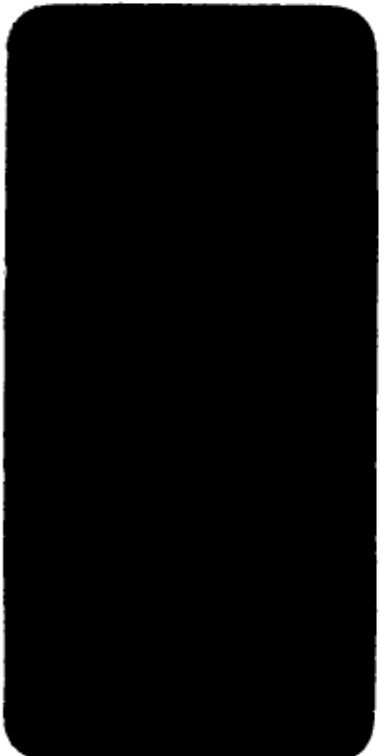


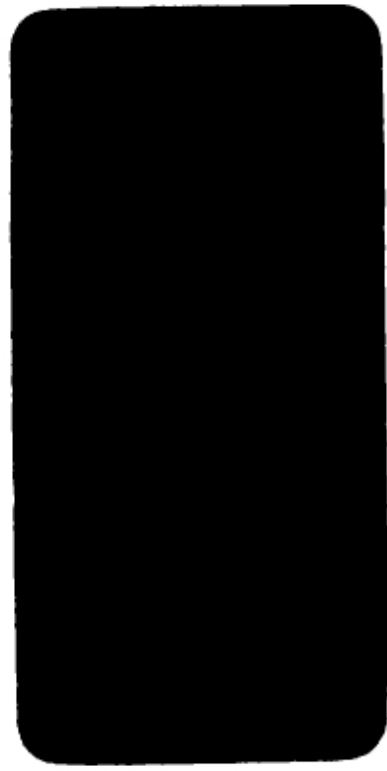
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**FINAL EVALUATION REPORT OF
CARE INTERNATIONAL INDONESIA'S
WATER AND SANITATION FOR A HEALTHIER
ENVIRONMENTAL SETTING
(WASHES) PROJECT**

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Date: 23 December 1991



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ACRONYMS AND DEFINITIONS

ACR	Assistant Chief Representative (in CARE Field Office)
ADB	Asian Development Bank
AIDAB	Australian International Development Assistance Bureau
APC	Assistant Project Coordinator (based in CIIHQ)
ARD	Associates in Rural Development, Inc.
BANGDA	Directorate General for Regional Development
BANGDES	Directorate General for Village Development
BAPPEDA	Regional Development Planning Board
BAPPENAS	National Development Planning Board
BPAB	Water Management Committee (post-construction)
BPAM	Interim Regional Water Enterprise
Bupati	Head of Kabupaten
CAWS	CARE-Assisted Water Sites (Survey)
CD	Country Director (CARE)
CIDA	Canadian International Development Agency
CII	CARE International Indonesia
CIIHQ	CARE/International Indonesia Headquarters (Jakarta)
Cipta Karya	Directorate General of Human Settlements, MPW
CP/M	Community participation and management
CR	Chief Representative (in CARE Field Office)
CSF	Community self-financing (approach)
CSFW	Community Self-financing of Water and Sanitation Systems Project (CARE/USA and USAID/Indonesia)
CSFW/MST	CSFW Management and Support Team (in CIIHQ)
DCD	Deputy Country Director
Desa	Village (1st local government level below Kecamatan)
Dian Desa	An Indonesian PVO operating in Yogyakarta
Dusun	Hamlet (villages are often composed of several)
EJ	East Java
FO	Field Officer
GFPS	Gravity-flow, piped (water) system
GI	Galvanized iron pipe
GOI	Government of Indonesia
HDP	High density polyethelene
HIPPAM	Village water management committee (instead of PSAB/BPSAB terminology used in EJ and NTB))
IG	Intermediate Goal
IKK	Literally, capital of a district, but in most cases refers to subdistrict town water supply system
IPVO	Indigenous private voluntary organization
KAP	Knowledge, attitudes and practices
Kabupaten	District



Kepala Desa	Village Chief
Kecamatan	Subdistrict
KUD	Village cooperative organization
LKMD	Village Development Committee (BANGDES-coordinated)
LMD	Village Legislative Forum
LPCD	Liters per capita per day (water demand)
LP2SD	An Indonesian PVO operating in Lombok
Lurah	Elected village leader (same as Kepala Desa)
MC	Mandi (bathing) and Cuci (washing), water distribution point, with taps, washing area, and usually storage
MCK	Mandi/cuci/kakus, a water distribution point, with taps, bathing and washing areas, storage, and water sealed latrines
MOH	Ministry of Health
MOHA	Ministry of Home Affairs
MPW	Ministry of Public Works
MST	Management and Support Team (based in CIIHQ)
NEED	No Excuse for Easy Desas (site selection process)
NGO	Nongovernmental Organization
NTB	Nusa Tenggara Barat (West) Province
O&M	Operation and Maintenance
OJT	On-the-job training
PAT	Project Activity Target
PC	Project Coordinator (based in CIIHQ)
PDAM	Regional Water Enterprise
PIE	Project Implementation and Evaluation (Report)
PIR	Project Implementation Report (renamed PIE)
PKK	Family Welfare (Women's) Organization (multi-leveled)
PM	Project Manager
PO	Project Officer
Posyandu	Community-managed health post (typically there are several in each village)
PPSAB	Village water development committee (construction phase)
Puskesmas	Subdistrict Health Center
PVC	Polyvinyl chloride pipe
PVO	Private voluntary organization
PW	Common reference to MPW (Cipta Karya)
QARQ	(water) quantity, accessibility, reliability, and quality
Repelita V	Fifth Five Year Development Plan (1989/90-1993/94)
RWS	Rural Water Supply
RWSG	Regional Water Supply Group (World Bank)
RWSS	Rural Water Supply and Sanitation
SHE	Sanitation and Hygiene Education
SRCD	Sulawesi Rural Community Development Project (CII)
TA	Technical assistance



TOMA	Community leaders (both formal and informal)
TOT	Training of Trainers
TPM	Team Planning Meeting (from the WASH Project Model)
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
VLOM	Village-level operation and maintenance
WASH	Water and Sanitation for Health Project (USAID)
WASHES	Water and Sanitation for a Healthier Environmental Setting (funded by CARE/USA & USAID)
WID	Women in development
WJ	West Java
WS&S	Water Supply and Sanitation



PREFACE

This report is the final evaluation of CARE/International Indonesia (CII)'s Water and Sanitation for a Healthier Environmental Setting Project (WASHES), designed to increase the access of rural communities to safe, reliable, and adequate water supply and improved sanitation facilities in the three provinces of West Java (WJ), East Java (EJ), and West Nusa Tenggara (NTB) in Indonesia. An evaluation of the predecessor to WASHES, CARE's Rural Community Water Supply (RCWS) Project, was conducted in 1984¹. An assessment of WASHES' community participation, hygiene and health education strategies was carried out in 1989². WASHES was jointly funded by U.S. Agency for International Development (USAID) Grant No. 86-1 and by CARE-USA unrestricted funds.

The core evaluation team included Rick McGowan, Senior Engineer of Associates in Rural Development, Inc. (ARD) (Team Leader and Technical Specialist), Consultant Rahardjo Soewandi (Community Participation and Management Specialist), and Consultant Judi Aabel (Hygiene and Sanitation Training Specialist). The core team was supported by Government of Indonesia (GOI) and CARE/Indonesia staff, including H. S. Nasution of the Government of Indonesia (GOI)'s Ministry of Home Affairs, CARE Project Coordinator (PC) Dan O'Brien, Assistant Project Coordinator (APC) for Hygiene and Sanitation Catherina Haryono, Evaluation Officer Glenn Gibney, and Assistant Evaluation Officer Hanna Tobing. The team was assisted during its field visits by Djoko Wartono (Ministry of Health), and four representatives from the Ministry of Public Works, Ir. A. S. Kriya, Ir. H. Tjahjono, Ir. B. J. Nugraha, and Ir. Sudradjat. The team planning meeting (TPM) took place in late September, and field visits during the first three weeks of October. The evaluation team spent one week in Jakarta briefing water project staff from CII headquarters (CIIHQ), GOI, and USAID staff, and finalizing this report.

The evaluation team would like to thank CARE's Field Office staff in Bandung, Pacitan, Mataram, and Bima for providing us with the information and logistical support critical to the success of this evaluation. We would also like to thank provincial GOI officials for their assistance and hospitality, and the people of rural Indonesia whom we met during our site visits, many of whom were direct beneficiaries of CARE's WS&S development efforts. We hope this report will be of use to CARE and other NGOs, government agencies, and donor groups working to provide safe, reliable WS&S services in rural Indonesia.

¹ *Evaluation of the Technical and Community Participation Approach of CARE-Assisted Rural Water Supply Projects in Indonesia*, Robert Gearheart and Subiarto Martono, WASH Field Report No. 107, the Water and Sanitation for Health (WASH) Project, February 1984.

² *CARE/Indonesia: Increasing Community Participation and Developing a Basic Strategy for Hygiene Education in Rural Water and Sanitation Programs*, May Yacoob, Dan O'Brien, and Rick Henning, WASH Field Report No. 284, the Water and Sanitation for Health (WASH) Project, December 1989.



EXECUTIVE SUMMARY

Purpose of the Evaluation

This is the final evaluation of the Water and Sanitation for Healthier Environmental Settings (WASHES) Project, implemented by CARE/International Indonesia (CII), and jointly funded by USAID and CARE International.

Project Background and Summary

CARE/Indonesia has been working in the water resources development sector in Indonesia for 14 years. During that time, CARE implemented a series of water development projects beginning with the Rural Community Water Supply (RCWS) Project, which evolved into the Water and Sanitation for Healthier Environmental Settings (WASHES-I) Project in 1985, the WASHES-II Project from 1988 to 1991, and finally, the Community Self-Financing of Water and Sanitation Systems (CSFW) Project, operating in the three provinces of West Java (WJ), East Java (EJ), and Nusa Tenggara Barat (NTB). The Sulawesi Rural Community Development (SRCD) Project, begun in 1978, is the largest of CARE's water supply and sanitation (WS&S) development efforts. WASHES-II was completed in September 1991.

This evaluation covers both WASHES-I and WASHES-II, which had different overall and intermediate goals. The WASHES-I overall goal was to significantly reduce the incidence of water-borne diseases in CARE-assisted communities. Intermediate goals were straightforward: to provide adequate and reliable WS&S facilities which are used regularly, and develop mechanisms for sustainable operation and maintenance (O&M) of those facilities. The final goal of WASHES-II was to accelerate access to reliable and adequate domestic water supply and sanitation facilities for rural villagers in Indonesia. Its intermediate goals were more diverse: to improve community organization and management before and during construction; maximize community inputs; encourage communities' use of credit to pay for systems, coupled with banks' willingness to provide that credit; and develop mechanisms for sustainable operation and maintenance of the facilities.

CARE's approach to community-based water supply and sanitation development has steadily evolved over the years. In RCWS, the focus was largely on community organization for the purpose of constructing and maintaining WS&S systems. CARE provided technical assistance in community organization for developing a water committee, technical training for construction, and construction supervision. Community inputs mainly comprised local materials and unskilled labor. The minimal attention given to post-construction system management was primarily in the form of informal assistance rather than community training. WASHES-I expanded that focus somewhat by encouraging a broader range of community inputs, including cash contributions and collection of user fees for O&M. CARE then began to provide some training in



financial management and preventive maintenance. In WASHES-II, community training was further extended to support greater community management (not simply participation) of the WS&S development process, broader participation in system design, resource mobilization, some modicum of sanitation and hygiene education, and more focused financial management. By this time, up to 50 percent of on-site system development costs were required from CARE-assisted communities.

The most unique aspects of WASHES (and its successor project CSFW, evaluated in June 1991³) which sets it apart from the myriad of other WS&S activities in rural Indonesia are the degree to which CARE-assisted communities both participate in and are encouraged to directly manage project activities, coupled with the level of community contributions both for initial system costs as well as the long-term recurrent costs of operation, maintenance, and repair. Direct CARE contributions by the end of WASHES-II included technical assistance, 50 percent of system on-site costs, and logistical support.

Major Findings and Recommendations

Major findings, recommendations, conclusions, and lessons learned can be categorized into the four areas of: community participation and management; engineering design, construction, and O&M; sanitation and health and hygiene education; and project management and implementation.

Multi-level community water management organizations are the basis for CARE's community participation/management approach. At the highest level are the community water committees (called either BPAB or HIPPAM depending on the province), typically consisting of 5 to 10 people who manage the entire system. Depending on the size of the system, there may be other levels of committees based around either particular water points (Kelompok) or large or small neighborhoods in the community. Community contributions of cash, labor, and local materials to construct, operate, and maintain the systems are collected through this organizational structure in a wide variety of ways, nearly always involving some degree of contribution from each beneficiary family in the community. Community motivation to participate in these projects is a function of water scarcity, accessibility, and, to a much lesser extent, water quality.

³ *Rural Water Supply and Sanitation in Indonesia - Midterm Evaluation Report of CARE/International Indonesia's Community Self-Financing for Water Supply and Sanitation Systems Project*, Rick McGowan, Dawam Rahardjo, and Nick Ritchie, CARE, Jakarta, June 1991.



CARE encourages active community participation throughout the various stages of assistance to a beneficiary community. First, CARE Field Officers initially approach a potential site and explain the project approach. Initial surveys are taken to determine the level of need for WS&S assistance, the ability of the community to make substantive contributions to support their system, and to assess whether the physical attributes of the site are appropriate for the various technology options which CARE typically provides. Water systems built under WASHES were most commonly gravity-flow, piped water systems, with some rainwater catchment tanks, handpumps, and, to a much lesser extent, hydraulic rams. Sanitation systems installed by WASHES were mainly water-sealed pit latrines (some with septic tanks and leach fields) for public use and ventilated pit latrines for private use. Once it is determined that a site fits the basic site selection criteria, CARE initiates community training in organization and management, resource mobilization, system design, construction, operation and maintenance, financial management, and sanitation and hygiene education.

There were significant differences between the three provinces where CARE worked in social customs and organization, cultural traditions, and economic conditions, all of which influenced the implementation of project activities in different ways. In general, the community management/participation approach developed by CARE in WASHES (and continuing to evolve in the CSFW Project) is a sound approach to WS&S development. Involving beneficiaries to a much greater extent in all major decisions involving their systems helps ensure their continuing support over the long term. There were many communities where the project was clearly a success. There were others where it was not. Apart from physical incidents such as landslides, floods, or changes in water resources, the most important indicator of the long-term success of the project in a given community was the strength and quality of the existing leadership. Strong, competent leadership brought out the best in communities. Incompetent or simply weak leadership prevented communities from taking full advantage of CARE's technical assistance.

The water supply and sanitation systems built with CARE assistance were well-designed and usually well-built. Sanitation facilities were not as widely supported by communities as were water supplies. Drainage was a noted weakness, largely because communities were not sufficiently aware of the direct linkage between proper sanitation practices and community health. Operation and maintenance practices varied considerably from one community to the next, as did the quality of system financial management. The majority of CARE-assisted communities managed to successfully operate and maintain their systems (some for up to 10 years). A minority had difficulties either for physical reasons (*force majeure*) or, more often, due to an inability to convince their fellow villagers of the importance of providing continuing financial and organizational support for their systems. Strategies to deal with such situations should include improved community training in operation and maintenance, financial management, and community organization. More careful site selection, taking into account an assessment not only of a community's physical, social, and financial



conditions, but also the quality of its existing leadership, may help to further improve CARE's already enviable success rate in WS&S development.

While the focus of the WASHES project was on installing WS&S facilities, much less attention was given to hygiene education and improvements in sanitation and related environmental problems. General community awareness of WS&S-related health problems remains relatively low. If future WS&S projects hope to contribute to significant improvements in community health, a carefully designed sanitation and hygiene education (SHE) strategy must be implemented throughout the period of CARE involvement in beneficiary communities, not just as an add-on after construction is completed.

The community development approach (in contrast to increasing awareness by simply providing information) used by CARE for constructing WS&S systems is a solid foundation upon which to build a hygiene education strategy. This approach consists of: working through community institutions and leaders; developing community responsibility for the planning and management of water systems; and using a problem-solving approach which strengthens the community's ability to analyze and solve problems. Future hygiene education efforts should use a community development approach to promote sustainable changes in community WS&S norms, and encouraging active community responsibility for solving problems such as drainage, WS&S facility use, and needed maintenance.

Given the central role which training plays in this strategy, it will be necessary to reinforce the training skills and/or hire additional training staff to assure ongoing training needs identification, and design and facilitation of FO training. Active support from Field Office management staff for hygiene and sanitation and for increasing the involvement of women in CARE's WS&S projects will be required if they are to be effectively integrated into future program strategies. As much as possible, FOs should collaborate with GOI counterparts (particularly the Puskesmas sanitarians) in developing and carrying out SHE activities at the community level.

CARE should continue to increase its efforts in coordinating its activities with other major players in the WS&S development sector (e.g., World Bank, UNDP, AIDAB, UNICEF, GTZ, Indonesian and international NGOs) by joint review of project planning documents, periodic interest group meetings, and sponsoring a conference on WS&S development (for both rural and peri-urban areas) in Indonesia.



