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ENVIRONMENTAL HEALTH PROJECT

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A Strategy for a Community-Based Hygiene
Education and Sanitation Project:
Proposal for the Eastern Highlands Province,
Papua New Guinea

Judi Aibel
Carol Jenkins

May 1993

Prepared for the Office of Health
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WASH and EHP

With the launching of the United Nations International Drinking Water Supply and Sanitation Decade in 1979, the United States Agency for International Development (USAID) decided to augment and streamline its technical assistance capability in water and sanitation and, in 1980, funded the Water and Sanitation for Health Project (WASH). The funding mechanism was a multiyear, multimillion-dollar contract, secured through competitive bidding. The first WASH contract was awarded to a consortium of organizations headed by Camp Dresser & McKee International Inc. (CDM), an international consulting firm specializing in environmental engineering services. Through two other bid proceedings, CDM continued as the prime contractor through 1994.

Working under the direction of USAID's Bureau for Global Programs, Field Support and Research, Office of Health and Nutrition, the WASH Project provided technical assistance to USAID missions and bureaus, other U.S. agencies (such as the Peace Corps), host governments, and nongovernmental organizations. WASH technical assistance was multidisciplinary, drawing on experts in environmental health, training, finance, epidemiology, anthropology, institutional development, engineering, community organization, environmental management, pollution control, and other specialties.

At the end of December 1994, the WASH Project closed its doors. Work formerly carried out by WASH is now subsumed within the broader Environmental Health Project (EHP), inaugurated in April 1994. The new project provides technical assistance to address a wide range of health problems brought about by environmental pollution and the negative effects of development. These are not restricted to the water-and-sanitation-related diseases of concern to WASH but include tropical diseases, respiratory diseases caused and aggravated by ambient and indoor air pollution, and a range of worsening health problems attributable to industrial and chemical wastes and pesticide residues.

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WASH Field Report No. 399

**A STRATEGY FOR A
COMMUNITY-BASED HYGIENE EDUCATION
AND SANITATION PROJECT:**

**Proposal for the Eastern Highlands
Province, Papua New Guinea**

Prepared for the Office of Health,
Bureau for Research and Development,
U.S. Agency for International Development,
under WASH Task No. 395

by

Judi Aubel
and
Carol Jenkins

May 1993

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RELATED REPORTS

CARE Indonesia: Increasing Community Participation and Developing a Basic Strategy for Hygiene Education in Rural Water and Sanitation Programs. Prepared by May M. Yacoob, Dan O'Brien, and Rick Henning. December 1989. Field Report No. 284.

Preparation of a Plan of Action for the Water Supply and Sanitation Component of the ADB-Sponsored Rural Health Services Component in Papua New Guinea. Prepared by Joseph Haratani and James K. Jordan. April 1987. Field Report No. 208.

Evaluation of the Water Supply and Sanitation Component of the ADB-Sponsored Rural Health Services Project in Papua New Guinea. Prepared by Joseph Haratani, James S. Baker, and James K. Jordan. July 1986. Field Report No. 182.

Tech Pack: Steps for Implementing Rural Water Supply and Sanitation Projects. Prepared by May Yacoob and Philip Roark. August 1990. Technical Report No. 62.

Community Management of Rural Water Supply and Sanitation Services. Prepared by Carolyn McCommon, Dennis Warner and David Yohalem. June 1990. Technical Report No. 67.

Community Participation and Women's Role in Supply and Sanitation in Developing Countries: A Three-Part Bibliography by Author, Subject, and Country. Prepared by Ellen Kendall. November 1982. Technical Report No. 18.

Facilitation of Community Organizations: An Approach to Water and Sanitation Programs in Developing Countries. Prepared by Raymond B. Isely. June 1981. Technical Report No. 7.

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CONTENTS

ACRONYMS	v
EXECUTIVE SUMMARY	vii
1. INTRODUCTION	1
1.1 Background	1
1.2 Scope of Work	2
1.3 Assumptions about Community Participation and Community-based Hygiene Education and Sanitation Programs	3
1.3.1 Community Management of Water and Sanitation Activities ...	3
1.3.2 Institutional Development to Support Community Water and Sanitation Programs	3
1.3.3 Rationale For Hygiene Education	4
1.3.4 Sociocultural Reality as a Basis for Program Development ...	4
1.3.5 The Role of Women in Water and Sanitation	6
2. RURAL WATER SUPPLY AND SANITATION PROGRAMS IN PNG	7
2.1 Responsibility for WS&S Programs	7
2.2 Policy Priorities	8
2.3 Donor Support	8
3. SITUATION IN EASTERN HIGHLANDS PROVINCE	11
3.1 Community Level	11
3.1.1 Related to Water and Sanitation Problems	11
3.1.2 Sociocultural Factors Related to Community Water and Sanitation Programs	11
3.1.3 Community Perception of Problems and Needs Related to Water and Sanitation	14
3.1.4 Situation in Communities with Improved Water Supply Systems	15
3.2 Institutional Level	18
3.2.1 Responsibility for Water Supply and Sanitation Programs ...	18

3.2.2	Provincial Water Supply and Sanitation Policy and Enforcement	19
3.2.3	Improved Water Supply Coverage	20
3.2.4	Training of Health Inspectors and Extension Agents	20
3.2.5	Hygiene Education	21
3.2.6	Maintenance Support	22
3.2.7	Development and Diffusion of WS&S Technological Options	22
3.2.8	Monitoring and Follow-up of Community WS&S Systems . . .	23
3.3	Conclusions Regarding Community and Institutional-level Issues in the EHP	25
3.3.1	Community Level	25
3.3.2	Institutional Level	26
4.	OUTLINE OF THE PROPOSED STRATEGY FOR A PILOT PROJECT	27
4.1	Project Goals and Strategy	27
4.1.1	Rationale for Choosing the Eastern Highlands Province	29
4.1.2	Complementarity with the ADB-Funded Project	29
4.1.3	Human Resources Requirements	29
4.2	Possible Funding Sources	31
4.3	Project Documentation and Monitoring	32
5.	CONCLUSIONS AND RECOMMENDATIONS	33
5.1	Water Supply and Sanitation Policy in PNG	33
5.2	Recommendations and Next Steps	33
5.2.1	Technical Assistance to Community-Based WS&S Programs in PNG	33
5.2	Eastern Highlands Province Hygiene Education and Sanitation Pilot Project	34
5.2.1	Potential Pilot Project Funding Sources	34
5.2.2	Project Design	34
	REFERENCES	35

F

APPENDIXES

A. Scope of Work 37
B. List of Persons Contacted 39
C. Consultancy Schedule 41

BOXES

1. Community-level Issues Related to Water and Sanitation 17
2. Institutional-level Issues Related to Water and Sanitation 24

FIGURES

1. Key Components of Community Management and Institutional Support Necessary for Effective Use and Sustainability of Water and Sanitation Systems 5
2. Phases in Project Development and Implementation 28
3. Human Resources Requirements 30

G

ACRONYMS

ADB	Asian Development Bank
ADRA	Adventist Development and Relief Association
CWSSP	Community Water Supply and Sanitation Program
DOH	Department of Health
EEC	European Community
EHP	Eastern Highlands Province
NGOs	nongovernmental organizations
PHC	primary health care
PNG	Papua New Guinea
PNGIMR	Papua New Guinea Institute of Medical Research
RWSS	Rural Water Supply and Sanitation
WASH	Water and Sanitation for Health Project
WASSCOM	Water Supply and Sanitation Committee (Eastern Highlands Province)
WHO	World Health Organization
WS&S	water supply and sanitation

EXECUTIVE SUMMARY

WASH consultant, Judi Aibel, specialist in community participation and hygiene education, visited Papua New Guinea (PNG) from February 12 to March 4, 1993 in order to develop a hygiene education and sanitation project for the Eastern Highlands Province (EHP). During the visit, Ms. Aibel collaborated with Carol Jenkins, medical anthropologist at the PNG Institute of Medical Research in Goroka, EHP and analyzed the situations.

At the provincial level, the consultant worked closely with Department of Health staff to analyze present program activities related both to community management and institutional support for community-based water supply and sanitation (W&S) programs. The primary conclusion of the activity was that despite adoption of promising provincial WS&S policies, significant constraints and weaknesses in community management of and institutional support for WS&S programs exist at the operational level.

An outline for a five-year community WS&S project in the EHP was developed in collaboration with the provincial Department of Health staff in Goroka. The proposed project would develop strategies to strengthen "community management" and "institutional support" for community-based water supply and sanitation activities and would develop methodologies and materials that potentially could be applied in other areas of the country. The project would be carried out in collaboration with the provincial Department of Health and would be complementary to the Asia Development Bank's (ADB) project which exclusively supports the construction of WS&S systems. During the field visit, a general outline of the project was developed and discussed with provincial and national Department of Health staff who strongly supported the concepts underlying the project.

Conceptual support, however, must be supplemented by considerable funding and technical expertise to implement the project. Lengthy discussions were held with the Director of the Adventist Development and Relief Association (ADRA), organization that is interested in providing some funds for such a project in the EHP. Follow-up contact with ADRA and other nongovernmental organizations (NGOs) already working in PNG should be made to identify additional potential funding sources.

