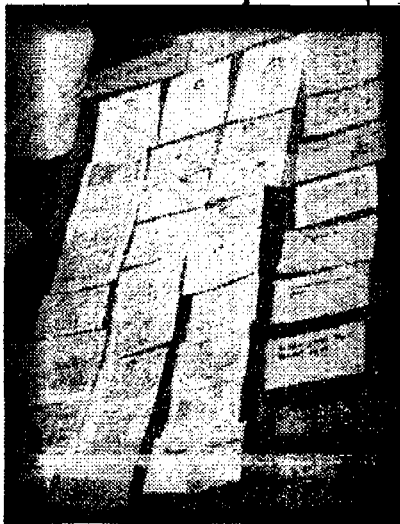


# Study of Community-based Approaches utilized in Unicef's Water and Environmental Sanitation (WES) Program in Indonesia



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Jakarta, 1999

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Jakarta, 1999

## ACKNOWLEDGEMENTS

*This document is the result of a participatory evaluation carried out by twenty village communities in two provinces of Indonesia, with the Centre for Regional and Urban Development and Research (P3WK) of the Institute of Technology, Bandung, and the Regional Water and Sanitation Group for East Asia and Pacific (RWSG-EAP) of the global UNDP-World Bank Water and Sanitation Program. The evaluation study was financed by UNICEF, Indonesia.*

*The views and information contained herein do not necessarily reflect the views of the World Bank, UNDP or UNICEF and do not imply the expression of legal opinion whatsoever concerning the legal status of any country, territory, city, or area concerning the delineation of any national boundaries or national affiliations.*

*Special thanks are due to Jerry Silverman, Manager RWSG-EAP and Richard Pollard, Indonesia Country Program Manager, for having faith in the application of participatory methodologies for program evaluation. I would like to express my deep appreciation of RWSG-EAP teammates, Ratna Indrawati Josodipoero and Alfred Lambertus, without whom this study could not have been successfully implemented. Gillian Brown's help in training technical surveyors is much appreciated*

*Sincere thanks are due to Jennifer Sara, Christine van Wijk Sijbesma, Risyana Sukarma, Richard Pollard and Andrea Silverman, whose review and comments added greatly to the value of this report. Priya Tuli added visual appeal with her design of the cover and photo pages. Herlina Dewi and Clara Mutter painstakingly typed and formatted the document several times over. Nevertheless, the Regional Water and Sanitation Group for East Asia and Pacific accepts full responsibility for any discrepancies and shortcomings in the report.*

*January 1999*

*Nilanjana Mukherjee*

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- B. **Sequence of Participatory Learning Exercises**
- C. **Questionnaires for Community Leaders and Technical Evaluation**
- D. **Samples of PHAST Tools Developed**
- E. **Sample Outcomes of PRA Exercises**
- F. **Terms of Reference**

## ACRONYMS, ABBREVIATIONS & INDONESIAN TERMS

---

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
BAPPEDA	Provincial & District Planning Boards ( <i>Indonesia</i> )
BAPPENAS	Central Government Planning Board ( <i>Indonesia</i> )
CARE	International NGO
DWP	Protected Dugwell
DWTP	Protected Traditional well ( <i>Rehabilitated</i> )
DUSUN	Sub Village Zone
GFS	Gravity Fed Systems
GFSPC	Gravity Fed Piped System with Household Connections + Public Taps
GoI	Government of Indonesia
INPRES	Presidential Instruction ( <i>GoI</i> )
INPRES Kesehatan	Local Health Program ( <i>GoI</i> )
Kabupaten	District
Kepala Desa	Village Chief
LKMD	Village Resilience Council ( <i>Lembaga Ketahanan Masyarakat Desa</i> )
MCK	Public Toilet – Bathing – Washing Facility
Musbangdes	Annual Village Development Consultation Meeting ( <i>Musyawah Pembangunan Desa/GoI</i> )
NGO	Non-Governmental Organization
O & M	Operation & Maintenance
PDH	Deepwell Handpump
PSH	Shallow Well Handpump
PHAST	Participatory Hygiene and Sanitation Transformation
PKK	Family Welfare Movement ( <i>Pembinaan Keluarga Sejahtera</i> )
PPAB-PLP	Clean Water Supply and Environmental Sanitation Program ( <i>Program Penyediaan Air Bersih dan Penyehatan Lingkungan Pemukiman</i> )
PRA	Participatory Rural Appraisal
Repelita	Five Year Plan ( <i>GoI</i> )
Rp	Rupiah ( <i>Indonesian Currency</i> )
RWSG-EAP	Regional Water Supply & Sanitation Group for East Asia & The Pacific
RWSS	Rural Water Supply and Sanitation
RWTH	Household Rainwater Collector Tank
RWTP	Public (Shared) Rainwater Collector Tank
Susenas	National Socio-Economic Survey ( <i>Survey Sosial Ekonomi Nasional/GoI</i> )
VIP	Village Infrastructure Project
VWSC	Village Water & Sanitation Committee
WSS	Water Supply & Sanitation
WSSLIC	Water Supply & Sanitation for Low Income Communities Project
UNICEF	United Nations Children's Fund

## EXECUTIVE SUMMARY

The present study was carried out by the Regional Water & Sanitation Group for East Asia and Pacific (RWSG-EAP) at the request of UNICEF Indonesia and the Government of Indonesia, in 20 villages of West Java and South Sulawesi during April - May 1998. The purpose was to review the experience of using the community-based approaches inherent in UNICEF's Water Supply and Environmental Sanitation (WES) program in Indonesia, with a focus on the cost-effectiveness and sustainability of services. This study is part of a series of Indonesian Rural water Supply and Sanitation (RWSS) studies being carried out by RWSG-EAP, integral to a sector policy improvement effort. The aim is to generate a comparable analysis and cull best practices for formulating an effective national sector policy.

The villages were selected out of a shortlist provided by UNICEF, based on a set of sampling criteria designed to serve the objectives of the study. A mix of quantitative and qualitative methodologies was developed for the study, including participatory evaluation tools developed from the repertoires of Participatory Rural Appraisal (PRA) and Participatory Hygiene and Sanitation Transformation (PHAST) methodologies. The study used a conceptual framework for analysis (*Fig. 1*) that is being developed under the *Global Participatory Learning and Action Initiative*, a collaborative effort of the *UNDP-World Bank Water and Sanitation Program* and the *International Water and Sanitation Centre (IRC)*. The study was designed as a participatory assessment. In each village focus group discussions and participatory analysis sessions were held with groups of men and women over a period of 3 days, at times and places chosen by them. The communities' response to the methodology was enthusiastic and the quality of their analysis high. Content analysis of qualitative data was supplemented with statistical analysis of data converted to quantitative scores, using a scoring and weighting system based on the conceptual framework of the study.

Of the following major findings that emerged, 1-4 are general conclusions from statistical hypothesis testing and the rest are findings specific to the WES Program of UNICEF. *For definitions of the indicators and methods for scoring/measurement of indicator values please refer to Figure 1, Operational Definitions (pp. 23-25), and boxes on pages 59, 76, 91, 100, 104 and 113 respectively.*

### General Conclusions

1. The more the water & sanitation services meet their users' demands, the more effectively they are used and sustained by them.
2. The greater the participation of users in establishing (planning and constructing) water supply services, the more the services will meet their users' demands.
3. The greater the participation of users in establishing water supply services, the more effectively they will be used and sustained by them..
4. **Sanitation** facilities meet more of their users' demands and are used and sustained by them more effectively when \*:
  - communities can effectively use and sustain their water supply services;
  - community water supply services meet their users' demands adequately:

- Users participate adequately in the management and establishment of their water supply services

(\* - This relationship is probably true only when the sanitation technology selected is water-intensive and there is no other technical option available)

*A discussion on the above conclusions follows in the section **Emerging Lessons** later in this Executive Summary.*

## **Findings Specific to UNICEF's WES Program**

### *Sustenance and Use of Services*

1. UNICEF assisted water supply systems in the 20 study villages are currently functional in varying degrees, 3-4 years after construction. In 25 per cent of the villages all water systems installed were fully functional. 55 per cent villages had more than half of all water facilities functioning. In the rest of the villages less than half the facilities were functional. The results of technical assessments of the facilities by technically qualified surveyors closely matched the assessment by user groups in the study.

The best functioning water systems at the time of the study are deepwell handpumps, closely followed by gravity-fed piped systems. The worst ones are public rainwater catchment tanks, mainly because they are not able to store sufficient rainwater for users in the dry season. Dugwells scored in-between, as some dry up in the dry season, are open to contamination and some wells have water that is considered unfit for drinking because it is saline, cloudy or having an unpleasant taste. Consumers satisfaction with water quality, quantity, and regularity of service showed the same highest and lowest rankings among systems. On the whole, the worst functioning systems tended to the ones built by contractors on whom the community had no influence or control and who could not be contacted by the community after construction e.g. contractors who built rainwater collectors in West Java. When users participated in construction or had access to the contractor after construction (as for handpumps in Indramayu or dugwells in South Sulawesi), water systems functioned better.

2. All the water systems are perceived to be saving their users' time and energy for water collection substantially. In 30 per cent of the villages this has resulted in new or more of existing income-generating activities being taken up by women. Health improvements, mainly a three-to-fourfold reduction in diarrhoeal and skin diseases, were reported only by the users of deepwell handpumps, gravity fed piped systems and about half of all the dugwells constructed.
3. Women and girls are the principal collectors and managers of household water in South Sulawesi. In West Java, however, men and boys collect 80 per cent of it. Average figures reveal that in these 20 villages, children collect and carry home almost half of the household's total requirement of water everyday. Boys and girls share the burden almost equally.

**Overall, the average score for *Effective Use and Sustenance* of all water systems was 40 per cent, when 100 per cent represented the sum of the highest possible scores from all related sub-indicators.** It is important not to equate this percentage with the proportion of systems found to be functioning, which is a technical performance score. The *Effective Sustenance and Use* score is a

behavioral score indicating that people are using and sustaining their water systems at 40 per cent of the ideal level, 3-4 years after construction.

4. People in 80 per cent of the study villages have constructed latrines with the stimulants received by all villages from UNICEF. However, only in 30 per cent villages people are using them consistently (i.e. defecation only in the latrines). For consistent household use the most important pre-condition is an assured water supply at household level throughout the year, possibly due to all latrines being the pour-flush type. However, when people are away from their homes (e.g. in the fields or forest), they tend to revert to bushes, ponds, rivers etc. There has not been a permanent change of habit for the majority in 70 per cent of the villages in the study.
5. Of those who own latrines, 45 per cent feel it was a highly worthwhile investment. The most perceived benefits are social (convenience, privacy, comfort, status, reported by 70 per cent groups). Health benefits are perceived by less than half as many people. The numbers of latrines that were functional at the time of the study were 80 - 90 per cent of the numbers originally constructed, in all villages except one. In the latter case the number presently functional was 400 per cent of that originally built by the project. The village had a good GFS system that brought piped water to household levels in adequate quantities throughout the year. This may have resulted in rapid replication of sanitation facilities by all households interested in acquiring their own latrines. (*CARE experience has shown similar high correlation between house connections and construction of household latrines.*)

The average score for *Effective Use and Sustenance* of sanitation facilities constructed was 56 per cent, when 100 per cent represented the sum of the highest possible scores from all related sub-indicators. This score is higher than for water supply systems. Possibly this is due to all the sanitation facilities in question being household latrines in which the owners had invested their resources to build, given a subsidy package of materials by the program. The decision to invest and build or not do so was rational and related to the pour-flush technology of the latrines. In two study villages no one had constructed latrines even though they received the same package, because they did not have easy access to water at or close to the household. Thus those who did construct household latrines were the ones that were sure that they wanted to use and sustain their facilities

### ***Community Hygiene Awareness***

1. Overall conclusions about current *community awareness of hygiene* and disease transmission routes (in the study villages) can be summarized as follows:
  - People in the study villages have a fairly good idea of the practices that are "good" or "bad" for health, but they are not very sure why it is so. There are many gaps in community awareness of how contamination travels. This leads to a lack of conviction about some of the "good practices" and the resulting behavior is not consistently hygienic.
  - People know that open defecation causes diseases, but are not fully convinced that the use of latrines will solve the problem. (The flow diagram from village Sapanang actually suggests that water from latrines pollutes the river! These are all pit latrines that do not discharge effluents into water bodies).



- Importance of hand washing is widely accepted. However, it is likely that it is being done with water only. Despite awareness that soap should be used, in practice people are not making much of a distinction between washing hands with and without soap. The value-added from the use of soap for blocking disease transmission is not taken seriously in practice.
  - The awareness of the three main routes of contamination reaching the mouth needs strengthening. The majority are aware of only 1 or 2 routes.
  - Boiling water for drinking is universally identified as a good preventive practice. Hygienic handling of drinking water after boiling is not consistently practiced and needs more local-specific promotion.
2. UNICEF's hygiene promotion programs could become more effective if targeted specifically at the above gaps in people's perception. Current exposure to UNICEF's IEC materials was low in the study villages. People had only seen them during training programs conducted by the Health Department. Hygiene promotion needs to move away from producing and disseminating standardized IEC materials, towards developing program processes and sector staff capacities for participatory hygiene assessment and action planning for specific hygiene behavior improvements - by and with community groups of men, women and children.

### *Cost Comparisons*

1. *Construction costs per household served* were several times higher in West Java than in South Sulawesi, for comparable water systems. This was mainly due to the coverage of water systems being limited to very small segments (average 10 per cent or less) of village populations in West Java. This finding together with data on user perceptions about the sharing of water supply benefits between rich/poor households suggests that an unfairly large share of WES program benefits are being appropriated by the economically better off households in West Java villages. It was not perceived by users to be so in South Sulawesi.
2. *The community share of investment costs* ranged between 2 - 67 per cent for different types of water systems in the study villages. The highest cost sharing (67 per cent) was for dugwells and the lowest (2 per cent) for deepwell handpumps. Both the highest and the lowest instances were found in South Sulawesi. There appeared to be no consistent rule or strategy to cost sharing. Higher levels of technologies and services such as gravity-fed piped systems required only 4 per cent community contribution whereas dugwells required 33-67 per cent community contribution in the two provinces. "Cost" included cash, voluntary labor, land, construction materials and food, all valued at 1992 prices.
3. *Inter-project comparisons* from prior phases of the Indonesian Rural Water Supply studies show that *per capita construction costs* were very similar for dugwells and rainwater catchment tanks built under the WSSLIC project and UNICEF project villages in West Java. The VIP project dugwells cost about twice as much to construct, in terms of per capita population served. But the VIP dugwells were also much larger in diameter, used better quality construction materials and had ancillary washing/bathing facilities and drainage constructed to the community's own design specifications. The VIP project also paid villagers providing construction labor whereas the UNICEF and WSSLIC wells were constructed with voluntary labor provided by the owner households. UNICEF's dugwells in South Sulawesi were 7 times cheaper per capita than in West

Java and WSSLIC, as they served larger numbers of households. Per capita construction cost for gravity-fed systems in UNICEF projects was more than twice as much as for WSSLIC and 3.5 times as much as for VIP GFS systems, probably due to the small populations the UNICEF systems served (between 3 - 22 per cent of village households).

### ***Demand-responsiveness of Services***

1. **Water supply facilities constructed under UNICEF's WES program are presently satisfying between 22 - 61 per cent (average 42 per cent) of the users' demands for services, in different villages.** The highest possible score of 100% would mean that consumer demands for service level and quality, quantity and regularity of water supply for all purposes was being fully met. User satisfaction varied considerably with the type of water system. The users of gravity-fed piped systems and deepwell handpumps are the most satisfied and the users of the rainwater catchment tanks the least satisfied.
2. **Sanitation facilities are meeting about 45 per cent of the users' demands in the 18 villages where they have been constructed.** The highest possible score of 100% would mean that consumer demands were being fully met in terms of number, location and design of sanitation facilities and they considered the cost incurred to be appropriate as well as fully worthwhile. The key to demand responsiveness of sanitation facilities seems to be the availability of water at the site of the latrine, probably because all of the latrines constructed by the project are the pour-flush type. Demand responsiveness of sanitation facilities is also a function of the presence/absence of design and construction faults in the latrines constructed and the extent of preparation of the users to receive the stimulant packages for latrines. In most cases the recipients of the "sanitation stimulant packages" met in this study had not asked for the facility. They had been assigned these construction material packages by their neighborhood chief.

This is the normal pattern of service delivery in the government's INPRES funded PPAB-PLP program, whereby a certain number of latrine stimulant packages are estimated during annual planning, at district level. When the final number of packages is received from UNICEF, a year later, it is distributed among sub-districts and then villages using locally developed allocation criteria which are generally unrelated to community demand. Village chiefs allocate proportional numbers to sub-village areas (*Dusuns* and *RTs*). Heads of *Dusuns* and *RTs* then assign packages to households using locally decided criteria e.g. households with water supply connections or wells etc. The process does not involve assessment of community demand for sanitation facilities.

### ***User Participation in Service Management: Sharing of Burdens and Benefits***

1. Both men and women in the study villages participated in the construction, upkeep and functioning of water supply and sanitation facilities. Work done by women, both skilled and unskilled, was always unpaid labor. Water supply and sanitation activities have nevertheless provided paid work to village men in 45 per cent and 20 per cent cases respectively.
2. User groups do not regularly pay user fees except in 3 villages with GFS piped systems. For public systems contributions are organized whenever repairs are needed. Water Committees had never been established in 80 per cent villages. No village had a functioning village Water Committee at the time of the study. Household facilities are managed and monitored by their owners. Public facilities (except the GFS systems) are generally perceived as "owned" by the

person on whose land they are located. This person, often a powerful member of the village elite, is also seen as the 'manager' of the facility and the money periodically collected from users for repairs. Users are unaware of the financial aspects of maintenance, management and repair. Financial information is never reported to them. They have never asked for it either. There has not been a formal handing over of the facilities to the villagers anywhere. No legal proof of ownership exists for any facility.

3. Users feel that the rich households are benefiting more than the poor ones, from the water supply systems constructed in West Java villages. Users in South Sulawesi felt the benefit sharing to be equitable, with a bias towards greater benefits for the poor households. The richer families often contributed more than the rest during construction, which later translated to greater control over the facilities by them. It happened more often in West Java.

**The overall average score for *user participation in service management* was 36 per cent, when 100 per cent was the sum of the highest possible scores from all related sub-indicators.**

### ***User Participation In Service Establishment***

1. Water supply systems were provided in response to requests/proposals from the communities, in 65 per cent of the villages, although what was provided often differed from what was requested by them, due to a limited menu of technologies supported by UNICEF. 35 per cent of the villages had received Water Supply systems without having asked for them. 75 per cent villages had received sanitation 'stimulant' packages without having asked for sanitation facilities, as already discussed in relation to lack of demand assessment.
2. Little or no choice was available to user communities in deciding the type and level of services they wanted and how they were to manage and finance them. Any choice available was exercised by the village Chief on behalf of all users. Project staff decided the type of technology. The village chief and project staff together decided the sites for facilities, population to be served, level of service, contributions to be paid. Water Committee members (all male, village elite) as well as trainees for all project training programs were selected by the village Chief. He consulted the village council/male informal leaders in about 50 per cent villages. Women were not consulted about any decision about water supply and sanitation services, formally or informally, except in 1 village out of 20, (where they were asked about the level of service only).
3. Women in both provinces are the household managers of water-using activities and the decision makers about which water source is used for what purpose. Although men have greater control of household income-producing assets and greater access to markets, women too have significant economic power within the household. They are able to express their preferences and demands for services and follow through with investments in the types of facilities they want. WES program rules and procedures, however, did not address the problem of the male-dominated decision-making system in the project villages, which precluded women's participation and hampered the expression of their demand.
4. At the time of establishment of services the richer households in some villages contributed more than the flat rate obligatory for all potential users. This investment was later translated by them into a higher level of control of the services and benefits from the common water facility.

5. Village men's groups were able to monitor construction schedules and materials in 65 per cent villages because they participated in the construction of dugwells, handpumps and rainwater collectors. In the rest of the cases they had no control because construction was done by contractors employed by and accountable only to the Public Works Department. Women had no voice in monitoring and quality control anywhere. Their participation in construction consisted of providing voluntary labor and/or food for the construction team.
6. Training had been provided in construction (latrines, rainwater collectors) and maintenance (handpumps) in 35 per cent of the villages. This training was given only to men. In half of the study villages women and a few men had also received training in environmental health and hygiene behavior. They were the "health volunteers" of the village. The village chief decided who would receive training.
7. Communities are participating in service establishment by contributing land, cash, labor and materials. However, they are doing this as directed by the village leaders, without adequate choice and voice in key decisions. In the absence of alternative sources, people tend to pay for essential services regardless of how they are provided. The users' motivation to sustain those services, however, is not assured unless the services meet their needs well and they develop a sense of ownership and responsibility towards the facilities that they helped establish. The study indicates that the users' feelings of ownership of the facilities and responsibility for their maintenance are low and the services created are meeting less than half the demands of their users. These imply the users' lack of real involvement in the process and, possibly, a desire for a higher level of service, for which there could be a potential willingness-to-pay. Attempts are not yet being made to assess and tap this willingness, due to : a) the limited menu of options and standard subsidy formulas governing UNICEF assistance, and b) the absence of a mechanism that ensures consultation with larger community groups (instead of just the village Chief) and the community's women about their preferences.

