratégie est fondée sur une approche standardisée, intégrant la participation effective des populations, tout en n'exigeant qu'un minimum de spécialistes de haut niveau.

Dans l'optique du bien-être des femmes et des enfants, on ne peut laisser inaperçu un autre aspect du rôle de l'eau dans le déve-

loppement économique. Partout ont été construits des barrages, des lacs artificiels; d'immenses travaux d'irrigation ont fertilisé les terres. En modifiant l'environnement, ces aménagements ont provoqué l'introduction ou la dissémination de nombreuses maladies, souvent mortelles pour les enfants. Hushang Rafatjah, ingénieur sanitaire à l'OMS, décrit quelques-unes des mesures qui, à condition d'être intégrées dès le départ dans l'économie du projet, seront susceptibles de contrecarrer ces effets nocifs. Cette condition retient encore trop peu l'attention.

Jean-Claude Funck, administrateur national des programmes de l'UNICEF en Afrique du Nord, évoque l'introduction d'un programme d'approvisionnement en eau potable dans un petit village en Algérie. Il explique comment ce programme, fondé sur la participation populaire, a débouché sur toute une série d'opérations de développement local.

Comment s'organise cette participation populaire ? Garba Hima, sociologue et Inspecteur adjoint à la Direction de la promotion humaine, analyse l'opération « puits en investissement humain » à laquelle il a participé au Niger. Jaime Mora Ramírez, Chef du Programme national d'assainissement rural et Orlando López Orozco, sociologue et Chef de la Section du développement communautaire, détaillent l'organisation prévalant en Colombie pour installer des adductions d'eau en zone rurale.

Quels sont les liens entre l'eau et la santé ? Luis A. Orihuela, Chef de l'Unité d'approvisionnements publics en eau et hygiène des collectivités à l'OMS, en traite, résultats à l'appui, dans la note de recherches. L'eau potable associée à l'assainissement du milieu permet de réduire considérablement les taux de morbidité.

L'ensemble des textes réunis ici souligne la nouvelle dimension du problème de l'eau qui sera demain à l'ordre du jour : l'accès à l'eau potable comme moteur de développement local et point d'ancrage de la motivation des populations intéressées à déclencher des séries d'actions en chaîne face à leurs besoins essentiels.

La participation populaire s'en avère le maillon essentiel.

P.-E. Mandl

Quelques faits et quelques chiffres

*** PLUS D'UN MILLIARD DE RURAUX MANQUENT D'EAU SAINE**

En 1975, 4/5e de la population rurale des pays en développement (à l'exclusion de la Chine) — soit plus d'un milliard de personnes — ne disposaient pas d'eau saine en quantité suffisante. Cette estimation globale se répartissait de la façon suivante selon les régions :

- Afrique : 155 millions
- Amérique latine et Caraïbes : 85 millions
- Méditerranée orientale : 150 millions
- Sud-Est asiatique : 160 millions
- Pacifique occidental : 75 millions.

*** ACCÈS À L'EAU ET ALLÉGEMENT DU TRAVAIL DES FEMMES**

Dans la plupart des zones rurales des pays en développement, les femmes sont chargées de la corvée d'eau. Il n'est pas rare que des femmes transportent quotidiennement 20 à 30 litres d'eau sur plusieurs kilomètres.

*** QUELS CRITÈRES UTILISE-T-ON POUR LA DOTATION DES POPULATIONS EN NOUVEAUX APPROVISIONNEMENTS?**

D'après l'enquête réalisée en 1971 par l'OMS, les trois critères les plus fréquemment cités par les gouvernements pour l'établissement de nouveaux approvisionnements d'eau sont : l'importance numérique de la collectivité considérée, la rareté de l'eau nécessaire, le potentiel de développement économique de la région envisagée. La santé ne vient qu'après.

Les politiques et priorités de l'UNICEF concernant l'eau potable sont de fournir de l'eau saine surtout aux populations rurales les plus défavorisées. Un des principes primordiaux de la mise en œuvre de ces projets est la participation des populations locales.

*** COMBIEN DE LITRES D'EAU CONSOMME-T-ON PAR JOUR?**

En 1970, dans le cadre de leur plan d'aménagement, plus de 90 pays prévoyaient une consommation quotidienne d'eau saine variant entre 60 et 110 litres par habitant en zone rurale.

*** QUELLES NORMES POUR L'EAU POTABLE?**

Selon les rapports des gouvernements, en 1970, 37 pays avaient adopté avec ou sans modification les *Normes internationales pour l'eau de boisson* de l'OMS, 13 possédaient leurs propres normes, 28 envisageaient la préparation de normes nationales et 12 indiquaient n'avoir aucun projet à ce sujet.

*** ÉVOLUTION DE L'ACCÈS A L'EAU SAINE DANS LES PAYS EN DÉVELOPPEMENT[1]**
(Chine non comprise)

RÉGIONS[2]	1970	1975
AFRIQUE :		
— zones urbaines	33 %	36 %
— zones rurales	13 %	21 %
AMÉRIQUES :		
— zones urbaines	61 %	67 %
— zones rurales	24 %	30 %
MÉDITERRANÉE ORIENTALE :		
— zones urbaines	56 %	52 %
— zones rurales	19 %	16 %
EUROPE :		
— zones urbaines	47 %	67 %
— zones rurales	45 %	63 %
ASIE DU SUD-EST :		
— zones urbaines	35 %	47 %
— zones rurales	9 %	19 %
PACIFIQUE OCCIDENTAL :		
— zones urbaines	65 %	75 %
— zones rurales	23 %	30 %
AU TOTAL :		
— zones urbaines	50 %	57 %
— zones rurales	14 %	22 %

1 Les chiffres ci-dessus indiquent les pourcentages de la population des régions considérées qui ont accès à l'eau saine, soit par branchement sur les réseaux urbains, soit par des postes d'eau dans les zones rurales.
2 Les régions considérées ici correspondent au découpage régional de l'OMS qui a établi ces statistiques à l'occasion de sa 29e Assemblée mondiale de 1976.

*** EXEMPLE DE L'IMPACT BÉNÉFIQUE DE L'EAU SAINE**

En 1962, le gouvernement japonais soumettait un rapport à l'OMS dans lequel on faisait état de l'impact bénéfique de l'approvisionnement en eau saine de 30 régions rurales. Après l'installation des équipements adéquats, les résultats suivants ont été constatés : réduction de 71,5 % des maladies intestinales, de 64 % du trachome, de 51,7 % du taux de mortalité infantile.

* ÉLÉMENTS DE PROSPECTIVE

Au lieu d'un objectif mondial, l'OMS a suggéré, lors de sa 29e Assemblée mondiale de la Santé, en mai 1976, des objectifs régionaux pour l'approvisionnement public en eau dans les pays en développement pour la deuxième décennie des Nations Unies (1971-1980). Selon ces objectifs, le pourcentage de la population à desservir est le suivant :

Régions	Zones urbaines		Zones rurales
	Branchements à domicile	Fontaines publiques	
Afrique	45 %	35 %	35 %
Amériques	80 % *	15 %	50 % *
Méditerranée orientale	60 %	30 %	25 %
Europe	80 %	15 %	80 %
Asie du Sud-Est	60 %	30 %	35 %
Pacifique occidental	85 %	15 %	35 %
TOTAL	68 %	23 %	36 %

* Objectifs fixés par le Plan décennal de santé pour les Amériques.

* ESTIMATIONS FINANCIÈRES

Selon une estimation de l'OMS, le coût global par habitant pour l'approvisionnement en eau d'une communauté rurale variait en 1975 entre US $ 12 pour des puits avec pompes à main (Sud-Est asiatique) et US $ 72 pour des réseaux simples de distribution (Amérique latine et Caraïbes).

Aux prix de 1975, respectivement 6,5 milliards de dollars et 14,5 milliards de dollars seraient nécessaires pour atteindre les nouveaux objectifs régionaux proposés pour 1980 pour la population rurale et pour la population urbaine.

* CONFÉRENCE MONDIALE SUR L'EAU

Les Nations Unies vont organiser une conférence mondiale sur l'eau. Elle se tiendra à Mar del Plata (Argentine), courant mars 1977. Une partie essentielle de la conférence sera consacrée à l'approvisionnement en eau des zones rurales.

Dossier

Drinking water for every village

Choosing appropriate technologies

Martin Beyer
Adviser, Drinking Water Programmes, UNICEF

The entire philosophy of the programmes assisted jointly by UNICEF *and* WHO *for the improvement of environmental sanitation is based upon the premise that the provision of ample supplies of safe water and the sanitary disposal of excreta have a direct and far-reaching effect upon the health and well-being of rural populations. Indeed, it is believed that no other single measure can make a comparable contribution to the improvement of their health and standard of living. The choice of an appropriate technology depends on local conditions.*

In addition to the important direct effects of clean water in reducing enteric diseases, a supply of drinking water can provide multiple benefits of broad developmental value. Access to safe water improves the quality of life within entire communities and frees mothers from the burdensome task of carrying water over long distances. Its provision within convenient reach is one of the measures recognized and recommended by governments and agencies alike, as being important for the integration of women in development. Moreover, the provision of village water supplies can be a catalytic element for a widening circle of health-oriented and other cooperative, self-help, community efforts, such as sani-

Some of the material in this article is based on the *Manual for* UNICEF *assistance to potable water supply and environmental sanitation programmes*, preliminary draft, 21 April 1975.

Résumé en français « De l'eau potable pour chaque village, le choix de technologies appropriées », p. 121.

Resumen en español « Agua potable para cada pueblo, elección de tecnolog as apropiadas », p. 128.

tation activities, family food production, reforestation for domestic fuel supply, and local support of health and education services. Such efforts can contribute greatly to the delivery of simple preventive health care by giving the community the capacity to maintain a healthy environment for all its members.

Water supply and integrated rural development

Rural water supply in developing countries has only in the last decades received more systematic attention from governments, international, bilateral and non-government organizations. It has become increasingly recognized that the problem of rural water supply is closely linked to that of environmental sanitation, and that if any project is to be reasonably successful, the only possible approach is a multidisciplinary one. This means that not only must appropriate technologies be applied, but that they must also be linked to the other sectors of rural development, including the education of villagers on the significance and proper use of water supply and sanitation installations, however simple they may be.

In general, a single national organization is formed, to be responsible for all rural water supply. Wherever possible, the villagers are encouraged to contribute in cash to the installation, operation and maintenance of the water supply system. In areas depending on subsistence farming, where the necessary monetary means may be lacking, an input can be provided through the villagers' participation in the labour, such as the digging of wells, and the construction of pump platforms or installations around protected springs and public standposts. The planning and implementation of the project should be coordinated with the government authorities in the different sectors involved, such as planning, local government, public works, health, agriculture and education.

The choice of an appropriate technology

The question of selecting and applying a water supply technology in any given area of the world is thus one of proper integrated planning and implementation. It is difficult to establish a standard scheme, as the choice of the right technology, organization

and methods of implementation depends on the prevailing physical, socio-economic and demographic factors.

The sources of water differ widely. They may consist of sparse reserves in tiny cracks and fissures, such as those occurring in the Pre-Cambrian basement of northeastern Brazil and many countries on the African continent, or they may be abundant springs such as on the mountainsides of the Himalayas.

The demographic and socio-economic conditions similarly show great variations. The relatively small and scattered agglomerations in Central Africa are often strung out along the roads. They present a different setting from that of the clustered houses of Indian villages.

Thus each area in the world has its own set of parameters and problems requiring a solution of their own.

The design of any project should therefore:

- be adapted to meet the real needs of the population
- be realistically conceived in order for the government and other participating organizations to be able to implement it with the means and manpower really at hand
- be prepared within the framework of economic and manpower development planning
- take careful consideration of the economic and technological levels, social attitudes, and potential for development of the local population. The latter imply as one important element the education of the villagers, especially the children. Through them, knowledge of the benefits of water to their health, nutrition and living conditions can be spread to their families.
- be adapted in degree of complexity to the level of the villages in order to ensure adequate operation and maintenance.

Accessibility and water consumption

The accessibility of the safe water supply in relation to the households where it is to be used, is one of the crucial factors in enhancing its health and socio-economic value. Ideally, a piped water supply with one or several taps in each household is the obvious solution. In reality, in many, if not most of the pro-

grammes, other solutions have to be sought. The simplest of installations, a dug or drilled well (with one or several in each village), needs to be located not only from the point of view of accessibility, but also according to hydrogeological and sanitary conditions. In an intermediate stage, a simple piped water supply system with public standpipes is able to provide water in acceptable quantities at distances that are at least tolerable from a carrying point of view.

There are no standard figures for the spacing of such public standpipes, but as an example a recent survey from Libreville, Gabon, shows a mean consumption of 35 litres per person per day up to a distance of 200 metres. This mean then drops gradually to 10 litres at a distance of 800 metres.

The access route, especially if differences in elevation are involved, also plays a determining role in the distances considered acceptable. Another factor is the nature of the water point: whether it consists of an open well, a single hand pump, or public standposts with one or several taps. The ease in the operation of hand pumps or different types of taps is also to be considered.

An adequate supply for individual needs

The criteria for the quantities needed in order for the supply of safe water to be adequate also vary greatly according to the population to be served, the level of technology that can be utilized for producing the water, the availability of safe water, or—under extreme hydrological conditions—any water.

To the average body intake should be added the water needed for daily hygiene and household use, the washing of dishes, clothes, etc. In some cases, where conditions so warrant, the water quantities aimed at may even be larger in order to make micro-irrigation possible for vegetable and fruit gardening or small-scale farming.

In a Tuareg household in the Sahara, there may not be more than five to six litres available per person per day, barely sufficient for drinking and cooking purposes. At the other end of the scale, the industrialized countries show a daily per capita consumption of 200 to 300 litres or more. A tolerable minimum in a warm climate might be estimated at around 50 litres per day, including water for body hygiene.

Standards for drinking water

In view of the fact that the principal aim is to provide safe water for the population, the criteria for water quality should be set as high as possible. The WHO as well as a number of national governments have set well-defined standards for drinking water. These include the limits of physically, chemically and bacteriologically acceptable values. Sometimes the ideal values cannot be fully reached, but attempts should be made to come as close as possible to them.

The anticipated quality must be based on a realistic appraisal of local conditions and the possibilities for yielding safe water, given the technology available. In certain emergency situations, or in areas where the present level of technology has not yet made it possible to provide fully satisfactory sanitary installations, facilities should be designed in such a way that they can later be completed.

Environmental sanitation and health education

The protection of water installations from pollution is of utmost importance, and one of the reasons for combining a water supply programme with environmental sanitation, including the disposal of waste water, waste and excreta.

It is highly desirable that water supply and excreta disposal be undertaken simultaneously in each community. This ideal is, however, often found to be unattainable in practice. The need for a good water supply is obvious, and in almost every case villagers without such a supply are anxious to obtain it and very willing to cooperate in its installation. The equally important need for sanitary disposal of excreta may not be so immediately apparent to them.

Experience has shown that the general rise in environmental standards brought about by a safe water supply, coupled with the example and education provided by health workers, often leads to a later, but more enthusiastic, acceptance of an excreta disposal programme.

The installation of a water supply is also frequently accompanied by the problem of disposing of waste water, which is most

acute in compact, densely populated villages built on impervious soil.

In any case, where there are schools, health centres or buildings of communal use (including markets), the full range of sanitary improvements should be installed from the start. Apart from the obvious health implications for large gatherings, their presence will assist in obtaining the villagers' acceptance of sanitary facilities.

The world's water resources

Of a total estimated eight million cubic kilometers of fresh water in lakes, streams and the ground, only some 30 000 cubic kilometers per year might be regarded as available for use over the entire surface of the earth. In reality, the available quantity is much lower, since there are large areas with water occurrences which are uninhabited, while other areas with a dense population do not possess the corresponding necessary resources.

Only a small part of the total fresh water resources consist of surface waters. The majority of these must be regarded as *a priori* polluted and unfit for human consumption, unless treated. In developing countries, this is economically feasible only in cities, towns and larger communities. Thus ground water remains the most important source of water for human consumption.

The possibilities for the success and efficient operation of any water supply project based on ground water are greatly enhanced if there exist prior regional hydrogeological surveys and data on the location of water points (wells), based on geological and geophysical studies of the individual sites. There are many highly sophisticated methods available to aid such studies, but in many countries the organization, means and skills to carry them out are lacking.

Still, some of the most modern exploration techniques bear the promise of at least providing a short cut in the reconnaissance phase of many projects. Among such especially interesting new techniques is the computer-based interpretation of satellite images. This allows rapid coverage of large areas for the location of water-bearing geological structures at a cost which is only a fraction of that of aerial photo material.

The extent of existing reserves and the rate these are being replenished must also be measured. Certain desert areas of the world are underlain by large aquifers (water-bearing formations), into which water once seeped under climatic conditions more humid than present-day ones. Ages of 25 000-35 000 years indicate that such waters run the risk of being " mined out ", unless precautions are taken to regulate water production.

Exploration and studies also bring to light the physical, chemical and bacteriological properties of ground water. In some regions harmful substances (e.g. fluorides) may occur which generally would make the water unfit for drinking, even if treatment in some cases can improve the water quality. During installation, upon the completion of the facilities and regularly during their use, analyses of the water should be made.

Surface water

The normal pollution and frequent turbidity of surface waters require the installation and subsequent operation and maintenance of treatment plants. These processes mostly require a costly capital investment, a high operation and maintenance budget, and trained manpower.

However, some water treatment processes are relatively simple and can be utilized—provided that proper maintenance is kept up — for relatively small communities. This is the case of slow sand filters which are basically basins with a layer of sand through which the water is filtered from above and drained through a gravel layer at the bottom. Also available are simple small-sized " package " plants with a combination of units, including flocculation, filtration and disinfection, such as those installed in villages of 1000-2000 inhabitants in Thailand.

For domestic use there are certain simple measures and devices that can be used, such as home-made charcoal/sand filters (the " canari " filters of West Africa). Boiling is the best way of rendering water safe. Disinfection by chlorine or iodine are also good measures, although with certain limitations as to the former (not effective against all organisms).

Rainwater

For areas which suffer great difficulties in obtaining water from underground or surface resources, the solution is the catchment and storage of rainwater, even if the rainfall is relatively scarce and intermittent.

Either roofs or specially prepared and protected areas on the ground can function as catchment areas. Water loss through infiltration can be countered by covering such areas with plastic sheets, bitumen or linings of cement/soil mixtures. An important aspect is storage. A covered storage is indispensable in order to protect the water from evaporation and pollution from outside sources.

In certain parts of the world, such as the Mediterranean countries, rainwater catchments were being constructed already thousands of years ago, sometimes on the ground, sometimes utilizing the roofs of buildings. In other parts of the world attempts are presently being made to adapt indigenous architecture to provide rainwater catchment and storage installations, as in the case of the famous villages of the Dogon in the dry Bandiagara plateau in central Mali. The inner walls of their tall granaries can be easily lined with cement or plastic sheets and filled with rainwater collected on the flat roofs.

Other simple constructions for the storage of rainwater have been developed recently in Botswana, Senegal and the Sudan, which seem promising and may provide water where there are no other possibilities at a low per capita cost. An increasingly utilized means of storing rainwater from large natural catchment areas is the construction of sand-and-gravel-filled dams from which water is extracted through a shallow well in the deepest part of the dam. Such a construction has the advantage of also providing good filtration; however, it may be rather costly and require equipment such as for public works.

Spring water

Spring water can in many cases be used without prior treatment, if the springs are properly protected by suitable concrete or masonry constructions with drainage pipes or screens in the ground.

Springs occur particularly in mountainous or hilly terrain. There are many areas in humid parts of the tropical zone, where springs flow consistently throughout the year and can be used for village water supply.

Although the construction of spring protections does not present great difficulties, problems may arise in the upkeep of protected springs, such as the habit among many populations to plant or leave trees growing close to the spring for shade as well as sometimes for religious reasons. Once they have gained a certain size, their roots frequently crack the masonry around the spring.

In order to lift water from springs with an abundant yield (or from surface sources) to higher ground, a design more than a hundred years old is now experiencing somewhat of a revival, the hydraulic ram.

Ground water

The techniques, ancient and modern, for reaching the water resources in the ground range from the simple digging of wells with hand tools to the excavation of the famous ghanats of Iran and Afghanistan, underground galleries which can extend many miles.

The predominant method, however, is the drilling of wells. The first known use of this method was by the Chinese more than 2000 years ago: they developed a simple percussion drill operated with human power. The methods currently most utilized are listed in the annex, which sets out the characteristics and applicability of each method.

The figures given in the table for the construction of water wells correspond to those incurred in implementation in the field, but not including administrative overhead. They only serve to give an idea of the cost proportions, as in reality the costs vary greatly in relation to an intricate pattern of interdependent factors.

Among major government programmes for village water supply around the world, there are two which from a technological point of view are especially interesting. Both are being implemented on a large scale with UNICEF assistance. At the same time they represent two widely contrasted types of technology, each adapted to the special conditions of the respective country.

An adaptation of local village technology: the Bangladesh programme

One is the programme in Bangladesh, where the plans foresee a total of 310 000 shallow wells to be sunk during the period of 1972 to 1980. These wells are " sludged " down into the soft clays and sands of the Ganges delta formations by local contractors. With the help of a bamboo scaffolding and lever, a galvanized iron pipe is " pumped " down into the ground. In a one-day shift the four- to five-man group of drillers manages to drill to a depth of 30 metres, withdraw the iron pipe, and replace it with a PVC screen and pipes for the final installation of a hand pump and platform on top of the well. This is an adaptation of local village technology, with the utmost simplicity but at the same time with high efficiency.

Special technologies: the India programme

The other programme, which is technologically very different, is being carried out in the hard rock areas of India. More than 70 % of India's surface is underlain by crystalline and semi-hard lava and ash rocks. The ground water is found in the bottom portions of pockets of loose, weathered rock and in the joints and fissures of the bedrock. The periodic replenishment of ground water reserves by the monsoon rains causes great fluctuations in the water table. Large parts of the country are areas with frequently recurring droughts and ensuing famines. Lacking the necessary equipment and techniques, the village populations are at great pains to extract any water for domestic use, other than from large open wells. These can be excavated only to limited depths, often not reaching the water table level of the dry season.

The drought in the Indian states of Bihar and Orissa in 1966-67 prompted the first utilization and later development of special technologies for the large-scale drilling of narrow diameter or " slim hole " wells (four to six inches in diameter) to average depths of 30 to 50 metres for the installation of hand pumps or submersible electrical pumps. Compressed air drill rigs are used with a slowly rotating percussion drill bit, driven by a pneumatic piston (now mostly encased in a motor unit immediately above the bit, called a " down-the-hole hammer ").

The experiences in India encouraged a number of manufacturers to adapt their equipment to the much greater depths needed.

They also developed simpler and more rugged machines in order to make them less dependent on often distant repair facilities and to reduce operation and maintenance costs. This has given rise to an increasingly important national manufacture of drill rigs and related equipment.

Although the average depth of water wells in most hard rock areas in the world would not exceed 50 metres, in some places deeper wells must be dug. There are now drill rigs which can reach depths of 200 metres with the advantages of rapid drilling (30 to 50 metres in one shift) and relatively light-weight equipment which permits mobility and easier access to remote well sites.

An interesting application of compressed air techniques is the revitalization of large open wells into which the flow of water has been blocked when the fissures which are normally water-bearing successively become clogged with finer mineral matter. The flow can be restored or improved by drilling new holes with simple pusher leg or hand-held rock drills and integral drill steels.

New techniques for water lift and distribution

The technology for water well drilling and construction is adequately developed. The question of water lift, however, still presents problems, as the majority of village water well projects throughout the world still have to rely on human or animal power to lift the water to the surface.

A major item in any village water project is therefore the hand pump. Until recently, with the exception of some very expensive constructions, most of the hand pumps available on the market were generally cast-iron pumps, originally designed for single households. Of these, the shallow well (suction) pumps are used for depths of less than seven metres. Deep well pumps for greater depths lift the water by means of a piston in a pump cylinder beneath the water table. It is only very recently that radically new designs have appeared, such as the full-hydraulic pedal pump, developed at the Interafrican Committee for Hydraulic Research in Ouagadougou.

Other innovative technological approaches include research in utilizing wind energy. The use of traditional windmills with horizontal axles for pumping works very well in regions where

there is a fair amount of wind throughout the year, and where there is appropriate maintenance. Experiments are now under way on wind motors with vertical axles.

Solar energy is another source much looked to for the future. There are solar pumps working on a trial basis, mostly built for heat transfer by butane gas to steam engines, or submersible pumps run on electricity generated from solar cells. In both cases the sophistication of the equipment and the prices are still forbidding for other than experimental use. Very recent research and the development of simple solar panels at a fraction of the cost of solar cells (presently about $ 30 per watt) may prove of interest for the future.

Another potential use of solar energy is for the production of fresh water from sea water in simple solar stills. However, such installations are costly in relation to their output and also require much care and maintenance. Except for some experimental installations, there are as yet only a few larger ones of " greenhouse " type in full-scale operation to supply larger communities, notably in Greece, Spain and Algeria.

In many countries where transport is a problem, more and more pipes of PVC or other lightweight plastic materials are being installed. Research has recently gone into the question of " no-waste " faucets, which prevent waste in public systems through excess overflow of valuable and scarce water.

Equipment and materials for water supply and sanitation are being increasingly manufactured in developing countries. A local technology has often developed, which can be much more appropriate to the actual needs of the country than products that are designed and manufactured in industrialized countries. The development of a domestic water supply on a large scale can thus be accompanied by the promotion of a national technology and industry which opens employment opportunities to local manpower and ultimately becomes an addition to the economy, both on the national and family level (Pakistan, Bangladesh, India, Tanzania, Ethiopia).

Operation and surveillance

It is essential to build up a suitable organization which will ensure the competent construction and efficient, foolproof oper-

ation and maintenance of completed facilities and the effective surveillance of drinking water quality.

Operation is the lesser of the two problems. With the exception of mechanically driven pumps and simple treatment works, the operation is carried out by the users themselves. Provided that the villagers have been taught to correctly use and adequately protect the equipment and that some surveillance can be maintained by a sanitarian or village head, there is no reason to anticipate any trouble in this direction.

The operation of a mechanically driven pump, chlorine doser or slow sand filter is usually entrusted to a villager, who will have received his instruction and simple training from the supervisor during the construction period. When the number of installations employing such attendants is sufficient to warrant it, some provision should be made for more formal initial and refresher training either in an attendants' school, or by the occasional visit of an instructor who will provide in-service training.

Organizing an effective maintenance system

The size of a village installation will normally be insufficient to justify the employment of skilled and experienced men as plant attendants. Maintenance also necessitates stocks of spare parts and the necessary tools and equipment to fit them, which would be most uneconomical for every small installation to hold.

As soon, therefore, as a number of water supply installations have been constructed within an accessible distance, a central maintenance organization in the charge of a skilled mechanic (or mechanical engineer if large enough to warrant this) should be set up. This would comprise workshops and stores, stock spares, be responsible for regular inspection of all equipment within its area of operation, and operate a simple system of accounting to enable the cost of maintenance to be allocated to the appropriate village installation. It could also be made responsible for supervising their operation, if so desired, including the supply of fuel and chemicals to individual projects from bulk storage. Minor plumbing maintenance (e.g., replacement of tap washers) and repairs to broken concrete (e.g., well aprons or latrine slabs) could also be undertaken. Payment of the cost of running the

maintenance centre would depend upon the financial system operating in the particular country, but would have to be worked out in advance of setting up the organization.

Recurrent costs

Leaving out the question of capital repayment, which is rarely possible in a rural project (in any case the villager will usually have already contributed to the initial cost), the following are the types of cost which should be individually assessed:

1. *Renewals:* particularly for machinery and equipment with an estimated life of 15 years or less. The payment of an annual amount into a sinking fund will ensure that money is available for replacement when required.

2. *Operation:* labour; fuel and oil, or electricity; chemicals; transport.

3. *Maintenance:* proportion of cost of running central maintenance workshop; spares; tools and equipment; cleaning materials. Regular painting and maintenance of buildings and structures must also be allowed for.

More than a problem of technology

At the end of the production line for safe water, whether it is the spout of a hand pump or a public standpost, there stand children, women and men. The chances for improving their health and social conditions as a result of the installation of facilities bringing them safe water much depends on how they use these facilities. It is symptomatic of the only recent recognition of the importance of a more consumer-related orientation that the vast literature on water supply includes only a few publications on how the consumers see and approach this vital problem.

International, bilateral and non-governmental organizations together with governments now regard the technology of safe water supply as only part of the problem. They increasingly recognize the importance of helping the people served to understand the benefits of the water supply, and the need to win their cooperation to keep the installations operating to improve their own living conditions and those of their children.

Annex

REMARKS TO TABLE « GROUND WATER EXTRACTION FOR VILLAGE WATER SUPPLY »

All figures are only examples, as the ranges in cost can vary greatly.

(3) An arbitrary estimate of several factors affecting drilling rates and equipment wear.

(8) Number of eight-hour shifts needed to sink a 50-metre well.

(9) Relates to the accessibility of the equipment to the well sites :
High : over 6 tons
Medium : under 6 tons
Low : can be transported by porters.

(10) Training background needed :
High : specialized training and long experience
Medium : indigenous experience and on-the-job training
Low : indigenous experience.

(11) Hypothetical example, based on 50-metre deep wells for potable water in villages with 1000 inhabitants.

(12) High : trained specialists needed
Medium : villagers with occasional outside assistance
Low : can be managed by villagers.

(13) The majority are examples from UNICEF-assisted government projects.

GROUND WATER EXTRACTION FOR VILLAGE WATER

Method / Characteristics (1)			GEOLOGICAL FORMATION			CONSTR	
			Formation stability (2)	Hardness or abrasivity (3)	Particle size (4)	Type (5)	Maximum depth (metres) (6)
I A	EXCAVATION Manual: vertical		Unconsolidated	(Low)	Fine to gravel	Dug wells	80
B	Manual: horizontal			(Low)	Fine to gravel	Ghanats	kilometers
C	Mechanical: vertical		Unconsolidated to consol.	All	All	Dug wells	80
D	Mechanical: horizontal			All	All	Galleries (adits)	> 1000
II E	DRILLING Wellpoint (driven)		Unconsolidated	Low	Fine	Tubewells	20
F	Sludging						40
G	Jetting						50
H	Percussion	Cable tool	Consolidated to unconsolidated	Medium to high	All	" Open " and screen wells	200
I		Air hammer		High (all)	All		200
J	Rotation	Coring		All	All	Exploration only	> 300
K		Rotary (fullbit)		Low to medium	All except hard gravel	" Open " and screen wells	> 300
L		Auger	Unconsolidated	Low	Fine to medium		100
M		Bucket		Low	Fine to medium	Large diameter wells	30
N	Combination (H to L)		Consol. to uncons.	All	All	" Open " and screen wells	> 300

SUPPLY : METHODS AND CHARACTERISTICS

UCTION		TECHNOLOGY		COST IN US$	OPERATION & MAINTENANCE	PROJECT EXAMPLES
Diameter (mm)	No. shifts per 50 m	Equipment weight	Sophistication	Per capita for 50-m well	Complexity	
(7)	(8)	(9)	(10)	(11)	(12)	(13)
> 1000	200	Low	Low	5	Low	Vietnam: shallow wells
> 800	100	Low	Low	(10)	Low	Iran: gravel outwash from mountain slopes
> 1500	50	Medium	Medium	15	Medium	Sahel: deep wells
> 1800	10-50	Medium to high	Medium to high	50	Medium to high	Cap Verde: volcanic slopes
50-200	10	Low	Low to medium	7	Low to medium	Liberia: pockets of loose material
35-50	1 (30 m)	Low	Low	1	Low	Bangladesh: Ganges delta
50-100	2	Low to medium	Low	1	Low to medium	Indonesia: river banks
150-600	25	High	Medium	10	Medium to high	Afghanistan: valley fills
100-200	1	Medium	Medium	5	Medium	India: " hard rock " areas
40-150	5	Medium	High	20	(Medium)	Ethiopia: hydrogeological fill sampling
> 150	1	High	Medium to high	5	Medium to high	Surinam: coastal villages
100-150	1/2	Medium	Medium	2	Medium	Sudan: Sudd swamp area
1000	2	High	High	20	Low to medium	Upper Volta: weathered soil pockets
> 150	10	Medium to high	Medium to high	10	Medium to high	Bolivia: boulders above bedrock

Dossier

Towards a user-choice philosophy in rural water supply programmes

Anne Whyte
Associate Professor
Institute for Environmental Studies
University of Toronto

In bringing a rural water project to an area, we not only introduce new techniques, but also new concepts about the relation of water to health and disease, and new forms of organizing the community. This process can be one of absorption rather than imposition.

A user-choice approach to rural water projects means allowing the user to decide, as far as possible, the type of system to be installed, or indeed, whether one is to be installed at all. It is a philosophy which involves self-determined rather than imposed social change.

Rural water projects have been dogged by lack of success. Many have failed because of technical and organizational problems, a lack of trained manpower, and a lack of mutual understanding on the part of both villagers and engineers. It is difficult to design a project that will be successful and maintained long after the engineers have left the village. It is even more difficult to create a system which will be diffused out from the original village and be copied, with a minimum of initiative from the outside, by surrounding settlements. The two problems are linked, for if a project is successful in one village—if it fulfills needs and provides benefits as perceived by the users themselves—it will spread to others.

Paper presented at the International Development Research Centre Seminar on Rural Water Supply and Sanitation in Lausanne, 29 May - 1 June 1973.
Résumé en français « Pour une politique de détermination du type de programmes d'hydraulique rurale par les intéressés », p. 121.
Resumen en español « Hacia una política de determinación por los usuarios de los sistemas de abastecimiento de agua », p. 128.

Rural water projects require technical expertise, equipment, and the allocation of limited funds and manpower. They also involve the assurance that at least part of the costs will be paid by the users. It is not possible, therefore, to allow users complete freedom of choice. Rather the strategy is one of structuring their choice—limiting it to what is practicable in design, financial and organizational terms, and increasing it by making them aware of a wider range of alternatives. An understanding of the user's environment and perceptions is essential.

Trends towards a user-choice approach

Considerable progress has already been made in the direction of a user-choice approach. Technological improvements have increased the reliability of components and increased their range at the less expensive and less sophisticated end of the spectrum. [1] The development of a "catalogue" of standardized components for water extraction, storage and distribution allows each system to be individually tailored to the needs and capacities of a community, while minimizing the costs of skilled manpower and the stock-keeping of components. [2] Both these developments actually increase the choices open to users.

A parallel movement towards a user-choice philosophy has taken place on the organizational side. It is characteristic of rural water projects now that local participation is seen as almost a prerequisite for success. [3] Partly to reduce costs, but also to reduce the chances of the system falling into disrepair and misuse after the engineers have left, local people are involved in the provision of labour, local materials and/or cash. Local officials organize labour and the collection of payments and a local man

1 For example, the simple cement-lined storage tanks for catching rainwater used in Botswana. See Bateman, G. M., Intermediate technology and rural water supplies, *Proceedings of Conference on Rural Water Supply in East Africa*, University of Dar es Salaam, 5-8 April 1971.
See also *Interim report on a research project on low-cost water technologies*, Intermediate Technology Development Group Ltd., London, 1972.

2 Ludwig, M. and Jorgensen, A. W., *Package approach for development of village water supply systems*, IDRC, Rural Water and Sanitation Seminar, Ottawa, 17-18 August 1972 (Working Paper N° 10).

3 See Donaldson, D., Rural water supplies in developing countries, *Water resources drill*, N° 2, 1972, pp. 391-398, for a discussion of the elements of successful programmes.

is often trained to maintain the system and carry out simple repairs.

The third movement towards a user-choice design is the increasing emphasis being placed on rural water and sanitation as an integral part of a broad health education programme and the provision of medical facilities. [4] It is now recognized that for people to accept modern improvements in their life, they must be able to understand them and to come to value the benefits they bring. They must in particular understand the relationships between water quality and quantity, and health and hygiene.

Each of these movements towards a user-choice design will be discussed, especially as to how one might push them even further while moving towards an integrated approach. I shall draw upon my experience in small villages in southern Mexico and southwest Iran to provide background material for the ideas put forward. Both areas are among the least developed within their countries, both are semi-arid, and both have severe water, sanitation and health problems.

Traditional user-choice systems

My starting point is that rural areas already have user-choice systems. Each area and each community, in some cases over thousands of years, has developed a traditional user-choice system that is finely adjusted both to the forms and processes of the physical environment and to the social and economic context of the community. The traditional user-choice system is based on detailed knowledge of the area and the community, and accords with the users' values and understanding. We would do well, therefore, to examine traditional user-choice systems in order to design an improved system that embodies an understanding of water use, water organization and water values. Without this understanding, user-choice systems will have little chance of success.

4 This is stated as part of the objectives of rural water development programmes in Columbia, Argentina and Peru, for example.
See in particular the publications of the Servicio Nacional de Agua Potable (SNAP) of Argentina on *Elementos de educación sanitaria* (1971) for a detailed and comprehensive approach to rural water and health education.

Traditional water use systems are multi-source

Traditional water use systems are characteristically multi-source. This is often a response to the constraint of no one source being adequate for all needs. It is also a characteristic means of reducing the risk in an uncertain environment. Where sources fluctuate in the quantity or quality of their supply, alternative sources of supply reduce the risk of total failure. The use of more than one source also reflects the different values placed upon the dimensions of water quality, water quantity and convenience of location, for the different purposes served by water.

For example, contrast the use of water in Mexico and in Iran. In the valley of Oaxaca, Mexico, drinking water is provided by unlined wells between three and ten metres deep located within the village. The same source is used for ritual bathing (for example, a mother after the birth of a child). However, for ordinary bathing and for washing clothes, a stream or seep which may be several kilometers away is used. The washing of clothes, particularly, is a communal activity: the women go weekly to a specific spot to work and talk to their friends for the day.

In southwest Khuzistan, Iran, recently settled Lurish nomads use canalized water flowing through the compounds and village streets for washing pots and clothes. They walk a kilometer or so out of the village to bathe at the ceremonial bathhouse located on a stream. And they obtain their drinking water from a spring 50 kilometers away. It is brought across the desert plain in an old truck, and is paid for by the gallon. Whenever it rains, the route is impassable, and drinking water is obtained from natural rainwater puddles as far out from the village as is deemed necessary to avoid the worst contamination.

Water use, an element of the socio-cultural system

Here are two very different patterns of water use, each reflecting the different values put upon water sources for different purposes. In both cases the closest single source would be adequate in quantity for all purposes. However, in Oaxaca the structure of peasant society is such that visiting between neighbours is considered purposive rather than casual; privacy within the home is valued, yet social interaction is desired. This is satisfied partly by building up a network of small debits and credits between house-

holds so that visits are made for the purpose of borrowing or being paid back, or buying an egg or a kilo of corn. It is also satisfied by communal activity in public places, such as washing clothes. To provide water for washing clothes within private dwellings would thus, if used, have repercussions on the social interaction and the ties between households that form a basis for the village social structure.