The implementation of a community-based WS&S project in the EHP would require specialized technical assistance. While it would not be cost-effective for WASH to provide such assistance exclusively to the EHP, WASH could develop a proposal for a series of training activities—covering the many steps in developing and implementing community-based water supply and sanitation projects—for government and NGO staff currently involved in such projects in the EHP and elsewhere in the country.

Chapter 1

INTRODUCTION

1.1 Background

The primary focus of efforts to promote rural water supply and sanitation in Papua New Guinea has been the installation of water supply hardware. While such investments in rural water supply systems contribute to improvements in community health, in Papua New Guinea these efforts have encountered a variety of problems that have contributed to system failures and to inappropriate and/or inadequate use of systems by communities. Overall improvements in community health depend on the availability and design of sanitation facilities and health education programs that promote appropriate sanitation-and hygiene-related behaviors.

In several reports and evaluations conducted in the water and sanitation sector in PNG, the following factors can be identified as contributing to breakdowns in and inadequate community use of many water systems:

- The absence of adequate maintenance systems
- Insufficient community participation and community ownership
- Inadequate involvement of women in planning and management of water and sanitation services
- Insufficient attention to the sociocultural realities of the communities in which water systems are to be established
- The absence of health education strategies which should accompany the installation and maintenance of water and sanitation facilities

The absence of adequate maintenance systems and insufficient community participation were recurring themes in at least three reports that analyzed several programs at various points over a period of more than a decade. In the Western Highlands Province, 90 percent of the 101 water systems installed between 1975 and 1981 (including 75 wells with handpumps, 14 reticulated piped supplies, nine storage tanks and three hydraulic rams) were not functioning at the time of a 1981 assessment of a rural water supply project. Factors identified as related to the high rate of breakdowns included inappropriate hardware and irregular maintenance schedules. (Wohlfahrt 1982).

A 1986 evaluation of the first phase of the Asian Development Bank loan for rural water supply identified the main shortcoming of the program as the lack of maintenance performed on installed water systems (Haratani et al. 1986). The report linked this problem with inadequate community participation in the management of water systems.

In a 1986 Discussion Paper the Department of Health identified two of the main problems in the national water supply program as inadequate community participation in the installation and maintenance of water supply systems and inadequate skills on the part of the health inspectors to promote community involvement.

A comprehensive review of the community participation and sociocultural aspects of national water and sanitation programs (Jenkins 1987) identified the following problems: villagers' limited knowledge about relationships between water quality, sanitation, and disease; limited availability of health education activities; health inspectors' limited skills in promoting community participation in water and sanitation programs for which they are responsible; insufficient attention to community land ownership patterns, to local conflicts, and to traditional beliefs related to water; and inadequate involvement of women in community decision-making related to water systems.

Earlier reports of the problems and constraints associated with the installation of rural water supply systems suggest that the constraints and problems identified in the EHP are very similar to those encountered throughout the country. Most of the available documentation on the limitations of WS&S strategies focuses on problems in the installation of water supply hardware and gives little or no attention to the development of community capacity to manage local WS&S systems and to promote changes in community members' behavior related to water and sanitation.

The 1990 annual report of the EHP Rural Water Supply & Sanitation Program, identified various constraints associated with the establishment of water supply systems at the community level, such as lack of community contribution and/or involvement in construction activities, tribal conflicts, and land disputes related to location of the water source or pipe passage. The current workplan for the EHP Dept of Health (1992-1996) mentions similar constraints to the rural water supply program including lack of community cooperation, participation and contribution, inadequate awareness of communities regarding water supply and sanitation-related problems, and insufficient health education efforts to inform communities.

1.2 Scope of Work

At the request of the USAID Mission in Suva, WASH collaborated with the Eastern Highlands Province Water Supply & Sanitation Committee (WASSCOM) and the Papua New Guinea Institute of Medical Research (PNGIMR) in Goroka, EHP, to develop a community-based hygiene and sanitation education strategy that could be implemented at the provincial level. A WASH consultant with specializing in community participation and hygiene education visited PNG in February 1993 to work on this task with Carol Jenkins, medical anthropologist at the PNGIMR. The consultant was expected to verify the supposition that the community participation and hygiene education components of the water and sanitation program in the EHP are inadequate and to develop a strategy addressing these inadequacies.

1.3 Assumptions about Community Participation and Community-based Hygiene Education and Sanitation Programs

The experiences of WASH and other institutions working in the field of rural water and sanitation in developing countries have contributed to the development of a number of lessons about approaches that may contribute to more sustainable community programs. The following lessons—which are related to community participation, hygiene education and sanitation—provided a foundation upon which the EHP strategy was based:

- Apply community management to water and sanitation programs
- Build institutional development as a means to support community water and sanitation programs
- Define a rationale for hygiene education
- View the sociocultural context as a basis for program development
- Establish a role of women in water and sanitation programs

1.3.1 Community Management of Water and Sanitation Activities

There is a growing consensus that both the longevity and impact of water and sanitation activities at the community level depend on community involvement and a sense of “ownership” of those activities. The historic concerns of promoting community participation have been supplemented with community management approaches to WS&S technologies and the promotions of community health. Based on WASH’s experience, “without community management and hygiene education water projects will yield fewer health improvements and be less sustainable.” (Yacoob and Rosensweig 1992).

Experiences with rural water and sanitation programs in many developing countries also have demonstrated that communities must receive training and follow-up support in order to effectively assume management and health promotion responsibilities. Simply delegating responsibility to communities does not ensure that communities will be capable of assuming such responsibility. Carefully designed training and follow-up programs are required to develop community capacity to assume responsibility for these activities.

1.3.2 Institutional Development to Support Community Water and Sanitation Programs

The 1980 International Drinking Water Supply and Sanitation Decade focused on community participation, community management and community financing. The importance of these community strategies has not diminished; however, the experience of the decade revealed that the viability and sustainability of these approaches require support from both local and national institutions. Institutional support is required to strengthen community structures, and according

to WASH's experience, national and central institutions also are beginning to recognize that "for community management to achieve its promise, long-term nurturing and support will be needed" (Yacoob and Rosensweig, 1992).

Defining policies related to water and sanitation technologies, community involvement, and hygiene education, etc. Assisting communities in developing the capacity to manage technologies and to promote health, helping communities access alternative technologies and develop maintenance and repair strategies, and providing them with training materials and methodologies and techniques to monitor and evaluate their own activities all require institutional support (See Figure 1).

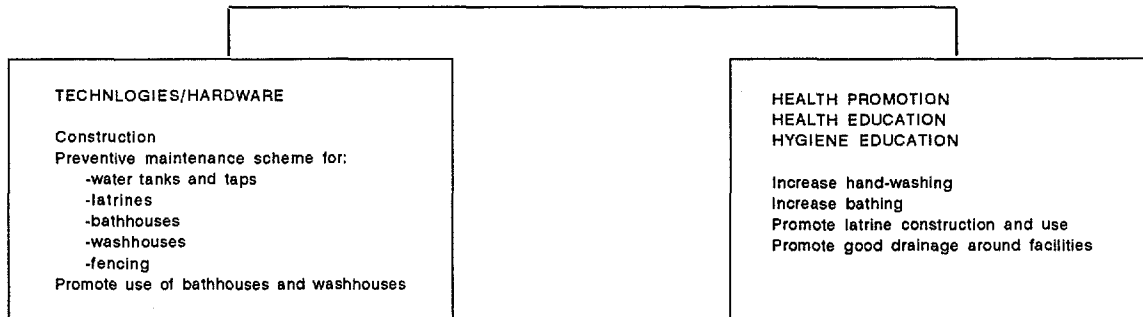
1.3.3 Rationale For Hygiene Education

In order to promote significant improvements in community health status, the construction of water and sanitation facilities must be accompanied with promotion of behavioral changes (regarding the use and maintenance of facilities, the use of water and disposal of wastewater, and personal and environmental hygiene) via hygiene education. The traditional concept of hygiene education is based on providing individuals with information—through media campaigns including poster drives, radio advertisements, etc.—discourages "risk behaviors" and encourages changes in community values and practices. Methods based on information transfer can have some effect on an individual's behavior; however, it is increasingly recognized that long-term changes in community members' behavior comes about when there are changes in group or community norms or habits; for example, regarding how often people should wash their hands or bathe.

1.3.4 Sociocultural Reality as a Basis for Program Development

In every society a set of sociocultural factors, inherited values, and behaviors define how life is organized at the community and household levels, and the success of community management and hygiene education strategies depends, in part, on whether such factors are assessed and taken into account in program development. However, water and sanitation programs tend to focus on installing water and sanitation technologies without first understanding the sociocultural factors that dictate traditional beliefs and practices that often influence the acceptability of such technologies and behaviors required to use them.