PART ONE - BACKGROUND OF THE PROJECT

CARE⁶ International Indonesia has been actively involved in the Water Supply and Sanitation (WS&S) sector since about 1978. The Rural Community Water Supply (RCWS) Project preceded the two phases of the Water and Sanitation for a Healthier Environmental Setting (WASHES-I and II) Project. The CARE/CIDA-funded Sulawesi Rural Community Development (SRCD) Project also has a substantial WS&S component. SRCD, which currently installs an average of 38 gravity-fed piped water systems annually, began in 1978. WASHES activities concentrated on the design and construction of WS&S systems in rural and, to some extent, peri-urban settings. WASHES uses a community-oriented approach to WS&S development, with a strong community training component to develop indigenous skills in community management, system design, and construction, with a secondary emphasis on operation and maintenance (O&M), financial self-management, and sanitation and hygiene education. By the end of WASHES-II, CARE had set target contributions (cash and in-kind) for communities at 50 percent of total installed cost (not including the cost of CARE's technical assistance). The successor project to WASHES, the Community Self-Financed Water Supply and Sanitation Systems (CSFW) Project, takes these concepts further by aiming at 100 percent community self-financing of systems, coupled with various credit schemes (including collateralized bank loans) to provide up-front financing of community systems. The CSFW Project¹ began in July 1988, and continues through 1993.

WASHES-I was implemented from 1985 to 1988. WASHES-II began in 1988, and was completed in September 1991. WASHES activities were based in the three provinces of West Java (through CARE's Bandung office), East Java (in Pacitan), and Nusa Tenggara Barat (NTB, in both Lombok and Sumbawa). WASHES constructed an average of 25 gravity-fed piped water supplies (GFPS) every year, with secondary efforts devoted to working with communities to build rainwater catchment tanks (in Pacitan), install handpumps on drilled boreholes, and install a small number (nine) of hydraulic ram pumps in all three provinces. WASHES also assists communities in building various kinds of sanitation facilities, including community water taps with bathing and washing facilities (called *mandi/cuci*, or MC) and sometimes also including public latrines (then called an MCK, for *mandi/cuci/kakus*, *kakus* being a latrine).

CARE's community management-oriented development approach, as initiated during RCWS and continued under WASHES-I and WASHES II, was motivated primarily by three circumstances:

- the GOI, while having committed itself to significant development support for the rural WS&S sector (according to the last three Five Year Plans, or Repelita) and the international donor community are simply unable to

¹ *Food for Self-Sufficiency: Community Self-Financing and Water and Sanitation Systems*, CARE/Indonesia, revised March 1988.



marshal and commit sufficient resources (personnel, financial, and material) to meet the urgent needs of rural Indonesians for adequate, reliable water and sanitation facilities of acceptable quality to support basic health and hygiene requirements;

- even if such resources were available to provide massive development support, the traditional approach to developing rural WS&S facilities (centralized, top-down, and without adequate provision for operation and maintenance) has been unsuccessful in terms of its long- (or even medium-) term sustainability; and
- experience in many countries around the world in rural development in general, and rural WS&S in particular, shows that communities are much more likely to financially and managerially support their water systems over the long term if they have a significant stake in them (i.e., when they have made significant contributions to their planning, design, construction, O&M, and direct funding through both cash and in-kind contributions).

Traditionally, government agencies took responsibility for developing rural water supplies. Both Cipta Karya (the department within the Ministry of Public Works now responsible for rural water supply) and the Ministry of Health have had responsibility for various aspects of rural WS&S over the years. However, increasingly apparent human and financial resource constraints have slowed the achievement of GOI development goals in this sector. Given these circumstances, CARE felt that the best way to promote sustainability in RWSS systems was to develop an approach whereby users would assume greater (but not complete) responsibility for planning, managing, financing, installing, operating, maintaining, and repairing their own systems.

The goal of WASHES-I was to reduce the incidence of water-borne diseases in CARE-assisted communities. This was modified under WASHES-II to accelerate access to reliable and adequate domestic water supply and sanitation facilities for rural villagers in Indonesia. Part of the reason for this modification was CARE's commitment to process-oriented projects, and the ever-increasing role of the beneficiary communities, particularly in system financing. WASHES-II intermediate goals were more diverse:

- improve community organization/management before and during construction;
- maximize community inputs to support project development;
- encourage communities' use of credit to pay for systems, coupled with banks' willingness to provide that credit; and
- develop mechanisms for sustainable O&M of the communities' facilities.



PART TWO - DESCRIPTION OF EVALUATION

2.1 Purpose

The final evaluation of the WASHES Project is a requirement of USAID/Indonesia Grant 86-1. It was conducted from September 23 to October 25, 1991. The purpose of the evaluation was to assess the extent to which the project achieved its goals and objectives, and to formulate lessons learned about sustainability of water system design and construction, provisions for operation maintenance, sanitation and hygiene education, and the role of community participation in developing and sustaining rural water systems. The lessons learned will be used to improve the design and implementation of future CARE's RWSS development projects, particularly the ongoing CSFW Project.

2.2 Terms of Reference

The Terms of Reference for the evaluation were to assess the following:

- the approach to community participation used to mobilize communities for WS&S system construction and maintenance;
- the sustainability of the WS&S systems over the long run;
- the degree of community responsibility for O&M of the WS&S systems;
- the transferability of the project strategy to other PVO/GOI institutions;
- the influence of the project on local and national WS&S policy;
- the efforts to involve women in decision-making roles;
- the effectiveness of the hygiene and sanitation component of the project; and
- the effectiveness of the training provided to and by CARE staff.

2.3 Core Evaluation Team

The core evaluation team consisted of three people. Rick McGowan, Team Leader and Technical Specialist for rural water supply and sanitation systems, is Senior Engineer and Senior Associate at Associates in Rural Development, Inc. (ARD). He has worked on water and energy projects in Africa, the Middle East, and Asia for over nine years. Judi Aibel, Hygiene and Sanitation Specialist on the team, is an independent consultant in health and hygiene education, and health training. She has worked for 12 years in community health and maternal and child health programs, primarily in Africa and Latin America. Rahardjo Soewandi, Community Participation Specialist, is an Indonesian anthropologist and independent consultant who has extensive experience with



community development projects throughout the country. The core team was supported by numerous GOI officials and CIIHQ and Field Office staff in each province.

2.4 Evaluation Methodology

The structure of the evaluation followed the standardized evaluation procedures as defined in the CARE Program Manual. A representative sample of WASHES sites in WJ, EJ, and NTB (both in Lombok and Sumbawa) were visited (see Appendix 1 for site list). The full evaluation team was divided into three sub-teams. The Technical Specialist led one sub-team which focused on project management, engineering design and construction, O&M, and financial management. The Hygiene and Education Specialist led another sub-team which assessed the sanitation and hygiene education activities in the project. The third sub-team, coordinated by the Community Participation Specialist, assessed community participation and management.

The evaluation methodology consisted of the following:

- a four-day planning meeting, during which the core evaluation team met with CIIHQ WASHES/CSFW staff and the Evaluation Officer to discuss the Terms of Reference and revise the site visit schedule. The planning meeting followed the WASH model for a Team Planning Meeting (TPM);
- review of relevant project documentation, including project proposals (WASHES I/II), periodic reports, technical manuals, reports from other CII projects (CSFW and SRCD), and WASH reports on Indonesian WS&S projects;
- review of GOI water sector development plans (i.e., Repelita V), and specific studies related to water resources, sanitation, and hygiene in Indonesia;
- site visits in three provinces (WJ, EJ, and NTB), interviews with field staff, provincial GOI officials, and project beneficiaries (water committees, water user groups, other community leaders); and
- meetings with personnel from donor agencies working in the WS&S sector (USAID, UNICEF, World Bank/UNDP) to discuss programmatic issues and constraints related to project planning and implementation.



PART THREE - FINDINGS

The principal findings of the evaluation team are grouped here according to the major areas of: community participation and management; engineering design and construction; operation and maintenance; sanitation and hygiene education; institutional linkages and policy impacts; progress toward project goals and objectives; and project management and implementation. Additional discussion is given to link these findings to the project's achievements and constraints, as well as to suggest modifications in the implementation strategy for the successor to WASHES, the Community Self-Financing and Water and Sanitation Systems (CSFW) Project.

3.1 COMMUNITY PARTICIPATION AND MANAGEMENT

Community participation² and management (CP/M) in CARE's WS&S projects is one of the central strategies for helping ensure the sustainability of improved WS&S systems. Community participation is a precondition for the community management approach that CARE has adopted for the CSFW project³. Active community participation in financing, constructing, operating, maintaining, and repairing their own WS&S systems has the direct benefit of mobilizing otherwise unavailable human and financial resources to support these systems. This can substantially assist the Government to alleviate its steadily increasing burden of supporting ever-expanding WS&S systems throughout the country with limited resources.

3.1.1 Communities' Socio-cultural Profiles

CARE-assisted communities in WJ, EJ, and NTB have some differences in their socioeconomic condition, social organization, and propensity for collective action. These differences help explain some of the community-held attitudes which affect constraints and opportunities for WASHES project interventions. WASHES beneficiaries in WJ are mainly farmers producing commodities (e.g., vegetables, coffee, fruits, pond-fish, and rice) for the large markets in Bandung (the provincial capital) and surrounding towns. Communities are stratified into large-scale farmers, traders, small farmers, and agricultural workers. Communities in WJ have long had formal organizational structure and hierarchical leadership. However, the economic and social stratification have tended to weaken these communities' sense of social solidarity. Still, collective action either through voluntary motivation (*gotong-royong*) or formal instruction (*kerja-bakti*) is common in these communities.

² An operational definition is: "Community participation is an active process whereby beneficiaries influence the direction and execution of development projects rather than merely receive a share of the project benefits." World Bank Discussion Paper No. 8, J. Paul, Washington, DC, 1987.

³ "Community participation provides the environment required for successful community management." from WASH Technical Report No. 67.



In EJ, WASHES beneficiaries are mostly small farmers working on less fertile lands, and producing less important commodities such as coconut and coconut sugar, and cassava. East Javanese are familiar with formal organizational structure and hierarchical leadership. In EJ communities (especially in Pacitan where CARE works), both social solidarity and collective action are exceptionally well-ingrained in peoples' social behavior.

In NTB, WASHES beneficiaries are mainly farmers producing commodities such as rice, coffee, and vegetables for small markets in just a few towns. They are socioeconomically stratified with strongly held traditional beliefs. Nonetheless, their social organizations, and therefore their capability for collective action and social solidarity, are relatively weak. For communities in NTB, voluntary group actions (necessary for financing and building a community water supply) tend to be difficult to organize and sustain.

In WJ and EJ, village communities are used to self-organize community action motivated by both the communities themselves (*gotong-royong*) or by the instruction of the super-village leadership (*kerja-bakti*). Both forms of community action have been known since time immemorial. In general, the less stratified the community the greater the likelihood of successful community mobilization. In Lombok (NTB), due to the strong traditional ties, organized community action tends to be more difficult.

3.1.2 Community Water Organizations

Community participation in CARE-assisted projects is encouraged by forming multi-level community water organizations. The smallest unit consists of WS&S users around a particular water tank (*bak penampung*) or MC/K, a group called a Kelompok. Members of the Kelompok choose a chairman (*ketua*) to represent them in the village (*desa* or *dusun*) water committee, and to be responsible for day-to-day administration of the Kelompok, including collecting water fees (if any), organizing *gotong-royong* support for construction and maintenance, and other related activities.

The Ketua Kelompok reports to the village water committee (called the PPSAB before and during construction, and either BPAB or HIPPAM⁴ after construction). The committee (or *panitia*) ideally is elected by water users themselves, or by village leaders who represent the wishes of the people. Typically, the election of the panitia takes place in a meeting of formal village leaders, the LMD. In reality, this election may or may not represent the views of the majority of villagers. For example, based only on the evaluation team's admittedly limited field visits, panitias in WJ in CARE-assisted communities tended to be less representative of villagers' interests than they did in EJ, where exceptionally representative committees were common. In NTB, the actions of

⁴ The term BPAB is used in WJ and NTB. HIPPAM is a legal entity which exists on the order of the Bupati in EJ. They all mean the same organization.



the panitia were sometimes constrained by religious sectarianism and subsequently divided loyalties within communities.

When BPAB/HIPPAMs represent the wishes of the people in the community, they can be powerful tools for motivating people to actively and constructively participate in the management, operation, maintenance, and financing of their WS&S systems. When BPAB/HIPPAMs are not representative, problems can occur which can have a major impact upon system operation. For example, if a particular Kelompok feels disenfranchised by virtue of inequitable water distribution (this was observed on several occasions), due to the undue influence of certain members of an unrepresentative BPAB/HIPPAM, the people in that Kelompok may decide to stop paying their water fees. This may in turn lead to other Kelompok also refusing to pay fees, thereby reducing funds available for needed repairs. If continued, necessary repairs may not occur, and some (or all) sections of the system may fall into disrepair. Another example of how lack of community organization can cause a system to deteriorate is when the BPAB/HIPPAM itself is not powerful enough⁵ to make and enforce the necessary decisions (e.g., about water tariff levels, distribution practices, unauthorized connections) to properly operate or maintain their system.

Field staff perceptions regarding village leadership in particular and the nature of community participation/management in general may have a strong impact on the success of CARE efforts in a particular community. Some FOs manage to quickly identify those members of the target community whose commitment (or lack thereof) will spell the success (or failure) of project interventions there. Other FOs seem somewhat constrained by a lack of understanding of the depth and complexity of social and political interactions within communities. They may feel that communities are homogeneous, and that they need only deal with village leaders to ascertain the interests of the community as a whole. This may not always be the case. Some village leaders may have agendas other than simply improving the community's water supply and sanitation facilities. It is important to ascertain whether villagers' views are adequately represented by formal leaders by making direct contacts with those villagers. Admittedly, this may be both politically and logistically problematic, but it may also be crucial to the success of project activities in that community.

3.1.3 Women's Involvement in WS&S Projects

In its community management approach to development, CARE has identified several key factors: facilitation, staff training and support, technology options, availability and use of credit, and a commitment to the involvement of women. The involvement of women in the planning and management of WS&S projects is necessary and appropriate because "Women benefit directly from the convenience and time-saving

⁵ For example, if the BPAB/HIPPAM decisions were overruled by a Kepala Desa or other politically powerful member of the community.



aspects of a closer water source, and from the improved health of their children.⁶

Despite inherent cultural constraints, the active involvement of women in development activities has been officially mandated in government development policy for several decades. This involvement is primarily through the Family Welfare Movement (or PKK) which extends from the national to the village level. Despite this, the status of women in many CARE-assisted communities is still low, and this restricts their existing roles in WS&S development projects. In WASHES activities, women typically provided support functions such as common laborers and cooking food for people working on construction. After construction, in some villages, women were responsible for activities such as fee collection, health and hygiene activities, and cleaning MCKs. Few, however, had formal decision-making roles⁷.

CARE should continue to identify possibilities to involve women in its WS&S development activities in whatever ways possible, including system design (e.g., deciding where MCKs will be built), resource mobilization (fee collection and management), as members of the BPAB/HIPPAM (at minimum on the health/sanitation subcommittee), as Kelompok leaders to organize MCK cleaning, and wherever possible, as formal members and leaders of PBAB/HIPPAMs. The role of women in WS&S system management is new and evolving, and should be expanded wherever opportunities are identified.

In summary, the capability of government and other external organizations to maintain WS&S facilities in rural communities is limited by financial, human resources, and other logistical constraints. Therefore, community management is the most reasonable approach to address the problem of sustainability of WS&S facilities built with CARE's assistance. Good community management requires active community participation in the preparation and implementation of the project. Community participation is only successful if it reflects a community's socio-cultural uniqueness.

⁶ CARE/Indonesia Community Management Workshop Handout, May 1990.

⁷ In WJ and EJ, some women are elected village administrators. In several sites in all provinces, women are in the BPAB/HIPPAM health section.



3.2 ENGINEERING DESIGN AND CONSTRUCTION

This section discusses WASHES system design and construction⁸. The main technologies used were gravity-flow piped systems, handpumps, and rainwater catchment tanks. In some cases, hydraulic rams were used. Water sources were mainly springs, with some rivers and small creeks. Gravity systems usually consisted of catchments (a "capting"), a collection tank sometimes acting as a sedimentation tank, the main pipeline (typically 1 km to 6 km in length), break-pressure tank(s) as required, secondary pipes to reservoirs, and water points. Depending on water quality, slow sand filters were sometimes used, particularly if the source was a river. There were four kinds of water points. Most common was an MC (a washing/bathing facility with separate areas for men and women, with two taps per area), usually with taps and a concrete apron for washing clothes and dishes. Another kind was an MCK, which is an MC with two latrines--one for men and one for women. At some sites, there were house connections (sometimes included in system design, sometimes simply hoses placed in MC tanks). Finally, some sites had public standpipes.

CARE handpump sites varied between provinces. The most common handpump used was the improved Bandung handpump, developed in part with USAID assistance. A variety of other variable quality and reliability pumps (all manufactured in Indonesia) were also installed. In Sumbawa, handpumps tended to be clustered in one area (e.g., Penanae, where 12 Bandung handpumps were installed on hand-drilled wells in a peri-urban *dusun*). This greatly increases the probability that the pumps will be properly maintained, since only one trained mechanic is needed to service all the pumps. The other criteria which helps to insure user support of handpumps is the lack of easy access to other nearby water sources. If these exist, users are seldom inclined to pay the additional cost of installing and maintaining handpumps to gain the incremental benefits of improved water quality and accessibility.

Rainwater catchment tanks were installed primarily in the Pacitan District, in areas where springs or other surface water sources were unavailable or, at best, very inconvenient. Their use is restricted somewhat by variable rainfall patterns in different areas. The rainwater systems consisted of suitably modifying conventional roof drains to collect rainwater in a ferrocement storage tank built near the house. Nine hydraulic rams ("hydrams") were installed in WJ and NTB. Their use is fairly restricted due to the specific topography needed for their proper and efficient operation, but where used, they were successfully maintained and fully operational. Sanitation coverage was not nearly as extensive as water supply coverage at the majority of WASHES sites. Many sites (especially in East Java) did have an adjoining latrine(s) built onto the MC, called an MCK. Of the 482 communities where CARE-assisted WS&S systems were installed between 1979 and 1990, 1,658 MCs and 623 community standpipes were constructed, and 78 communities were assisted in building a total of 875 MCKs⁹.

⁸ For more detail on engineering of the CARE systems, see the CSFW Project midterm evaluation report.

⁹ See also Chapter 3.4 for more detail on sanitation facilities.