In Deh Luran, Khuzistan, the women carry out a larger proportion of their tasks within the confines of their compounds, rather than using them as a reason for social interaction. The local stream would be adequate in quality for drinking water (more so than the puddles used) if water were extracted above the village. Its taste, however, is sulphurous, and so the villagers prefer to pay for unreliable supplies hauled the great distance of 50 kilometers. This water is also bought by nomads camping within 15 kilometers of the distribution point in Deh Luran. In fact, a survey of the nomad encampments scattered across the plain showed little locational preference for natural sources of water for domestic use.

An adaptation to the physical environment

The use of several sources for water is not only intimately bound up with the social structure and values of the community. It also reflects a detailed knowledge of the physical environment and the adoption of a variety of techniques and materials over a range in size of water system. Even the smallest of sources are used (for example, a well with a yield of 500 litres per hour or a stream with a discharge of 0.5 litres per second). The simplest of materials, such as stone and branch dams or bamboo aqueducts, are also employed. Variety and ingenuity make up for size and sophistication with a minimum of environmental impact or social consequences. The lesson to be drawn is that it may sometimes be better to design a project in which the aim is to improve the water supply from several different traditional sources instead of concentrating on the provision of a single, larger alternative source.

A variety of traditional organizational structures

Another important feature of traditional user-choice systems is that they show a wide variety of organizational structures. This is easily recognized at the cultural level—for example, the

differences between Iran and Mexico. It is less appreciated at the local level where it is nevertheless important and, I believe, is crucial to our progress in developing successful user-choice alternatives to traditional systems.

The valley of Oaxaca, for example, is a natural geographic and administrative unit for a rural water programme, comprising some 700 square kilometers of valley floor with 256 rural settlements. The physical environment is very varied and water is traditionally obtained from many different sources using a range of techniques. [5]

The design of any overall scheme or series of projects within it would take account of this physical variation. It would be less likely to allow for the differences that exist in social structure between communities, because all the villages are nucleated, agricultural peasant communities similar in appearance and sharing much of a common history. Within this general cultural similarity, however, the different patterns of social organization which exist are significant for water use and control.

Some villages, particularly those using canal irrigation, have a traditional formal organization for water use; other villages using floodwater or wells do not.

Even within the villages using canal irrigation, its exact form varies. The organization may consist of an elected committee with president, secretary, treasurer and several other members who serve for one, two or three years. It may be a single water controller, who combines the duties of daily water allocation, inspection, organization of maintenance and construction labour, and arbitration of water rights. Sometimes water is paid for according to the amount used; sometimes it is paid for at a fixed rate per user; sometimes it is free. Where several villages share one river or one canal, the organization may extend to the intervillage level with complex divisions between communities on a time, water discharge, water use, or fixed cash rate basis.

In contrast, farming communities using floodwater characteristically control water on an informal basis of individual responsibility, whereby those that join in the effort of diverting and canal-

5 Kirkby, A. V., The use of land and water resources in the past and present valley of Oaxaca, Mexico, *Memoirs of the Museum of Anthropology*, N° 5, University of Michigan, Ann Arbor, 1973 (now publishes under Whyte).

izing water enjoy its benefits. In villages using wells, no effective formal or informal water control organization usually exists.

Social patterns and water control

Two points are important here.

One is that these villages have developed very different patterns of social organization both in direct relation to water control and within the structure of village life in general. The degree of support for communal labour *(tequio)* on village land and community projects, the strength of risk-sharing social mechanisms like the *guelaguetza* reciprocal exchange of goods and labour, and the value placed on the *cargo* hierarchy of religious and civil offices vary greatly between communities. These differences are as real and important as the range in the physical environment. They imply that no one organizational form is appropriate for all villages, just as no single rigid technical design could be applied to different physical settings.

The second point follows from the first: the establishment of cooperatives, self-help or elected committees will not be successful in all villages even within a small area, and the existence of a specific organizational form for one aspect of village life may not necessarily indicate that the same organization can be transferred to another aspect. In the valley of Oaxaca, some villages which already had a formal committee management structure for water seemed to more readily be able to use a similar organization for the development of, for example, agriculture or an electrical supply. Villages which had no communal water control were less able to share and maintain a communal tractor and preferred to individually hire the services of a privately owned one. In another village, groups of farmers who cooperated in sharing water for their fields could not cooperate in sharing the use of a tractor on the same land.

My main concern is that the texture of organizational and social differences within an area may be very fine. It is thus difficult to generalize, and a standardized approach to the organization of rural water is as unlikely to succeed as an inflexible technical "package". It is, however, characteristic of water supply projects that despite flexibility in the technical design of a system, a single

standardized organizational structure is imposed on the community at the outset. [6] This is usually in the form of an elected committee which collects dues and organizes cooperative labour.

The process of choice making

There are two ideas which should be put forward here. One is that the process followed by communities to decide between choices varies, and that this is significant for the degree of commitment felt by the individual towards the community decision. The second is that traditional forms and beliefs are part of a continuous choice process. They both result from as well as give rise to choices. It seems to be an attitude common to rural water literature and also to other fields that tradition is a block to change. But tradition is not static; it undergoes change through the very agents that uphold it. Recognition of this process may help us to utilize traditional processes of change for modern forms of change.

Different styles of community decision making

Among nomads in Iran

Nomads make choices in relation to water every few days—that is, whenever they move camp. [7] All the families in the group are involved in the decision, but at no point is there an assembly of people. Indeed, it is very important that an assembly not occur, because it would allow each view to carry equal weight; it would require opinions to be made explicit and associated with particular individuals and it might give rise to a confrontation of views—all of which are carefully avoided. Instead, as soon as the camp has been pitched, individual members will consult with one another in pairs and small groups, discussing the probability of water and pasture in various places. They are careful not to commit themselves to a clear alternative: they will always follow one proposal with the opposite point of view. It is rather a pro-

6 See, for example, the official publications on rural water development in Columbia, Argentina and Peru.

7 The process of decision making among nomads in southern Iran as well as other aspects of their life is well documented in Barth, F., *Nomads of South Persia*, Allen, London, 1964.

cess of feeling out a consensus. Sometimes no clear common view has emerged after hours of discussion and participants retire to bed not knowing whether they will strike camp the next morning.

The discussions are not entirely structureless, for although the camp leader has no means of imposing his opinion on the other tent households, he can influence the decision through his family network. If he believes strongly in a particular choice, he will go to the tents of his sons and other close relatives and let them know his view. They in turn will disseminate his opinion in their discussions with their relatives, and so on through the kinship network. If there is a lack of agreement anywhere in the camp, it will not be revealed by confrontation; the discussion will continue until a consensus is reached. Thus each individual is committed to the group choice and will conform as an individual to that choice. This process is vital to the cohesion and viability of the nomad group.

In a Mexican village

Decision making in a Mexican peasant village is based on the very act which Iranian nomads so carefully avoid: an assembly of people; the confrontation of views; explicit, vigorous argument of opinions; and public commitment by individuals to specific choices before consensus is reached.

A government project, for example, will first be discussed informally and formally between the village leaders. Individuals will bring what influence they can to bear on the selection of their favoured choice, but there is a common attempt to reach an agreed set of recommendations on the issue to be put before the general assembly of the community (usually consisting of all adult males). One of the leaders describes the issue and the alternatives to the community assembly. He then presents the recommendations of the leadership. If the general assembly provides contradictory views, the leaders argue in defence of their opinions. Usually their views hold sway and a consensus is eventually reached.

While individuals participating in the consensus agree with the outcome as a community decision, their degree of commitment to it as far as their individual behaviour is concerned may vary considerably. Miller discusses two examples of lack of individual commitment to community decisions in a village in Chiapas,

southern Mexico. [8] The first decision was to build a medical post, which involved the village in the provision of labour and local materials with government support for equipment and personnel. The second decision was to build latrines for each household. In both cases a decision-making process similar to that described above took place with the addition that in the case of latrines, each man signed his personal agreement to build one. Participation in a community decision to provide the facilities did not commit individuals to conform in using them. Only 59 % used the medical post instead of traditional cures, and only 65 % of those who had private latrines actually used them.

Traditional attitudes and social change

This distinction between individual and community choice is part of a more general issue in the design of user-choice systems. That is, for what level of user are we designing? At one level, the user is the national or regional government; at the next level, it is the community; and ultimately it is the individual. Rural water projects are designed to accord with the needs of governments and it may not be possible ever to divorce the supply of rural water from government policy, especially in the area of planned social change. This is strikingly so in areas like Tanzania and Iran where water supply has been part of a social policy to settle and concentrate shifting, dispersed populations. It is also, though less obviously, true in Mexico, where water control is taken out of the hands of traditional village authorities and placed in those of officials who are directly responsible to the central government. [9] Whether intended or not, such a policy will inevitably contribute to the fall of local autonomy and community social structure.

The emerging strategy of designing user-choice systems is aimed at the community as user and decision maker. Its success, however, will ultimately depend on how it fulfills the perceived

8 Miller, F. C., Cultural change as decision making, a Tzotzil example, *Ethnology, IV*, N° 1, 1965, pp. 53-65.

9 Lees, S. M., Socio-political aspects of canal irrigation in the valley of Oaxaca, Mexico, *Memoirs of the Museum of Anthropology*, N° 6, University of Michigan, Ann Arbor, 1973.

needs of individuals and how it is used by them. The process of change is a delicate one in which community leaders sit astride two world views, two sets of beliefs and practices. If they move—or are moved—too rapidly towards the Western view, they may well persuade the community to install a rural water project or a medical centre but they will not have changed the way the main body of villagers perceive their environment. Ultimately, it is the set of beliefs, values and knowledge that an individual holds that organizes the way he adopts and uses new ideas and new technology.

Beliefs about water, health and disease

In discussing water use, water organization and the process of decision making, up to this point I have been emphasizing their detail and variation. The same variety is also true for the beliefs and practices of rural people in relation to water, health and disease. However, it is also relevant here to stress the similarities in traditional concepts between cultures and areas in order to show their relation to social structure. In this way, I believe it is not only easier to understand why some innovations fail, but also how they might best be enabled to succeed.

Modern and traditional concepts of health and disease differ in two important respects. The first is that in traditional views, disease and illness are related to religious, magical and moral concepts instead of just hygiene and aesthetics. The second is that whereas modern concepts of disease are focused on a knowledge of pathogenic organisms as causal or contributory, traditional medicine is unaware or less concerned with a germ theory of disease. It concentrates less on pathogenic cause and more on the idea of the translation of a substance from one part of the natural environment to another.

These concepts are intimately bound up with attitudes towards the environment and man's relation to it. Modern views tend to set man farther apart from the rest of nature than do most traditional views, in which the environment is likely to be seen as personal, centred on man and endowed with some of his faculties. At the same time, man is not so much set above nature that his spirit cannot exist in, and be transferred to, other animals, plants

or even rocks. Events are more likely to be explained in terms of good or evil; the physical environment is often endowed with intelligence and the power to discern truth as well as to judge men. It may be seen as able to appreciate and respond to gifts, symbols and human speech.

Within this context have developed many of the traditional beliefs and practices that now appear to confront medicine and hygiene. Disease may have a moral cause. The illness of an individual may be related to that of a tree or animal which shares his spirit; thus reviving the tree will bring good health to the man. Cures will be effected instantly once the disease-causing substance or spirit has been ejected from the body, and a return to good health needs to be accompanied by communication with the natural environment in the form of chants, symbols, purification or sacrifice.

Associated with beliefs about illness are sets of proscriptive rules on how to avoid it, in both traditional and modern societies. Often these rules are expressed in terms of separation of certain categories within one aspect of life. It may be certain kinds of food that cannot be brought into contact with man, or with each other. [10] It may be one category of people who bring defilement or illness to another. [11] For the North American Yurok tribe, the categories of separation are focused on water: good water must not be mixed with bad, nor urine with river water, nor sea with fresh water. What these diverse rules have in common is that whatever their medical rationale, they associate health and illness with morals and religion. They also provide clarity and definition for a moral code by making a vague moral issue an unequivocal case of right or wrong. And in order to decide the issue, in many cultures the physical environment is brought into play as an arbitrator and marshaller of public opinion, and a deterrent to wrong-doing. [12]

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10 For example, dietary rules about eating cloven-hoofed animals and not wild ones, or eating meat products separately from milk products.

11 The caste system in India is probably the most elaborate example. More widespread are marriage proscriptions between kin and the almost universal incest taboo.

12 Mary Douglas provides great insight into the relationships between morals, religion and pollution laws. See Douglas, M., *Purity and danger*, Routledge and Kegan Paul, London, 1966.

The function of tradition in social structures and change

While beliefs and practices about health and disease can be seen as arising from a common conception of the total environment, they have an important social function in holding the organization of the community together. In many traditional societies they also link man with the rest of nature in such a way that when social institutions fail to maintain cohesion and conformity within the group, the powerful forces of the environment can be brought to bear on the situation.

Adherence to these beliefs and conformity to traditional laws thus ensures the continuity of the social group. Modern concepts which oppose traditional beliefs or make irrelevant the proscriptive rules, are thus not changing or threatening merely an isolated practice, but may be undermining the whole value structure which holds the group together.

Traditional beliefs and practices serve therefore to bind the group together as well as to bind its members to a set of absolute values. Their purpose is as much social as spiritual. As long as they are effective in maintaining the group, as a group, what they actually dictate can change. Traditional concepts therefore contain the capacity for change. Indeed, the very specification of a rule, by allowing for the eventuality of breaking it, makes that possibility conceivable. [13] Douglas also argues that where proscribed practices are associated with easy purification for infringing them, the whole complex of traditional beliefs acts not to impose conformity but to encourage individuals to risk deviation and change by being "a kind of safety net which allows people to perform what, in terms of social structure, could be like acrobatic feats on the high wire". [14]

Implications for rural water supply

What does this imply for rural water improvement? First, that in designing a user-choice system we are not only concerned

13 Thus, for example, the strict rules and fear among the Bembu concerning adultery were originally designed to uphold the institution of marriage. But by being able to purify themselves from the sin of adultery, they now use the same rule as a rationale for divorce and remarriage.

14 See Douglas, *op. cit.*, p. 137.

with water as a commodity but as a focus for a whole set of beliefs, values and rules. In bringing a rural water project to an area, we are bringing not just new techniques, but new concepts about the relation of water to health and disease and new formats for organizing the community. In order to improve the health and well-being of rural people, we believe that many of the old traditions will need to be transformed into modern concepts and practices of hygiene.

However, the process can be one of absorption rather than imposition. Traditional value systems carry within themselves the capacity for change; and those members of the community whose role is to uphold tradition, such as the local healers, priests, elected and hereditary leaders, are also traditionally the main agents of change within rural communities. If we recognize tradition as a progressively changing body of beliefs and practices designed to adapt itself to the needs of the social group—that is, a *process* rather than a *form*—tradition itself can be adapted to, or used to bring about, desired social change as a movement which is indigenous, and therefore more likely to be successful.

From this brief look at existing user-choice systems, two main points seem important for the design of improved water systems:

1) one is that we are dealing with a set of pre-existing conditions which we not only need to take into account, but can learn from and use in the process of bringing about change;

2) the second is that where the two systems of practices, organizations or beliefs come into conflict, we should try first to adapt our modern system to the traditional one instead of the other way around.

Suggestions for the design of user-choice systems

From these considerations of traditional systems, what practical outcomes can be suggested?

1. *A catalogue of management systems*

One solution is to design a "catalogue" of standardized organizational components which will allow the user to select a complete management system that is tailored to the existing social and

economic structure of the community in the same way that a catalogue of standardized technical components allows the design of individual technical systems. Flexibility in organization at the community level could thus be made compatible with the requirements of the government or agency for reliability or organization and payment of cash. As an example, one such catalogue of management components could be suggested for the valley of Oaxaca, based on the existing variety of traditional practices, and allowing each village to choose a system that closely resembles its present one.

The development of such an organization "catalogue" for each regional or national plan would require the appointment of a social scientist in a parallel role to the present design engineer. His task would be to find out the range of management practices and social institutions that already exist in the area and the strength of their support by the communities as well as their potential for adaptation to a rural water scheme. He would then design standardized organizational components for various aspects of water management, such as the collection of dues, labour for construction, cash for repairs and replacements, and maintenance service.

Three parallel roles—those of a social scientist, a health education/medical expert, and an engineer—would be involved in designing, implementing and evaluating the total technical, management and educational components of a user-choice system.

The design of an organization component system such as is being suggested here involves a knowledge and understanding of the social structure of rural communities and their value systems as well as their demographic characteristics. Much can be learned from anthropological and ethnographic sources. In some areas, for example Mexico, another possibility for obtaining such data rapidly is to organize the compilation of a village book in each community. Its format could range from structured questions about the number of households or the sources of water they use for different purposes, to personal accounts and pictures of village life, traditional concepts and practices and the forms that village organization and social interaction take. The quality of such books would inevitably vary, but in total they could act as invaluable sources of material for rural water projects and many other development schemes. One such book was organized by Alicja

Iwanska in a Mazahua Indian village in central Mexico.[15] It not only provided great insight into the life of the village but also gave the village a feeling of pride and a sense of their own community and history. Research done in this way can thus be of direct benefit instead of being largely extractive.

If such a project were organized, it would provide valuable data for the design of a rural water scheme as well as enable the community to undergo a process of self-study so that they would be more prepared for the scheme when asked for or implemented. The placing of bound copies of the book in the village church, school or administrative centre would also be likely to produce a feeling in the community that their customs and ideas were valued rather than denigrated by the agents of change. In many areas the best organizers of such a scheme would probably be the village schoolteachers, who could involve parents in it as a school project. It might also be useful to extend the scheme to a regional competition as was done in the recent village book project in England.

2. *Increase of local involvement in system design*

Another element in the design of a user-choice system which seems desirable, is the increasing involvement of the community in not just the construction and maintenance of the system but also in its design. This may require a change in attitude on the part of the engineer in accepting imperfect, small and incremental improvements to perhaps several existing water systems instead of their replacement with a single, large, new system up to high technical and design standards. In respecting the values and knowledge of the villagers, he will come to design the system with them instead of for them.

3. *Integration into a broader health programme*

The design of a user-choice system is best done within a larger programme of health education and the provision of medical facilities. Providing rural water without also providing some understanding of the relation of water to health achieves only half the objective of improving the well-being of rural populations, and does not enable them to make genuine choices. It is in this

15 Iwańska, Alicja, *Purgatory and utopia: a Mazahua Indian village in Mexico*, Schenkman, Cambridge, Mass., 1971.

context that traditional leaders can fulfill the role of change agent. Elected officials, high status families, priests and teachers are obvious examples. [16] Local healers are also particularly influential in the changing of attitudes towards medicine and hygiene practices because it is considered within their special field of competence.

4. *Creation of new roles associated with water supply*

It is also practical to design the new tasks associated with a rural water project, for example, maintenance and simple repairs, as an integral part of existing roles within the community. For example, it has been found in Tanzania that the most successful way to provide skilled maintenance after the engineers have left is to integrate the skills required for water system mechanics with general mechanical training (e.g. the repair of other machinery and vehicles). Trainees can thus be established in a small general repair shop to serve the community, and are more likely to remain in the village after training. [17]

Use of a management component system in research and development

Some of these suggestions are new in the rural water context. Others have already been tried out in different parts of the world and have demonstrated their effectiveness locally. One advantage of the management component system put forward here is that it provides flexibility for incorporating and evaluating locally successful ideas within a broader framework. For example, if such a scheme as that outlined above were developed for an area, promising ideas—such as the Peruvian use of local healers [18] as change

16 The study by Niehoff and Andersson of the effectiveness of using teachers as change agents for agricultural innovations in the Philippines suggested that failure was because teachers were not considered to have competence in agriculture even though they were highly respected as educationists.

17 Matanog, R. R. and Mayerle, D., The experience with rural self-help water schemes in Lushoto District, *Proceedings of Conference on Rural Water Supply in East Africa*, University of Dar es Salaam, 5-8 April 1971, pp. 229-238.

18 The Peruvian government's approach to rural water includes the policy of using the competence and influence of local healers in changing attitudes to illness and health.

agents for attitudes to medicine, or the Tanzanian experiment in training and establishing general mechanics with rural water skills as well—could be components within the overall design.

An integrated component system can therefore be used not only for development, but as a research framework for field evaluation of many diverse ideas. The first step in such a research project would be the compiling of successful components from ongoing rural water projects. This may involve short-term evaluative studies of their local success and potential for translation to other areas and cultures. Following from this, it would be possible, for one or two specific areas, to design an integrated component system for management, education and technology. It would be based on a knowledge of traditional patterns of water use, culture and physical environment as has been outlined here for Oaxaca. It could also include as components ideas adapted from other areas and other rural water schemes. In this way we would be structuring the user's choices by both broadening his alternatives to include new ideas, and limiting them to components which were designed to fit together and had proved themselves either by being part of the local traditional system or by success elsewhere.

Dossier

Rural water supply in Latin America

Organizational and financial aspects

David Donaldson
Regional Adviser
Rural Water Supplies
and Sanitation, PAHO/WHO

By signing the Charter of Punta del Este in 1961, the governments of the Americas adopted the goal of supplying water and sewerage to at least 50 % of their rural population by the end of that decade. At the time they were set, these goals represented an unparalleled challenge, for only about 8 million rural dwellers (7 % of the total rural population) had adequate water supplies. To meet this challenge it was obvious that many tens of thousands of projects would have to be planned, designed and built in order to bring water to the target population of 64 million people.

The best data available show that by the end of 1974 the countries of the region had raised the proportion of rural dwellers having a potable water supply from about 7 to 26 %. This means that about 33 million rural inhabitants are now being served by approximately 30 000 systems that they themselves helped national programmes to build.

While some of these programmes achieved less than the desired results, each served to refine existing techniques and to

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Résumé en français « Programmes d'hydraulique rurale en Amérique latine, leur organisation et leur financement », p. 122.
Resumen en español « Programas de agua potable rural en América Latina, su organización y financiación », p. 129.

increase understanding of existing problems. The effort to date—that of building the foundations for future efforts—may not be readily apparent to the casual observer. But those who know where to look can see that many of the programmes can be traced from national/PAHO/UNICEF demonstration efforts to full-scale national rural water programmes.

Three types of rural water supply programmes

There has been a tendency in the past to lump several different programmes under the single heading of rural water supply. In reality, however, there have been at least three separate and distinct types of " rural " programmes, consisting of 1) "individual source" programmes, or community wells for dispersed populations; 2) "rudimentary aqueduct" programmes for semi-concentrated populations; and 3) "rurban" water programmes for villages and other small but concentrated populations. The term "rurban" is a combination of "urban" and "rural" developed by rural sociologists. [1]

1. *A protected spring or a well*

The most basic programme—an individual source programme—involves developing a protected spring or providing a well with a hand pump to serve a number of scattered families. Little or no formal community structure is associated with its operation, and it is usually maintained and paid for by a national programme or a ministry at no cost to the user.

2. *A rudimentary aqueduct*

The second programme, that of rudimentary aqueducts, utilizes a well or spring, a small storage tank, and a limited distribution system for delivery of water to public fountains and perhaps a few patio connections in order to serve a semi-concentrated population. The users of such a system pay a small sum, but depend heavily on the national programme to assist them in maintenance, operation and future expansion.

1 Rose, Cecil W., *Common sense designs for rural water systems*, International Conference on Water for Peace, 1967.

3. *Water in every house*

The third programme is the one most people are referring to when they talk about the "rural water programme of the Americas". It is usually designed to serve a community with a central core of at least 100 houses, and the immediate surrounding area. The system normally utilizes a protected spring, a pumped well, or a treatment plant, and delivers water to a storage tank. Its distribution system is designed to supply water through "house" or "patio" connections, making minimal use of public fountains. A local water board—with the assistance of the national programme—operates, maintains, and administers the system and collects water rates.

Characteristics of different rural programmes

Type of programme	Population served	Source	Distribution systems	Water delivery	Local organization	Financial recovery
Individual source	Dispersed	Well or protected spring	None	At well only	None	None
Rudimentary aqueduct	Semi-concentrated	Pumped well or protected spring	Simple	At public fountains plus a few patio connections	Minor, mainly for operation and maintenance of system	Little or none
Rurban	Concentrated around a 500-person core	Well, spring, or treatment plant	Complex, serving core area plus nearby concentrated areas	At patio connections and a few public fountains	Major, for operation, maintenance, and administration of system and collection of rates	Enough to pay for operation, maintenance and local administration of system and to set up a reserve fund

A community's progression

Clearly each of the three programmes is part of an interrelated process. The community wells serve to attract the surrounding people, and with time the nearby population density grows. When the density becomes high enough, a rudimentary aqueduct can be considered. In the past the change-over from well

to rudimentary aqueduct took an average of 12 to 15 years, while the next step—from public fountains to about 80 % patio connections—took an average of eight to ten years. It is felt that progress from one stage to the next could be speeded greatly if coordinated efforts towards individual sources, rudimentary aqueducts, and rurban systems were to replace the independent rural programmes we have often had in the past.

In most programmes, hand pumps are only an intermediate goal, with any type of piped water a long-term one. While they have their place, and many tens of thousands have been installed, in the Americas an assessment of the problem has indicated the best approach (the one that gives the most water to the most people at the lowest cost, from the very limited financial and human resources available to us, while at the same time obtaining the most benefits for the most people) is that of piped water systems developed, built, and operated with strong local participation.

Three fundamental concepts of rurban programmes

Despite differences of scale and technique, the various rurban programmes of the Americas have much in common. For instance, they have all been based on three fundamental concepts. These are:

1) strong and active community participation in the development, construction, administration, and financing of the local systems;
2) focusing of resources on the problems of concentrated instead of dispersed populations;
3) extensive use of technicians to assist a limited number of professional personnel.

Other common features include the criteria used to select target communities, the methods used to finance projects, the widespread use of "mass approach" techniques, and the use of local boards which administer and operate the systems.

Criteria for selection of target communities

The criteria for selecting target communities and scheduling the construction of systems are determined at the national or regional level after a review of existing manpower and financial constraints.

The criteria used by one of the most successful programmes for choosing target communities were the following:

1) communities with the largest number of inhabitants (not more than 2000);
2) communities with access by road for trucks;
3) communities that have expressed interest, have requested a water system, and have offered financial or other assistance for its construction and operation;
4) communities located within one of the zones of influence of the national or local development plan;
5) communities where the project can avoid unusual or expensive solutions.

In practice, the criteria were not applied in a rigid manner but were used as guidelines. It was later found that selections made in the "project identification" phase were adhered to about 70 % of the time. Failure to meet the third and fifth criteria was found to be the main reason for removing communities from the list.

Establishing a local water board

Once the community has been selected, the programme promoters assist the community leaders to organize and conduct their campaign to elect and establish a local water board. Its responsibility is to obtain a community contribution of labour and/or cash which will serve to reduce construction costs, and to organize and supervise the community's efforts to build the system which has been designed by the national/regional programme.

Too often it has been concluded that "poorly educated" rural people lack the required skills to construct, operate, maintain and administer their own water system. But it has been shown time and again that with proper guidance community leaders can make meaningful choices, motivate others, and provide the leadership required for success.

Once the system is completed, the day-to-day operation, administration, and financial matters for the individual systems are turned over to the locally elected water board (usually president, secretary, and treasurer). They receive technical and financial advice and assistance from the central programme on a periodic and/or need basis. The cost of organizing this board was estimated in 1969 by one programme [2] to be around $ 320 (including the proportional costs of ministry of health personnel used at central and local levels, and the costs of training the system operator as well as the board members) and took about two months. During the first six months the programme maintained a close watch on their activities and then reduced the supervision to about one inspection trip per two or three months. The cost of the initial period was estimated at $ 26.60 per month, which then dropped to $ 8.00 per month/per board.

Community participation in programme financing

The construction cost of a system has usually been broken down as follows: about 50 % is covered by a loan from an international agency, which is often repaid by the central government; about 30 % is granted by national and state programmes; and the remaining 20 % is obtained from the community in the form of cash, materials and labour during construction.

Those programmes involved in water supply have obtained and disbursed US $ 116.2 million from the 26 loans that international credit agencies made in this field between January 1961 and December 1974. Realizing that for each loan there are national matching funds in the amount of 40 to 60 % of the loan, and that the government often contributes 20 to 30 % more in construction grants and an additional amount for operational funds, it has been estimated that about $ 651 million was invested in rural water programmes between 1961 and the end of 1974. About 82 % of this has come from national sources.

In general, the operating and administrative costs are paid by the community, together with an additional amount which can

2 Acurio, Guido, *Agua potable rural : Perú*, unpublished report, División de Saneamiento Rural, Lima, Peru, October 1969.

serve as a reserve or help amortize loan costs. These revenues are obtained through water rates collected by the local water board under the direction of the national programme. The basic financial responsibility is thus a local one, but it is carefully watched, supervised and coordinated by the national programme which carries out financial planning for the programme as a whole.

Areas of administrative responsibility

The functions of the various levels of a typical rural water programme, and the major areas of responsibility are as follows:

1) *At the national level*

- Provide a financing channel for national counterpart funds, international loans, national grants and local contributions
- Develop norms and policies (technical and administrative)
- Conduct long-range planning
- Supervise the execution of the national plan
- Supervise regional programmes
- Coordinate construction efforts
- Exercise overall financial control
- Provide technical and administrative assistance
- Provide training

2) *At the regional level*

- Supervise programme execution
- Carry out design (in case of larger countries only)
- Supervise the construction, operation and administration of projects
- Undertake community promotion and supervision of projects

3) *At the local level*

- Administration of system
- Operation of system
- Maintenance of system
- Collection of water rates.

Regional programmes, which exist in a few countries, are usually organized as separate operations, but are tied together

under the "umbrella" of the national programme through common criteria, designs, and techniques.

A revolving fund to finance community projects

In order to implement techniques which will permit low-cost solutions, it is necessary to establish sound long-range financing for rural water programmes. The revolving fund appears to offer the best possibilities in this regard, because of its flexibility and its adaptability to local conditions. A formal definition of the term "revolving fund" would be: A fund that is continually replenished as it is used, by income generated by the activity that it finances.

In terms of rural water programmes, a revolving fund implies the establishment of a fund on a regional or national level to finance the construction of individual community projects. The loaned funds are recovered by having the benefited community repay the revolving fund. As the repayments come in they are reloaned to finance additional projects. An advantage of the technique is that methods for obtaining the original financing, terms of the loans, and terms of the repayments can be adapted to local conditions. To assist the governments of the Americas in developing this approach, a document entitled *The Establishment and Operation of Revolving Funds* (Pan American Health Organization, 1969) has been written and distributed throughout the region.

Revolving funds promote community involvement

While the style of the revolving funds used has varied from place to place in Latin America, the fact that they require a repayment scheme has tended to promote effective organization at the local level. The communities (as well as local and national officials) thus become accustomed to community financing of services received. This community involvement is one of the major benefits that result from the establishment of a revolving fund.

Recent studies of conditions in Latin America [3] indicate that it

3 *Village water supply, a World Bank paper*, Washington, D.C., March 1976.

is feasible for a rurban family to pay for the operation and maintenance of a typical rurban water system and for the capitalization of part of the total investment.

Our experience indicates that the rate necessary would equal 4 to 5 % of the minimum monthly salary of the area. For this to be feasible, a rurban programme should be based on the following:

- rural communities in which 80 % of the inhabitants have house connections installed at the time of construction and paid for in the water rates;
- the active participation of the community in the promotion, construction, operation and maintenance of the system;
- adaptation of the programme structure to the requirements of large-scale planning and execution.

In developing new funds the highest possible degree of local community participation is essential. Without community participation funds often become little more than construction funds which "revolve" only once.

A rural water supply package approach

The need to increase the output of the various programmes has led to a mass or "systems" approach of which the objective has been to develop a coordinated and integrated "packaging" of those concepts that permit a more rapid promotion, design, installation, operation, maintenance, and administration of the various projects.

Under this systems approach to the problem, a rural water programme is broken down into its various elements—promotion within the community, technical design, programme financing, etc. —and each is studied for its effects on the others. A model is then developed which coordinates all of the programme elements in such a way that they will focus on the desired goal: a mass-scale programme that will result in rural water systems that can and will be operated, maintained, and financed by the community. As a rural programme must repeat the same tasks for thousands of villages—in some countries tens of thousands—the development of "standardized" techniques has been essential in order to multiply limited resources.

Technical design of a water system

The technical design of a project is prepared on the basis of existing maps or aerial photos and standardized design criteria, using predesigned elements and standardized equipment lists. The materials are assembled in a central yard and sent to the community as a package along with all the necessary tools and items not readily available locally.

Promoting community participation

Professional staff train and supervise volunteer workers at the local level to help stimulate community involvement. These workers carry out developmental and promotional activities according to the carefully designed and coordinated guidelines of the package programme. The design and timing of a particular package are determined by the needs of the project considered within the context of the overall programme.

Experience in Latin America has shown that these modules and this standardization can be a powerful and practical tool when the solutions developed are constantly reviewed to see that they produce maximum benefit at minimum cost. These evaluations must be made against the varying availability of financial and manpower resources.

Each individual system part of a larger framework

A rurban water supply problem is more administrative than technical in nature. Too often the matter has been approached via a series of small projects requiring independent technical solutions and a large number of highly skilled and hard-to-find professional personnel. In fact, the more successful programmes have shown that each individual system should be treated as part of a larger framework using mass approach techniques to construct, operate and administer hundreds of systems. This means that all actions (technical, administrative, and financial) must be coordinated at the central level—without forgetting that each project also needs strong local participation.

It must also be recognized that several years of groundwork will be needed to develop, coordinate, and refine techniques and to train technicians before the first system is built—and that as

the programme grows the techniques must be redesigned and the technicians retrained.

Areas for additional research

Research into a number of subjects is also needed. For example: What is the potential for making more effective use of financing schemes such as revolving funds? What exactly are the monetary costs and benefits of water supply systems? How can we reduce the cost of expensive programme elements? How can we get more accurate data on water consumption, water loss, and future population growth? What new methods—such as the use of plastic pipe, modular units, and the "mass" approach—should be considered, and when?

In addition, we need to improve and/or modify many of the skills and techniques that have been developed in the 1960s. Among other things, as programmes expand into smaller communities and dispersed areas, closer attention will have to be given to developing solutions which are socially and administratively feasible as well as financially acceptable to the user—not projects no one can "afford". (When this happens, the fault lies not in the user's inability to pay, but in the designer's inability to meet the need. It is the designer who must change, not the user.) We will also need to improve our communications with the policy makers and the techniques by which information is developed for them, in order that they can better understand the actual costs of their decisions.

Development of long-term financing schemes

Another problem that must be faced in the future is the question of developing financing schemes which will permit the long-term functioning of these programmes. The question of self-financing vs. subsidy operation must be faced and the recovery from each level must be realistically determined. The question of how much recovery to expect from the local level must be decided in the context of each sub-programme (i.e., well, rudimentary, and rurban) and then the overall sector financing must be determined. We need to investigate such approaches as how to interest other

government and/or official agencies such as central banks and social security to make long-term low interest loans instead of building marble-faced expensive offices.

In addition, there have been changes in the type of financing that is available to the rurban programmes. Up to now the project breakdown has been approximately 50 % international loan, 30 % government grant, and 20 % local contribution. Local administration, operation and maintenance, and part of the loan costs were paid for out of the local water rates; the programme overhead was covered by the government as a social cost. Now, as the international agencies require more matching money, programmes are having to revise their financing sources and techniques. Studies are being started to determine the interest rate and the terms these programmes should be expected to carry.

Five problems to resolve

Other problems that must be faced as the programmes grow and/or expand into new areas are:

- Should the rurban programmes continue to enter the public works or social sectors, or stay in the public health sector?
- If the rurban programmes leave the public health sector, how will they develop the local-level personnel so necessary to their programmes?
- What criteria must be revised as the programmes expand? For example, are project design periods of 20 years justified? If not, what are more reasonable figures?
- How and by whom should the cost of programme development in the semi-concentrated and dispersed areas be borne?
- What data collection activities, bibliographies, and cooperation with other agencies should be fostered in order for basic information to be available once the new programmes are started?

In the past the emphasis has been on urban areas; consequently, a backlog of need has developed in rural areas. To meet this challenge, new approaches will have to be developed.

However, time is of the essence, for if we continue at our present rate it will take about a hundred years to provide a safe supply to the 80 % of the world's population that is now condemned to drink unsafe water.

Dossier

Projets hydro-agricoles et maladies transmissibles

Hushang Amir Rafatjah
Ingénieur sanitaire
Division du paludisme et
autres maladies parasitaires, OMS

L'approvisionnement en eau potable ne saurait suffire à éliminer les maladies associées à l'eau qui entraînent de nombreuses souffrances et une morbidité étendue. Les projets de développement agricole pour lesquels de vastes travaux d'irrigation sont nécessaires, constituent une grave menace pour la santé des populations si l'on omet de prévoir des mesures spécifiques tendant à prévenir la propagation de maladies telles que le paludisme, la schistosomiase, l'onchocercose et d'autres encore. Ces maladies sont extrêmement débilitantes et atteignent encore plus durement les jeunes générations. Elles sont une cause de mortalité infantile élevée.

Il est essentiel de prendre la santé en considération dès le premier stade de la formulation d'un projet hydro-agricole et de prévoir des fonds qui permettront la mise en œuvre de mesures sanitaires nécessaires au cours des différentes phases de l'exécution.

Les pays en voie de développement, — dont le progrès économique repose dans une large mesure sur le développement de l'agriculture, accordent un rang de priorité élevé à l'approvisionnement en eau à des fins agricoles par l'irrigation intensive et

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Extraits d'une communication présentée à la Session spéciale de Moscou, 1975, reproduits des Actes avec l'autorisation de la Commission internationale des irrigations et du drainage.
Summary in English "Irrigation projects and communicable diseases", p. 124.
Resumen en español « Proyectos hidroagrícolas y enfermedades transmisibles », p. 129.

l'amélioration du drainage qui ouvre de vastes étendues de terres en friche à la culture productive. Le développement économique entraîne un accroissement continu des besoins en eau.

Cependant, l'eau exerce un rôle dans la propagation d'un certain nombre de maladies transmissibles.

Maladies liées à l'irrigation et à la retenue des eaux

Plus que d'autres ouvrages réalisés par l'homme, les travaux de retenue des eaux et d'irrigation modifient l'environnement et peuvent créer des conditions écologiques favorables à l'introduction de vecteurs et d'hôtes de maladies dans des régions qui en étaient exemptes. Peu après la mise en chantier d'un programme d'irrigation, le taux de maladies parasitaires au sein des populations agricoles s'élève souvent de façon alarmante.

L'épidémiologie de ces maladies parasitaires et virales à hôtes intermédaires est complexe, rendant ainsi plus difficiles la prévention et la lutte. De plus, souvent des médicaments sûrs, préventifs et/ou curatifs, ne sont pas disponibles. Ces maladies se répartissent dans de vastes zones s'étendant sur plusieurs continents où vivent des centaines de millions de personnes et sévissent en particulier dans les régions rurales où les installations sanitaires sont rares et les communications difficiles.

Extrêmement débilitantes, ces maladies affaiblissent la capacité de travail des populations, entraînant une diminution de la productivité. Elles atteignent plus profondément encore les jeunes générations et déterminent une mortalité infantile élevée. Elles ont donc des répercussions considérables sur le contexte socio-économique et peuvent compromettre sérieusement les projets de développement.