**COMMUNITY MANAGEMENT OF WATER
AND SANITATION TECHNOLOGIES
AND PROMOTION OF HEALTH**



**COMPONENTS OF
INSTITUTIONAL SUPPORT
NECESSARY TO DEVELOP
COMMUNITY MANAGEMENT CAPABILITY**

1. Definition and enforcement of policies
 - community participation
 - maintenance fund
2. Training at two levels
 - field staff
 - community water and sanitation committees and leaders
3. Health education program development including
 - content
 - methods
 - materials
4. Logistical and maintenance support
5. Develop and diffuse alternative technologies
6. Monitor accomplishments and problems in order to develop "lessons learned"

Figure 1

Key Components of Community Management and Institutional Support Necessary for Effective Use and Sustainability of Water and Sanitation Systems

1.3.5 The Role of Women in Water and Sanitation

In the past, hygiene education strategies have primarily and often exclusively targeted women, expecting them to assume all responsibility for promoting changes at the family level. Hygiene education strategies aimed at bringing about changes in shared community values and practices; however educate women, men, and young people in the community. A community development approach often requires identifying and training community leaders and other influential individuals. In a community development approach to hygiene education, these individuals or “gatekeepers” and community institutions are enlisted to promote change.

In PNG, as in most developing countries, women traditionally are the main water carriers the primary managers of water at the household level, and they are responsible for promoting hygiene practices at the family level. It is argued that they should play an active role in community WS&S activities related to introduction of new technologies and the promotion of new practices. Because they are key actors in community and household water and sanitation-related activities, they should be involved in decision-making regarding, for example, where facilities will be installed and how the community will organize itself to clean and maintain the facilities. Educational activities in which women play a major role not only as “learners” but also as trained “teachers” of others in the community should be implemented. Extension workers can play a critical role in identifying culturally acceptable ways of involving women in water committees so that their voices are heard and so that their ideas are incorporated into community plans.

Educating and involving men in improving community sanitation and hygiene is very important as well. If community programs are to have a significant impact, men need to be able to support women in improving household sanitation and hygiene conditions and practices, to modify their own behavior, and to make informed decisions related to community efforts to improve sanitation and hygiene.

Chapter 2

RURAL WATER SUPPLY AND SANITATION PROGRAMS IN PNG

2.1 Responsibility for WS&S Programs

Government involvement in rural water and sanitation programs is relatively recent. The National Water Supply and Sewerage Act, which established the National Water Supply and Sewerage Board, was passed in 1982. The National Water Supply Policy, which defined the optimistic target of providing safe water to 80 percent of rural PNG communities by 1990 and spelled out strategies for achieving coverage based on "self-help" and "community participation" approaches, was adopted in 1984. Then in 1990, responsibility for rural water supply was delegated to the Health Department.

Presently, the Rural Water Supply & Sanitation Program at both the national and provincial levels is under the auspices of the Department of Health in the Environmental Health Unit. At the national level the unit includes five sections: water supply and sanitation, vector control, food sanitation, occupational health, and solid waste disposal. The senior health inspector responsible for the WS&S section, Kaoga Galowa, recently was transferred to the Health Education/Primary Health Care Section. While he continues to be involved with WS&S activities on an ad hoc basis, there is currently no senior health inspector for the WS&S sector, and it is not known when this position will be filled. Mr. Galowa has considerable experience with community-based WS&S programs, possibly more than anyone else in the country. He worked in 1989 with USAID/ADB consultant Wilbur Hoff to develop a manual for training community leaders for WS&S activities. The manual was developed specifically for WS&S programs, however, the content deals with generic leadership training approaches and has been adopted by the Department of Health for training community leaders to assume responsibility for primary health care (PHC) activities.

Since the early 1980's WHO has provided a water supply and sanitation technical officer to assist the environmental health section in coordinating WS&S activities. The section has been very much involved in encouraging the provincial departments of health to establish WS&S committees and to adopt WS&S policies consistent with the national policy. The present officer, Steven Iddings, is an engineer who advises the PHC section on technical issues. Mr. Iddings' understanding of organizational development enables him to play a coordinating role in encouraging the provincial departments to comply with national policy.

Since 1983, the Department of Health has been decentralized and primary responsibility for programmatic and budgetary decisions delegated to the provincial level. Recently, however, the government stated that it intends to abolish the provincial level government structures and return some authority to the central level. It is as yet unclear what effect such a change would have at the provincial level.

2.2 Policy Priorities

The water supply policy adopted in 1984 did not include sanitation as an integrated component, nor did it give serious attention to the role and operationalization of community participation in WS&S activities. In 1987, WHO and ADB, in collaboration with PNGIMR, sponsored a national WS&S policy development workshop. The "Draft Policy Guidelines for Community Participation in Rural Water Supply and Sanitation Programs" document produced at that workshop was to be modified and approved at both the national level and in each of PNG's provinces. The guidelines were formally adopted at the national level in 1987 and revised in 1991. One of the important conditions of the national policy is that each province must establish a WS&S committee to ensure policy compliance and to coordinate all activities in the WS&S sector whether they are funded by the government or by other donors. As of March 1993, 13 of the 19 provinces had adopted the guidelines, and committees had been formed and were active. In the other six provinces policy development and approval and committee formation were at various stages.

The national WS&S policy is quite progressive, compared to that of many countries, in terms of the importance it accords to community responsibility for construction, operation, and maintenance of WS&S systems; hygiene education to accompany the installation of WS&S hardware; and strengthening the ability of the Department of Health to implement community-based WS&S programs at the central and provincial levels. The Department of Health's focus on the importance of fostering community responsibility for WS&S systems is clearly articulated in the 1991-1995 National Health Plan:

This plan embraces the primary health care approach for improvement of health and gives first priority to the promotion of good health and emphasizes the responsibility of the community in maintaining and improving its own health. The emphasis is to be shifted from promoting specific projects and objectives to a process of empowering village people to take charge of their own lives by identifying their water supply needs and mobilizing their strengths and resources to meet these needs with assistance from relevant government agencies (p. 258).

Both national DOH policy and the National Health Plan define community participation primarily in terms of the "kina for kina" system wherein communities are expected to contribute approximately 50 percent of the cost of a water system in cash or in kind. The assumption is made that financial investment will foster a sense of community ownership and appropriate management of the water system.

2.3 Donor Support

The Asian Development Bank provided major support for the construction of rural water supply systems in PNG, in the form of a loan agreement to support rural health services. The first loan was initiated in 1982 and expanded in 1985 to include all 19 provinces and to cover various expenses related to the construction of water systems. In the third phase of ADB funding (1991-1996), support is being provided to all 19 provinces; however, the amount of

support has been decreased to cover only approximately 50 percent of the cost of construction materials for water and sanitation hardware. The provincial health departments are expected to cover salaries of construction crews and the transport and subsistence for DOH staff and construction crews.

Since 1990 the European Economic Community (EEC) has provided considerable funding (420,000 kina per province) for water projects in five provinces (Central, East Sepik, Madang, East New Britain, and Milne Bay). The EEC work focuses on financing the construction of water supply systems; however, some community mobilizing activities are being carried out with the assistance of a few expatriate volunteers in each of the provinces. The EEC has set ambitious targets on the number of systems they aim to install within a predetermined time frame, and they follow the policy guidelines that require communities to contribute 50 percent of construction costs.

Church organizations are extensively involved in the health sector in PNG. They operate approximately 50 percent of the services in the country and employ 16 percent of health service personnel. Some of the activities of church organizations involved in rural water supply are detailed below, although only limited information was available on the locations and scope of their work.

The Adventist Development and Relief Association is involved in water supply projects in several provinces: Enga, Southern Highlands, East Sepik, and Morobe. ADRA's work has involved the installation of piped and rain-water catchment systems as well as the construction of latrines at schools and in the community. ADRA's policy is to assist communities that agree to help with construction and assume responsibility for maintenance following construction.

While many of the communities that ADRA has supported are Adventist, this is not exclusively the case. The organization's policy is to provide assistance to communities that demonstrate evidence of interest and commitment regardless of their religious affiliation. ADRA has developed and installed several different latrine slab designs and is currently evaluating the popularity of different models.

ADRA's assistance to schools and communities has not included systematic hygiene education programs or training of local persons to ensure preventive maintenance and repair of the systems. The director of ADRA in PNG, Peter Gwynne, recognizes that these areas should be given more attention in the future, and ADRA is very interested in being involved in the EHP pilot project, proposed in this document as a means of expanding the scope of its involvement in WS&S projects.

The Church of the Nazarene has supported rural water supply activities on a limited scale in two provinces. The Church of the Nazarene's approach is similar to ADRA's in that they respond to initiatives in communities where interest in and commitment to WS&S have been demonstrated.

Other organizations that have been involved in installing community water systems include United Nations International Children's Emergency Fund (UNICEF), local Rotary Clubs, the Hans Seidel Foundation, and the International Human Assistance Program. On Manus Island, the Hans Seidel Foundation has installed hand-dug wells with pumps and developed community capability to maintain them. In the foundation's program, community delegates are trained extensively in pump maintenance and repair at what was the Manus Training Centre and currently is under auspices the Department of Education. In addition, a simple manual on pump repair was developed in Pidgin.

While attempts to coordinate the activities of governmental and nongovernmental organizations involved in the rural water supply sector are being made at both the national and provincial levels, in general, coordination appears to be weak. Most of the provinces have established coordinating committees to ensure that certain policy priorities, such as community participation, are respected in all community intervention schemes; however, there is a need for greater coordination of activities of provider organizations within the provinces. Frequently, local government counsels, politicians, and other organizations break Department of Health guidelines that require communities to contribute to the construction of water facilities. Stronger coordinating committees could ensure compliance with pre-construction and follow-up product guidelines.