3.2.1 Design Standards

In general, CARE designs compared well with accepted standards for gravity flow water systems¹⁰. While in some cases they appeared overbuilt (in dimensional terms), the small additional cost and effort will likely be repaid in additional years of relatively trouble free operation. This strategy of building higher initial cost systems is likely to result in lower O&M costs for the community. CARE designs in most cases are quite similar to those used by the Ministry of Public Works' (Cipta Karya), responsible for developing all Government of Indonesia's water supply system specifications. There are some minor variations that do not appear to compromise the quality of the CARE systems, and some which reflect technical innovations which CARE staff developed such as the following:

- bamboo cement tanks, which substitute bamboo matting for steel reinforcing bars in tank sidewalls (saving money, but requiring more attention to detail during construction);
- removable floor-mounted overflow pipes in water storage tanks and some capterings which can be easily lifted out of their seats when cleaning or draining is necessary. This saves using the large and expensive gate valve which would otherwise be necessary on the cleanout/drain pipe;
- locally manufactured (in Bandung and Lombok) hydraulic rams for lifting water at suitable sites;
- novel slow sand filter designs; and
- dissemination of the fairly reliable low-head Bandung handpump.

CARE systems are designed to meet a demand of 60 to 80 liters per capita per day (LPCD), with an assumed demand growth rate of 1.5 percent to 2.5 percent per year over 10 years. Cipta Karya designs assume 60 LPCD for house connections, and 30 LPCD for public water points, with a 2 percent growth rate over the same period. System designs varied between CARE Field Offices, reflecting differences in staff experiences or preferences and, to some extent, differences in locally available materials. For example, in some areas central reservoirs (made of ferrocement, bamboo cement, or masonry using either brick or stone) were used with separate water points. In other

¹⁰ *A Handbook of Gravity Flow Water Systems*, Thomas Jordan, IT Publications, London, 1984.



areas, MCs and MCKs were built with adjoining storage tanks and no central reservoir. CARE should undertake a review by its water project staff of the strengths and weaknesses of designs based on the experiences of the three Field Offices and, coupled with a review of Cipta Karya designs and discussion with their colleagues in Cipta Karya, standardize their designs across all field offices.

Communities sometimes undertake system expansion (of new MCKs) without due consideration of the technical limits (pipeline carrying capacity, source debit) of their systems. During initial system design, CARE technical staff should advise communities on where potential system expansion opportunities exist and where they do not. While this is apparently done verbally, it would help to leave specific written instructions on a copy of the community's water system plan with the water committee indicating where (and how much) system expansion is possible. This would help prevent excessive demand on subsystems which are not designed or built to handle that increased level of demand.

3.2.2 Community-Assisted Construction

CARE's community participation and management approach to water and sanitation system development has both advantages and disadvantages. The advantages become obvious long after initial construction, when communities tend to be much more well-equipped to deal with technical problems involving system operation, maintenance, and repair than communities which do not receive CARE community training. The disadvantages of using community members to build their own systems tend to become most evident during the initial construction phase of the project. Being inexperienced, they require much more guidance and direct supervision than experienced builders. Even though assisted by competent CARE field staff, when the community needs to mobilize and manage its own resources (human, material, and financial) prior to and during construction, the process takes much longer than it might otherwise.

Construction is generally well done. However, some problems that were observed (e.g., inadequate attention to grey water drainage) could be resolved by closer supervision and periodic inspections during the construction process by experienced FOs, coupled with a review by project staff summarizing what subcomponents must be included in the systems during construction (e.g., vent pipes for tanks, drainage channels away from tank foundations, concrete blocks to hold exposed GI pipes firmly in place). Following are some of the problems noted at some WASHES sites:

- control devices on water tanks are a regular maintenance problem. Float valves break easily, and inlet valves break and are removed so that there is no way to balance the system's water distribution. CARE should look into alternatives for float valves which do not break so easily;
- for water storage tanks (which are generally well constructed with few instances of significant leaks), installing simple vent pipes in the top of the tank would reduce inside air/water temperatures and reduce micro-organism growth. During system construction, the MC(K) should not be



built until piped water is available at the site. This might help to reduce surface cracking when water is not readily available to keep masonry damp while curing;

- for spring catchments, there were no vent pipes or surface water drainage channels. Some were missing pipe screens on outlets to prevent clogging;
- at some sites, pipelines running under roads were broken by unexpectedly heavy loads (trucks passing overhead) because they were not buried properly or deep enough. At some sites, there were exposed sections of PVC pipe--this is not acceptable practice under any circumstances; and
- construction of adequate sanitation facilities varied significantly by province. In NTB, MCKs and private latrines were absent in many CARE-assisted communities. Local hygiene practices and a lack of awareness of the linkage between proper sanitation and health make it difficult for CARE to convince communities of the need to build sanitation facilities in some areas. In general, EJ sites had the greatest number of latrine installations (both public and private) per community, followed by WJ, then NTB.

While drainage was included in CARE standard designs, at many sites visited during the evaluation, drainage channels had either significantly deteriorated or were absent altogether due to inadequate maintenance or improper construction. Where it did exist, drainage from MC/MCKs was typically channelled to natural drainage (e.g., a nearby creek), fish ponds (especially in WJ), wood treatment ponds (soaking construction lumber is used as a natural wood preservative technique in both EJ and WJ), or to irrigate fruit/shade trees or vegetable gardens (especially in Pacitan, Dompu, and Sumbawa). Some sites visited had adequate covered drainage channels from MCs to natural drainage or storage pools, but many did not. To minimize growth and transmission of pathogens, proper drainage systems¹¹ need to be built and properly maintained at all sites. Due to a low awareness of the health impacts of improperly handled wastewater, the drainage situation in NTB was generally worse than at most EJ sites visited.

3.2.3 Technology Selection

CARE was fortunate that many of its potential sites accommodated gravity flow piped water systems. Where such systems can be used, they are generally the easiest and cheapest to build and maintain of any improved water supplies. For areas where shallow or moderate water tables exist, handpumps are the next least complex and inexpensive options. However, handpump maintenance is generally greater than well-built gravity

¹¹ This means using either buried pipe, or tightly fitted stone/brick channels, bridged at all typical path crossings. See Part Three, Section 3.4.



systems. CARE has installed few handpumps in the last few years, since many handpumps installed early in the project no longer function. Provisions have to be made to assure adequate provision of spare parts, periodic lubrication, and replacement of leathers and other worn-out components over time. Often, communities without adequate resident technical expertise find even these minimal O&M requirements difficult, and systems deteriorate prematurely.

If future funding becomes available for technical assistance in the WS&S sector, CARE should consider whether a handpump rehabilitation program would fit into their sectoral development approach. If there is clearly a willingness to pay for and ability to maintain handpumps, they can be a low-cost, low-maintenance approach to potable water supply. In that event, other handpumps offering improved performance and reliability should be reviewed, such as the India Mark IV and the Afridev. Both of these designs draw heavily upon the handpump research and development work which has been supported by the World Bank Community Water Supply Program over the last five years.

Local manufacturing of these advanced designs is being undertaken or planned in a number of developing countries, including Indonesia. More widespread use of handpumps should be considered only if improved, locally manufactured handpumps (i.e., locally produced versions of the India Mark IV or Afridev, or the Bandung handpumps) are used, and beneficiary communities are well-trained in village-level operation and maintenance (VLOM). Handpumps should be clustered in communities so that no more than 20 families use each pump, increasing the likelihood that suitable maintenance skills will be easily available.

In addition, given the large number of open wells that are commonly used in rural Indonesia, CARE may want to consider providing assistance in open well rehabilitation¹². However, programs to rehabilitate dug wells (common in NTB, EJ, and WJ) must be carefully considered due to rural Indonesians' apparent unwillingness to pay for improved water quality¹³. Lastly, given their inherent simplicity and robustness, the use of locally manufactured hydraulic rams should be considered wherever applicable.

As the number of sites without improved water systems diminishes, and where gravity systems, low/medium head handpumps, and hydraulic rams are not technically appropriate, CARE should consider potential use of medium/deep well pumped water

¹² See *A Workshop Design for Well Improvement: Protecting Open Wells*, WASH Technical Report. No. 34, the WASH Project, Washington.

¹³ For a discussion of the many factors affecting design and implementation of water system rehabilitation projects, see *Rehabilitating Rural Water Supplies - Planning and Implementation*, (draft) McGowan and Hodgkin, WASH Technical Report series, 1991.



supplies using diesel, wind, and solar pumps¹⁴. Such systems would involve substantially higher per capita costs than for gravity, handpump, or open well water systems, so CARE should consider such systems only after careful analysis of whether communities would be both willing and able to pay the much higher construction as well as O&M costs associated with their use.

In any event, it is not recommended that handpump or open well rehabilitation, or broader technology applications programs be initiated under CSFW. Since there are only two years remaining in that project, there is little rationale for redirecting project efforts at this point to undertake new programs. Better that CARE continue to make use of its substantial investment in and expertise with the development of gravity flow water systems, handpumps, and rainwater catchment systems.

3.2.4 Technical Training

Reflecting the predominantly technical focus of the WASHES project, the focus of project training activities, both for CARE field staff and beneficiary communities, has been on technical training for system design and construction. The generally good quality of construction by most CARE-assisted communities reflects the usefulness of this training. However, similar to hygiene and sanitation, O&M training has received little emphasis thus far. This situation should be changed to ensure that community project activities are sustainable. A formal training needs assessment should be undertaken for CARE field office technical staff to determine future training requirements.

CARE needs to increase training activities for O&M, hygiene and sanitation, and financial management tasks such as bookkeeping. Financial and O&M records ranged from detailed to nonexistent. This training focus is receiving more attention in the CSFW Project. CARE technical staff feel that resource mobilization is the most difficult part of their job, and more training in that area is required. Whenever possible, CARE staff should participate in joint training activities with government agencies such as Cipta Karya, Dinas Kesehatan, and Bappeda. Cipta Karya in particular routinely provides technical training for its staff which would be of benefit to CARE, and would also help strengthen the institutional ties between the organizations. CARE staff do not have ready access to technical reference materials¹⁵. Where reference collections exist in

¹⁴ For detailed discussion of choosing and costing pump systems for a particular site, see WASH Technical Report No. 61, *Pump Selection: A Field Guide for Developing Countries*, R. McGowan and J. Hodgkin, 1989.

¹⁵ A list of suggested references in the areas of gravity fed and other types of water system design and construction, sanitation, health and hygiene education, community participation and management, and other relevant areas is given in Appendix Four of this report.



Field Offices, they are usually treated as belonging to senior staff, and not used by FO staff. Even CARE documents such as the BOOM manual were not available in the Bima office¹⁶. CARE should develop a small technical library at each Field Office clearly designated for use by FOs/POs/PMs. In addition, each FO should have their own copy of two or three standard references (e.g., on gravity flow water systems, handpumps, and sanitation system construction). Where possible, the references should be in Bahasa Indonesia¹⁷. The Cipta Karya technical design manual would be an excellent addition to Field Office libraries.

¹⁶ It does appear that some FOs do not have much interest in the references that are available. References written in Bahasa Indonesia might help encourage their interest.

¹⁷ Scott Faiia's manual in Bahasa Indonesia should be reprinted and a copy given to each FO.



3.3 OPERATION AND MAINTENANCE

Proper operation and maintenance (O&M) is second only in importance to sound design and construction for system sustainability. In conjunction with the community participation and management approach used in WASHES, CARE provides O&M training to enable communities to take responsibility for maintaining their systems over the long term.

3.3.1 The WASHES O&M Approach

In the RCWS and WASHES-I projects, the emphasis was on construction rather than sustainability. It was assumed that communities well trained in construction would automatically be able and willing to maintain and repair their systems, but this was not necessarily the case. As the systems built under RCWS and WASHES-I aged, CARE realized that communities needed strengthened technical and management capabilities to do proper O&M. During WASHES-II, increased emphasis was placed on O&M, and communities began to receive specific training in preventative maintenance procedures. As mentioned in the previous chapter, systems installed with CARE assistance were generally well-designed and built, so that maintenance requirements were relatively low, especially early on. Also, the level of O&M requirements varies considerably between gravity, handpump, and rainwater catchment systems.

In theory, CARE's role after completion of construction is limited to periodic informal monitoring of the sites for informational purposes. In practice, CARE continued to provide technical assistance over the years at many sites to communities that were experiencing maintenance or repair problems. As the CARE training program evolved, some communities were able to take advantage of the improved CARE technical and management training in nearby communities where new systems were being installed. CARE provided communities with a schedule and description of recommended O&M activities for gravity, handpump, and rainwater catchment systems.

3.3.2 Site Observations

The state of system O&M varied greatly from one community to another during the site visits. While the great majority of WASHES sites are still operating successfully, in all three provinces there were well-maintained and successfully operating systems as well as ones which barely functioned. Since design and construction quality was similar (and generally acceptable), the major variable affecting the state of the system was the capability of local-level community management. This does not necessarily mean management through a strong and active water committee (BPAB or HIPAM). In fact, analysis of data collected for the CARE-Assisted Water System (CAWS) Survey suggests there is little demonstrable correlation between an active water committee and a well-maintained system. It appeared that many systems were adequately managed through the efforts of just one or two active and capable individuals in the community. However, based on our site visits, the most important contributing factor in poorly managed, under-funded and inadequately maintained systems was weak community leadership.



Most systems observed were operating with few or usually minor problems. Examples of the types of problems encountered in some communities include the following:

- *Capterings*--Some capterings had cracks between the tops and sides because they were cold-jointed during construction. Most that were inspected were relatively clean, but some required more frequent sediment and root removal. There were several instances where capterings were destroyed in landslides. Few if any had vent pipes (a minor problem), and some were missing screens in the offtake pipe. Lips on the manholes were often not high enough to prevent groundwater intrusion during heavy rains. While some had alarmingly large cracks which clearly required immediate attention, the great majority were soundly constructed, showing little evidence of deterioration even after 10 years of operation.
- *Pipelines*--At most sites visited, few if any leaks or other problems were observed. At some sites, significant leakage was occurring, and some clearly inadequate patches had been put on. Several sites had experienced major pipe problems such as a river-crossing being washed out from flooding, or a pipeline slung along a rocky ridge which failed. Communities often repaired these problems themselves, and sometimes were assisted by CARE FOs or government agencies such as Cipta Karya. Several sites had pipe breaks due to being broken when roads were widened, or being broken by heavy vehicles crossing a length that was not sufficiently buried or otherwise protected. Washouts needed to be more regularly drained. From the flow of water into tanks, it was apparent that air relief valves were either not properly installed or not operating at some sites. They should be vented regularly as part of the preventative maintenance program.
- *Tanks* (including break pressure tanks [BPT], sedimentation, distribution boxes, and water storage tanks)--like capterings, the various kinds of water tanks were generally well built so that significant leakage or complete failure was uncommon, although it did happen occasionally. Minor leakage was observed at many sites. With their technical training, communities were usually able to replace failed tanks themselves. Some tanks were not built as designed, usually reflecting inadequate FO supervision (perhaps due to commitments at another site) during construction. Most tanks observed had proper manhole caps with locks, but many (especially in NTB) had neither (communities said they were planning to build them, in some cases several years after completion of construction). All tanks should be properly locked, and keys should be kept by the Ketua BPAB or Kepala Desa.



- **Water Points**--Some MC/MCK had eroded floors, some severely, due either to insufficient floor mortar thickness, insufficient cement in the mix, or simply heavy use. For some MC/MCK, masonry work was quite adequate, but water controls (float and inlet gate valves) were often damaged or missing altogether. This meant that some tanks overflowed at times wasting water. More important is that with no control valves on the water points, systems cannot be balanced, so that it can (and did) happen that some water points get no water. Float valves are costly (Rp. 30,000), and villagers often see no reason to replace them, especially since they break so easily. Some communities remove float valves on purpose, in the mistaken belief that they will thereby get more water. Clearly, a better water control device or strategy is needed (Cipta Karya uses the same float valves and has the same problems). Most MC/MCK tanks observed were sufficiently clean, but some were seldom if ever cleaned (sediment, moss). Many water points had broken or missing tap valves (a common and really minor problem, as long as water wastage is not significant), usually supplanted by a simple wooden or rubber plug in the tap. Some water points had illegal (or at least not according to design) house connections, often with plastic hoses strung from a tap or tank. Since house connections inevitably increase consumption, this can greatly increase system demand and imbalance the system so that other water points do not receive sufficient water. Lastly, many water points had inadequate drainage (see below).
- **Drainage**--Drainage was the biggest single technical problem (other than the lack of sanitation facilities at some sites) observed during the evaluation. At some sites, it was never constructed in the first place. At others, it was inadequate and soon deteriorated to the point where it was not useful. Few sites followed accepted drainage standards, meaning that wastewater should be carried from the site by a non-erodible channel (e.g., an 8 cm x 8 cm flat-bottomed V-channel) or pipe (90 mm high density polyethylene [HDP]) to a suitable place (natural drainage such as a creek, or ponds for fish, wood treatment, or gardens). Channels need not be mortar, but should be fitted stone or brick, and bridged at all common crossings¹⁸. Drainage channels need to be regularly maintained. Ignoring proper drainage practice can cause growth and transmission of pathogens to the community through contact with contaminated wastewater.
- **Slow Sand Filters (SSF)**--While many SSFs were properly operated and maintained by the communities, some communities clearly do not understand the need for periodic cleaning of their filters. Where CARE installs these low-cost and effective filters, communities need to receive additional training on their O&M requirements, which include periodically

¹⁸ *A Handbook of Gravity Flow Water Systems for Small Communities*, Tom Jordan, IT Publications, 1984.



removing the top (slime) layer of sand and replacing it with clean, suitable-sized sand. If this is not done when needed, SSFs can actually decrease water quality by becoming a source of bacterial contamination.