Le paludisme, souvent consécutif à la construction de barrages et de réseaux d'irrigation

Le paludisme, la principale de ces maladies, affectait jusqu'à une époque récente plus des deux tiers de la population mondiale; trois millions de décès par an lui étaient imputables et le nombre des cas s'élevait à 300 millions. Les conséquences du paludisme peuvent atteindre des proportions catastrophiques et handicaper les projets de développement, parfois même les vouer à l'échec.

Il existe de nombreux exemples d'épidémies de paludisme ou

d'accroissement du taux d'incidence consécutifs à la construction de lacs artificiels ou de réseaux d'irrigation et de drainage.

Le paludisme sévit surtout dans les régions rurales où il est souvent lié à des systèmes défectueux d'irrigation et de retenue des eaux ou à des méthodes inadéquates de culture. Les moustiques vecteurs du paludisme ont besoin d'eau pour se développer. Ils se reproduisent dans les canaux d'irrigation, les rigoles de drainage et les cours d'eau à circulation lente, dans les eaux d'infiltration et les mares, dans les eaux peu profondes des marécages et près des rives des réservoirs et des lacs.

La cécité des rivières

L'onchocercose, ou cécité des rivières, est une maladie parasitaire transmise par une mouche (simulie) qui, au stade larvaire, se reproduit dans les eaux courantes. La mouche adulte s'attaque à l'homme et lui inocule par sa piqûre un ver qui croît et qui se multiplie dans l'organisme, produisant des millions d'embryons. La filaire femelle ne mesure au départ qu'une fraction de millimètre, mais elle peut atteindre 70 cm de longueur et vivre jusqu'à 15 ans. Les embryons causent des lésions cutanées pouvant provoquer la cécité.

Cette maladie est largement répandue en Afrique ainsi que dans certaines régions de l'Amérique du Sud et de l'Amérique centrale. Dans les sept pays d'Afrique occidentale, là où sévit l'onchocercose, on estime que sur dix millions d'habitants, un million de personnes sont atteintes dont 70 000 sont aveugles.

Le pullulement des simulies, l'infection et la cécité qui en résultent ont souvent contraint les habitants à abandonner les terres fertiles qui longent les rivières et à se réfugier sur les plateaux avoisinants où les conditions sont moins favorables à l'agriculture. Ils sont en outre si affaiblis par la maladie que leurs cultures suffisent à peine à les nourrir, même lorsqu'ils ne sont pas atteints de cécité. L'onchocercose représente donc une grave menace pour le développement économique et agricole des zones touchées. Ces dernières peuvent être très étendues étant donné que le rayon de vol des simulies atteint jusqu'à 150 km.

La maladie du sommeil

La trypanosomiase, maladie parasitaire transmise par la mouche tsé-tsé (glossine), peut être indirectement influencée par

l'eau et le développement des ressources hydrauliques. La création de lacs artificiels amène les populations à se concentrer le long de leurs rives et introduit des modifications climatologiques. Ces phénomènes créent des conditions favorables à l'intensification de la transmission et à la propagation de cette maladie. L'homme et le bétail sont victimes des ravages causés par la trypanosomiase — aussi dénommée maladie du sommeil. On en imagine aisément les répercussions sur les projets de développement agricole.

En raison de la récente sécheresse, les populations de la zone soudano-sahélienne se déplacent vers des régions plus fertiles où l'eau est plus abondante, mais où sévit malheureusement la trypanosomiase.

Autres maladies transmises par des vecteurs ou par des hôtes intermédiaires

Certaines maladies peuvent être transmises par des vecteurs ou par des hôtes intermédiaires autres que les moustiques. Ce sont par exemple la schistosomiase transmise par des mollusques, la fasciolase, la draconculose transmise par un crustacé, ainsi que la clonorchiase et la paragonimiase transmises par le poisson. Dans ces deux derniers cas, la transmission nécessite l'intervention de deux hôtes intermédiaires et la maladie est contractée lors de l'ingestion de poisson ou de crabe crus ou mal cuits.

La schistosomiase ou bilharziose

La schistosomiase est la plus répandue de ces maladies et sans doute celle qui a les conséquences les plus néfastes pour le développement de l'agriculture dans les régions rurales. On estime que, dans les zones tropicales et sub-tropicales, 200 millions d'habitants de 71 pays sont infectés par la schistosomiase. La maladie peut avoir une issue fatale, mais elle se présente souvent sous forme de maladie et de handicap chroniques comportant une hypertrophie du foie, une défaillance rénale, une perte de poids et parfois des complications pulmonaires et cardiaques.

Le cycle de transmission débute lorsqu'une personne ou un mammifère infecté rejette dans l'environnement les œufs du parasite. L'éclosion de l'œuf dans l'eau donne naissance à une première larve qui doit trouver et pénétrer son hôte spécifique en l'espace d'une journée faute de quoi elle périt. Elle se développe et se multiplie à l'intérieur de l'hôte intermédiaire et une nouvelle

larve retourne alors dans l'eau; cette larve pénètre l'homme ou l'animal par voie cutanée ou, plus rarement, par voie orale. Pour contracter les infections de ce groupe, un contact direct avec de l'eau est nécessaire.

Les projets de développement hydraulique comprenant la construction de lacs artificiels ou de systèmes d'irrigation et de drainage entraînent invariablement à courte échéance une infestation par les mollusques — hôtes intermédiaires, et l'infection des habitants des environs. Le taux d'infection est généralement très élevé; il atteint parfois des proportions considérables. Les pertes de ressources financières et humaines subies lors de l'exécution de tels projets n'ont pas encore fait l'objet d'une estimation. Il ressort toutefois de l'expérience qu'il est extrêmement difficile et coûteux de déloger la schistosomiase dès qu'elle s'est implantée aux alentours d'un système d'irrigation ou de drainage.

La schistosomiase sévit actuellement près de presque tous les lacs artificiels d'Afrique tropicale et de la plupart des systèmes d'irrigation de ce continent, ainsi que dans certaines régions d'Asie et du Moyen-Orient.

Dans la zone du lac Volta, le taux de prévalence avant les travaux de retenue des eaux était inférieur à 5 %. Il atteint maintenant près de 100 % dans un grand nombre de villages situés sur les rives du lac. Les ravages du paludisme et de la schistosomiase dans la zone irriguée de Gézireh au Soudan — d'où le pays retire 75 % de son revenu national, fournissent encore un exemple frappant des conséquences que peut entraîner la surveillance insuffisante d'un projet de développement, alors même que des efforts considérables et des sommes très importantes y ont été consacrées.

Conditions propices au développement des vecteurs

Les vecteurs et les hôtes intermédiaires de la plupart des maladies associées à l'eau se développent dans des eaux peu profondes, stagnantes ou à circulation lente aux abords des rives des lacs, des étangs et des cours d'eau ou dans les marais où ils trouvent des conditions propices pour se nourrir, s'abriter et pondre leurs œufs.

Les moustiques se développent aussi bien dans les eaux stagnantes que courantes, dans de l'eau pure ou fortement polluée, en l'absence ou en présence de végétation, au soleil ou à l'ombre,

et certaines espèces peuvent supporter un taux de salinité allant jusqu'à 15 000 ppm.

Les mollusques s'adaptent à l'eau courante et résistent à des vitesses de 30 cm à la seconde, mais ils meurent au-delà d'un certain degré de pollution. Les mouvements de houle, la turbulence, les courants et les fluctuations rapides freinent la prolifération tant des moustiques que des mollusques.

Les larves de moustiques se nourrissent de micro-organismes et de matière organique désagrégée présents dans l'eau. Les mollusques se nourrissent de végétaux aquatiques et, à défaut, de vase riche en matière organique en décomposition, tels que les excréments humains et animaux. Ils peuvent survivre sur des surfaces de ciment ou de pierre, à condition que les algues nécessaires à leur nourriture y poussent.

Les plantes aquatiques protègent les mollusques et les larves de moustiques du courant, du soleil et du vent et peuvent également abriter la ponte. Les œufs de moustiques ne survivent pas hors de l'eau ou en l'absence d'humidité. Certains cependant résistent à de longues périodes de sécheresse, à l'instar des mollusques et de leurs œufs. La mouche noire appelée simulie dépose ses œufs dans l'eau courante et agitée des rapides et des chutes. Les œufs et les larves écloses se fixent aux roches ou aux végétaux submergés par un filament fin et résistant.

Effets préventifs de la retenue des eaux

La retenue des eaux peut parfois contribuer à l'élimination des gîtes larvaires des vecteurs de certaines maladies. Les lacs créés par la construction de barrages détruisent les gîtes larvaires des anophèles, des simulies et des mollusques, bien que les voies d'écoulement puissent parfois abriter de nouveaux gîtes. Les mouvements de houle et d'aspiration observés dans les grands réservoirs contraignent les moustiques et les mollusques à chercher des lieux proches des rives pour se reproduire; les gîtes peuvent alors facilement être identifiés et éliminés.

L'onchocercose et le paludisme sont généralement éliminés des régions où des projets de retenue des eaux, d'irrigation et de drainage correctement conçus sont mis en œuvre. Ainsi, la construction du barrage d'Akosombo, au Ghana, et la submersion du bas-

sin de la Volta sur une longueur de 400 km ont éliminé l'onchocercose naguère endémique dans la région. De même, en 1937, la construction du lac artificiel de Wheeler dans la vallée du Tennessee avait provoqué une chute spectaculaire de l'endémicité paludéenne dans le comté avoisinant de Lawrence, en Alabama. L'endémicité paludéenne qui atteignait 60 % en 1932, est tombée à 1 % après la construction de l'ouvrage.

Élimination des gîtes larvaires et des mollusques dans les systèmes d'irrigation

Aménagement et entretien des canaux d'irrigation

La reproduction des moustiques ne devrait pas être possible dans des canaux d'irrigation convenablement aménagés et entretenus. C'est seulement lorsqu'ils ne sont pas nettoyés régulièrement ou que la végétation envahit leurs rives que les moustiques peuvent y trouver des lieux propices à leur reproduction. Les mollusques au contraire viennent volontiers chercher asile dans les canaux d'irrigation, en particulier dans les tronçons de distribution qui alimentent les champs irrigués. Néanmoins, la pente constante et le caractère rectiligne des canaux, de même que leur débit mesurable, facilitent considérablement le dosage et l'application des pesticides utilisés dans la lutte contre les mollusques et les moustiques.

Revêtement des canaux

Le revêtement des canaux est une opération onéreuse, c'est pourquoi on n'y a recours que lorsque l'eau est rare et le sol particulièrement poreux. Le revêtement permet toutefois d'obtenir des surfaces intérieures plus lisses et des sections transversales plus régulières, ce qui accélère le débit et diminue la turbulence. Il en résulte une augmentation de la capacité des canaux, que l'on peut alors concevoir dans des dimensions inférieures, ménageant ainsi de plus grandes surfaces cultivables. Un débit rapide entraîne avec lui les végétaux et les débris flottants et réduit les dépôts de limon. Le revêtement résiste à l'érosion, diminue les infiltrations et inhibe la croissance des algues et autres plantes. Tous ces facteurs contribuent à l'abaissement du coût d'utilisation car ils permettent de réduire les travaux d'entretien, de dragage et de réparation.

Les vecteurs et hôtes intermédiaires ne trouvent pas dans les canaux cimentés des conditions propices à leur reproduction : privés de nourriture, d'abri et de protection, ils ne peuvent ni survivre ni se multiplier. D'autre part, ce genre de canaux facilite le dosage et l'application des produits chimiques qui sont distribués de manière plus régulière et transportés sur de plus longues distances. On obtient également une persistance accrue de ces produits ainsi qu'une diminution des végétaux et des matières organiques avec lesquels la plupart des produits chimiques entrent en réaction. Étant donné que les dépôts de limon sont réduits, les mollusques peuvent plus difficilement s'enfoncer dans la vase et échapper à l'action toxique des molluscicides.

Canalisations souterraines

Il est également avantageux, tant pour la santé que pour l'agriculture, de couvrir les canaux. Ce procédé présente les mêmes avantages que l'irrigation par canaux revêtus mais, en outre, les conduits et les canalisations souterraines empêchent l'évaporation de l'eau et lui permettent d'exercer une pression plus forte sur les dépôts de limon. Les autres avantages consistent en une économie de terrain, une réduction du nombre des passerelles et une baisse spectaculaire des frais d'entretien.

A part quelques organismes vivants, les canaux couverts ne contiennent ni plantes ni animaux ; la santé en retire des bénéfices évidents, même lorsque seuls sont couverts les tronçons d'alimentation des champs cultivés à proximité des habitations et des zones de travail.

Appareils d'arrosage et tuyaux perforés

Les appareils d'arrosage et les tuyaux perforés offrent de nombreux avantages partout où l'approvisionnement provient d'une source, d'un cours d'eau ou d'un puits. Ils permettent d'éviter de creuser des canaux et de construire des structures de contrôle du débit. Le système d'irrigation consiste en tubes rigides facilement ajustables ou en tuyaux flexibles qui permettent une distribution rapide et un réglage précis de la quantité d'eau nécessaire. L'irrigation par pulvérisation supprime le gaspillage et rend le drainage inutile ; il faut toutefois disposer d'une pompe pour actionner les arroseurs.

Dans les systèmes d'irrigation existants, spécialement lorsque

l'eau est rare, les arroseurs et les pompes portatives remplacent les petits canaux et les rigoles d'alimentation. Une pratique correcte de l'irrigation par pulvérisation élimine les habitats des vecteurs et des hôtes; par conséquent, elle interrompt la transmission des maladies.

Entretien et nettoyage des canaux de drainage

En l'absence d'un niveau hydrostatique élevé et de salinité du sol, on a tendance à négliger l'entretien des canaux de drainage; il en résulte de sérieux problèmes pour la culture des terres. Ces canaux peuvent entraîner des conséquences considérables pour la santé des habitants. Le nettoyage contribue non seulement à affaiblir la transmission des maladies, mais il permet aussi un usage plus rationnel de l'eau et un meilleur contrôle de l'irrigation.

Alors que le revêtement des canaux de drainage stoppe l'infiltration de l'eau souterraine, empêchant ainsi le drainage du sous-sol, un revêtement rigide et imperméable permet en revanche un meilleur écoulement de l'eau en empêchant de ce fait la formation de mares où les moustiques et mollusques pourraient se reproduire.

Contrôle de l'écoulement des eaux

Il importe de régler soigneusement la quantité d'eau, car trop abondante elle exerce un effet néfaste sur la croissance et le rendement des cultures, tout en créant des conditions favorables à la reproduction des vecteurs de maladies.

La méthode traditionnelle, qui consiste à garder les rizières inondées en permanence, favorise une intense reproduction des moustiques et des mollusques. De plus, elle peut se révéler nocive pour la plante. Au contraire, une irrigation intermittente permet d'économiser l'eau et, comme on l'a observé, d'améliorer la culture et la récolte.

Réduction des gîtes larvaires par le drainage des marécages

Le drainage des marécages aux fins de la récupération des terres fait disparaître l'habitat des moustiques et des mollusques. Au début de ce siècle, il constituait en fait la principale méthode

de lutte antipaludique. Le succès de cette méthode a été confirmé par l'éradication du paludisme en Italie dans les marais Pontins et en Sardaigne et de la fièvre jaune dans la zone du canal de Panama. Actuellement, dans les programmes de lutte contre les moustiques et les mollusques, quelques opérations de drainage viennent s'ajouter aux autres mesures de lutte.

L'expérience a démontré que les économies réalisées dans les coûts de la lutte antipaludique par la réduction des gîtes larvaires peuvent dépasser les dépenses entraînées par le drainage.

Incidence des mouvements de population

Les projets d'irrigation attirent les populations des régions avoisinantes qui viennent travailler à la construction des ouvrages; plus tard, lors de la mise en service, de nouveaux habitants et des cultivateurs s'établissent dans la région. D'autre part, les grands projets peuvent entraîner l'installation de travailleurs et d'habitants venus de régions lointaines où les conditions écologiques, sanitaires et sociales sont différentes. De tels mouvements de populations, s'ils ne sont pas contrôlés, peuvent contribuer à la propagation des maladies ou provoquer des poussées épidémiques parmi les travailleurs ou les populations indigènes.

L'importation de main-d'œuvre pour l'exécution d'un projet devrait s'accompagner, dès le début, d'examens systématiques et de mesures de protection contre les maladies qui sévissent dans la région, telles que la vaccination, les mesures préventives et la lutte antivectorielle. Il s'avérera nécessaire également de protéger la population locale contre l'introduction et l'implantation des maladies transmissibles.

Intégrer la santé préventive dans la conception de projets hydro-agricoles

Dès le premier stade de la formulation du projet et au cours des études de factibilité, un examen des problèmes et des besoins sanitaires liés au développement et à l'exécution du projet devrait être prévu. De même, afin de prévenir ou d'entraver la propagation des maladies, certains concepts examinés dans cet article

devraient être repris dans la formulation des plans, car ils permettraient par la suite d'ajouter selon les besoins d'autres mesures de lutte et de protection. Il faut également prévoir des approvisionnements suffisants en eau saine, des systèmes adéquats d'évacuation des matières fécales et un minimum d'hygiène de l'habitat et du milieu, toutes mesures qui jouent un rôle important dans la prévention des maladies d'origine hydrique et dans la lutte contre la plupart des maladies parasitaires.

Pour cela il est indispensable que, dès le début, et tout au long de la planification, de la construction et de l'utilisation des travaux d'irrigation, des rencontres aient lieu entre les responsables du projet hydro-agricole et les services de la santé et de l'agriculture afin d'aboutir à une action concertée.

Il est aussi indispensable que des fonds suffisants réservés à la santé soient affectés au projet pour la construction d'installations sanitaires et pour l'organisation des mesures préventives et de la lutte contre les maladies.

études de cas
case studies
estudios de casos

Photos Mandl, Cnav-Niamey, Mandl.

Étude de cas

L'introduction d'un programme d'eau potable à Belhassenat

Jean-Claude Funck
Administrateur national des programmes
UNICEF, Alger

L'eau potable permet de réduire la mortalité infantile. Mais l'eau n'est pas uniquement utile à la santé des femmes et des enfants. L'introduction d'un programme d'hydraulique villageoise, surtout s'il est fondé sur la participation des populations, constitue souvent un instrument privilégié de conscientisation des possibilités de leur autodéveloppement.

La présente étude de cas décrit l'introduction d'un tel programme dans un petit village algérien et toutes les gammes d'initiatives locales qui en résultèrent.

Des étrangers venus de la ville

La population du petit douar [1] traditionnel de Belhassenat est en effervescence : femmes tenaillées entre la crainte d'être vues et la curiosité avide de ne rien laisser perdre du spectacle qui, pourtant tout proche, ne leur est pas offert; enfants timides qui, à l'écart, forment un très large cercle. Au centre, les hommes tiennent conversation avec des étrangers venus de la ville. Ces étrangers représentent pour les uns une autorité officielle : Conseiller auprès de la Wilaya [2], Chef de Daïra [3], Président de l'Assem-

1 Groupe d'habitations traditionnelles non structuré administrativement : territoire d'une tribu.
2 Unité territoriale correspondant à un département, avec une préfecture.
3 Sous-préfecture.

Summary in English "Introducing a drinking water supply to Belhassenat", p. 124.
Resumen en español « Introducción de un programa de agua potable en Belhassenat », p. 130.

blée populaire communale, représentants d'organisations locales, du parti, de ministères, et une femme, déléguée de l'Union Nationale des Femmes Algériennes; pour les autres, ce sont des fonctionnaires internationaux, dont les membres de l'UNICEF.

Que se passe-t-il donc dans ce petit village bâti sur un dos d'âne, au flanc de la montagne, en partie tourné vers la mer dont les vagues là-bas, dans une échancrure, scintillent au pied d'une cité moderne en pleine expansion ? Il paraît si misérable et si isolé, ce village, malgré le murmure constant des moteurs de véhicules qui empruntent non loin de là le principal axe routier reliant la capitale à l'est du pays.

Le douar a été choisi par les pouvoirs publics comme point de départ d'une campagne d'assainissement et d'eau potable dont le but est de protéger la santé de tous les habitants. Près des puits, de nombreux tas de fumier et dépôts d'ordures devront être enlevés, car ces matières contaminent l'eau et les microbes donnent des maladies dangereuses.

Ce message ne provoque ni murmures ni commentaires ; cependant, l'un des anciens du douar se saisit d'un seau relié à une corde, puise de l'eau, et ostensiblement étanche sa soif!

De l'eau potable pour réduire la mortalité infantile

La base du programme est constituée par le problème de l'eau potable et l'hygiène du milieu dans les zones rurales pauvres. Les buts à atteindre : la réduction du taux de mortalité et de morbidité infantiles, une action en profondeur pour faciliter et consolider l'action de la médecine préventive.

Par des opérations pilotes ponctuelles, choisies dans des contextes favorables mais suffisamment différents afin de dégager le maximum de leçons méthodologiques, il s'agit de stimuler l'attention des populations afin que celles-ci se sentent concernées. Conscientes de leurs intérêts, non seulement elles participeront, mais en outre elles accompliront des opérations d'assainissement du milieu en utilisant à leur tour les moyens qu'elles auront jugé bon d'adopter.

En plus du contact étroit et amical avec la population, il sera nécessaire que la Wilaya — qui, dans le cadre de la décentralisation du pouvoir central, détient le contrôle de l'ensemble des ser-

vices publics — applique judicieusement la sensibilisation et la multicoopération de ces services impliqués aux divers degrés de l'évolution des ruraux vers le mieux-être.

Deux bidons d'eau par jour et par puits

Le chef traditionnel, dont le patronyme correspond à la dénomination du douar, explique que les puits ont trop peu de débit (un à deux bidons d'eau par vingt-quatre heures) pour mériter une attention particulière. Le principal apport complémentaire est constitué par une source située à quelques kilomètres de là. Le transport est assuré à dos de mulet et les récipients vont de l'outre en peau au jerrican en plastique. Seulement, cette facilité ne dure qu'un temps, il faut en effet, sur le trajet, franchir à gué deux petits oueds; et par un hiver douloureusement récent trois enfants ont été noyés au cours d'une crue subite.

Captage d'une source et contrepartie villageoise

Bien sûr, une visite de cette source s'impose. A mi-pente, dans une étroite vallée, en un site sauvage et magnifique, l'eau limpide et fraîche à souhait s'échappe d'un captage en maçonnerie (édifié en 1939) avec un débit de 0,7 litre/seconde.

— Si nous vous aidons à capter cette eau et l'amener jusqu'au village par un système de tubes enterrés, serez-vous disposés, vous les villageois, à condition bien sûr que cette eau soit contrôlée et acceptée par les Services de santé, à vous engager pour une contrepartie ?

— Quelle contrepartie ?

— Oh! pas de l'argent, cela va de soi, mais de la main-d'œuvre par exemple, nettoyer votre douar et n'utiliser pour votre consommation et celle de vos enfants que de cette eau de source.

— J'accepte, et tous avec moi acceptent aussi! Quand aura-t-on le matériel ?

— Nous devons consulter les responsables de la commune pour les frais complémentaires qu'il faudra nécessairement engager ; puis encore des techniciens pour étudier le passage des canalisations. De toute façon, nous vous reverrons bientôt.

Les interlocuteurs se séparent sans parvenir à faire disparaître l'attitude sceptique du chef du douar.

Le président de l'Assemblée populaire communale, enseignant de son état, vivement intéressé par le projet étendu à l'ensemble de son territoire, est un partenaire mobilisé et attentif ; aucun effort n'est ménagé.

Assistance technique des services publics

Les topographes de l'Hydraulique et d'une société nationale de construction, instruits des buts du projet, dressent au cours de congés hebdomadaires le profil définitif avec les courbes de niveau du futur réseau, calculent le diamètre de tube à utiliser, les pertes de charge et assurent que par simple gravité l'eau peut parvenir jusqu'au cœur du village et même jusqu'à la mosquée. Distance à couvrir : plus de 3 km.

La bonne nouvelle est accueillie au douar avec une joie bien vite tempérée car il faut encore analyser l'eau et, à cet effet, le responsable du secteur de la Santé publique est sur place. La porte d'accès du bassin de captage de la source, bloquée par la rouille, est forcée pour faciliter les prélèvements. Là, dans l'eau, s'ébat une « chose » tout d'abord prise pour un serpent par un citadin.

— C'est une anguille, expliquent en riant les villageois, c'est pour que l'eau soit bonne!

— Comment ?

— Oui, l'anguille mange les herbes et toutes les petites bêtes qui parfois tombent, ainsi l'eau reste pure!

L'anguille n'en est pas moins ôtée pour être rendue à un autre milieu aquatique.

L'infrastructure du bassin doit être revue et améliorée pour le nouveau captage. Malgré l'isolement du lieu, un périmètre de protection devra être mis en place autour de la source, car les animaux sauvages (chacals et sangliers fort nombreux) risquent de la polluer.

Le verdict de la Santé est donné : l'eau est parfaitement saine, aucun système de désinfection permanent n'est à envisager au niveau de la source. Le feu vert est donné. L'équipe d'intervention de la Wilaya, dotée de matériel UNICEF (atelier mobile, outillage, pompes, tubes galvanisés, etc...) est sur pied. Le Ramadhan (mois

de jeûne des musulmans) est tout proche, l'été et ses fortes chaleurs sont aussi au rendez-vous. Il faut maintenant creuser la longue tranchée et disposer le lit de sable sur lequel reposeront les tuyaux.

— Vous avez tenu parole, nous tiendrons la nôtre, affirme le chef du douar, revenez dans quinze jours, tout sera prêt.

Une tranchée longue de trois kilomètres

Au jour dit, la tranchée profonde parfois de 0,80 à 1 m ondule comme une longue saignée jusqu'au centre du village. Les hommes ont obtenu de la commune des engins de terrassement qu'ils ont conduits eux-mêmes : bulldozer, ouvrant la voie à une pelle mécanique, de la source au village. Cependant, dans sa fougue et son zèle, le conducteur a approché le captage de trop près, ébranlant la roche poreuse par des vibrations, provoquant une modification de la résurgence souterraine. La source n'est plus qu'un mince filet d'eau qui va s'amenuisant.

La situation paraît grave, mais bientôt avec une perte de niveau de près d'un mètre et à quelque distance de son point primitif, l'eau sourd à nouveau en trois petits jets presque groupés. Une nouvelle infrastructure de captage en béton avec bassin de réception et bassin tampon de distribution est étudiée. Malgré la perte de niveau, l'eau parviendra encore jusqu'au centre du village.

L'équipe mobile d'intervention de la Wilaya est à pied d'œuvre; en un mois, le tuyau est installé : lourdes chappes de béton armé et gabions au passage des oueds, vannes de purge aux points les plus bas du profil, piquages et construction de fontaines avec abreuvoir à l'approche des tout premiers groupes d'habitations sur le flanc de la colline.

De l'eau au milieu du village

A la fin du Ramadhan, l'eau s'écoule avec un débit de 1 litre/seconde juste au milieu du village.

Vu le nombre de foyers permanents, 150, soit près de 1000 personnes, un réservoir tampon de 30 m^3 sera construit avant

qu'un nouveau réseau partant de là alimente l'autre versant, jusqu'à la mosquée en contrebas. L'UNICEF fournira les crédits nécessaires pour le plan d'architecte, la Wilaya dans un but d'économie détachera des spécialistes d'un bureau d'études national, la commune subventionnera le gros-œuvre et les hommes gâcheront le mortier.

Les plans sont terminés, le réservoir tampon sera d'un type semi-enterré avec passage de visite, prise d'air filtrante et trop plein muni d'une grille à mailles très fines.

Après l'eau, des douches, un lavoir, une école

Certes, le village est devenu plus propre, nulle trace de fumier ou de tas d'immondices ne subsiste. Cependant les animateurs du projet estiment que l'on devrait tirer profit de la mise en œuvre du réservoir pour entreprendre quelques actions d'éducation sanitaire, telles que l'hygiène corporelle quotidienne, en particulier des femmes et des enfants (les hommes de par leur mode de vie et leur facilité de déplacement vont très souvent au bain maure), ainsi que la création de pôles d'attraction pour permettre aux femmes de mieux se fréquenter, de s'affirmer et ainsi de s'exprimer.

Cependant une visite au douar permet aux animateurs de constater que la population a réfléchi elle aussi et qu'elle a beaucoup de choses à demander. L'Imman, chef religieux, propose à l'usage de toute la communauté la construction de douches ainsi que de toilettes. Quant au Cheikh Belhassenat, il offre une parcelle de son jardin pour qu'on y construise un lavoir. Les femmes, dit-il, y seront tranquilles, à l'abri des indiscrets et elles se raconteront des histoires de femmes.

Le chef de l'Assemblée populaire communale est d'accord de construire une école. Elle comprendra un logement pour le maître et deux classes pour les plus petits, ce qui leur évitera de parcourir, comme les autres à chaque trajet, environ 8 km pour s'instruire.

Près du site où s'érigera la future école, une anomalie attire l'attention de Mohammed, le conducteur des travaux de l'équipe d'intervention de la Wilaya : des tubes de fibrociment ont été posés en travers de la tranchée. On lui explique qu'un voisin construit un égout. Mohammed convient que l'idée est bonne. Mais étant donné que ce tuyau transportera des eaux usées, donc dangereuses,

s'il venait à perdre son étanchéité ou à se casser, ces eaux imprégneraient la terre autour du tube de la source. Si ce dernier s'abîmait lui aussi, tout ce que l'on a eu tant de peine à faire serait détruit. On décide donc de replacer les buses bien en dessous du passage de l'eau de source. De cette façon le problème est inversé.

Ensuite de l'eau pour l'autre versant

Le projet piétine quelque temps, faute de bois de coffrage. Mais tout n'est pas stoppé pour autant, car dans deux agglomérations de quinze et quarante foyers (satellites de Belhassenat, sous l'autorité duquel ils sont placés), Mohammed poursuit des opérations d'importance : curage, amélioration, couverture de puits, installations de pompes à main, captage d'une source très proche d'habitats traditionnels de pierre et terre battue, construction de lavoirs et abreuvoirs.

Une fois le réservoir terminé, l'eau coule à la mosquée. Le Cheikh Belhassenat est radieux : des émigrés ayant tout appris, ont écrit d'Europe, ils veulent maintenant construire des maisons modernes en vue de leur retour.

Puis de l'électricité et une route

Ça et là, des fontaines évitent aux usagers les longs déplacements d'antan, mais, bien que gratuite, l'eau cause des problèmes. En effet, sous prétexte de la proximité du circuit d'adduction certains villageois ont voulu user de leur influence pour installer à leurs frais des canalisations dans leur maison. Refusé! L'eau est un bien collectif qui doit être offert de la même façon à tous. Une demande d'électrification a été présentée à l'Administration et les habitants désireux d'ouvrir quelques commerces ont sollicité la construction d'une route; malheureusement, faute de fonds, la commune a refusé. Astucieux, les villageois ont exigé (pour droit de péage et accès sur leurs terres jusqu'à la sablière de l'oued) que les sociétés nationales de construction procurent des camions de sable et de tuff pour réaliser cette route qu'ils attendent. Hélas, les dernières pluies ont eu raison de leurs efforts, aucune couche d'asphalte n'ayant imperméabilisé le tracé.

Une nouvelle conscience de leurs possibilités

Aujourd'hui la discussion prend un ton plus grave car l'équipe d'intervention va bientôt se retirer du secteur. Elle ira travailler dans une autre commune pour aider des gens qui ont eux aussi bien des difficultés. Mais au douar on estime que le travail n'est pas du tout fini et qu'il y a encore beaucoup de choses à faire. Il faut que l'équipe aide à obtenir du chef de la Daïra le prêt du tracteur de la coopérative. En outre, on songe déjà à une cantine scolaire. L'idée semble prématurée puisque les fondations de l'école ne sont pas encore terminées. Mais le Cheikh observe « qu'il faut penser à l'avance avec l'administration ». Et il ajoute : « nous voulons que les enfants apprennent à manger comme il faut pour mieux travailler ».

Toutes les actions entreprises dans le cadre du projet n'auront pas eu des résultats aussi positifs qu'ici. La Wilaya le sait bien, et son équipe retiendra pour le bien général certaines leçons : dans tel douar, pour des raisons de mésentente, la pompe installée sur un puits récuré, puis couvert, a été cassée et les gens font la corvée d'eau jusqu'à l'oued, 1 km plus loin ; dans tel autre, les tuyaux pour le captage d'une source, entassés, attendent en vain la tranchée qui les abritera parce que la population compte sur les employés communaux pour ce travail.

Sensibilisé au concept de l'animation et de l'évolution du douar, le président de l'Assemblée populaire communale, désireux de créer un lieu de détente, où jeunes et vieux pourront communiquer, vient de proposer l'octroi d'une licence de café maure (les boissons alcoolisées y sont interdites) à une femme de Chahid (veuve de guerre), qui serait désignée par les villageois.

Heureux ceux de Belhassenat qui ont su interpréter le message et en tirer profit!

Étude de cas

Hydraulique villageoise et investissement humain au Niger

Garba Hima
Sociologue, Inspecteur adjoint
de la Promotion humaine

*Dès le lendemain de l'indépendance juridique de 1960, des travaux en hydraulique furent exécutés, en régie, par des entreprises privées. Mais, parallèlement et surtout à partir de 1967, une expérience de travail en commun fut menée dans le Département de Niamey (Arrondissement de Say) par la section « Puits en investissement humain » de l'*OFEDES *(Office des Eaux du Sous-Sol) et le Service de l'animation humaine. Cette expérience illustre non seulement l'intérêt d'une coopération étroite entre les différents services, mais également à quel point la disponibilité réelle des populations concernées à participer aux actions de développement s'avère importante.*

L'eau, un besoin prioritaire au Niger

Maîtriser l'eau, qu'il s'agisse des eaux de surface, des eaux souterraines ou des eaux de pluies, voilà un des problèmes majeurs que le Niger devra résoudre dans les prochaines décennies.

Le besoin d'eau est prioritaire et la construction de puits s'impose à titre primordial depuis que la dernière sécheresse, dont les effets sont malheureusement visibles sur le terrain, a tragiquement révélé l'insuffisance d'une infrastructure en hydraulique humaine et pastorale. A cela s'ajoute la nécessité d'une véritable

Summary in English "Rural water supply and human investment in Niger", p. 125.
Resumen en español « Abastecimiento de agua e inversión humana en el Niger », p. 131.

politique en matière d'hydraulique qui tienne compte des besoins réels en eau d'un pays comme le Niger situé dans la sous-région soudano-sahélienne.

Disposer d'eau potable, en quantité suffisante, à une distance raisonnable de l'habitation, constitue un objectif important du gouvernement.

Pour environ 10 000 villages de plus de 200 habitants, on compte à l'heure actuelle, seulement 4000 à 5000 puits cimentés. Une différenciation dans la problématique de cette maîtrise de l'eau entre les zones sédentaires et les zones nomades aggrave cette carence. Il faut multiplier les points d'eau potable et améliorer le système de puisage.

L'opération puits basée sur l'investissement humain

« L'opération puits » basée sur l'investissement humain concrétise des besoins exprimés par les populations des zones animées. En effet, à partir de 1962, sous l'action et l'impulsion de l'animation rurale, les populations nigériennes commencèrent à exprimer leurs besoins et à participer de façon responsable aux différentes opérations de développement.

Cependant, certaines régions du Niger ne bénéficient pas encore d'un Service d'animation ou bien ce dernier est d'implantation toute récente. Ainsi l'investissement humain en zones nomades n'a commencé qu'au courant de l'année 1974 selon la formule des travaux communautaires. Cette formule, engendrée par les circonstances consécutives à la sécheresse, permet aux populations nomades, moyennant une rémunération en vivres et en espèces, de participer à des travaux de développement à caractère communautaire (puits, magasins de stockage, etc.).

Le rôle du Service de l'animation

Exécutée en plusieurs étapes, l'opération fait intervenir divers acteurs qui jouent un rôle déterminant à chaque phase. Ainsi au cours de la première étape, le travail essentiel revient au Service de l'animation dont la tâche est de sensibiliser et d'organiser les communautés villageoises pour qu'elles puissent prendre en charge leur propre développement. Dans le cadre de « l'opération puits »

basée sur l'investissement humain, le Service de l'animation, par sa connaissance du terrain, par les relations qu'il a pu nouer avec les villages et surtout par sa méthodologie d'intervention, prépare la bonne réussite de l'opération.

1. *Identification des besoins de la population*

Le Service de l'animation procède à une évaluation des besoins en eau (quantitatifs et qualitatifs) de la population, compte tenu de l'éloignement des points d'eau déjà existants. Cette évaluation s'appuie sur une étude du milieu qui permet de faire émerger l'ensemble des problèmes auxquels sont confrontées les populations. Ces problèmes sont ensuite exposés aux villageois qui les discutent et les hiérarchisent par priorité. Le problème majeur fait souvent l'objet d'une enquête spécifique complémentaire, dont le but est de mieux identifier les besoins. S'agissant de l'« opération puits », plusieurs facteurs sont pris en considération.

Sur le plan quantitatif, les besoins des populations sont déterminés par :

- le nombre de points d'eau exploités ou exploitables (puits traditionnels ou modernes, mares permanentes ou non) ;
- la distance qui sépare ces points d'eau des différents centres d'activité (villages, marchés) ;
- la quantité d'eau utilisée par jour et par famille (cuisine, hygiène corporelle et consommation courante) ;
- le nombre de têtes de bétail abreuvées par jour aux points d'eau.

Sur le plan qualitatif, il s'agit essentiellement :

- d'analyser le degré de pollution des différents points d'eau exploités ;
- d'identifier les maladies locales transmises par l'eau (ver de Guinée, etc.).

2. *Évaluation du degré de motivation*

Parallèlement, le Service de l'animation mène une enquête et une campagne d'information auprès des populations pour saisir leur degré de motivation. En d'autres termes, il lui appartient d'obtenir les réponses aux questions suivantes : la population est-elle disposée à fournir un effort en vue de l'exécution d'un programme de puits en investissement humain ? Sous quelle forme ? Quelles sont les motivations des populations ?

A cette dernière question il semble que les réponses sont partout les mêmes. La rareté de l'eau en quantité et en qualité justifie à elle seule l'extraordinaire motivation des populations. L'eau est rare non seulement pour satisfaire les besoins de consommation courante des populations des zones rurales (cuisine, boisson, hygiène corporelle) mais aussi pour abreuver les animaux domestiques. Cette insuffisance est plus marquée dans les régions à vocation pastorale. L'eau suffit à peine à satisfaire les besoins des populations nomades et sert surtout à abreuver leurs troupeaux d'ovins et de caprins.

Il faut noter aussi que le puisage de l'eau reste une activité essentiellement accomplie par les femmes et les jeunes. Dans certaines régions, la femme parcourt plus de 10 km à pied pour ramener 20 litres d'eau sur sa tête. Avec la corvée du bois, celle de l'eau est l'une des activités les plus pénibles des femmes en milieu rural.

3. *Information des populations sur ce qu'on attend d'elles*

C'est également le Service de l'animation qui expose le principe de l'investissement humain et les différents modes d'intervention, en particulier celui de la participation des populations qui ne doit présenter aucune ambiguïté. Les populations auront à construire une ou deux cases pour abriter le matériel importé (ciment par exemple), elles devront fournir des habitations aux deux puisatiers et à une dizaine de travailleurs, apporter dans la mesure du possible certains matériaux locaux (gravier, sable, etc.) et enfin procurer pour l'essentiel leur force de travail.