In reflection of the above situation, average scores for *user participation in service establishment* were 14 per cent for Water Supply services and 21 per cent for Sanitation services, when 100 per cent in each case represented the sum of the highest possible scores from all related sub-indicators.

MAJOR STUDY QUESTIONS	Services/Facilities Constructed with UNICEF Assistance in the 20 Sample Villages	
	<i>Water Supply</i>	<i>Sanitation</i>
How effectively are the constructed services / facilities being used and sustained ?	40 %	56 %
To what extent are the facilities meeting their users' demands for services ?	42 %	45 %
To what extent are the users participating in the management of the facilities ?	36%	
To what extent did the users participate in establishing the services ?	14 %	21 %

(100% represents the sum of the highest possible scores in each case See *Scoring System*, Chapter 2)

## Emerging Lessons

### What really determines effective sustenance and use of services ?

Effective Sustenance and Use of services varied directly with Demand-Responsiveness of the services. This relationship seems to hold consistently, under all kinds of conditions.

Effective Sustenance and Use of service did not, however, vary significantly with the types of water systems, although user satisfaction levels varied considerably with different types of water systems. At first glance this may seem contradictory. The relationship between Sustenance and Use and type of water systems is not a direct and simple one. The intervening and deciding variable seems to be Demand- Responsiveness, as explained below.

When users have access to several types of water systems, they make different demands on each type of system because they have different preferences for water use. For instance, handpump or GFS water may be preferred for drinking (due to its "perceived" superior quality) and well water for washing and cleaning purposes (due to its possible proximity and "perceived" inferior quality). Every project intervention is made into the specific environmental context of a community, which includes a complex of factors influencing demand e.g. cultural preferences for water sources for certain uses, availability of other types of water sources, distance of each source from home, local criteria used to judge water quality, seasonal changes in water quality criteria and quantities available - among others. The water facility provided by a project is evaluated against all these factors by the users, who then decide how they will or will not use the new source. This determines the demands that they will then make on the new source. Depending on how far the new source can meet those demands, they will/will not continue to use and sustain it.

Due to the myriad situation-specific possible factors that can influence demand, it does not seem useful to try to draw IF - THEN conclusions by classifying the pre-project environment in different categories and formulate rules/guidelines for planning in each context. The key rule to adhere to seems to be "*accurate assessment of the client community's demand*", with all the qualifiers necessary, i.e. demands of *women and men*, demands of the *majority of the population*, demands of the *poor as well as rich*, demands of the *isolated*, the *ethnic groups*, the *unserved and high risk groups* etc.

The challenge is to find ways of making community demand assessment accurate enough to base project design and funding decisions on.

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### Does user participation in service management ensure effective sustenance and use of services ?

Effective Sustenance and Use was not found to be significantly associated with User's Participation in Service Management, but it increased significantly with User Participation in Service Establishment. Demand-responsiveness of services also increased significantly with User Participation in Service Establishment.

The emerging lessons seem to be:

- 1) Effective sustenance and use of services can be promoted by having the users participate effectively in establishing the services, because this allows them to make the services more responsive to their demands/preferences. The greater the choice available to users and the greater the voice they have in making key decisions for service creation, the higher is the likelihood of the services being responsive to their demands, and therefore more effectively used and sustainable by them.
- 2) Effective Sustenance and Use cannot be ensured by trying to involve users in O&M, **if demand-responsiveness of the services has not been ensured or achieved.** Under such circumstances the users feel little motivation to organize themselves for service management, have a low sense of ownership of the facilities and do not feel responsible for their upkeep. On the other hand, it can be hypothesized that when the services created are sufficiently demand-responsive for a majority of users in a community, community level management arrangements evolve spontaneously to keep the services functioning.

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### **What kind of user participation in service establishment leads to effective sustenance and use of services ?**

The level and type of user participation required (in service establishment) to ensure effective sustenance and use needs to be fully recognized.

The study found users making contributions for construction with little choice and voice in the process of establishing water supply and sanitation services. In many cases the services finally created differed from those that the users wanted. Key decisions were made by village leaders and project authorities without consulting majority of the users. In general, users had little control over construction of facilities and the utilization of funds contributed by them.

The lowest scores for Effective Sustenance and Use, Demand-responsiveness of Services and User participation in Service Establishment were found in the villages where: a) users had not initiated the project themselves (there was no formal proposal to the effect from the village); b) had no say in deciding the technology, level of service, management and financing arrangements; c) had contributed the amount of cash specified by the village chief but not contributed in-kind or labor; d) had no control on construction activities; and e) had received no training for O&M or any other purpose. The highest scores for the same three variables were found in villages where the communities had: a) initiated the WS intervention through formal proposals; b) been able to exercise choice in deciding the level of service and arrangements for management; c) contributed a specified amount of cash as well as materials and unpaid labor; d) participated in construction or supervised it with some control of materials procurement and payment to masons; and e) received training in O&M and Health/Hygiene.

The lessons related to the above seem to be that user participation in service establishment can lead to effective sustenance and use of the services, when "participation" means:

- a. informed choice from among a range of service level and cost options, by **user households.**
- b. **contributions for service creation based on informed choice, by user households.**

- c. democratic formation of user groups for service management.
- d. users are able to have some control of funds contributed by them, and the quality and schedule of construction by the implementation agency. i.e. the implementation agency is accountable to users for construction to agreed design, quality, schedule and costs to users.

User contributions without informed choice do not constitute real user participation in service establishment and do not accurately represent user demand. Demand assessment is only accurate to the extent that users have access to information on which to base their choices.

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### **What is the nature of current demand for water and sanitation services in rural communities in the study?**

This study was not designed to assess community demand in rural Indonesia. However, from the assessment of consumer satisfaction levels and data gathered regarding participation history of the communities in the sample, there seems to emerge evidence that given a choice, rural communities may opt for a higher level of service and higher technology than is currently being provided by the program. There are definite indications of a higher willingness to pay for better services. This demand is as yet unexpressed, not responded to, and the potentially higher willingness-to-pay still untapped because no service delivery agency is asking them or offering options. Wherever there is an opportunity, communities are expressing their choice and demand, evidenced as follows :

- Users are most satisfied with deepwell handpumps and Gravity Fed Piped (GFSPC) systems, the two higher cost and higher level technology options offered in this program.
- Users are least satisfied with rainwater tanks and partially satisfied with dugwells - the cheapest and lowest technology level options offered in this program.
- No community has built more rainwater tanks or dugwells following project interventions with these technologies. Villagers have, however, replicated and expanded a Gravity Fed Piped system. They reported that they would like to replicate handpumps but lack the equipment, know-how, and the means to drill.
- In the World Bank-financed Village Infrastructure Project (VIP), where the communities received a grant out of which they decided the level of service (individual or shared water facilities), costs and the type of dugwells they wanted, and had them built, the per capita construction cost of dugwells is twice as much as in the UNICEF assisted program. The VIP dugwells are, however, of a larger diameter, with higher quality construction materials and workmanship, better equipped with ancillary facilities and drainage- according to the community's own design specifications.
- In one village in West Java where sanitation coverage has increased dramatically after project interventions had been completed, the latrines constructed by households themselves are of substantially higher quality and cost as compared to the units provided under the program...

The principal lesson emerging from the above findings is that rural consumers in Indonesia seem to be discerning about quality and willing to pay more to get the services that they really want. A

program decision that limits their options to the lowest-cost and lowest service levels can lead to the creation of levels and types of services that people are not really satisfied with and therefore not motivated to sustain in the longer term. By finding out and becoming more responsive to the rural users' preferences for services, water and sanitation projects could greatly enhance community cost-sharing, thereby ensuring cost-effectiveness and sustainability of investments - which can free up more funds for wider coverage.

This study was carried out during April - May 1998, during the period of economic crisis in Indonesia. Public opinion regarding investment costs, although collected during 1998, referred to a period three to four years ago. It may have altered in the interim period. The important point is not to try to predict what the changes might be but the manner in which decisions are made about technological options. If technical feasibility and overhead costs of the (community's) desired levels of services are unrealistic in a current or future specific village situation, the communities concerned need to understand why and decide for themselves what is feasible. They should be consulted and negotiated with, **before** decisions are taken to limit technological options. This decision, if at all necessary, needs to be a joint one between the communities and the service delivery agency personnel interfacing with them, and be based on fully informed choice on both sides.

## Recommendations

In view of the findings of the study, it seems relevant to raise the following issues and recommendations in dialogues with all the stakeholders concerned, for increasing the sustainability and cost-effectiveness of services in the WES program.

- a) A shift of focus from providing and accelerating the coverage of services to promoting the effective use and long term sustainability of water supply and sanitation services. Reviewing all indicators, responsibilities and procedures for monitoring and evaluation of WES, to that effect.
- b) Designing program procedures and rules to promote informed choice making by user communities out of a wider menu of options for technology, service levels and costs, to enable potential user groups to express their preferences. This would imply developing implementing agency capacity for tasks described in point f) below, in accordance with equitable principles such as described in c) below.
- c) Reviewing formulas for subsidies and stimulants to incorporate cost-sharing principles such as:
  - subsidies only for the minimum technologically feasible option. Additional costs borne by users. Increasing cost-sharing with increasing levels of technology and services.
  - subsidies only for the "poorest", not for the entire village population (using village level targeting criteria, developed with user communities)
- d) Providing services only in response to expressed community demand, backed by evidence of the users' readiness to invest in service establishment. e.g. Village Action Plans produced in a publicly displayed visual form (e.g. a community map with planned facilities marked) and signed off by groups of users; community contributions deposited into user group accounts prior to the commencement of construction.
- e) Facilitating community empowerment for planning and construction of water-sanitation services that meet community demands. This implies improving community level processes to ensure the



participation of the poorest households and women's groups in community decision/choice making about WSS services, and effectively reducing the dominance of the village chief in the process. Formulating project rules to require evidence that the desired participatory processes are being followed and that the decisions/choices made reflect the voices of both women and men, the rich and the poor.

- f) Building capacities and motivation of sector staff for consultative dialogues with men and women of potential user communities, for the purposes of:
- assessing community demand
  - assessing community preferences and their rationale for the same
  - working out and negotiating costs to be shared
  - communicating effectively about technology options, their advantages and disadvantages, their investment/running/replacement costs, etc. *(to facilitate informed choice-making)*
- g) Using participatory-analysis-based approaches for village level WES planning - which implies planning both for services and the hygiene behavior improvements identified and prioritized by user communities themselves. Not viewing hygiene behavior improvement only as women's responsibility, but using it as the starting point for village-level WES demand analysis with men, women and children's groups.
- h) **The IEC Strategy recommended for the WES Programme is one that is fully integrated with service planning and delivery, as explained below.**
- *Planning Phase* - At the community level WES-related communication should begin with a participatory analysis of existing community water and sanitation behavior. It should then proceed to identify with the villagers what levels of improvements they desire to make in their water-sanitation situation -- which includes the key behavioral changes they want to make PLUS the WSS services they want to acquire (and pay for). Thus an important component of the IEC intervention in the planning phase is the effective communication with the community about a menu of technology and service level options and costs. A second important IEC component is the identification of gaps in current hygiene awareness, so that the 2 - 3 key behavioral changes desired for maximal health impact may be prioritized by consensus in each community. This is possible using the PHAST methodology
  - *Implementation and Monitoring Phase* - To promote the identified key hygiene behaviors, locally relevant IEC messages and locally produced, low-cost media materials should be developed at district level --- with the involvement of district and community-level media resources e.g. Non Formal Education channels, religious networks, folk media personnel, School Health programs, government department units having mobile communication facilities among others. WES IEC messages should consistently reinforce the same few key hygiene behaviors (identified through participatory analysis in 10-20 villages in each district) through all media channels reaching the communities in the district. Experience worldwide has shown the futility of having a large number of behavior change messages at any given time. As programme implementation proceeds, participatory monitoring using PHAST and PRA methodologies can track changes in key community hygiene behaviors.
  - Minimize the use of centrally designed and produced IEC materials. Selectively use mass media resources available at Province level, to reinforce locally relevant messages e.g. provincial newspapers and radio/TV programs.
  - Developing extension staff **capacities and incentives to carry out the participatory interaction process with community groups**, needed for the above and Recommendations f) and g).

- i) Incorporating poverty-focused and gender-segregated process, outcome and impact indicators in MIS systems supported/developed by the WES Programme. Institutionalizing the use of Participatory Monitoring for all data from the community level.
  
- j) Utilizing participatory monitoring and evaluation methodologies (like the one developed for this study) to improve institutional capacity to listen to client communities and respond to their demands. Utilizing the capacities of independent academic and research organizations (such as P3WK in Bandung, which has been trained for the purpose by RWSGEAP, as well as NGOs specialized in participatory methods), through institutional partnership contracts between such organizations and Government agencies implementing water supply and sanitation programs.

## *Chapter 1*

### **INTRODUCTION**

Access to clean water and safe disposal of waste continue to be major problems for a large segment of the Indonesian population. According to the *Survei Ekonomi Nasional (SUSENAS 1997)* 65.7 per cent people in rural areas are currently estimated to have access to water supply and only 49 per cent have access to safe disposal of excreta. Access to water supply does not necessarily imply access to safe drinking water. Water-sanitation related diseases continue to be a major cause of morbidity and mortality. Diarrhoeal diseases still are the second largest killers of children under five.

The Government of Indonesia and many bilateral and multi-lateral donor agencies have been investing in bringing water and sanitation services to communities through projects in many parts of the country for more than the last twenty years. These include UNICEF, the World Bank, the Asian Development Bank, AusAID, CIDA, international and national NGOs like CARE, PLAN International, Yayasan Dian Desa, Yayasan Indonesia Sejahtera, among others.

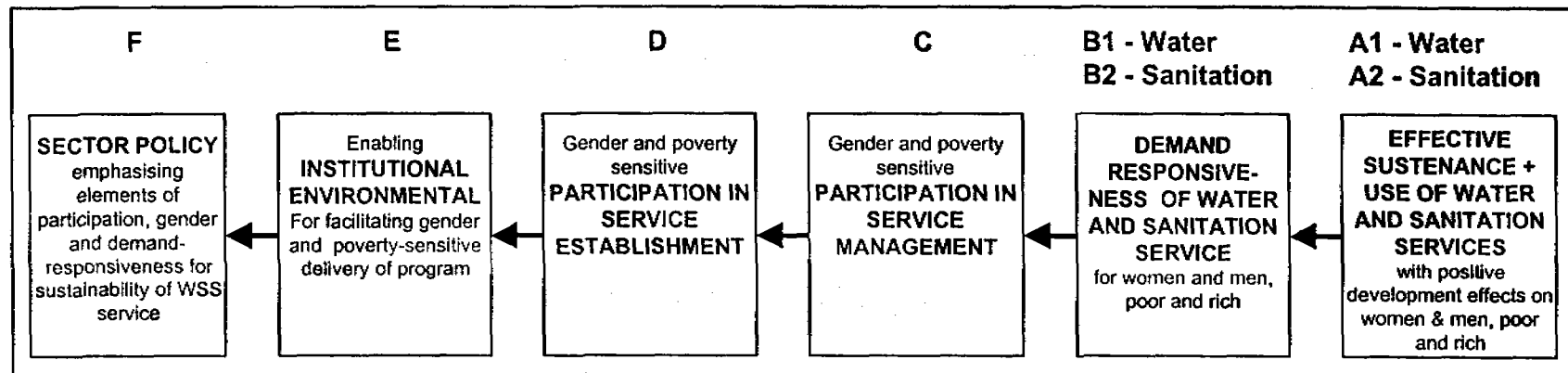
The initial emphasis on supplies, equipment and physical construction of services has given way to more people-centred approaches as experience was gained by all agencies about what makes services sustainable and effective on the ground. However, national policies and regulations regarding drinking water and sanitation in Indonesia are still not fully evolved and adequately in line with the globally recognized principles and best practices. There is increasing interest within the government and the donor agencies to improve the policy environment for water and sanitation, to ensure the efficiency of investments in the sector and maximizing positive impact of services on the communities.

This was the context for a request from UNICEF Indonesia in co-operation with the Government of Indonesia, for a study of UNICEF-assisted Water and Environmental Sanitation projects in selected Indonesian provinces, to be carried out by the Regional Water and Sanitation Group for East Asia & Pacific (RWSG-EAP) of the UNDP/World Bank Water and Sanitation Program. The study had the following Objectives.

#### **Objectives And Focus of Study**

1. To review the experiences of selected Rural Water Supply & Sanitation (RWSS) projects in implementing community-based approaches, with a focus on costs, effectiveness and sustainability of services.
2. To develop quantitative and qualitative methodologies for the review, including participatory evaluation tools, analysis & reporting formats. The methodology and instruments thus developed will be replicable for future evaluations.
3. To train Indonesian research teams from a national resource institution on participatory evaluation of water and sanitation projects.
4. To make recommendations to the Government of Indonesia, based on the results of the study, about appropriate models/strategies for rural water supply, environmental sanitation and hygiene behavior promotion, taking into account different geographic, cultural and social-economic conditions in Indonesia.

**Fig. 1- Conceptual Framework For Participatory Assessment**



**INDICATORS**

- National sector policy promotes Demand responsive, & poverty gender-sensitive participation in management of water and sanitation

**INDICATORS**

- Sector agencies have Demand responsive, gender & poverty responsive participation verifiably reflected in:
  - Policies
  - Staffing
  - Structure
  - Planning & Monit. System
  - Staff cap. Building
  - Performance evaluation system
  - Incentive systems
  - Skills mix

**INDICATORS**

- Participation in initiating project (5%)
- Extent of informed choice (20%)
- Contribution in construction (20%)
- Community organisation for managing services; formation, composition, roles, legal status, bank account, statute (15%)
- Accountability of implementors to community (20%)
- Whose capacity built for what, when, why & how (20%)

**INDICATORS**

- Economic participation (25%)
- Managerial participation (25%)
- Participation in benefits (25%)
- Perception of ownership (15%)
- Perception of responsibility (10%)

**INDICATORS**

- Whose demand for what being met (30%)
- Value attached to service by users (40%) (Consumers' satisfaction re. Perceived benefits)
- Perception of cost effectiveness (30%)

**INDICATORS**

- Functioning system (25%)
- Effective use (25%)
- Effective management (25%)
- Effective financing (25%)

The focus of the study is the operationalization of demand responsive, community-based, gender sensitive approaches, their links with the cost effectiveness and sustainability of the services and their impact on community life.

Similar studies are currently underway in Indonesia, in projects supported by the World Bank, the Asian Development Bank and AusAID in collaboration with the Government of Indonesia. Technical guidance for the studies is provided by the Regional Water and Sanitation Group for East Asia & Pacific (RWSG-EAP). This review requested by UNICEF of its WES projects in Indonesia is expected to add to the comparability of finding and enrich lessons learned on the subject in Indonesia.

## Conceptual Framework of the Study

The methodology and conceptual framework for analysis used in this study are based on an evolving methodological guide for a global *Participatory Learning Initiative* being developed by the UNDP-World Bank Water & Sanitation Program in collaboration with the IRC International Water and Sanitation Centre.<sup>1</sup>

The analytical framework (*Fig. 1*) illustrates the basic underlying assumption that community level outcomes of programs are a function of the way programs are delivered, which in turn is a function of institutional arrangements for implementing the programs and further, of sector policies. The present evaluation of UNICEF's WES program in Indonesia is limited to assessing only the outcomes at the community level, as that was UNICEF's request to RWSG-EAP. The institutional and policy level assessments will be undertaken as a separate future exercise, by RWSG-EAP with national counterparts.

The following assumptions are inherent in this framework:

- A. A community uses and sustains Water Supply and Sanitation Services made available to it, to the extent that
- B. the services meet the users' demand. To the extent that users demands are being met
- C. the users participate in managing and maintaining the services. The extent to which they participate in managing the services is a function of
- D. the extent of their participation in establishing/creating services of their choice.

(Users = Major population categories i.e. rich/poor, men/women that use the services.  
Participation = Equitable participation of all major categories of users. i.e. poverty and gender-sensitive participation.)

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<sup>1</sup> *Participation Gender and Demand Responsiveness: Making the links with Impact and Sustainability of Water Supply and Sanitation Investments.* Draft Guide on Methodology and Tools, Version dated April 1998.

In other words, the better the rich and the poor women and men are enabled to a) initiate the services; b) make informed decisions about types of services and management/financing systems they want and c) build capacities to maintain and manage services so that benefits and burdens are equitably shared, the better they can sustain the services and use them for maximal positive impact on their lives.

To test these assumption, the study selected the following 4 principal variables, divided into 18 main indicators (*Figure 1*)

- A:     **Effective Sustenance and Use of Services (Water Supply and Sanitation)**  
*Dependent variable*
- B:     **Demand-responsiveness of Services (Water Supply and Sanitation)**  
*Independent variable*
- C:     **Users' Participation in Service Management/Benefits/Burdens**  
*Independent variable*
- D:     **Users' Participation in Service Establishment.**  
**(Decision making and capacity building processes)**  
*Independent Variable*

Findings and conclusion are reported using the same outline.