- *Drought*--One point worth noting was that even during what appears to be one of the worst drought in recent years, all sites visited were still operating, although some in Pacitan were at alarmingly low levels. At many CARE-assisted sites in Pacitan, the HIPAM has initiated water rationing, with rotating dry-outs every day to each MC/MCK on the system. There, the drought has become so serious that PDAM has been forced to truck in water to many of their sites which used to depend on shallow groundwater or springs.
- *Handpumps*--From observations made during this evaluation, except for the Bandung handpump, many of the locally manufactured handpumps such as the Dragon have such serious maintenance (and design) problems that CARE no longer uses them. Bandung pumps are well-maintained in some sites where clustering is dense, and local mechanics are available to perform the necessary maintenance. Where handpumps are installed with only a few in a given area (less than the critical mass needed to ensure maintenance), they typically failed due to lack of proper maintenance.
- *Rainwater Catchments*--Only a few rainwater catchments were observed in Pacitan. No significant problems were noted after several years of service, except for the fact that it hasn't rained in seven months.
- *Sanitation Facilities*--Many sites had filled septic systems and subsequently plugged MCK latrines. CARE needs to reassess its designs for public latrines to solve this problem. Due to cultural norms, it is unlikely that communities would ever empty septic tanks¹⁹. Either pits will have to be converted to septic tanks with suitable leach fields (or enlarged where used already), or multiple tanks (with T-pipes) have to be built initially, or communities have to be convinced of the need to build additional tanks when the first one fills up²⁰. Septic tank design needs to better reflect local soil absorption rates and anticipated number of users.

¹⁹ Although this service is provided in urban and peri-urban areas such as around Surabaya by private contractors.

²⁰ See especially *Appropriate Sanitation Alternatives - A Planning and Design Manual*, J. Kalbermatten et al., World Bank Studies in Water Supply and Sanitation No. 2, Johns Hopkins press, Baltimore, 1982. Some specialists suggest that septic tanks need to be greater than 1.5 m deep to insure that physical/chemical degradation proceeds at a fast enough rate to minimize the chance the tank will fill overly quickly.



It is difficult to generalize about regional differences in O&M practices, except the clear difference in general community commitment and organization to support their WS&S systems in Pacitan compared to in WJ, and even moreso in NTB. In all provinces, there are very well-maintained systems and very poorly maintained ones. Either way, this appears most often to be a function of the quality of community leadership rather than any design or construction-related problem.

3.3.3 Improving O&M Programs

Much attention has been given in the development community worldwide over the last 10 years to assessing and improving water and sanitation system O&M. It is generally agreed that successful O&M is dependent upon seven major components, including institutional capability, system operations and maintenance practices, availability of spare parts and supplies, adequate logistical support, sufficient user fees (or other sources of funds) to financially support O&M, proper record keeping, and adequate human resources and training support²¹. CARE has considered all of these elements in its community-oriented O&M program thus far, with varying degrees of success. Of these components, institutional capability (usually the community itself, or the BPAB/HIPPAM) varies from site to site, as do O&M practices. Availability of spare parts and supplies is generally not an issue here. Logistical support (transportation, communications) is usually not a major problem. User fees (discussed below) are generally collected, but amounts, management, and use vary significantly from site to site. Human resources for O&M support vary from community to community. While some O&M training is provided by CARE, clearly many communities do not yet appreciate its importance.

Few communities have proper O&M plans, and few appear to fully implement preventive maintenance programs. CARE needs to assist communities in developing better operation and maintenance plans for their water supply and sanitation systems. While most (but not all) sites visited did maintain their water systems, drainage systems in particular needed more attention. Preventive maintenance programs for gravity systems should include periodic inspection of the entire system (looking for leaks, cracks, and other impending problems before they become major problems), cleaning all water tanks and spring catchments, clearing air relief valves and washouts, cleaning SSFs as necessary, and checking drainage areas to make sure wastewater is properly dealt with.

²¹ See especially *Assessment of the Operations and Maintenance Component of Water Supply Projects*, Jim Jordan and Alan Wyatt, WASH Technical Report No. 35, the WASH Project, Washington, June 1986.



For handpumps, periodic maintenance should include regularly tightening all nuts and bolts, cleaning wastewater drains so that water does not leak back into the well (daily); lubricating and greasing all pivot points; repairing any cracks in the pump foundation, well slab, or drainage channels (monthly); periodic chlorine disinfection of the well; and replacing leathers as needed (every 6 to 12 months)²².

Periodic water quality monitoring is an important but often neglected part of preventive maintenance. CARE tests the water quality of sites once before and once after construction by sending water samples to DINKES water quality laboratories. The exception is on Sumbawa, where FOs use their Hatch water quality testing equipment since no DINKES laboratory is available. Unfortunately, there is no regular program for periodic water quality testing after construction. CARE should help the community make arrangements with the Ministry of Health/Dinkes to ensure periodic (annual, or biannual at most) water quality testing at a charge (about Rp. 30,000) which could be covered by water user fees.

3.3.4 Financial Management

Water system construction and periodic user fee assessment and collection varies widely from one community to the next. Construction fees are assessed by family in some communities, by Kelompok (the people living in the area around one water point) in others, and by RT or RW (large and small neighborhoods, a formal political division) in others, following traditional local practice for raising community funds (e.g., for mosques). User fees vary from Rp. 100 to 500²³ per family per month. Where they exist, direct house connections are charged at higher rates--up to Rp. 2,000 per month. In some communities, fees are collected regularly on a monthly basis; in others, after harvests are completed and farmers have money; in others, on an irregular basis whenever users have cash; and in still others, they are not collected at all. Some communities had more than Rp. 1 million in user fees saved, others had essentially nothing. Some user fee funds were kept in bank accounts, while others by the Kelompok or BPAB/HIPPAM treasurer²⁴.

²² *Preventive Maintenance of Rural Water Supplies*, The World Health Organization, Geneva, 1984.

²³ \$1 U.S. = Rp. 1,940.

²⁴ It is possible that there is a correlation between better accounting practices (and O&M in general) and the year in which CARE provided technical assistance to the community, since CARE's training improved over time. However, the evaluation team did not determine whether this was the case.



Water fee management and use also varies considerably. In some communities, these fees are only used for water and sanitation system operation and maintenance. In others, they are used to fund system expansion, provide capital for revolving loan funds, or to buy unrelated items such as mosque loudspeaker systems. In some communities, the fees are split into two categories. For example, in a community charging Rp. 300 per month, Rp. 200 goes toward O&M, and Rp. 100 toward what amounts to community health insurance by paying doctor fees and medical costs when community members visit the Puskesmas.

The most important shortcoming in financial management concerns bookkeeping. Some communities have excellent records, but others are nearly nonexistent. Bookkeeping was particularly well done in communities where local teachers were actively involved with the BPAB. For systems to be sustainable, good records of all income and expenses must be carefully kept. CARE needs to standardize and broaden its financial management for communities. Where possible, former WASHES BPABs should be invited to participate in CSFW financial management training. CARE used to give communities account books and water fee collection cards (similar to those used by the government fee collection process through the BPAM or PDAM) after their financial management training was completed. This practice was discontinued since it was felt that doing so went against the spirit of community management. This may have something to do with the lack of appropriate financial and O&M records at many sites. Routinely providing all CARE-assisted communities with proper account books and fee collection cards should be reinstated immediately.

The major point of concern in the O&M area is determining what CARE-assisted communities can do in the event of the need for a major system repair which is clearly beyond their technical capability. Examples are a major washout of pipe on a river crossing (requiring installation of a pipe bridge, suspension, or under-river burial), or a landslide destroying a captering. In these cases, it is very unlikely that even a CARE-trained community would be able to effectively deal with the problem by itself. There would be several options, including soliciting support directly from CARE (done occasionally for free, but not a recognized CARE responsibility), hiring a local construction contractor or tradesman to do the job (done occasionally, at a high price), or finally, requesting the intervention of a government agency (e.g., Cipta Karya's water system technical support unit BPAM, or the Kabupaten's technical support unit PDAM). The latter has been tried by a number of communities, so far with no reported success. The only way in which PDAM or BPAM could formally be involved with a community water supply is if the system were formally "turned over" to them, and user fees collected to support O&M costs. However, this would negate the whole purpose of the community management approach on which the community's water system was based. This institutional problem remains to be resolved.



Post-WASHES project institutional support for O&M is an area to which CARE and government counterpart agencies (e.g., Bappenas, Bappeda, Cipta Karya, Bangda, and Dinas Kesehatan) need to devote some thought. This issue is considered across a broader range of institutional support requirements and institutions in Chapter Five of Part Three.



3.4 SANITATION AND HYGIENE EDUCATION

During the course of the WASHES project, the goals, objectives, and strategy proposed by CIIHQ for the sanitation and hygiene education (SHE) component were modified several times. In the 1986 project proposal, the project's final goal was to decrease the incidence of water-borne diseases. Intermediate goals dealt with proper use of WS&S facilities. However, the project strategy gave much greater emphasis to the construction of WS&S facilities using a community participation approach, and focused very little on the SHE component. It was initially anticipated that WASHES would be implemented at the same sites as VPHC, and that VPHC would share responsibility for SHE-related activities. This occurred only at a limited number of sites.

In the 1988 WASHES-II proposal, the final project goal was no longer health-related, and addressed only improved access to domestic WS&S facilities. Similarly, revised intermediate goals and implementation strategy did not include explicit SHE activities or targets²⁵. In addition, both the CARE Country Director (CD) and WASHES project management changed several times during the course of the project, with each new manager having different interests and priorities. This caused some confusion among Field Office staff (especially FOs) regarding project priorities.

3.4.1 Hygiene and Sanitation Accomplishments

In the evaluation, no attempt was made to assess changes in health status (incidence of water-borne diseases) after construction of the WS&S facilities. Methodologically, it is extremely difficult to measure the health impact of WS&S interventions, and it is not advisable to attempt to do so in the context of action projects. However, changes in some hygiene-related behaviors can be measured, although no behavioral baseline data had been collected to support this. The focus of sanitation and hygiene-related activities during the project was on the construction of WS&S facilities, namely latrines. At the 449 sites (from the WASHES, RCWS, and CSFW projects), a total of 1,658 MCs, 875 MCKs, 623 public standpipes, and 9,425 private latrines (not all were necessarily built with CARE assistance) were constructed.

Hygiene education was given much less emphasis than resource mobilization and construction of WS&S facilities. FOs worked closely with water committees and other formal community leaders (mostly men) to mobilize resources and construct WS&S facilities. In most cases, hygiene education consisted mainly of informing their

²⁵ Many of the IGs related to self-financing, since it was unclear at that point whether CSFW would be separately funded.



community collaborators about basic health and hygiene aspects of WS&S²⁶. Few water committees systematically promote SHE in their communities. While many committees have sanitation and/or health sections, few carry out hygiene education activities. The limited SHE accomplishments appear related to a series of factors:

- the emphasis given other project components in both project proposals;
- the changing priorities of CIIHQ and WASHES senior management;
- limited expertise of Field Office staff in hygiene education concepts and methods;
- the emphasis on WS&S technical and construction aspects in field staff training;
- job descriptions (until the recent revision) and work targets which focused on community mobilization; and
- no clear understanding by CARE field staff of CIIHQ expectations for the SHE strategy, and a reluctance to implement SHE activities.

The typical rationale for including a SHE component in a RWSS project is to improve community health. Improved access to WS&S facilities alone is not sufficient to promote significant improvements in health, which will only come about if there are also changes in community practices in the use of those facilities as well as to other aspects of environmental sanitation. Promoting changes in sanitation and hygiene-related behavior requires a comprehensive strategy paralleling all phases of community mobilization for facility construction. CARE staff at both Field Office and CIIHQ levels do not share a consensus on the rationale for SHE. Many WASHES field staff equate "sanitation" with "latrines." For example, some staff feel that simply informing people that it is more hygienic to defecate in latrines than rivers will change their behavior. That is not enough. Systematic and sustained educational efforts to inform communities of the direct impact of their sanitation and hygiene practices on their health and the health of their children is necessary.

²⁶ CARE West Java staff conducted community training on health, hygiene education, and environmental sanitation from 1985 to 1986. However, responsibility for these activities passed to the VPHC project, which only worked in some RCWS communities.



3.4.2 Hygiene and Sanitation Practices

A variety of hygiene and sanitation problems were observed in all communities visited, but significant differences exist between the three provinces in the types and severity of problems. The greatest problems were in NTB, with considerably fewer in WJ, and fewer still in EJ. The main types of problems observed relate to defecation practices; methods of water transport and storage; use, maintenance, and cleaning of WS&S facilities; wastewater and garbage disposal; animal excreta management; and water-related diseases (especially scabies and diarrhea). The team collected data on the extent to which community members (both male and female) are aware of these problems. Overall, at sites in all three provinces, the level of awareness of sanitation and hygiene problems is low. In EJ, community awareness is fair; in WJ, it is less and in NTB, there is very limited awareness of the relationship between sanitation practices and health among both men and women interviewed.

There are several common problems directly associated with installing WS&S facilities which communities generally do not perceive as problems. These are inadequate drainage (and subsequently standing water at water taps and latrines) and inadequate maintenance and cleaning of the facilities. In WJ (where fish ponds are very common) a frequently observed problem was the construction of latrines and MCs immediately adjacent to fish ponds, often resulting in highly polluted ponds. In all provinces, the cleanliness of MCs and latrines was a problem at most sites. There appeared to be no clear system for organizing people and monitoring cleaning. Many community sanitation and hygiene-related practices, such as constructing animal pens in close proximity to living quarters, defecating in fish ponds, and defecating and bathing in polluted rivers, are rooted in long-standing socio-cultural traditions. Changing such practices is very difficult. FOs must always take into account both technical and socio-cultural constraints when making decisions about installing WS&S facilities and promoting changes in community practices.

While local institutions such as the PKK, Posyandu, and Puskesmas are responsible for conducting health and hygiene education-related activities, in many cases, such activities appear limited (especially in NTB). In a few communities visited, one or more of these institutions was actively involved in promoting good sanitation and hygiene practices. In few cases did WASHES staff appear to systematically carry out sustained hygiene education activities with different community leaders, institutions, or groups. In some cases, FO awareness of and concern for solving problems like MC/K drainage and cleanliness appeared relatively low. This may be explained in part by the training emphasis FOs were given, and in part by work targets which have not sufficiently addressed sanitation and hygiene.

It is clear from the FOs' experience with numerous communities that, in all cases, the communities' primary interest in the WASHES project activities was to have easier access to water to save time and energy. In general, communities did not view the installation of WS&S facilities as a means of promoting community health. The motivation to construct and use sanitation facilities is generally much lower than for



water facilities. While that motivation is relatively greater in EJ and WJ, in NTB, community interest in latrine construction is extremely limited. Given communities' lack of appreciation of the health value of latrines, the concept of 100 percent community self-financing (in the CSFW Project) for latrine construction may not be feasible over the near term.

Some FOs and Field Office management staff said that if communities do not perceive certain sanitation and hygiene situations (e.g., defecating in the river) as a problem or "felt need," then FOs need not encourage communities to address such problems. In that case, one FO role should be to try to increase community awareness of such problems in hopes that they will become felt needs, and then be dealt with accordingly. In addition to the fact that communities often do not view improvements in hygiene/sanitation as priorities, changing community WS&S-related knowledge and practices is a long-term process which requires sustained efforts. Community decisions about constructing sanitation facilities (e.g., whether to build latrines, or how to manage wastewater disposal) should be made based upon sufficient awareness of the health implications of those decisions.

3.4.3 Community Development Vs. Information-Transfer Approach

Most CARE field staff interviewed have a fairly limited notion of what hygiene education is, and of appropriate strategies to promote changes in deep-seated sanitation and hygiene-related behaviors. This is not meant as a criticism, but merely as an observation regarding their present level of awareness and related skills. The traditional concept of hygiene education is the direct transfer of hygiene-related information or "messages" by individuals, or through educational materials such as posters, films, or signs on the latrines to encourage their use. While these approaches have value, experience in hygiene education shows that just providing information to people encouraging them to change their behavior is usually not sufficient to promote change. Experiences in many countries suggests that more effective ways to promote sustained changes in individual hygiene-related behavior are to change community norms and values regarding those practices. This is an admittedly difficult task. WS&S programs adopting this strategy have two key elements:

- Hygiene education efforts are focused on influential community "gatekeepers" to increase their awareness of problems and commitment to solving them. The assumption is that if the Toma, Imam, Tuan Guru, and Kelompok Air leaders are convinced that it is important to use latrines, and if they in fact construct and use latrines, they will influence others to follow their example.
- Gatekeepers encourage community groups to analyze sanitation and hygiene-related problems, identify ways to solve those problems, and develop a simple management system to assure that planned solutions are implemented. For example, to deal with the problem of unclean MCs might involve conducting educational sessions with women coordinators of water user groups, developing (with FO assistance) a simple system to



organize group members to clean MCs, and acceptance of the water committee's responsibility to periodically monitor the system.

The community development approach successfully used in the project to mobilize communities to construct WS&S systems is an excellent foundation upon which additional hygiene education activities can be built. This approach consists of:

- working through community institutions, organizations, and leaders;
- developing community responsibility for the planning and management of water systems; and
- using a problem-solving approach in working with the community to strengthen their ability to analyze problems and to identify viable and sustainable solutions.

This community development approach should be incorporated into the new SHE strategy CIIHQ is developing for CSFW. Strategy guidelines, training, and follow-up will need to be provided so that FOs can fully understand and implement activities using this approach.

3.4.4 Roles of Community Water Committees

In WASHES-I, the role assigned to community water committees was to construct the WS&S systems. In WASHES-II, this was expanded to include resource mobilization prior to construction, and O&M of facilities. However, few committees said that they had any responsibility for promoting proper sanitation and hygiene practices related to using those facilities. While some committees do have a sanitation and/or health section, the definition of their health-related role is usually unclear and their activities very limited.

Many committees have not established effective management and monitoring systems for routine maintenance and cleaning of sanitation facilities and drainage systems. This appears due in part to their generally low awareness of health-related aspects of WS&S. In most cases, FOs have informed water committees of health considerations related to construction (example, the need for proper drainage systems) and of proper maintenance/cleaning. However, these informal efforts are not sufficient to ensure that committees understand the health implications of their decisions, and that they establish procedures for sustained monitoring of facilities. This is illustrated by the fact that at many sites, while system designs call for proper drainage, committees decided not to construct the drainage system and serious drainage problems now exist.