Enfin, le Service de l'animation porte à la connaissance de la population concernée les conditions de subvention de l'État et de certains organismes internationaux.

La répartition des tâches

Le principe même de l'investissement humain prend toute sa signification au niveau de la répartition des tâches. En effet, dans le cadre précis de « l'opération puits », les charges sont réparties entre l'OFEDES (service maître d'œuvre qui représente l'État) et la population concernée.

L'opération est réalisée du début jusqu'à son terme sous la

direction effective de l'OFEDES et en particulier de sa section « Puits en investissement humain ». Cette section fut créée en 1967. Son rôle consiste à creuser des puits cimentés modernes dans les régions où les populations sont disposées à fournir une contrepartie en nature ou en force de travail.

L'organisation du travail en équipe

Outre l'information et la sensibilisation, le Service de l'animation organise les communautés villageoises. Il procède à la formation des équipes et organise le système de roulement. Dans chaque équipe, comptant de cinq à dix personnes, les tâches sont réparties de manière à intégrer les femmes et les jeunes. La constitution des équipes se fait de manière tout à fait démocratique. Les leaders identifiés par le Service de l'animation servent de chefs d'équipe derrière lesquels les hommes valides viennent s'aligner. Le système de cooptation est utilisé même au niveau des élections de membre de coopérative et mutuelle. L'intégration et la participation des femmes se fait selon la nature de la tâche qu'elles auront à exécuter. Il s'agit notamment de ravitailler les différentes équipes en eau potable sur le chantier, de faire la cuisine. Cependant, il n'est pas rare de voir le groupe des femmes participer aux travaux les plus durs comme le transport du gravier et du sable. Quant aux jeunes, leur participation est effective à tous les niveaux et ils sont associés directement aux équipes des adultes. Le système d'investissement humain est proche du système d'entraide traditionnelle surtout dans la répartition des tâches.

Cette organisation tient compte des activités saisonnières, donc d'un calendrier.

Un contrat entre la population et les autorités

Toute cette action d'initiation et d'information se fait au cours d'une série de réunions avec les communautés villageoises (autorités villageoises, population). L'objectif visé est d'aboutir à une sorte de contrat par lequel la population et les services techniques s'engagent à œuvrer ensemble dans les limites d'un calendrier indicatif. On comprend aisément que cette phase de sensibi-

lisation est déterminante pour la suite de l'opération. L'adhésion des populations en dépend.

Le rôle de l'OFEDES

1. *L'identification des points d'eau*

D'une manière générale l'OFEDES intervient au niveau de la préparation de l'opération pour résoudre certains problèmes d'ordre technique, tels que la détermination des possibilités hydrauliques des régions en vue de choisir avec les populations le lieu de creusement du puits.

Les cartes hydrologiques régionales d'une précision technique suffisante font souvent défaut au Niger. C'est pourquoi les techniciens de l'OFEDES s'en remettent fréquemment aux conseils des villageois pour déterminer le lieu où le creusement du puits aura la plus grande chance de réussite (profondeur de la nappe, qualités pédologiques, etc.).

Il arrive cependant que pour des raisons techniques un puits ne puisse être creusé à proximité du village et qu'une autre formule de captage de l'eau s'impose. Nous citerons le cas du village de Ibohamane (sous-préfecture de Keita) dans l'Ader-Doutchi-Maggia où la nappe phréatique est natronnée et donc impropre à la consommation. Un forage susceptible d'atteindre la nappe fossile à 300 ou 400 mètres de profondeur est actuellement la solution envisagée.

2. *Les charges de l'*OFEDES

Les charges de l'OFEDES consistent à fournir le matériel de base nécessaire à l'exécution de l'opération, le ciment, les fers à béton, les buses, les moyens logistiques (carburant et camions) et le personnel qualifié, les deux puisatiers spécialisés.

L'OFEDES assure :

- le fonçage, creusement jusqu'à la nappe phréatique, effectué par le puisatier et l'aide puisatier avec le concours des populations organisées en équipes. Le creusement se fait avec des pelles et des barres à mine. Le puisatier dispose en outre d'un treuil et de moules (cuvelage, margelle) ;
- la mise en eau : c'est l'opération la plus délicate. Des équipes spécialisées de l'OFEDES installent les buses au fond du puits (deux à trois selon les cas) à l'aide d'un derrick, équipé d'un moteur.

3. *L'entretien des puits*

Ce travail technique (fonçage et mise en eau) est accompli en étroite collaboration avec les puisatiers du village, s'il en existe. L'OFEDES initie par la même occasion ces puisatiers traditionnels aux techniques modernes. Il ne suffit pas de construire de nouveaux puits, encore faut-il les entretenir, d'où la collaboration de la population à toutes les phases de réalisation.

Ceci est d'autant plus important que les moyens dont dispose actuellement le service d'entretien de l'OFEDES sont insuffisants et ne lui permettent de visiter les puits qu'une fois tous les trois ans. En moyenne, il est souhaitable de récurer un puits une fois par an afin d'assurer un bon débit, surtout dans les régions sablonneuses. En outre, dans certaines régions, la nappe phréatique subit d'importantes fluctuations de niveau. On a pu voir ainsi, durant les dernières années de sécheresse, l'assèchement de plus d'un puits.

Le puits, point d'ancrage de nouvelles actions

Dans la sous-région soudano-sahélienne, la construction de puits est un investissement socio-économique. En outre, le puits peut être considéré comme un puissant moyen d'envisager d'autres opérations. Ainsi au Niger, à l'occasion de « l'opération puits basée sur l'investissement humain », on a entrepris parallèlement les opérations suivantes : action sanitaire, nutritionnelle, jardin, etc.

1. *L'opération jardin*

En ce qui concerne l'opération jardin, le problème est double. Il s'agit d'une part de vulgariser le jardinage dans les régions où les terres sont riches et où l'eau est abondante, et d'autre part de sensibiliser à l'action de jardinage les populations participant aux « opérations puits ».

« L'opération jardin » est menée par les Services de l'animation et de l'agriculture, services maîtres d'œuvre. L'objectif premier visé est l'amélioration du revenu des paysans grâce à la vente de leurs produits. Cependant, tout récemment, l'opération a été orientée vers une amélioration de l'alimentation des paysans eux-mêmes et surtout celle des enfants. Pour cela l'animation, en étroite collaboration avec l'Agriculture et la Santé a formé des

animatrices en nutrition [1]. Celles-ci conseillent et vulgarisent toute action susceptible d'améliorer l'alimentation des groupes vulnérables au niveau du village (consommation d'œufs, légumes...).

2. *L'opération jardins scolaires*

Enfin, il nous faut mentionner l'expérience des jardins scolaires menée par l'Éducation nationale. Cette expérience est intéressante du point de vue pédagogique, nutritionnel et sanitaire, notamment dans la région de Maradi où la présence de puits permet l'initiation des élèves à la pratique du jardinage. Un projet de l'UNICEF s'intéresse, par ailleurs, à étendre cette formule aux écoles nomades du département d'Agadez, l'intervention de l'UNICEF devant porter sur le creusage des puits et le matériel de jardinage.

3. *L'opération filtre à eau*

Pour mieux illustrer le lien qui existe entre le puits et la santé, il nous faut décrire très brièvement l'action filtre à eau.

Il est apparu que les efforts en éducation sanitaire et l'amélioration nutritionnelle restent vains si chaque village n'est pas doté d'eau potable. Ainsi avec le lancement des puits creusés par l'OFEDES et la participation des communautés villageoises il a semblé opportun d'entreprendre des actions éducatives en vue de limiter la pollution des eaux des puits cimentés. A cet effet, les Services de santé et de l'animation entreprirent la construction et la vulgarisation du filtre à eau à partir des matériaux locaux (canaris de terre cuite, toile percale, sable fin, gravier, charbon de bois).

Nécessité d'une pompe

Ces opérations demeurent toutefois au stade embryonnaire, la simple disponibilité de l'eau primant souvent encore, et de façon compréhensible, sur le problème de la qualité. Maintes discussions (entre l'OFEDES, les Services de santé et d'animation) ont débattu du problème de l'installation d'une pompe sur le puits, pour réduire le dur labeur du puisage de l'eau qui revient principalement aux femmes et pour résoudre le problème de la potabilité de l'eau.

1 Opération menée à Keita, Tillabery, Madarounfa, Konni, Doutchi et Matameye.

Cependant, une pompe à moteur pose immédiatement le problème du coût de son fonctionnement et de son entretien. Les divers modèles de pompes à main expérimentés au Niger n'ont pas donné de résultats satisfaisants tant du point de vue de leur débit que de leur résistance. Il est néanmoins acquis aujourd'hui que pour résoudre le problème fondamental de l'eau potable, la base de toute action sanitaire conséquente, la solution envisagée passera nécessairement par une pompe quelconque.

Ressources humaines et financières

L'expérience de « l'opération puits » basée sur l'investissement humain, bien qu'ayant connu un succès notable, se trouve limitée par un certain nombre de facteurs internes et externes. Avec la sécheresse qui a abaissé la nappe phréatique et qui a favorisé l'exode, les travaux sont devenus difficiles et la main d'œuvre locale manque. Grâce à l'instauration récente des travaux communautaires, l'opération pourrait reprendre un nouveau souffle. Toutefois la hausse des prix des matières premières (ciment, fer à béton, barres à mine, etc...) va grever considérablement le budget destiné à ce type d'opération.

Notons toutefois que le Niger a obtenu de certains organismes internationaux le financement de programmes de puits en investissement humain. Citons pour mémoire le programme quadriennal 1974-1978 financé en partie par l'UNICEF en vue de creuser 400 puits.

Parallèlement et conjointement l'UNICEF et le PNUD ont financé un programme de 100 puits d'urgence, en 1975-1976, qui cependant est exécuté, en régie, par l'OFEDES. Le coût de la participation non nigérienne s'élevait à 400 000 dollars dont 250 000 pour l'UNICEF.

De nouvelles formes d'organisation et de participation

En conclusion, il faut noter que cette opération qui part des besoins exprimés par les populations a favorisé l'émergence de nouvelles formes d'organisation et de participation effective des masses nigériennes.

En effet, à partir de 1968 l'opération DRS et CES [2] a été lancée

2 DRS = Défense et Restauration des Sols.
CES = Conservation des Eaux et des Sols.

dans le Département de Tahoua. Cette opération vise à construire des banquettes anti-érosives par investissement humain. Autre exemple : en 1969, l'opération matrone est lancée dans le Département de Maradi. Cette opération consiste à recycler les matrones traditionnelles des villages aux techniques modernes d'accouchement. C'est là une forme de participation d'une partie de la population à une tâche spécifique.

L'important dans la situation actuelle, c'est la disponibilité des populations pour toutes les actions et en particulier pour l'opération puits.

Bien que limitée seulement à l'aspect travail, l'opération aurait pu aboutir à l'implantation de nouvelles structures comme le comité de gestion des puits de forage à l'image des pharmacies de village. Pour être exemplaire, le creusement de puits par investissement humain doit être intégré, désormais, dans les opérations susceptibles d'être prises en charge par les coopératives de production et de commercialisation.

C'est là un autre problème. Bref, l'intégration ponctuelle des actions ayant une portée socio-économique doit faire partie d'une véritable politique du développement.

Estudio de caso

Participación comunitaria y saneamiento básico rural en Colombia

Jaime Mora Ramírez
Jefe Nacional del Programa de
Saneamiento Básico Rural
con la colaboración de
Orlando López Orozco
Jefe de la Sección de Promoción Comunitaria

La División de Saneamiento Básico Rural del Instituto Nacional de Salud de Colombia es la unidad gubernamental encargada de realizar el Programa Nacional de Saneamiento Básico Rural, entendido como el conjunto de las obras y actividades necesarias para dotar de agua potable y de una adecuada disposición de excretas y aguas residuales a núcleos humanos hasta 2500 habitantes.

Para el Programa, la realización de la obra sanitaria no constituye el fin último sino tan sólo un medio o instrumento para lograr un cambio de actitud de la comunidad, traducido en una participación consciente y permanente en su propio desarrollo. En este sentido dentro del Programa se ejecutan actividades de ingeniería sanitaria y de promoción social.

El problema de saneamiento básico rural en Colombia

El Estudio Sanitario de Comunidades Rurales estableció para 1971 un balance aproximado del problema. Teniendo en cuenta los resultados de la investigación y después de actualizar la información con las realizaciones alcanzadas por el Programa durante

Résumé en français « Participation communautaire et assainissement rural en Colombie », p. 123.
Summary in English "Community participation and rural environmental sanitation in Columbia", p. 126.

los años 1972, 1973 y 1974, la situación sanitaria del área rural en el país a 31 de diciembre de 1974 es la que figura en el siguiente cuadro :

Servicio	TOTAL				CON SERVICIO				SIN SERVICIO			
	N° localid.	%	N° hbts.	%	N° localid.	%	N° hbts.	%	N° localid.	%	N° hbts.	%
Acueducto	7100	100	4 025 000	100	2975	42	1 672 000	42	4125	58	2 353 000	58
Alcantarill.	7100	100	4 025 000	100	660	9	402 000	10	6440	91	3 623 000	90

FUENTE : Estudio Sanitario de Comunidades Rurales y Planes Seccionales, Div. Saneamiento Básico Rural.

Dicha situación, como se ha mencionado, prevalece en las localidades de 50 a 2500 habitantes. En cuanto a la población dispersa, que asciende a 6 000 000 de habitantes aproximadamente, cerca del 15 % cuenta con servicios de disposición de excretas por medio de letrinas o sistemas similares y alrededor de un 25 a 30 % cuenta con abastecimiento de agua.

Los objetivos del Programa

El Programa Nacional de Saneamiento Básico Rural trata de transformar esta situación por medio de la aplicación técnica de la ciencia sanitaria a los problemas de salud.

Son objetivos específicos del Programa :

a) proveer de servicios de agua potable a localidades rurales con población hasta 2500 habitantes;

b) obtener una adecuada disposición de excretas y aguas residuales, basadas en la construcción de unidades sanitarias y alcantarillados en las áreas de su competencia;

c) partiendo del mejoramiento de la salud con la realización de este Programa, desencadenar un proceso de desarrollo integrado de la comunidad en el campo económico y social.

El Programa es ejecutado por intermedio de la División de Saneamiento Básico Rural del Instituto Nacional de Salud que es un establecimiento público, es decir, una entidad dotada de personería jurídica, de autonomía administrativa y de patrimonio propio, y se desarrolla a través de los cuatro subprogramas siguientes : abastecimiento de agua, alcantarillados sanitarios, unidades sanitarias escolares, unidades sanitarias rurales.

Filosofía del Programa

La filosofía del Programa de Saneamiento Básico Rural se basa en principios de salud y bienestar social, a saber :

a) El desarrollo económico-social no es posible sin un adecuado marco de salud y bienestar que posibilite la realización del individuo, de su familia y de su comunidad;

b) Dentro de los factores condicionantes de la situación de salud el de saneamiento básico es el más importante por el amplio ámbito de su repercusión;

c) La participación popular se fundamenta en el aprovechamiento del potencial que existe en las comunidades para participar activamente en la solución de sus propios problemas y en la orientación de su desarrollo;

d) La participación de la comunidad en la realización de las obras sanitarias, a través de su trabajo, del aporte económico y de materiales locales, constituye un pilar fundamental del Programa;

e) El Programa encauza los esfuerzos de la población para que integrados a los del gobierno y a los de otras agencias, puedan emplearse en la búsqueda del mejoramiento de la salud de las comunidades rurales, incorporándolas además a la dinámica del desarrollo nacional;

f) La contribución de la comunidad va más allá de la participación en la realización de la obra. Durante la ejecución de ésta, se despierta el interés de la población y su capacidad creadora, todo ello encauzado hacia sus futuras actividades de conservación, ampliación y correcto uso del servicio puesto a su disposición;

g) Una vez concluida, la obra es entregada a la comunidad que la administra y mantiene a través de una Junta. Esta es elegida democráticamente por los usuarios del servicio y cuenta con la representación y asesoría del Programa;

h) La realización de la obra sanitaria no constituye el fin último del Programa, sino tan sólo un medio o instrumento para lograr un cambio de actitud de la comunidad, traducido en una participación consciente y permanente en su propio desarrollo.

Proceso metodológico del Programa

En la ejecución del Programa se ha venido aplicando una metodología que consta de cinco grandes etapas como partes de una sucesión de fenómenos cuyos límites se confunden y compenetran entre sí. Estas cinco etapas son las siguientes :

1. *Estudio de la comunidad*

Durante esta primera fase se pretende hacer un inventario-registro o indagación de los aspectos sanitarios, económicos, sociales y culturales de las comunidades preseleccionadas para el Programa, como también de los factores positivos y negativos que pueden surgir durante el desarrollo del mismo. Una de las finalidades importantes del estudio será la de ayudar a seleccionar en forma definitiva las comunidades, estableciendo un orden de prioridades, dado que señalará el estado sanitario, el interés de la población por las actividades de acción comunal, los recursos humanos y materiales con que se cuenta, la gravedad de los problemas y la jerarquía de los mismos, etc., factores éstos que son decisivos para planificar y decidir muchas acciones futuras del Programa.

2. *Preparación del proyecto*

Esta etapa comprende actividades técnicas de ingeniería. Se llevan a cabo los estudios topográficos y los planos correspondientes, los cuales permiten a los ingenieros preparar el diseño y el presupuesto de la obra.

3. *Motivación, promoción y organización de la comunidad*

La tercera etapa pretende sensibilizar y despertar el interés de la comunidad, impulsándola a participar en la ejecución de la obra. Para ello es necesario transmitir a la gente los conocimientos que la inciten a actuar por convencimiento antes que por coacción, dado que reconoce la conveniencia y utilidad de la obra para sí

misma, para su familia y su comunidad. Algunas de las actividades que se llevan a cabo durante esta etapa son las siguientes : contacto y reuniones con las autoridades y los dirigentes locales, entrevistas con los directores de grupos organizados, visitas a los líderes, reuniones con los maestros de escuela, asamblea general de vecinos, constitución de la junta de acción comunal, formación de grupos operativos, firma del convenio de construcción, financiación de la obra, etc.

4. *Construcción de la obra*

Una vez se ha firmado el convenio entre el Programa y la comunidad, se da comienzo a la construcción de la obra. Una de las actividades específicas de esta cuarta etapa consiste en el control de la obra, de la inversión por semana, de los materiales y de los aportes de la comunidad, etc.

5. *Administración y supervisión*

La participación del Programa en el proyecto no cesa con la entrega de la obra a la comunidad y la delegación de la responsabilidad de su mantenimiento en la Junta Administradora. Por el contrario, a través de toda una última etapa, cuyo límite no puede precisarse, continúa brindando orientación y asesorando la organización social y la operación del sistema.

Participación de la comunidad durante el desarrollo del proceso metodológico del Programa

A continuación se precisa la participación específica de la comunidad durante el desarrollo de las cinco etapas del proceso metodológico del Programa anteriormente descritas :

Estudio de la comunidad :

- Suministra información sobre aspectos sociales, económicos y sanitarios,
- Ayuda a recolectar información,
- Orienta a los funcionarios que realizan el estudio,
- Proporciona sugerencias en base a sus experiencias en la acción comunal,
- Facilita la integración entre las familias y los funcionarios.

Preparación del proyecto de la obra

- Suministra auxiliares para los estudios topográficos,
- Proporciona datos locales para el diseño y el presupuesto,
- Ayuda con materiales y mano de obra durante el levantamiento topográfico,
- Dona terrenos para la ubicación de las diferentes partes de la obra,
- Da el consentimiento para la utilización de las aguas,
- Permite el paso de las tuberías por los predios.

Motivación, promoción y organización de la comunidad

- Pone a disposición del Programa su experiencia y organización comunal,
- Asiste a las asambleas generales,
- Participa en las actividades programadas y cumple las responsabilidades asignadas,
- Divulga el Programa, sus beneficios, su mecánica y desarrollo,
- Busca la vinculación de recursos institucionales al Programa,
- Autoriza a la Junta Comunal la firma del contrato con el Instituto Nacional de Salud,
- Fiscaliza el desempeño de los dirigentes y funcionarios del Programa,
- Divulga el Programa a comunidades vecinas y a otros sectores de la población.

Construcción de la obra

- Aporta materiales, mano de obra, dinero, medios de transporte, herramientas y otros,
- Asume tareas tales como : excavaciones, apertura de zanjas, aprovisionamiento de materiales, vaciado de tanques, etc.,
- Cuidá los materiales depositados en la localidad,
- Realiza actividades sociales para recolectar fondos,
- Desempeña actividades en comités, equipos y brigadas de trabajo.

Administración y supervisión

- Suministra el plomero encargado de cuidar el sistema,
- Desempeña sin retribución económica cargos en la Junta Administradora,

- Colabora financieramente para los gastos de administración de la obra, mediante el pago de la cuota familiar,
- Cumple o hace cumplir el reglamento de funcionamiento de la obra,
- Facilita el local para la operación de la Junta Administradora,
- Informa sobre la marcha administrativa y técnica de la obra,
- Asiste a reuniones y asambleas de evaluación administrativa de la obra,
- Recibe, guarda y administra los fondos de las cuotas familiares,
- Capacita personas para las tareas de administración del sistema,
- Sugiere programas de ampliaciones y mejoras del sistema.

Organización administrativa

La administración, operación, mantenimiento y mejora de los acueductos y alcantarillados rurales construidos por el Programa están a cargo, en cada localidad, de una junta autónoma denominada Junta Administradora del Acueducto o del Alcantarillado, según el caso.

La Junta Administradora está constituida por tres miembros :

a) un representante de la Junta Directiva de Acción Comunal del lugar, preferentemente usuario de la obra, nombrado en la asamblea general de usuarios ;

b) un representante de los usuarios, que no sea miembro de la Directiva Comunal, nombrado por la asamblea de usuarios ;

c) un representante del Programa de Saneamiento Básico Rural, escogido por el Ingeniero Jefe del Programa en cada territorio, el cual actúa como Secretario-Fiscal.

Los miembros elegidos por los usuarios en asamblea general desempeñan los cargos de Presidente y Tesorero. La Junta Administradora debe prestar el servicio de acueducto y alcantarillado con criterio de servicio público, con miras al bien general, pero haciendo pagar por su uso con el fin de asegurar el sostenimiento, desarrollo y ensanche del mismo. Los miembros de la Junta Administradora desempeñan sus cargos sin percibir sueldo.

Alcances socio-económicos del Programa

Con la ejecución del Programa, además de la realización física de la obra, se obtienen otros resultados de tipo económico y social. Estos últimos, eminentemente cualitativos, se manifiestan en un cambio de actitud de la población rural y si bien es cierto que se requieren sistemas sofisticados para su medición inmediata, a largo plazo producen efectos positivos y perdurables en el desarrollo del país.

Alcances económicos

Aumento de la inversión : Aunque las obras con participación de la comunidad pueden requerir un período de ejecución mayor, con el consiguiente aumento de gastos generales, el Programa obtiene en términos globales un mejor rendimiento económico puesto que el aporte de la comunidad en las obras supera, por varios miles de pesos, el mayor costo de los gastos generales.

Utilización de recursos materiales locales : Utiliza los recursos materiales propios de las comunidades, siendo los unos donados por la misma población y los de carácter especializado comprados con los fondos del Programa, contribuyendo así al mejoramiento económico de las pequeñas empresas familiares y comunales.

Creación de empleos : Utiliza mano de obra especializada dando, en esta forma, ocupación remunerada a numerosos miembros de la comunidad.

Capacitación de la población : Mediante la participación de la población en las actividades materiales del proyecto, ésta es capacitada en nuevas actividades que le proporcionarán, en el futuro, otras fuentes de ingreso.

Valorización de la propiedad : Para los campesinos, el tener una parcela y una vivienda con un servicio adecuado de abastecimiento y eliminación de aguas, constituye un motivo de prestigio personal y comunal, además de la valorización de las propiedades que cuentan con estos servicios.

Ahorro de tiempo y de capital : Estos servicios ahorran tiempo y dinero a la población que antes compraba el agua o se veía obligada

a buscarla a grandes distancias, a la vez que producen efectos saludables para su mejoramiento económico.

Diversificación de inversiones estatales : Mediante la constitución de Juntas Comunales Administradoras de obras, se ahorran grandes inversiones al Estado en la operación y mantenimiento de los sistemas, lo cual permite ampliar la cobertura del Programa o irradiar fondos a otras acciones de desarrollo.

Incentivo artesanal y turístico : La construcción del acueducto ha servido, en algunas áreas, de incentivo para instalar o mejorar pequeñas industrias y para atraer corrientes turísticas.

Alcances sociales

Surgimiento de proyectos comunales rentables : La construcción de una obra sanitaria permite la introducción en la comunidad de un grupo empresarial (junta administradora) que sirve de modelo o incentivo para la formación de otros, tales como cooperativas, etc. En diciembre de 1974 existían en el país 1160 Juntas Administradoras.

Mejoramiento de las personas y de la comunidad : Gracias al Programa los miembros de la comunidad toman conciencia de sus problemas y se organizan para resolverlos.

Disminución del éxodo rural : Se está tratando de aminorar el éxodo acelerado del campo a la ciudad y por lo tanto de disminuir las graves consecuencias de una inmigración desmedida.

Educación : Con la construcción de la obra sanitaria el grupo va cobrando confianza en sus propias capacidades y potencialidades. La gente que ha realizado un esfuerzo social y económico aprende a valorar el servicio y lo quiere y cuida como algo suyo, como un fruto de su propio esfuerzo.

Integración de los servicios de desarrollo : El Programa trata de vincular o se vincula a otras agencias oficiales, semioficiales o privadas que trabajan en áreas determinadas. Esto también obedece a la firme convicción de la importancia de la coordinación intersectorial, con la asignación de responsabilidades específicas en la ejecución de acciones, para el logro de un desarrollo integral de las zonas rurales. La dotación de agua o la eliminación de excretas y aguas residuales, por sí solas, no generan desarrollo. Para ello

será necesario unir estas acciones a otras acciones de salud, de educación, de obras públicas, de agricultura, etc., tendientes a influir en el mejoramiento de los ingresos, en la creación de empleos, en la extensión de los servicios sociales, y en fin en la búsqueda del mejoramiento del nivel de vida de la población rural.

Unión de los esfuerzos gobierno-comunidad : Finalmente, el Programa encauza los esfuerzos de la población para que integrados a los del gobierno y a los de otras entidades, puedan emplearse en la búsqueda del mejoramiento de la salud de las comunidades rurales, incorporándolas además a la dinámica del desarrollo nacional.

Cuantía de la participación comunitaria

Como ya se ha dicho, la filosofía que orienta el Programa Nacional de Saneamiento Básico Rural, contempla como uno de sus aspectos fundamentales la participación comunitaria en la construcción de las obras sanitarias y posteriormente en la administración y mantenimiento de los sistemas construidos.

Como norma general se ha establecido que dicha participación, en lo referente a la etapa de ejecución, represente un 20 % del costo total de la obra. La comunidad puede brindar su aporte en dinero efectivo, en materiales locales, en transporte, en terrenos y en mano de obra. Se insiste mucho en la participación en forma de mano de obra por su alto valor educativo.

Es conveniente, sin embargo, aclarar que el 80 % restante es financiado en parte por un préstamo a largo plazo (10 a 15 años y 6 % de interés anual) que el Programa concede a las comunidades según el convenio celebrado con ellas. Dicho préstamo oscila entre un 40 y un 60 % de esta última parte, dependiendo el porcentaje de la capacidad de pago de la comunidad, factor éste que es conocido por medio del estudio socio-económico previamente realizado. El resto del costo corresponde a la contribución de la entidad, la cual representa un 40 % de la inversión efectuada en la obra.

Como ya se dijo, una vez concluida la obra, se constituye una Junta Administradora de la misma, la cual se encarga de la administración, operación, mantenimiento y mejora del sistema. Con el fin de que la Junta Administradora tenga los recursos suficientes para desarrollar sus actividades, la población aporta una contri-

bución mensual llamada : cuota familiar. Parte de esta cuota corresponde al reembolso del préstamo concedido, el cual, a través de la Junta Administradora, va en su totalidad al Fondo Rotatorio de Saneamiento Básico Rural permitiendo la financiación de nuevas obras.

Analizando la participación de la comunidad a partir de los aspectos anteriormente descritos, es decir, desde el punto de vista de la rentabilidad económica, es necesario decir que son muchos los millones de pesos aportados durante los varios años de ejecución del programa. A modo de indicación se ofrecen a continuación los datos de 1974 correspondientes a los aportes de la etapa de construcción de las obras, al reintegro de los préstamos concedidos y a la inversión en el mantenimiento de las obras sanitarias :

Inversión durante la construcción de la obra sanitaria			Reintegro Fondo Rotatorio a través Junta local Administradora	Aporte comunitario en mantenimiento de la obra [1]	Total volumen participación cuantitativa de la comunidad
I.N.S.	Comunidad	Total			
107 162	17 223	124 385	6615	13 920	37 758 [2]

Miles de pesos

El factor educativo en el Programa

Para obtener esta amplia participación de la población en todas y cada una de las actividades del Programa, y especialmente para lograr los resultados socio-económicos anteriormente descritos, es claro que debe existir algún elemento especial. Ese elemento es la educación que se imparte a la comunidad a través de todo el proceso y que desarrolla personal calificado en la materia.

El factor principal del éxito del Programa consiste en la preparación de la comunidad proporcionándole conocimientos ade-

1 Sobre la base de 1160 Juntas Administradoras existentes en diciembre de 1974 y una inversión promedio mensual por Junta de $ 1000,00.

2 Aproximadamente US $ 1 258 600 al cambio de 30 Pesos M/cte. Col. por US $ 1.

cuados sobre el agua y especialmente aquellos que se refieren a su aprovechamiento y conservación. Esta educación sanitaria se hace a través de la escuela, utilizando sus instalaciones, equipos y maestros. Los alumnos y los padres de familia son los primeros en recibirla. Las charlas se complementan con materiales educativos tales como cartillas, plegables y en general con el uso de los medios audiovisuales, especialmente el cine. La educación sanitaria trata de inculcar en la población la idea de que la salud pública en su sentido más amplio está bajo la responsabilidad del pueblo mismo.

Pero estas actividades educativas no se circunscriben solamente a los aspectos sanitarios propiamente dichos, sino que abarcan nuevos niveles de educación de la comunidad. Estos se traducen en la comprensión y aceptación de ulteriores programas de desarrollo social y económico, y en la admisión de su responsabilidad en dichos programas, por ser medio y objeto del desarrollo. En este sentido, el personal no olvida que además del interés de la obra en sí, no habrá una plena realización del Programa si éste no produce una resultante educativa en la comunidad, medida en un cambio de actitudes y de valores en relación al desarrollo integral del grupo. En este orden de ideas, la obra constituye un instrumento que favorece el mejoramiento del hombre que es considerado con sus derechos, sus responsabilidades y su capacidad de participar en todas las etapas del proceso.

El éxito futuro del Programa depende de la calidad de la educación, dado que sólo así puede garantizarse la participación, aceptación y cooperación de la comunidad en la construcción, administración y mantenimiento del servicio.

El nivel directivo central del Programa incluye entre sus unidades ejecutivas una Sección de Promoción Comunitaria cuya dirección se ha encomendado a un sociólogo especializado en « Desarrollo de la comunidad ». El equipo de colaboración está formado por cuatro promotores de desarrollo de la comunidad, una educadora sanitaria, un técnico de comunicación social, un dibujante publicitario y cuatro auxiliares de promoción comunitaria encargados cada uno de la operación de una unidad móvil audiovisual.

El equipo de colaboración tiene la obligación de planificar, orientar, coordinar y asesorar la labor de los Promotores Seccionales que operan a nivel de la obra (118 en total). En cada una de las Seccionales del Programa (21 en total) se cuenta con un prome-

dio de seis Promotores dedicados a todas aquellas funciones, ya mencionadas, de educar y promover a las comunidades que serán beneficiadas, de coordinar todas las actividades de obtención de los recursos requeridos de la comunidad y de controlar el recaudo de contribuciones, o sea el movimiento de materiales y equipos enviados a la obra. Asimismo el personal de Promotores — en su calidad de representantes de la entidad en las Juntas Administradoras locales — asesoran la organización comunitaria creada en torno a la Junta y supervisan la correcta administración y mantenimiento de los sistemas construidos, al mismo tiempo que fiscalizan lo correspondiente al movimiento financiero de la Junta y al reembolso del préstamo concedido por medio de las cuotas recaudadas.

Algunas de las actividades educativas propiamente dichas que se realizan en el Programa son las siguientes : capacitación al desarrollo de la comunidad para Promotores de Saneamiento Básico Rural y para miembros de Juntas Administradoras de Acueductos y/o Alcantarillados Rurales, preparación de affiches, cartillas, carteles, reglamentos y manuales, promoción por medio de unidades móviles audiovisuales, elaboración de películas y sonovisos, y asesoría en la educación sanitaria y en el desarrollo de la comunidad a nivel operativo.

DISEASES RELATED TO DEFICIENCIES IN WATER SUPPLY OR SANITATION

Group	Diseases	Route leaving man [a]	Route entering man [a]
Water-borne diseases *Water acts only as a passive vehicle for the infecting agent. All of these diseases depend also on poor sanitation.*	Cholera	F	O
	Typhoid	F, U	O
	Leptospirosis	U, F	P, O
	Giardiasis	F	O
	Amoebiasis [b]	F	O
	Infectious hepatitis [b]	F	O
Water-washed diseases *Lack of water and poor personal hygiene create conditions favorable for their spread. The intestinal infections in this group also depend on lack of proper human waste disposal.*	1) Scabies	C	C
	Skin sepsis	C	C
	Yaws	C	C
	Leprosy	N (?)	?
	Lice and typhus	B	B
	Trachoma	C	C
	Conjunctivitis	C	C
	2) Bacillary dysentery	F	O
	Salmonellosis	F	O
	Enterovirus diarrheas	F	O
	Paratyphoid fever	F	O
	Ascariasis	F	O
	Trichuriasis	F	O
	Whipworm (Enterobius)	F	O
	Hookworm (Ankylostoma)	F	O, P
Water-based diseases *A necessary part of the life cycle of the infecting agent takes place in an aquatic animal. Some are also affected by waste disposal. Infections spread other than by contact with or ingestion of water have been excluded.*	Urinary schistosomiasis	U	P
	Rectal schistosomiasis	F	P
	Dracunculosis (guinea worm)	C	O

Group	Diseases	Route leaving man [a]	Route entering man [a]
Water-related vectors *Infections are spread by insects that breed in water or bite near it. Adequate piped supplies may remove people from the biting areas or enable them to dispense with water storage jars where the insects breed. Unaffected by waste disposal.*	Yellow fever	B	B mosquito
	Dengue plus dengue hemorrhagic fever	B	B mosquito
	West-Nile and Rift Valley fever	B	B mosquito
	Arbovirus encephalitides	B	B mosquito
	Bancroftian filariasis	B	B mosquito
	Malaria [c]	B	B mosquito
	Onchocerciasis [c]	B	B Simulium fly
	Sleeping sickness [c]	B	B tsetse
Fecal disposal diseases *These are one extreme of a spectrum of diseases, mostly water-washed, together with a group of water-based type infections likely to be acquired only by eating uncooked fish or other large aquatic organisms.*	Hookworm (Necator)	F	P
	Clonorchiasis	F	Fish
	Diphyllobothriasis	F	Fish
	Fasciolopsiasis	F	Edible plant
	Paragonimiasis	F, S	Crayfish

a. F=feces; O=oral; U=urine; P=percutaneous; C=cutaneous; B=bite; N=nose; S=sputum.
b. Though sometimes water-borne, more often water-washed.
c. Unusual for domestic water to affect these much.

Source: Saunders, Robert J. and Warford, Jeremy J., *Village Water Supply: Economics and Policy in the Developing World*, published for the World Bank by the John Hopkins University Press, Baltimore, 1976.

RELATION BETWEEN WATER SUPPLIES AND INFECTIOUS DISEASES

	Commonness	Severity	Chronicity	Volume effect	Purity effect	% Reduced by water improvement
Cholera	(++)	+++			↓↓↓	90
Typhoid	+	+++			↓↓↓	80
Leptospirosis	±	++			↓↓	80
Bacillary dysentery	++	+++		↓↓	↓↓	50
Amebic dysentery	+	++	++	↓↓	↓↓	50
Tularaemia		++			↓	40?
Paratyphoid	±	++		↓	↓	40
Infectious hepatitis	++	++	+		↓	10?
Enteroviruses (some)	++			↓	↓	10?
"Gastroenteritis"	+++	+++		↓↓	↓↓	50
Skin sepsis	+++	+	+	↓↓		50
Skin ulcer (chronic)	+++	+	++	↓↓		40
Trachoma	+++	++	++	↓↓↓		60
Eye inflammation	+++	+	+	↓↓		70
Scabies	++	+	+	↓↓		80
Yaws	+	++	+	↓		70
Leprosy	++	++	++	↓		50
Tinea	+	+		↓		50
Otitis externa	±			↓		40
Louseborne typhus	±	+++		↓		40
Louseborne relapsing fever	±	+++		↓		40
Ascariasis	++	++	+	↓↓		40
Urinary schistosomiasis	++	++	++		↓↓	80
Rectal schistosomiasis	++	++	++		↓	40
Guinea worm	(++)	++	++		↓↓	100
Yellow fever	±	+++				10?
Onchocerciasis	++	++	++			20?
Malaria	+++	++	+			10?
Gambian sleeping sickness	+	+++	++			80

Note : Indications of commonness refer to East Africa, except for cholera and guinea worm. Both of these important infections happen to be rare in East Africa, and a global frequency is given in parentheses.

The authors qualify the percentages given for the reduction of morbidity which might result from an improved water supply, as largely guesswork based on a wide experience of East African conditions.

Source: White, Gilbert F., Bradley, David J., and White, Anne U., *Drawers of water: domestic water use in East Africa*, reprinted with the authorization of The University of Chicago Press, Chicago and London, 1972, p. 211.

Mortalité infantile, eau potable et assainissement

Luis A. Orihuela
Chef, Approvisionnements publics en eau
et hygiène des collectivités
Division de l'Hygiène du milieu, OMS

Les risques d'origine hydrique qui nous préoccupent ici peuvent se répartir en deux catégories principales :

a) *risques liés aux agents biologiques susceptibles d'affecter l'homme, soit par l'ingestion d'eau, soit par d'autres formes de contact avec celle-ci, ou encore par l'intermédiaire d'insectes vecteurs;*

b) *risques dûs à la présence dans l'eau de polluants chimiques et radioactifs habituellement constitués par des déchets industriels.*

Maladies provoquées par des vecteurs associés à l'eau

La plus répandue des maladies provoquées par des vecteurs associés à l'eau est le paludisme dont l'agent de transmission est le moustique anophèle. L'habitat des différentes espèces de vecteurs anophèles, de même que leur écologie et leur bionomie, sont bien connus.