*Two Indonesia-specific study topics that were specially requested by UNICEF did not fit within the global analytical framework. These were: a) Inter-project Construction Cost Comparisons; b) Community Hygiene Awareness levels. They have been studied and reported on in Chapter 4, but not included in the scoring and weighting.*

## **Participating Communities**

The study covered two provinces, West Java and South Sulawesi. Two districts (*kabupatens*) of each province were identified: *Kabupatens Bandung* and *Indramayu* in West Java and *Kabupatens Takalar* and *Jeneponto* in South Sulawesi. A total of 20 villages, 10 in each province were selected from these districts using the following criteria agreed with UNICEF. Field Offices of UNICEF in West Java and South Sulawesi helped identify villages with these criteria.

- population range between 500 to 2500 people
- age of WSS system not less than 2 years and not more than 5 years
- selected villages may have any type of water system: i.e. dugwell, rainwater tanks, handpumps, spring protection, gravity fed piped systems and also have sanitation interventions and IEC (Information, Education, Communication) activities.

Project intervention by UNICEF or INPRES in the selected villages had started in the early 1990s, but only the systems completed around 1995 were evaluated. The rationale was to look at systems which have been completed and are functioning for at least 2 years or more, to enable an assessment of how they are being used and maintained. The reason for excluding much older systems (e.g. completed 8 years ago or longer) is that it is very difficult to collect accurate information regarding the process of service establishment by going more than 3-4 years back in the past. People's recall is reduced and due to population shifts, many who were involved in the process 5-6 years ago are not available in the village at present.

Although the initially agreed criteria of maximum population was not more than 2,500 people, it was hard to find villages with this criterion. Only 7 villages met the mentioned criterion. Average household size in West Java was 3.9 and in South Sulawesi, 4.6 persons. Both West Java and South Sulawesi villages had high coverage with electric connections. 90 per cent villages in West Java were fully covered and 10 per cent partially covered (not all hamlets). In South Sulawesi 70 per cent villages had total coverage and the rest were partially covered. Construction of water and sanitation systems was done both by the community and contractors. In West Java 70 per cent systems were constructed by contractors only and 30 per cent jointly by community and contractors. In South Sulawesi 10 per cent were constructed by contractors only, 60 per cent jointly by community and contractors and the remaining 10 per cent by the community on its own.

## **Participating Organizations**

The Study was designed and carried out by RWSG-EAP in collaboration with the Centre for Regional and Urban Development and Research (P3WK) of the Institute of Technology, Bandung. A team of 12 P3WK members, 2 illustrators and 4 external researchers from NGOs/other World Bank financed projects worked with the RWSG-EAP core team from the design to the analysis stage of the study. The names are listed inside the back cover.

UNICEF Indonesia was closely involved in the process and participated with RWSG-EAP in:

- finalizing the Conceptual Framework of the study
- developing sample selection criteria
- developing indicators and sub-indicators
- reviewing proposed methodology and tools
- briefing researchers during their training prior to field work
- identifying villages for data gathering

Madeline Wegelin-Schuringa of IRC (Netherlands) participated in preliminary meetings to design the study and contributed valuable suggestions for developing the indicators.

## *Chapter 2*

# METHODOLOGY

UNICEF's primary requirement was an evaluation of its community-based approach to water and environmental sanitation in Indonesia. Such approaches can only be properly evaluated by the communities that have experienced them, not by external evaluators. The study accordingly selected a participatory evaluation approach, whereby user communities themselves assessed how the program was planned and implemented and what has been its impact, both on the sustenance of services and on their lives - after the services were created. Due to the need for preserving uniformity in the type of data collected in all 20 villages, the process could not be fully opened up to people's participation - which would have allowed community groups to begin by selecting even the indicators to assess. UNICEF's Terms Of Reference (Annexed) specified the broad indicators. Research methods were then designed to maximize people's participation in collecting related information, analyzing it, reaching and expressing conclusions.

### **Why Participatory Assessment Approach?**

Communities are complex systems. Research studies tend to oversimplify complex realities for the ease of analysis. In order that research findings are able to grasp and illustrate a sufficient amount of the community's own reality, research methods must be open-ended and allow even unexpected information to flow in. Thus, although the indicators of this study were pre-determined, the methodology to assess them was designed specifically so as not to limit the inflow of information in anyway. The reasons for selecting participatory methods were many, the most important ones being:

- a. **Conventional surveys extract data from communities, who become objects of research, supplying factual information demanded of them. Participatory methods allow them to provide not only information but also their assessment and analysis of their situation. The information produced is thus far richer and more reliable as it is not open to misinterpretation by external researchers.**
- b. **Participatory methods are group methods, which minimize data biases due to individual researchers or respondents.**
- c. **Participatory methods can benefit both sides, without exploiting either. They bring about mutual learning by researchers as well as communities, usually resulting in community action to improve their own situation - due to the group insights gained from participatory analysis.**
- d. **Participatory methods are faster and more effective for getting insights into community situations than conventional surveys. Conclusions from participatory research are reached and confirmed on-the-spot, with the community groups involved, as compared to survey results that become available only weeks or months after field work and may be distorted by the researchers' understanding (or lack thereof) of the situation.**
- e. **Participatory methods are specially useful for finding answers to WHY questions, which yield more accurate explanations for what has happened and help make reliable predictions for the future.**



## A Combination of Tools

The aim of this study was to seek the user community's assessment of the program, and their rationale for the same. A second requirement was that the results of this study should be comparable to a series of similar studies being carried out by RWSGEAP of water supply and sanitation projects in Indonesia, which began with the Indonesian chapter of the Global Rural Water Supply study carried out in 1996 by the global UNDP-World Bank Water Supply and Sanitation Program.

To meet both the requirements, this evaluation used a combination of qualitative, participatory, quantitative and technical assessment methods. The participatory assessment exercises were specially designed to fit the study objectives and the socio-cultural contexts of the communities involved. They were drawn from the repertoires of Participatory Rural Appraisal (PRA) and Participatory Hygiene and Sanitation Transformation (PHAST), and built upon the methodology evolving at that time for the global *Participatory Learning and Action Initiative* (collaborative effort of the UNDP-World Bank Water and Sanitation Program and IRC International Water and Sanitation Centre).

<b>DATA COLLECTION METHODS</b>
<ul style="list-style-type: none"> <li>▪ <b>Technical Assessment of Systems</b> (<i>Tool adapted from Global RWS Study</i>)</li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Village Water Sanitation Committee/Managing Group Interview</b> (<i>Tool adapted from Global RWS Study</i>)</li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Review of Community Records</b></li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Participatory Assessments with Men and Women's Groups, in the following sequence:</b> <ol style="list-style-type: none"> <li>1. Gender analysis of task-roles in the community and household.</li> <li>2. Gender analysis of control of resources in the household.</li> <li>3. Wealth classification of community members.</li> <li>4. Mapping access to services</li> <li>5. Water-use pattern matrix (variation of pocket voting).</li> <li>6. Group rating scales for consumer satisfaction.</li> <li>7. Hygiene awareness – pile sorting.</li> <li>8. Contamination routes awareness – flow diagram.</li> <li>9. Trend analysis for impact of services on quality of life.</li> <li>10. Decision making pattern for service establishment (matrix – variation of pocket voting)</li> </ol> </li> <li>▪ <b>Focus Group Discussions with Men and Women's Groups, linking the above exercises</b></li> </ul>
<ul style="list-style-type: none"> <li>▪ <b>Photographic Records of Village WSS Situation and Systems/Facilities Observed</b></li> </ul>

The set of data collection instruments and indicative field work schedule is in the Annexures. Data from different instruments were triangulated and cross-checked for consistency during analysis.

## MAPPING ACCESS TO SERVICES



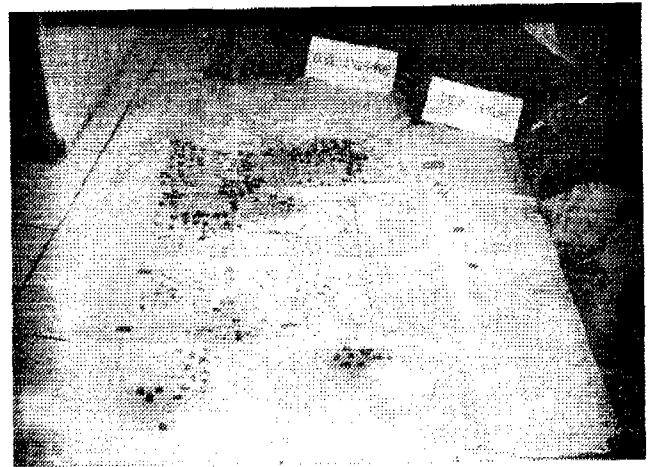
Village women draw maps to illustrate... What facilities exist? Where? Who has access to which ones? Who does not?



Discussions then lead to... 'WHY'.

Rich households often contribute more cash, materials or land during construction.

This can translate into gaining them greater control over public WSS facilities, after



## Selection of Communities

In order to satisfy the purpose of this evaluation UNICEF chose to locate the study in two provinces which had received substantial UNICEF investments for water and sanitation during the 1990-95 country programs of cooperation i.e. South Sulawesi and West Java.

Study villages were short-listed with the help of UNICEF and Government of Indonesia offices in the provinces, using the following criteria. The aim was to obtain an appropriate sample which could adequately represent an universe of poor rural communities which received UNICEF WES Program assistance during the period 1990-95 of the Repelita V (Government of Indonesia's 5<sup>th</sup> Five-Year Plan). UNICEF assistance during this period had focused on 30 districts in 5 provinces of the country. The present study was designed to cover 4 of the 30 districts, in 2 of the 5 provinces. The total number of villages to be covered was 20 which would be considered inadequate for quantitative analysis. However, quantitative averages not being the focus of this study, it was estimated that 20 villages would be able to provide an adequate picture of program processes and resulting patterns of interactions with communities. This was of special interest to UNICEF since during the reference period 1990-95, the WES Programme had undergone a major directional change, moving away from hardware supply activities towards community-based self-help approaches and investment in capacity building /software activities. The sampling criteria are stated below.

- Number of villages : At least 15 to be identified per province (in order that 20 be finally available for study)
- Geographical Spread : From at least 2 districts in each province
- Age of WSS Systems : Not less than 2 years and not more than 5 years (average age of systems was 4 years in the study)
- Type of Intervention : Villages may have any type of water system supported by UNICEF. However, they must also have sanitation interventions and IEC (Information, Education, Communication) interventions.
- Type of Support : A mix of villages that received:
  - both UNICEF and INPRES funded assistance
  - only UNICEF assistance
  - only INPRES assistance
- A mix of villages considered "successful" and "not successful", to allow a range of lessons to emerge
- Size of Village : Population between 500 – 2500\*
- (\*This criterion proved hard to meet. Most villages were larger, with 3000-5000 people. UNICEF assistance went to selected sub-village zones or *Dusuns*)

The final selection of villages from the shortlist depended on the willingness of the village community to participate in the assessment. The final selection did not differ much from the shortlist since it was necessary to include almost all that satisfied the above criteria, to make up 20.

## Data Collection and Analysis

The study was designed and carried out by RWSGEAP in collaboration with the Centre for Regional and Urban Development and Research (P3WK) of the Institute of Technology, Bandung. A team of 12 researchers from P3WK was supplemented by 4 researchers from Indonesian NGOs specialised in participatory techniques. Two illustrators worked with them to develop participatory tools specific to the two study provinces. Four multidisciplinary teams of 4 people each were formed for West Java and South Sulawesi. They were trained together by RWSGEAP in the use of all research instruments, in a week long training which included field testing of the instruments. The teams planned their field work schedule at the end of training. They spent the next four weeks in the 20 sample villages gathering and analyzing data with men and women's groups, after first using a poverty targeting PRA exercise to identify and include men and women of rich, poor and in-between classes in the assessment activities in each village. Fieldwork took about 3 days and nights in each village.

### Activity Sequence in Each Village and Learning Thereof

In each village the team of researchers first consulted with the village chief to confirm the presence of UNICEF assisted WSS interventions in village and explain their purpose, i.e., *to learn about the community's WSS situation and its impact on their lives*. The first meetings was with the village chief and other village leaders, during which the researchers asked if the villagers would like to participate in the study. If this was agreed, they obtained basic data on village population and WSS facilities at the first meeting. The Wealth Classification exercise was also carried out to understand local criteria for classifying families as well off, average, poor.

The team then visited *Dusuns* which had received UNICEF assisted facilities, met with residents, explained their purpose and agreed time and place convenient to the residents for the next activity, i.e. social mapping. Mapping was the most successful of all participatory exercises and generated the most public interest. It worked best when done preliminarily by women, and then discussed with both men and women's groups. Women were enthusiastic and very thorough with their depiction of requested information on the map. They often came back to the first draft on the following days and embellished it further with colourful legends and creative use of local marking materials. The map illustrated the WSS facilities and the access of the rich/average/poor households to the services. Reasons for the situation were probed through semi-structured interviews with men and women's groups around the map. The map was then used to identify facilities to be observed and clusters of households that should be visited for the rest of the research activities, to ensure a sample representative of both the better off and poorer groups in the village.

Over the next two days the research team split up and continued the sequence of assessments explained earlier, simultaneously with several groups of men and women, usually in the afternoons or evenings when people were free to talk with them. In general all the participatory analysis exercises were well understood and enthusiastically participated in by men and women. Some learning from their application was as follows:

#### 1. Water-Use Pattern Matrix

This activity was for learning if UNICEF assisted water facilities had brought about changes in people's water use pattern. In several villages this was difficult to isolate as there were multiple water sources available from several projects. This activity worked well where the UNICEF supported facility was a gravity-fed piped system.

## 2. Hygiene Awareness Pile Sorting

A few of the visuals were being interpreted in different ways by different groups. The team soon learned to verify the groups' understanding of each picture before asking them to sort the pile.

## 3. Trend Analysis

Community responses to this instrument turned out to be overwhelmingly quantitative e.g. in terms of amounts of time/effort/resources saved or spent collecting water before or after the project. Possibly there was qualitative impact too on people's lives, but the research team was not able to probe with sufficient skill to bring those out. This point will need to be addressed in future research team trainings.

## 4. Decision Matrix

While groups of men/women filled out this matrix on the floor, sometimes they tended to divert their focus on the content of "key decisions about WSS facilities" rather than on "Who was involved in deciding" it. Facilitators had to observe the process from a distance and if necessary, remind the group unobtrusively about the original task. This was possibly due to most villagers' lack of experience of involvement in decision making - as the process had been monopolised by village chiefs.

## 5. Gender Analysis of Control of Resources in the Household

The idea of "control" proved difficult to communicate. The research teams tried various alternatives and finally decided that the most workable way is to ask "*Who has the authority to buy/sell which household asset/resource?*"

## Analysis of Data

Encoding, categorisation and tabulation of data was a collective exercise involving all 16 members. A core team of three P3WK staff continued collaboration with RWSGEAP throughout the statistical analysis, done in the offices of P3WK and RWSGEAP. The data gathered through all instruments was content analyzed, categorized and scored using the table of Indicators and Scoring System (*see at the end of this section*). This was developed from the Conceptual Framework of the study explained earlier in Chapter 1.

For summing up sub-indicators into scores for the major indicators, a weighting system was used, as detailed in the Conceptual Framework. Statistical analyses were based on these weighted totals and sub-indicator means. Associations between variables were tested with Pearson's Product - Moment correlation. Variances between means were tested with Analysis of Variance (ANOVA). Wherever relevant, graphic presentations have been included to illustrate the findings and conclusions.

## Operational Definitions

Access to Service: The degree to which each household and persons in these households are able to use the service. Criteria for water services set by sector policies mostly combine the number of users with the distance to the facility, e.g. minimally one improved water point per 250 inhabitants at a distance not greater than 200 meters. Whether these criteria are the same as those of the users depends on local conditions. There are also situations where social relationships will bar certain groups from use or where new facilities are not competitive to indigenous sources in terms of social or physical access.

**Benefits:** The gains from the service as perceived by the respective stakeholders for themselves, their family and group in terms of greater convenience, more or better or more reliable water for various uses, collection safety for women and girls, more time for children (boys and girls) to go to school, higher status of the family, improved hygiene/health, reduced social or economic conflicts, more time for rest or development, increased value of plots, more income, cost savings from buying from vendors & better health, etc.

**Community:** The geographic and administrative agglomeration of all hamlets, quarters and households which has 'adequate access' to an improved water supply system or combination of systems.

**Costs:** The price paid for using the service as defined by the stakeholders in terms of time and efforts and sharing of collection burdens for use, level of payments, risk of social conflicts, sanctions for not adhering to norms or rules, reduced contacts, temperature/ taste/qualities for cooking and laundry etc.

**Demand:** The level of service and benefits for which people are willing to contribute in time, kind and cash.

**Demand-responsive Approach (DRA):** An approach that allows demands of the consumers as individuals and as a community to guide key investment decisions and service management.

Such an approach establishes clear linkages between the kind of service and service benefits the respective stakeholders want and what they are willing to contribute in cash, kind, labor and time for the establishment and running of these services. Ideally, in a demand-responsive system, communities make informed decisions about the level of service they want to invest in, manage and sustain, with an understanding of the implications of their decision. Priority for participation in a demand-responsive approach is given to communities that actively seek improvements to their water supply as a community service.

Since improved water supply and sanitation are basic services strongly related to public health and health costs of a society, a demand-responsive approach to these services is not only geared to meet the demands of individual users but also of the community as a whole, i.e. the combined demand of the households within its boundaries.

**Effective Use:** The degree to which all individuals, rich and poor (and those in-between), male and female in the community (as defined above) hygienically use the improved facilities throughout the year and have abandoned more risky hygiene patterns. Whether the intended users actually use the service will depend on whether the costs of the service as perceived by the various stakeholders match their perceived benefits.

**Gender:** Refers to the socially determined division of roles, responsibilities and power between women and men. While biological division referred to by the male or female sex is static, socially constructed gender identities and relations are dynamic. They vary over time, from culture to culture and with economic classes, age and marital status.

**Informed Choice :** A choice made by a group or individual with a clear understanding of the implications of that choice. The implications may be in terms of investment or recurrent cost, expected participation in planning and implementation, responsibility for operations and maintenance and possible effects of the service, in terms of social, economic and health effects.

**Poverty:** Situation where access to and control over resources is insufficient to cover the basic requirements for water, food, shelter, health and education. Poverty is not only an absolute but also a relative concept, in that in each society some groups will have better access to and control over resources than others. Poverty can be gender specific in those societies where men and women in households each have their own sources of income and responsibilities for financing. So it can occur that male heads of households have a considerable income from e.g. cash crops, yet the women in the household cannot pay for water and food which are culturally their responsibilities, because they have less access to the means of production than the men. The classification of relatively rich and poor households is done through participatory tools (*see Chapter 3*) and related to access and benefits of the service and the participation process.

**Sanitation Service/Program:** Any provision or combination of provision to dispose of human and animal waste and waste water.

**Social Intermediaries:** Organizations or departments within the government that provide the interface between the formal service delivery system and the community. There is a range of government, non-government and community organizations that can provide social intermediation services.

**Social Intermediation:** The process that disseminates information on project rules and ensures that community demand reflects the choice of all; facilitates agreements among actors, both within and outside the community and provides necessary training to communities for undertaking required roles and responsibilities with respect to planning, implementation and management of their water and sanitation services. Social intermediation in the context of DRA is of particular significance and is a new way of doing business for many service delivery agencies.

**Sustained Sanitation:** The maintenance, by the community, of an acceptable level of public and household sanitation without further external support.

**Sustained Water Service:** The maintenance, by the community, of an acceptable level of water service throughout the design life of the water supply system without direct external support. Sustained services are examined both in terms of physical infrastructure and in the ability of the users and local management organization to adequately maintain, manage and finance the service. Thus, level of sustenance may be influenced by factors such as consumer satisfaction, commitment (of women and men); technical and managerial abilities (*idem*), financial arrangements (to cover O&M), legal or informal ownership, and ease of access to tools/ spare parts / technical skills close to the community.

**Water Service:** Any combination of improved water supply systems that delivers water for domestic and small-scale productive use within a community (as defined above) or cluster of communities.