3.4.5 Community-Level Target Groups

The focus of FO work with communities has been to establish and routinely coordinate project activities with the water committees. Following a community development approach to promoting SHE, other community "gatekeepers" and institutions can be mobilized either to assume responsibility for promoting health and sanitation or to expand their current roles in health and sanitation. In addition to the water committee, other potential community target individuals and groups include: Tomas, traditional leaders (particularly in NTB), water user group leaders, PKK, Posyandu cadres, LKMD health section, Imams and Tuan Gurus, and teachers. It is important that the gatekeepers include not only "formal" leaders (which are typically men), but also informal women leaders. FOs should not work with the community at large, but rather focus on developing the potential of community leaders and institutions to make their own action plans to promote hygiene and sanitation. In addition, FOs should attempt to coordinate all WS&S activities with Puskesmas sanitarians.

Potentially, all these community institutions and individuals can be mobilized to take greater responsibility for WS&S activities, but, in most cases, their level of organization appears weak. Therefore, expectations for their active collaboration should be limited. Even for them to assume limited but sustained roles in WS&S will require considerable training and follow-up by FOs. Based on the gatekeeper role in a community development approach to hygiene education as discussed above, it is better to refer to them as "mobilizers" or "organizers" rather than "messengers," to emphasize their role in organizing the community to take action to solve SHE problems.

Many project staff interviewed suggested that hygiene education focus on women, since they are primarily responsible for managing domestic WS&S. However, educating and involving men in improving community sanitation and hygiene practices is very important as well. Husbands need to both support women in improving household sanitation and hygiene conditions and practices, and modify their own behavior. Men also need to make informed decisions about community efforts to improve sanitation and hygiene if community programs are to have a significant impact. In a community development approach to hygiene education, influential individuals, gatekeepers, and community institutions which influence men as well as women must be involved in promoting change.

3.4.6 Hygiene Education Messages, Materials, and Activities

Most project field staff equate hygiene education with "messages." This is in keeping with the widespread notion that hygiene education consists of giving people information which will lead to behavior changes. Educational messages relative to, for example, latrine use and maintenance, wastewater disposal, and home water storage and use, are one important part of a hygiene education strategy. Probably more important than formulating hygiene messages per se is developing at the community level sustainable mechanisms for involving community members in assessing sanitation and hygiene-related problems, for participating in defining action strategies for solving those problems, and for developing simple monitoring systems to assure that those strategies



are implemented over time. Such action strategies could include the following:

- plans to regularly clean MCKs;
- regular home visits to monitor water storage practices;
- demonstrations and follow-up visits on proper goat cage cleaning and composting;
- periodic fish pond cleaning;
- drainage system monitoring and cleaning;
- community clean-up campaigns; and
- lotteries to support household latrine construction.

The priority messages to be promoted with all communities are those which relate directly to WS&S facility use such as:

- using, maintaining, and cleaning latrines;
- water transport, home storage, and household use (including the need for boiling water before drinking it); and
- disposal of wastewater around MCKs and in households.

How these messages are promoted and what actions communities take to deal with them will vary. Other educational concepts/messages related to garbage disposal, management of animal excreta, and water-related diseases (particularly scabies and diarrhea) are of secondary importance. They should be seriously dealt with in community education activities only after the community has developed action plans addressing the three priorities given above. It is unrealistic to expect communities to quickly make multiple behavioral changes.

FO training should include all areas of sanitation and hygiene associated with the use of water and water and sanitation facilities, personal and environmental hygiene, as well as the rationale for promoting the three priority messages. FOs should also be provided with written guidelines for analyzing priority problems with communities, assessing present socio-cultural practices related to those problems, and helping community gatekeepers to develop action strategies for promoting priority messages/concepts. Culturally acceptable action strategies developed with active community participation will more likely be successful and sustainable.

Often "hygiene education" is equated with "educational materials." While printed or other types of materials (billboards, logos, etc.) can be useful in supporting educational processes, sometimes it is assumed that materials in and of themselves will



promote changes in community practices. In addition, facilitators can become dependent on prepared materials and convinced that, without special materials, they cannot educate the community. Few educational materials dealing with sanitation and hygiene problems have been produced thus far either by CIIHQ or the Field Offices. A few booklets and flip charts were produced in the Field Offices. However, from an adult education perspective, these materials are more directive than participative in nature, and do not build on community socio-cultural perceptions and values.

In future WS&S project activities, educational activities should focus on training community gatekeepers and institutional collaborators to conduct simple activities using locally available materials and creativity. Examples of inexpensive, community-produced and sustainable activities/materials include puppet shows which incorporate health and sanitation messages, simple community-produced signs with health and sanitation slogans displayed around the village, the presentation of health and sanitation songs by children during a school or community event, and the presentation of skits on health and sanitation by several women at an arisan meeting.

Simple educational materials should be developed for the gatekeepers. Brochures should be developed describing their roles in WS&S activities and defining key SHE concepts or messages which they should promote. Other simple educational materials could be distributed to them for use with community groups. It is important that such materials be based upon adult education principles (andragogy) and be participative rather than directive²⁷. The material's content should include elements of the communities' socio-cultural reality. The structure of the materials should lend itself to a participatory rather than directive style of teaching. They should encourage discussion and learning among community members, and not only by community members from the facilitator.

Project staff should review the SHE materials prepared by MOH and some NGOs to assess their usefulness in rural EJ, WJ, and NTB. Similarly, broader application of CARE's excellent environmental magazine *Asyik*²⁸ at the community level should be explored. However, since the magazine specifically targets school children, its applicability to an adult audience needs to be carefully assessed.

3.4.7 Technical and Managerial Support for SHE Component

During the life of the project, the emphasis given to the SHE component by CIIHQ project management has varied relative to other project priorities. A comprehensive SHE strategy was not developed until late 1989. However, that strategy did not include sufficiently detailed guidelines to allow field staff to implement

²⁷ For example, "picture-question cards" and "stories with questions."

²⁸ *Asyik* is published by CARE's environmental education project.



comprehensive sanitation and hygiene activities. Based upon that strategy, some training of field staff was carried out. Early in 1990, the decision was made to suspend use of the strategy to allow field staff to focus their efforts on resource mobilization and community management.

Another major effort by CIIHQ project management was to develop a flow chart of project cycle activities, including training modules for use at the community level. While the overall task-specific module training strategy is sound, additional formal training needs to be planned for FOs on the content of the modules, particularly those on hygiene, sanitation, and women's involvement in project activities. In addition, training to strengthen FO facilitation and problem-solving skills is needed. Review of the 25 SHE-related training modules suggests that, in many cases, the content level is too complicated for community-level participants, and in others there are methodological problems in module design. Modifications need to be made to reflect the changes in the SHE strategy proposed in this evaluation. Some suggestions on each of the modules have been given to the APCs for Training and Health. The module revision should include the participation of an expert in health and adult education/training.

CIIHQ has been developing a comprehensive SHE strategy corresponding to the steps defined in the flow chart. The basic content of the strategy is good, but several modifications should be made in the sequence and content of the SHE activities at the community level, so that they reflect a community development approach to hygiene education (based on promoting community action to improve health and sanitation conditions) rather than an information-transfer approach (merely diffusing messages). The strategy needs to be modified and further detailed before it is distributed and discussed with Field Office staff. The Field Offices are anxious to receive the new strategy, and it should be completed as soon as possible.

The APC for Health's role is to provide Field Offices with methodological tools to:

- training modules for FOs;
- strategy guidelines for health and sanitation, and for increasing women's roles;
- documentation (books, articles, reports);
- periodic training for Field Office staff; and
- guidelines for different levels of monitoring and evaluation of project activities.

Most of these are already being provided by the APC. In addition, in keeping with a process-learning approach to program planning and implementation, the APC should reinforce the mechanisms for synthesizing lessons learned from the Field Offices.



Interviews conducted with Field Office management in WJ, EJ, and NTB indicate considerable variability in terms of their understanding of and support for SHE activities. In many cases, their understanding of what is required to promote sustainable changes in community sanitation and hygiene behavior is limited. In a few cases, they do not appear to support the underlying health-related rationale for these activities, and in several cases, SHE activities are viewed as distractions from the more important construction activities. The increased FO commitment to assume responsibility for SHE activities will require the full support of CARE Field Office management staff. Providing management staff with detailed information on the proposed SHE strategy, including FO expectations and detailed discussions on how SHE tasks can be incorporated into current FO work plans, is an essential step in developing this support. Periodic discussions should be held with Field Office management staff to ensure that they understand and are supportive of this component.

3.4.8 FO Attitudes, Knowledge, and Skills

The implementation of a comprehensive SHE strategy requires personnel who believe both in the importance of sanitation and hygiene activities and that they have a role to play in promoting such activities. Secondly, it requires personnel who have the knowledge and skills necessary to carry out such activities. Interviews with FOs in EJ, WJ, and NTB suggest that while a majority of them stated that SHE is an important component of a rural water supply program, most do not consider it their responsibility, and virtually all are unclear about how SHE activities should be carried out at the community level. This is not surprising, considering that past FO training and responsibilities did not focus on this area, and project expectations of them were significantly modified during the project's implementation.

The attitude of many male FOs is that educational activities should be carried out mainly with women, that such activities should be the responsibility of female FOs, and that they would prefer to concentrate on resource mobilization and construction of WS&S systems. Most female FOs believe they should have responsibility for all project components, including SHE. They believe that efforts to promote appropriate community hygiene and sanitation practices should be carried out not only with women, but with a variety of community gatekeepers and institutions, and that all FOs should have some ongoing responsibility for these activities.

It is difficult for all FOs to be experts in all aspects of community development (i.e., community organization, participation and management, resource mobilization, WS&S system design, construction, O&M, SHE). Therefore, certain FOs should focus on certain aspects of project activities, although these areas of emphasis should not be exclusively defined along gender lines. All FOs should be trained and involved to some extent in all aspects of program implementation. Additional formal training of FOs is necessary in order to assure that the notion of responsibility for SHE is understood and accepted.

While virtually all FOs have informally and occasionally made efforts to educate communities about SHE, many of them feel that they do not have the knowledge, skills,



and tools necessary to carry out comprehensive educational activities. Guidelines describing the steps for developing SHE activities based upon a community development approach should be developed for FOs²⁹. Such guidelines would allow each FO to adapt the general approach to the specific situation of each community. Special formal training activities should be organized for FOs in which the guidelines are presented, and in which they could practice using some of the basic SHE concepts and skills.

The FOs' main role is to promote community management, community problem-solving, and sustained community responsibility for all project activities, including SHE. Key to FO effectiveness is their ability to non-directively help communities, analyze sanitation and hygiene problems, assess alternative action strategies, develop simple action plans, monitor community actions, and evaluate those actions. Based upon discussions with FOs and CARE management staff, the non-directive facilitation skills of FOs need to be strengthened. While older FOs have participated in training activities where these skills were addressed to some extent, both old and new FOs should be provided with concentrated formal training and systematic supervision/follow-up on community problem-solving and facilitation skills. A 10-day course should be organized for all FOs and a simple methodology for follow-up observations and feedback to FOs on these skills should be developed. Such training should be developed and facilitated with the assistance of an expert in adult education and community facilitation skills. These same skills will reinforce FO abilities to conduct experiential training at the community and government levels.

After CARE's involvement with WS&S development is completed, other agencies and organizations will have to assume responsibility for the kinds of technical assistance CARE has been providing. Considerable training and follow-up of CARE's FOs is required for them to effectively carry out SHE activities. Given the human and other resource constraints of the GOI related to training and follow-up of personnel, it may not be realistic to assume that GOI sanitarians would easily be able to fully adopt the CARE community development approach to hygiene education without additional support.

²⁹ In fact, the basis of such a document is the health and hygiene strategy which is now being developed by the APC for Health.



3.5 INSTITUTIONAL LINKAGES AND POLICY IMPACTS

This chapter addresses institutional linkages with government agencies and other donor groups working in WS&S development at the various levels (primarily central and *kabupaten*) at which project operations take place. In the project proposals, close coordination between project staff and activities and Government agencies and Indonesian NGOs was encouraged. CARE has also made some efforts to liaise with other major donor institutions working in the sector such as World Bank, UNDP, AIDAB, and UNICEF.

Institutional linkages and policy impacts are important to ensuring the sustainability of CARE's efforts, both in terms of supporting communities where CARE has already provided technical assistance (and where systems now built must be maintained over the long term), as well as identifying new communities which are appropriate for and willing to self-finance the development of their own improved WS&S systems.

3.5.1 Coordination with Government Counterparts

CARE coordinates its WS&S development activities through a variety of formal and informal meetings with government counterpart staff at the national, regional, and district levels, including periodic meetings to report project status, planning and site selection meetings, joint training activities, and presentation of informational workshops.

Coordination with government agencies at the national level is mainly through the Directorate General of Regional Development (BANGDA) which is CARE's main counterpart. At the regional level, the counterpart is BAPPEDA (Regional Development Planning Board), through BANGDA at the provincial (Tingkat I) and district (Tingkat II) levels. However, the central-level project agreement (between BANGDA and CIIHQ) is not automatically followed by all CARE Field Offices. For example, in West Java, the current counterpart organization is the Bureau for Social Affairs (a unit of the Governor's Office). Through and together with these local counterparts, additional coordination and collaboration efforts are made with other government agencies such as Cipta Karya (in the Ministry of Public Works) and Dinas Kesehatan (in the Department of Health). These efforts are pursued bilaterally as well as multilaterally through the routine local development coordination meeting (RAKORBANG).

CARE made a wise choice in specifically including four Cipta Karya staff and one representative from Departemen Kesehatan on this evaluation, enabling those staff to gain a better understanding of CARE's activities in the sector, and acting as dissemination vehicles for CARE's approach to their own staff. Nevertheless, some government officials have expressed concern about what they feel to be insufficient coordination with CARE activities. Some complaints are a result of insufficient information disseminated by CARE about its field activities. This could be relatively easily resolved if CARE were to make certain that its quarterly project reports (which are regularly provided to a certain GOI audience) were more widely circulated among



the various government formal and informal counterpart agencies, perhaps in a less detailed but more accessible format than currently used.

Considerable input to WASHES activities was provided by GOI funds for materials and equipment (M&E) through CARE's provincial GOI counterparts. While this helped offset the cost of the water systems for communities, there were two problems associated with it. First, the GOI or provincial government obligated M&E funds for a specific community for a given fiscal year. As the WASHES approach evolved more toward stronger community management and resource mobilization, the community preparation phase (i.e., pre-construction) naturally took longer (a year or more in many cases). This created difficulty in promptly expending GOI's or provincial government M&E budget line item, so that CARE was pressured to accelerate project implementation, and sometimes community preparation suffered accordingly.

The second problem was that total M&E budgets were based on a fixed estimated cost per site. As the level of community self-financing increased toward the end of WASHES-II, CARE was simply not expending enough M&E money per site, making it difficult for GOI or provincial government to expend its budget line item.

In general, CARE has had more success coordinating its activities with GOI agencies on the provincial and district rather than national levels. It is also at this level where CARE has had most interaction with other donor groups working in the sector. For instance, on Lombok (NTB), besides GOI agencies, CARE staff also meet occasionally with UNICEF, AIDAB, and PLAN International project staff. As there are so many players in WS&S development on Lombok, this informal coordination helps coordinate future site planning and minimize otherwise redundant project efforts.

To help formalize these and further linkages, CIIHQ project staff should work with their designated counterpart, the Ministry of Home Affairs, as well as with the other two agencies which are of greatest importance in CARE's water and sanitation development efforts, the Ministry of Public Works/Cipta Karya and the Ministry of Health. Both of these agencies should be encouraged to issue directives to their provincial-level staff to formalize contacts with CARE Field Offices. This would establish formal linkage at the provincial level with these two important ministries.

The issue of coordination is even more important now that the WASHES Project is formally completed, and the question has arisen as to what public and private agencies (including both local and international NGOs) are capable of and appropriate for taking over CARE's support roles. The problem of potentially having to coordinate multiple inputs from different support organizations brings further into question how (or whether) technical assistance will continue to be provided both to communities where CARE has already provided technical assistance, as well as to new communities to which the WS&S self-financing program might be expanded.

In general, the higher the status (i.e., recognition of a project's value by central government authorities) of a development project, the more attention other government agencies pay to it and, consequently, the easier the interagency coordination. This status



does not depend solely on the objectives and success of the project locally, but on recognition by the central government as well. If a development project receives high recognition, even though its impact may not be particularly significant, the central government may issue a special order to establish a so-called operational working group (or POKJANAL). This order is a joint instruction by the related Ministers to relevant government agencies within those ministries at the provincial, *kabupaten*, and *kecamatan* (subdistrict) levels. In the past, a POKJANAL was decreed for the promotion of the village integrated health service (Posyandu) which established a mechanism for coordinating a number of ministries including Health, Home Affairs, Religion, Information, Education, and the Family Planning Board. Although establishing a POKJANAL does not necessarily ensure good coordination between the various participating agencies, this recognition symbolically stresses the importance of the program, thereby reinforcing the commitment of government agencies involved.

A POKJANAL for WS&S has not yet been established, so that the many WS&S sector development activities in Indonesia do not have the symbolic significance which they might otherwise have had. In lieu of this national-level recognition, perhaps a special directive from the Governor to all government agencies under the provincial administration could be devised to have a similar impact at the provincial level. The experience of CARE's Village Primary Health Care (VPHC) project casts some light on this proposal. Prior to the establishment of the POKJANAL to support Posyandu, each CARE Field Office had made use of similar existing directives by provincial Governors to support inter-ministerial efforts for this purpose.

CARE has increased its efforts to disseminate the results of projects such as WASHES to other donor agencies. There are clear indications that CARE's approach to WS&S development has had some impact upon sector development policy both by the GOI as well as by other major donors. At the direction of Repelita VI, Cipta Karya has begun to include community participation as a component in its water development activities. The inclusion of Cipta Karya staff in this evaluation has provided a reality check in terms of the opportunities and constraints involved in helping communities to assume responsibility for developing their own systems.