Le vecteur (la simulie) de *l'onchocercose*, ou *cécité des rivières*, est lié à diverses conditions naturelles, telles que la présence de sources d'eau vive s'écoulant sur un lit rocheux. Faute de certaines précautions, les mêmes conditions peuvent se reproduire dans des ouvrages artificiels édifiés pour développer les ressources en eau, comme les déversoirs de barrages ou les canaux bétonnés. La création de nouveaux gîtes larvaires, par suite de la mise en valeur de

Les éléments de cet article sont tirés d'une communication présentée à la Conférence des pays de l'Afrique australe sur l'approvisionnement en eau et la lutte contre la pollution, Mbabane, Swaziland, 2-5 juin 1975.
Summary in English « The health hazards of polluted water » p. 126.
Resumen en español « El agua contaminada, un peligro para la salud » p. 131.

ces ressources, est un problème particulièrement important en Afrique, car l'une de ses conséquences peut être d'annihiler les avantages potentiels de tels travaux [1].

Parmi d'autres maladies transmises par des vecteurs de même nature, citons *la fièvre jaune* (transmise par le moustique *Aedes aegypti*), un certain nombre d'affections à arbovirus ainsi que *la trypanosomiase (maladie du sommeil)*, très répandue en Afrique, et qui est transmise par la mouche tsé-tsé, plus particulièrement associée aux zones de végétation en bordure de l'eau.

La filariose, qui affecte plus de 250 millions d'individus dans le monde, demeure l'une des principales infections parasitaires [2]. Les risques d'accroissement de l'infection et de développement de la maladie augmentent dans les zones urbaines des pays en voie de développement. Cette tendance est due essentiellement à l'urbanisation rapide qui caractérise beaucoup des pays neufs d'Afrique et d'Asie, et qui se traduit par de vastes mouvements de population et la prolifération de ghettos urbains accompagnée d'une multiplication importante des gîtes de reproduction du principal vecteur, le *Culex pipens fatigans* [3]. En Afrique, *la filariose de Bancroft* est transmise par les anophèles vecteurs du paludisme.

Parmi les dangers que présentent pour la santé les agents biologiques transmis par contact avec l'eau, la *schistosomiase* occupe une place de tout premier plan, notamment en Afrique. Les statistiques précises de morbidité et de mortalité font défaut, mais une estimation prudente permet d'évaluer à quelque *200 millions le nombre d'individus infectés* à un moment quelconque par le parasite sur l'ensemble du globe. La prévalence de la maladie peut dépasser 50 % dans certaines zones d'endémicité [4].

Lors d'une enquête sur les infections à *Schistosoma haematobium* chez les enfants d'âge pré-scolaire à Ibadan (Nigeria),

1 *Comité* OMS *d'experts de l'onchocercose, deuxième rapport, Série de Rapports techniques*, N° 335, OMS, Genève, 1966, 101 p.

2 *Comité* OMS *d'experts de la filariose, troisième rapport, Série de Rapports techniques*, N° 542, OMS, Genève, 1974, 56 p.

3 *Comité* OMS *d'experts de la filariose (Infections à Wuchereria et à Brugia), deuxième rapport, Série de Rapports techniques*, N° 359, OMS, Genève, 1967, 50 p.

4 *Comité* OMS *d'experts de la bilharziose, troisième rapport, Série de Rapports techniques*, N° 299, OMS, Genève, 1965, 58 p.
*Epidémiologie et prophylaxie de la schistosomiase, rapport d'un Comité d'experts de l'*OMS, *Série de Rapports techniques*, N° 372, OMS, Genève, 1967, 39 p.

Siegal (1968)[5] a noté que le nombre d'œufs d'hématobies était sensiblement plus grand chez les enfants demeurant plus près de la rivière.

Le taux d'infection différait également en fonction de la nature des approvisionnements en eau ; 5 % seulement des enfants vivant dans des habitations possédant l'eau courante étaient porteurs de vers, alors que le pourcentage était de 20,9 dans le cas des habitations dépourvues d'installation de ce genre.

La fascioliase figure au nombre d'autres affections d'origine hydrique transmises par les mollusques.

Le ver de Guinée, qui infeste un crustacé d'eau douce présent dans les étangs et les puits, provoque sans doute dans beaucoup de régions d'Afrique une débilité générale. *Les ankylostomes* et *strongyloïdes* sont d'autres parasites pénétrant dans la peau. Bien que l'eau constitue parfois le milieu par lequel ces agents infectants sont absorbés, l'infection est généralement provoquée par pénétration cutanée à partir du sol.

La leptospirose est la principale infection bactérienne transmise à l'homme par les vertébrés à la suite d'un contact direct avec de l'eau polluée par l'urine d'animaux infectés.

Les risques pour la santé occasionnés par les baignades sur des plages et dans des eaux côtières polluées ne sont pas encore pleinement définis et, pour le moment, il n'a pas encore été établi de critères reconnus sur le plan international qui s'appliquent à la qualité des eaux côtières, tant au point de vue de la contamination microbienne que de la pollution chimique.

Affections bactériennes transmises par l'eau

Les bactéries pathogènes, les parasites et les virus sont les principaux agents biologiques responsables de maladies dues à l'ingestion d'eaux polluées. Les polluants peuvent être constitués par des excrétions — fécales et urinaires — d'origine humaine et animale, des eaux et des effluents d'égouts, ainsi que des eaux de ruissellement. Les infections sont propagées à la fois par les malades

5 Siegal, Francine M., Schistosomiasis hematobia in preschool children of Ibadan, Nigeria, *The American Journal of Tropical Medicine and Hygiene*, *XVII*, May 1968, pp. 737-742.

et par les porteurs de germes dont les urines et les fèces hébergent des agents pathogènes. Les bactéries pathogènes transmises directement par l'eau, ou indirectement par celle-ci aux aliments, sont l'une des sources importantes de morbidité et de mortalité dans les pays en voie de développement. *Le choléra, la dysenterie bacillaire, la fièvre typhoïde et les paratyphoïdes, la gastroentérite, la diarrhée du nourrisson* constituent quelques-unes des affections bactériennes les plus fréquentes qui peuvent être transmises par l'eau ou par des aliments préparés avec elle.

Choléra et approvisionnement en eau potable

On a noté au cours de la dernière décennie une régression sensible du choléra classique dû au *Vibrio cholerae*, même dans des régions telles que Calcutta. Toutefois, *le choléra El Tor* qui a débordé en 1961 de son foyer d'endémicité en Indonésie, s'est propagé à de nombreux pays du Pacifique occidental, de l'Asie du Sud-Est et de l'Asie centrale. En 1970, une série de flambées épidémiques de *choléra El Tor* se sont manifestées dans des zones habituellement épargnées, telles que la Méditerranée orientale et un certain nombre de pays africains [6].

En 1971, le choléra a frappé neuf nouveaux pays d'Afrique et de petites poussées épidémiques, ou des cas isolés, se sont produites dans six pays européens. Le choléra peut se transmettre d'individu à individu, mais le mode le plus fréquent de dissémination se fait par l'environnement, et plus particulièrement l'eau [7].

En Inde, vers la fin des années 1940, des puits ont été forés dans un certain nombre de villages et un nombre limité de latrines ont été installées. On a tenté divers essais d'éducation des populations locales sur la nécessité d'utiliser des latrines et de consommer de l'eau propre. Il est apparu, les années suivantes, que le choléra avait considérablement régressé dans les districts ayant adopté ce programme d'assainissement et que le taux de mortalité cholérique était plus faible dans les villes dotées d'installations d'adduction

6 *Actes officiels de* l'OMS, N° 193, Genève, 1971, p. 144.
Ibid., N° 221, 1975, p. x.

7 Barua, D., Burrows, W. et Gallut, J. C., Lutte contre le choléra, précis et guide pratique, dans : *Principes et méthodes de la lutte contre le choléra*, *Cahiers de Santé publique*, N° 40, OMS, Genève, 1970, pp. 123-139.

d'eau sous canalisations que dans les régions des districts dépourvus de ces avantages [8].

De 1968 à 1970, le comité philippin du choléra a réalisé une enquête sur les incidences de l'assainissement dans la lutte anticholérique. Ces travaux ont démontré que l'amélioration des installations d'approvisionnement en eau et d'évacuation des déchets se soldait par une diminution considérable de l'incidence de la maladie et que les mesures d'assainissement l'emportaient largement, au point de vue du rapport coût-efficacité, sur la pratique de la vaccination, compte tenu de l'efficacité des vaccins anticholériques présentement disponibles.

Le Malawi offre un exemple récent des effets bénéfiques d'une alimentation en eau saine dans la réduction de l'incidence de la maladie [9]. Le choléra s'est manifesté sous forme épidémique à partir d'octobre 1973. Plusieurs villages du district de Mulange avaient été dotés d'installations d'adduction d'eau sous canalisations par le Ministère du Développement communautaire. Les prises d'eau sont situées à haute altitude, en montagne, et bien qu'elle ne soit pas traitée, cette eau est relativement peu contaminée. Ces deux catégories de villages offrent un aspect identique en ce qui concerne la densité de population, le niveau d'instruction, le niveau de vie, l'accès aux services de santé, etc., et ne diffèrent donc que par la qualité des approvisionnements en eau.

Une enquête, faite entre octobre 1973 et mars 1974 sur le nombre de cas de choléra dans les zones approvisionnées en eau sous canalisations et dans celles dépourvues de telles installations, a fait ressortir un écart très considérable. Dans les premiers villages, les cas étaient très rares. Peut-être même s'agissait-il d'habitants consommant de l'eau de rivière ; quelques cas importés ont également été observés.

8 Subrahmanyam, K., *Note on the importance of environmental sanitation in the campaign against cholera* (unpublished document WHO/Cholera/12), 1951.

9 Pineo, C. S. et Subrahmanyam, D. V., *Adduction d'eau et évacuation des excreta dans les pays en développement, quelques réflexions, Publications Offset N° 15*, OMS, Genève, 1975.

Mortalité infantile, diarrhées, eau potable et assainissement du milieu

Une étude de diverses maladies diarrhéiques faite entre 1960 et 1965 dans sept pays en voie de développement [10] a démontré que, d'une manière générale, la présence d'un système d'approvisionnement en eau sous canalisations dans une collectivité dotée uniquement d'installations sanitaires de base se traduisait par une réduction statistiquement significative des cas de diarrhée et des taux d'infection par *Shigellae* et *Balantidium coli*.

Cependant, dans tous les pays ayant fait l'objet d'investigations, la réduction effective demeurait limitée et seul un ensemble complet de mesures d'assainissement permettait d'obtenir une diminution significative des taux de diarrhée, de shigellose, etc.

L'importance de la mortalité infantile dans les pays en voie de développement, tels que certains pays d'Amérique latine, est liée à l'incidence élevée des maladies diarrhéiques qui constituent une cause majeure de décès dans la plupart d'entre eux [11].

L'amélioration des approvisionnements en eau s'est soldée par une régression de ces affections [12] et la même constatation a été faite dans le cas d'une amélioration des services de santé primaires.

Des enquêtes faites ou patronnées par l'OMS ont pleinement mis en lumière les avantages de l'assainissement [13].

Les taux de mortalité varient en proportion inverse du niveau d'assainissement. Au cours de l'une des années 1968, 1969 ou 1970,

- dans cinq pays où les conditions sanitaires étaient très médiocres, la mortalité due aux maladies diarrhéiques atteignait 2,2 pour mille de la population totale,
- dans 16 pays où ces conditions étaient un peu meilleures, ce chiffre était de 0,3 pour mille,

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10 Zijl, W. J. van, Studies on diarrhoeal diseases in seven countries by the WHO Diarrhoeal Disease Advisory Team, *Bulletin of the* WHO, *35*, Geneva, 1966, pp. 249-261.

11 *Rapport de Statistiques sanitaires mondiales*, OMS, *27*, N° 12, 1974 a. *Ibid.*, *27*, N^{os} 3-4 et 9, 1974b.

12 *Bureau sanitaire panaméricain, rapport du Directeur : Quadriennal 1970-1973, Document officiel N° 131*, Washington, D. C., 1974.

13 Azurin, J. C. and Alvero, M., Field evaluations of environmental sanitation measures against cholera, *Bulletin of the* WHO, *51*, 1974, pp. 19-26. Schliessman, D. J., Diarrhoeal disease and the environment, *Bulletin of the* WHO, *21*, Geneva, 1959, pp. 381-386.

- dans 10 pays développés et industrialisés, il tombait à 0,02 pour mille.

Dans les mêmes trois groupes de pays, le taux de mortalité infantile était respectivement de 14, 6 et 0,3 pour mille naissances vivantes.

Lors d'une enquête sur les approvisionnements ruraux en eau et les projets d'assainissement dans plusieurs villages de l'Uttar Pradesh, en Inde [14], une diminution générale des taux de morbidité a été observée pour la diarrhée, la dysenterie, la typhoïde, la gale, le trachome et la conjonctivite.

A la suite d'une enquête exécutée en Afrique orientale, Bradley [15] est parvenu à la conclusion que les avantages les plus appréciables seront obtenus probablement grâce à l'installation d'eau courante à domicile, mais qu'une régression substantielle de la maladie ne dépendra sans doute pas uniquement de l'eau.

Une autre étude pratique menée dans le sud des États-Unis d'Amérique, à Porto Rico et en République Dominicaine [16] a mis en relief le caractère normatif de la perception des risques que présente la pollution de l'eau pour la santé et des pratiques adoptées en matière d'assainissement, chaque société s'inspirant de ses propres coutumes ; une telle situation peut persister, même si le niveau de vie est modifié. On a tendance à s'attacher dans tous les domaines à l'aspect visuel de la propreté, en négligeant le côté théorique de la propagation des germes.

Les virus

Les entérovirus, les adénovirus, les réovirus, ainsi que l'agent de l'hépatite infectieuse sont les virus qui se rencontrent le plus souvent dans l'eau et les eaux usées [17]. Bien que le virus de l'hépa-

14 Saunders, R. J. and Warford, J. J., *Village water supply and sanitation in less developed countries*, International Bank for Reconstruction and Development, Public Utilities Department (P.U. Report N° RES 2), Washington, D. C., 1974, p. 35, item N° 18.

15 Bradley, D., Infective diseases and domestic water supplies, in : G. Tschannerl, ed., *Water supply*, BRALUP Research Paper 20, University of Dar es Salaam, 1971, pp. 115-133.

16 Belcher, J. C. and Vazquez-Calcerrada, P. B., *Cross cultural aspects of sanitation norms*, paper presented at the Third World Congress of Rural Sociology, Baton Rouge, Louisiana, Aug. 23-24, 1972.

17 Chang. S. L., Waterborne viral infections and their prevention, *Bulletin of the* WHO, *38*, Geneva, 1968, pp. 401-414.

tite infectieuse n'ait pas encore été identifié, ni isolé, il ressort de nombreux indices épidémiologiques que les flambées épidémiques de cette infection, qui sévit dans le monde entier, sont provoquées par des eaux polluées [18]. Cette maladie peut également être propagée par des coquillages contaminés par des effluents d'égouts [19].

Polluants chimiques de l'eau

Un autre groupe de substances présentes dans l'eau et qui constituent un risque pour la santé a pour origine la pollution chimique et radioactive. Certains polluants chimiques, comme l'arsenic, le nitrate ou le plomb, exercent un effet toxique direct en cas d'ingestion, si leur concentration dépasse le seuil de tolérance. Outre les effets qui peuvent être associés à la consommation d'eau ou à d'autres contacts directs avec celle-ci, les polluants chimiques contenus dans cette eau peuvent agir indirectement sur la santé en perturbant les écosystèmes aquatiques ou en s'accumulant dans des organismes aquatiques que l'homme utilise pour son alimentation.

Les types de polluants chimiques issus de déchets industriels se comptent par dizaines de milliers. D'autres, tels que les nitrates, l'arsenic et les fluorures, peuvent être présents sous une forme naturelle à des concentrations qui rendent l'eau impropre à la consommation. L'intoxication arsénicale est responsable de la mélanodermie du pied. Des concentrations élevées en nitrates risquent de provoquer chez les jeunes enfants une méthémoglobinémie. Une teneur appropriée de l'eau en fluor peut contribuer à diminuer notablement l'incidence de la carie dentaire chez l'enfant, mais une concentration trop forte risque d'entraîner des phénomènes de sclérose se traduisant par des lésions du squelette [20].

Des statistiques provenant de plusieurs pays indiquent qu'il

18 Koff, P. S., CRC *Crit. Rev. Environm. Control, 1*, 1970, pp. 393-442.
Mosley, J. W., Transmission of viral diseases by drinking water, in : G. Berg, *Transmission of viruses by the water route*, Interscience, New York, 1967.

19 *Comité* OMS *d'experts de l'hépatite, deuxième rapport, Série de Rapports techniques*, N° 285, OMS, Genève, 1964, 27 p.

20 Adler, P. et al., *Fluor et santé, Série de Monographies*, N° 59, OMS, Genève, 1972, 384 p.
Bugaisa, S. L., Significance of fluorine in Tanzanian drinking water, in : G. Tschannerl, ed., *Water supply*, BRALUP Research Paper 20, University of Dar es Salaam, 1971, pp. 107-115.

existe un rapport inverse entre la dureté de l'eau de boisson et le taux de mortalité par maladies cardio-vasculaires [21].

On rencontre dans certaines régions des pays en voie de développement des concentrations élevées en substances chimiques telles que l'arsenic, les nitrates et les fluorures, notamment dans les eaux souterraines, mais il s'agit ordinairement d'un problème de caractère local. Les pays en voie de développement connaissent également une pollution des cours d'eau associée à la décharge de déchets industriels, surtout à proximité des grandes agglomérations ou d'autres centres de concentration industrielle. Les problèmes de la pollution de l'eau, et plus particulièrement de celle qui est due aux effluents industriels, ont été étudiés dans plusieurs publications de l'OMS [22].

Importance de la pollution biologique

D'une manière générale, toutefois, c'est la *pollution biologique*, c'est-à-dire la pollution des eaux naturelles par les excreta, qui préoccupe le plus les pays en voie de développement. En bref, l'absence d'eau saine en quantité suffisante pour satisfaire à la demande de très importantes masses de population entraîne, dans les zones les moins développées, de grands risques pour la santé.

Même les collectivités dotées de systèmes d'adduction d'eau sous canalisations ne peuvent être considérées à l'abri de tout danger, car un grand nombre de ces installations ne fonctionnent pas de façon satisfaisante. De multiples facteurs sont responsables

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21 Oligo-éléments et maladies cardio-vasculaires, *Chronique* OMS, 26, Genève, 1972, pp. 59-68.
Masironi, R., Cardiovascular mortality in relation to radioactivity and hardness of local water supply in the USA, *Bulletin of the* WHO, *43*, Geneva, 1970, pp. 687-697.
Masironi, R. et al., Geochemical environments, trace elements and cardiovascular diseases, *Bulletin of the* WHO, *47*, Geneva, 1972, pp. 139-150.

22 *Lutte contre la pollution des eaux, rapport d'un comité d'experts de l'*OMS, *Série de Rapports techniques*, N° 318, OMS, Genève, 1966, 35 p.
*Lutte contre la pollution des eaux dans les pays en voie de développement, rapport d'un comité d'experts de l'*OMS, *Série de Rapports techniques*, N° 404, OMS, Genève, 1968, 42 p.
Quelques aspects de la protection des eaux contre la pollution, Cahiers de Santé publique, N° 13, OMS, Genève, 1963, 123 p. Ce numéro contient une étude très intéressante de T. Nagibina au sujet des pratiques adoptées à cet égard en URSS et dans les pays de l'Europe de l'Est.

de cette situation. Divers pays ne disposent pas de moyens suffisants d'information dans ce domaine. Depuis de nombreuses années, l'Organisation Mondiale de la Santé s'efforce d'appeler l'attention sur ces problèmes en procédant à des enquêtes, en publiant des directives et en offrant une assistance directe aux Etats membres.

Nombreuses sont les contraintes qui ont retardé les pays en voie de développement dans la réalisation de leur objectif, qui est de fournir à l'ensemble de la population de l'eau saine en grande quantité. La précarité des conditions économiques et sociales est, de toute évidence, à l'origine de bien des difficultés.

Les trois contraintes suivantes ont notamment été identifiées :

1) insuffisance des ressources financières internes,
2) manque de personnel qualifié,
3) insuffisance de l'aide extérieure.

D'autres contraintes figurent aussi dans la liste. Les pays à faible produit national brut par habitant avaient encore des besoins considérables à satisfaire tant en ce qui concerne l'approvisionnement en eau salubre que l'évacuation des excreta. Le fait est confirmé par d'autres constatations dues à Atkins [23]. Il a observé que l'incidence de la fièvre typhoïde, de la diarrhée et de l'entérite était inversément proportionnelle au revenu par habitant et aux conditions d'hygiène directement liées à celui-ci. Il a également été amené à conclure que, dans les pays à faible revenu, une dépense équivalente aux frais entraînés en une seule année par les trois maladies citées plus haut permettrait d'amortir en cinq ans les investissements consacrés aux installations d'adduction d'eau et d'évacuation des excreta. Aucun calcul de ce genre n'a été fait à partir de l'enquête de 1970 de l'OMS.

Cependant, certaines études pratiques, comme l'enquête sur le choléra aux Philippines, déjà mentionnée, indiquent pour les mesures d'assainissement un rapport coût-efficacité très élevé. Les pays en voie de développement sont néanmoins dans l'incapacité de mettre à exécution, avec la célérité voulue, les mesures qui s'imposent dans le domaine de l'approvisionnement en eau et de l'évacuation des excreta. Seule une attaque concertée menée sur plusieurs fronts peut laisser espérer des résultats.

23 Atkins, C. H., *Some economic aspects of sanitation programmes in rural areas and small towns* (unpublished document WHO/Env. San/56), 1953.

WATER IN THE INTERNATIONAL WORLD : RESEARCH AND POLICY DEVELOPMENT

In order to promote and coordinate research and development policies for rural water supply, an Ad Hoc Working Group for Rural Water Supply and Sanitation was formed in Montreal in April, 1974, with the participation of the UN secretariat, UNDP, WHO, IBRD, FAO, UNICEF, OECD and IDRC.

The Coordinator of the Group is Dr. Myer Cohen, former Deputy Administrator of UNDP.

In order to promote and coordinate research and developmental activities throughout the world, the Group recommends a substantial reinforcement of the International Reference Centre for Community Water Supply in Voorburg, Netherlands [1], and the major regional research institutes in the field. These comprise in the first instance the CEPIS [2] in Lima, Peru, the CIEH [3] in Ouagadougou, Upper Volta, the PAID [4] in Douala, Cameroon (for community development aspects). This network is later to be enlarged to include one or several institutes in Asia. Other institutions, such as the CETESB [5] in Sao Paolo, Brazil, are associated with this group.

Many countries have their own institutes on the national level as well. One of the larger ones is the NEERI [6] in India. Research is also carried out at many agricultural, engineering and public health faculties. One example among hundreds is the Agricultural Engineering Faculty in Bangkok, Thailand, where for some time research has been under way on the development of simple shallow-well hand pumps almost entirely made from inexpensive plastic (PVC) components.

International groups such as the OECD or the European Common Market actively participate in research and development as well as in the elaboration of organizational and financial principles. An important contribution to the latter is being made by the World Bank and the Regional Development Banks.

A number of non-government organizations are also working on new techniques for rural water supply, both on a global and local scale. Predominant among these are humanitarian and religious organizations.

There is thus a considerable amount of technical information available.

The Ad Hoc Working Group's proposal to strengthen the international network of research institutions includes the development of a better system for collecting, processing and disseminating information, in order to greatly enhance the chances of rural populations, which make up the majority of the world, to have access to an adequate water supply.

1 International Reference Centre for Community Water Supply, Voorburg, P.O. Box 140, Leidschendam, Netherlands.
2 Centro Panamericano de Ingeniería sanitaria y Ciencias del Ambiente, Calle los Pinos 259, Casilla postal 4337, Lima, Perú.
3 Comité Inter-Africain d'Études Hydrauliques, B.P. 369, Ouagadougou, Haute-Volta.
4 Panafrican Institute for Development, B.P. 556, Douala, Cameroon.
5 Companhia Espadual de Tecnologia de Saneamento Básico, E. Defesa do Melo Ambiente, Av. Prof. Frederico Herman Junior 465, Alto de Pinheiros, Sao Paulo S.P., Brasil.
6 National Environmental Engineering Research Institute, Nehru Marg, Nagpur 20, India.

***Assessment of environmental sanitation and rural water supply programmes assisted by the United Nations Children's Fund and the World Health Organization (1959-1968), UNICEF/WHO Joint Committee on Health Policy,* JC16/UNICEF-WHO/69.2 and JC16/UNICEF-WHO/WP 69.1 through 69.7, WHO, Geneva, 1969.**

On the basis of data from 73 countries, the effectiveness of programmes assisted by UNICEF is assessed, and recommendations are made on steps to be taken in the future. A discussion of criteria and guidelines is included, as well as cost data. Country reports from Taiwan, India, Kenya, Pakistan, Paraguay, Peru and Senegal are incorporated in the documents.

BARBOSA, F. S., PINTO, R. and SOUZA, O. A., Control of Schistosomiasis Mansoni in a small north east Brazilian community, *Transactions of the Royal Society of Tropical Medicine and Hygiene, 65,* 1971, pp. 206-213.

In 1960-61 the sanitary standards and prevalence of schistosomiasis were recorded in a village of slightly over 1000 inhabitants. A health education programme and some medical care were then introduced, followed by the construction of household latrines, a central wash-house with showers, and nine wells with hand pumps. Snails, small mammals and faeces were periodically examined. Faecal examinations were also carried out in three similar villages in 1963 and 1969 in order to provide non-project control data.

Though a general improvement in social and economic conditions between 1961 and 1968 led to a decline in human infection rates in the project area and in two of the control areas, it was concluded that the more dramatic reduction in infections in the project area was a direct result of the sanitation and education programme.

DIETERICH, Bernd H., The water supply situation in developing countries, in : *Human rights in health* (CIBA Foundation Symposium N° 23, new series), ed. K. Elliott and J. Knight, Associated Scientific Publishers, London and New York, 1974.

The author reviews the unsatisfactory condition of water supply and sanitation in developing countries. Lack of internal and external resources, man-

power and adequate local support for operation and maintenance are the greatest constraints. He suggests that water supply be integrated into development programmes aimed at increasing production, and that the IBRD give more priority to investments in concentrated rural and urban fringe areas.

***Manual del promotor*, Ministerio de Obras y Servicios Públicos, Servicio Nacional de Agua Potable, Argentina, 1972.**

Este Manual tiene como objetivo principal poner « al alcance de los promotores del Plan Nacional de Agua Potable Rural los conocimientos indispensables para el desarrollo de su labor... Consiste fundamentalmente en una recopilación y selección de conceptos expuestos en un importante material bibliográfico disperso volcado luego con un criterio pedagógico, para colocarlo en un nivel alcanzable para todos los promotores del plan... sean o no profesionales ».

El volumen consta de cinco secciones. La primera expone los objetivos generales del plan, sus niveles y financiación. La segunda ofrece nociones de ingeniería sanitaria, de medicina sanitaria, de administración y contabilidad. La sección siguiente intitulada « Sociología, antropología y psicología social » quiere proporcionar los conocimientos necesarios para la acción del proyecto trazando conceptos como el de « comunidad », « grupo humano », « interacción social », etc. La cuarta sección estudia la motivación y organización de la comunidad por medio de la aplicación de las técnicas de investigación sociológica. Contiene también un capítulo dedicado a la educación sanitaria como tarea del promotor. Una ultima sección proporciona nociones de organización y administración de cooperativas entendidas como instrumento de promoción económica y social. Se insertan numerosos gráficos y organigramas.

Hélène FICKEL.

***Rural water supply and sanitation in less-developed countries, a selected annotated bibliography*, compiled by Anne U. WHITE and Chris SEVIOUR, International Development Research Centre, Ottawa, Canada, 1974, 82 p.**

A very clear and concise overview of the diverse and complex problem of rural water supply is found in the Introduction, which outlines the three main approaches to water supply development described in the literature, and the questions of safe water and health, costs and expected benefits, and appropriate technology and training.

The material reviewed in the bibliography is organized under the headings "General", "Technology" and "Health and diseases". Included are documents containing useful data or evaluations which have remained unpublished. A final section lists other bibliographies bearing directly on rural water supply and sanitation.

STANLEY, N. F. and ALPERS, M. P. (eds.), *Man-made lakes and human health*, Academic Press, Inc., London, 1975, 495 p.

Concerned about the effect of man-made lakes on the health of the surrounding population, the contributors of the articles in this volume attempt to provide sufficient accurate data to enable governments, public health authorities and the scientific community to take effective action against the health hazards which the construction of dams can produce. For example, the careful designing of the dam and reservoir, the rational application of molluscicides and insecticides to the water, controlled fluctuation of the water level, and proper maintenance are measures which can help to control the proliferation of the vectors and intermediate hosts of water-related diseases.

The articles are divided into four main sections: health problems, specific geographic areas, ecological factors, and the human aspect of the problem.

Janet NELSON.

***Village water supply, a World Bank Paper*, Washington, D. C., March 1976, 96 p.**

More than 1000 million people living in rural areas do not have reasonable access to safe drinking water. Their number is growing faster than safe water supplies can be installed.

The crucial constraints are institutional and financial. If these could be resolved, the technological problems would be less difficult.

The World Bank Paper suggests that governments make clear the priority they attach to the subsector by giving it greater prestige, that they provide training from the village to the professional level, and that they improve salaries and other benefits for staff in rural water supply agencies.

The financial problems stem from the fact that governments have not attempted to recover enough of the construction and recurrent costs of village water systems. Villages should normally meet all operating and maintenance costs, and should contribute, to the extent possible, to meeting the costs of construction.

World Bank involvement in rural water projects will only gradually increase, as "most governments continue to view the needs of the water supply sector largely in terms of urban systems". In the meantime, however, one of the Bank's most important functions will be "in improving sector knowledge, formulating sector policies, and developing investment programs designed to serve rural areas".

WAGNER, E. G. et LANOIX, J. N., *Approvisionnement en eau des zones rurales et des petites agglomérations, Série de Monographies*, N° 42, OMS, Genève, 1961, 351 p.

L'ouvrage se divise en trois parties. La première traite de l'établissement des plans d'un réseau d'adduction d'eau, compte tenu des considérations suivantes : financement, ressources techniques et personnel, relevés topogra-

phiques, choix des méthodes de traitement, conception technique du réseau et aspects pratiques des problèmes de construction et d'exploitation. La deuxième partie est consacrée à un exposé très complet de l'installation de divers types de réseaux d'adduction d'eaux d'origine souterraine ou superficielle. La troisième partie examine la théorie et la pratique de la gestion de petits réseaux. Cette monographie est complétée par neuf annexes qui fournissent, sous forme de texte, de schémas et d'illustrations, de nombreux renseignements utiles concernant la construction des réseaux d'eau.

WHITE, Gilbert F., Domestic water supply : right or good? in : *Human rights in health* (CIBA Foundation Symposium N° 23, new series), ed. K. Elliott and J. Knight, Associated Scientific Publishers, London and New York, 1974.

Very little progress will be made by the end of the next decade in bringing potable water to the populations of the developing countries unless there is a change in the policies of nations and international organizations dealing with water supply programmes. The author suggests that the concept of water as an economic good should be replaced by the view that access to potable water is a right. The result could be an increase in the rural improvements undertaken primarily by self-help efforts rather than by centralized programmes, and a reduction in costs as communities become more directly involved.

WHITE, Gilbert F., BRADLEY, David J. and WHITE, Anne U., *Drawers of water: domestic water use in East Africa*, The University of Chicago Press, Chicago and London, 1972, 306 p.

Based on detailed field investigations in East Africa, where close to nine out of ten families draw their water from sources outside the home, this study examines the amount of water used in various environments, the factors affecting its use, and the cost in energy and money to obtain it, a chore often relegated to women and children.

Because expected gains to public health are used as the chief justification for promoting water supply programmes, the authors discuss very realistically the health benefits to be expected from an improved water supply, the extent and nature of diseases connected with water use, their social and economic effects, and the minimal water improvements needed to avoid them.

Concerned about the difficulty faced by many developing countries with only limited resources for investment in water supply programmes, in the last chapters of the book the authors explore different types of water improvements, their respective costs and organizational requirements, and propose possible alternatives to existing policies.

Janet NELSON.

Martin BEYER, **De l'eau potable pour chaque village, le choix de technologies appropriées**

Pour l'UNICEF et l'OMS, l'approvisionnement en eau potable des communautés et l'assainissement de l'environnement sont les mesures les plus efficaces pour la santé des femmes et des enfants et l'amélioration de la qualité de la vie dans les zones rurales.

L'approvisionnement en eau potable d'une communauté permet d'y réduire de façon significative les taux d'incidence d'un grand nombre de maladies, surtout si cette action s'accompagne d'un programme d'éducation sanitaire. L'accès à l'eau potable est aussi un moyen primordial pour alléger le travail des femmes en leur épargnant la traditionnelle corvée d'eau.

Disponible en quantités suffisantes, l'eau potable peut être utilisée à la fois pour la boisson, l'hygiène corporelle, la lessive et la vaisselle comme pour l'irrigation des cultures domestiques et le petit élevage destinés à l'amélioration de la nutrition au niveau local.

Un programme d'hydraulique villageoise, par conséquent, doit être conçu de façon intersectorielle et s'insérer dans une stratégie globale du développement rural.

Chaque situation locale particulière dicte le choix de la technologie appropriée parmi les nombreuses techniques existantes.

Une prise de conscience généralisée se produit aujourd'hui : le choix d'une technologie appropriée n'est pas une condition suffisante de réussite. On accorde de plus en plus d'importance à la participation effective des populations intéressées et à leur éducation à la consommation de l'eau potable.

Anne WHYTE, **Pour une politique de détermination du type de programme d'hydraulique rurale par les intéressés**

Un programme d'hydraulique rurale introduit dans une communauté une nouvelle conception des rapports entre l'eau, la maladie et la santé. Ce processus peut être librement accepté ou imposé. La détermination d'un type de programme d'hydraulique par les usagers eux-mêmes signifie qu'on leur donne la possibilité de décider de la nature du programme, pour autant qu'ils en souhaitent un. Cette approche nouvelle s'inscrit dans une optique d'autodétermination du modèle de développement local de préférence à un changement social imposé.

Nombre de programmes d'hydraulique rurale ont échoué pour n'en avoir pas suffisamment tenu compte. Les populations n'acceptent en profondeur des

modifications substantielles dans leur genre de vie que si elles en comprennent le sens et si elles sont convaincues d'y trouver des avantages réels. C'est pourquoi, s'agissant de l'eau, il s'avère indispensable de commencer par procéder à une analyse des systèmes traditionnels d'approvisionnement d'eau au sein de la communauté, car ces systèmes sont l'expression de structures sociales et de valeurs socio-culturelles.

En laissant le choix du système d'approvisionnement en eau à la population, celle-ci l'intégrera dans le système socio-culturel existant. Il sera perçu comme une continuité plutôt que comme une rupture imposée par des étrangers. La capacité interne de changement des systèmes traditionnels a presque toujours été sous-estimée.

Aujourd'hui la diversification des possibilités techniques alliée à la reconnaissance accrue de la nécessaire participation populaire et au mouvement d'intégration des programmes d'hydraulique et d'éducation sanitaire constituent autant de facteurs favorables à une politique d'autodétermination des systèmes d'hydraulique par les usagers.

David DONALDSON, **Programmes d'hydraulique rurale en Amérique latine, leur organisation et leur financement**

En 1961, les gouvernements d'Amérique latine signaient la Charte de Punta del Este dont l'objectif était de fournir de l'eau potable à 50 % de la population rurale dans la décennie à venir. A l'époque, seulement 7 % en disposaient. A la fin de l'année 1974, cette proportion atteignait 26 %.

Trois types de programmes d'hydraulique rurale doivent être distingués en Amérique latine :

— le type le plus simple, la source individuelle ou le puits, au bénéfice de populations dispersées;

— les adductions d'eau élémentaires pour les populations semi-dispersées;

— les programmes dits « rurbains » dans les villages et agglomérations de 100 foyers, apportant l'eau courante à domicile.

Ces trois types de programmes correspondent à des stades successifs d'amélioration du système d'approvisionnement en eau potable. Le branchement d'eau à domicile (programme « rurbain ») lorsqu'il est fondé sur une participation des populations en nature et en argent, est le plus avantageux pour fournir de l'eau au plus grand nombre et au meilleur prix.

Ce programme est caractérisé notamment par la présence d'un Comité local pour l'eau potable, élu par les villageois. Il bénéficie d'une assistance technique de la part des autorités centrales.

Du fait que les programmes « rurbains » doivent être étendus simultanément à des dizaines de milliers de villages, de grands efforts furent entrepris pour développer des méthodes standardisées en matière de participation populaire, d'élaboration technique et de financement du projet. Malgré d'excellents résultats, de nombreuses questions restent encore sans réponse. Il faudra les résoudre d'urgence si l'on veut, dans les cent ans à venir, fournir de l'eau potable aux trois quarts de l'humanité qui en sont encore dépourvus.

Jaime MORA RAMIREZ et Orlando LOPEZ OROZCO, **Participation communautaire et assainissement rural en Colombie**

L'étude sanitaire des communautés rurales effectuée par le Département d'assainissement rural a révélé qu'en 1974, sur 7100 localités, 4125, soit 58 %, ne disposaient d'aucun système d'approvisionnement en eau potable et que 6440, soit 91 %, se trouvaient dépourvues de tout système d'égouts. Cette situation prévalait dans les villages de 50 à 2500 habitants.

C'est pourquoi le gouvernement colombien a entrepris un programme national d'assainissement rural, dans le but non seulement de doter la population rurale d'eau potable et de systèmes d'égouts, mais encore de modifier l'attitude de la population en la faisant participer à son propre développement.

La communauté participe activement aux différentes étapes du programme. Pendant la phase d'étude, elle concourt à établir l'inventaire des aspects sanitaires, économiques, sociaux et culturels en apportant toutes sortes de suggestions et d'informations fondées sur son expérience. Elle participe ensuite aux activités techniques préliminaires et à la construction de l'ouvrage même en fournissant le terrain, du matériel et de la main-d'œuvre et en recueillant des fonds.

Les travaux une fois terminés, l'œuvre est remise à la communauté. L'administration et le maintien en sont confiés à un comité local pour l'eau potable qui comprend trois membres : un président et un trésorier nommés par l'assemblée générale du village ainsi qu'un secrétaire, représentant du programme, nommé par l'ingénieur en chef.

La participation de la communauté au coût de l'ouvrage représente environ 20 % du montant total. Les 80 % restants sont en partie financés par un emprunt à long terme qui varie selon les possibilités de remboursement de la communauté (40 à 60 %). Cette dernière verse une contribution mensuelle appelée « cotisation familiale ». En 1974, cette participation se montait à 1 258 000 us $.

La réalisation du programme national d'assainissement permet de prévoir, à long terme, des effets économiques favorables à la création d'emplois et à la valorisation des terrains ainsi que des avantages sociaux comme la conscientisation croissante d'autodéveloppement par les communautés, la diminution de l'exode rural et surtout l'éducation sanitaire qui s'inscrit dans le contexte plus ample de nouveaux programmes d'amélioration des conditions de vie de la population rurale.