## Indicators And Scoring System

		Season	
		Dry	Rainy
<b>A1. EFFECTIVE SUSTENANCE AND USE - Water Supply Services</b>			
<i>Water - Functioning System</i>			
<b>WFS 1</b>	<b>Physical Quality of Works</b>		
<b>WFS 1-a</b>	Functioning System in Place - water systems functioning fully - water systems functioning partly - water systems not functioning at all	2 1 0	
• <b>WFS 1-b</b>	Design Quality - good design, no design faults - fair, minor design faults - poor design, major design faults	2 1 0	
• <b>WFS 1-c</b>	Quality of Workmanship and Material - good workmanship and material - fair - poor workmanship and material	2 1 0	
• <b>WFS 1-d</b>	Construction Completed According to Requirements - construction completed - construction not completed	2 0	
<b>WFS 2</b>	<b>Water Quantity</b>		
<b>WFS 2-a</b>	Water Quantity-Seasonal - no water at source in any season - seasonal lack of water at source - no seasonal lack of water	0 1 2	
<b>WFS 2-b</b>	Water Quantity-for Domestic Needs - adequate water quantity for all domestic needs - adequate water quantity only for drinking and cooking - insufficient water quantity even for selected domestic purposes	2 1 0	2 1 0
<b>WFS 3-a</b>	<b>Water Quality</b> Seasonal Quality - good quality all the time - water quality depend on the season and geographical location - poor quality all the time	2 1 0	2 1 0
<b>WFS 3-b</b>	Source Protection - available source protection and preservation measures - no source protection measures	2 0	
<b>WFS 3-c</b>	Water Testing - water tested regularly - water tested once when built/never tested	2 0	
<b>WFS 4</b>	<b>Regularity of Service</b> - water available everyday - water only available several days in a week - no water available	2 1 0	2 1 0



		Season	
		Dry	Rainy
<b>A1. EFFECTIVE SUSTENANCE AND USE - Water Supply Services</b>			
<i>Water - Effective Use</i>			
<b>WEU 1</b>	<b>Access to Service</b> - water system can be utilized by all sections of the community - water system can be utilized only by some sections of the community/elite group - majority cannot use the system	2 1 0	2 1 0
<b>WEU 2</b>	<b>Change in Water Use for Better Health</b> - no change in water use - change in water use for washing and cleaning only - change in water use for drinking and cooking only - change in water use for all domestic purposes	0 1 2 3	0 1 2 3
<b>WEU 3</b>	<b>Coverage (Population % Served by Facility) :</b> - Less than 10% - 10.1% - 20% - 20.1% - 30% - 30.1% - 40% - 40.1% - 50% - 50.1% - 60% - 60.1% - 70%		1 2 3 4 5 6 7
<i>Water - Effective Financing</i>			
<b>WEF 1</b>	<b>Cost Covering Financing</b> - recurrent costs covered partially - recurrent costs covered fully - recurrent costs covered fully with surplus for expansion/depreciation .... - recurrent costs with surplus plus part of investment costs covered		0 1 2 3
<b>WEF 2</b>	<b>Local Financing System</b> - financing unrelated to actual costs and consumption - flat rate for all related costs - those who use more pay more (according to consumption) - rate according to consumption and capacity to pay		0 1 2 3
<i>Water - Effective Management</i>			
<b>WEM 1</b>	<b>Management Organization (Water Committee)</b> - no water committee - informal water committee only - formal water committee exists - not active - formal water committee exists - active		0 1 2 3
<b>WEM 2</b>	<b>Maintenance and Repair</b> - no proven ability - have successfully made minor repair (small leaks, etc.) - have successfully made more major and minor repair (new tanks, etc.) - have extended the system or built other systems elsewhere		0 1 2 3
<b>WEM 3</b>	<b>Operating Personnel</b> - there is no maintenance activity/arrangement - maintenance is done by anyone who wants to - maintenance is done by land owner/"owner of the facility" - maintenance is done by operator (not paid and not trained) - maintenance is done by operator (paid and not trained) - maintenance is done by operator (paid and trained)		0 1 2 3 4 5

<b>A1. EFFECTIVE SUSTENANCE AND USE - Water Supply Services</b>			
<i>Water - Effective Management Contd.'</i>			
<b>WEM 4</b>	<b>Financial Management</b> - no budget and accounting; funds collected as and when required - systematic budgeting and collection, but no accounting for service to users - systematic budgeting and collection, accounted to some users - systematic budgeting and collection, accounted to all users	0 1 2 3	
<b>WEM 5</b>	<b>Users' Assessment of Appropriateness of Fees</b> - actual scores from rating scale	0 - 10	
<b>WEM 6</b>	<b>Users' Assessment of Effectiveness of Management</b> - actual scores from rating scale	0 - 10	
<b>A2. EFFECTIVE SUSTENANCE AND USE - Sanitation Facilities and Services</b>			
<i>Sanitation - Functioning System</i>			
<b>* SFS 1</b>	<b>Quality of Design &amp; Construction</b> - functioning system in place - good design, no design/construction fault - good workmanship & materials in construction - construction completed according to requirements	Yes 1 1 1 1	No 0 0 0 0
<b>* SFS 2</b>	<b>Environmental Soundness of System</b> - latrine at least 10 meters or more away and not upstream from water source	2	0
<b>SFS 3</b>	<b>Effective Performance</b> - adequate water available to operate sanitation facility all the time - sometimes water is not available/not enough to operate facility - no water available to operate facility	2 1 0	
<b>SFS 4</b>	<b>Reliable Service</b> - sanitation facility can always be used, whenever users need to - sometime sanitation facility cannot be used when users need it - sanitation facility cannot be used at all when users need it	2 1 0	
<i>Sanitation - Effective Use</i>			
	<b>Access to Service</b> - Facility not available - Those having access are not those who need it - All who want access, have access	0 1 2	
<b>SEU 2</b>	<b>Change in Sanitation Habit</b> - no changes in sanitation habit. Majority still dispose of excreta as before - sanitation facility is used but not consistently by majority - sanitation facility is always used for disposing of excreta by majority	0 1 2	
<i>Sanitation - Effective Financing</i>			
<b>SEF 1</b>	<b>Degree &amp; Type of Investment: HH Facilities</b> - all households subsidized by more than 50% of cost - all receive subsidy of 50% or less - only low income households receive subsidy of 50% or less	0 1 2	
<i>Sanitation - Technical /Monitoring/Financial/Mgt. Capacity for Sanitation in the Community</i>			
<b>SEM 1</b>	<b>Technical Capacity for Private Sanitation</b> - no material and skills for ongoing construction in the community - materials & skills present in community - for only 1 design of facility - materials & skills present in community - for a range of designs	0 1 2	
<b>SEM 2</b>	<b>Community Capacity to Monitor Sanitation</b> - no monitoring of sanitation conditions and practices in the community - occasional checks of conditions and practices made in the community - regular monitoring of sanitation conditions and habits in the community	0 1 2	

<b>A2. EFFECTIVE SUSTENANCE AND USE - Sanitation Facilities and Services</b>			
<i>Sanitation - Technical/Monitoring/Financial/Mgt. Capacity for Sanitation in the Community</i>			
SEM 3	Sanitation Coverage Level		
	- percentage HH with improved sanitation facility is unknown/going down		0
	- percentage HH with improved facility staying constant		1
	- percentage HH with improved facility going up		2
SEM 4	Financial Management		
	- no rules being followed about subsidies		0
	- subsidized by UNICEF - without allocation guidelines		1
	- subsidized by UNICEF - with allocation guidelines		2
<b>B1. DEMAND RESPONSIVENESS OF - Water Supply Services</b>			
<i>Water - Demand Met for Service Level</i>			
WDML 1a	Level of sharing		
	LOS Sharing: Private/Public		
	- public water system		0
	- public and private water system combined		1
	- private water system/house connections		2
WDML 1b	Ancillary Facilities		
	- no ancillary facilities		0
	- private-ancillary facilities built by individuals for private use		1
	- public-ancillary facilities built by community groups		2
WDML 1c	Kind of Ancillary Facility		
	- no ancillary facility		0
	- ancillary facility-drainage only		1
	- ancillary facility-for bathing & washing		2
	- ancillary facility-for bathing, washing, drainage		3
WDML 2a	Domestic Utilization Demand Met:		
	- not meeting any domestic demands adequately		0
	- for bathing and washing only		1
	- for drinking and cooking only		2
	- for all domestic uses		3
WDML 2b	Productive Utilization Demand Met		
	- no productive utilization, only domestic use		1
	- productive utilization of water from system		2
<i>Water - Demand Met for Value of Service</i>			
WDMV 1	Perceived Benefit	Yes	No
	- social	1	0
	- economic	1	0
	- health	1	0
WDMV 2	Cost Benefit Perception		
	- cost greater than benefit		0
	- cost proportional to benefit		1
	- cost less than benefit		2
WDMV 3	User's Satisfaction Level With:	Actual values	
	- quality of water service	from 3 rating	
	- quantity of water service	scales, ranging	
	- regularity of water service	from 0 - 10	

<b>B2. DEMAND RESPONSIVE NESS OF - Sanitation Facilities</b>			
<i>Sanitation - Demand Met</i>			
<b>SDM 1</b>	<b>Number/Location/Design/Cost</b> -number of facilities appropriate with community demand - facility location appropriate with community demands - design appropriate with community demands - project cost appropriate with community demands	Yes 1 1 1 1	No 0 0 0 0
<b>SDM 2</b>	<b>Perceived Benefit</b> - social - economic - health	Yes 1 1 1	No 0 0 0
<b>SDM 3</b>	<b>Worthwhileness of Sanitation Facility to users</b> - actual rating scale score	Range 0 - 10	
<b>C. USERS' PARTICIPATION IN SERVICE MANAGEMENT</b>			
<i>Water - Service Participation in Management</i>			
<b>WSPME</b>	<b>Economic Participation</b>		
<b>WSPME1a</b>	<b>Division of Work to Keep Service Functioning</b> - work done by men, skilled, paid - work done by men, unskilled, paid - work done by men, skilled, unpaid - work done by men, unskilled, unpaid	4 3 2 1	
<b>WSPME1b</b>	<b>Division of Work to Keep Service Functioning</b> - work done by women, skilled, paid - work done by women, unskilled, paid - work done by women, skilled, unpaid - work done by women, unskilled, unpaid	4 3 2 1	
<b>WPMM</b>	<b>Managerial Participation :</b>		
<b>WPMM1</b>	<b>Women's Share in Decision Making</b> - women did not participate in decision-making for water facility - women attended meetings about facility, did not participate in decisions - women attended meetings, and participated in decision-making about the water facility	0 1 2	
<b>WPMM2</b>	<b>Users' Knowledge of Fees Collected: Amount per Month</b> - do not know - there are no fees - users know and specify the amount	0 1 2	
<b>WPMM3</b>	<b>Users' Knowledge of Fees Collected: Where Kept ? How Used ?</b> - do not know - there are no fees - users can answer where kept and how used	0 1 2	
<b>WPMM4</b>	<b>Mechanism for Financial Information Sharing with Users</b> - no mechanism available - mechanism exists, but not used - mechanism exists and used to give regular information to users	0 1 2	
<b>WPMB</b>	<b>Participation in Benefits</b>		
<b>WPMB1</b>	<b>Ratio of Present Number of Users to Planned Number :</b> - present more than planned - present = planned - present less than planned - no one gets any benefit	3 2 1 0	

	WPMB2	Who Gets More of the Water Service - poor get more than rich - poor and rich get equal amount - rich get more than the poor	3 2 1
<b>C. USERS' PARTICIPATION IN SERVICE MANAGEMENT Contd.</b>			
<i>Water - Service Participation in Management</i>			
	WPMO WPMO1	<b>Perception of Ownership of Water Facility</b> Who Owns Facility - owned by government/outside agency - owned by owner of land (on which facility stands), or "facility owner" - owned by village government - owned by users groups/individual users	0 1 2 3
	WPMO2	Legal Ownership - legal status of ownership exists - no legal ownership status	2 0
	WPMR WPMR1	<b>Perception of Responsibility</b> Responsibility for Operation & Maintenance - outside agency/government - land owner/owner of facility - village government/LKMD/Kepala Desa - users themselves	0 1 2 3
	WPMR2	Responsibility for Repairs - outside agency/government - land owner/owner of facility - village government/LKMD/Kepala Desa - users themselves	0 1 2 3
<b>D1. USERS' PARTICIPATION IN SERVICE ESTABLISHMENT - Water Supply Services</b>			
<i>Water - Project Initiation</i>			
	WPEI 1	<b>Project Initiation</b> - men & women proposed the project, after mutual consultation - men (only) proposed the project, without consulting women - village elite proposed the project - project is given by agency, without request from community	3 2 1 0
<i>Water - Informed Choice</i>			
	WPEIC 1	<b>Technology Option</b> - no technology option - only one technology option feasible (as informed to community) - technology option chosen by elite/village chief - technology option chosen by men only - technology option chosen by community (men and women)	0 1 1 2 3
	WPEIC 2	<b>Service Level Option (LOS)</b> - no LOS option given - village chief/elite decided LOS - men decided LOS, without consulting women - community decided LOS (men and women)	0 1 2 3
	WPEIC 3	<b>Management Organization Option</b> - no special arrangement, part of general administration - local leadership appointed the committee-mostly male elite - community chose-without getting information on rights & responsibilities - community chose after getting rights & responsibility related information - men/women, rich/poor chose local mgt., with full info on rights & responsibilities	0 1 2 3 4

**D1. USERS' PARTICIPATION IN SERVICE ESTABLISHMENT - Water Supply Services (Contd.)**

<i>Water - Informed Choice Contd.</i>		
<b>WPEIC 4</b>	<b>Local Design of Facility Option</b>	
	- community had no choice & influence on design of facilities	0
	-local designs were adjusted-if community asked but no efforts made to get community views	1
	- local designs were adjusted within financial margin of project-by asking communities	2
	- local designs adjustment options offered, at a cost to users	3
<b>WPEIC 5</b>	<b>Financing System Option</b>	
	- project agency introduced standard financing system	0
	- project agency helped introduce locally adjusted financing system	1
	- potential users chose FS-without specific involvement of Men/Women/Rich/Poor	2
	- all users had a voice to choose FS, Men/Women/Rich/Poor	3
<i>Water - Contribution in Construction</i>		
<b>WPECC 1</b>	<b>Cash Contribution</b>	
	- no cash contribution	0
	-the richer contribute more cash if they want	1
	- flat rate cash contribution, compulsory for all	2
	-flexible cash contribution-rich/poor/flexible timing-jointly decided	3
<b>WPECC 2</b>	<b>In-Kind Contribution</b>	
	- no in-kind contribution	0
	-the richer contribute more in-kind if they want	1
	- flat rate in -kind contribution	2
	- different in-kind contribution by rich/poor - jointly agreed	3
<b>WPECC 3</b>	<b>Type of Labor Contribution</b>	
	- labor contribution paid for	0
	- labor contribution paid less than market rate	1
	- voluntary, unpaid labor	2
<b>WPECC 4</b>	<b>Monitoring &amp; Control of Finances</b>	
	- done by community	2
	- done by contractor-community chosen	1
	- done by contractor employed by outside agency	0
<i>Water - Organization of Management</i>		
<b>WPEOM 1</b>	<b>Composition of Water Committee</b>	
	- no water committee	0
	- men/elite only members	1
	- men & women of elite or higher classes as members	2
	- community group representing men/women/rich/poor members	3
<b>WPEOM 2</b>	<b>Roles &amp; Responsibilities of Committee</b>	
	- no community mobilization	0
	- mobilization of contribution only	1
	- planning & management of participation in project by the local committee	2
	- planning & management authorized by stakeholders committee	3
<b>WPEOM 3</b>	<b>Legal Status of Committee</b>	
	- no legal status	0
	- implicit legal status derived from community body	1
	- formal legal status	2
<b>WPEOM 4</b>	<b>Rules and Tools of Committee</b>	
	- no statutes, no accounts	0
	- informal rules, one account holder	1
	- formal rules and statutes, inbuilt protection against misuse	2
	- rules and tools poverty and gender - conscious	3

<b>D1. USERS' PARTICIPATION IN SERVICE ESTABLISHMENT - Water Supply Services (contd.)</b>				
<i>Water - Adherence to Agreed Design &amp; Schedules, Accountability of Contractors</i>				
<b>WSPEA 1</b>	<b>Accountability to Men for</b>	Yes	No	Partial
	- materials	2	0	1
	- designs	2	0	1
	- construction quality	2	0	1
	- construction schedule	2	0	1
<b>WSPEA 2</b>	<b>Accountability to Women for</b>	Yes	No	Partial
	- materials	2	0	1
	- designs	2	0	1
	- construction quality	2	0	1
	- construction schedule	2	0	1
<b>D 1&amp;2 CAPABILITIES BUILT OF STAKEHOLDERS - Water Supply and Sanitation Services</b>				
<b>WSPECB1</b>	<b>Who Was Trained - Men/Women in What</b>			
	- no training			0
	- training men only for construction. & maintenance., women only for health/hygiene			1
	- training men for construction&maintenance,women for health/hygiene,both for management			2
<b>WSPECB2</b>	<b>Methods of Training</b>			
	- no specific capacity building			0
	- single course-theory only			1
	- single course-theory & demonstration			2
	- single course-theory & hand on for all			3
- theory & hands on, repeatedly			4	
<b>D2. USERS' PARTICIPATION IN SERVICE ESTABLISHMENT - Sanitation Facilities and Services</b>				
<i>Sanitation - Project Initiation</i>				
<b>SPEI 1</b>	<b>Project Initiation</b>			
	Project is given by agency, not requested by community			0
	- village head/elite proposed project			1
	- men (only) proposed project			2
- men and women proposed project			3	
<i>Sanitation - Informed Choice</i>				
<b>SPEI 1</b>	<b>Technology Option</b>			
	- no technology option			0
	- technology option-chosen by elite/village head			1
	- technology option-chosen by men only			2
- technology option-chosen by community (both men and women)			3	
<b>SPEI 2</b>	<b>Service Level Option</b>			
	- no LOS option			0
	- elite decided LOS			1
	- men decided LOS, without consulting women			2
- community decided LOS (both men and women)			3	
<b>SPEI 3</b>	<b>Financing System</b>			
	- subsidized by UNICEF-without allocation			0
	- subsidized by UNICEF-with allocation			1
- no subsidy from UNICEF			2	

<b>D2. USERS' PARTICIPATION IN SERVICE ESTABLISHMENT - Sanitation Facilities and Services</b>	
<i>Sanitation - Contribution in Construction</i>	
<b>SPECC 1</b>	<b>Cash Contribution</b> - no cash contribution 0 - the richer contributed more cash if they want 1 - flat rate cash contribution by all 2 - different cash contribution by rich/poor, jointly decided by all 3
<b>SPECC 2</b>	<b>In -Kind Contribution (Material and Labor)</b> - no in-kind contribution 0 - the richer contributed more in-kind if they want 1 - flat rate in-kind contribution 2 - different in-kind contribution by rich/poor, jointly decided by all 3
<b>SPECC 3</b>	<b>Kind of Labor Contributed</b> - labor contributed paid for at market rate 0 - labor contributed paid less than market rate 1 - voluntary labor, unpaid 2
<b>SPECC 4</b>	<b>Monitoring &amp; Control</b> - done by contractor employed by agency 0 - done by contractor-community chosen 1 - done by community 2
<b>Note :</b> Indicators WSPEA and WSPECB are common to both Water and Sanitation Service Establishment	



## Chapter 3

### PROJECT CONTEXT AND SETTING

This chapter briefly outlines the project environment and social setting of the participating communities.

#### Project Environment

##### *UNICEF's Water and Environmental Sanitation Program in Indonesia*

The Government of Indonesia - UNICEF Master Plan of Operations 1995-2000 states that :

“GOI and UNICEF co-operation since the first Five Year Development Plan (*Repelita I*, 1969-1974) has evolved from a solely hardware supply sub-component to one with greater emphasis on software activities with community self-help approaches. Efforts to bring about this change began in mid-*Repelita IV* as a result of the evaluation of the National WES Program. But most of these changes took place during *Repelita V* (1990-1995).”

GOI-UNICEF co-operation in *Repelita V* focused on 30 districts in 5 provinces and ten cities. During this period the thrust of the WES Programme was on establishing provisions and procedures for maximizing community self-help-based construction of services, thereby accelerating demand and sustained coverage of services. The bulk of the systems surveyed in this study were constructed during this period. The underlying assumption was that studying the process used for creating the services during this period would provide useful insights about whether the Program is changing in the desired direction, what is working/not working and why.

#### *Project Rules*

UNICEF in Indonesia supports the *PPAB-PLP (Program Penyediaan Air Bersih dan Penyehatan Lingkungan Pemukiman)* program of the Government of Indonesia. UNICEF funds are used for specific activities within PPAB-PLP such as community-based planning of services, Information, Education, Communication activities, training programs for implementors, managers and community members in planning/management/O&M, provision of stimulant packages for the construction of a range of WES facilities, monitoring and evaluation of the Program. Presidential INPRES funds are used for the rest of the activities. The following box summarizes the project rules.

## Summary of Project Rules

- ◆ **Project Type:** Single Sector - Water Supply, Sanitation, Hygiene Education
- ◆ **Funding & Implementation:** Implementation by Departments of Health, Public Works and Home Affairs, through GOI's PPAB-PLP Program. UNICEF funds used for specified activities within PPAB-PLP, INPRES funds used for other activities considered necessary. Funds based on approved village level proposals made through the GOI's annual bottom-up planning cycle.
- ◆ **Decision Making:** Communities involved in planning through village level Musyawarah Desa that proposes village development action proposals for the P3MD bottom-up planning cycle each year.
- ◆ **Design:** Provincial Public Works Department responsible for designing water - sanitation systems. A limited range of design options available from UNICEF
- ◆ **Construction:** Built by contractors employed by Public Works Departments, by communities together with contractors, or by communities themselves.
- ◆ **Supervisions & Training:** Public Works Department supervises construction and provides training in construction. Health Department and Local Government agencies provide training in Health & Hygiene, Maintenance and Operation of facilities.
- ◆ **Community Contribution:** No contribution specified for Water Supply or sanitation services. Stimulants\* specified for family latrines, dugwells, rainwater collectors, spring protection, school latrines.
- ◆ **Participation:** Community self-surveys, Preparation of Village WES plans, Formation of User Committees for O&M.
- ◆ **Women's Involvement:** Specific activities to address women for hygiene behavior improvement. Recommendations for women's involvement in Water Committee and village level planning, but no specific rules/requirements established to that effect

(\* Stimulants are specified amounts of partial fund assistance not paid in cash but in the form of a package of construction materials specific to each type of facility)

## *Technology Options*

Five different technology options had been provided by the projects in the villages surveyed. In upland areas like in Bandung where natural springs are available, the villages were served by gravity fed piped systems (3 villages). In Indramayu the options consist of dugwells, rainwater catchment tanks and deepwell boreholes equipped with shallow handpumps. Even though the wells were drilled as deep as 113 meters, shallow handpumps are quite appropriate, because the water table from deep aquifers reached high levels in this area. In South Sulawesi the technology options are limited to dugwells and deep/shallow handpumps. Technology options are rarely discussed with the communities. Decisions were made almost entirely by projects staff based on their experience and availability of water source. Other options, such as water treatment from surface water have not been explored.