3.5.2 Coordination with Other Major Groups and PVOs/NGOs

CARE meetings with other WS&S development groups have been fairly ad hoc to this point. In order to promote CARE's approach (and act as an information source on both the advantages *and disadvantages* of the community management and self-financing approach), CARE staff should make an effort to establish regular (perhaps quarterly, at minimum semi-annually) meetings at both national and regional levels with these groups. Another way to disseminate the results of CARE's experience with this approach is to co-sponsor a national level conference on sustainable WS&S development. Possible co-funding could be made available from the World Bank Regional Water Supply and Sanitation Group (RWSG, now based in Jakarta), UNICEF, UNDP, AIDAB, USAID, GTZ, and other major bilateral donors such as the Dutch and Japanese.

In addition to increasing its informal contacts with agencies such as UNICEF, UNDP, the World Bank, and AIDAB, CARE has become involved in providing technical assistance for project design either indirectly (through former CARE WS&S project staff as consultants on project design missions) or possibly even directly as subcontractors on project preparation activities such as that for the World Bank project on Water Supply and Sanitation for Poor Communities. CARE staff have initiated contact with the Water Supply Division of the Asian Development Bank in Manila, and the Water Supply Division of the World Bank in Washington, DC. Since both of these agencies will have major impacts upon rural water supply and sanitation development in Indonesia, these types of contacts need to be encouraged if CARE wants to increase the policy impact of its WS&S development experiences.

Thus far, the private sector plays a fairly limited role in community-managed WS&S systems. Private contractors build most of PW/Cipta Karya's systems through competitive bidding. In addition, private contractors provide some degree of repair services. Other possibilities for future consideration might include O&M contracts, and water vendors building their own systems for direct water sales to users.

One area where CARE has made little progress is in addressing the lack of any significant coordination with any Indonesian PVOs (IPVOs). This was specified in the project proposal as an activity which would be pursued under WASHES³⁰. Opportunities appear to exist with organizations such as Dian Desa (based in Yogyakarta) and LP2SD (based in Lombok³¹), both of whom have experience in WS&S development. Cultivating relationships with such organizations would further strengthen the ability of indigenous organizations to carry on CARE's approach after CSFW is completed.

³⁰ A draft CARE strategy for developing better working relationships with IPVOs has been developed but not yet finalized and implemented.

³¹ LP2SD is involved in open well construction and rehabilitation (every 10 families get one well) in Lombok Timur.



There are plans to shut down the WJ Field Office after the completion of CSFW, and CIIHQ is discussing the possibility of assisting the staff there in forming an NGO. This idea should be carefully reviewed and supported if possible. Given the demonstrated high level of technical and managerial competence within the existing office staff, any opportunity to continue their work in WS&S system development should be supported where policy and funding permit.



3.6 PROGRESS TOWARD INTERMEDIATE GOALS AND ACTIVITY TARGETS

This chapter reviews project accomplishments relative to the Intermediate Goals (IG) defined in the Project Implementation Reviews (PIR) and proposals. Five IGs were defined in the WASHES-I project document (1986). Five different IGs were defined in the WASHES-II document (1988). WASHES-I IGs focus more on construction and use of facilities, whereas in WASHES-II, they focus on community system financing and management.

3.6.1 Intermediate Goals for WASHES-I

Intermediate Goal #1: Adequate supply of clean water provided.

The Project Activity Target (PAT) was to construct: 43 gravity-flow piped systems; 750 handpumps; and 8 rainwater catchments. One hundred eighteen gravity-flow piped systems were constructed for both WASHES-I/II between 1986 and 1990. Three hundred twenty-six handpumps were installed at 17 sites, and 1,758 rainwater catchment containers were constructed at 61 sites, not including sites where systems were not fully completed.

Intermediate Goal #2: Water facilities are regularly used.

In virtually all communities where the water facilities are working properly, they are used by community members. However, some people may continue to also use traditional water sources (i.e., the river or dug wells in cases where the water debit is small, or where dug wells are closer to the family dwelling than communal water facilities).

Intermediate Goal #3: Sanitation facilities are regularly used.

The PAT was the construction of 1,820 latrines. A total of 9,425 latrines were constructed in CARE-assisted villages, but not all of these were necessarily constructed with CARE assistance. The evaluation team collected information on latrine usage both through observation and community interviews. Observations suggested that almost all of the functioning communal and individual latrines were in use, but it was methodologically very difficult to collect data on the percentage of the community actually using the latrines.

Intermediate Goal #4: Drinking water properly utilized.

Proper utilization of drinking water includes both proper transport and storage at the household level. Boiling water prior to drinking has also been advised by MOH and CARE. Observation of water transport and storage containers at sites visited suggest that the cleanliness of such containers varies considerably. In many places, they are neither sufficiently clean nor properly covered during household storage. It is very difficult to get reliable data on water boiling practices. It appears that many EJ people boil their water, while this practice is less common in WJ, and practically nonexistent in NTB.



Intermediate Goal #5: Self-sustaining mechanisms for the operation and maintenance of installed WS&S facilities are established.

This was accomplished to varying degrees at different project sites. In many communities, designated water committee members were trained in O&M, and carry out O&M functions to a greater or lesser degree. In some communities, no mechanism for O&M has been established. In addition to the five IGs, three additional PATs were defined--two related to collaboration with the GOI and with IPVOs, and one related to efforts to influence GOI policy development.

PAT: To develop a training program for GOI and IPVO personnel in the planning and implementation of community WS&S projects.

Efforts were not explicitly made to develop such a training program. This activity is planned in the context of the CSFW project.

PAT: To develop collaboration between CARE and IPVOs to implement community water projects.

Very little was done to develop such collaboration. This activity should be seriously pursued in CSFW.

3.6.2 Intermediate Goals for WASHES-II

Each IG has several quantitative indicators of achievement. In most cases, it was impossible to obtain precise quantitative data relative to each of these indicators. Based on site visit observations and interviews, general conclusions relative to each indicator are given.

Intermediate Goal #1: Improved community organization and management of their water and sanitation projects before and during the physical construction of the facilities.

Indicator: Number of functioning committees for the construction of the WS&S facilities at each project site.

During the construction of the WS&S facilities, 100 percent of the communities had functioning water committees.

Indicator: Collection of local materials and cash from the community by committees, and the committee members know their tasks and maintains proper records.

At 100 percent of the sites, communities contributed materials and cash toward construction costs. One hundred seventy-five (175) out of 202 communities assisted under WASHES contributed some cash, but contribution amounts varied. In many cases, committee members knew their assigned tasks. However, for Sanitation and Health Sections of the committee (which existed in some but not all committees), their understanding of their task was often weak. This is probably due to the fact that



sanitation and hygiene education was not of priority importance in the project documents and implementation plans.

Indicator: Appropriate bookkeeping procedures are followed by the committee for: cash transactions, deliveries, and usage of materials maintained by the committee.

The bookkeeping procedures vary considerably between the sites, from very carefully kept records to no records at all.

Indicator: Bank accounts are kept.

In the WASHES project, the use of bank accounts was encouraged to a very limited degree. Very few communities opened and kept bank accounts. In part, this was also due to the relative lack of accessibility to banks by rural people. Banks have only recently begun to open in areas outside the principal cities and towns.

Intermediate Goal #2: Maximum community inputs generated at CARE-assisted WS&S project sites.

Indicator: More than 75 percent of participating communities have contributed at least 50 percent of capital costs of the constructed WS&S system.

The percentage of community contribution increased progressively between 1988 and 1991 as the project gave increasing emphasis to community inputs. Initially, the community contribution was mainly in labor and local materials. In later sites, cash contributions were also made. However, it did not reach the 50 percent target in 75 percent of the communities. Where in-kind costs are included, the contribution of communities is probably inflated due to the methodology used to calculate the community contribution in labor.³² Seventy (70) out of 202 communities assisted under WASHES contributed at least 50 percent of the total cash and in-kind cost. Forty (40) of those 202 communities contributed at least 50 percent of total costs when only cash is counted.

³² For example, CARE did not use actual costs incurred by communities or some fixed hourly cost for skilled and unskilled labor to calculate the value of community labor contributions, mostly because the total labor cost so calculated would be very difficult to determine with any accuracy. Rather, they used a fixed cost per meter of pipeline laid (a standard value used by Cipta Karya system designers). This value is probably above what the actual cost incurred was, since it assumed laborers were working at a fixed minimum wage (which many people, in reality, don't get paid) as well as including the cost of a highly paid supervisor on-site at all times. Consequently, it is unlikely that the second cost was actually incurred in most cases.



*Intermediate Goal #3: Demonstrated community willingness to use credit to build their own WS&S facilities.*³³

Clearly, all communities where CARE has assisted in the development of systems have demonstrated this willingness by virtue of having built their own WS&S systems.

Intermediate Goal #4: Banks are willing to provide loans for self-financed rural WS&S systems.

Indicator: Decisions are made by selected communities to request bank loans for construction of WS&S facilities, to offer land as collateral, and to submit and receive bank loans.

In the WASHES project, very little effort was made to encourage communities to take out bank loans. In fact, very few communities requested loans and fewer were granted. In cases where loans were granted, collateral was offered in the form of land.

Intermediate Goal #5: Self-sustaining mechanisms for operation and maintenance of installed facilities established and functioning at all project sites.

Indicator: A user fee collection system is established by the community. A committee is established and trained to manage user fee funds.

In most communities, user fees were established. Communities were trained to variable extents with varying degrees of success to appropriately collect and manage their user fees.

Indicator: Less than 10 percent delinquency rate on user fees one year after system completion.

In most of the sites visited, user fees are being paid regularly--most frequently on a monthly basis, but, in other cases, on a biannual or annual basis.

Indicator: Proper records and basic accounting procedures are maintained by water committee for collection and use of user fees.

Record keeping varies considerably from one community to another, from no financial records at all to very well kept records.

³³ These and most other financially focused goal indicators were apparently inserted into the project documentation as a contingency in the event that the CSFW project was not funded. Since it was funded, WASHES did not need to focus so heavily on the self-financing aspects.



Indicator: Local village technicians are appointed, trained, and have a clearly defined role for O&M.

In most cases, the communities have a village technician who has been trained in O&M and who is making basic system repairs. The amount of preventive maintenance being done is minimal.

Indicator: Village technicians are remunerated for their services.

Generally, village technicians are not remunerated for services.

Indicator: Technical problems of the water system are promptly and independently solved by the community.

In most cases, minor technical problems of the water system are successfully dealt with by the community. When large repairs are required, communities are sometimes not able to deal with them and look outside the community to CARE or the GOI for assistance.



3.7 PROJECT MANAGEMENT AND IMPLEMENTATION

This chapter summarizes evaluation findings related to management structure, operations, planning and monitoring of project activities, and human resources development and training.

3.7.1 Project Management Structure

To review the efficiency and effectiveness of CARE's management structure for the project, a brief description of the two major divisions of CIIHQ's management structure is necessary. One is geographical, based on provincial Field Offices, and the other is project-oriented, across all Field Offices. The first divisional structure is composed of (from the top down) the CARE Country Director (CD) and the Deputy Country Director (DCD), both based in Jakarta, then the three Field Office Chief Representatives (CR), and finally the Assistant Chief Representatives (ACR) in each CARE provincial Field Office.

Field Offices typically have from two to four projects being implemented at any given time. The project-oriented management structure is headed by each project's Project Coordinator (PC), one or more Assistant Project Coordinators (APC, of which there were two and will soon be three WS&S projects) all Jakarta-based. In each Field Office where the project is implemented, project activities are headed by the Project Manager (PM), assisted by one or more Project Officers (PO), who each manage three or more Field Officers (FO). This structure would seem to work fairly well, with considerable constructive interplay observed between all levels of project and management staff.

While this is a reasonable management structure in principle, and job descriptions exist for personnel at each level, in practice, individual roles and responsibilities somewhat overlap both within Field Offices as well as between individual Field Offices and the water project Management and Support Team (or MST, consisting of the PC and APCs) based in Jakarta. Within Field Offices, the degree of overlap varies from one Field Office to another, but is particularly apparent where former technical staff who once worked directly with the water and sanitation projects have assumed senior management roles in the Field Offices. While it is natural (and often quite helpful) that their personal involvement and long experience with the project would increase their interest in helping it progress further by providing direct technical and management assistance, the effect has sometimes been micro-management of project activities--in some cases, usurping certain responsibilities of project-specific personnel (especially PMs).

The other major area of overlap (if not in theory, at least in practice) is between the MST and the Field Office-based project and management staff. In the Field Offices, the feeling exists that their day-to-day familiarity with project operations, in direct contact with beneficiary communities, and experience with what works and what doesn't in the project approach better qualifies them to assess planned changes in project direction than the MST. Changes in personnel at the PC level (there have been three



PCs since the project began) has dramatically changed the project's focus from almost purely construction to community participation and resource mobilization, to what now appears to be a more balanced approach emphasizing community management, resource mobilization, supervised construction, operation and maintenance, and hygiene and sanitation. The field staff have received directives from Jakarta dramatically changing the focus of their activities three times, without (as they see it) consulting them first.

From the MST side, their experience in routinely dealing with project management in all Field Offices reveals regional differences in the implementation approach, and helps them develop recommendations for improving components of the overall approach within each Field Office. Field Office staff see this as top-down management, the antithesis of CARE's community-oriented development approach. The MST feels that they are providing necessary and helpful technical assistance to help improve project performance in each region (and indeed we feel that they are). In short, most field staff seem to feel that the project is being managed top-down (except from their level down). Since this is a recurrent theme from past evaluations, CARE senior management staff (both provincial and central) need to discuss these issues directly, review existing job descriptions, modify them if necessary to minimize overlapping responsibilities, and ensure that the project is implemented accordingly.

3.7.2 Day-to-Day Operations

Field Officers are the front line of the CARE community management approach to WS&S development. Their wide-ranging responsibilities include community training (for organization, management, resource mobilization, hygiene and sanitation, and construction), engineering surveys, system design, construction supervision, negotiation, community organization, and performing whatever tasks are necessary to prepare communities and get systems built. In the past, they were required by their supervisors to be goal-oriented in installing water systems which, overall, they have done well.

As the project focus changed, FO roles evolved from being construction-oriented, to being community motivators for resource mobilization, to now being given responsibility for implementing hygiene and sanitation training programs. Their responsibilities have expanded to be too comprehensive for the time available. They would prefer to do what they do well, which in most cases is construction. They express reluctance to take on what they perceive to be the most difficult (and in their opinion, unnecessary) task of resource mobilization, especially for 100 percent self-financing (under CSFW). Coupled with the resurgent expectation for training villagers in health and hygiene, their morale in many cases appears to be decreasing. In some Field Offices, FOs have begun to spend less time in the field where their active and ongoing presence is absolutely necessary for the project to succeed.



The concept of an FO team has been discussed in previous assessments³². This approach might consist of encouraging FOs to develop specialist areas of expertise and interest for which they would serve as a resource to other FOs. To some extent, this is already done. For example, in Lombok, one FO (on a rotating basis) is designated as the primary system designer. He is responsible for assisting all other FOs there in developing and drafting the initial water system design, which is then submitted for approval to the PO and the PM. In other regional offices, certain FOs have developed expertise in surveying and are used by other FOs to assist them with that task.

It is not difficult to imagine extending this idea to include all areas of required expertise, including hygiene and sanitation, resource mobilization, and construction supervision. In this concept, all FOs would be expected to develop skills in all of the required technical areas, but would be encouraged to specialize in one area. One obvious shortcoming is that it assumes that at least one FO in each regional office would develop special competence in each of the required technical areas. Thus far, FOs tend to shy away from what they perceive to be the more difficult areas of resource mobilization and hygiene/sanitation. There also appears to be a gender-based expectation (both among the FOs and senior managers) regarding who will handle which areas (men in construction, women in hygiene and sanitation). FOs should be encouraged to specialize in the technical area they are good at and interested in, as long as a way can be devised to make sure all areas are covered.

3.7.3 Planning and Monitoring Project Operations

While activity planning procedures vary somewhat from one region to the next, PMs typically have weekly staff meetings with POs and FOs to discuss status of sites, resolve outstanding problems, and plan FO activities for the upcoming week. FOs apparently prefer weekly planning to monthly planning due to the difficulty of scheduling that far in advance asks which depend upon community involvement. Nonetheless, during monthly meetings, monthly schedules of activities by sites are developed, and training requested by FOs or needs identified by the PO/PM for specific tasks often takes place. Monthly site status reports are written on forms developed for that purpose, on which activities completed during the previous month, next month's priority activities, and any problems worth noting are listed.

The use of site logs (including all visits by project staff, activities undertaken) should be initiated in every CARE-assisted community. This is necessary to assess the usefulness of CARE's TA and the project approach, and to identify any major problems which might affect CARE's approach to assisting future communities. As it is now, it is very difficult to find out what has and has not taken place in terms of training implemented, status of resource mobilization, and status of construction. To some

³² *Mid-Term Evaluation of CARE/Indonesia's Community Self-Financing of Water Supply and Sanitation Systems Project*, R. McGowan, D. Rahardjo, and N. Ritchie, CARE/Indonesia, Jakarta, June 1991.



extent, Fact Sheets (which are kept on most but not all sites) have some of this information. The information contained in the Fact Sheets varies from region to region. They should be standardized and should contain a checklist of all major project activities undertaken, with dates of initiation and completion.

While not strictly a part of WASHES, but rather the CSFW project, CARE's WS&S project planning has been considerably refined to include the development of a strategic plan. This plan identifies a vision statement for the project, develops unit goals and subunit objectives, specifies performance standards against which to measure the achievement of those goals and objectives, identifies required tasks to meet those goals and objectives, and develops associated workplans and job descriptions of staff needed to undertake the project as defined. Since this is a recent development, its usefulness has yet to be determined, but it appears to be a significant step in the right direction.