Hushang Amir RAFATJAH, **Irrigation projects and communicable diseases**

The provision of potable water alone is not sufficient to eliminate water-related diseases such as malaria, schistosomiasis and onchocerciasis. Furthermore, large-scale irrigation and impoundment projects often lead to their spread.

Extremely debilitating, these diseases reduce the productivity of the population to the extent that they can seriously compromise agricultural development projects. In the Volta Lake region, for example, before impoundment the prevalence rate of schistosomiasis was less than 5 %. It has now risen to nearly 100 % in many communities around the lake.

There are certain measures, however, which, integrated into the construction of an irrigation system, can greatly reduce the health hazards. Proper grading and maintenance of irrigation and drainage canals reduce the breeding areas of vectors and intermediate hosts such as mosquitoes and snails, and increase the effectiveness of pesticides. The lining of canals facilitates maintenance, and the use of sprinklers and perforated pipes completely eliminates the habitats of disease-carrying vectors and hosts. Other measures such as the careful regulation of water flow and the draining of marshes also eliminates the habitats of snails and mosquitoes. Experience has shown that savings accrued in control costs by the reduction of breeding areas may more than cover the cost of drainage.

Health measures should also be implemented from the beginning to protect the population which normally settles around irrigation schemes. The provision of potable water and excreta disposal systems, and systematic medical examinations are of utmost importance if existing diseases are not to become epidemic, or new ones be introduced. Sufficient funds should be appropriated for such services, to be planned and implemented in conjunction with the local health authorities.

Jean-Claude FUNCK, **Introducing a drinking water supply to Belhassenat**

A rural water supply programme significantly improves the health of the local population. It can also bring to a community a new awareness of its possibilities for development.

The government of Algeria has undertaken, with the help of UNICEF, a campaign to reduce infant mortality and morbidity in the rural areas by providing safe drinking water and improving the level of sanitation.

A series of pilot projects have therefore been launched in varying circumstances to provide a basis for establishing an effective methodology. The underlying principle is popular participation.

The wells of Belhassenat, one of the villages chosen as a point of departure, produced only one or two containers of water every 24 hours. Most of the water had to be carried in water-skins or jerrycans on donkeyback from a spring three kilometers away, on the other side of two wadis where in the winter there is a constant danger of flash floods.

As the water from the spring proved to be both pure and abundant, through discussions with the village leaders it was agreed that the government would provide pipes, pumps and any other material needed, while the villagers would dig the trench for the pipes, and insure the water's protection from pollution. Within two months the water system was installed. A reservoir was then built, and the project was extended to include outlying groups of houses.

Access to an adequate water supply quickly stimulated a series of local initiatives, such as the construction of public showers and latrines, a washhouse and a school. Requests for electricity and a paved road have also been presented to the local government, and the improved living conditions have begun to attract back to the village some who had emigrated.

Garba HIMA, **Rural water supply and human investment in Niger**

The government of Niger has adopted as one of its primary objectives the provision of an accessible and adequate supply of drinking water for its population.

For in this country where the tragic effects of the drought are still visible, there are only some 4000 ciment-lined wells for 10 000 villages.

Since 1967 the "Wells through Human Investment" division of the OFEDES (Office for Ground Water) and the Department of *Animation rurale* have been carrying out a project to drill modern ciment-lined wells in areas where the population is prepared to furnish a contribution in money or in labour.

The task of the Department of *Animation rurale* is essential: because of the relationship it has already established with the villages, it is able to lay the groundwork for the project by identifying the needs of the communities, evaluating their degree of motivation, and informing them of the support expected of them. The OFEDES is responsible for the technical aspect: it decides on the location of the wells, and provides the basic material, logistical means and specialized personnel to carry out the drilling and installation of facilities. It also introduces traditional well-diggers to modern techniques to enable them to later provide maintenance for the wells.

The water supply programme has led to the creation of related projects such as "operation water filter", and to the initiation of activities in the areas of environmental sanitation, nutrition and vegetable gardening. The popu-

lation's participation in various development efforts has encouraged the emergence of new forms of organization.

Jaime MORA RAMIREZ and Orlando LOPEZ OROZCO, **Community participation and rural environmental sanitation in Columbia**

A study of rural communities carried out by the Department of Environmental Sanitation revealed that in 1974, out of 7100 communities, 4125, or 58 %, had no potable water supply, and that 6440, or 91 %, had no sewerage disposal system. This situation existed in villages ranging from 50 to 2500 inhabitants.

The government of Columbia therefore launched a national programme in the aim not only of providing the rural population with drinking water and sewerage disposal systems, but also of modifying its attitude by involving it in its own development.

Each community actively participates in the different phases of the programme. During the study phase, the community helps to analyze the health, economic, social and cultural situation and offers suggestions based on its experience. It then participates in the preparatory tasks and in the construction of the system itself by providing land, material and labour, and by collecting funds.

Once the work has been completed, the system is turned over to the community. Its administration and maintenance are entrusted to a local potable water committee which is made up of three members: a president and a treasurer appointed by the village's general assembly, and a secretary who is a representative of the programme and is appointed by the chief engineer.

The community provides approximately 20 % of the funds needed to cover the costs of the system. The remaining 80 % are in part financed by a long-term loan, the amount of which varies according to the reimbursement possibilities of the community (from 40 to 60 %). In 1974 the monthly payments, or "family fees", from rural communities came to US $ 1 258 000.

The implementation of this national programme should in the long run create employment possibilities and increase the value of the land. It should also bring social benefits, such as a growing awareness on the part of the communities of their possibilities for development, and a decrease in the rural exodus. Further benefits should result from the health education which is included in the new programmes to improve the living conditions of the rural population.

Luis A. ORIHUELA, **The health hazards of polluted water**

The two main categories of water-associated health hazards for man are: 1) water-borne and water-related diseases, and 2) chemical pollution.

The greatest concern in developing countries are the water-borne (cholera, diarrhoeal and viral diseases) and water-related diseases (malaria, filariasis and schistosomiasis).

The provision of potable water can significantly reduce morbidity and mortality due to both types of diseases, especially among children where diarrhoeal diseases are a major cause of high infant mortality rates. In Malawi, for example, cholera reached epidemic proportions in some areas in 1973, but was rare in those villages benefiting from a supply of potable water. In Uttar Pradesh in India, a general decrease in morbidity rates for diarrhoea, dysentery, typhoid, scabies, trachoma and conjunctivitis resulted from rural water supply and sanitation schemes. A study of diarrhoeal diseases from 1960 to 1965 in seven developing countries also showed that, in general, provision of a piped water supply to a community with only basic sanitation led to a statistically significant reduction of diarrhoea.

Investigations have shown that a further significant reduction results through the implementation of environmental sanitation measures and the improvement of primary health services.

The three obstacles to the provision of ample quantities of safe water in developing countries are 1) insufficient internal finances, 2) lack of trained personnel, and 3) insufficient external assistance. Researchers such as C. H. Atkins have concluded that in low income countries a sum equal to the yearly cost of typhoid fever, diarrhoea and enteritis, would amortize within five years the cost of water supply and excreta disposal facilities. Yet the developing countries are unable to implement programmes to provide these facilities with the speed that is required. Only a concerted attack on a number of fronts can have any possibility of achieving results.

Martin BEYER, **Agua potable para cada pueblo, elección de tecnologías apropiadas**

El UNICEF y la OMS estiman que el abastecimiento de agua potable de las comunidades y el saneamiento ambiental son las medidas más eficaces para la salud de la mujer y del niño y el mejoramiento de la calidad de la vida en las zonas rurales.

El abastecimiento de agua potable permite reducir de modo significativo el grado de incidencia de muchas enfermedades, sobre todo si esta acción se acompaña de un programa de educación sanitaria. El acceso al agua es también un medio primordial para aligerar el trabajo de las mujeres evitándoles la tradicional ida a la fuente.

Disponible en cantidades suficientes, el agua potable puede ser utilizada para la bebida, la higiene personal, el lavado de la ropa y de la vajilla, así como para la irrigación de los cultivos domésticos y la cría del ganado menor, destinados a la mejora de la nutrición a nivel local.

Un programa de hidráulica rural debe ser concebido, por lo tanto, de manera intersectorial e integrarse dentro de una estrategia global de desarrollo rural. La situación local será la que dicte, en cada caso, el sistema a elegir entre los muchos existentes.

Hoy día se produce una toma de conciencia generalizada : la elección de la tecnología apropiada no es una condición de éxito suficiente. Se atribuye cada vez mayor importancia a la participación efectiva de las poblaciones interesadas y a su educación al consumo de agua potable.

Anne WHYTE, **Hacia una política de determinación por los usuarios de los sistemas de abastecimiento de agua**

Un programa de hidráulica rural introduce en el seno de la comunidad una nueva concepción de las relaciones existentes entre el agua, la enfermedad y la salud. Este proceso puede ser aceptado libremente o bien impuesto. La elección de un determinado sistema por los mismos usuarios significa para ellos, la posibilidad de decidir la naturaleza del programa, siempre que este último sea deseado. Esta nueva estrategia entra en el marco de una óptica de autodeterminación del modelo de desarrollo local con preferencia a un cambio social impuesto.

Un gran número de programas de hidráulica rural han fracasado por no haber tenido suficientemente en cuenta este factor. Las poblaciones aceptan en

profundidad las modificaciones sustanciales de su género de vida, sólo si comprenden el sentido del cambio y están convencidas de sus ventajas reales. Por este motivo, tratándose del agua resulta indispensable empezar analizando los sistemas tradicionales de abastecimiento en estas comunidades, ya que dichos sistemas expresan estructuras sociales y valores socio-culturales.

Al dejar que la población escoja su propio sistema de abastecimiento de agua, ésta lo integrará en el sistema socio-cultural existente, percibiéndolo más bien como una continuidad que como una ruptura impuesta por extraños. La capacidad interna de cambiar sistemas tradicionales ha sido, con frecuencia, subestimada.

Hoy en día, la diversificación de las posibilidades técnicas, unida al creciente reconocimiento de la necesaria participación popular y al movimiento de integración de los programas de hidráulica y de educación sanitaria, constituyen factores en favor de una política de autodeterminación de los sistemas de abastecimiento de agua por los mismos usuarios.

David DONALDSON, **Programas de agua potable rural en América Latina, su organización y financiación**

En 1961, los gobiernos de América Latina firmaban la Carta de Punta del Este, cuyo objetivo era el de abastecer de agua potable el 50 % de la población rural en el próximo decenio. En aquella época, sólo el 7 % de la población rural se hallaba atendido; a finales de 1974, la proporción alcanzó el 26 %.

En América Latina es preciso distinguir tres tipos de programas de hidráulica rural : la fuente individual o el pozo, para las poblaciones dispersas; los acueductos elementales, para las poblaciones semidispersas; y los programas llamados « rurbanos » en los pueblos y localidades de 100 hogares hasta un total de 2000 habitantes, que llevan el agua corriente a domicilio.

Las conexiones domiciliarias basadas en una participación de las poblaciones en especie y en metálico, es el medio más ventajoso, para suministrar agua al mayor número posible de poblaciones y al menor costo. Este programa se caracteriza, entre otras cosas, por la presencia de un comité local para el agua potable, elegido por los aldeanos. Beneficia de asistencia técnica por parte de las autoridades centrales.

La necesidad de extender estos programas « rurbanos » simultáneamente a millares de pueblos, ha llevado al desarrollo de métodos estandardizados en materia de participación popular, de elaboración técnica y de financiación del proyecto. A pesar de los excelentes resultados alcanzados, numerosas cuestiones permanecen todavía sin respuesta. Será preciso resolverlas con urgencia, si se pretende, en los cien años venideros, suministrar agua potable a las tres cuartas partes de la humanidad que aún carecen de ella.

Hushang Amir RAFATJAH, **Proyectos hidroagrícolas y enfermedades transmisibles**

El abastecimiento de agua potable, por si sólo, no basta a eliminar ciertas enfermedades relacionadas con el agua, tales como la malaria, la schistosomiasis y la onchocercosis. La irrigación, el drenaje y la construcción de embalses con frecuencia crean condiciones favorables a la propagación de estas enfermedades.

Sumamente debilitantes, estas últimas reducen la productividad de la población hasta el punto de comprometer seriamente los proyectos de desarrollo agrícola. En la región del lago Volta, por ejemplo, el grado de incidencia de la schistosomiasis, antes de la construcción del embalse, no llegaba al 5 %. Ahora, por el contrario, alcanza casi el 100 % en numerosas comunidades, que viven en las cercanías del lago.

Sin embargo, existen medidas que, integradas a la construcción de un sistema de irrigación, pueden reducir de manera notable los peligros para la salud. El acondicionamiento y el mantenimiento de los canales de riego y de drenaje reducen las áreas de reproducción de algunos vectores, como los mosquitos y los moluscos, y aumentan la eficacia de los pesticidas.

El revestimiento de las cañerías facilita su mantenimiento y el uso de aparatos de riego y de tuberías perforadas elimina totalmente los habitats de los vectores transmisores de enfermedades. Asimismo la regulación cuidadosa del caudal de agua y el drenaje de los pantanos tienen la ventaja de destruir dichos vectores. La experiencia demuestra que los gastos ocasionados por la lucha antipalúdica, una vez reducidas las áreas de reproducción de los vectores, son muy inferiores al costo del drenaje.

Medidas sanitarias preventivas, a favor de las poblaciones que normalmente se establecen en torno a los cultivos de regadío, deberían ser tomadas, juntamente con los servicios sanitarios locales, desde el primer estadio de la formulación del proyecto.

Jean-Claude FUNCK, **Introducción de un programa de agua potable en Belhassenat**

Un programa de abastecimiento de agua mejora sensiblemente la salud de la población. Con frecuencia puede aportar a la comunidad una nueva conciencia de sus posibilidades de desarrollo.

El gobierno de Argelia ha emprendido con la ayuda del UNICEF una campaña, para reducir la mortalidad infantil y la morbilidad en las zonas rurales por medio del abastecimiento de agua potable y la mejora del saneamiento ambiental.

Las fuentes de Belhassenat, uno de los pueblos escogidos como punto de partida, producían sólo uno o dos bidones de agua cada 24 horas. La mayor parte del agua debía ser llevada con mulos en pellejos o en jerrycanes desde la fuente a una distancia de tres kilómetros, atravesando dos arroyos y siendo sus crecidas un constante peligro durante el invierno.

Como el agua de los manantiales era pura y abundante, tras discusión con los líderes del pueblo, se decidió que el gobierno proporcionaría las tuberías, las bombas y otros materiales, mientras los aldeanos excavarían las zanjas y asegurarían la protección del agua contra las basuras y los estiércoles.

El acceso a un sistema adecuado de agua potable estimuló rápidamente una serie de iniciativas locales, tales como la construcción de duchas públicas, letrinas, un lavadero y una escuela. También fueron presentadas al gobierno local peticiones para la instalación eléctrica y la pavimentación de una calle. Las mejores condiciones de vida han provocado el regreso de personas que habían emigrado.

Garba HIMA, **Abastecimiento de agua e inversión humana en el Niger**

El Niger, cuyo suelo lleva todavía las huellas trágicas de la sequía, cuenta con apenas 4000 pozos para cerca de 10 000 pueblos.

Desde 1967, una experiencia de trabajo en común, realizada por la Sección « Pozos en inversión humana » de la OFEDES y el Servicio de la animación humana, ilustra el interés de una cooperación estrecha entre distintos servicios y la población rural. El fin de la operación es cavar pozos modernos de cemento en aquellas regiones donde las poblaciones estén dispuestas a proporcionar una contrapartida en especie o en fuerza de trabajo.

El papel del Servicio de animación es esencial, puesto que prepara la operación sensibilizando el pueblo a la acción, identificando sus necesidades, evaluando su grado de motivación e informándole de la colaboración que se espera de él. En cuanto a la OFEDES, su papel se sitúa a nivel técnico : determina el lugar de excavación de los pozos, aporta el material básico, los medios logísticos y el personal especializado. La OFEDES asegura, además, la perforación y la puesta en marcha, así como la iniciación de los poceros tradicionales a las técnicas modernas, que les permitirán, más adelante, mantener los pozos.

A partir de la « operación pozos » otras iniciativas han sido realizadas, tales como intervenciones sanitarias y de nutrición, la operación filtro de agua, la operación jardín, etc. La participación de las poblaciones en distintas actividades de desarrollo, ha favorecido también el nacimiento de formas nuevas de organización.

Luis A. ORIHUELA, **El agua contaminada, un peligro para la salud**

En los países en vías de desarrollo la mayor preocupación se deriva de las enfermedades directamente relacionadas con el agua, como el cólera, la diarrea y las enfermedades virales y las enfermedades provocadas por vectores asociados al agua, como la malaria, la filariasis y la schistosomiasis.

El abastecimiento de agua potable puede reducir de modo significativo la morbilidad y la mortalidad debidas a ambos tipos de enfermedades, especialmente entre los niños, en los que las enfermedades diarreicas son una de las causas principales de los porcentajes elevados de mortalidad infantil. En Uttar Pradesh, India, una general disminución de la tasa de morbilidad producida por la diarrea, la disentería, la tifoidea, la sarna, el tracoma y la conjuntivitis, resulta del abastecimiento de agua y sistemas de saneamiento. Un estudio de las enfermedades diarreicas realizado entre 1960 y 1965 en siete países en vías de desarrollo, ha demostrado que en general la presencia de un sistema de abastecimiento de agua por cañerías, en una colectividad dotada sólo de instalaciones sanitarias básicas, se traducía en una reducción estadísticamente significativa de los casos de diarrea.

La investigación ha revelado, además, que una reducción ulterior resulta del incremento de medidas de saneamiento ambiental y de la mejora de los servicios sanitarios básicos.

Los tres impedimentos que han retrasado en los países en vías de desarrollo el abastecimiento de agua salubre en gran cantidad son : 1) los recursos financieros internos insuficientes, 2) la falta de personal cualificado, 3) la insuficiencia de la ayuda exterior. Científicos como Atkins han concluido que en los países de baja renta per cápita un gasto equivalente al costo anual de la fiebre tifoidea, de la diarrea y de la enteritis amortizaría en el plazo de cinco años las inversiones dedicadas a las instalaciones de abastecimiento de agua y evacuación de excretas.

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who international reference centre for community water supply

postal address: p.o. box 140, leidschendam, the netherlands
office address: nw havenstraat 6, voorburg (the hague)
telephone: 070 - 69 42 51, telegr.: worldwater the hague, telex: 33604

SLOW SAND FILTRATION PROJECT

International Meeting on
Extension and Community Participation
in the Slow Sand Filtration Project

Voorburg, (The Hague), The Netherlands
May 29th - June 2nd, 1978

BACKGROUND PAPER V

"WATER AND COMMUNITY DEVELOPMENT"

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INTEGRATED DEMONSTRATION PROJECT ON SLOW SAND FILTRATION

The internationally coordinated research and demonstration project on Slow Sand Filtration (SSF) is developed by the WHO/International Reference Centre for Community Water Supply and Sanitation, as part of a programme on the integral transfer of knowledge and experiences on appropriate technologies for water supply and sanitation in developing countries.

The objective of the project is to promote the application of slow sand filtration for the preparation of drinking water. Slow sand filtration is a simple, efficient, and reliable method for the biological purification of water and is very appropriate for application in developing countries.

A programme for applied technical research and development as well as for the demonstration of the process under local conditions, has been set-up and is carried out by various participating institutions in developing countries, on the basis of international collaboration.
The programme is financed by the Ministry of Foreign Affairs of the Netherlands (Directorate for International Technical Assistance). Counterpart contributions up to 50 to 70% of the total costs, are made available by the participating countries. The IRC performs the international coordination of the programme.

The project is developed according to the concept of an integrated demonstration project, which is characterized by an integral approach towards the various structural problems and constraints related to the set-up of water supply and sanitation programmes in developing countries and by the integral transfer of knowledge and experiences on the technological, organizational and sociological aspects of such programmes. This includes the generation, diffusion and the provision for the application of the knowledge.

In developing the project, a variety of aspects is taken into account, such as: planning, design, construction, operation and maintenance, organization and management, financial aspects, as well as infrastructural and sociological aspects. Therefore a series of complementary and supporting activities of a multi-disciplinary nature, such as: improvement of the institutional and organizational framework, extension and community participation, sanitation education, manpower development and training, information exchange, etc. are grouped around the central theme: slow sand filtration. This technical subject serves as the vehicle for the integrated development of the various components and elements of the project.

Special attention is paid to the development of local capabilities and responsibilities, as well as to the improvement of the national and local infrastructure in the field of water supply and sanitation. The major part of the work is carried out by the participating institutions in developing countries.
Another starting point for the development of the project is the direct orientation on local circumstances of a cultural and socio-economic nature, in order to come to a socially acceptable and appropriate approach. Therefore, people concerned are actively involved in the planning, design and implementation of the programme at all levels.

The programme is devided into two phases.
In the first preparatory phase applied research on pilot units, field investigations on existing plants, literature studies and additional organizational activities have been carried out by various participating institutions in developing countries.
In the second phase of the project the possibilities of applying and practising slow sand filtration in developing countries are further developed. Therefore, full scale village demonstration plants are constructed in several rural villages under various local conditions. These plants will be used for demonstration purposes and further investigations.
Much attention is also paid to local circumstances of a non-technical nature, such as social, cultural and economic factors.
An extension programme is developed, on the basis of community participation and impact studies on the public health and socio-economic situation are carried out.
Towards the end of the project, several seminars will be organized to transfer know-how and experience gained and to promote the application of slow sand filtration.
The project is regarded as a practical preparation for future large scale implementation programmes; such programmes will be initiated in many countries, as a follow-up of this project. The total duration of the present project is about five years.

The programme is developed on the basis of international collaboration between institutes in eight developing countries: Colombia, Ghana, India, Jamaica, Kenya, Pakistan, Sudan and Thailand. In each of these countries a Project Managing Committee (PMC) has been established. These committees have the final responsibility for the planning, implementation, coordination and evaluation of the country programmes. The Project Managing Committees consist of representatives from:
- national institutes for research and development in environmental engineering
- agencies responsible for community water supply and sanitation both at national and district level, and
- agencies responsible for rural extension in the water supply and sanitation sector

In each country one of the participating institutions performs the function of Project Coordinating Institution (PCI) and has a final responsibility towards the other cooperating countries and the IRC.
The main task of the PMC is to improve the collaboration between governmental authorities, universities and research institutes, and executing agencies concerned and to try and bridge the gap between research and implementation. Adequate collaboration within the country is considered a basic prerequisite for an effective planning and coordination of the various activities.
The project managing committee is responsible for the organization of the planned activities, the staffing and the progress control of the programme, the selection of communities and locations for the village demonstration plants and the consultations with other national and local authorities concerned.

The main elements of the country programmes are: applied research and development, field investigations, literature studies, institutional and organizational arrangements, an extension programme, the set-up of village demonstration plants, impact studies on the public health and socio-economic situation in several rural villages, demonstration of the appropriateness of the system, and the preparation of large-scale follow-up programmes.

The technology component of the programme covers applied research and development on pilot installations as well as the design, construction, operation and maintenance of full-scale slow sand filtration plants and related simple pre-treatment systems. The pilot units, that consist of two or three filters and in some cases also include a pre-treatment step, are also used for educational purposes.
Feasability studies on the set-up of village demonstration plants are carried out in all participating countries. Various full-scale slow sand filtration demonstration plants are planned and designed for rural villages. The construction of these plants provides a good opportunity to visualize the input from the country itself. Optimal use is made of local resources in terms of know-how, labour, experience, materials and finance. Eventually, the village demonstration plants will be placed under full control of the community.

The institutional component includes the improvement of the organizational and administrative infrastructure. Special attention is given to the improvement of the internal collaboration between the various disciplines and levels involved in the project. The same goes for proper programme management and the organization of operation and maintenance, including financing and manpower development. The project managing committees play an important role with regard to these aspects.

The extension programme includes public information and local communication support including aspects such as sanitation education, social management and community participation. Health benefits will only materialize from rural water supply and sanitation programmes if full attention is given to the improvement of personal hygiene and sanitary practices. Therefore, sanitation education is considered of crucial importance and the same goes for adequate community participation in all phases of the introduction of the new water supply in the demonstration villages. Local health workers are involved from the very beginning in the planning, design, and implementation of the extension activities.

In the context of the training component guidelines are developed for the selection, training and supervision of caretakers for slow sand filtration schemes. The training course for the local operator for the village demonstration plant is mainly directed to imparting the skills that are specifically required for proper operation and maintenance of slow sand filtration plants , as well as some craftsmans skills in the field of piping, masonry and mechanics. As future manpower requirements call for a broad spectrum programme, also training in the field of management and administration is promoted.

The evaluation of the programme will be based on, amongst other things, a series of studies on the socio-economic and public health impact in various demonstration villages. These studies will span a period of approximately 2 to 3 years. Base-line studies are carried out in a very early stage of the programme.

The purpose of the outlines prepared on the various components and elements of the programme is to provide guidance to and to assit the project participating institutions in planning and developing their country programmes.

The project aims at the demonstration of the suitability and appropriateness of slow sand filtration in developing countries from both technical and socio-economic point of view. In addition to this also the interrelated character of the various components and the synergetic effect of the integrated programmatic development of these components are demonstrated. The demonstration takes place both at local, national and international level.

Next to the demonstration effect of the village demonstration plants on neighbouring communities, a high priority is given to the demonstration at national level. This may support the development of similar large scale projects in the near future.
Towards the end of the project special seminars will be organized, directed to the transfer of knowledge to other developing countries and to the international community. Actually, the project is a demonstration to and a demonstration by developing countries at the same time.

The following interim results can be reported:
- pilot installations have been built at universities and research institutes in various developing countries; these installations are used for applied research and educational purposes;
- preliminary results of the pilot experiments and field investigations have been reported to the IRC and made available to other participants; the research and development work is continued;
- a Project Managing Committee has been established in each of the participating countries; in addition to this Task Forces are set-up on respectively the technological, organizational and sociological aspects;
- a selected and annotated bibliography has been published, as a result of the combined literature studies;
- various interim publications are prepared; amongst these are: outlines for impact studies on public health and socioleconomic aspects, outline for the set-up of the extension programmes, manual for the design and construction of small slow sand filtration plants, manual for the operation and maintenance of slow sand filters, an outline of a training course for the plant operator and a state-of-the-art report on slow sand filtration for village water supply in developing countries;
- various full-scale village demonstration plants are planned and designed for rural communities in developing countries; these plants will be used for demonstration purposes and continued investigations;
- international collaboration amongst more than fourty institutes in eight developing countries has been established;
- an increasing interest from the side of industrialized countries can also be regarded as an encouraging result of the promotional work on slow sand filtration;

The development of an appropriate methodology for the integral transfer of knowledge and experience to and between developing countries is an integral part of the project. This includes the generation, diffusion and the provision for the application of the knowledge on technological, organizational and sociological aspects of community water supply and sanitation programmes.

DRAFT

PLANNING AND EVALUATION OF A COMMUNITY EXTENSION PROGRAMME: HEALTH EXTENSION IN PHASE 2 OF THE SLOW SAND FILTRATION PROGRAMME. *

Prepared for the WHO International Reference Centre for Community Water Supply, P.O. Box 140 Leidschenam, The Netherlands.

Hermione Lovel

Institute of Development Studies
University of Sussex
Falmer
Brighton BN1 9RE

February 1978

* A revised version of Alastair White's outline sent in January 1978, with additional material on extension work in the village, higher level support and evaluation aspects of the SSF project.

Background to the paper

This paper was written in response to a request from Alastair White for a contribution to the extension, higher level support and evaluation aspects of the paper he was preparing on community involvement in the SSF programme.

In writing these additions to Alastair's paper the aim has been to interweave the new material as closely as possible to the original outline sent by him to you in early January. In order to blend the early and later material together the original format has been slightly rearranged.

Contents

Page Number

2. Setting the objectives of a slow sand filtration community extension programme: analysing the phases of the programme.

1. Introduction

1. Introduction

The following paper is intended to present some ideas as to what might be considered the objectives of community participation and health education in the slow sand filtration project. It will discuss some of the concepts involved, and set out approaches which might be adopted. It is to be regarded more as a floating of ideas and possibilities than as a set of specific recommendations for action, the more so as circumstances will differ greatly from one country to another.

The recent evidence that more rather than purer water is most important for health improvement, in the current circumstances of the majority of inhabitants of developing countries, underlines the necessity, when purer water is provided, for serious efforts to be made to improve hygiene and sanitation as well. Otherwise it is clear there will be little benefit from purification.

There is an urgent need for experiements using different approaches to the problems of improving sanitation and hygiene, since little is known about the conditions for success of different programmes. Slow sand filtration is but one of several possible water purification projects, but if the water purification approach cannot be shown to yield demonstrably high returns in decline of water-related disease compared with other approaches to improving hygiene and sanitation it might well be said that the SSF programme should be discontinued and all energies devoted to improving people's access to larger quantities of water.

2. What should be the objectives of a slow sand filtration community extension programme: analysing the phases.

The phases of a slow sand filtration system

A water supply system involving slow sand filtration must be constructed, operated and maintained, and used. These three phases require different strategies of communication between external agencies and the community where the slow sand filtered supply is to be located.

Construction will require at least a community decision and communal work.

Operation and maintenance will require work by a local person or persons with the co-operation of the community so that the machinery is not unwittingly damaged.

Hygienic use of the new filtered water supply will probably require changes in personal behaviour by all members of the community.

With these three specific slow sand filtration phases in mind the possible approaches to community involvement and extension education can be considered and the most relevant aspects of each selected for the SSF project in a particular local area.

3. Identifying methods available for fulfilling the SSF objectives in the village

3.1. Procedures for enabling community participation in the programme.

3.2. Approaches to running an extension programme.

3.3. Procedures for a community diagnosis ('baseline information').

3. What methods are available for taking action on an SSF community extension programme?

Once the broad objectives of the SSF community extension programme have been stated, the possible contributions of different types of community participation programmes can be considered and the possible approaches to extension education reviewed to see if any of them are relevant to the local conditions where the SSF project is taking place. Complimentary to these two reviews of what has happened elsewhere, and in order to decide on a final plan of action, it is essential to gather some 'baseline' information from the local communityand find out what seems likely to work best there.

3.1. Procedures for enabling community participation in an SSF project

The necessity of 'community participation' for the success of water supply projects in rural areas of developing countries is being increasingly recognised. But in different countries community participation has taken different forms and there is a wide variation in the intensity of involvement. Yet terms like 'self-help', 'self-reliance', 'endogenous development', as well as 'participation' and 'involvement' are often used almost interchangeably. There is, therefore, a need to clarify what may be meant when one of these terms is used.

Community participation may mean:

1a. Consultation with community representatives or leaders to ensure that the programme introduced by the outside agency is adapted to meet the needs of the community and to avoid difficulties in implementation.

1b. Consultation with other members of the community, or specifically the poor, to ensure that the programme meets their needs.

2. A financial contribution by the community to construction or to pay the operator.

3. Self-help projects in which a specific group of beneficiaries contribute labour (perhaps also materials), especially in construction work, to reduce financial costs.

4. Self-help projects in which the whole community collectively contribute labour (perhaps also materials), especially in construction work.
5. The training of one or a few community members to perform specialised tasks (e.g. as village health worker, or operator of a slow sand filtration system of water supply).
6. Mass action: collective work aimed directly at an environmental change of general benefit, e.g. to drain the waste water (distinguished from self-help by the relative unimportance of any input by an external agency).
7. Collective commitment to change in personal behaviour, and collective social pressure for the realisation of such changes (e.g. construction and use of a latrine, frequent handwashing with use of soap).
8. Self-reliance in the sense of the autonomous generation within the community of ideas and movements for the improvement of living conditions, as opposed to stimulation by outside agents. But the community may well have recourse to external agencies to help with implementation.
9. Self-reliance in the sense of using only the efforts of the community members themselves, not appealing to outsiders for help.
10. Self-reliance in the sense of using local materials and manpower directly, rather than collecting funds internally in order to purchase goods and services from outside; including increasing local capacities with this kind of self-reliance as a goal.

This list of approaches to community participation is arranged in a scale of involvement by the local community. The latter steps of high involvement may be more difficult for an outside agency to achieve. But it should be noted that these high involvement approaches have a far greater potential than the low involvement courtesy calls for improving the living conditions of the rural communities, both in the short and in the longer term.

Community participation should not be over estimated

Even though an autonomous self-reliant project is likely to have the most effect on continuous improvement of rural living conditions and even though the idea of community participation has now received general support, the potential contribution of community participation should not be over-estimated.

Community participation is very likely to be able to assist projects by providing labour and community liaison persons who can ensure the acceptability of a programme and to whom external agencies can relate.

However, community participation may well not be able to solve the perennial rural project problems such as failure to maintain equipment, particularly if the project has a built-in design fault of ensuring the community is dependent on an external supply of spare parts or technical advice. In this last case, it is essential that adequate back-up services are supplied for if this does not occur the opportunity of further co-operation in that community is likely to be lost for a very very long time.

Self-reliance should not be over-estimated

It is also important not to over-estimate the extent to which communities can become self-reliant, particularly in so far as knowledge and ideas about what changes are necessary are concerned. Typically, a community's stock of technical knowledge is limited. Community members are aware of this, and reasonably assume that the answer is to bring to the community what knowledge and skills exist in larger and more prestigious communities. However, in bringing this information it should be offered to the community in a way to help them become self-reliant rather than by providing services but no know-how or training but no local jobs.

It is also important to recognise that internal differences of interest within communities may make the pursuit of common goals very difficult.

Choosing a strategy of community participation

The strategy chosen will depend in part on the emphasis given to each of the three goals of community participation:

(1) Ensuring that the specific actions are taken which will lead to successful implementation of the SSF water supply project.

(2) Fostering the growth of the community's capacity for self-reliant co-operation.

(3) Ensuring that the interests of poorer sections of the population, and of women, are served by raising the level of collective self-consciousness among them and weakening their dependence on the more powerful.

The first of these goals implies no more than a 'minimal' strategy, concentrating on meeting in the easiest way the requirements of the job on hand. This will probably mean communicating mainly with a small group of community representatives and individuals active in organising the project, and responding to difficulties as they arise rather than looking for opportunities to expand the scope of participation.[1]

If the purpose were only to ensure the smooth operation of the sand filter and water supply, a 'minimal' strategy of community participation would probably be chosen as having the greatest prospect of success in achieving that objective with relatively little administrative effort. Such a 'minimal' strategy would probably include a community contribution to construction, in labour and/or money, but little else.

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1. For instance, if it is found that trenches dug by unskilled labour in communal work are insufficiently straight and level, the solution might be to employ a more experienced labourer to 'finish' them; he might in fact end up doing more than half the work. This may well be the most efficient way of completing the trenches to the required specification, but it involves no learning by community members. (Reference also to Carruthers case study.)

The second goal involves a 'maximal' strategy of actively and imaginatively seeking ways in which more community members can become involved to understand more fully the reasoning behind what they are asked to do, and to participate more fully in making the minor decisions in implementation. It requires more time, effort, and skill on the part of the extension agent. The potential reward is that the community gains in knowledge and skills, and in individual and collective self-confidence. These rewards are more important than the completion of the particular project and outweigh the costs of the greater extension effort. There will be no pre-existing community demand for this approach to be adopted: the impetus must come from a commitment among the external agencies involved. In this respect, one can draw a parallel with preventive health activities as against curative care, for which there is a greater demand.

The difficulties involved in an attempt to achieve a greater range or depth of community participation should certainly not be minimised. However, unless it is achieved it is extremely unlikely that health benefits will flow from the installation of the slow sand filter, to any measurable extent. Health benefits will result only if there is a substantial change in standards of hygiene and sanitation, and such a change is unlikely to be brought about without extensive community participation. An active involvement with the planning, construction and operation of the slow sand filter and water supply will be complementary to the efforts being made to improve hygiene and sanitation, in the sense that the more interest and involvement people have in either area, the more receptive they are likely to be to suggestions that they become involved in the other - at least, one would expect this to be so if the connexion between the two is well understood.

The third goal may raise even more problems and difficulties, for the attempt to involve most actively those sections of the population, the poor and women, where they have been relegated

to a subordinate role in the past, will meet with the incomprehension and very likely the hostility of the dominant groups. In some places it will simply be impossible to achieve much in this direction, much more thorough structural reforms will be needed to break the power of these dominant groups before anyone can act against their wishes. But in other cases it is possible for an extension agency to concentrate its efforts on the subordinate groups. In the case of a water supply system, it will not be a question of working exclusively with poorer sections of the population (as it might be with agricultural extension for instance): the point is only to ensure that the project benefits and actively involves the poor as well as the rich. However, there is a case for trying to work mainly with women, since they are the main carriers and users of water in most communities. The attempt to do so will undoubtedly meet with great problems, since women are often not invited to deal with a 'modern' technology introduced from outside the community, or even to deal with formal relationships with outsiders on behalf of the community. And women, largely, accept exclusion from these roles. A water project may, however, offer a 'handle' for confronting such exclusions, as it can be argued that it is a matter of particular concern to women.

Checklist 1:

Elements of a maximal strategy for community participation

1. Extended consultations with community authorities.

2. Informal dialogue with community members of all strata and both sexes

3. Making appropriate response to difficulties caused by:
   - 3.1 lack of interest in improved water supply
   - 3.2. lack of customary community cooperation: individualism
   - 3.3 factionalism and internal conflict within the community
   - 3.4 inappropriateness seen in collective work in communities with wide social differences and in which work is usually paid
   - 3.5 fears that the supply will benefit only the powerful
   - 3.6 distrust of government agencies
   - 3.7 over-enthusiastic initiatives (e.g. in collecting funds or starting work before the water agency is ready to respond)

4. Community-wide committee/self-help water association (to be fostered; founded if absent)

5. Arranging for women's representation/control on a water committee

6. Decision on financial arrangements, to take account of interest of poorer sections

7. Mobilising existing institutions and organisations within the community to play a role in the water project/health education:
   - 7.1 institutions representing women or grouping them, from a traditional head of the women to a mothers' club
   - 7.2 cooperative or self-help associations
   - 7.3 church, youth, and other voluntary organisations
   - 7.4 the school.

8. Mobilising any home-town or school-leaver association, uniting community members resident elsewhere (able to collect financial contributions and to coordinate with official bodies in national/regional capitals)

9. Dialogue at ward level: with representatives of wards if they exist, and open meetings held in wards (open meetings of a size small enough to give ordinary community members confidence to speak freely are important for 2-way communication; in a small community, a community-wide open meeting may be effective, but the larger the community, the more inhibited most people will be, including particularly women)

10. Community self-surveys (useful for getting people involved rather than from the standpoint of gathering reliable data; in particular, survey of morbidity from water- and hygiene-related diseases, but possibly also census-type data other than income, or time-budget or water-use data; schoolchildren easy to involve in surveys, adults less so but worth while if at all possible)

11. Gaining active interest and involvement of key influential persons (must include convincing them to accord importance to the changes required in hygiene as well as in the more prestigious new water system)

12. Gaining support of opinion leaders on questions of health (who may include recognised traditional practitioners but will certainly include persons to whom neighbours and friends turn for advice on health)

13. Visits to other projects of a similar type

14. Using those (e.g. SSF operators) with relevant experience in their own communities, to give advice at the sites of later projects

Mobilisation of community participation in the construction phase of the SSF project

Methods and techniques for first contact with the village and the putting of proposals

It is assumed that there will be an early meeting with community authorities, at which the plans for the water supply will be put and discussed. It is important that this meeting should leave no doubt about the extent of the water authority's commitment: whatever costs will fall upon the community should be explained then. This implies that the policy on the division of costs has already been decided. It is also necessary that the first meeting should raise, if not decide upon, other basic questions such as the particular form of financing, the use of communal labour in construction, and whether house connections are envisaged for some or all households, or only public standpipes. If the water authority is not to take responsibility for payment of the operator, then this difficult question must be settled.