## *Sources And Availability of Water*

Water sources could be put into three categories according to the availability and quality of water.

Good quality upland natural water springs: In the West Java upland area, natural springs are often available. These water sources are ideal, as they usually have good quality water, are situated at levels higher than community habitations and have often been used by the villagers for generations, using traditional means to transport the water to villages through bamboo pipes. In these areas the villagers will usually propose a gravity fed piped system and the project will accordingly accept the proposal as long as it is within the budget limit.

Poor quality shallow groundwater. Geographically, this area, is located near coasts and the water table is shallow. Communities tend to use the ground water for their daily use no matter how poor or good the quality is. Almost all water points in these areas deliver brackish, turbid or colored water very rarely of good quality. In these areas people tend to purchase water for drinking and cooking or carry water from good wells, especially in the dry season when water quality gets worse. If the project does provide other options such as deepwell boreholes (deep aquifers) or rain water catchment tanks, people use them as alternative sources for drinking and cooking.

Good quality shallow groundwater. Villages which fall in this category have no problems with their water source. In such areas people are used to digging or drilling their own wells although the dugwells are often without lining. The only problem they face is in areas where they must dig/drill through hard soil or rock which pushes up construction costs and only rich families can afford to construct their own wells.

## *Other Water And Sanitation Projects*

Besides UNICEF, water and sanitation facilities were also constructed in the study villages by other government and non-government agencies. Government agencies were represented by SIPAS, a Cipta Karya led project. The project is funded by the central government and implemented by local authorities. BKKBN, another government agency, provides funds for water and sanitation, although in a limited way. AMD, an Armed Forces initiative for rural development has also developed a few water and sanitation projects in the villages. PLAN International, a major foreign NGO has

constructed several water systems in Sulawesi and IWACO, a major Dutch Consulting Company, has constructed water systems in Indramayu, West Java.

## **Poverty and Gender Aspects of the Communities**

### ***Villagers' Wealth Classification Criteria***

In order to differentiate between rich, poor and in-between classes in the village, this study used a PRA exercise whereby the focus groups developed their own criteria for different socio-economic status groups. The results were used to identify differentials of rich/poor households' access to services, sharing of benefits, control of facilities and participation in decisions about services.

The resulting criteria are summarised in *Tables 1a* and *1b* in terms of frequencies with which they were mentioned in the two provinces. Some general trends observed are discussed here.

The 'rich households' are those that are characterised by assets such as car, motorcycle, TV, parabola, refrigerator, land under paddy crops and permanent homes constructed with bricks, cement and tiled roofs. Some houses of the rich in South Sulawesi were also reported to have latrines with ceramic pans, clean environmental surrounds and household water connections. The "in-between" categories have semi-permanent houses, land under rice crops (so they don't have to buy rice), motorbikes, televisions. A few of them have their own wells (West Java) and a few have latrines constructed by themselves (South Sulawesi). The "poor" households have only non-permanent houses i.e. thatch roofs and mud floors, no assets and land of their own. They work on other people's land as wage labourers. Their food and clothing are inadequate and their living environments unclean. They are said to have no wells or handpumps, no bathing places or latrines of their own.

Access to and ownership of water supply and sanitation facilities are evidently seen as a function of increasing socio-economic status in the village. In addition, lack of environmental hygiene is seen as a corollary to poverty. Notably, in the classification of 'rich' and 'in-between' classes, ownership of TV, means of transport and even refrigerators are mentioned more often than the ownership of a sanitary latrine.

**Table 1a WEALTH CLASSIFICATION: West Java**

Criteria Used to Describe					
Poor	F	In-between	F	Rich	F
House made of wood	10	Semi- permanent house construction	9	Have rice field/lots of land	13
Working as a laborers	8	Have rice field	6	Permanent/luxury house with electricity	10
Not enough food	6	Have 14" television	5	Have cars	9
Having old bicycle	4	Have motorcycle	4	Have television/VCR	7
Can not repay loans	4	Simple clothes	4	Have motorcycle	6
Steal electricity	3	<b>Have own well</b>	3	Have parabola	5
Have many children	2	Eat healthy food	2	Have refrigerator	4
School dropouts	2	Have simple furniture	2	Have clean clothes	4
<b>Have no bathroom</b>	<b>2</b>	Farmers with farm animals	1	Have household industry/boat/fish pond	6
Easily irritated	2	Factory laborer	1	Wealthy/have savings/lot of money	4
No television	2	Government employee	1	Ceramic floor	3
Have a small radio	2	Have 2 children	1	<b>Ceramic WC/sanitary latrine</b>	<b>3</b>
Old clothes	2	Have motorcycle for public transport	1	Have jewellery	3
No rice field	2	Have bicycle	1	Have telephone	2
<b>Lives in dirty environment</b>	<b>1</b>	Have electricity	1	High education	2
Jobless/no skill	1	Small trader	1	Able to go pilgrimage	2
Have no children that can earn	1	Money	1	Healthy body	2
Have no peace of mind	1			Have expensive household goods	2
House with mud floor	1			Have cows/lot of chicken	2
Do not have hand drill	1			Steady income	1
No motorcycle	1			Not many children	1
Rented land tenant/join with others	1			No loan to the bank	1
Rented house tenant/join with others	1			Always happy/helpful	2

**Table 1b WEALTH CLASSIFICATION: South Sulawesi**

Criteria Used to Describe					
Poor	F	In between	F	Rich	F
Poor( <i>ill-constructed</i> ) house	8	Ordinary ( <i>bare minimum</i> ) household	9	Have vehicle	8
Incomplete/ <i>faded</i> clothes	5	Junior/Highschool graduated	5	Have luxury house	6
Not enough food	5	Not buying rice/ <i>have</i> rice field	5	Have rice field/ <i>big</i> plantation/ <i>land</i>	6
Children drop out of school	5	Enough clothes	5	Have good clothes	5
Not wearing sandal	3	Enough food	4	Have television	5
Feel inferior	3	Television	3	Have refrigerator	5
Live in dirty environment	3	Radio	3	Have gold/ <i>jewellery</i>	4
Need help	2	Enough for daily needs	2	Have enough food	4
Not wearing jewellery	2	Self constructed toilet	2	Have animals	3
No vehicle	2	Simple jewellery	2	Have boat	3
Have to buy rice	2	Have motorcycle	2	High degree in education	3
Have no well	2	Have 5 cows	2	Can afford to go for pilgrimage	3
Have no toilet	2	Have bicycle	2	Have savings	2
Have little furniture	2	Socially active	1	Helpful	2
Work on others rice field	2	Recreation is not necessity	1	Paddy milling	2
Can not meet living costs	2	Not proud	1	Clean house and environment	1
No savings	1	Liked by many people	1	Have clean water supply	1
Helpful to other poor people	1	Ordinary stove	1	Have stove	1
Sick often	1	Live in clean environment	1	Like to show off	1
Earn income as a laborers	1	Trader	1	Don't like to be competed with	1
Have leaking roof of house	1	Have 2 children	1	Have telephone	1
Have mud flooring in house	1	Have plantation	1	Have parabola	1
				Have good life	1
				Have steady job	1

### ***Division of Household Work Responsibilities***

In order to provide a perspective for understanding water-sanitation related gender-roles in the two provinces, a PHAST tool was used comprising a set of province-specific illustrations of everyday tasks. Focus groups of village women sorted these illustrations according to who was responsible for carrying them out in their community - i.e. men, women, men and women together, female children, male children (*Tables 2 a-b*). In addition, a '100-seeds distribution' exercise (PRA) was used to elicit who collected how much of the family's daily requirement of water.

The resulting frequencies were tabulated.

Table 2a DIVISION OF WORK : WHO DOES WHAT? ( West Java )

No	Men	F	Women	F	Men + Women Together	F	Boy	F	Girl	F
1	Collect fire wood	9	Cooking	10	Plait cane	5	Feed cattle	7	Mop the floor	9
2	Water collector	8	Mop the floor	10	Fish harvest processing	4	Collect water	6	Wash dishes	7
3	Cutting grass	7	Washing clothes	9	Catching the fish	4	Cutting grass	5	Wash clothes	6
4	Cutting trees	3	Cleaning toilet	9	Shopping	3	Wash dishes	3	Cooking	5
5	Cleaning drainage	3	Feeding the children	9	Cutting the grass	3	Collect fire wood	2	Sweeping	5
6	Cutting wood	3	Washing dishes	7	Cutting the trees	3	Plait cane	1	Feed brother/sister	4
7	Boiling the water	2	Bathing the children	7	Cutting the paddy	3	Fish harvest	1	Cleaning the toilet	3
8	Agriculture/rice field work	2	Boiling the water	7	Boiling the water	2	Clean the drains	1	Bathe small sister/bro	3
9	Work on plantation	2	Working on plantation	7	Work in the rice field	3	Sea fishing	1	Shopping	2
10	Feeding domestic	2	Shopping	5	Collect fire wood	2	Ojek driver	1	Agriculture	2
11	Build a house/toilet	2	Agriculture/rice field work	5	Collect the water	2	Boiling the water	1	Boiling water	1
12	Milling rice	1	Sweeping the floor	3	Take care of shop	1	Feed small sister/bro.	1	Collect water	1
13	Plaiting cane	1	Cutting the trees	2	Feed the cattle	1	Work in rice field	1	Working abroad/TKI	1
14	Shopping	1	Small trader	2	Wash dishes	1			Feed the chicken	1
15	Catching fish	3	Collecting water	1	Bathe children	1				
16	Rice harvest	1	Selling the fish	1	Sort the fish	1				
17	Working in town	1	Rice harvest	1	Trading	1				
18			Cutting fire wood	1						
19			Feeding animals	1						
20			Make WC pans with	1						
21			Working at factory	1						
22			Wires plaiting	1						

Table 2b DIVISION OF WORK: WHO DOES WHAT? South Sulawesi

No	Men	F	Women	F	Boy	F	Girl	F	Grand Father	F	Grand Mother	F
1	Ploughing rice field	10	Bathing children	9	Collect water	6	Washing clothes	10	Take care of cattle	3	Bathing the grandchild	4
2	Collect grass fodder	8	Small trader	8	Shopping	4	Cleaning the house	10	Cleaning the fish	2	Harvest	2
3	Collect fire wood	7	Collect water	8	Work in the rice field	5	Washing dishes	9	Planting vegetables	1	Guarding the house	1
4	Plant rice	5	Cleaning the house	7	Collect fire wood	4	Collecting water	7	Harvest	1	Cleaning the garden	1
5	Drying the fish	4	Cooking	4	Look after cattle	3	Boiling the water	5	Work in plantation	1	Plaiting basket	1
6	Bathing the children	4	Boiling water	4	Fisherman	2	Shopping	4	Cutting the grass	1	Drying the paddy	1
7	Fisherman	3	Planting the rice/corn	6	Cut grass	2	Manage shop	3	Guarding the house	1	Drying the fish	1
8	Volunteer labor	3	Shopping	3	Manage shop	2	Bathing small sister/bro.	3	Sweeping	1	Duck breeding	1
9	Collect water	3	Drying the paddy	3	Sweeping	2	Plant the rice	2			Boiling the water	1
10	Rice harvest	2	Paddy harvest	3	Lift the well material	2	Drying the rice	2			Watching the shop	1
11	Washing the clothes	2	Washing the clothes	3	Washing	2	Paddy harvest	1			Sweeping	1
12	Digging the well	2	Work in plantation /	5	Drying the fish	1	Selling cookies	1				
13	Pulling boat	1	cleaning field		Work in plantation	1	Gardening	1				
14	Boat owner	1	Washing dishes	2	Voluntary labor	1	Cooking	1				
15	Tie the fish basket	1	Collect fire wood	1	Boiling water	1						
16	Teacher	1			Making boat	1						
17	Driver	1			Making drainage	1						
18	Garden cleaner	1										
19	Shopping	1										
20	Feed cattle	1										
21	Making boat	1										

\*) Plantation = Fruit trees/coffee/palm/coconut trees owned by family



# FINDING OUT: WHO DOES WHAT WORK?

(and who collects how much of the household's water)



Children collect- and carry- 49% of the family's daily requirement of water.

**Table 2c WHO COLLECTS HOW MUCH OF THE FAMILY'S WATER?**  
(Results of "100 seeds" exercises )

District	Village	% Men	% Women	% Boys	% Girls
Bandung	Babakan Peuteuy	50		50	
	Mekarwangi		100		
	Dukuh	50		50	
Indramayu	Langut	50		50	
	Kiajaran Kulon	50		50	
	Rambatan Wetan	50	50		
	Panyindangan Wetan	50		50	
	Kertajaya	50		50	
	Plewangan	100			
	Lombang	33	33		33
<b>Average</b>		<b>48.3</b>	<b>18.3</b>	<b>30</b>	<b>3.3</b>
Takalar	Balang Loe		50	50	
	Bungung Loe		33	33	33
	Tamalate			50	50
	Aeng Batu-Batu				100
	Towata		100		
Jene Ponto	Pattiro		35	15	50
	Kayuloe Timur	5	15	30	50
	Sapanang	10	30	40	20
	Timbuseng	18	49	13	31
	Kampung Beru		21	13	66
<b>Average</b>		<b>3.3</b>	<b>33.3</b>	<b>24.4</b>	<b>40</b>
<b>Total Average</b>		<b>25.3</b>	<b>25.8</b>	<b>27.2</b>	<b>21.7</b>

The general pattern emerging is as follows :

In West Java, contrary to popular assumption, men and boys are the main collectors and carriers of water for domestic uses. Men collect about 48 per cent of the day's water, boys collect 30 per cent, women 18 per cent and the rest (4 per cent) is collected by girls. In addition, the men collect fuelwood, construct homes, fish and work in paddy fields. Women cook, clean homes and toilets, wash clothes/dishes, look after and feed children, boil drinking water, buy daily necessities, participate in family production of furniture/basketry/mats, harvest crops, process fish catches. Boys are responsible for feeding household cattle and other animals, collecting water, cutting grass for fodder. Girls follow their mothers in being responsible for cleaning houses and toilets, cooking, washing, caring for and feeding younger siblings.

In South Sulawesi men collect only 3 per cent of the family's water. Women and girls collect 73 per cent of it - sharing the load almost equally. Boys collect the rest i.e. 24 per cent. The overall average from 20 villages reveals that children carry almost half the burden (49 %) of daily water collection for the household. Girls and boys share the burden almost equally. Impact assessment by users (Chapter 5) confirms this finding, whereby the women reported that the water facilities from the UNICEF project have resulted in saving children's time for water collection and they are no longer late for school.

In South Sulawesi men are principally responsible for ploughing crop fields, collecting fodder grasses and fuelwood, planting rice, fishing and drying fish. Women and girls share the tasks of cooking, child care, boiling drinking water, cleaning of homes and collecting water. In addition most women have petty trading activities, work in paddy fields during transplanting and harvest and do the post-harvest processing of paddy. Girls do almost all the washing and cleaning, look after family shops (warungs), buy daily necessities and help mothers with child care. Boys collect water, fuelwood and fodder, look after domestic animals, help in the crop fields and with family shops/fish catches. Grandparents, if present, help with harvests and child care while the parents and older children are away for work. They also look after domestic animals.

### ***Gender Differences in Control of Resources***

The study used a PHAST exercise to elicit the community's gender analysis related to control of household resources. The purpose was to understand gender differentials in financial power and decision-making within households - which influences the expression of men and women's demands for services. The summary of gender analysis of resources (*Table 3*) shows that men have sole control in both provinces of the family's means of transport, coconut and banana trees, equipment for agriculture/fishing and the large animals, i.e. cows, buffaloes, horses. Women have sole control of vegetables grown, household equipment, jewellery, furniture, a part of the household cash for daily necessities, paddy and corn crops, and small animals such as chicken. Men and women jointly control the family's land, home, money for non-daily expenses, TV/radio, most of the food crops and fruits trees.

**This situation indicates that although men in these villages have greater control of the income-producing assets and greater access to markets, women too have significant economic power within the household. If they can be adequately involved in decision making about water and sanitation facilities, women in these areas have the potential to express their demand adequately and follow through with investments in the types of facilities they want. Project outcomes will depend on whether both women and men are given the choice and an opportunity to express that choice.**

Table 3

## GENDER-ANALYSIS: Control of Resources

WHO OWNS/CONTROLS WHAT?						
Province	Man Owns	F	Woman Owns	F	Jointly Owned	F
West Java	Hoe	10	Household equipment	9	House	7
	Goats/sheep	8	Jewelry	9	Land	7
	Motorcycle	7	Vegetables grown	9	Television	6
	Cows	7	Money	5	Radio	6
	Coconut trees	6	Corn	6	Furniture	6
	bicycle	5	Rice	5	Money	5
	Banana trees	5	Chicken	5	Chicken	5
	wheeled buggy/cart	5	Furniture	4	Duck	5
	Television	3	Ducks	4	Rice field	4
	Land	2	Rice harvest	3	Land	3
	Rice	2	Banana tree	3	Coconut trees	3
	Radio	3	Radio	3	Banana trees	3
	Boat	1	House	2	Hulled rice	3
	Becak (motorized cart)	1	Rice field/land	1	Bicycle	3
	Tractor	1	Television	1	Jewelry	3
	Money	1	Motorcycle	1	Goats	2
	Car	1	Bicycle	1	Cow	2
	Chicken	1			Motorcycle	2
	Duck	1			Corn	1
					Unhulled paddy	1
					Boat	1
				Small shop/stall	1	
				Gift from children	1	
South Sulawesi	Hoe	10	Household equipment	10	TV, radio, parabola	10
	Coconut trees	8	Jewelry	9	House	10
	Goat/sheep	7	Vegetables	8	Land	8
	Cows	7	Furniture	8	Motorcycle/Vespa	6
	Buffaloes	6	Money	6	Corn	6
	Banana trees	5	Paddy	4	Furniture	6
	Motorcycle	5	Chicken	4	Chicken	5
	Car	4	Hulled rice	3	Banana trees	4
	Horse	4	Salt	3	Rice field	4
	Wheeled buggy/cart	2	Duck	2	Money	3
	Truck	2	Corn	2	Duck	3
	Bicycle	2	Plantation	2	Coconut trees	2
	Becak (3 wheeler vehicle)	2	Clothes	1	Car	2
	Plantation	2	Food	1	Building material	2
	Land	2	Banana tree	1	Goat/sheep	2
	Building material	2			Bicycle	2
	Paddy	1			Plantation	2
	Boat	1			Hulled rice	2
	Money	1			Shop	1
	Tractor	1			Water pump	1
	Chicken	1			Cows	1
Sanitation facility (WC)	1			Buffaloes	1	
				Jewelry	1	

## Chapter 4

# WSS SERVICES: HOW SUSTAINED AND USED

The principal dependent variable in this study is the final outcome at the community level i.e. how effectively the services are sustained and used by the community. Sustainability is more than a matter of physical existence of services. A measure of sustainability needs to take into account the tangible evidence (physical condition of systems) and the less visible sustaining aspects of how the systems are managed and financed. Moreover, for the desired impact on peoples lives, sustained services must also be used by the majority of these who need and want them, and they must be used in ways that improve their hygiene and health. Thus this principal dependent variable combines measures of Sustenance and Effective Use of services for water supply and sanitation (refer Box A in the framework for Analysis). The water supply indicators are discussed first, followed by sanitation.

Systems observed in this study were constructed with UNICEF assistance under the UNICEF and INPRES funded PPAB-PLP Program of the Government of Indonesia. Age of the systems ranged between 2 - 4 years except in 1 village which had systems completed in 1992 (i.e. 6 years ago), the village was Sapanang, South Sulawesi. The age for both water and sanitation projects in each village evaluated was the same. Project intervention was implemented in one package in the same year for water and sanitation.

This chapter is divided in three parts:

- Technical Assessment and Cost Comparisons
- Users' Assessment - Water Supply and Sanitation Services
- Hygiene Awareness

The first one presents a Technical Assessment and comparison of costs of different systems, done by the team of external researchers who used standard technical criteria to evaluate the condition and performance of the water and sanitation systems in the sample villages. The second part is the Users' Assessment of how the services are functioning and how they are being used by them. The third section reports on their existing Hygiene Awareness.

## Technical Assessment and Cost Comparisons

### *Technology Types in the WES Program*

The study found a variety of technologies introduced by the UNICEF assisted Water Supply and Environmental Sanitation Programme in the targeted villages. Technical assessment was conducted by the surveyors through direct observation on the water systems. In West Java, 41 per cent or 93 out of a total 228 facilities constructed and in South Sulawesi 84 per cent or 132 out of 158 facilities constructed were thoroughly assessed. The types of water supply Technology observed were gravity fed piped systems, rain water catchment tanks, deepwell handpumps and dugwells in West Java and deepwell handpumps, shallow handpumps and dugwells in South Sulawesi.