The CARE-Assisted Water Sites (CAWS) Survey is another tool developed with CARE to monitor the progress and accomplishments of its WS&S development efforts. This survey gathers quantitative data on virtually all sites where CARE has implemented WS&S activities. It may be very worthwhile to invest additional resources in the analysis of this data to determine whether any lessons can be drawn from it. An example of the usefulness of CAWS data is shown on the following page. The significant GOI contribution (\$581,708) to the project in the form of M&E is a good indicator of the strong GOI support for CARE's WS&S projects and their innovative implementation approach. Also note that the per capita installed cost of CARE's systems (including all project support costs such as Personnel and Operations) is about \$14 per user. Average values for such systems are more typically \$20-\$25 per person in developing countries.

3.7.4 Human Resources Development and Training

During WASHES and its predecessor projects, CARE has undertaken a wide variety of training activities (both formal seminars/courses and on-the-job training, or OJT) for project staff and beneficiary communities covering virtually all areas in which CARE provides technical assistance. Early WASHES sites received training focusing almost exclusively on community organization and construction. Later sites received training which reflected the evolving focus of project activities in resource mobilization and financial management. Hygiene and sanitation training has been minimal thus far. Training has consisted of both OJT, usually for FOs by their PO or PM, as well as formal classes, especially in regional workshops, held periodically for all water and sanitation project staff. Loosely defined in the early stages of the project, community training became more formalized with the development of the Training Module series in mid-1990. As yet, the Training Modules are apparently not used on any significant or regular basis by FOs, although they are being encouraged to do so.

There have been two training needs assessments for CARE project staff undertaken since 1989, with some modicum of follow-up. Given the large number of new WS&S staff (both as a result of periodic staff turnover and upgrading the Bima Field Office), and since CSFW has two to three years remaining in its project life, it would be helpful to repeat this exercise by doing needs assessments (especially focusing



on FOs) carefully tailored to job descriptions and tasks defined in the MST Strategic Plan.

Follow-up CARE staff training should take advantage of both in-house and external training opportunities. GOI agencies, especially PW/Cipta Karya and Dinkes, offer technical and management training courses for their staff. After discussions with CARE, PW/Cipta Karya has invited them to participate in future training. Due to the high level of technical expertise and experience, CARE should try to participate not only as trainees but also as trainers for the courses. This would be mutually beneficial for both parties, since it would help CARE staff hone their training skills for higher-level audiences, as well as increase their credibility and stature in the WS&S sector in Indonesia. CARE would do well to approach MOH and BANGDES about possible joint training activities in SHE education and community management/participation as well.



WATER SYSTEM COSTS BY SOURCE AND TYPE

(US DOLLAR)

F/86-FY83

SITES LOCATED IN WEST JAVA, EAST JAVA, NUSA TENGGARA BARAT AND NORTH SUMATRA

DATA SOURCE

FY COMPL	(FIELD OFFICE DATA)	(FIELD OFFICE DATA)	COST FP M&E	COST PER SITE	(FIELD OFFICE DATA)	(FIELD OFFICE DATA)	(FIELD OFFICE DATA)	(FIELD OFFICE DATA)	(FIELD OFFICE DATA)	(EXPENDITURE ANALYSIS REPORT)	TOTAL M&E PLUS	TOTAL WITHOUT COMMUNITY
	POP SERVED	# OF SITES			CARE CONTR	COMMUN CONTR M&E PLUS	GOVT CONTR M&E	TOTAL M&E (+ COMM)	TOTAL P&O			
83	59,788	45	\$10	\$13,058	\$27,471	\$100,822	\$159,259	\$597,590	\$268,108	\$975,700	\$704,978	
84	71,653	55	\$7	\$5,209	\$244,002	\$182,529	\$104,800	\$511,444	\$234,526	\$845,970	\$662,401	
85	53,567	31	\$3	\$16,350	\$702,575	\$198,868	\$105,422	\$506,856	\$230,341	\$840,206	\$641,009	
86	36,591	25	\$11	\$16,655	\$82,372	\$254,566	\$69,732	\$416,370	\$272,400	\$688,800	4-24,204	
87	85,050	51	\$8	\$12,905	\$159,595	\$292,009	\$122,652	\$574,256	\$221,729	\$870,924	\$511,016	
TOTALS	306,649	207			\$912,015	\$1,185,733	\$591,728	\$2,590,425	\$1,550,174	\$4,230,600	\$3,044,967	

COST PER PERSON FOR M&E + P&O + COMMUNITY CONTRIBUTION (CASH + INKIND)

\$13.73

COST PER PERSON FOR M&E + P&O EXCLUDING COMM CONTR (CASH + INKIND)

\$9.50

COST PER PERSON FOR M&E + COMM CONTR (CASH + INKIND) EXCLUDING P&O

\$8.73

COST PER PERSON FOR M&E EXCLUDING COMM CONTR (CASH + INKIND) + P&O

\$4.67

* M&E MEANS MATERIALS AND EQUIPMENT USED TO CONSTRUCT THE WATER SYSTEM
 ** P&O MEANS ALL OF THE PERSONNEL AND OPERATIONS COSTS INVOLVED IN IMPLEMENTATING, ADMINISTERING AND MANAGING THIS RURAL WATER SUPPLY PROJECT
 *** COMM CONTR (CASH + INKIND) MEANS CONTRIBUTION OF THE RECIPIENT COMMUNITY TO THE CONSTRUCTION OF THEIR WATER SUPPLY SYSTEM. THIS INCLUDES ESTIMATED COSTS FOR LABOUR AND LOCAL MATERIALS (SAND, BRICKS, ETC.) AS WELL AS CASH CONTRIBUTIONS OR THE CASH VALUE OF MATERIALS WHICH THE COMMUNITY PURCHASED
 **** SITE MEANS A COMMUNITY WHERE A CARE ASSISTED WATER SYSTEM WAS CONSTRUCTED AND COULD BE AN ENTIRE VILLAGE OR PART OF A VILLAGE
 ***** TECHNOLOGIES EMPLOYED WERE GRAVITY FLOW PIPE SYSTEMS, RAINWATER CATCHMENTS, HANDPUMPS AND HYDRAMS



One training problem identified during the evaluation was that older WASHES communities did not receive the level of training that is planned for CSFW communities, especially in the areas of financial management, O&M, and SHE, since these areas were not emphasized during the earlier days of WASHES. To maximize the benefits of ongoing CSFW community training, BPAB/HIPPAM members from old WASHES communities should be encouraged to participate in new training opportunities (or just refresher courses) help under CSFW in nearby villages wherever possible.

In 1990, WASHES senior management decided to take advantage of the joint experience of WASHES field staff and involve all Field Offices in the development of a detailed flow chart of the community project cycle activities. In addition, they developed modules for "task-specific training" corresponding to each of the initially developed 86 steps included in the flow chart. The training modules³³ are intended to be used by FOs for direct community training. The development of the flowchart and modules took more than one year. Ultimately, 86 modules were produced which have already undergone several revisions.

This effort to systematize the project cycle activities and to develop standardize task-specific training modules were an excellent initiative by CARE senior management, and the products of this work are generally sound. After reviewing the flowchart and modules, the most obvious observation is that the flowchart is extremely detailed. While that level of detail is no doubt useful for management decision making, it may well intimidate some FOs to the point where it is not used in community training. The Training Modules themselves are quite extensive, and are used by some FOs in some cases, but not extensively.

One general weakness in the overall task-specific Training Module strategy is that, in some areas (e.g., health and sanitation), there appears to have been limited training of the FOs on the content of the modules and developing the training skills necessary to facilitate each of the modules³⁴. It was envisioned that, prior to using the modules, FOs would review and revise them with the assistance of their supervisors, but this does not appear to have happened as planned. FOs need to be given more training on the content areas covered in the modules, especially those in the more recently included topics such as sanitation and hygiene education, and involving women in WS&S activities. The system for reviewing and revising the modules prior to the more widespread use by FOs needs to be more clearly defined.

³³ The training modules were developed in part to standardize among the different training manuals used in each of the Field Offices.

³⁴ FOs were also in need of some additional tools to implement the training modules, such as completed health and hygiene development strategy (now approaching completion by CIIHQ) or dissemination tools (e.g., simple handbooks or handouts on construction or bookkeeping for village water committees' use).



3.7.5 Project Staffing

Over the last six months, the project has become nearly fully staffed (there is a full complement of CR, ACR, PM, and PO in the regional office, and the full complement of PC, two APCs, and the third Technical APC is expected to arrive in late November). There has been a fairly high turnover in certain Field Offices, and this may continue over the near term, particularly on Lombok. The project office in Bima will be upgraded to a fully staffed Field Office within the month, and there are plans to hire more FOs in Lombok. Due to current hiring policy, all of these new FOs will be women to better balance the gender mix of field staff. Prior to 1991, all FOs were males. In 1991, a decision was made by CARE senior management to begin aggressively recruiting female FOs as one means of increasing project contact with women at the community level. All three (of the soon to be four) Field Offices have recruited female FOs, but all the NTB female FOs are now operating out of the Bima office. The Lombok office needs to make further efforts to recruit female FOs to follow this policy.

Impressions of the female FOs interviewed suggest that they have been well accepted into the FO teams in each province, that they have useful insight into how village women's involvement in WS&S activities can be increased, and that they are determined to take responsibility for all aspects of WS&S project implementation, including construction. However, it appears that there is a higher turnover rate for female FOs (based on anecdotal evidence). If this is in fact the case, CARE needs to identify the reason(s) for this high turnover, and take measures to minimize it³⁵. For example, female FOs could be assigned responsibility for less remote communities, or avoid sites where community cultural or religious attitudes present particular obstacles to using single women as extension workers. This should only be done in cases where the ability of female FOs to carry out their multiple responsibilities would be obviously impeded otherwise.

Bringing on the new Technical APC to complete the MST provides a good opportunity for CARE to review the roles and responsibilities of the MST, and to identify new ways in which the MST can increase the quality of its technical and management support to the Field Offices implementing the project. Besides technically backstopping Field Offices as the need arises, this person could also

- work with Field Office technical staff to assess which of a variety of component designs work best (and help standardize those designs across all field offices);
- participate in technical training for both new and old FOs and POs; and
- liaise with technical staff from GOI agencies such as Cipta Karya and Dines Kesehatan (the value of technical liaison with agency staff was quite clear during this evaluation).

³⁵ It may be helpful to review SRCD's experience with female FOs.

3.7.6 Site Selection

CARE coordinates site selection with the standard provincial GOI process which, in theory, proceeds as follows. The community-level LKMD reviews and prioritizes various community requests for development assistance. If technical assistance in water supply is accorded a high priority, a request is forwarded to the *kecamatan*. If approved there, it is forwarded to the *kabupaten*. The Coordinating Committee then prioritizes all site requests from the communities within the *kabupaten*, and develops a set of sites from which CARE draws its "bank of sites". Unlike WJ, where the list of proposed sites to CARE is largely decided by the Committee, in EJ and NTB negotiation then takes place between CARE and the Committee members over sites for which CARE will assume responsibility. In addition, CARE has developed its own site selection process, the latest incarnation of which is the NEEDS (No Easy Desas) site selection process. NEEDS uses a certain set of parameters (e.g., water scarcity, disease incidence, population density) to pick sites. These parameters are formulated with the intention of reducing the incidence of communities chosen for other than those reasons³⁶.

In the past, while some sites met official CARE site selection criteria, others which did not were still accepted based on special requests by the Coordinating Committee. Site selection is the one area where CARE does coordinate closely with GOI. Site selection has become somewhat less flexible under CSFW than under WASHES, because of the greater difficulty in identifying communities willing to extensively mobilize their own resources. Due to the much longer completion time (typically two to three years start to finish) for a community WS&S system due to the need to mobilize greater community resources under CSFW, CARE needs to carefully consider the number of sites where project activities will commence over the next two years, to leave ample time to complete systems (without massive injection funding) prior to CSFW project termination.

There are distinct regional differences in the distribution of CARE sites. In WJ, at any one time, CARE has worked in as many as 10 *kabupatens* all over the province. This has obvious implications for the level of logistical support required from CARE, with implications for the effectiveness and efficiency of CARE/WJ project operations. In EJ, where all CARE-assisted sites were clustered into just one *kabupaten*, the opposite was true. Transportation time for both personnel and equipment was greatly reduced, and there was considerably more interaction between communities where CARE worked and those which then requested technical assistance from CARE to work at their sites. In NTB, CARE also worked in every *kabupaten* on Lombok and Sumbawa.

A large part of the effort CARE invests in organizing a community has to do with first familiarizing the community with the project's goals, and then convincing the candidate community to accept the implementation approach focusing on community resource mobilization. When sites are more densely clustered such as in Pacitan, the likelihood of neighboring communities familiarizing themselves with the project goals

³⁶ For example, on the basis of political ties to influential persons.



and approach through their direct contact with a beneficiary community greatly reduces the amount of effort required by CARE to work in that second community, and should be taken advantage of as much as possible. In the future, it is therefore recommended that CARE focus its technical assistance in as few *kabupatens* as possible in a given province. This site selection strategy would in all likelihood increase both the efficiency of use of project personnel and transportation, as well as increase the effectiveness of project inputs by increasing awareness of CARE's work in a given area.

A second way CARE could increase efficiency and effectiveness of its project inputs is to, wherever possible, choose water and sanitation project sites to coincide with sites where its Village Primary Health Care project is also active. The opportunities for doing so vary somewhat by province. For example, VPHC is only active in one *kecamatan* in both NTB and WJ. This considerably narrows the opportunities for coinciding sites. In EJ, VPHC works in two *kecamatans*, so the opportunities are somewhat greater. To extend this, Phase Two of VPHC might choose only *kecamatans* and *kabupatens* which coincide with those where CSFW activities are implemented.



PART FOUR - RECOMMENDATIONS AND LESSONS LEARNED

This chapter summarizes recommendations and lessons learned based on the findings, discussion, and conclusions in Part Three. Each of the sections given below is divided into four subsections each, focusing on: 1) community participation and management; 2) engineering design, construction, operation and maintenance; 3) hygiene and sanitation education; and 4) project management and implementation.

4.1 RECOMMENDATIONS

CARE has made significant achievements in helping rural communities develop their own water supply and (to a lesser extent) sanitation systems under sometimes difficult working conditions. These recommendations are intended to further improve the quality of CARE's technical assistance and support of community-based WS&S development.

4.1.1 Community Participation and Management

Socio-cultural/economic differences among the three WASHES provincial sites are evident, so it is inappropriate to generalize about project success among the three provinces in terms of staffing, planning, implementation, and training. Exposure to GOI development programs came much later to NTB than to either WJ or EJ, which accounts in part for the greater extent of project interventions in WJ/EJ. In addition, the less socially stratified the community, the stronger the feeling of social solidarity, and the greater the familiarity with collective voluntary action, the greater the likelihood of successful community mobilization to achieve common goals such as developing community water and sanitation systems³⁷.

In general, CARE's community participation approach has been successful. A very encouraging sign was that, in several cases, CARE-assisted communities were able to successfully help neighboring communities develop *their* own systems, with little or no direct assistance from CARE. Based on findings discussed in Section 3.1, to further increase the sustainability of CARE's WS&S interventions, the following recommendations should be implemented:

- ***Socioeconomic Training***--The stress on construction activities has diverted FOs' attention away from the need to take into account site-specific socio-cultural/economic conditions that are the basis for successful community development. To increase their awareness of the opportunities and constraints dictated by such conditions, FOs would benefit from task-specific training focusing on applied rural sociology and women in

³⁷ Nonetheless, CARE achievements in NTB have been significant. For example, CARE-assisted WS&S activities in NTB amount to nearly 15 percent of Repelita VI targets for the entire province.

development. This will help FOs better implement the "working through leaders " strategy by better identifying key persons in each community. In addition, CARE should recruit one FO in each Field Office with a strong sociology or anthropology background as a resource person for other FOs.

- *Water Committee Membership*--As community participation requires representative community organization, FOs need to better facilitate the inclusion of more broadly representative cross-sections of the community in system management, at least at the Kelompok level.
- *Female FOs*--To overcome problems that some male FOs have when working with women, additional female FOs should be recruited for each Field Office. Consideration should be given to addressing external factors that may affect their activities in the field.
- *Site Visits*--Due to the introverted nature of many community members toward outsiders, FOs should make an effort to spend more time at their prospective WS&S development sites to take advantage of opportunities to become more familiar with and better define wants and needs of people not necessarily represented by community leaders.
- *Roles of Women*--FOs should make consistent efforts to promote the roles of women from the time of first contact with communities. This issue should be stressed in community meetings and training sessions. Efforts should be made to ensure that women are actively involved in management, at least in Kelompoks. FOs should have focus group discussions with Kelompok-level women to determine their perceptions and, together, develop ways to address them. To provide a comfortable environment for women to voice concerns, discussions should be conducted only with women concerned, and without the participation of village leaders, PKK officials, or the water committee.
- *Training Women*--Efforts should be made to include women in all community training sessions. If this is impossible for some reason, separate training should be organized exclusively for women. The aim is to enable women to play active roles in system management, first in their own Kelompok, and then in the village water committee.
- *Collaboration with PKK*--PKK is the official forum for women's activities in the village. Because PKK deals with various women's activities, each Field Office should assess the capabilities of local PKKs, and make every effort to collaborate with them in project activities such as training. Field Offices should advise *kabupaten* PKK offices about major planned activities for women in WS&S.



- *BPAB Workshops*--CARE has supported workshops to bring together representatives from many BPABs to share experiences and develop solutions to common problems about operation, maintenance, and repair of their systems. As available funding permits, CARE should periodically co-sponsor (along with supporting contributions from the BPAB/HIPPAMs themselves) further joint BPAB workshops to encourage cross-pollination of ideas, monitor the progress of systems in CARE-assisted communities, update training (especially in O&M and financial management), and perhaps to assist BPABs outside of EJ to establish an overseeing body with legal status such as the EJ HIPPAM.
- *Staff Training*--CARE FOs need further task-specific training on CP/M strategies and activities which reflect updated CSFW CP/M goals and project expectations. This training should include the development of commonly accepted CP/M performance indicators which reflect CARE's considerable experience in community-oriented development thus far. Consideration should be given to developing guidelines for CP/M (based on existing Training Modules) which incorporate women in development (WID) issues discussed here.