A national committee on water supply and sanitation composed of representatives from various government departments—Geological Survey, Department of Health, Department of Works, Bureau of Water Resources, Water Board, and the PNG University of Technology—was established in mid-1987. The committee, who meets regularly every two months, is charged with promoting appropriate policies and legislation, coordinating training, stimulating information exchange, and coordinating the activities of all government and nongovernmental organizations involved in WS&S programs.

Most of the individuals who attend the committee's meetings are associated with government departments or units. In the past, the attendance by NGOs and bilateral donors working in the WS&S sector in PNG has been irregular, but attempts are being made to increase their involvement.

Chapter 3

SITUATION IN EASTERN HIGHLANDS PROVINCE

3.1 Community Level

3.1.1 Related to Water and Sanitation Problems

In the EHP, community health problems related to inadequate access to water and poor sanitation conditions include diarrhoeal disease, gastroenteritis, intestinal worms, skin diseases and typhoid, though typhoid has been endemic in the province during the past few years. Preliminary results of the PNG Institute of Medical Research's epidemiological research on the transmission of typhoid suggest that the primary pathway of transmission is fecal-hand contamination rather than water. This finding is supported by the general deficiencies in household sanitation and personal hygiene that are found in both urban and rural areas.

3.1.2 Sociocultural Factors Related to Community Water and Sanitation Programs

Water and sanitation programs traditionally have focused primarily on technological aspects of water supply construction and have been implemented primarily by personnel with technical (construction) backgrounds. However, a variety of sociocultural factors should be taken into account when water and sanitation systems are introduced and associated behavioral changes are promoted in rural PNG communities. The importance of the sociocultural dimensions relate both to the short and long-term viability of community water and sanitation systems, and in PNG communities these dimensions have not been sufficiently appreciated.

PNG has over 700 language groups; however, since the amount of behavioral variation among the groups is less than the linguistic variation suggests, it is possible to make certain geographic generalizations, according to medical anthropologist Jenkins (1987); for example, contrasting the highlands communities with the islanders. A summary of the numerous sociocultural factors that have implications for water and sanitation programs are presented in Jenkins' review of water and sanitation programs in PNG (1987). In this report only a few of the most salient sociocultural factors related to community water and sanitation schemes in the EHP are reviewed:

- The general level of technological development
- Land ownership patterns and conflicts
- Settlement patterns
- Community leadership

- Women's roles
- Traditional beliefs and practices related to water and sanitation

Technology

Until very recently, rural EHP communities were accustomed to only very rudimentary levels of technology. Lengths of bamboo were used to transport water. Very simple household utensils and clothing were made of bush materials. The regions limited exposure to modern technology suggests that the introduction of relatively sophisticated water and sanitation systems, such as piped water and latrines, would require a considerable effort to familiarize communities with the systems and to educate them on use and maintenance. In places where the introduction of the technologies was not accompanied with education, villagers misused and in some cases destroyed them unknowingly.

Land Ownership

Issues of land ownership patterns and conflicts arise both between and within clans and are an extremely complex aspect of life in PNG. Land ownership is important to consider in siting of water taps and tanks, in planning the installation of water pipes that traverse over several households' land, and in using water that originates on an individual's plot of land.

Land and water ownership issues related to the installation of water systems are very complex and often not easily resolved. However, since ignoring the issues can lead to future problems, ownership rights and conventions must be considered and consensus reached prior to the construction of water systems. Personnel who are responsible for initiating water and sanitation schemes must be aware of loyalties that exist in a given locality and take them into consideration both in constituting committees and in developing water allocation schemes. Furthermore, mechanisms to resolve conflicts that arise once water systems are built should be defined based on an initial assessment of community ownership patterns in areas adjacent to the projected water system.

Settlement Patterns

The social structure of highland communities is clan-based. Clans consist of subclans, which are made up of households that usually contain the extended and nuclear family. Allegiance is to the nuclear family first and to the subclan or clan second. Traditionally, strong rivalries exist between clans and in some cases between subclans. In multiclan settlements, political life typically is characterized by rivalry or open conflict. Numerous conflicts in which water systems have been vandalized, purposely polluted, or cut off by individuals or clans whose land or water "rights" were infringed on have been reported. Water and sanitation programs—and other community development activities that in attempting to elicit cooperation from groups do not follow traditional lines of power—can expect a level of cooperation that corresponds with that which currently exists in the community. In most water supply schemes in Papua

New Guinea, it appears land ownership and social organization have not been given sufficient attention.

Community Leadership

Traditional patterns of leadership at the community level have important implications for water and sanitation programs that work through local leaders to develop a community's capacity to manage its own water and sanitation systems. With the exception of certain island and coastal areas of PNG, genealogical or other inherited systems of leadership do not exist.

In the highlands, recognized leaders can include elder clan members and "big men" who have demonstrated respected qualities such as the ability to speak forcefully, generosity, fearlessness in conflict, and the ability to mobilize others for important activities. Traditional community-recognized leadership roles are never conferred on women; however, wives of clan elders and women who are articulate and relatively more educated do perform informal leadership roles.

Formally structured community organizations, such as development committees, are a recent phenomenon introduced by the government. Such committees, including water committees, often have younger members who have had formal schooling, and can communicate more easily with outsiders. Though these committee members fill leadership positions, they often are not true authority figures in the community. The complex patterns of traditional and "modern" leadership make establishing water committees a task which requires time and careful analysis on the part of both extension workers and community members.

Efforts to establish sustainable community health committees in PNG have often met with failure, but water and sanitation programs can collaborate with community leaders who are capable of mobilizing community decision-making and speaking for the community if traditional concepts of both formal and informal leadership are taken into consideration.

Role of Women

Despite the fact that women in rural communities are the main carriers and users of water, and have primary responsibility for household sanitation such as the disposal of children's feces tradition dictates that men are responsible for making decisions related to community and family affairs. This sociocultural reality suggests that if WS&S programs are committed to involving women in decision-making related to the installation and management of water and sanitation systems, considerable educational efforts will be required to first convince men that women need to be involved and second to ensure that women are involved substantively.

Traditional Beliefs

In the highlands of PNG, a variety of traditional values and practices dictate people's perceptions of water: how and where they use water, how they perceive and dispose of excreta, and how they deal with other environmental health hazards. These beliefs and traditions—an extensive discussion which can be found in the WHO report prepared by Carol

Jenkins (1987)—have important implications for the selection of water and sanitation technologies and for the development of hygiene education strategies. Traditionally, in the highlands, water was used in relatively small quantities. Historically, water was transported using bamboo tubes that carried a small amount of water and stored it in the tubes which were kept outside. Presently in rural households, relatively small quantities of water are stored in sauce pans and 2-liter plastic containers. In the highlands, food is cooked using little water and food, primarily yams, is cooked over coals.

Bathing has been discouraged in some of the highland societies and practiced infrequently in others; however, in villages visited to prepare this strategy people now bathe before going to church. Bathing—which occurs in the river often at the same time as clothes-washing—has been promoted by the church for many years and has increased. If a family is fortunate enough to own a tub, children sometimes bathe in it rather than in the river. In other cases, water is merely poured over the child.

As with bathing, hand-washing still is infrequent. Ethnographic research conducted by Carol Jenkins demonstrated that mothers infrequently wash their hands before preparing food, before eating, and after disposing of children's defecation (Jenkins 1992).

Traditional concepts of disease provide communities with causal explanations for common water-related ailments such as diarrhoea and stomachaches. The notions that unclean water comes from women's contact with water, the presence of women's bodily fluids in the water, or sediment that has entered the water during the washing of women's clothes, and the belief that water from the same source should not be used for both drinking and bathing have implications for water projects. However, in the villages visited it was found that villagers were willing to transport tap or tank water used for drinking to another spot where they used that same water for clothes washing.

3.1.3 Community Perception of Problems and Needs Related to Water and Sanitation

In general, the need for improved access to water is felt more by women than by men. Women are responsible for carrying water to the house for domestic use and for transporting clothes and utensils to the river or stream to be washed. Relatively small amounts of water also have been transported to the household level for cooking, drinking, and in some cases, for bathing babies. Clothes washing and bathing have always been done in the river or stream away from the house.

In many communities improved access to water is perceived as a need not only by women, but by men as well. In communities where traditional water sources often are visibly dirty and/or have a bad smell, both men and women defined improved water quality as a priority. In the EHP, community interest in improving access to good water has been demonstrated by communities' willingness to contribute sizeable amounts of money (between 1,000 kina and 3,000 kina) for the construction of water systems.

Most communities are interested in improving their access to water; however, both communities awareness of health risks associated with water quality, and community understanding of the importance of personal and environmental sanitation, are inadequate. Since the villagers' understanding of germ theory is limited, at best, most do not perceive a relationship between contaminated water and dirty hands or contact with animals or human or animal excreta. In addition, villagers often do not realize the need for cleanliness around the water tap, in the water tank, or at the household level.