Dugwells were considered as single systems each. They were mostly household facilities, often shared with neighbors. Rainwater catchment tanks were single systems shared by several households living next to each other. Each GFSPC was a complete neighborhood system consisting of spring protection, public water taps and a network of pipes connecting user households. Each handpump was a public standpost, considered a single system and used by as many households as had access to it.

### *Gravity Fed Piped Systems (GFSPCs)*

Two new and one rehabilitated GFSPC water supply systems were observed in West Java. In general, the new systems constructed consist of: a spring protector and a PVC piping network with an average length of 3,000 meters. Water is distributed through 1.5 to 9 cubic meter brick/rock tanks fitted with public taps, except for the rehabilitated water system in Babakan Peuteuy where fiber glass tanks are used. Community involvement in the construction of the water systems are limited to providing labor, land and meals for the village self-help team. A users' fee system was developed by the village leaders and fee was collected by the Village Committee which is being used for simple maintenance and operation cost. In general the water quality of GFSPC systems are sufficient except in Babakan Peuteuy. In terms of quantity the systems provide sufficient water for all purposes. In Babakan Peuteuy water could not be used for drinking and cooking due to its bad quality.

### *Rainwater Collection Tanks (RWTPs)*

These were found only in 4 surveyed villages in West Java. The tanks are made of ferrocement had a volume of 4,000 to 6,000 liters. The foundation is made of red bricks and water is fetched from a tap close to the bottom of the tank. It is not clear how the decision about the volume of the tank was made. Although the tanks were constructed by contractors, in general the users are able to repair small cracks on the tank walls. In Panyindangan Wetan and Lembang a number of tanks (20 to 25 per cent) were broken. It is suspected that the quality of sand and the ratio of cement to sand was not sufficient for the construction. One village (Lembang) practiced a users fee collection, which is very rare for this type of water supply. Community contribution is usually bricks (500 pieces), labor and land for a tank unit. The users have no complaints about the quality of the water. The downside of RWTP is it only provides water for drinking & cooking in the wet season. In the dry season it has no water but is often used for storing water bought from water vendors.

### *Deepwell Handpump (PDH)*

Deepwell Handpumps were installed in two villages in West Java (Kertajaya & Plewangan) and two villages in South Sulawesi (Pattiro & Kayuloe Timur). The differences observed between West Java and South Sulawesi were the depths of the boreholes and the types of pumps used. In West Java water is pumped up from 100 to 130 meters deep confined aquifers, while in South Sulawesi it is pumped from a depth of 9 to 43 meters. Even though, water is fetched from very deep water layers in West Java, the static water table in the confined aquifers is shallow enough to allow a simple section pump such as a "Dragon" handpumps to be used. In some cases, the community/users take the initiative to change the handpump to a shallow electric jet pump. In South Sulawesi the deepwell boreholes were equipped with India Mark II deepwell handpumps. In both places the handpumps were supported with a washing slab of approximately 4 - 6 square meters size. For operation and

maintenance of the systems the users collect money only when they need to repair the pump or the washing aprons. For construction, people's contributions were land, labor/payment of labor and additional material worth between of Rp.500,000 to Rp.1,500,000 per unit in West Java. In South Sulawesi users' contribution was limited only to labor, land and meals for the people's self-help team.

### *Protected Dugwell (DWP)*

In West Java only in 1 village the surveyors team observed a dugwell water supply system, which was in Rambatan Wetan. Dugwell systems were more common in South Sulawesi, being found in 7 out of 10 villages. The average depth was 2 to 3 meters in West Java, while in South Sulawesi it reached a depth of 3 to 12 meters. The well lining was made of bricks in West Java and a combination of concrete rings and bricks in South Sulawesi. The walls were constructed down to the water table or sometime deeper. Like handpump systems, a washing apron of 4 to 6 square meters is constructed around the well. In some wells people use a bucket & pulley to draw water and in some other cases they use just roped buckets and fetch water directly. The community share of constructions cost consisted of cash (Rp.20,000 to Rp.100,000), labor and land in West Java and materials, labor, land in South Sulawesi. In both provinces the users only collect money when they need it for repairs. The main complaint of the users in West Java (Rambatan Wetan) is water quality of the dugwells where many wells have turbid water with an unpleasant taste, although water quantity is sufficient in both dry and wet seasons. In two South Sulawesi villages (Aeng Batu-batu and Kayuloe Timur) water quality is very bad. Water has an unpleasant taste and it is mostly used for bathing and washing. In the other 6 villages water quality is not a problem and the water is used for nearly all purposes but half of them tend to dry up in the dry season. In two villages instead of new wells dry, existing wells had been rehabilitated with lining and washing platforms.

### *Shallow Handpump (PSH)*

Shallow Handpumps are only installed in 1 out of the 20 villages, in South Sulawesi (Bungungloe). The borehole depth averages 4.5 meters. The handpump is usually a "Bandung" shallow handpump type. Like other handpump/dugwells an apron of 4-6 square meters is constructed around the handpump. All the pumps were constructed by contractors. No community contribution was required. The quality of water is bad. Almost all pumps give turbid, colored, bad-tasting water. Water quantity is also poor especially in the dry season. Water is used only for washing and bathing. People collect money if needed, for simple repairs.

### *Technical Assessment*

An assessment of technical aspects of water supply systems was undertaken. Twelve parameters was used to measure the performance of each single system, which are:

1. Proportion of system/s functioning in each village
2. Water availability in wet and dry season
3. Water utilization for drinking/cooking, bathing and washing
4. Physical conditions
5. Design quality

6. Water resource contamination (possibility of water source being contaminated)
7. Water testing/Quality control
8. Water quality based on: taste, color and turbidity
9. Land and facility ownership (public vs. household)
10. Facility ownership (public vs. household)
11. Replicability (of system by the community)
12. Ability to operate and maintain the water supply system

Data for 1 (*Functioning of System*), 11 (*Replicability*) and 12 (*Ability to Operate and Maintain the System*) were obtained from qualitative assessment, while data for the remaining no. 2 to 10 was collected through Technical Observation (See *Criteria for Assessment and Scoring & Ranking Tables in Appendix*)

### *Functioning Water Supply Systems*

Three sub-parameters is used to measure how the water systems are functioning. A water system is considered *good* if 100 per cent of the systems (for GFSPC 100 per cent of water outlets) constructed in the village are still being used and is scored 2. For water systems with more than 50 per cent being used was considered as *fair* and is scored 1. Villages with functioning systems less than 50 per cent is scored 0 and considered as a *poor* system.

In West Java out of 10 water supply systems 5 villages scored 2, meaning that all the systems are functioning. The remaining villages scored 1, none scored *poor*. In South Sulawesi the number of *good* systems were much less, only in 2 villages. On the remaining 7 scored *fair* meaning that between 51 per cent to 99 per cent of the systems within the villages were working.

The *good*, *fair*, or *poor* performance of water supply systems did not seem to be related to the type/technology of the system itself, since all the technologies constructed within the villages showed a wide range of performance. However, two villages in West Java and one in South Sulawesi having deepwell handpumps enjoyed the best services of the water supply systems. (Kertajaya, Plewangan, Pattiro)

### *Water Availability*

Water availability is measured using standards of minimum water that should be supplied by the systems in both the rainy and the dry seasons. For example: a rainwater collection tank should at least provide 5 liters per day per capita, while a piped system is expected to provide at least 60 liters per capita per day. A water supply system can reach a maximum score of 9 if water is sufficient the whole year long.

Only 3 systems in West Java scored 9. All were by gravity fed piped systems. One deepwell handpump and 1 dugwell scored 7, three villages scored between 5 to 6.6 and two remaining villages scored between 3.9 to 4.42. In South Sulawesi, only 1 village (Aeng Batu-batu/dugwell) scored 9, 4 villages scored between 7 to 8.20 and the remaining 5 scored between 4.8 to 6.46. It is interesting to learn that two different types of technology introduced in the same village can provide different quantities of water. In Kayuloe Timur the project installed dugwells and deepwell handpumps. In this particular village the score for water availability was 4.8 for dugwells and 6.6 for handpumps.



### *Water Utilization*

Services provided by the water systems are expected to meet the needs of the users for all purposes, such as (by priority): 1) drinking/cooking; 2) washing, and 3) bathing, throughout the year. The score given is 3 if water is available for drinking in the wet months and 6 if it is also available in the dry months. Score is 2 when water is sufficient for washing in the rainy season and 4 when it is sufficient also in the dry season. A score of 5 is given when the water is sufficient for bathing in the wet season and 2 when the water sufficient also in the dry season. A system can obtain a maximum score of 12, when the services could meet the needs for all purposes in all seasons.

Two systems in West Java (all piped systems) had water sufficient for all purposes all the time. In South Sulawesi 1 dugwell and 2 deepwell pumps scored the same. The lowest score in West Java was 4.54, for rainwater collection tanks in Panyindangan Wetan and the lowest score in South Sulawesi was 3, from dugwells.

The type of technology can influence how the people utilize their water resources. In Kayuloe Timur the people have both deepwell pumps and dugwells. The handpumps showed a high score in water utilization with a score of 10.40 and the dugwells scored only 3. It seems that water utilization has strong correlation with quality of water. In this village the score for quality of water for handpumps is 5.2 (out of a maximum score of 6) whereas the dugwells scored only 2.4 for quality.

### *Physical Condition*

The Study Team based its analysis of physical condition of the water systems through technical observation. The surveyors checked single water systems one-by-one, e.g.: dugwells, handpumps, rainwater collection tanks. For integrated systems, (like gravity piped systems), they checked all parts of it to get the total picture. The water systems was divided in five categories: *good*, *slightly damaged*, *fairly damaged*, *seriously damaged*, and *total loss*. Each performance category used certain criteria based on the type of the system. For example: a single rainwater collector is considered *good* if it has no cracks on the wall, tap in good condition, water saving capacity 100 per cent, etc., and the system can then achieve a maximum score of 4 (*see criteria matrix in Appendix A*).

The average physical condition score of water systems in West Java was 3.0 compared to 3.31 for South Sulawesi. Best scores in South Sulawesi (4) were in two villages with deepwell pumps and 1 dugwell. In West Java the maximum score was for a GF piped system. Only 1 village reached this score. The lowest was scored by another GFSPC (1) in West Java and a dugwell water system in South Sulawesi (2.4).

### *Design Quality*

The Team faced some difficulties in measuring the design quality of the water systems since Detailed Engineering Designs (DED) could not be obtained from the project coordinators in the field. The survey team decided to focus on field findings about the presence/absence of design faults.

Criteria for design quality were based on different water technologies as follows:

***Rainwater Collection Tanks:*** An RWTP should at least have the capacity to store 5 liters per capita per day (for drinking & cooking only) for at least 60 days (continuous dry days). For example: a family should have a water saving of  $1 \times 3.9$  (average person per family in West Java)  $\times 5$  liters  $\times 60$  days = 1,170 liters at least. RWTP capacities in the project are mostly 4,000 liters. Some had a capacity of 6,000 liters. This means that the 4 cubic meter tanks should be used by not more than 3 families and the 6 cubic meter tanks by not more than 5 families.

***Gravity Fed Piped Systems:*** A GFSPC should base its placement of water distribution outlets on a *hydraulic water gradient line and the size of piping network on the head difference and water debit conditions*. This is a basic formulation for the designer to plan a proper water system. Design fault examples could be seen in villages Babakan Peuteuy and Mekarwangi where several water outlets do not bear water since the locations ignore basic design requirements.

***Dugwells:*** One technical requirement for a well design is the need for regular sediment cleaning and well deepening. To do this the well diameter should be wide enough for people to go down and work safely and comfortably in the bottom. In case of accidents, the hole should have space for at least two people to go up & down at the same time. To meet this technical specification a well diameter should be at least 1.2 m wide. Almost all wells in the study area has an inner diameter of less than the technical specification requires, often due to predetermined size of concrete rings provided by the project.

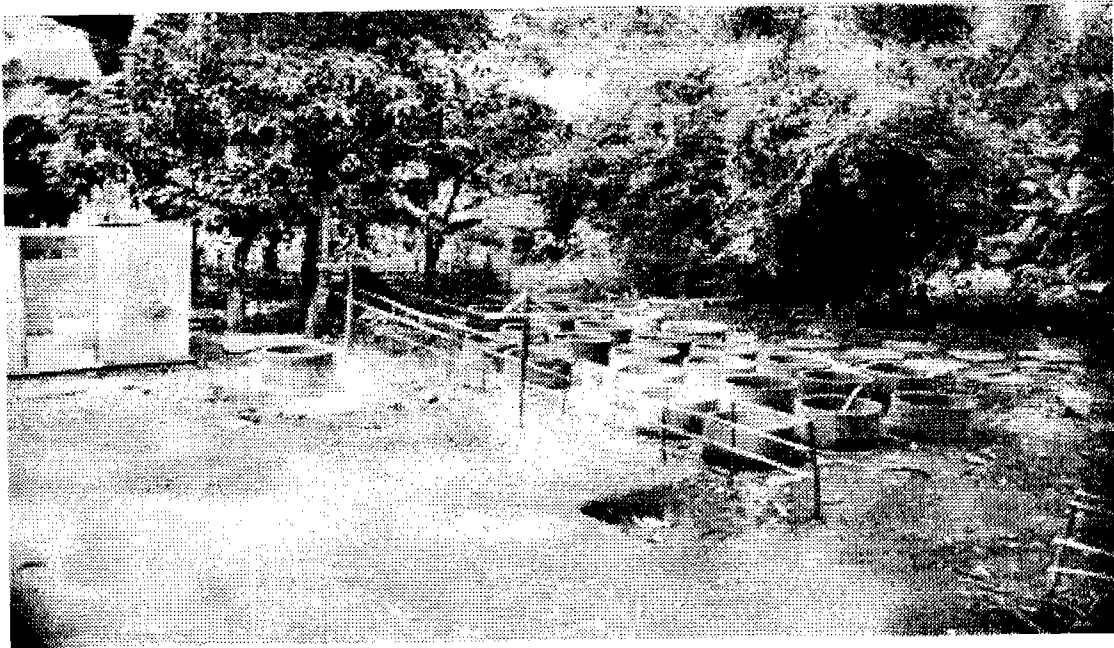
***Deep/Shallow Handpumps:*** The determination for deep or shallow handpump is based on the distance of the suction head and the depth of the water table which should not be more than 7 meters. A handpump which has the suction chamber installed above the ground is considered as a shallow handpump. In deepwell boreholes with water table depths more than 7 meters from the ground the suction chamber of the pump is usually installed in the casing to avoid a water suction more than 7 meters. In the field it was commonly observed that shallow handpumps were forced to suck water from depths of more than 7 meters. This condition make pumping difficult and can easily damage the pump.

The design of a water system plays an important role in its effective use and sustainability. Presence of one or more faults in the design of the water system was scored as 0. Absence of design faults was scored as 2. Gravity Fed Piped Systems and Rainwater Collection Tanks in West Java showed unnecessary mistakes in the design and in South Sulawesi this was true of near all the dugwells.

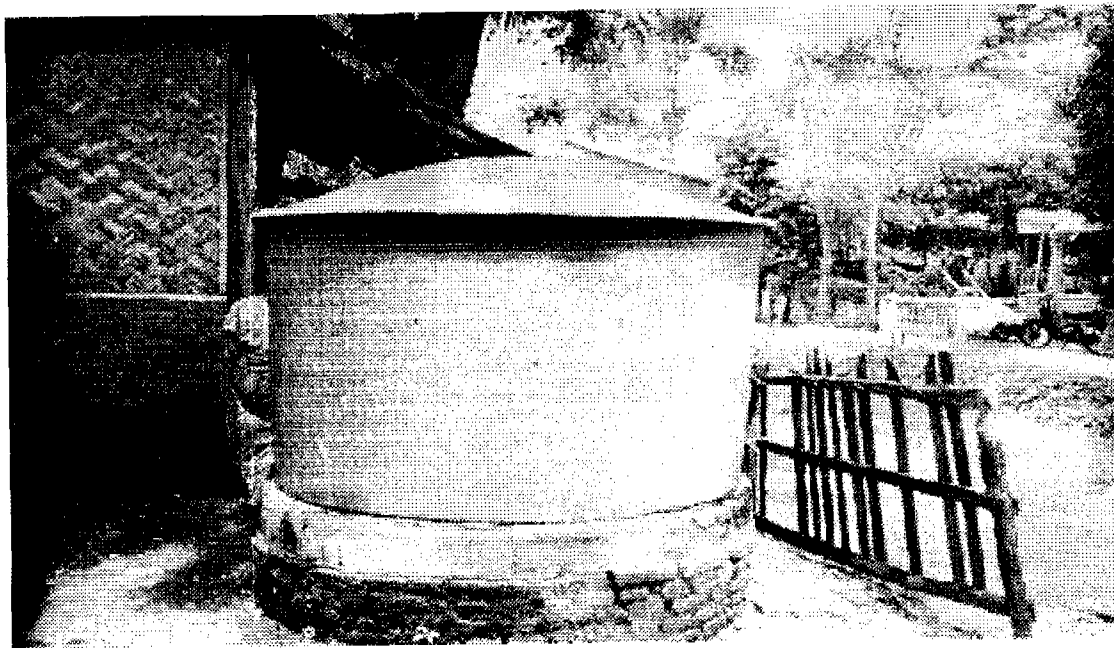
### ***Possible Water Contamination***

Distance from water sources to pollutant sources was checked by the surveyors. Type of polluters differs from system to system and from one source to the other. Pollution of rain water collection tanks could be from the air. For dugwells and handpumps possible polluting resources could be septic tanks, drain ditches and cracks in the washing apron and casings. For piped systems unprotected springs and open tanks are considered as unhealthy water resources. Water systems like dugwells, handpumps with distance from polluting resources less than 10 meters is considered as *possible contaminated water resources* and is scored 0.

## "WHAT WE WOULD LIKE IS..."



Cement rings for lining new dugwells, provided by UNICEF, South Sulawesi. Users would like rings with a larger diameter, allowing them to climb down and deepen wells when they dry up.



GFS water tank in West Java. Piped systems with household connections, serving 3.3-22% of village populations surveyed. These systems were found only in West Java, and are the only systems requiring monthly payment of user fees. Users are highly satisfied with the service.

Possible Water Contamination scores were similar for West Java (score of 1.42) and South Sulawesi (a score of 1.51). In West Java the lowest score (0) was for a gravity fed piped system which had no protection for the spring and 0.6 for a shallow hand pump system in South Sulawesi.

### *Water Testing*

Water testing is to be done for 2 purposes: 1) to ensure that the users consume hygienic water and, 2) needs for water system designing (if the system does need extra water treatment facilities). Water testing is more focused on the content of E. Coli in the water sources for regular water control, and both Bacterial Test and Chemical Testing is done in the beginning for designing purposes.

In this study, water testing is divided in 3 ranges. Regular water control (E. Coli after system completed) is scored 2. One in the beginning is scored 1, and Never is scored 0. In West Java only 2 villages scored 1 and the remaining never undergo a water test. In South Sulawesi 2 villages has regular water testing, two villages rates from 0.6 to 1.6 and the remaining villages water was never tested.

### *Water Quality*

In almost all villages the community uses these basic criteria to judge water quality, i.e. good quality water should have: *no taste, no color and no turbidity*. The evaluation team based its study on water quality also on this simple criteria. Each water symptom is scored 2, so, a good water source can reach a maximum of 6. Even though, simple measurement criteria is used as base, not many systems could meet the maximum score. Only in 40 per cent villages in West Java and only 10 per cent villages in South Sulawesi the water systems could meet these criteria. This means that to meet the simplest water quality criteria as demanded by the people is not as simple as it looks and quality is influenced by a variety of factors in addition to technology type. Even though, type of water source play a significant quality also. Two examples from West Java shows how maintenance and construction quality influenced the water quality. Panyindangan Wetan and Lombang used the same RWTP technology as Kiajuran and Langut. In the two mentioned villages the score for water quality was relatively low compared to the last two villages. In Panyindangan and Lombang the users tend to ignore regular tank cleaning. Many tanks have sediment on the bottom and water has become turbid. In Babakan Peuteuy, the people open the pipeline close to the spring protector to tap water from an open marsh to increase the water debit. This method is lowest the water quality compared to 2 other villages Dukuh and Mekarwangi who used the same type of system (GFSPC).

### *Land and Facility Ownership*

*Land and Facility Ownership*, was included in the assessment to understand people's opinion about their feeling on ownership of land the water system is located and the system itself. In rural areas it is common that people sacrifice land for public services, but, it is hoped that the services built on are still felt to be public property. In 60 per cent villages in West Java and 40 per cent in South Sulawesi the people, feel that *the land and the water system on it was privately owned*.

### *Replicability*

One of the desired outcomes of the project is the replication of water systems by the villagers to increase coverage. Replication of water systems could happen if an organization within the village which is supported with clear plans and strategy has been formed and it has the capacity to recruit/mobilize the know how to build the water systems. The study measured water system replication capacity based on the availability of institutions within the village and evidence of new constructed systems after the project has been completed. A score of 2 is given to villages which meet the 2 criteria, a score of 1 is for villages meeting 1 criteria, and 0 for villages not meeting either criteria.