The extension agent should then begin gathering base-line information (see below) and at the same time making informal contacts in all sections of the community, engaging in dialogue concerning the proposed project, and making sure that the whole population is well informed about the proposal including its benefits and what they will be expected to contribute. At the same time he or she will be making contact with organisations and key individuals (see above: "Elements of a maximal strategy for community participation") and should gather a group of appropriate persons, formally as a comittee on sanitation or perhaps preferably informally (avoiding questions of status rivalry with other committees). This committee or group will be consultative in the first instance: it may or may not take on an active role later. It will be the group in which expert knowledge and local knowledge are pooled to produce ideas on necessary changes in behaviour and how to bring them about. It

will probably be best to include a schoolteacher or similar person with formal education, but also to include persons from less advantaged sections of the population, and, where possible, women. It is drawn only from an upper stratum, it is likely in many communities merely to condemn rather than to understand the behaviour of the poorer classes.

Checklist 2:

Mobilisation of community participation in the construction phase of the SSF Project

2. .1. Have community representatives or leaders been consulted?

2. 2. Has the programme been adapted to meet the community's needs as expressed by community leaders?

2. 3. Are the poor and the majority of users in the local community taken into account in adapting the programme to their local situation?

2. 4. Have members of the community, other than the leaders, e.g. the poor and the main probable users, been consulted?

2. 5. Can the technical information be improved so that it is put in such a way that the villagers understand the need for change and how it is to be effected by the project?

2. 6. Will the community contribute money for the construction of the SSF system?

2. 7. Will the community contribute labour (or materials) for construction
(a) from a specific group of people who will benefit?
(b) from the whole community acting collectively?

Would a self-help water association be more apt?

2. .8. Could more use be made of local materials and manpower rather than the community collecting funds to purchase goods and services from outside?

2. .9. Could dependence on external help with construction be decreased?

2. 10. Can the villagers be made aware that they can improve the project themselves?

2.11. Could a self-help water association be founded?

(follow on)

Obstacles to be avoided in the construction phase of the SSF project

2.12. If the community has not requested external help then avoid over-sell of the project.

2.13. If the community leaders want the location of the SSF and pure water outlet pipe to be near their houses this may contradict with the needs of the poor or the majority of users in the community if most of them live some distance away. Exacerbation of social conflict in the community is to be avoided, one way might be by emphasising technical factors in the selection of a location.

2.14. Contributions in labour, cash or materials may be increasingly resented in some countries where the rural population has been constantly required to contribute to development projects while the urban people have had services such as a purified water supply routinely supplied by the district council. "If the urban people get it on their rates why can't we?"

2.15. External intervention of any type may, in some other countries, be a more serious source of resentment. Some communities may rather do nothing and have nothing done, or manage for themselves even if it is badly, rather than having strangers telling them what to do.

Checklist 3:

Community participation in the operation and maintenance phase of the SSF project

3.1. Have community leaders been consulted?

3.2. Have other community members, particularly the main users been consulted?

3.3. Have the main running problems been identified
(a) from experience elsewhere?
(b) from user experience in the local community?

3.4. Has the operation and the maintenance programme been adapted to the local user problems, materials life in the local climate, etc.

3.5. Could a local person or persons be trained to operate and maintain the SSF system?

3.6. Is the traineee someone who regularly uses the SSF system?

3.7. Will the community pay a salary to the operator, in cash or kind?

3.8. Are there occasions in the maintenance cycle when the whole community will need to take part in maintenance work, e.g. to change the sand or rebuild the structure?

3.9. Are the people prepared to do the work of 2.8.?

3.10. Is there any personal action which if taken by all users of the SSF system would help minimise operating problems and reduce the need for maintenance?

3.11. Will collective commitment be possible to ensure that the personal actions minimising maintenance are kept up because of social pressure?

3.12. Can dependence on people, materials and spare parts from outside the community be reduced, and so ensure that correct operation and maintenance can be successfully managed by the community iteslf?

Obstacles to avoid in the operation and maintenance phase

3.13. Unsuitable potential trainees may be put forward by village leaders or by self-selection, they may be people who are not interested and are not responsible for water in their normal duties and who may see thejob as a mere stepping stone in status. A better choice is probably someone who is concerned about water supply as fetching water is part of their daily activity, and someone whose regular routine brings them in contact with the other people who will be using the supply, so there is plenty of opportunity for informal information exchange about how to keep the system working correctly. If village leaders understand in detail what the person doing the job will be expected to do (including this informal communication) they will most likely suggest suitable people. It is only when thejob description and qualities expected . . not explained fully that "unsuitable trainee" problems arise.

3.14. If the operation and maintenance programme is too sophisticated or too dependent on outside supervision and materials, the SSF system will soon stop working, if not immediately then during the first rainy season when many roads will become impassable so the supervisor cannot visit and materials cannot be delivered.

Checklist 4: Hygienic use of the SSF system by community members

4.1. Have the community leaders been consulted?

4.2. Have other community members, particularly the main users, been consulted? If the main users are children, have their parents been consulted?

4.3. Is there a need to train one or several of the users or one of the leaders, e.g. 'the Queen Mother', leader of the women, so that this person or persons can teach everyone else?

4.4. Is the community so motivated that it will ensure everyone is informed what to do without any help being needed by external agencies?

4.5. Will the community exert sufficient social pressure so that everyone continues to use the SSF system correctly?

4.6. Will the community generate its own regular public education to remind people how to use the SSF system well?

4.7. Can the dependence of the community on external information about what is to be done be reduced?

4.8. What local communication methods, e.g. music, puppets, masks, could be used to teach the users the correct use of the SSF system, and to reduce dependence on external media for communication?

Obstacles to be avoided in the hygienic use phase

4.9. Unless clear objectives are set for the hygienic use phase this is the part most likely to fail because of vagueness. (For suggestions of objectives in extension work see checklist 31 p. 93.

4.10. A major problem may arise if the SSF water is to be used mainly for drinking and other sources are to be used for washing if this distinction between supplies has not been observed previously. It could happen that children aged 6-12 always used to collect all water, but with the arrival of the new SSF system the older women, for example, may fetch the drinking water from it for status reasons, or because the children may not use the system correctly. In general it is probably wise to try to minimise such changes in role, but if they arise then to let them be, but with the proviso that the project is not encouraging one group to exploit another.

If the users have not been involved from the start of the project, there may be many and severe problems at this stage.

Identifying methods for fulfilling the SSF objectives in the village:

3.2. Approaches to running an extension programme.

Introduction

In order to run an educational extension programme it is recognised that four main questions need to be considered by the planners of the programme:

1. What is to be taught?
2. Who are the learners?
3. What methods of teaching and learning are to be used?
4. How will the teachers and planners know if anyone has learnt anything?

These are the four basic questions but in answering them the current consensus of work in community extension programmes tends to emphasise the necessity of also keeping closely to six principles:

(a) Define the task in terms of actions so that you can see whether they have taken place.
(b) Make the task relate to local people's problems.
(c) Build teaching on local people's current beliefs. Try to show that while certain actions were useful for certain conditions in the past, now times have changed, habits need to change as well.
(d) Use local media, such as local characters, local stories, local puppets, wherever possible.
(e) Create a dialogue in discussion so people express themselves. They are far more likely to go on thinking about issues if they join in than if they sit or stand passively.
(f) Try out or 'pre-test' all communications.
(g) And in monitoring the effects of the programme, examine most carefully all the negative attitudes, the failures and where things went wrong, as these are likely to be the most helpful things for designing future programmes.

Adult education is obviously different from the teaching of children. In particular it is necessary to take especial account of the interests, daily pattern and social status of the learners in the community.

Making extension teaching relevant to adult interests

Within a particular culture most people learn all the skills that are essential for their way of life. Where learning is difficult it is generally because the particular task to be learned is unrelated to the learners' experience.

No one remembers something which is irrelevant to them, but everyone is concerned about their own problems and the things that affect them everyday. This may seem very obvious but too often the beliefs and interests of the local people have been ignored in planning adult extension programmes, and people have wondered later on why nobody came, or if they did come, why they simply went away politely and did the same thing as before. Only at the end of expensive evaluations did the planners find out their target group thought "it wasn't useful to me".

Fitting extension education into the daily pattern of the community

People will only be able to attend a meeting or discussion if it is timed to fit in with their daily work. So the pattern of people's daily activities needs careful observation if any extension programme is to enable people to be involved rather than discouraging them.

In many countries there are two particularly busy times of the day: the early morning when water has to be collected, the home swept and people washed before leaving to work on the land; and the early evening when a meal has to be prepared, possibly more water collected and all children given another thorough bath from a bucket of water.

House to house visits by an extension worker are one way of reaching people so that their daily work is not interrupted too much. In some countries where houses are close together it may be possible to hold 3-6 household meetings so that everyone present during, say, an afternoon gathers together in a central spot in the shade and can talk and hear what is to be said together.

However, if most people farm or trade or wash clothes at the stream during the day such day-time house to house visits will only find the elderly and the very young at home. And with this pattern of daily activity it may be more useful to hold evening meetings or to consider holding meetings out at the farms or the market places or at the stream, where most people are working.

Social status and age

Age differences can create important status barriers so that new ideas and messages are not acceptable. Thus in a society where age is revered and all important there may be problems in using a very young extension agent. However, if the society reveres education and this young person is well educated and has been trained to respect the local people, then an age difference may be overcome.

Planning an extension programme

3.2. 1. What is to be taught?

(a) in the construction phase?

(b) in the operation and maintenance phase?

(c) in the user phase?

To specify the answer to this question, one approach is to divide up the subject to be taught into three sections: knowledge, attitudes and skills, and specify each in terms of actions so that you can see if they have taken place at the end of the programme.

Checklist 5: For example, In the user phase

What do these local people need to be able to do at the end of the user phase of the programme to ensure the correct operation and maintenance of the SSF system?

5.1. What should the users do that is different from present when collecting the SSF water? Why do they need to change their present habits?

5.2. What should users never do in order to avoid damaging the system?

5.3. What local ideas are there on how to explain this to users?

5.4. What should users never do because it is dangerous to themselves (e.g. the system will fall over)?
What local ideas are there on how to explain this to users?

5.5. What local sanctions are possible against people who misuse the system?

5.6. What problems with the SSF system is education trying to avoid? (Muddying by animals, puddles, etc.)

What do these local people need to know (perhaps what not to do) at the end of the programme to ensure correct operation and use

5.7. e.g. What problems need to be avoided and so unwittingly destroying the SSF system?

5.8. e.g. What dangers can arise with an SSF system? Can people be taught to recognise them?

5.9. e.g. Do people need to be taught to deliver water clean into clean receptacles, at least for drinking and food preparation?

5.10. e.g. Are there other features for promoting personal hygiene and sanitation which need to be covered?

5.11. What do these local people need to think/feel about aspects of the programme (carefulness, preventive maintenance, ?social sanctions against those who damage the SSF system, recognition that the SSF system is useful to the problems, that is easy to use with care, etc.).

Checklist 6 for Example:

If the objective is development of favourable attitudes towards the SSF programme, and enhancement of co-operation in general;

In some countries the need for developing positive attitudes may be more pressing than in others where both the desirability of a pure water supply and the practice of community initiative and self-help are more accepted. But in most places at least some sections of the population are likely to be sceptical or apathetic. In the enthusiasm to overcome scepticism and apathy there is a danger of exaggerating the virtues of water purification or overlooking sound reasons for scepticism. Keeping this in mind, the subject content implied might be detailed as:

6.1. - Creating awareness of the health hazards of a polluted water supply;

6.2. - Presenting information on likely pollution of the existing supply;

6.3. - Demonstrating, wherever possible, the pollution of the existing supply;

6.4. - Stimulating community discussion of costs and benefits of the slow sand filtration system and the improved water supply as a whole;

6.5. - Gaining an idea of where the costs borne by the community are likely to fall and whether for any section of the community they might outweigh benefits or result in a net gain much lower than for other sections;

6.6. - In such a case, endeavouring to ensure that costs are more fairly borne;

6.7. - Keeping in touch with opinion in all sections of the community, and taking conciliatory or other appropriate action in case of disagreements.

Obstacles to avoid in deciding what is to be taught

When Health education is conceptualised as fostering 'knowledge, attitude and practice' of the desired behaviour, the approach presupposes a one-way communication of a fully predetermined message, as well as a model of the process of adoption of behaviour patterms which may not be applicable.

3.2. 2. Who are the learners? And what is their situation?

(a) in the construction phase?
(b) in the operation and maintenance phase?
(c) in the user phase?

3.2. 2.1. Which of their problems or concerns do the subjects taught aim or solve?

This approach takes its starting point from the observation that people do most about things that concern them. If the SSF programme first finds what the local people are concerned about and deals with those issues first, and then moves on to discuss SSF, the SSF project will in the end be much more acceptable to the community.

3.2. 2.2. At which stage of disease transmission is change needed

In this approach we conceptualise the broad educational need as being:

(a) To build up, in consultation in the community, a detailed knowledge of the ways in which customary behaviour needs to be changed in the areas of water use, hygiene, and sanitation. This is done by bringing together the expert's knowledge of the potential routes of disease transmission, with local persons' knowledge of local circumstances and behavioural habits.

(b) To spread, throughout the community, the knowledge that has been built up, i.e. to improve the general understanding of the relevant processes of disease transmission and the ways it could be reduced.

(c) To increase each community members' motivation to reduce disease transmission in the ways suggested by the above discussion and pooling of knowledge.

(d) To facilitate such actions in any way feasible (e.g. by the provision of materials).

The major assumptions involved in this conceptualisation are that it is feasible to achieve an improved understanding of disease transmission (the routes, if not the processes involved) in a largely unschooled population, and that improved understanding will

motivate more effective changes in behaviour than can be achieved from recommendations or precepts not supported by improved understanding. It is possible that, for some communities at least, these assumptions are misconceived. The possibility may therefore be raised of testing them experimentally by adopting a different approach to health education at one or more of the experimental sites.

Checklist 7: disease transmission; where is change needed?

7.1. Of the diseases for which water purification might play some role in reducing incidence, it is the faecal-oral category (diseases transmitted by an faecal-oral route) which is of overwhelming importance in the tropics as a whole (together with schistosomiasis; also locally, guinea worm might be important in a particular community, but there are much simpler ways of avoiding wading in water used for drinking than to install SSF).

7.2. The faecal-oral category of disease accounts, in all the poor and relatively poor communities of the world, for a very high proportion of infant and child mortality; in fact, recent evidence suggests an even greater role for it in triggering off the spiral of worsening nutritional status and infection than was previously realised.

7.3. Faecal-oral transmission routes are multiple, and only sometimes involve contamination of water prior to the point of collection. In the present project, since filtration will take care of any such contamination, primary attention must be paid to preventive interventions in those faecal-oral transmission routes which do not involve contamination of water prior to the point of collection.

7.4. The number of possible routes is almost infinite, and many are in practice impossible to investigate with any precision; but the attack can be to some degree pinpointed through the exercise of logic and simple local knowledge. The logic reminds the investigator that the multiplicity of routes all lead from A to B - from defecation to ingestion - which implies that an attack concentrated around these two points has a prospect of success in cutting off a large proportion of the transmission: the limiting factor will be the difficulty of this attack - of changing behaviour in these areas - rather than the imprecision of the task.

7.5. The local knowledge, primarily of the details of habitual behaviour, can be brought to bear by local people; but delicacy is involved in encouraging frank discussion.

7.6. At the point of origin of the faecal-oral transmission routes, the specific matters to consider will probably include:

- will the faeces themselves, in the place where they are deposited, possibly start a cycle of infection through:
  - being directly exposed to other persons or to domestic animals (rather than in a latrine hole, covered, or at a good distance from houses, etc.)
  - being exposed to flies (inadequately covered latrine or as above)
  - being moved or transported (either in the case of systems of disposal of nightsoil, or the way young children's faeces are disposed)
  - being washed during rains or floods by water which finds its way to ponds, wells, streams, etc. (but this is the one major route which, as far as drinking is concerned, should be taken care of by water purification)
  - being washed as above or by irrigation water - water which is waded or bathed in (danger of schistosomiasis)
- will soiled latrines (or potties) themselves possibly be the origin of a chain of infection?
- what about objects (paper, leaves, corncobs, etc.) used for personal cleansing?
- is personal cleansing effectively done? Is the situation frequent that the necessary paper, etc. or water is not available?
- Is the washing of the hand(s) after defecation habitual? Is it thorough, with soap? (It seems conceivable that this is as important as the use of a latrine, but it is far less often mentioned.)
- what about the disposal of the excreta of babies? If on the ground, is the clearing up thorough? May it leave particles on ground or brushes? If babies' clothes are soiled, how are they washed, where is water thrown?

7.7. At the end point of the faecal-oral transmission routes, the specific considerations will probably include the following:

- is the washing of hands before preparation of food thorough, with soap?
- are hands washed before eating? Again, is it thorough, with soap?
- do people put fingers into water containers and cups when taking water?
- is food protected from flies? (An are flies more abundant than they need be, in the sense that breeding grounds which could be eliminated are left?)

3.2.2.3. Other ways of analysing who are the learners

Checklist 8: Other learner characteristics

8.1. Which groups of people most need the SSF system?

8.2. Do people think they need an SSF system?

8.3. What do people currently do in collecting water; is any change needed in an SSF system?

8.4. If any habit change is being considered, is it possible to demonstrate why the habit change is likely to be helpful to people from their point of view?

Obstacles to avoid in identifying who are the learners and what is their situation

If learner analysis is conceptualised as 'starting from existing knowledge and felt needs, engaging in dialogue, and developing critical consciousness', there may be dangers of over-estimating the relevance (to the particular problem in hand) of indigenous systems and concepts of medicine and disease, and of under-estimating the importance of simple ignorance about, for instance, the mechanisms of disease transmission.

3.2.3 Which methods of teaching and learning are to be used?

a) in the construction phase ?
b) in the operation and maintenance phase ?
c) in the user phase ?

Introduction

It is reasonable to classify the reasons why people may adopt a change in behaviour relevant to health, as follows:

1) they understand, more or less well, the process by which the change is likely to have a positive effect. Motivation is directly in terms of the health goal, and is self-directed.

2) They accept authoritative assurances that it will have a good effect for health. The acceptance may be hedged with scepticism, and it may be short-lived.

3) A reference group of persons of higher or similar status adopt the change, so that it is endorsed by group judgment.

4) Informal social rewards and sanctions may play a role: they may seek admiration for innovating in directions others will follow, or fear to incur a low opinion, negative comments, etc. by omitting to do what has become conventional.

5) Formal sanctions (punishments, fines, etc.) are threatened against those who fail to perform the action. This may, of course, apply to children within a family, or others in subordinate positions, while the motivation of the parent can be classified in another category.

These reasons are not, of course, mutually exclusive and they do shade into one another. But they provide a basis for thinking about the ways in which behaviour can be influenced.

The less publicly visible - more private - the behaviour, the less the latter reasons (3, 4, 5) can apply, and the more emphasis must be put on the development of understanding. This is probably why many programmes aimed at the improvement of sanitation have concentrated on the construction of latrines (visible), neglecting for instance the washing of hands (private).

The use of authoritative assurances (2), which is indicated when the behaviour is highly specific (while the reasoning concerning

the need is complex) (e.g. taking a particular medicine), is less useful when the behaviour cannot be specified in such detail (hygiene requires the exercise of judgment, therefore understanding).

A private activity can be turned into a more public one by public discussion or, in particular, by any kind of check-up or evaluation in which people are asked whether they have adopted a certain practice. This makes it impossible to avoid observer bias in an evaluation aiming to compare the effectiveness of different approaches to health education, in so far as the private areas of behaviour are concerned.

Another way in which private behaviour can be made more subject to change through social rewards and sanctions, is by linking it with a visible change. For instance, handwashing is generally a private activity. But increased handwashing may be achieved through a physical change, such as the installation of a tap in a place convenient for washing on return from a latrine, or by encouraging the use - visible for others to see - of a bowl and soap.

In this example there is also, of course, an element of facilitation: any policy to persuade people to change their behaviour should provide, wherever possible, for making it easier for them to do so.

With this conceptual approach, then, the problems of achieving appropriate behaviour in relation to water use, hygiene, and sanitation become:

First, establishing in consultation with local people what are the appropriate behavioural changes.

Then, establishing, again in consultation with local people, which of these changes may be susceptible to feasible efforts to:

- increase understanding by detailed explanation, demonstration, etc.

- Have authoritative statements made (by various authoritative figures, from the extension agent or other health personnel, to community leaders, religious leaders or traditional practitioners, or perhaps by bringing in a cinema van with films, using the authority of a modern medium).

- Have a group of persons adopt the innovation in a publicly visible way, or gain group commitment to do so and follow it through.

- Check up by asking people about their behaviour, or otherwise manipulate informal rewards and sanctions.

- Impose rules for public behaviour, e.g. acts which cause public nuisance.

- Facilitate changes: helping with obtaining materials, mutual aid in construction of latrines, etc.

Checklist 9:
Possible procedures for identifying media for teaching

9.1. What local media could be used on a basis for teaching?

9.2. Are there any local stories, tales?

9.3. Are there any puppets, dramatic figures, etc.?

9.4. How can dialogue be created?

9.5. Can 3-6 household discussions be used?

9.6. What times of day are suitable for reaching which groups in the community?

9.7. Does the extension worker have credibility?

9.8. Is the aim to sell preconceived ideas to the villagers or to help them become aware they can change and improve their situation?

9.9. Is the aim to provide technical information to enable villagers to understand the need and how to effect change?

9.10. Is the aim to create an awareness that major constraints to change in hygiene and sanitation lie in the local power structure?

Identifying the functions of materials and teaching activities (1)

NB Preparation of materials may not be needed in societies where people are accustomed to learning through spoken stories rather than by printed pictures or words .

Any activities that learners join in will have one or more of three functions:

1) The activities may reinforce the memory of a point just learnt, for instance, by taking an SSF system to pieces to see the parts which make it work.

2) Activities may help learners to understand and learn through action. Many things are not fully understood unless they are tried out. Thinking is needed to clarify and learn ideas and thinking can be stimulated by discussion.

3) It is well known that it is much easier to learn and remember if what you learn has some relationship to your personal experience. So activities are needed to help people perceive such relationships. Materials can either be prepared for people within a small region where the majority shares a common approach to life, or questions can be posed in materials which require people to draw on their own experience and relate it to the topic under discussion.

An example of the latter type is as follows:

"We are going to study ways of protecting the main water supply in the village. What do you do at the moment to protect the water supply from animals and mud?"

"Mosquitoes breed in these sorts of places: (list) Which of these do you have in or near your village?

Such questions are the first stage in a process where local practices are compared with new ideas, the relationship drawn out, and the new ideas accepted or rejected on the basis of understanding rather than whim.

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1. Principles taken from a thesis being prepared for London University by Janet Jenkins, International Extension College, Cambridge.

Checklist 10:

Making printed materials easy to learn from(1)

Print may be the sole medium of instruction for people learning alone or in groups, or it may be used to back up instruction from broadcasts or other media. In whatever situation it is used, it must be planned on lines that will stimulate active learning. A brief radio programme guide sheet should suggest learner activities, while a totally print-based instruction should be packed with a variety of activities.

Frequent activities reinforce learning. Although there is no clear ruling on how frequent they should be, it is a useful rule of thumb to assume that three minutes is the maximum amount of time people should read without some sort of variation. As a rough guide for every page of solid print there needs to be some activity, for higher level materials. For those who have only a low level of literacy, and therefore read slowly, activities need to be much more frequent.

One simple way to retain learners' attention is to vary the style of presentation, to mix stories, commentary, pictures and exercises, as is appropriate for the context.

Another device that is particularly helpful for holding attention is headings in the form of questions. If these are carefully phrased they draw attention to what follows and guide people to look out for the most important points.

Summaries too, immediately after the presentation of several points, help learners to retain what they have just learnt.

Quick questions for learners to answer at the end of each section enable learners to find out if they have picked up the main points intended.

NEW PAGE Checklist 11:

Making still pictures easier to learn from

Introduction

You do not need to be able to read to see and understand a picture. Pictures are, therefore, very useful for carrying messages to everyone, those who can read well, or a little, or not at all.

(1) op cit

However, it is often difficult for some people to recognise what a picture is meant to represent, and even more difficult to comprehend its message. People who are not used to looking at pictures may have particular difficulty. The problem is so common that the terms visual literacy and visual illiteracy have been coined. People have to be helped to become visually literate. This is less of a problem than teaching people to read but it means we have to be extremely careful in designing pictures for use with adults who may not be accustomed to seeing them.

Use of pictures (excluding mathematical diagrams, tables and graphs)

Pictures may be used in the following ways:

1. To explain something which is difficult to describe in words.
2. To aid learning by: (a) convincing people (such as showing them pictures of astronauts on the moon);
   (b) reinforcing a previous message;
   (c) in the form of symbols to help people organise activities.
3. To remind people, for example after a talk, the picture summarises what has been said.
4. For variety. Pictures interspersed in a booklet can serve this function.

II.1 1. The subjects of pictures need to be familiar. People aren't interested in pictures which do not seem to be relevant to them, apart from the fact that they are less likely to be able to recognise the subject. It has been found that learners will identify more readily with people wearing their own national dress rather than those wearing European style clothes or the dress of another ethnic group.

II.2 2. There should not be too much detail in a picture. It is tempting to try to make a composite picture look more authentic by including details characteristic of the environment, but this can simply cause distraction.

In Botswana some pictures illustrating a course on vegetable gardening showed a cat sitting by the garden fence. In group discussion people were worried by this cat and spent considerable time discussing its significance.

Irrelevant detail may also lead to a complete misinterpretation of a message. In a picture used in Ghana, where the main feature was meant to be a girl throwing rubbish on a refuse tip, she was thought to be feeding the animals which had been added for detail in the foreground.

II.3. Centre pictures on human activity

It has been shown in a study from the Malagasy Republic that the first thing rural people tend to look at in a picture is people, and to identify with what they are doing.

II.4. Details in pictures need to be completely accurate

There should be no mistakes in realism. In Upper Volta a picture of a woman carrying spinach in a sack distracted the audience as spinach is always carried in baskets.

At the other extreme a picture used in Zambia of a woman preparing food was much appreciated. People could tell not only that she was preparing 'nshima' from the way she was pounding it, but also confirmed their opinion by looking for, and seeing, the dust flying from the bowl as she worked. Details like this can act as important cues for interpretation.

Colour too must be accurate in every detail. In a study of posters with agricultural messages in the Malagasy Republic, inaccurate colouring distracted people from the central message.

II.5. Gross distortions in size are difficult to understand

This is particularly true with enlargements. Several tests have been done on people's recognition of enlarged insects, e.g. a housfly used in hygiene teaching. In general the larger the model the fewer people reconise them, especially if the people concerned are illiterate.. 'Our flies are not as big as that; what was said does not concern us here'.

11.6. Local clothing in pictures is very important

If a teaching centre provides printed sheets of figures for the group members to choose and cut or press out themselves, one way of overcoming local cultural differences is evident. Instead of a static picture in a booklet, which unfortunately shows a woman from a neighbouring tribe, a choice of people in different tribal dress can be provided, and the learners can choose the one they prefer.

11.7. Head the picture with a question which tests if the picture is understood

A short clear heading will provide an instant reminder to the teacher and learners of what the picture is supposed to be dealing with. 'What does this picture teach you that you should do?'.

Obstacles to avoid in picture preparation

11.8. Parts of objects

There are basic conventions in the picture form, which are not difficult to learn. However, if someone experiences difficulty in recognising the subject of a picture, these factors may come to the fore and make comprehension even harder. A photograph of a rural slow sand filter may include a tree partly cut away by the edge of the picture. If someone is initially puzzled by the content of the picture he may focus on this part-tree and worry over its significance.

When parts of objects are presented alone, e.g. a filter from the SSF or a tap, they may cause difficulty.

11.9. Unfamiliar angles

Objects seen from unfamiliar angles can also be hard to understand.

11.10 Artistic and cartoon conventions are to be avoided

Perspective conventions of lines moving closer together, or arrows or speech bubbles can all cause great difficulty. Arrows can be replaced by foot prints which everyone can read.

Some possible sources of teaching material and training information on environmental health

In French

Center for Health Promotion
Bureau d'Études et de Recherches pour la Promotion de la Santé, B.P.
Kangu-Mayombe
République du Zaïre

1) Two-year training course qualify te as a sanitatio education auxiliary

2) Catalogue of educational materials available free on request

Spanish and English

Carlos Campesino rural health series
Committee for Adult Education
Huehuetenango
Guatemala, C.A.

1) Carlos Campesino learns about hygiene (Aprende la Higiene). Filmstrip and notes.

Distributors: Producciones Carlos Campensino
Apartado 2444
Guatemala City
Guatemala
Central America

Carlos and his family liv in miserable, unhygienic conditions which cause him and son to fall ill. The social worker pre-scribes medicine, and teaches the family the ba. ics of hygiene. Designed for non-formal education of rural audiences.

Scotney, N., (1976) A manual of health education.
African Medical and Research Foundation, P.O. Box 50125, Nairobi, Kenya.

5 step method of approach to changing health habits about wells, pp.15-21.

Indonesia Department of Health
Health Centre Reference Manual (1976) Vol. 4: Hygiene and Sanitation.

Use of mapping to monitor progression in improving environmental health and sanitation, page 4/viii/1 - page 4/viii/5

Checklist of health education for hygiene and sanitation, page 4/ix/1 - 4/ix/3

Inspection checklist for public places, page 4/vii/2

Guidelines for refuse management

Surinam Government Health Education Department in Co-operation with Pan American Health Organisation, Schistosomiasis:

Television tape of the story of a young boy exposed to infected snails while wading in a nearby stream. The programme includes the life cycle of the Schistoma organism responsible for the disease and some health tips on prevention. The tape is also dubbed in Sranan Tongo a local language, and is intended for children in rural areas.

An art contest has been run following the film with paper, crayons and paints provided by the education department, a great novelty to children usually using only notebooks and black pencils. The results were excellent, children created their own versions of the lessons from the videotape. These pictures were judged on the theme of prevention of schistosomiasis.

MATERIALS ON NON-FORMAL ADULT EDUCATION

Srinivasan, Lyra, (1977) Perspectives on non-formal adult learning 120 pages $ 5. World Education 1414 Sixth Avenue, New York 10019

AIM: A creative approach to teaching adults 58 pages $4, (1977) World Education 1414 Sixth Avenue, New York 10019

A step by step guide to creating learning materials that are based on the student's own life experiences. Includes sample photo-stories.

Baird, Bil , (1971) Puppets and population. World Education 1414 Sixth Avenue, New York 10019 $3.25.

Covers how to use puppets in any non-formal teaching situation.

India, Ministry of food and agriculture, Guide for the village worker Available from Rural Communications, 17, St James' St South Petherton Somerset England

Outlines four basic extension principles and gives 21 teaching [illegible] for best rural development results

Boserup, E and Liljencrantz (1975) Integration of women in development Why when and how? 42 pp United Nations Development Programme

Includes very useful checklist (pages 40-41); 11 short questions for people planning to ask themselves how women's lives may be affected by new developments and how women may need to be included in local participation efforts, project goals, evaluation, reports, and project planning and implementation teams.

3.2.4 What methods of obtaining feedback on teaching are to be used?

a) in the construction phase
b) in the operation and maintainance phase
c) in the user phase?

In the rural situation the most likely best methods of feedback on teaching will be by question and answers in discussions and by observation of daily practice in using the SSF system. Evaluation merely reflects the objectives of a programme so the effectiveness of the extension evaluation will depend on how well the objectives are expressed in the first place.

Checklist 12: Preliminary questions for evaluating the extension programme

12.1. What problems have been experience, what failures?

12.2. What went wrong with the SSF system that teaching should have avoided?

12.3. Were communications pre-tested?

12.4. What negative attitudes have been experience that could be helpful for testing as potential obstacles in future programmes?

Identifying methods for enabling community participation in the village

3.3. Procedures for a community diagnosis

Introduction

There must always be a compromise between the desirability of thorough knowledge about a community before an attempt is made to influence it, and the need to get on with necessary changes. It is not usually practical to take the advice of a prominent anthropologist who says "It is therefore necessary, not only before implementing a scheme, but before creating it, to begin with a careful study of the population on which one wishes to act, to know its culture in all its details and in all sectors...." (Roger Bastide, Applied Anthropology, London: Croom Helm 1973, p.121). Indeed, it can also be argued that knowledge of a community's capacity to change can only be confidently established in the process of introducing change. However, some pitfalls may be avoided by information about whether the changes which seem necessary to the outsider are seen as necessary within the community.

The topics on which information about a community should be gathered, then, are those which are relvant to the acceptance of the programme. i.e. the construction, maintenance and use of the system and to possible constraints upon any of these phases; also data on the institutions and organisations which may be enlisted to help with implementation.

Checklist 13: Community information to be obtained about acceptance of the programme

13.1. Have community representatives taken an initiative to request improved water?

13.2. If yes: (1) Consult with them on whether the SSF system proposed meets their needs:

(a) Are they satisfied that it is sufficiently "modern"?

(b) Are they satisfied that the commitments, financial and other, that they will be required to make, will not be seen as too big a burden, by comparison with a lower-level improvement which, it should be pointed out, will still meet most health goals)

(2) Consult informally with community members of all strata and both sexes - in some situations this may need to be done by 2 different extension workers - discussing the technical options, their virtues and their requirements, and ascertaining whether a broad consensus already exists or is likely to be formed given existing attitudes. Elicit, in particular, attitudes of poorer strata towards paying a financial contribution and toward performing communal work in the construction phase: would they prefer to be left with more time to work on their own farms or other occupation? Do they fear that the water supply will reach or benefit only the dominant group?

13.3. If no: (1) Establish level of satisfaction with existing water source(s).
A survey is needed to establish satisfaction, in each section of the community by geographical location, social group, and sex, with each aspect of the existing supply: accessibility, taste, appearance, and whether it is associated with disease(s). (Suggestions for survey questions will be given in a subsequent section.)

(2) Establish as far as technically feasible the objective level of pollution of the existing supply - especially where majority opinion in the community is satisfied: it may be that the satisfaction is justified and an alternative location should be sought on "worst first" grounds.

(3) Establish whether there are any features of the manner in which water is drawn from the existing source, such as the social gathering involved, which are valued and which might be lost with a reticulated supply; e.g. women may bathe at a secluded water source, but could not do so at a tap in the village.

Checklist 14: Community information to be obtained about constraints to implementation and co-operativeness

14.1. What forms does co-operation already take in the community?

14.2. What are the constraints against increased co-operation?

Every community has some interest in making a favourable impression on outsiders. This is especially true of the community authorities and dominant individuals and groups, and is most clearly expressed at formal meetings with outsiders. The more formal the enquiry, the more it is made to community representatives without realistic possibility of cross-checking with others, and the more it is made with other members of the community listening, the more likely the reply will overestimate the degree of co-operation likely. The following approaches may circumvent the difficulty:

14.2 a) Asking not about the potential for co-operation, but about actual projects already carried out. Even here there is a danger of exaggeration, of attributing more to communal co-operation and less to outside help.

14.2 b) Establishing rapport with individuals from various groups in the community, including non-dominant groups, and asking them informally and privately about the problems of co-operation. Tact is, of course, essential.

14.2 c) Asking disinterested persons who may have objective knowledge on the question, such as schoolteachers who are not indigenous to the community. There is some danger, however, of giving undue weight to a subjective judgement which may not in fact be well founded.

14.2 d) Use of projective techniques such as the structured scenario, in which a sample of community members is asked to comment on a hypothetical situation with a theme of co-operation.

14.3. On the extent of integration into the cash economy

The aim is to estimate how much of what is produced in the community is:

i) traded with the external world, internationally or nationally

ii) traded for money within the community

There are several reasons why this may be important. First, any prediction of success of the programme of SSF with community participation elsewhere in a country (or large region) cannot assume that what holds true in a less commercialised economy will hold true in a more market-oriented one or vice-versa: incorporation into the market is a fundamental variable for communities, just as socio-economic status is for individuals. For the development of the extension programme in the experimental community, it will also be extremely useful to know:

14.3a) - what the monetary resources of the community are. The more commercialised the community, the more likely it is that a financial contribution to the construction and operation of the SSF and water supply can be made: conversely, it may be less likely that a contribution in the form of communal labour will be thought appropriate.

14.3b) - whether all community members share the income from cash crops, etc. In general, commercialisation is accompanied by increasing disparities in income as some community members are "left behind", often in fact losing rights or the protection of traditional mechanisms of reciprocity etc. which kept them from falling into extreme poverty; and there may be an influx of poor in-migrants.

The extent of integration into the market economy might be measured through:

1) The census of households which may be done in connection with the evaluation of the SSF programme. Apart from questions on wealth or income, each household might be asked what proportion of productive work of household members is given to the production of items which are traded, including cash crops, or to trade itself, or to working for wages as compared

to the proportion spent growing food eaten by the household members.

2) Records of buying agencies where they handle the totality or the bulk of local cash crops.

3) By asking questions about the types and the proportion of food which is bought as compared with that which is grown by the household eating it.

Checklist 15 : Community information about organisations in the community

It will be useful to make an inventory of all organisations which exist in the community. Particularly relevant will be any organisation of women, including any traditional institution such as a "head of the women" or "green mother", if no formal organisations of women exist, any possible observation should be made of ways in which informal gatherings take place. A female extension agent, in particular, might participate in such informal gatherings to hear, and to influence, the formation of opinion on the water supply system.

Checklist 16: Community information about relevant features of the social structure

Introduction

In many countries, the main threat to the success of the programme is likely to come from sharp differences of interest between different sections of the community. In one case, domination by one group may be so extreme that the implementation of the project will necessarily be entirely on that group's terms, with no possibility of developing self-reliant capabilities among other groups whom it would be appropriate to call the "oppressed". In another case, one group may still be powerful and politically dominant, but other groups may be more or less actively disaffected. Although a water supply project may be designed to benefit all sections of the population equally, in such circumstances it will be seen in the community largely in terms of the sectional advantages it may offer - there will be distrust and co-operation will be difficult to organise. The range of possible situations will differ in each country: it may be possible for a typology of half a dozen typical community social structures to be drawn up for each country, in terms of the types of groups or individuals holding power and the basis on which that power rests, the extent of challenge and whether it is factional or class-based, etc. A different way of approaching the fostering of co-operation, even for such a politically-neutral purpose as a water supply project, may need to be developed for each type. A typology might, at least, help the extension agent to formulate a description of the informal social structure in a community where he is working. Such a description should be regarded as necessary baseline information.