Pigs, a symbol of wealth and status, can serve as disease carriers, but most communities do not perceive this risk. Traditionally, communities have lived in close contact with pigs, with women and children sometimes sleeping next to pigs in order to keep the pigs warm, through recent attempts to discourage such close contact with pigs have met with some success.

Only a small minority of villagers are aware of the risks of contamination from contact with human or animal feces, and the present level of interest in latrine construction and usage appears to be low.

3.1.4 Situation in Communities with Improved Water Supply Systems

The provincial DOH has completed 286 water supply systems, consisting primarily of rain-water catchment with storage tanks and taps and reticulated (piped) water projects. Based on visits to nine of the villages where systems have been installed, available documentation, and discussions with provincial DOH staff, a number of constraints and problems related to the following areas have been identified in communities that already have improved water supplies:

- **Community participation:** Communities have understood community participation exclusively in terms of their involvement in financing and providing labor for the construction of water supply systems. Some communities have not been able to organize themselves in order to collect the necessary funds.
- **Community water and sanitation committees:** Water and sanitation committees do not exist in every community, and where committees do exist they do not appear to be promoting proper water and sanitation-related behaviors. Procedures for establishing committees vary considerably, as do criteria for choosing members and definition of their role. None of the committees' members have been trained to promote water- and sanitation-related behaviors, and committee actions are not monitored regularly. While the water and sanitation policy states that committees should include female members, this has occurred in an undetermined number of sites. Of the villages visited, no women committee members were found.
- **Water use:** In most of the communities visited, tap water is being used exclusively for drinking and cooking. Although communities were informed that the water is sufficient for all domestic and individual purposes, no systematic hygiene education reinforced this message.

- **Personal hygiene:** Generally, communities do not understand the relationship between personal hygiene and health. In most cases, both adults and children bathe infrequently in rivers rather than with tap water. No bathing facilities close to the tap are available, and no hygiene education has been conducted.
- **Maintenance and cleanliness of tap sites:** Maintenance has been defined as the repairing of systems when they break down. The concept of preventive maintenance has not been promoted, and community delegates have not been trained to carry out this task. Tap sites are not cleaned regularly, are not fenced off in most cases, and have produced pools of stagnant water in some cases.
- **Vandalism and interruption of systems:** Some systems have been intentionally damaged due to inter-clan fighting, and land owners sometimes have cut off other community members' water supply.
- **Defecation practices:** Unhygienic traditional practices such as defecating in the bushes, cleaning oneself with leaves or sticks, and not washing one's hands following defecation, persist.
- **Hygiene education:** Systematic health education programs for village water committees or the community at large have not occurred. Priority health education content has not been defined; materials have not been developed; and responsibility for this activity has not been defined clearly.

The existing WS&S policy indicates that each committee will establish a maintenance fund, amounting to 16 percent of the community's total contribution. The fund should be deposited in a local bank for safe keeping; however, there are no records of how many communities have established bank accounts. None of the villagers interviewed reported knowledge that their villages had maintenance funds.

Box 1 shows examples of the constraints and problems associated with community activities.

Box 1

COMMUNITY-LEVEL ISSUES RELATED TO WATER AND SANITATION

Community participation in system construction:

- Lack of community participation in and contribution to projects.

Water committees:

- Some communities have a committee.
- The role of the committee is not understood by all community members.
- Few committees have female members.
- Some committees have maintenance accounts.
- Committees' functions are defined primarily as construction, and do not include ongoing maintenance, promotion of health education, and sanitation.

Water use:

- Taps are used primarily for drinking. Bathing and washing still is done in the river.
- In keeping with tradition, limited quantities are used.
- Drinking water is taken from the tap, but according to traditional beliefs, water to be used for washing clothes or bathing must be transported from elsewhere.

Personal hygiene:

- Many adults and children bathe infrequently.
- Mothers state that more frequent bathing of infants requires more of their time away from gardening responsibilities.
- People complain that water is too cold for bathing.
- Hand-washing is infrequent.
- The community does not have clear understanding of relationship between washing and skin diseases
- Soap is usually unavailable.

Maintenance and cleanliness of tap site:

- Only some taps are fenced off.
- Areas around the taps are not cleaned regularly. (Stagnant water, moss, etc., exist.)
- No one is assigned responsibility for this task.

Preventive maintenance and repair of systems:

- No preventive maintenance is done.
- No one is assigned responsibility for and trained in preventive maintenance.
- Many times when break-downs occur, nothing is done.
- Sometimes when break-downs occur, an individual pays for the repair.
- The community does not know what to do when systems fail.

Drainage around water tanks and taps:

- Provisions for proper drainage often are not present.
- Drainage schemes must be monitored and maintained.

Water transport:

- Because small pots and bamboo are used, transporting larger quantities of water for bathing and washing is difficult.

Water storage:

- Water is stored at the household level in small pots.

Vandalism and interruption of systems:

- As a result of clan conflicts water systems are sometimes attacked.
- Water is cut off by land owners.

Sanitation-related problems:

- Most defecation and disposal of infant excreta takes place in the bushes.
- Adults and children in the community perceive no danger of direct contact with fecal matter.

3.2 Institutional Level

3.2.1 Responsibility for Water Supply and Sanitation Programs

At the provincial level, the Community Water Supply and Sanitation Program (CWSSP) in the Environmental Health Unit of the Department of Health has primary responsibility for the installation of rural water supply systems. Several other governmental and nongovernmental entities—such as local government councils and mission groups—also are involved in installing systems. The Division of Works is responsible for water supply systems to public institutions such as schools and training institutions, and the urban water supply service in the provincial capital of Goroka is operated by the Goroka Capital Authority.

The Environmental Health Unit has three health inspectors, which are each responsible for one of three areas: vector control, food sanitation, and rural water supply and sanitation (RWSS). The health inspector is the only staff member at the provincial level who is responsible for rural water and sanitation. This inspector is trained in the technical aspects of water and sanitation systems construction and supervises a team of construction workers who are ADB-funded contractors.

The province is composed of six districts, each of which supports one health inspector position. The inspectors are responsible for all three of the environmental health areas. At the

present time, three of the six health inspector positions are vacant, and because of the present national hiring freeze it is unclear when those positions will be filled.

In addition to the environmental health staff, there is one provincial primary health care coordinator, posted in one of the districts, and one provincial health educator, posted in Goroka. In theory, these officers have province-wide responsibilities, but in practice their activities are much more limited in scope. There should be collaboration between these two staff members and the RWSS program but such collaboration has not occurred in the past and seems unlikely to contribute to the tasks the RWSS program aspires to implement at the community level in all six districts.

In the third phase of the ADB loan (1991-1996), the budget is allocated for the purchase of materials for construction of the reticulated water and rain-water catchment systems. Since 1990, ADB funds have also been used to subsidize the production and sale of latrine slabs. Technically, the loan does not cover any expenses related to the salaries or expenses of construction teams, trainers, health educators or extension workers.

According to the Health Department staff, the funding level for the province has decreased over the past few years. For 1993, the loan amounts to approximately 19,000 kina for the construction of 40 water systems, down from 60,000 kina in 1988.

3.2.2 Provincial Water Supply and Sanitation Policy and Enforcement

In 1986, the provincial Water Supply and Sanitation Committee (WASSCOM) was created and was given the task of developing policy and coordinating the activities of the different institutions involved in water and sanitation in the province. In 1987, following the national policy development workshop, the Eastern Highlands Provincial Water Supply and Sanitation Policy, which emphasizes that community participation is an essential part of rural water and sanitation programs, was adopted. The policy states:

Previous experience in Papua New Guinea and elsewhere indicates that the construction, maintenance, and beneficial use of water supply and sanitation projects can only be successful when the target community is closely involved with the project from its initial stages. It is, therefore, proposed that the basis of the provincial policy will be that of 'community participation' at all stages of project planning, funding, implementation and, maintenance (DOH EHP 1987, p. 8).

The EHP policy prescribes the creation of village water and sanitation committees in communities that wish to embark on a water and sanitation project, and it defines the responsibilities of such committees as: mobilizing cash resources from the community for construction costs; organizing community labor and materials collection for construction; conducting health education programs during and after construction; promoting latrine construction and use; establishing of a maintenance fund; and choosing and supervising one or more local persons who will ensure maintenance of the facilities following proper training.

The policy states that communities should contribute 50 percent of the cost of purchased materials but that a sliding scale—from 20 percent to 50 percent—is to be applied depending upon each community's ability to pay. Since 1988, in the communities that the Department of Health has assisted in the installation of water supply systems, "community participation" in practice has been community contributions in cash, labor, and local materials for the construction of the system. Communities have contributed approximately 50 percent of the capital costs of construction prior to the initiation of the work, in the "kina-for-kina" approach.

The participation of rural communities in the partial financing of their water supply systems is a significant accomplishment. However, the other components of the policy related to establishing committees with a variety of responsibilities both during and following construction, have been given insufficient attention. These shortcomings are not due to a lack of commitment on the part of the Department of Health but rather to the severe limitations of existing human resources and the absence of other resources required to adequately develop these other components.

The EHP has taken some important steps toward encouraging the development of feelings of ownership of water systems in communities. However, much remains to be done to ensure that both community and institutional investments contribute to sustainable systems that are properly used and lead to significant improvements in community health.