Only 1 system in West Java (Dukuh) could show a clear replication capacity. This village has a clear strategy for project expansion and it has evidence of new constructed facilities built by the village committee. In 2 other villages in West Java there is some evidence of project replication but it is not supported with a strong management system. In the remaining villages nothing related with system replication is happening. In South Sulawesi 6 villages initiated increasing water system coverage, however it is more on individual basis rather than an organized strategy. And, in the remaining villages no action or plans were seen for project expansion.

### *Water System Operation & Maintenance*

To learn more about the ability of the people to operate and maintain their water facilities, the study divided the water systems in 2 categories: 1) integrated/communal and 2) single/individual water systems. Integrated systems consist of piped systems which are more complicated in terms of water distribution and technology. Dugwells, handpumps, and rainwater collectors were categorized as single systems. The user community is considered as able to operate and maintain integrated systems if it meet the following criteria:

- an organized water and sanitation management system is established
- there is evidence of available workmanship (including the recruitment of outside artisans/technician).
- there is regular users' fee collection and system maintenance plans (including users fee collection for repairs)

Villages meeting all three criteria scored 2. Villages meeting only 1 or 2 criteria scored 1, and a 0 score was for villages not meeting any criteria.

Villages with single/individual water systems should meet 2 criteria, i.e.:

- there is evidence of available workmanship (including the recruitment of outside artisans/ technician).
- there is regular users fee collection and maintenance plans (including users fee collection for repairs)

Villages meeting 2 criteria were scored as 2. Those meeting 1 and none were scored as 1 and 0 respectively.

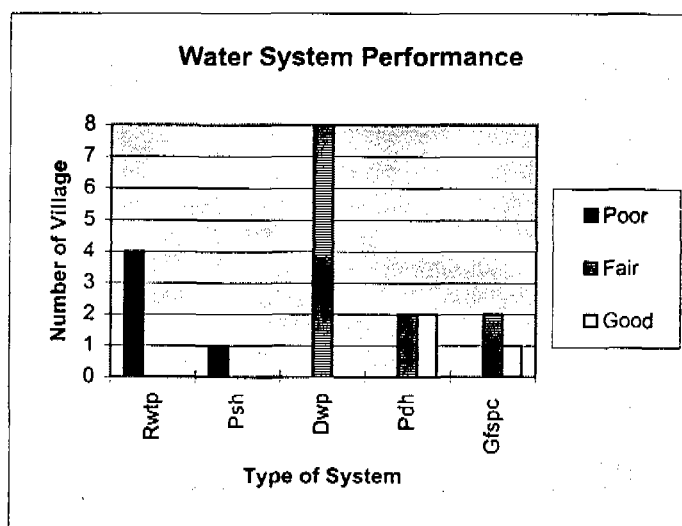
The ability to operate and maintain the water systems was not different in West Java and South Sulawesi. Five villages in West Java scored the maximum score of 2, whereas 6 out of 10 did so in South Sulawesi. In the remaining villages in provinces figures averaged between 1 to 1.80. This mean that the users are quite familiar with the water system technology constructed in their villages and have the capacity to maintain them.

### Conclusions

1	3	Dukuh	gfspc	44.00	good
2	6	Kertajaya	pdh	34.40	fair
3	7	Plawangan	pdh	34.40	fair
4	2	Mekarwangi	gfspc	34.00	fair
5	8	Rambatan Wetan	dwp	29.00	fair
6	1	Babakan Peuteuy	gfspc	28.00	fair
7	4	Kiajaran	rwtp	25.46	poor
8	5	Langut	rwtp	24.20	poor
9	10	Lombang	rwtp	23.49	poor
10	9	Panyindangan Wetan	rwtp	18.85	poor

11	20	Sappanang	pdh	41.13	good
12	18	Pattiro	pdh	39.54	good
13	20	Sappanang	dwp	37.50	good
14	19	Kayuloe Timur	pdh	36.00	good
15	12	Tamalatte	dwp	33.10	fair
16	11	Towata	dwp	32.91	fair
17	15	Timbuseng	dwp	31.37	fair
18	13	Aeng batu-batu	dwp	29.00	fair
19	17	Balangoetarorang	dwp	29.00	fair
20	14	Kampung Beru	dwp	27.12	fair
21	19	Kayuloe Timur	dwp	19.50	poor
22	16	Bungungloe	psh	18.50	poor

	Rwtp	Psh	Dwp	Pdh	Gfspc
Poor	4	1	0	0	0
Fair	0	0	8	2	2
Good	0	0	0	2	1



To better illustrate the overall performance of water systems the total scores were categorized as follows: Scores 36 and above - GOOD; 27 to 35.9 - FAIR; Less than 27 - POOR. All *poor* systems included the rain water collectors (4 villages) in West Java and 1 dugwell and 1 shallow pump in South Sulawesi. Compare to West Java, South Sulawesi had more *good* as well as *fair* systems (40 per cent), West Java only 1 system could be considered as good. In comparison to West Java, South Sulawesi had more *good* and *fair* systems and fewer *poor* ones.

## ***Cost Comparisons***

One of the objectives of the present study was to obtain a first-hand assessment of costs of creation of water and sanitation facilities at the community level and do a comparative analysis between systems.

The total cost of provision of services includes a) the construction cost plus b) cost of technical assistance, training and administration. Since the latter (b) costs are incurred through existing government (Public Works and Health) systems, they are calculated by provincial governments according to provincially/nationally applicable financial ceiling, regardless of the construction costs of facilities. They were not the subject of this study. The study focused instead on construction costs at village level which included community contributions and all kinds of subsidies, costed at 1992 prices. This information was usually obtained from the village chief, through the community questionnaire and calculated on the spot with the village leaders based on village level records of materials received and community contributions. The information was further verified through focus group discussions with users. This information had been much easier to find in villages under WSSLIC and VIP projects since these projects require a formal Village Action Plan (VAP) to be developed with detailed cost estimates, which is then formally agreed between the village leadership and the service providing agency.

The VAP is an official document kept in the village and used by villagers for monitoring the construction of facilities thereafter. In the UNICEF assisted villages only the village chief had information about what was requested for the whole village and what was finally received/constructed. The users knew only about what they were required to pay or do to get usership.

Costs of construction of each type of system in the UNICEF assisted villagers are shown in *Table 4a*. Inter-project comparisons of per capita construction costs are in *Table 4b*. To obtain per capita construction costs, the following formula was used:

$$\text{Per capita construction cost} = \frac{\text{construction cost per household served}}{\text{average household size in the province}}$$

The average household sizes found in this study were 3.9 persons in West Java and 4.9 persons in South Sulawesi.

**Table 4a Construction Cost Comparisons For Water Systems**

		GFSPC*	RWTP	PDH	DWP	PSH
Households Served/Total No. of Households in Village	WJ	225/2501 (8.9%)	558/5666 (10%)	90/2331 (4%)	64/1660 (4%)	-
	SS	-	-	538/1448 (37%)	1180/4918 (24%)	50/566 (9%)
No. of Units Constructed in Study Villages	WJ	2	165	20	40	-
	SS	-	-	26	122	10
Unit Cost of Construction, according to village records at 1992 prices	WJ	81,267,625	341,000	1,855,000	229,500	-
	SS	-	-	3,896,000	219,758	710,000
Construction Cost per HH Served	WJ	722,379	100,833	412,222	143,437	-
	SS	-	-	188,283	22,721	142,000
Subsidy provided, out of Unit Cost of Construction (In Rupiah)**	WJ	78,217,625	218,000	1,000,000	154,500	-
	SS	-	-	3,818,000	72,820	710,000
Subsidy provided as % of unit Cost of Construction	WJ	96%	64%	54%	67.32%	-
	SS	-	-	98%	33.14%	100%
Community Contribution as % of Unit Cost of Construction	WJ	4%	36%	46%	32.68%	-
	SS	-	-	2%	66.86%	0%

\* GFSPC Cost counted only for 2 new systems, 1 rehabilitated system is not included

\*\* 1992 prices, when exchange rate was Rp. 2000 per US \$ 1

WJ = West Java  
SS = South Sulawesi

**Table 4b Construction Costs Per Capita Served**

WS Type	VIP		WSSLIC		UNICEF (WJ)		UNICEF (SS)	
	Rupiah	US \$	Rupiah	US \$	Rupiah	US \$	Rupiah	US \$
Gravity PS	55,818	23	85,329	35	185,225	93	N/A	N/A
Pumped PS	35,012	14	N/A	N/A	N/A	N/A	N/A	N/A
Deep HP	N/A	N/A	N/A	N/A	105,698	53	40,931	20
Dug Well	69,113	28	30,364	12	36,779	18	4,939	2
Rainwater	N/A	N/A	31,662	13	25,855	13	N/A	N/A

Note: US \$ amounts based on an exchange rate of Rp. 2000 per US \$ 1 for UNICEF systems, built around 1992  
For VIP and WSSLIC systems built in 1995-96, the exchange rate is approx. Rp. 2450 per US \$ 1



### *Unit Cost of Construction*

Unit cost of construction systems ranged from a minimum of Rp.219,000 (\$109) for dugwells to a maximum of Rp.81,267,625 (\$40,633) for gravity-fed piped systems, at 1992 prices. Rainwater catchment tanks cost only a little more than dugwells. Shallow handpumps cost about 3 times as much as dugwells. Deepwell handpumps cost about 8 times as much as dugwells in West Java, but 18 times as much as in South Sulawesi. This was due to different types of handpumps installed in the two provinces, i.e. the simple section pumps like "Dragon" handpumps in West Java and the "India Mark II" handpumps in South Sulawesi, for reasons of different depths of water tables.

### *Construction Cost per Household Served*

Due to the different technology mixes offered in the two provinces, it was possible to compare them only in terms of protected dugwells and deepwell handpump. The served populations for both systems are much larger in South Sulawesi. Construction cost per served household served by deepwell handpumps in West Java is more than twice as much as the cost in South Sulawesi. The difference for dugwells is more dramatic. In South Sulawesi it costs less than one seventh of what it costs in West Java, to provide households with access to dugwells.

*Table 4a* shows that on an average each dugwell serves 14 households in South Sulawesi but only 2 households in West Java. One deepwell handpumps serves 21 households in South Sulawesi, but 5 households in West Java. The overall picture is one of very small segments of village populations being served by the UNICEF supported water systems in West Java. In West Java the GFS systems and rainwater catchment tanks are serving about 9 per cent of village households; deepwell handpumps served only 4 per cent (compared 37 per cent of households in South Sulawesi) and dugwells are serving only 4 per cent (24 per cent in South Sulawesi). This finding together with data on sharing of water supply benefits between rich/poor households (*Figure 22 a*, Chapter 6) indicated an unfair appropriation of WES Program benefits by the richer minority in West Java villages. The situation calls for instituting effective institutional strategies for poverty-targeting and equity in sharing of WES program benefits.

### *Cost Sharing*

There seems to be no clear pattern of rule regarding the percentage of subsidies provided for construction of different types of systems. Although there are limits prescribed for subsidies ("stimulants") from UNICEF<sup>1</sup>, these do not necessarily match the subsidies provided in the study villages which ranged from 33 per cent to 100 per cent for various systems. Community contribution for installation varied widely. It includes the cost of construction materials, voluntary labor, food provided to construction teams and cash. For the same type of systems average community contributions in the two provinces differed as much as 2 per cent and 46 per cent (for PDH) or 33 per cent and 67 per cent (for dugwells).

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<sup>1</sup> Rp.200,000 for dugwell; Rp.225,000 for rainwater collectors; Rp.3 million for spring protection.

The percentage contribution by communities seems to be highest for dugwells (33 per cent to 67 per cent) which are at the bottom of the technology scale, and lowest for gravity fed-piped systems (4 per cent) which represent a far higher level of service and technology. If the purpose is to stimulate community investment, the rule needs to be just the reverse, i.e. the higher the level of technology and service, the higher should be contributions required from user communities, and the lower should be the subsidy.

Per Capita Construction Cost: Inter-Project Comparison

Table 4b lays out a comparative analysis of per capita construction costs from VIP, WSSLIC and UNICEF projects, derived using the same basis and calculations. Due to varying technology mixes in the three projects, comparisons are only possible for 3 types of systems. The UNICEF assisted GFS systems have substantially higher per capita construction costs (Rp.185,225) as compared to WSSLIC (Rp.85, 329) and VIP (Rp.55,818). The price reason is the smaller number of households served by the UNICEF GFS systems. UNICEF and WSSLIC GFS systems are built by contractors employed by the Public Works Department. GFS systems in the VIP project are built by the communities themselves with technical assistance supervision by Field Engineers, or by contractor employed by the communities themselves.

Per capita construction costs of dugwells are similar for WSSLIC and UNICEF projects (Rp.30,364 and Rp.36, 779) in West Java. Due to the greater number of households served in South Sulawesi, the per capita cost for UNICEF assisted dugwells goes down to Rp.4,939 in that province. The VIP dugwells are more than twice as costly, per capita (Rp.69,113). The UNICEF dugwells are often constructed by the communities themselves, using 80 cm diameter. concrete rings received as stimulants from UNICEF. The VIP dugwells are designed by the communities with technical advice of Field Engineers. They are larger (about 2 meter diameter) and built with construction materials procured by communities themselves. Out of a discretionary grant received by the village for a range of possible development infrastructures in addition to water supply.

Rainwater collectors cost about the same to construct (per capita) in WSSLIC and UNICEF. The VIP project had no rainwater collectors because no village had chosen to construct them. This may be an important indication of villagers' opinion of rainwater catchment tanks. In the present study these water systems scored consistently the lowest in term of users satisfaction, quantity and regularity of water service. They invariably ran dry in the dry season in every village where they had been constructed. In half the villages 20 per cent to 25 per cent tanks had cracked and broken up probably due to insufficient cement; sand ration in the construction by contractors of the Public Works.

Deepwell handpumps were installed only in UNICEF assisted villages, not in WSSLIC or VIP. Per capita construction costs in West Java were 2.5 times the cost in South Sulawesi, for reasons of smaller coverage of the village households, (i.e. 4 per cent total households served in West Java and 37 per cent in South Sulawesi), in spite of the fact that the handpumps installed in South Sulawesi were of a higher quality and more expensive.

## Users' Assessments - Water Supply

Users' assessment of *Sustenance and Effective Use* was done using the following indicators, further divided into 15 sub-indicators, for water supply services.

1. Functioning System in Place	<ul style="list-style-type: none"><li>• Physical Quality of Works (functional system/design quality/quality of workmanship + materials/completion of construction)</li><li>• Water quality at source</li><li>• Water quantity at source</li><li>• Regularity of service</li></ul>
2. Effective Use	<ul style="list-style-type: none"><li>• Access to service</li><li>• Coverage of system</li><li>• Change in water use pattern (towards more health improving practices).</li></ul>
3. Effective Financing	<ul style="list-style-type: none"><li>• Extent of Cost Coverage being achieved</li><li>• Type of local financing system (extent of relation to costs and consumption rates).</li></ul>
4. Effective Management	<ul style="list-style-type: none"><li>• Existence and functioning of local organization for management</li><li>• Proven ability to maintain and repair</li><li>• Operating personnel</li><li>• Existence and transparency of financial management system</li><li>• Users' assessment of appropriateness of fees</li><li>• Users' assessment of effectiveness of management</li></ul>

### *Functioning Systems in Place - Water*

This was measured in term of Functional Systems, Physical Quality of works, Water Quality & Quantity at Source and Regularity of Service. Results are illustrated in *Figures 2a-e*.

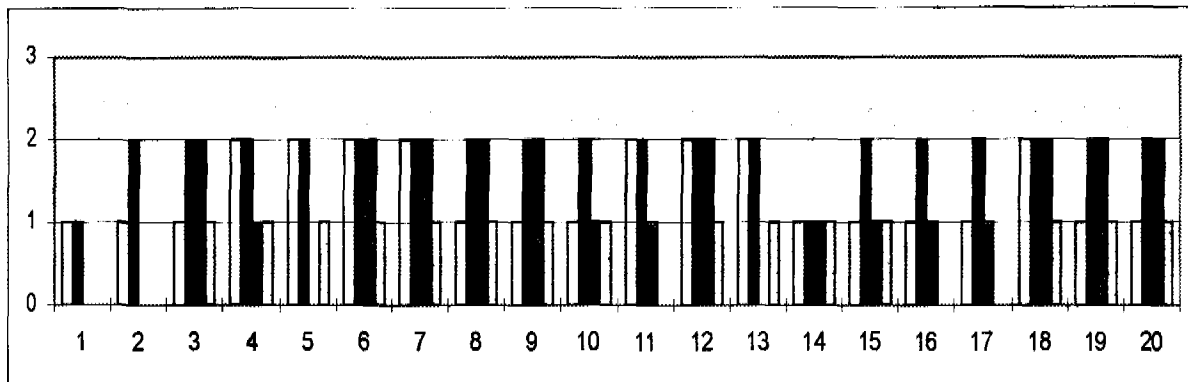
#### *Physical Quality of Works*

**Functional systems:** Out of the 20 villages, 8 had fully functional systems in place and 12 had partially functional ones. No village had a completely non-functional system. Of the fully functional ones most (6 out of 8) were built by the communities together with contractors from the Department of Public Works. The contractors independently built 9 out of the 20 systems. Of them 7 were partially functional at the time of survey. The least functional systems in West Java were the public rainwater tanks. In South Sulawesi the least functional ones were dugwells. All the deepwell handpumps

observed were fully functional. Systems using all the other technologies (GFSPC, DWTPs, RWTP) were partially functional due to broken taps, cracked tanks and walls, broken well rings, worn out pump valves (shallow pump).

**Design Quality:** Out of 20 systems observed, 18 were reasonably free of design faults. Users reported design faults such as a GFS scheme with a public tank located too high up to fill naturally (Babakan Pateuy, West Java); dug wells lined with cement rings with no cement plastering between rings that allow grey water to seep back into wells or wells constructed without surrounding platform (Towata, South Sulawesi).

**Fig. 2a Effective Sustenance & Use of Water Services:  
Functioning Systems- (Physical Quality of Works -WSF1)**



- |   |               |                                      |
|---|---------------|--------------------------------------|
| □ | <b>WSF1-a</b> | <b>Functioning System in Place</b>   |
| 0 |               | Water System not Functioning at all  |
| 1 |               | Some of Water System not Functioning |
| 2 |               | All Water System functioning fully   |
  
- |   |               |                                  |
|---|---------------|----------------------------------|
| ■ | <b>WSF1-b</b> | <b>Quality of Design</b>         |
| 0 |               | Poor Design, major design faults |
| 1 |               | Fair, minor design faults        |
| 2 |               | Good Design, no design faults    |
  
- |   |               |  |
|---|---------------|--|
| ■ | <b>WSF1-c</b> | <b>Quality of Workmanship and Material</b> |
| 0 |               | Poor Workmanship and Material              |
| 1 |               | Fair                                       |
| 2 |               | Good Workmanship and Material              |
  
- |   |               |   |
|---|---------------|---|
| □ | <b>WSF1-d</b> | <b>Construction Completed According to Requirements</b> |
| 0 |               | Construction Not Completed                              |
| 2 |               | Construction Completed                                  |

**Construction Completed:** Construction had been completed as agreed with Communities in 15 out of 20 villages.

**Quality of Workmanship and material:** was good in 7 villages, fair in 6 and poor in 7. The problems specific to each type of system were as identified by users as:

- Handpump - washing slabs not properly constructed, no drain constructed
- Dugwells - collapsed wall lining because of poor cement to sand ratio and drainage not built
- Rainwater tanks - cracked walls due to insufficient cement in plaster
- GFS piped systems - insufficiently protected water source, inappropriate location of reservoirs.

In terms of *Physical Quality of Works* the top scoring systems were PDH, followed by DWP/DWTP, thirdly RWTP/RWTH and lastly by the GFSPCs (Figure 2a.)

### ***Quality of Water at Source***

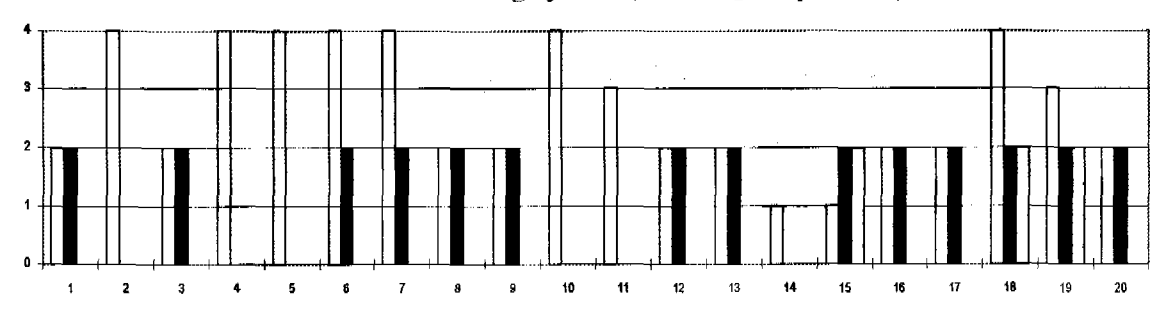
**Seasonal Variation:** In the users' perception, water quality in systems was not affected by seasons in 7 villages. These were villages with deepwell pumps, public or household rainwater tanks and one GFS system. Other GFS systems had poor quality water in rainy season. Wells mostly had poor quality water as perceived by the user community, from the color (muddy, cloudy), taste (saline, metallic), and smell.