4.1.2 Engineering Design, Construction, Operation, and Maintenance

- *System Design*--While generally sound and conforming to accepted standards, two major (improved drainage and broader installation of sanitation facilities) and a number of relatively minor improvements need to be made. CARE technical staff should review the strengths and weaknesses of their designs based on experiences in all Field Offices, and coupled with a review of Cipta Karya designs and discussion with their colleagues there, standardize designs across all Field Offices. During initial system design, CARE FOs should emphasize to communities where potential system expansion opportunities exist and where they do not, to prevent potential system overloading.
- *Construction*--Construction practices are generally sound. Improving construction supervision and regular inspections of community-based construction to ensure that systems are built as designed would help improve quality control.
- *Drainage*--Drainage is inadequate at many sites, resulting in standing wastewater which is a potential source for breeding and transmission of pathogens. CARE staff must make sure that proper drainage is constructed and regularly maintained at all sites, and that villagers understand the need for and importance of this.



- *Range of Technologies*--Most CARE systems are either gravity-flow systems, rainwater catchment, or handpumps. CARE might consider using a broader range of technologies (rehabilitation of existing open wells or handpumps, or using diesel/wind/solar pumps) in areas where gravity systems are not appropriate, but only if another CARE WS&S project is funded in the future.
- *Operation and Maintenance*--CARE should increase its existing emphasis on community O&M training, work with communities to develop preventive O&M plans, and increase awareness of the need to carry out proper and timely O&M procedures on a regular basis.
- *Water Quality*--As part of its O&M training, CARE should emphasize to communities the importance of annual water quality testing of their source. Samples can be taken by Puskesmas and sent to regional Dines Kesehatan laboratories for analysis, and paid for through user fees.
- *Financial Management*--The wide variety of water user fee assessment, collection, and use practices need not be standardized, but communities need to be more strongly encouraged to collect user fees on some regular basis (e.g., monthly, annually after harvests) to ensure that funds will be available when needed for repairs. For systems to be financially sustainable, good records of all income and expenses must be carefully kept. CARE needs to standardize and broaden its financial management training for communities. Whenever possible, community members from former WASHES sites should be invited to participate in CSFW financial management training.

4.1.3 Sanitation and Hygiene Education

- *SHE Strategy*--The SHE comprehensive strategy drafted by CIIHQ is basically sound, but is based mainly on transfer of messages or information as a means of promoting behavioral change. It should be modified to reflect a community development approach to hygiene education, aiming not only to increase community awareness of problems, but emphasizing strategies to strengthen the capacity of community leaders and groups to organize community actions to improve sanitation and hygiene practices.
- *FOs as Facilitators*--The focus of the FO's work should be with the water committees and other community leaders or "gatekeepers," and not with the community at large. FOs should be facilitators to strengthen the ability of community leaders and institutions to implement their own SHE strategies. FOs should also coordinate all WS&S activities with the health center (Puskesmas) sanitarians.



- **Training Modules**--The integration of the SHE component into a community-level WS&S strategy requires the development of training activities first for FOs, and secondly for communities. Training Modules for FOs covering all basic aspects of SHE should be developed and all FOs should receive this training. Twenty-five (25) SHE community Training Modules exist, but all need to be reviewed/revise to assure that the content level and training methodology are appropriate. Community SHE training should focus on men as well as women, since their sanitation and hygiene beliefs and practices also affect the health of their communities.
- **FO Core Training Program**--A core set of training modules for the training of FOs should be developed, focusing on the main areas of FO responsibilities:
 - Community Preparation,
 - Resource Mobilization,
 - Hygiene and Sanitation,
 - Construction,
 - Operations and Maintenance, and
 - Monitoring & Evaluation.

In addition, modules should be included on

- involving women in water and sanitation activities, and
- community development facilitation skills.

All new FOs should participate in formal training in each of these areas. Older FOs should participate at a minimum in modules no. 3 and 5 through 8, and the others as appropriate. Developing a core training program would involve both synthesizing elements of past training courses and developing additional modules. With each module, simple guidelines should be developed to help FOs and PMs monitor their application of learned skills. The FO core training program would be a key document to distribute to the GOI and other PVOs interested in using the CARE methodology in WS&S development.

- **SHE Manual**--FOs need clearer methodological guidelines to implement SHE activities. A manual for FOs should be developed to explain the methodology used to develop a community SHE strategy. This will help assure that FOs have a common understanding of the rationale for and practical steps to help communities define problems, identify solutions, and monitor action plans. The manual should be flexible enough so it can easily be adapted to specific community circumstances.



- ***SHE Activities in the Project Cycle***--The construction of WS&S facilities should be preceded by hygiene education. SHE activities should be carried out during the entire period of FO involvement in a community, as in the project flow chart and draft SHE strategy. Before construction, community SHE training can include WS&S and health linkages, identifying gatekeepers, data collection on present WS&S awareness and practices, and formulating hygiene messages.
- ***Strengthening Field Office Training Capacity***--Training is a key element in the interaction of FOs and community collaborators. If possible, each Field Office should have a Training Officer responsible for ongoing training needs identification, training session planning and facilitation, and follow-up monitoring of future training needs. An alternative approach would be to have the CIIHQ Training Officer provide advanced TOT training to Field Office PMs and POs to fill this role.
- ***Baseline Data***--Besides basic quantitative baseline data, initial data collection for new communities should use a participatory methodology to collect data in collaboration with community gatekeepers. The methodology should be informal and qualitative. More regular collection of detailed baseline data in CARE-assisted communities will allow later determination of health, economic, community organization, and environmental impacts of CARE project interventions. While anecdotal information and observation certainly supports the contention that the project has had positive impacts in these areas, insufficient quantitative baseline data exist to support this impression.
- ***SHE Consultancy***--CARE should fund a consultancy to assist with developing a SHE manual for FOs based on the draft SHE strategy, including increasing women's involvement in SHE activities, and developing simple, participative community assessment tools for use in initial stage of community data collection.

4.1.4 Project Management, Implementation, and Training

- ***Site Selection***--Communities have been reluctant to pay for better water quality, so CARE should avoid working in communities which have easily accessible existing water sources, even if those sources are lower in quality and quantity than the proposed system. CARE should avoid working where other agencies are already providing water services. Whenever possible, CARE should restrict future sites to fewer *kabupatens* in each province, reducing logistic support requirements and allowing field staff to more efficiently and effectively carry out their work. Wherever possible, CARE should cluster VPHC and CSFW sites. The NEED site selection criteria should be more formally applied. Finally, CARE should focus



particular attention during initial site review on the quality and strength of existing community leadership, since more failures are due to a lack of competent leadership than any other factor.

- *Field Officers*--CARE should review roles and responsibilities of FOs, and determine what opportunities exist for restructuring their individual responsibilities into a more team-oriented approach to extension services.
- *Project Monitoring*--Since sustainability is a critical issue in determining the appropriateness of the WS&S development approach, data collection at all WS&S project sites should include long-term periodic monitoring of the status of completed systems. This should be formalized by regularly updating the primary WS&S data base, the CAWS survey. This will allow both better analysis of project quantitative achievements (e.g., per capita system development costs) as well as potential correlation of specific project interventions (e.g., types or degree of community training provided) with observed impacts (e.g., reduced incidence of diarrheal disease, or low O&M costs). Improved Site Fact Sheets for each site should be developed and standardized based on the most useful components of those from each Field Office.
- *Training*--WASHES training should focus on community organization, resource mobilization, and construction. This should be expanded to include improved O&M procedures, financial management, and sanitation and hygiene education. Where possible, CARE should participate in joint training with government agencies such as Cipta Karya and Dinkes, both as trainers and trainees. A formal training needs assessment should be conducted for CARE Field Office staff to provide direction for determining future project staff training activities. CARE should develop small technical libraries at each Field Office, and provide each FO with their own copies of several standard references (wherever possible in Bahasa Indonesia).
- *Coordination with GOI and Other Agencies*--CARE should increase coordination with government agencies and other organizations working in the WS&S sector. Regular meetings (e.g., quarterly) should be encouraged with TK-I and TK-II level organizations such as Bappeda, PW/Cipta Karya, Departemen Kesehatan, and BANGDES. BAPPENAS, as the national coordinating body for cross-sectoral development planning, should receive the specific attention of the CARE Country Director. CIHQ should strengthen its ties with relevant central-level GOI agencies, and encourage Cipta Karya and Depkes to issue directives to their provincial counterparts to formalize contacts with CARE. CARE should actively support recent initiatives by the World Bank and UNDP to meet regularly (albeit informally) to discuss problems with major sector players (ADB, UNICEF, AIDAB, GTZ, JICA, and Dutch Aid), and to possibly co-sponsor a Conference on Sustainable Indonesian Rural Water Supplies.



- *Sustainability*--The quality of CARE training in community organization and construction will insure that many CARE-assisted sites will be sustainable after CARE's involvement ceases. Additional training in O&M and financial management would strengthen communities whose capabilities are at present marginal. Program-level sustainability, however, is more questionable. Thus far, little progress has been made in identifying organizations (especially GOI and IPVOs) which will be both willing and able to undertake the various support functions now provided by CARE when CSFW ends. Attention needs to be given to this well before the project draws to a close, so that the program and its unique community-focused, self-financing approach will become an accepted component of community-level WS&S development in Indonesia.

4.2 LESSONS LEARNED

CARE's community participation/management-based WS&S development approach has allowed communities, in part supported by their own resources, to plan, build, and maintain their own water supply and (less so) sanitation systems. These systems are in many (but not all) cases self-sustaining due the communities' willingness to provide financial support, and their ability (by virtue of CARE's technical training) to provide technical support to operate, maintain, and repair their own systems. This is in distinct contrast to many other small community sites in these same provinces, where communities are dependent upon the continuing assistance of GOI water development and support agencies whose own financial, logistical, and human resources are often taxed beyond their limits.

The success of the project is based on the clearly demonstrated needs of communities for improved WS&S systems (which was the motivation for their willingness to participate in the project), on the village water committee approach to system management (as demonstrated by the number of committees organized and still functioning), and on the obviously high quality of technical and management staff who have worked on CARE water development projects since 1978, now in its fourth incarnation as CSFW.

To maximize the benefits of WS&S development, hygiene education which increases the community awareness of the crucial link between health and hygiene/sanitation must accompany the construction of WS&S facilities. Water accessibility is itself sufficient motivation for communities to invest time, effort, and money in building an improved water system. However, only heightened awareness of health impact of improved sanitation/hygiene practices will motivate communities to modify their personal behavior, and to finance, build, and maintain sanitation facilities. In Indonesia, this awareness varies considerably from place to place. Improving hygiene/sanitation practices is difficult and time-consuming, and depends heavily upon taking site-specific beliefs and customs into account. The community development



approach used in the project to strengthen the ability of community leaders and institutions to analyze and solve local problems is a solid foundation upon which more extensive hygiene education activities could be built.

CARE-assisted communities do not always take full advantage of one of their most valuable resources--the skills, energy, and community connectedness of their women. Increasing women's involvement in community WS&S activities by systematically identifying and encouraging broader culturally acceptable roles for women's substantive involvement in WS&S activities would likely increase the sustainability of the project's interventions.

The project's implementation strategy has evolved over time from an initially narrowly focused set of activities directly supporting water supply construction, to a broad-based intervention strategy which strengthens community organizations and their ability to deal with a wide variety of technical and organizational needs. While steadily improving the quality and breadth of support services delivered to beneficiary communities, CARE now needs to focus its attention on ensuring that there will be organizations both willing and able (technically, organizationally, and financially) to continue to provide those support services to new beneficiary communities after direct CARE support for WS&S projects terminates.



APPENDICES



APPENDIX ONE - SITES VISITED DURING THE EVALUATION

Below is the list of sites visited during the evaluation, grouped by province. Since the evaluation team was split into three groups, sites are also listed by which group visited there. Group One was the Technical/Management Team, Group Two was the Community Participation Team, and Group Three was the Sanitation and Hygiene Education Team.

West Java

- Group 1 - Cibeureum, Nagrog, Linggamukti, Tanjungkarang, Ciwarak
- Group 2 - Cibodas, Cikadut, Balagedog, Ujungberung, Lebakwangi, Sedareja
- Group 3 - Bojongkoneng, Cimanggu, Loa, Rancakalong, Sukahurip, Bangunjaya

East Java

- Group 1 - Wonoanti, Pringkuku, Dersono, Karanganyar, Sidomulyo
- Group 2 - Ketepung, Gembuk, Ngadirojo, Gedompol, Sukodono
- Group 3 - Banjarsari, Bangunsari, Kledung, Watupatok, Kluwih, Widoro

NTB

In NTB, Group One travelled to Sumbawa Island while Groups 2 and 3 stayed on Lombok.

- Group 1 (Sumbawa) - Penanae, Lelamase, Ndano, Saneo, Jia, Boke, Nowa
- Group 2 (Lombok) - Longseran, Merce, Mamben Lauq (Kalijaga), Lenek (Liposos - Ramben Biak), Bentek, Rempek
- Group 3 (Lombok) - Sesaot-1, Aiknyet, Lembah Sempage, Ledang Bunga, Aik Dewa, Sekujur



APPENDIX TWO - SUGGESTED FURTHER STUDIES

During the remainder of the CSFW project, useful consultancies to consider include the following:

1. Feasibility study for applying the WASHES/CSFW approach to urban/peri-urban areas (a draft Scope of Work for this activity is included in the CSFW Evaluation Report).
2. In-depth community studies to examine the effectiveness and efficiency of CARE's approach to community management and self-financing.
3. Development of a simple methodology for participatory data collection, analysis, and message develop for health and hygiene education. This would also define minimum baseline data collection needed to carry out impact assessments (health, economic, environmental) at the conclusion of CSFW.
4. Development of a manual for FOs on sanitation and hygiene education, based on the steps in the draft sanitation and hygiene methodology, including women's involvement in sanitation and hygiene activities.
5. Feasibility study for expanding CARE technical assistance to sites where pumping systems (e.g., diesel, grid electric, wind, and solar pumps) could be used. The study would determine technical constraints and cost parameters for applying CARE's community management approach to the installation of these inherently higher cost and more complex technologies.



APPENDIX THREE - EVALUATION TEAM ACTIVITIES AND ITINERARY

WASHES Team Planning Meeting Schedule (Jakarta)

Day One (Sept. 24, 1991) (CIIHQ Staff and Evaluation Team)

- Review Evaluation Travel Schedule
- Introduction to Headquarters and WASHES Staff
- Introduction to CARE/Indonesia and CARE's Water Projects
- Introduction to WASHES, Overview of Project Documents
- Discussion on Evaluation TOR, SOWs, Activities
- Development of Evaluation Purposes and Outcomes
- Briefing on Administration

Day Two (Sept. 25, 1991) (with USAID representatives)

- Summary of Day One Evaluation Purpose and Outcomes
- Small Group Discussions to Identify Information Needed to Answer Evaluation Questions
- Panel Presentation of Small Group Discussions
- Development of Draft Report Outline

Site Visits to West Java, East Java and NTB

West Java - Sep. 29 - Oct. 4
East Java - Oct. 5 - Oct. 9
NTB - Oct. 10 - Oct. 20

Post Site Visit Tasks in Jakarta (Oct. 21-25)

- Presentation and Discussion of Evaluation Results with CIIHQ (Oct. 22).
- Presentation and Discussion of Evaluation Results with GOI (Oct. 23).
- Presentation and Discussion of Evaluation Results with USAID (Oct. 25).
- Final Report Completion for CIIHQ Review (Oct. 21-25).



APPENDIX FOUR - SUGGESTED REFERENCE LIST FOR FIELD OFFICE LIBRARIES

The references given in this appendix should be procured and kept as a resident technical reference library in each CARE Field Office. Note that a great many of these publications are available for free through the WASH Project Operations Center in Washington, DC.³⁸

Engineering Design, Construction, Operation and Maintenance
Driscoll, F., Groundwater and Wells, 2nd Edition, The Johnson Co., Milwaukee, Wisconsin, 1986. This is a comprehensive and detailed manual on all aspects of water resources development, the definitive reference in this area. Highly recommended.

Edwards, D. et al, A Workshop Design for Rainwater Roof Catchment Systems. A Training Guide, WASH Technical Report No. 27, the WASH Project, USAID, Washington, DC, 1984.

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APPENDIX FIVE - SUGGESTIONS FOR INCREASING WOMEN'S INVOLVEMENT IN WS&S ACTIVITIES AT THE COMMUNITY LEVEL

This appendix gives a set of brief suggestions which CARE should consider to increase women's involvement in its WS&S development projects. It is not intended to be either detailed or comprehensive.

1. Provide WID training to FOs and communities, including Values Clarification related to women.
2. Send occasional short (1 to 2 page) WID-related articles or other related documentation from different sources to each FO, PO, PM.
3. POs and PMs should discuss with FOs the following: Have you attempted to involve women in this activity? In what ways? What possibility is there of involving women? When you tried to involve women in a particular activity, was it successful? Why or why not?
4. CARE management should consider female FOs as special resources for developing strategies for working with women. In FO meetings, female FOs should be asked for suggestions on how to involve women in specific community activities.
5. Monthly FO work plans should include plans to contact and work with women gatekeepers/leaders/groups.
6. In quarterly discussions with FOs, they should discuss among themselves what they have learned about working with women.
7. Review CARE's track record of using female FOs. How has the hiring been done in each province? Why have more female FOs resigned in some offices than others? Are there particular opportunities or constraints with female FOs which help/hinder them from accomplishing their designated duties? How have they or could they be overcome? How could opportunities be taken greater advantage of?
8. Develop case studies (perhaps with help from university students in rural sociology/anthropology) on sites where attempts to involve women have been more and less successful. What lessons are learned?
9. Recruit FOs with training in rural sociology and/or anthropology.
10. Define a systematic strategy to gradually increase the involvement of women in WS&S development, including strategies focused at both the community level and for CARE field staff.