While the EHP WS&S policy guidelines are both comprehensive and appropriate, in practice the Department of Health has been unable to implement these policies fully, much less enforce them regarding the water and sanitation activities of other institutions working in the province.

3.2.3 Improved Water Supply Coverage

According to the Department of Health, only 9 percent of the rural population in the EHP had access to water supply schemes in 1992, 91 percent of the rural population was using unprotected water sources (DOH EHP 1992). The department has set the ambitious goal of providing access to safe and adequate water supplies to 65 percent of rural communities in the province by 1996.

3.2.4 Training of Health Inspectors and Extension Agents

The human resources required to carry out ongoing community-level training and education activities with community leaders and committees prior to and following construction of the water systems do not exist. No programs have been developed either to train health inspectors and extension workers to work with community committees or to assist extension workers in training community members to assume the different responsibilities associated with community management of WS&S systems. The Department of Health presently has neither the expertise necessary to develop such programs nor the positions within the civil service through which such staff could be hired. As stated in Section 3.2.1, there is only one full-time health inspector in the province in the WS&S program, and that inspector coordinates the

construction and maintenance activities. No other extension agents have collaborated with the WS&S program on a regular basis.

3.2.5 Hygiene Education

To date, very little hygiene education has occurred in conjunction with the construction of water systems. According to Department of Health/CWSSP staff, during construction of the water systems, communities are informed of how to use and maintain their systems; however, no systematic hygiene education program has been developed. There is a consensus among Department of Health staff that insufficient attention has been given to hygiene education; however, given the extremely limited human resources presently available it is unclear who will assume responsibility for this important and time-consuming task.

An example of the absence of and need for hygiene education along with the construction of WS&S hardware is pointed out in a recent evaluation of an experimental project carried out by PNGIMR in Okapa, EHP. The evaluation of the project which introduced a rain-water catchment washhouse concluded that a major weakness of the project was the absence of an ongoing health education program to teach the washhouse users and owners how to use and maintain the facilities (Wai 1992). In some cases the washhouses were not used regularly; in others they were not maintained or cleaned regularly; and in others they were used for purposes other than bathing.

When asked who had responsibility for carrying out health education at the community level, Department of Health staff responded that "all health workers are health educators." The Health Education Program in the Department of Health was abolished at the national level in 1982, and it was anticipated that all health workers would "accept their educational responsibilities." According to this theory, staff at the various levels of the health system (aid posts, health subcenters, and health centers) should carry out health education activities at the community level.

However, discussions with CWSSP staff and a 1992 study of the health services (Beracochea et al. 1992) showed that health personnel are minimally involved in health education due to the following factors:

- They do not perceive health education as a priority relative to their other responsibilities.
- Their training in health education methods is limited and their communication skills weak.
- They do not have health education materials to use.

3.2.6 Maintenance Support

If provided with adequate training and follow-up, communities should be able to assume responsibility for certain tasks related to both the preventive maintenance and repair of their own water supply systems. However, communities also must have access to outside technological support for major system repairs. While the WS&S policy is consistent with this concept, a series of factors that impede compliance with the policy can be identified. The tasks expected of community members have not been spelled out in writing and left with community members. Simple technical instructions for carrying out maintenance tasks have not been prepared. Plans for training community members have been neither developed nor carried out, and follow-up has not been possible.

A back-up support system to ensure community access to the necessary tools and expertise necessary for repairs has not been adequately developed. The maintenance support system needs to be analyzed. A feasible system must be designed and training of and follow-up with community members must occur. There was a plan that called for distributing tool sets to district health inspectors so that communities could borrow them for repairs; however, due to vacancies in three of six health inspector positions, all tools were returned to Goroka.

3.2.7 Development and Diffusion of WS&S Technological Options

The CWSSP has focused on water supply technologies and on the development of latrine slabs. To date, other sanitation and hygiene-related technologies have not yet been explored. Because the Department of Health guidelines on rural water supply specify that simple water supply technologies will be employed, all of the DOH-installed schemes are either rain-water catchment or reticulation (piped water) schemes. The current five-year plan states that wells and hydraulic rams are not used because of frequent breakdowns and the unavailability of parts; however, the CWSSP does anticipate experimenting with well construction this year.

Since 1990, the provincial DOH has been distributing latrine slabs, produced by the construction team in Goroka for approximately 13 kina each. Each slab is sold for the subsidized price of 5 kina each. The cost of the slabs is being subsidized in order to attract buyers. In terms of sustainability, however, subsidizing the price may prove to be disadvantageous if they are to be sold later at real value.

A total of 120 slabs were sold and distributed to schools, health service centers and individuals between January 1990 and December 1992. An operation that could be expanded if all villages knew about the slabs and how to obtain them. The fact that health education is not being conducted systematically in conjunction with the distribution of the slabs ultimately could create problems related to latrine cleanliness.

In addition to the latrine slabs, the Department of Health is interested in developing other simple and appropriate technologies that promote household and personal hygiene and sanitation, such as bathhouses, washhouses, and possibly solar heating of water. Such technologies are necessary to promote widespread use of WS&S systems.

3.2.8 Monitoring and Follow-up of Community WS&S Systems

Since, no ongoing monitoring of completed water supply projects or communities the project served is being carried out, precise information on such issues as the number of fully and partially functioning systems, the number of functioning committees, the number of committees with female members, the number of committees with maintenance accounts, etc., is unavailable.

The Department of Health has constructed water systems in 286 communities and has projected that an additional 40 systems will be constructed in 1993. The one health inspector in the EHP plans to start a simple monitoring system, but it is unlikely there will be adequate time for periodic updates.

In addition to the absence of a quantitative monitoring system, there is no mechanism for qualitatively monitoring the community projects so that successes, failures, and lessons learned can be generated on an ongoing basis and used to reshape program strategies.

In Box 2 the main problems and constraints associated with institutional support for community-based WS&S systems in the Eastern Highlands Province are summarized.

Box 2

INSTITUTIONAL-LEVEL ISSUES RELATED TO WATER AND SANITATION

Provincial water and sanitation committee: WASSCOM

- Policy states that a committee should be formed; however, the role and function of the committee are not clearly defined.
- Technical standards and policy to be followed by all government and nongovernment providers is not spelled out.
- No procedures exist for approval of water supply projects funded by other sources.
- Responsibility for planning and installing water systems is not yet clearly defined.

Community water and sanitation committees:

- Policy states that in each village a new or already existing committee should be responsible for overseeing the water system. The composition of the committee, its responsibilities, and its training have not been specified.
- Committees are created only for reticulated water systems.
- At present no one at the community level is responsible for promoting appropriate WS&S related behaviors (i.e. promoting changes in community norms).

Decisions related to siting of water pipes and taps:

- Technical and engineering staff make decisions and do not always discuss options with community leaders.
- Community meetings are not always held prior to decisions.
- Land ownership patterns around the water source and between the source and the taps are not always analyzed sufficiently.
- Policy states that land ownership conflicts must be resolved before a project is approved and agreements must be in writing.
- Policy states that kinship/clan groupings should be taken into consideration in choosing system sites; however, this has not always been done.

Water system maintenance:

- Policy states that the community's contribution should include a maintenance fund and tools. Clear guidelines for establishment and functioning of maintenance fund and system are not yet developed.
- Criteria for choosing community member(s) to ensure preventive maintenance and monitoring of system are not defined.
- Content and method for training community maintenance person is not defined.
- Suitable system to make tools available at district level is not yet developed.
- Referral system for repair of systems breakdown not clearly defined.

Health and hygiene education:

- Policy states that all government extension workers should promote improved WS&S practices; however, this is not being done.
- Little or no hygiene education taking place at the village level.
- The health inspector is not trained and does not have time to do ongoing health education in 286 communities.
- Health education content and materials have not been developed.

Water and sanitation policy:

- No clear mechanism exists for monitoring compliance with the WS&S policy.

Latrine slabs:

- Latrine slabs are being sold at a subsidized price.
- Health education has not accompanied slab distribution. Communities must learn to care for this new technology so that it does not become a health hazard.

Water and sanitation technologies:

- Policy suggests washhouses should be promoted and technologies for heating water explored.
- Communities do not have places close to new water sources for washing clothes.

Monitoring of completed water systems:

- The health inspector is initiating a simple information and record keeping system on existing and new community water and sanitation systems.
- It is impossible for one health inspector to monitor 286 systems periodically.

3.3 Conclusions Regarding Community- and Institutional-level Issues in the EHP

3.3.1 Community Level

A strong policy exists that charges the community with responsibility not only for constructing its own water systems but also for maintaining them. An important step has been taken to require community contributions in cash and labor for the construction of the water systems. However, major constraints related to the broader concept of community management and use of WS&S technologies have been identified at the community level.

- Existing water supply systems are not being adequately maintained.
- Latrines have been promoted only to a limited extent, and other sanitation facilities including bathhouses and clothes-washing sites are needed if the health benefits of improved access to water are to be achieved.

- Village WS&S committees required for sustained community management are not trained and functioning.
- The representation and involvement of women on WS&S committees is inadequate.
- Constructed facilities are not being used adequately.
- Changes in personal hygiene and sanitation behavior have been very limited.
- Ongoing hygiene education programs are not being implemented.
- Community-level WS&S activities are not monitored periodically.
- Most of these shortcomings are the result of limited human and other resources available to the provincial Environmental Health Unit.