It is necessary, of course, to pay particular attention to those socio-economic divisions which might make some members of the community look on the water project with less favour than others. A checklist might be prepared, with such items as the following:

16.1) Are there any people (men, women, or children) who are currently paid to fetch or cart water for others? If so, their predicament should be discussed both with them and with village representatives (a water carrier might, for instance, have a good claim for consideration as the operator of the new supply).

16.2) Are there people with private wells who sell their water?

16.3) Are there people whose incomes are so low that they will be hard pressed or unwilling to pay the charge envisaged for installation or for subsequent supply? Frequently, the fact is overlooked (by those who expect ready cooperation for communal ends) that an equal contribution or charge represents a greater proportion of a poorer family's income, and therefore a greater real burden - a situation which may well lead to apathy. If the community produces a cash crop, particularly if it is handled through a single buying agency, it may be possible for the cash contributions to come from a fund established by a levy on the cash crop, a form of progressive taxation. An alternative way of solving the problem of apathy, namely to found a self-help water association providing water only to members, would appear to solve it only by ignoring the needs of the poor (though this may not be true in all cases when the full circumstances are taken into account).

16.4) Is there any possibility that the water might be appropriated by the powerful sections of the community just for themselves (e.g. for their farms, not leaving sufficient to reach the homes of poorer people)?

16.5) Could a simplified network analysis help to identify the leaders and existing learning groups in the local community?

This technique is easily put into practice by asking everyone in the community whom they consult about their problems. A map is then made of who talks to whom. In general it is found that certain people are consulted more than others, they end up with a cluster of dashes round their hut on the map. In one village two or three major groupings may emerge, with a few people who consult people in more than one group. Some people are isolated or talk to very few others.

In this way it is possible to identify those whose opinions are most respected on matters in the community, and these people are potential group leaders. Different topics will have different communication networks, so you cannot use information from one network for another subject. However, the survey should not take too long. It has been used in South Korea, Ecuador and Colombia for research on existing learning groups as well as for identifying group leaders.

Checklist 17: Community information about the points where water pollution currently occurs

In Dr. Feacham's companion document, 'Public Health Studies in Phase Two of the Slow Sand Filtration Project', a classification of water-related diseases is given (Table 2), critical questions about local water use are listed (page 18) and methods of water pollution analysis between collection and use are described and illustrated (Figure 7). Local data to provide information on these topics would clearly be most useful in health extension work in the community.

It would also be desirable to pinpoint where the pollution occurs more exactly, by taking samples at various sub-stages of the collection and storage process and, if observer bias can be avoided, in cups or other containers used for drinking. The main problem is one of observer bias, i.e. the likelihood that people will make a special effort to clean their utensils when they know measurements will be taken. The extension agent should pay special attention to minimising such bias if possible and to noting down when it has clearly not been possible to avoid it.

The differences between the measurements from different households' containers might be a basis for recommending particular practices. But it is essential not to give offence by publicly identifying those whose water vessels are most polluted.

The health education purposes will be best served if people are shown as much as possible how the analysis is carried out. At the least, full explanations should be given from the time of sampling and the average results should be shown and discussed. At best it may be possible to arrange for schoolchildren or others to learn the procedures and carry out analyses themselves.

Chapter 4

Support for the slow sand filtration programme from outside the village.

4.1. Introduction

The organisation and management or the "implementation phase" of projects is notorious for being overlooked by project designers. Many projects have failed to produce results simply because project designers never thought further than stating their own vague aims.

In fact considerable help to the organising of a project can be given by using one straightforward principle and a few techniques which can be applied in nearly all situations.

The key principle of effective organisation lies in obtaining feedback about what is happening in the project. In order to get this information specific targets need to be set with each group involved in the project and then the progress towards reaching these targets needs to be carefully monitored.

One of the first activities needed in organising a project is to allocate clearly defined responsibilities to various units who will be involved in implementing the project, and simple methods whereby the central project co-ordinator will be informed about how work is progressing.

Following the allocation of responsibilities a structure plan of the organisation of the project will need to be drawn up and circulated so that all departments involved have a clear view of the communication links between one part of the project and another.

Each department/unit/or Ministry involved in the project will need to be given guidelines on how to set up and monitor the progress of finances, personnel, supplies and transport. In organising the financial aspects of the project, effective organisation and feedback is obtained by budgeting in advance and costing what has been spent.

In organising people effective organisation and feedback is obtained by providing detailed job descriptions, (and criteria for recruitment and selection) and supervision procedures which aim to help people do their job better as well as see what problems they have.

In organising supplies for a project, effective organisation and feedback is obtained by budgeting volumes needed, setting targets for procurement dates, scheduling maintenance of equipment and monitoring how supplies are being used.

In effective organisation of transport for a project, target schedules for maintenance and a budget for mileage per month can be drawn up and records kept to monitor how the transport aspects of the project keeps to its schedules.

Thus in all the areas of the organisation of the project the two complimentary activities of target-setting and monitoring progress are needed. To avoid expensive and time-consuming excesses of supervisory activity by central staff a project can usefully aim to make each area of its organisation self-supportive with its own self-regulating feedback system to show how well progress is going.

Checklist 18: Helps to organising and providing higher level support for the SSF project

18.1. Have the broad objectives of the SSF project been specified?

18.2. Have responsibilities been allocated to the various ministries and departments involved in the project?

18.3. Has a structure diagram been prepared showing which ministries/departments have responsibilities and do dotted lines show the communication lines which need to exist to make sure activities in particular ministries/departments are kept in touch with one another?

18.4. Have formal meetings (if appropriate) been scheduled to make sure that different ministries/departments with complimentary responsibilities keep in touch with each other during the project.

18.5. Have dates been put for final completion of objectives/ responsibilities allocated to the different ministries/ departments?

18.6. In each department/ministry has a budget been prepared for the finances they are responsible for?

18.7. Have monthly costing procedures been outlined for each department or do procedures exist already in all departments involved in the project? Have copies of costing procedures been lodged with the central project co-ordinator?

18.8. Have job descriptions been written for every single person involved in the project? Have ministries/departments returned copies of the job descriptions to the central project co-ordinator?

18.9. Have guidelines/criteria for supervision been laid down for everyone doing supervisory jobs? Do these criteria correlate with the job descriptions of the people being supervised?

18.10. Have supervisors been trained to recognise problems in the job situation of the people they supervise and do they know ways of helping people overcome those problems?

18.11. Has each department/ministry budgeted their supplies and taken the local procurement procedures into account in estimating realistically when the supplies will be available for use in the project villages?

18.12. Has each department/ministry sent a copy of its maintenance schedules for equipment and transport to the central project co-ordinator?

18.13. Has each department/ministry developed a monthly record keeping system to monitor use of supplies and record maintenance actions?

18.14. Has each department/ministry produced target schedules for vehicle mileage and maintenance per month and records for monitoring vehicle use? Does the central project co-ordinator have copies of these plans and records?

4.2. Allocation of responsibilities to ministries and departments, regions and project villages

The allocation of responsibility to the various ministries and departments who need and ought to be involved in the slow sand filtration project involves finding answers to the following questions:

Checklist 19: Allocation of responsibilities

19.1. Is the government committed to the slow sand filtration project?

Has the government allocated resources for the project and publicly stated its support for the SSF project? Has the government specified that slow sand filtration systems will be extended to certain areas if the project reaches certain measures of success? If the government is not particularly interested in the project it may not be worth doing these as the expense and effort involved in getting things done will probably be too much.

19.2. Has a country steering committee or country programme organiser been appointed?

It is essential that a country steering committee or a country programme organiser be appointed as early as possible in planning the organisation of a project. The composition of a committee will of course need to reflect the interested groups at a national level. The job of a steering committee or a programme organiser should be simply to plan the organisation, and then hand over to other people (see below) for implementation of the project. The key element in selecting a person or people for a national SSF steering committee is that they should not only be responsible and interested in the subject but also capable or prepared to learn about planning such a self-supporting decentralised village based system.

(follow on)

Decentralising responsibility to the regions or districts has the advantage of assigning responsibility to people who are directly involved with the implementation of the SSF project and most interested in its success.

(follow on)

19.3. Who should be responsible for implementation?

If the project is national in scope, or if the Ministry of Health operates in a highly centralised manner, or if there is a Ministry of Works department or division which is responsible for slow sand filtration or if the SSF project is a top priority then in all these situations it may be necessary to assign responsibility for implementation to someone at a high level within either the Ministry of Health or the Ministry of Works where this Ministry runs only water projects.

However, it is usually very difficult for such high level people to devote much time to new efforts.

19.4. What sources of funds and manpower should be used for the management and support of the SSF project?

If Ministry and health service or local authority staff are involved in the SSF project, the critical question is what SSF project activities will they in fact be able to do over and above their often very busy routine duties.

It may be possible to second people temporarily to work on SSF project activities. If this is the case, funds for salaries will not be needed but transport, secretarial support and office space may have to be found and funded.

19.5. Are there potential problems of political, technical or public acceptability?

If so, the SSF project staff may have to spend some time and effort promoting changes of, e.g., public health laws or changes in professional policies (e.g. because health inspectors have not learnt about SSF previously). Alternatively time may need to be spent obtaining support and coordination if, for example, the Ministry of Health is responsible but has never liaised with a water and sewerage corporation before, but in this case it is the water and sewerage corporation who will do most of the work.

19.6. Can milestones be identified in the SSF project schedule?

If so, the coordination between the various departments involved will be very much easier.

19.7. Are there unknown or open options about organisation and leadership?

Most situations will need some flexibility to allow for changes as the SSF project continues.

Example. The SSF steering committee in country X first satisfied themselves that the proposed objectives of the SSF project could be paid for. They then decided to have a working meeting to create a list of organisational activities of the SSF project, and to create a list of obstacles likely to be encountered, drawing on their experience of all projects trying to implement a new idea.

The group concluded that the completion of so many diverse activities would not be possible unless there was a full-time project manager. They decided the project manager should be placed at the regional level and should report directly to the director-general of health services.

Because of the shortage of staff within the region, the SSF project manager must be assigned from within the Ministry. And owing to the national interest and need for application of the experience throughout the country the manager would be seconded from the National Health Planning Unit.

They also decided project staff should be appointed full-time and part-time from within the Ministry of Health and the Ministry of Local Works, nationally and in the Region.

One of the project director's first tasks would be to set up a Regional SSF Advisory Committee made up of representatives of the public, professional and private interested parties. This committee to act as a sounding board for publicising the results of the project and monitoring its progress, and for assisting in inter-agency and private sector coordination and support.

They decided that the steering committee at the national level would be converted into a technical guidance committee and would also be responsible for national inter-agency coordination.

Finally they decided the project should remain active for at least two years, but in no case longer than five years. The criterion for completion should be the ability of all regional health inspectors to implement the SSF systems on their own.

They decided that the regional project team should be responsible for conducting the evaluation of the project in the region and would be responsible for making recommendations as to whether or not the SSF system should be applied to other particular areas or throughout the country.

Checklist 20: The organisation tasks at the central (national) level

20.1. Who has been assigned overall responsibility for the project and for its overall direction?

20.2. If supplies and their distribution need to be organised centrally, what is the procedure for their budgeting, procurement and monitoring of use?

20.3. What reports are to be received centrally from whom?

20.4. What operations are to take place in the regions? How will the central organisation know if things are progressing all right?

20.5. What staff need recruiting?

20.6. What training programmes are needed?

20.7. Who is responsible for overall evaluation of the project?

Checklist 21: Organisation tasks at the regional level

211. Who is responsible for following the progress of the work in the villages? How will progress be monitored?

212. Who is responsible for supplies and their distribution to the project villages? How will supplies be organised?

213. Who is responsible for collecting reports from the project villages? What reports are needed, for whom? Who will send information to the national SSF programme organiser?

Checklist 22:

Organisation tasks in the project villages

22.1. Who is responsible for the care and maintenance of the SSF system? What has to be done?

22.2. Who is responsible for supplies for the SSF system? What is likely to be needed at what dates?

22.3. Who is responsible for monitoring the progress of correct use of the SSF system by villagers? How will this information be obtained? How will the programme be changed to take account of problems?

22.4. What information is needed by the regional committee to help them decide whether the SSF system would be useful for other areas, or whether the SSF system has too many problems to make it worthwhile?

43. Organisation structure plan to show communication links

Working out an organisation structure plan will be particularly important for the SSF programme, as an SSF water supply project may directly or indirectly concern many Ministries nationally and locally and many traditional groups.

At the national level it is quite possible that the Ministry of Health will need to be kept informed of what is happening, even if it does not have overall project responsibility, as the local health inspectorate supervising water supplies may be ultimately responsible to the district medical officer. The Ministry of Local Government may need to be involved if it is this Ministry which employs the health inspectorate in the districts, or if the local government revenues pay for improvements to water supply. If there is a separate Water and Sewerage Corporation, perhaps under a Ministry of Works, it will need to be involved, and the Ministry of Works may have to be brought in anyway if it happens that all import licences for building materials such as concrete have to be forwarded to the Ministry of Finance through it. Whether the Ministry of Education runs non-formal adult education programmes or not, it may be very useful to involve it in the SSF programme, as the rationale and methods of using an SSF system might easily be made part of the primary school science curriculum, or the using of an SSF system could be taught through non-formal adult education programmes. Other relevant Ministries may include Community development, the Treasury, Information, Social Welfare and Planning. It could be that the Ministry of Defence is already using SSF systems or would be interested in doing so, in which case it may be useful to inform them about the project. If they have been using SSF systems they may have some helpful experience about how to explain to local people how to use the system correctly.

In addition to the Ministries which may be interested in the SSF project, there may be private firms to whom work could usefully be put out to tender for local production of the basic parts and any spares needed.

One way of monitoring whether the organisational framework is working is to schedule meetings and/or dates by which reports should be sent from one department to another, to ensure that relevant people are kept informed at various stages of the project.

Technical and financial liaison

The closest liaison will be necessary with the agency carrying out the technical and financial aspects of the programme (the water authority). At least three areas will need particular attention to ensure a fruitful collaboration between extension agency and water authority:

(1) the question of finance: settling the amount and form of the community's obligations, particularly in money though also in materials and labour;

(2) co-ordination of the community's labour in construction - including any community delivery of local materials - with the water authority's input of professional and skilled labour, construction machinery and tools;

(3) the training and supervision of the operator.

In view of the need for such close liaison, it may be considered desirable for long run objectives to create a permanent extension section within the water authority.

Checklist 23:

Obstacles to avoid in working out liaison channels of communication.

23. 1. Ministries of Health are often made up of many parts, several of which may need to be approached. Potentially relevant departments for SSF include community health, laboratory services, transport pool, maternal and child health, health education, epidemiological services, communicable disease control.

23. 2. Government Ministers are busy people, so unless careful arrangements are made for them to understand the programme they may put the subject on one side. Possible arrangements for helping understanding include briefing the Minister of Health so that an explanation of the programme can be given at a cabinet meeting which could be asked to give support to the programme or sending an explanatory letter from the Minister of Health to other Ministers.

23. 3. Interest and support may be needed from a number of key individuals other than the Ministries. These may include political leaders, including the leaders of minority groups, deans of medical schools and other health oriented institutions, leaders in the industrial and commercial sectors, trade unions, head teachers, religious leaders, mass media producers, and heads of voluntary organisations. These people could be written to as outlined for government officials.

23.4. The task of contacting the relevant health professionals (health inspectors, etc.) may be too great to do individually. One way round this is to encourage lectures/discussions as part of the normal activities of the professional bodies to which they belong, or writing an article in the professional journals.

23.5. Schoolteachers may be forgotten as a very useful resource for providing information to villagers.

4.4. Organising financial aspects of the project

The critical features of financial management are advance budgeting and costing of actual expenditure. These activities will need to be performed nationally by the SSF project steering committee or project director, regionally by the SSF regional advisory committee and locally in the project villages.

Budgeting and costing for national aspects of the SSF project

Budgeting and costing will need to include a number of categories staff salaries or the portion of salaries taken up in work for the programme; capital cost of equipment such as the slow sand filter, sand, cement, vehicles; the cost of supplies such as additional sand, tap washers, fuel (petrol, kerosene,oil); stationery; the maintenance cost of equipment for vehicles and the slow sand filters; the cost of training activities, including the salaries of training personnel, travel and overheads and teaching aids, and the cost of public health education and publicity about the SSF system, including personnel salaries, travel and overheads,teaching aids and pre-testing costs.

The aim of budgeting is of course to make sure enough money is available to cover provision of a working programme, and the aim of costing the actual expense is to answer the most important question: What has the programme cost? Answers will be needed by the project director at least each month, and possibly more frequently.

If at the end of the SSF project it is hoped to be able to specify how much it has cost for each household to be supplied with say 12 gallons of filtered water per day, it will be essential that built into the collection of costing data there is also a provision for collecting information on the number of households collecting water from the SSF system and how much water they collect from it.

For any of the costing exercises dates are very important, so that costs per certain periods, say one month or one year, can be compared with other months (perhaps in the rainy season) or another year when perhaps the cost of imported cement for the SSF has gone up 400%.

In addition to explaining any overall savings or overspending of the project, the monthly financial report should highlight if there have been high or low spendings in certain categories, e.g. there might have been a balancing over all but a very high expenditure on construction in one period because of ordering supplies balanced by very low expenditure on salaries as people have still to be appointed.

It may be helpful to outline the trend of costs in each category; for example the cost of running vehicles rising at a certain rate.

Finally, the financial report should show what immediate action is required and how plans should change next year.

Checklist 24 Budgeting and costing for regional aspects of the SSF project

24.1. What staff salaries are involved? What overheads for rural travel?

24.2. What equipment is needed?

24.3. What supplies need to be ordered / have been used?

24.4. What fuel has been used?

24.5. What have been vehicle and equipment maintenance costs?

24.6. What training costs will be / have been needed? Salaries, travel and overheads, teaching aids. pre-testing of training communications costs.

24.7. What publicity costs will be / have been needed? Salaries, travel and overheads, pre-testing of public communications costs.

24.8. What dates do budgeting and costing exercises run from and to?

24.9. How many households benefit from the SSF project costs?

24.10. How much water goes through the SSF system per £ spent?

24.11. Who on the Regional Advisory Committee is responsible for budgeting and monitoring expenditure?

Checklist 25: Budgeting and costing for village aspects of the SSF project

25.1. Who will draw up the budget and monitor spending? How often?

25.2. What staff salaries in ~~cost~~ cash or kind are involved?

25.3. What volunteers are contributing time to the project? They need to be included in costing data so that other projects can calculate how many people are needed to run a rural SSF system well.)

25.4. What equipment is needed?

25.5. What supplies need to be ordered / have been used?

25.6. What fuel has been used?

25.7. What have been vehicle and equipment maintenance costs?

25.8. What training costs will be / have been needed?

25.9. What publicity costs will be / have been needed? Salaries, travel, overheads, teaching aids.

25.10. What dates do budgeting and costing exercises run from and to?

25.11. How many households benefit from the SSF project notes?

25.12. How much water goes through the SSF system per £1 spent?

Checklist 26:

Obstacles to avoid in financial management

The main obstacles to avoid in organising the finances of the SSF project are likely to be two-fold:

26.1. Unneeded early costs and shortage of money at the end of the project because money has been spent without planning for all phases of the project. The most likely thing to happen is that too much money is spent on the construction phase and insufficient money is spent on pre-construction discussion with villagers to explain the needs for the SSF system and problems to be avoided by using it properly.

26.2. Unauthorised costs will of course arise if there is not some form of control of who can spend the money. The best people to give responsibility to are probably the national project director, the local authority regional treasurer and the village operator together with the village chief.

4.5. Organising supplies for the project

The main problems likely to arise with supplies are obtaining the imported items and getting all items to the villages at the time they can be used.

4.5.1. Purchasing and preparing (bricks) supplies

Supplies of every kind will need to be purchased or prepared long before they have to be used in the villages. For this reason the purchasing of supplies will have to be an early activity in the SSF programme. If periodic restocking of supplies is needed this will have to be built into the supplies management.

The first step is to compile a complete inventory of supplies from planning documents. The quantity of supplies required for each region will need to be calculated.

Import licences etc. will all have to be arranged.

4.5.2. Keeping supplies

Storage space and a methodical system will be needed for items like stationery. A reference label can usefully be made to tally with the inventory item number.

4.5.3. Monitoring use of supplies

Dates and quantities used, whether bags of cement or pads of paper should be recorded.

Checklist 27: purchasing supplies

27.1. Who at the national level is responsible for ordering
- cement
- stationery; evaluation forms, etc.
- petrol
- transport
- sand

27.2. On which criteria are annual requirements of supplies decided?

27.3. Who is responsibile for regional allocation of these supplies-

27.4. Describe in detail each stage in the chain of distribution from arrival in the country to delivery to the village with the names of persons responsible at each stage.

27.5. Obtain a list of the make, type, capacity, year of manufacture, mileage and registration number of all vehicles available to the SSF project. Give their geographical distribution and their present official uses in working days and mileage per year.

27.6. Identify the person responsible for:-
a) allocation of transport to special project activities
b) allocation of petrol/oil (or cash in lieu) to special project activities
c) the servicing of vehicles and allocation of spare parts
d) the replacement of vehicles
e) the allocation of cash for additional transport for the project and for overnight rural work

27.7. Identify office space available for the SSF project.

4.6. Organising transport aspects of the project

The key to effective transport organisation is the keeping of a log for the use and maintenance of each vehicle with schedules laid down for the planned use and maintenance of it.

Hopefully the SSF project will be able to call on a transport pool for its transport and so will be able to hand the responsibility for transport to a ministry.

4.7. Organising personnel resources for the project

The main assistance to organising the people resources of the project is likely to be found in writing clear job descriptions for everyone involved. When job descriptions are precisely defined recruitment, selection and supervision procedures are straightforward and simple to design.

4.7.1. Preparation of job descriptions

For each person involved in the SSF project a job description will need to be prepared to include the title of the post, the duty station, the service conditions, the duties to be performed, responsibilities, by whom the person is to be supervised, and what skills and education or experience are required.

Checklist 28:

Central staff needed (national or regional)

28.1. The central SSF programme director. This person will need to be able to coordinate the regional and local activities, to be able to communicate clearly and probably to know the local languages of the project villages, as well as to have a working knowledge of arithmetic and how to present percentage statistics. A similar person at regional level may be needed.

28.2. A transport manager may be needed to organise the delivery of supplies, to maintain vehicles, to administer procedures for paying for fuel and repairs, and ordering spares, to plan delivery and analyse log books.

28.3. A central storekeeper may be needed for organising supplies. Key features of the job include record keeping and complete integrity and reliability, the three parts of the job are purchasing, receiving and stocking supplies; distributing supplies; and monitoring use.

28.4. Drivers will need to be selected carefully by the transport manager. A probation period of employment is essential, during which period a driver's performance can be assessed, also the ability to solve breakdown problems and the conscientiousness in maintaining the vehicle and the willingness to adapt work to rural conditions.

Checklist 29: Possible sources of collaborative workers at national or district level

Different countries will have one or more of the following types of organisation to foster community development. The possiblities for taking advantage of existing organisations of this kind should be explored.

29.1. The employment of 'community development officers' whose job it is to activate communities, encouraging and helping them to undertake development initiatives in all sectors.

29.2. The use of lower-level staff of sectoral departments (e.g. community health nurses within a health ministry) to encourage community participation for purposes related to that sector.

29.3. The training of community members, for instance as village health workers, given responsibility to call for community efforts in that sector.

29.4. The training of village 'leaders' or 'youth leaders' in training centres.

29.5. Use of the channels of local government administration to set up community development committees to give existing representative bodies responsibility for development tasks.

29.6. Mass mobilisation through the governing party organisation and its local committee in each community.

29.7. Mass mobilisation through one or more national voluntary organisations sponsored by government, including women's and youth organisations.

29.8. A radio forum programme, with listeners' groups in rural communities.

In the experimental programme, such organisations might be approached for:
- providing background information on the communities chosen (including, for instance, data on informal aspects of the social structure);
- providing entrée (a channel of introduction to the community);
- providing general advice and assistance in community development.

In a subsequent expanded programme, these existing types of organisation might be called upon to play a bigger role, including for instance the identification of suitable communities as sites for slow sand filtration with community participation, or taking on some of the functions of community mobilisation - even in some cases taking it over entirely.

4.7.2. Supervision

With supervision a compromise must be made between the desirability of very close supervision, indeed direct involvement of supervisory personnel in each phase of the experimental programme, so that the supervisors become familiar with the problems at first hand, and the need to predict what will happen when such supervisory support is not so readily at hand. One way of solving this problem would be to vary experimentally the amount of supervisory support given at different sites. Each extension agent should receive close supervisory support at the first site where construction is undertaken, but at other sites the frequency and length of regular visits might be deliberately varied, visits made to solve particular problems could not be varied in this way, but their number and type should be recorded.

Local supervisor of project

This person will probably be needed to make sure that the scheduling of the SSF project (community contact and construction) is carried out efficiently. It will also be necessary to make sure that the public education programme has been carried out in ways that help villagers to understand the project, and that supplies and transport are ready for use when needed.

The type of checklist supervisory questions which can help this work are

1) Did the supplies reach the village in the day or week planned?

2) Did the supplies reach the village by the shortest route?

3) Was the work done in a week high or low, in your judgement? Give reason.

4) Ask women if they have heard about the SSF system, ask women if their friends know about it, ask women what the purpose of the SSF system is, ask women what is to be done to store and use water at home correctly.

Checklist 30:

Example of job description for local supervisor

Title of post

Local supervisor of SSF projects in X and Y villages - required to spend two weeks at each villeage each month supervising the setting up (community liaison) and construction of an SSF system.

Duties to be performed

Programming the work of the team

Budgeting supplies, listing the people to be visited in the village, the actions to be taken in the construction phase, the actions to be explained to users of the SSF system, the estimated time at which each activity will take place. Instructing the village operator.

Organising construction sessions

Choosing a site for the SSF system, organising clearance and preparing the ground, digging and construction.

Collecting and summarising project progress and costing records and submitting them to the regional group.

Responsibility for decision-making

The local supervisor of the SSF project will need to decide what budget is needed, how supplies should be stored, the most appropriate site for the SSF system, the course of action if there are delays.

Supervision: a) Direct supervisor: Regional Project Officer
b) Supervision exercised over others:
construction workers
SSF operator(s)

Skills required in this post

Fluency, written and spoken in the official language.
Working knowledge of spoken local language(s) used in the project villages.
Arithmetic, including percentage calculation.

Education required

? Post primary school and public health training.

Experience required

At least five years working in rural disease eradication campaign or environmental health work and at least two years in a supervisory capacity.

4.7.3. The extension work in the village

Checklist 31: tasks to be done in the village by the extension agent

31.1. Diagnose the community's water supply problems.

31.2. Know and be able to demonstrate the correct use of the SSF by a member of the public.

31.3. Be able to explain to a member of the public how the SSF system works.

31.4. Be able to explain to a member of the public what can go wrong with the SSF system (e.g. ? too much water drawn off; so not filtered properly) and thus how certain procedures are very important.

31.5. Be able to explain and recognise danger signs which indicate the SSF system has gone wrong.

31.6. Know where to get help for dealing with the SSF system when it goes wrong.

31.7. Know and teach others (as well as practise) good hygiene habits from the time of collecting water to the time of consumption.

31.8. Be able to liaise with the local environmental health officer.

31.9. Be able to organise group meetings at the stream-side, in the market place and for 3-4 nearby households to hold discussions on environmental health matters.

31.10. To receive information on environmental health from various organisations.

31.11. To request up-to-date information from the area supervisor, the water and sewerage corporation, etc.

31.12. Be able to organise community inputs, especially communal labour, on the construction of the improved water supply.

In some countries it may be decided that communal labour will not be used for construction. Where it is difficult to co-ordinate communal labour so that it is available to work at the time that the water authority can allocate scarce skilled manpower and machines, it may be decided that it is cheaper to use paid labour. Before such a decision is taken, however, it is worthwhile considering first whether the presence of an extension agent could not sufficiently improve co-ordination, and second, whether sufficient account has been taken of the suitability of slow sand filtration systems for labour-intensive construction using predominantly unskilled labour. In another case community authorities may themselves consider paying a contractor for the work, or communal labour may simply not be habitual, with the monetisation of all transactions and the general demand for payment of wages for work done. It may be difficult to organise communal labour in a community divided into social classes with markedly different financial means. In such cases it may be worth while to consider the employment of labour by the community, for a wage (or through a food-for-work scheme), retaining as many as possible of the characteristics of a communal effort. In an extreme case, of course, this will not be possible and the majority of workers engaged would be labourers from elsewhere (there may be implications for the siting of projects). Where communal labour or some variant of it is possible, however, it involves:

Checklist: Methods of organising communal labour

- Allocation of responsibilities to committees and then to individuals.
- Establishing a timetable of detailed activities, in co-ordination with the water authority.
- Solving practical problems arising during construction phase.
- Ensuring that commitments taken on are fulfilled.

Ideally, an extension agent should act only as initiator and observer, or even only as observer, checking that these things have been done. In order to foster self-reliant capabilities in the future, (s)he should take on as little of the detailed co-ordination work as possible. In practice, a balance will have to be maintained between this goal and the smooth operation of the project, while the extension agent's availability will inevitably lead to active involvement in the day-to-day activities of organisation.

3(.13. Be able to teach and supervise one or more operators in the operation and maintenance of the supply system; to settle the question of external and communty support for them.

4.8. Organising training aspects of the project

4.8.1. The responsibility for organising training will probably fall on the programme director who may be able to obtain assistance from the regional team. The strength of the training programme will depend entirely on the ability to specify the job descriptions of the people who are being trained, and on the ability to find out what they know and wish to know during the training programme. The quality of the people coming forward to do the training will probably depend on their interest in the subject and whether the system or the training helps to solve some of their or their community's current concerns. (see Job Descriptions section, see How to Teach section).

4.8.2. The SSF operator

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Checklist: Matters to arrange in appointing and training an SSF system operator who will also maintain the system

Slow sand filtration is technically well suited to operation and maintenance by a community member with only short training. The procedures to appoint and train the operator include:

32.1. Reaching a decision on whether the operator should be a man or a woman.

32.2. Selection of the individual.

33.3. Settling the question of a salary or other form of recompense.

33.4. Arranging initial technical training.

35.5. Arranging on-the-job- training during subsequent operation, especially the first time each kind of job has to be carried out (e.g. first removal of top layer; first replacement of sand).

36.6. Ensuring that any difficulties arising over payment or conditions are solved.

36.7. Listing tasks to be performed by the operator to cover, for example, activities in:

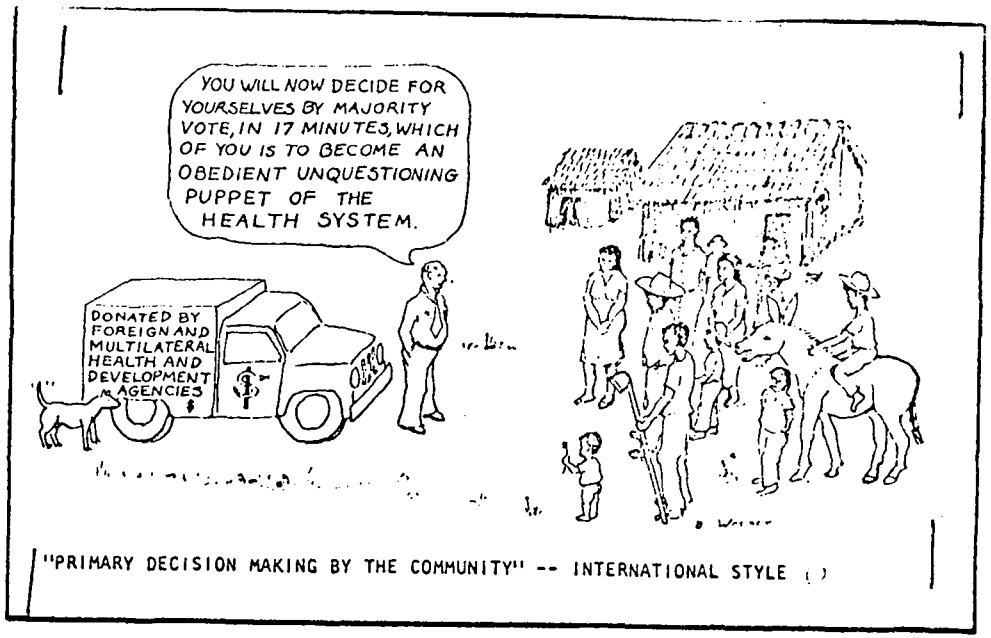
(a) routine maintenance
(b) danger signs and first aid to the system.
(c) how to recognise if outside help is needed
(d) where to obtain outside help
(e) what weather conditions may harm the system
(f) how to explain to the extension agent what needs doing
(g) how to explain to community members how the system works and what they must do to keep it working.

4.8.3. Election of trainees: obstacles to avoid and suggested procedures

1. Do not hold election until community has a basic understanding of the programme (this may entail several meetings)

2. When ready for elections draw from the people the qualifications they think are needed by their volunteer worker. Be sure the community understands the responsibilities of the health worker.

3. Are the nominees willing, available and interested in serving the community?



"PRIMARY DECISION MAKING BY THE COMMUNITY" -- INTERNATIONAL STYLE (1)

(1) David Werner "Where there is no doctor" 1977

4.8.4 Procedure for training

1. Schedule meetings in consultation with the trainees (consider climate, planting and harvest, fiestas etc.)

2. Schedule a pre-seminar meeting with trainees to explore their expectations, to initiate the acquaintance of trainees with each other and with staff, to collect baseline survey date, to plan topics and activities for the seminar, to decide what to bring etc.

3. Maximise participation of government and private people.

4. Accomodation for the training should approximate to the people's actual living conditions.

5. Methods should be simple, practical and participatory.

6. The local language should be used.

7. Allot time to explain links between theory and local conditions e.g. why dysentry occurs.

8. Nightly synthesis and evaluation sessions with trainees clarifies and gives reinforcement.

9. Be aware of the needs of trainees for social activities, recreation etc.

10. Be sensitive to the feelings of a group and work out conflicts when they are recognised.

11. Staff should meet daily for evaluation of process and content

12. Midway in the seminar there should be group evaluation, allowing opportunities for change of procedure.

13. Decide what are acceptable standards at completion of the course at the beginning of it so that you can see if a course has achieved its aims.

14. A graduation ceremony may be useful.

4.8.5 What can go wrong with a training programme?

1. Resource persons can contradict the values of the programme.

2. Resource persons may not appear.

3. Resource persons may not follow the course content intended.

4. There are no follow-up meetings. These are needed at least at monthly intervals for sharing problems, submitting reports, providing extra information, discussing how to meet cultural practices, i.e. what explanations are acceptable.

5. The supervisor is insensitive to how the work is affecting the growth of the worker as a person and the changes taking place in community relationships.

6. The supervisor takes no personal interest in the worker.

7. The supervisor never looks at the log book, supplies records, etc.

8. There is no built in self-assessment of training or work done each week.

4.5.6. Example: Training aspects of the public education programme.

1. If the job description of the public health educators includes the abilities to communicate effectively with individuals, families, and community groups about the SSF system and to enable the village workers to continually evaluate their educational work, then all the training programme will need to be closely related to enabling the trainees to do these tasks.

2. One useful approach to preparing the material for a public education programme in a particular village may be to draw up a table of local factors working for and against the use of an SSF system.

Some factors working against correct use of an SSF system	Some factors working against correct use of an SSF system
1.Diseases involved not known or thought to be rare or unimportant or accepted as inevitable and so not feared	Diseases (diarrhoeas etc.) known, recognised and feared.
2.SSF believed ineffective	SSF believed to prevent diarrhoeas etc.
3.Interruption to normal procedures and delays in obtaining SSF water feared and resented	Delays known and accepted as contributing to SSF process
4.SSF personnel feared,mistrusted and disliked	SSF personnel known, respected and trusted.
5.Unwelcome associations with SSF people.	Attends with friends and meets others, welcomed and encouraged.
6.Time spent, effort involved excessive	Effort, time reduced to minimum in programme design and felt to be reasonable in relation to benefits.
7.Obligations to family.Family lack of sympathy with programme.	Family support programme and assist and encourage participation.

3. Another help to designing a community education programme is to make an inventory of public communication systems in use locally and aim to build on it. This might be done as part of the baseline information collection (See section 3.3 page 49+)

a) What methods are correctly used in the district to inform people about the purpose, practices and procedures of health relative activites such as, e.g. immunisation? (nationally, regionally and locally too).

b) What methods are used to inform community leaders and women in the local community about the time and place of meetings?

c) How well informed are community leaders and women from different social strata about the purposes, practices and procedures of SSF?

d) How are local communities currently involved in environmental health activities?

e) What methods might be used to assess the public knowledge, attitudes and motivation of people to preventive action against disease?

f) Are any local answers available for question e?

4.87. ? Section on evaluation of training

(See section 3.2.4 page 47+ : Feedback on teaching)

Chapter 5: Evaluation

5. Evaluation

5.1 Introduction

At each phase of the programme, acceptance, construction, maintenance and use by the villagers, the experience of the organisers should be summarised and the obstacles to date identified. For details see sections 2 and 3, community participation and extension education.

When the SSF has been in use for some considerable period, say a year or two years, the experience of the whole period might be summarised. In particular the overall assessment needs to include an analysis of the project's effects on the social structure, particularly on the position of the poor and of women, and whether the SSF system has in fact made access to water any easier for anyone.

If funds are available for extensive baseline information gathering and post-experiment analysis then data could be collected on target diseases, water collection and storage habits and how well the programme management met specific operational and efficiency targets.

Checklist 33: Types of evaluation

3.3.1. Administrative evaluation

This should reflect the organisation strategies to see how well they have worked, in particular they need to cover allocation of responsibilities, costing, job descriptions, supervision, supplies record keeping, transport logs and feedback procedures from the training programmes.

Questions of the type, Have job descriptions been written for every staff member? have x hours of inservice training been given, etc. Mirroring the organisation section (page 61 ff.) will provide a regular feedback on operational activities.

3.3.2. Disease surveillance

AW water tests cf. page 59

3.3.3. Acceptability to householders

Interview.

3.3.4. Project evaluation

Details needed.

Checklist: Examples of obstacles that might be avoided in future programmes

34.1. Planning community participation: potential obstacles

34.1.1. Change in the village may be small unless the stock of technical information is changed.

34.1.2. The local power structure may hamper co-operation, so any change found soon dwindles away.

34.1.3. The individual basis of production may impede the continual practice of new ideas.

34.2. Obstacles encountered at the pre-acceptance stage

34.2.1. No interest by village leaders.

34.2.2. Dominance by certain village groups.

34.3. Obstacles met at the construction stage

34.3.1. No communal labour assistance.

34.3.2. Shortage of transport, supplies and training support staff.

34.3.3. Poor weather.

34.4. Obstacles met at the operation and maintenance stage

34.4.1. Trained operator leaves.

34.4.2. Trained operator fails to do work.

34.4.3. Village fails to remunerate operator.

34.4.4. Demand overloads SSF system.

34.4.5. Shortage of spare parts or materials to maintain system.

34.4.6. Cows knock the system over.

34.5. Obstacles met at the user stage

34.5.1. Use causes damage to the SSF system.

34.5.2. No one uses the system.

34.5.3. Only élite or the poor use the system.

34.5.4. Clean water is put in dirty containers.

34.5.5. Clean water is drunk from dirty muddy cups.