3.3.2 Institutional Level

At the provincial level, the Department of Health has adopted a policy related to rural water supply and sanitation, and a provincial committee has been established to coordinate all WS&S activities and to enforce policy guidelines in the province. Currently, the WS&S policy guidelines are not uniformly and rigorously enforced in the DOH project or in other projects carried out by government entities, NGOs, or local political authorities. Procedures for implementation of the policy are outlined but need to be developed in further detail.

The focus of DOH's work in WS&S has been on the installation of village water facilities. Much less attention has been given to other areas required for community management of water systems, such as the development of skills of community members, hygiene education, and household and environmental sanitation promotion and facilities. Training programs on community management and hygiene education strategies have not been developed for extension workers or community-level committees and leaders. Viable back-up maintenance schemes at the community and provincial levels are not in place. A system of periodic follow-up and monitoring of community projects has not been implemented. All of these shortcomings are related to the limited number of personnel assigned to the CWSSP. Furthermore, the one available staff person has a technical background and is not trained extensively in community participation approaches to WS&S programs. Thus, despite the presence of a commitment at the provincial level to promote community management of WS&S technologies and hygiene education, there is an inability to operationalize this commitment.

Chapter 4

OUTLINE OF THE PROPOSED STRATEGY FOR A PILOT PROJECT

The proposed strategy outlined here was formulated and discussed with the following institutions and organizations involved in WS&S activities: provincial and national level Department of Health, PNGIMR, NGOs involved in WS&S-related activities, USAID, EEC, and ADB. Provincial and national DOH staff, PNGIMR, WHO and USAID contact persons, and the ADRA/PNG Director expressed verbal support for the basic strategy.

4.1 Project Goals and Strategy

The primary long-term project goals of developing community capacity to manage water and sanitation facilities and of promoting appropriate water-and sanitation-related behaviors in 40-48 villages are to be achieved through the development and testing of an approach to promote community-managed water and sanitation systems and through the development of institutional supports necessary to promote community-based, community-managed water and sanitation programs.

Based on the weaknesses identified in the present WS&S program in the EHP, The proposed project would be designed to develop strategies at the community and institutional levels to strengthen both community management of and institutional support for community-based water supply and sanitation activities. The project would be carried out in one province, the Eastern Highlands, and community-level activities would be implemented in a limited number of villages. The proposed duration of the project is five years, which would allow sufficient time to develop institutional- and community-level methodologies and materials, to experiment with them, and to generate lessons learned for application elsewhere.

The project would be designed to demonstrate to policy-makers how community- and institutional-level activities can be developed and to substantiate the need for expertise and personnel at both levels, as a means of promoting community-based WS&S activities.

In the EHP, as in other provinces, there is an extreme shortage of DOH personnel responsible for rural WS&S. At the present time, neither the expertise nor manpower exist to carry out the community and institutional level activities required to promote sustainable community WS&S activities. Therefore, additional staff would be hired by the project.

While the constraints associated with hiring additional personnel are recognized, this appears to be the only feasible alternative.

While past government- and donor-supported WS&S programs have focused almost exclusively on the installation of water supply hardware, the proposed project would generate lessons which could influence the direction of future government and donor programs. This concept was discussed at length with Department of Health staff at both the provincial and national levels. All of the personnel interviewed stated that there is a need for strategies, consistent with WS&S policy orientations, that strengthen both community- and institutional-level program components. Such strategies developed in the EHP could potentially be applied elsewhere in the country.

The proposed follow a *process learning approach*—i.e., experimental learning—to program planning and implementation (see Figure 2), and include mechanisms for systematically documenting program activities and for generating lessons to be applied elsewhere. In addition, a mechanism for periodically sharing and discussing project successes, constraints, and lessons learned with both provincial- and national-level Department of Health staff involved with WS&S programs would be incorporated into the project.

Phase I	Existing water supply and sanitation policy Development of methods/procedures/ technologies/materials for: <ul style="list-style-type: none">-establishing of water committees-establishing of maintenance funds-conducting training programs-conducting health education programs
Phase II	Baseline and formative data collection Training of health inspectors and extension workers
Phase III	Establishing of water and sanitation committees <ul style="list-style-type: none">-training (6 to 12 months before water system) and follow up (1 to 2 years afterward)-follow-up with other community groups
Phase IV	Ongoing monitoring in order to formulate lessons learned and incorporate them into the program

Figure 2

Phases in Project Development and Implementation

4.1.1 Rationale for Choosing the Eastern Highlands Province

The rationale for choosing the EHP for the pilot project is based on several considerations.

- The commitment shown on the part of the Provincial Department of Health leadership to implement rural WS&S programs using a community participation and communities management approach.
- The existence of a strong WS&S policy based on this approach.
- Identification of a series of constraints or problems associated with the implementation of the WS&S policy.
- A commitment on the part of the Institute of Medical Research to support such a pilot intervention.

4.1.2 Complementarity with the ADB-Funded Project

The hygiene education and sanitation project would be complementary to the support that the CWSSP is receiving through the ADB loan agreement that covers the costs of materials and hardware for water supply systems construction. The project would be proposed in communities that have initiated the request for a water supply system and who are in the process of collecting funds corresponding to 50 percent of the construction costs, as stipulated in provincial WS&S policy.

4.1.3 Human Resources Requirements

The following staff based in the EHP and recruited exclusively for the purposes of the project activities would be required. See Figure 3 for graphic representation.

A project coordinator trained and experienced in developing training and health education programs for rural community-based and community-managed water supply projects and developing monitoring and evaluation systems and with management skills, would be needed. Based on discussions with provincial- and national-level officials, it is unlikely that a qualified Papua New Guinean could be identified for this position. Hence, it is anticipated that this position would be filled by an expatriate.

The coordinator will need a counterpart who has training and experience in as many of the above areas as possible and a strong commitment and interest in rural development programs. The counterpart position would be filled by a Papua New Guinean who will progressively assume more responsibility for project management. It is anticipated that the project counterpart and coordinator will collaborate closely and that the counterpart will get on-the-job training and experience that develop his or her conceptual and skills.

Extension workers (male and female) who are educated through the 10th or 12th grade and are strongly committed to rural development programs should be hired. One male and one

female staff member would work together as a team and be responsible for a number of geographically adjacent communities. It is believed that using mixed teams of extension workers would facilitate mobility for female staff and would contribute to ongoing contact and involvement of both men and women at the community level.

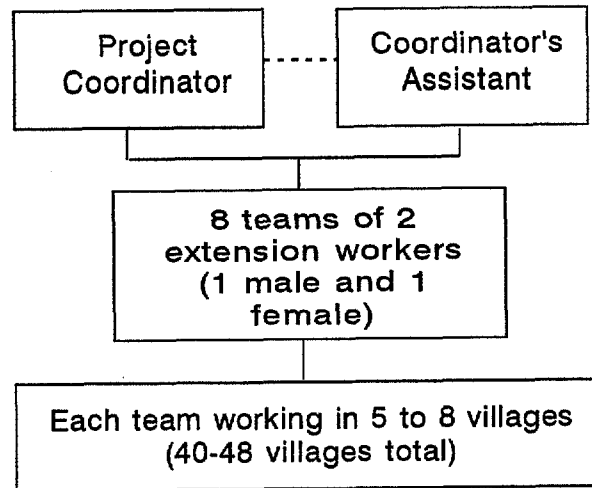


Figure 3

Human Resources Requirements

It is proposed that the project coordinator and counterpart have offices in the Health Department's Environmental Health Section to facilitate and ensure close collaboration with Health Department staff. Based on discussions with the provincial DOH staff, this should be feasible although at present space is limited. Extension workers would live in rural areas and come to Goroka periodically for training sessions.

In addition to the staff described above, the possibility of recruiting one or two volunteers from the United States, Europe or Australia was discussed. These staff would research and experiment with water and sanitation-related appropriate technologies (bathhouses, washing sites, water storage sites, and latrines) and/or adult education and health education training and materials development. In the past, the DOH and PNGIMR have had positive experiences involving U.S. Peace Corps volunteers in different programs.

Project funds would be administered by PNGIMR Goroka. Staff recruited for the project would be contracted by PNGIMR, and the Institute would be paid administrative services rendered.

4.2 Possible Funding Sources

Possible donor funding sources for the community-based hygiene education and sanitation project in the EHP were discussed with the Adventist Development and Relief Association in Lea and with USAID in Port Moresby.

ADRA is very interested in expanding the scope of WS&S activities that it is currently supporting to include hygiene education and sanitation. Furthermore, ADRA is very interested in becoming involved in community-level development activities in the EHP. The broader concepts of community management and institutional support for community-based WS&S projects were discussed in detail with the director of ADRA who stated that his organization would be very interested and able to provide funding for a project based on these concepts and carried out in close collaboration with the DOH. Precise levels of ADRA funding were not specified, but the director stated that they could possibly provide funding for the extension worker and counterpart positions, a vehicle, and other operating costs.

Though ADRA could potentially contribute financial resources to such a WS&S project, it does not have technical resources or expertise in PNG. ADRA's program in PNG is run solely by the Director. Subsequent to the identification of other potential sources of financial and technical assistance for the proposed project, follow-up discussions should be held with ADRA to determine exactly how much financial support it would be able to provide and for what budgetary items.

While they both stated that the proposed project strategy for the EHP responds to priority needs of the sector, the USAID mission in Port Moresby has no funds available for such a project. A suggested alternate source of funding is the NGOs already working in PNG. These NGOs, who should be contacted to assess their interest in funding all or part of a community-based project, include:

- Save the Children U.K.
- CARE Australia
- Salvation Army
- World Vision
- Catholic Relief Services
- Church World Service
- CODEL (supported by the Catholic Church and based in New York)

4.3 Project Documentation and Monitoring

Documentation of project intervention would be kept at the community and project management levels. Formative and baseline studies would be conducted at the outset; project activities would be monitored in quantitative and qualitative terms; and lessons learned regarding the methods used and the related obstacles and accomplishments would be generated on an ongoing basis. All levels of staff collaborating in the project, including members of the community, would be involved in periodic evaluation of project activities. An explicit objective of the project would be to develop methods (for training, health education, monitoring, and evaluation) and simple WS&S technologies that could be used elsewhere in the province and in other provinces.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Water Supply and Sanitation Policy in PNG

At both the national and provincial levels in the EHP progressive WS&S policies are in place. The policies accord great importance to: community involvement in both the construction and maintenance of WS&S systems; hygiene education to accompany WS&S systems construction; and the involvement of women in community WS&S activities. There is however, a significant gap between policy priorities and program implementation. Considerable resources currently are being invested in the rural WS&S sector in PNG; however, most efforts focus exclusively on the installation of water supply systems. To date, limited attention has been given to related water and sanitation technologies, community management of WS&S systems women's involvement in WS&S activities, and hygiene education. In the Department of Health, at both the national and provincial level, there is an awareness of past programs' limitations and an interest in developing a more comprehensive approach to community WS&S.

5.2 Recommendations and Next Steps

5.2.1 Technical Assistance to Community-Based WS&S Programs in PNG

The concepts of "community management" and "institutional support" necessary for sustainable community-based WS&S programs were discussed with all of the individuals and organizations contacted at the national and provincial levels during the consultancy. There was a broad consensus that the WS&S programs in the country should evolve toward a more comprehensive approach and that additional expertise and resources are required to support such developments.

Given the dearth of expertise in community-based WS&S program development in PNG, a proposal should be drawn up to conduct a series of training workshops for both governmental and NGO staff involved in such programs in the EHP and elsewhere in the country on various facets of the planning and implementation of community-based programs. Individuals who are responsible for training other project staff should participate in training sessions that include: participatory and skill-based training methods (i.e. training of trainers); community development and community participation methods; establishment and supervision of community management committees; development of hygiene education strategies and materials; institutional support for back-up maintenance systems; and monitoring and evaluation methods.

A detailed proposal to carry out a set of technical assistance training activities should be developed by WASH in collaboration with the Water Supply and Sanitation Program of the Department of Health, and the National Committee on Water Supply and Sanitation.

5.2 Eastern Highlands Province Hygiene Education and Sanitation Pilot Project

An outline for a five-year community WS&S project in the EHP was developed in close collaboration with the provincial Department of Health staff in Goroka. The proposed project would develop strategies to strengthen “community management” and “institutional support” for community-based water supply and sanitation activities and would develop methodologies and materials which could potentially be applied elsewhere in the country. The project would be carried out in close collaboration with the Department of Health in the province and would complement the ADB project that supports the construction of WS&S systems. Community-level interventions would be carried out in 40 to 48 villages. During the consultancy, a general outline of the project was developed and discussed with provincial and national DOH staff, and at both levels there was strong support for the project strategy.

5.2.1 Potential Pilot Project Funding Sources

Based on the proposed project outline for EHP, WASSCOM and PNGIMR should conduct further discussions with the PNG/ADRA Director and also with the other NGOs already working in PNG to identify the financial support necessary for the EHP project.

ADRA is interested in providing funds; however, it is unclear whether ADRA would be able to fund a position for a full-time expatriate advisor. Additional funding sources for partial support for that position might need to be identified.

5.2.2 Project Design

Upon further exploration and clarification of funding and technical assistance sources for the EHP project, a working session to develop a detailed project design should be organized in-country. Participants should include representatives from DOH/EHP, PNGIMR, ADRA, Kaoga Galowa, and DOH, among others.

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Appendix A

SCOPE OF WORK

Papua New Guinea: Community-Based Hygiene Education and Sanitation Strategy

Background and Objectives

At the request of the USAID Mission in Suva, WASH has been asked to collaborate with the Institute of Medical Research in Papua New Guinea in order to develop a hygiene education and sanitation strategy for the Eastern Highlands Province. The proposed strategy will consist of community-based approaches to improving environmental sanitation and the development of a province-wide policy for supporting the process developed at the community-level.

Tasks

The consultant will undertake the following steps to accomplish the objectives of this activity:

- 1) Participate in a one-day team planning meeting prior to departure to PNG. This will be piggybacked on another WASH activity at little extra cost.
- 2) Upon arrival in PNG, meet with staff from the PNGIMR and plan strategy with Dr. Carol Jenkins (non-WASH funded local counterpart).
- 3) Meet with the USAID mission to discuss their interest in and level of commitment to this activity and the potential for future funding from the mission.
- 4) Meet with policy-makers and conduct field visits to obtain an understanding of the conditions that affect the preparation of hygiene and sanitation programs.
- 5) In conjunction with the local counterpart, draft a hygiene education and sanitation strategy, and outline the specific activities needed to implement it.
- 6) Conduct a debriefing at WASH (tentatively) for interested WASH and USAID personnel.
- 7) Prepare a WASH Field Report outlining the strategy and the activities needed to implement it.

Appendix B

LIST OF PERSONS CONTACTED

Angie Braun, Acting Assistant Secretary for Health Education
Department of Health, Port Moresby

Anna Maben, Literacy Coordinator
YWCA, Goroka

Barbara Freeman, Program Assistant
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Carol Jenkins, Research Fellow in Medical Anthropology
Papua New Guinea Institute of Medical Research, Goroka

Elva Lionel, ADB Project Coordinator, ADB Project Implementation Unit
Department of Health, Port Moresby

Jerry Russell, Chief of Party
USAID Child Survival Project, Port Moresby

Julie Levico, Acting Assistant Secretary of Health
Department of Health, Goroka, Eastern Highlands Province

Karl-Heinz Bode, Technical Adviser
European Economic Commission, Port Moresby.

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Kween Isikiel, Womens Officer
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Lindsay Piliwas, Acting First Assistant Secretary
Department of Health, Boroka.

Louis Kuhn, USAID Director for PNG, Port Moresby.

Margaret Street
USAID Child Survival Project, Port Moresby

Martina Wowoe, Literacy Coordinator Counterpart
YWCA, Goroka

Megin Passey, Typhoid Research Project
Papua New Guinea Institute of Medical Research, Goroka

Michael Singip, Coordinator of Health Extension Services
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Miriam Kewa, Executive Officer
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Appendix C

CONSULTANCY SCHEDULE

- Feb. 12 Arrival in Port Moresby
- Feb. 13 Travel to Goroka, Eastern Highlands Province
Meeting with Carol Jenkins, PNGIMR
- Feb. 14 Reading/study of background documents
- Feb. 15 Meetings with Dept of Health staff, Goroka, EHP
Meeting with Carol Jenkins
- Feb. 16 Visits to EHP villages with Philip Uwau, DOH/EHP
- Feb. 17 Visits to EHP villages with Philip Uwau, DOH/EHP
Meeting with Anna Maben & Marina Wowoe, YWCA Women's Literacy Project
- Feb. 18 Visits to EHP villages with Natan Suve, PNGIMR
- Feb. 19 Working session with Carol Jenkins and Megin Passey, PNGIMR
- Feb. 20 Report writing
- Feb. 22 Working session with Philip Uwau, DOH/EHP
- Feb. 23 Travel to Lea to meet with ADRA Director, Peter Gywnne
- Feb. 24 Travel to Goroka
Debriefing with DOH/EHP staff: Michael Singip, Philip Uwau and Ken Neyakawapa.
- Feb. 25 Visit to EHP villages with Megin Passey, PNGIMR
Meeting with Kween Isikel, Provincial Women's Council, EHP
- Feb. 26 Debriefing with Julie Levico, Assistant Sec. for Health, EHP and Carol Jenkins, PNGIMR
- Feb. 28 Travel to Port Moresby.
- March 1 Meet with Margaret Street, USAID Child Survival Project, Port Moresby
- March 2 Meetings at National Dept of Health: Angie Braun & Kaoga Galowa, PHC/Health Education Unit; Steven Iddings, WHO; and Elva Lionel, ADB.

March 3 Meeting with Lindsay Piliwas, Acting First Assistant Sec. of Health, and Steven Iddings, WHO.

Preparation of report.

March 4 Debriefing at USAID with Louis Kuhn and Barbara Freeman.

Meeting with Karl-Heinz Bode, EEC.

March 5 Depart PNG