**Source Protection:** 16 systems had some source protection measures in place i.e. protective wall around spring catchment, washing platform around wells and handpumps and drains leading waste water away from the water source.

**Water Testing:** In 17 out of 20 villages the users reported that water testing had never been done or done only once when constructed. Only 3 systems, all in South Sulawesi, were being tested for water quality regularly, as reported by users.

Users gave the highest scores for *Water Quality* to deep well handpumps (PDH), followed by public rainwater tanks (RWTP). Lowest scores were given for rehabilitated traditional wells (DWTP) (Figure 2b).

**Fig. 2b Effective Sustenance & Use of Water Services :  
Functioning System ( Water Quality -WFS3)**



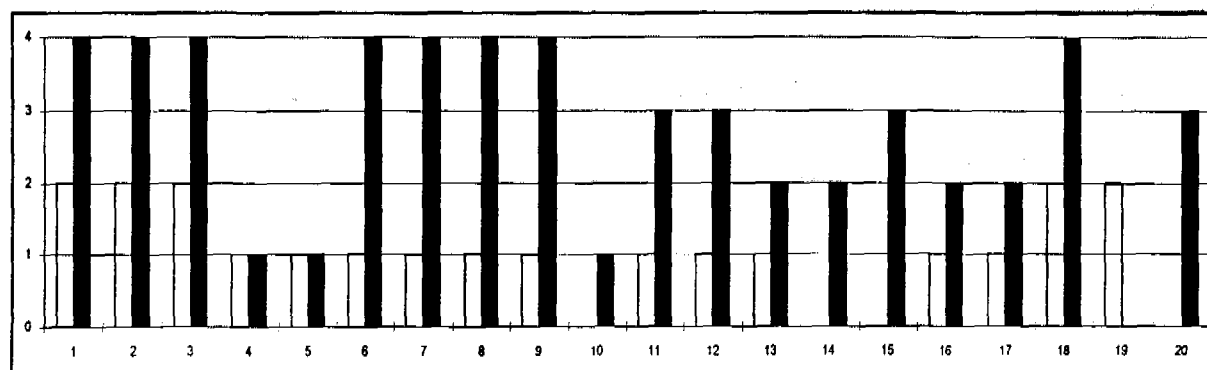
	<b>WSF3-a</b>	<b>Water Quality - Seasonal (sum of score for Dry + Rainy seasons)</b>
	Dry S.	Rainy S.
	0	0
	1	1
	2	2
		Poor Quality in all Systems
		Water Quality depend on the season and geographical location
		Good Quality in all Systems
	<b>WSF3-c</b>	<b>Water Testing</b>
	0	Water System Tested once when constructed/ Never Tested
	2	Water Tested regularly
	<b>WSF3-b</b>	<b>Source Protection</b>
	0	Source protection measures absent
	2	Measures available for Source Protection and preservation

### *Quantity of Water at Source*

**Seasonal Supply:** The villagers informed that water was always available at the source both in dry and rainy seasons, in only 5 village water systems. These were GFS systems or deepwell pumps. In all other villages the systems supplied less than enough water in dry seasons, although the deficiency was severe only in 3 villages. These were the household rainwater tanks or broken down/damaged dugwells. In some villages where protected dugwells dry up in the dry season, the users complained about the diameter of the UNICEF wells. UNICEF's design provides for cement rings having a diameter of 80 cms. This makes it impossible for users to climb down into wells and deepen it further, when the dry season pushes the water tables deeper down. They can do this in their traditional wells which have diameters of 1.2 meters or more, thus maintaining their water supply in the season of water scarcity.

**Adequacy for Domestic Purposes:** In 7 out of 20 villages the water systems supplied their users with adequate quantities for all domestic purposes in both seasons. These were, again the GFS systems (which serviced small percentages of the population), deepwell pumps (which served between 18 per cent to 66 per cent of population) and one village with dugwells. The rest are adequate in the rainy season (4 villages) or adequate only for drinking and cooking in both seasons (5 villages). In 1 village the systems were not providing enough even for drinking and cooking in any season. This was a shallow handpump system in South Sulawesi. (Figure 2c).

**Fig. 2c - Effective Sustenance & Use of Water Services :  
Functioning System - (Water Quantity-WFS2)**



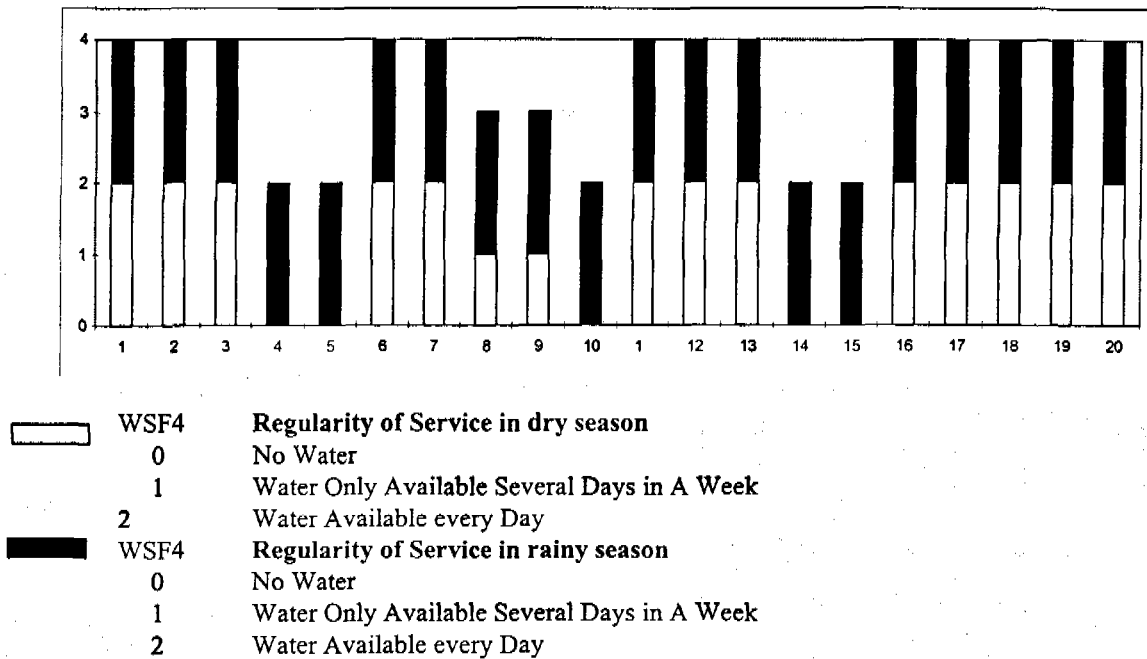
**WSF2-a Water Quantity - Seasonal variation**  
 0 No Water at source in any season  
 1 Seasonal lack of water at source  
 2 No Seasonal lack of water  
  
 **WSF2-b Water Quantity - For Domestic Needs**  
 Dry S. Rainy S.  
 0 0 Insufficient Water Quantity for All Domestic Needs  
 1 1 Adequate Water Quantity only for Drinking and Cooking  
 2 2 Adequate Water Quantity for All Domestic Needs

Regularity of Service: Water is available everyday from water systems, in both rainy and dry seasons, in 13 out of 20 villages. These are villages with GFSPC and PDH systems and some dugwells. Public rainwater tanks can provide water only 2-3 days a week in the dry seasons. All household rainwater tanks and some rehabilitated wells are usually dry in the dry season. (Figure 2d).

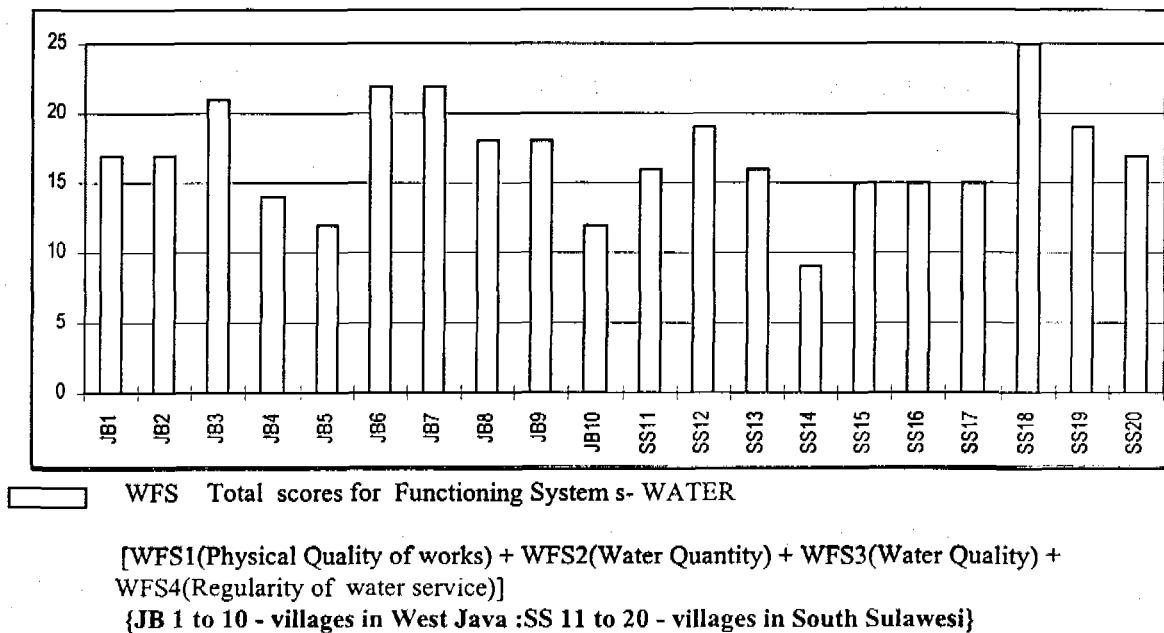
According to users, the best functioning systems in terms of physical condition, quality, quantity and regularity of water service were found to be the deepwell handpumps. Next best were the GFS systems. Protected dugwells and rehabilitated traditional wells were in the third place. Rainwater tanks scored the least.

Village System			Village System		
JB1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarawang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP

**Fig. 2d Effective Sustenance & Use of Water Services :  
Functioning System - (Regularity of Service -WFS4)**



**Fig. 2e Effective Sustenance & Use of Water Services :  
Total Scores for Functioning System**



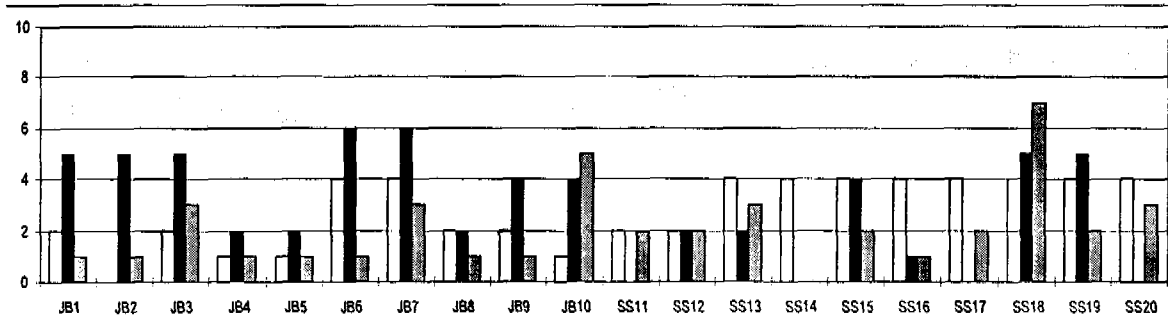


## Effective Use - Water Services

Most of the systems observed had been completed between 1992-1995 and were thus not old enough to show major wear and tear. Besides functioning of systems, sustainability was therefore assessed also from effective use and the effectiveness of management and financing of the services which are good predictors of how the system will be sustained in the future. In addition, effective use was assessed in terms of how far the water systems were delivering adequate water services to a majority of those who needed them. If a system is used effectively by a sufficiently large majority, it is likely to generate sufficient motivation amongst the users to keep it functioning well.

Effective Use was measured using the sub indicators of peoples Access to services ; the population served by the system as proportional to the total population i.e. Coverage , and Change in Water Use in ways that contribute to better hygiene and health. (See Figures 3a-b)

**Fig. 3a Effective Sustenance & Use of Water services: Effective Use**



- WEU1 Access to Service (Scores 0-4 for dry + rainy seasons together)**
- 2 Water system can be utilized by all section of community
  - 1 water system can be utilized only by some sections of the community/elite group
  - 0 majority cannot use the system
- WEU2 Change in Water Use for better Health (scores 0-6 for dry + rainy seasons together)**
- 0 no change in water use
  - 1 change in water use for washing and cleaning only
  - 2 change in water use for drinking and cooking only
  - 3 change in water use for all domestic purposes
- WEU3 Water Service Coverage as % of population served**
- 0 Data not available
  - 1 Less than 10%
  - 2 10.1% - 20%
  - 3 20.1% - 30%
  - 4 30.1% - 40%
  - 5 40.1% - 50%
  - 6 50.1% - 60%
  - 7 60.1% - 70%

# WATER SOURCE PREFERENCES- 1

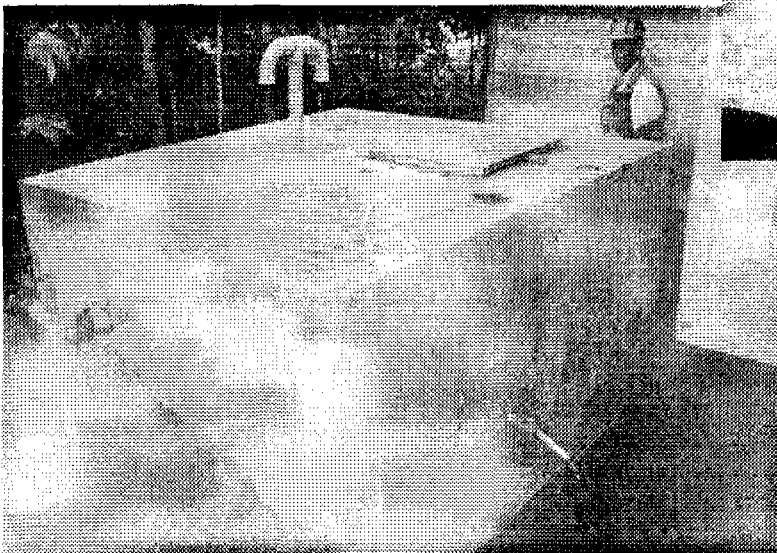
## For drinking and cooking...



- Handpumps and rainwater catchment tanks in the rainy season.

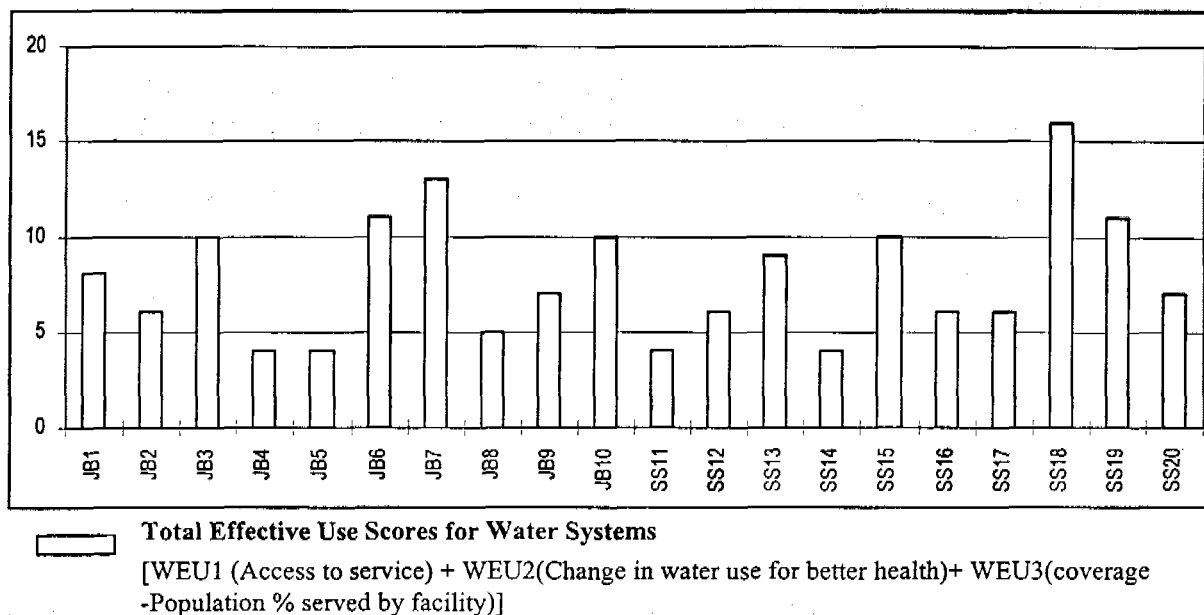


- Handpumps and spring water in the dry season.



- Spring protection tank in GFS system, West Java.

**Fig. 3b Effective Sustenance & Use of Water Services : Total Scores for Effective Use**



**Access:** Focus groups of men and women were asked whether the water system could be utilized by all sections of their community or only by some groups, and whether the majority could not access it for some reason. The answers revealed that only about half the systems could be utilized by all sections of the community in both dry and rainy seasons. Most of these (8 out of 10) were in South Sulawesi. This category included all the deepwell handpumps. In 6 out of 20 villages only certain community groups (the village elite) could utilize the system during the dry season. In another 4 villages, the majority of the population could not utilize the system in any season. These were the rainwater tanks - both public and household. Even in rainy season, they seem to serve only a few households in each village.

In other words, the deepwell handpumps were found to provide the highest year round access to the greatest majority of people. the protected dugwells and rehabilitated wells in South Sulawesi were providing comparable access. The GFS systems barred access for the majority in dry season although there was water available, and served only the elite. The rainwater tanks had little or no water in the dry season, thus could not provide access to most at that time of the year.

**Coverage:** Data on population served/not served by water systems was available from the village administration records.

It revealed that the GFS systems were serving between 3.3 per cent to 22 per cent of the population, rainwater tanks averaged 4.6 per cent to 20 per cent, the dugwells between 13 per cent to 25 per cent and the hand pumps served 22.9 per cent to 67 per cent of people.

**Coupled with the access data, this situation indicates the deepwell handpumps benefit the largest number of people all the year round and seem to be the best performers in terms of quality, quantity and regularity of service. Both GFS and RWTP systems tend to serve small populations. The dugwells come somewhere in the middle, but cannot be relied upon for quality of the water.**

*Change in Water Use:* The study examined the impact of the new (UNICEF assisted) system upon the community's pattern of water use. In almost all villages observed, UNICEF systems formed a part, sometimes small, of the overall availability of water sources. Invariably the villages had traditional sources that they continued to use such as the river, spring, pancuran (bamboo pipe transporting spring water to a lower altitude point) and unprotected wells. In addition villages had water facilities provided by other agencies such as IWACO and SIPAS in West Java, PLAN international in South Sulawesi and government agencies such as BKKBN and AMD in both provinces.

The impact of a new (UNICEF assisted) facility was thus difficult to isolate unless it made a major change in the way people used the different sources. Depending on perceived quality and quantity of water available and nearness of the source, users tend to shift some or all of their usage to the new source. How they shift their usage pattern has implications for an increase or decrease in their hygienic use of water. This is the aspect that the study strives to assess.

Since the underlying purpose of UNICEF's WES program is to improve people's access to safe water sources, the study assigned higher scores where users shifted to the safer new (UNICEF assisted) source for all domestic purposes or even just for cooking and drinking water. The results were as follows: (See Figures 3a to 3b).

The highest scores achieved were for deepwell pumps again. Where they had been installed, users had started using the handpump water for all domestic purposes, in both the dry and the rainy seasons. Only when the queues at the pumps grew too long, particularly in the dry season, users substituted water from lower quality but closer-to-home sources for washing and bathing such as the river or wells.

Where there are GFS systems, they too tend to become the most preferred sources for drinking and cooking water in the dry season. In the rainy season the most preferred sources for cooking and drinking are the handpump and rainwater tanks. Peoples' criteria for water "fit for drinking and cooking" are that water should look clear, taste and smell good. Unboiled water is considered tastier than the boiled water in many villages. These criteria were rarely met by dugwell water. It was evident that the protected dugwells and rehabilitated traditional wells are generally used as sources for washing and bathing only. They were not being used for drinking water in most villages, due to the water tasting salty, wells drying up or water turning muddy in the dry season. Wells are used for drinking water only when other preferred sources are unavailable i.e. RWTP, springs, *Pancuran*.

**Thus health benefits due to increased availability of clean water for all purposes including drinking can be most expected among users of deepwell handpumps and to a lesser extent among users of GFS/RWTP systems. Dugwells seem unlikely to make a difference in terms of health. However since they bring water closer to homes than the other systems do, dugwells tend to effect greater saving in women's time and energy leading to other indirect benefits, as compared to the rest of the systems. Additionally, the availability of a dugwell at home/near home is an important factor for promoting latrine construction and use. Unless there is a piped water connection or a dugwell at home, people are not willing to construct latrines. If obliged**

## WATER SOURCE PREFERENCES- 2

For washing and bathing...



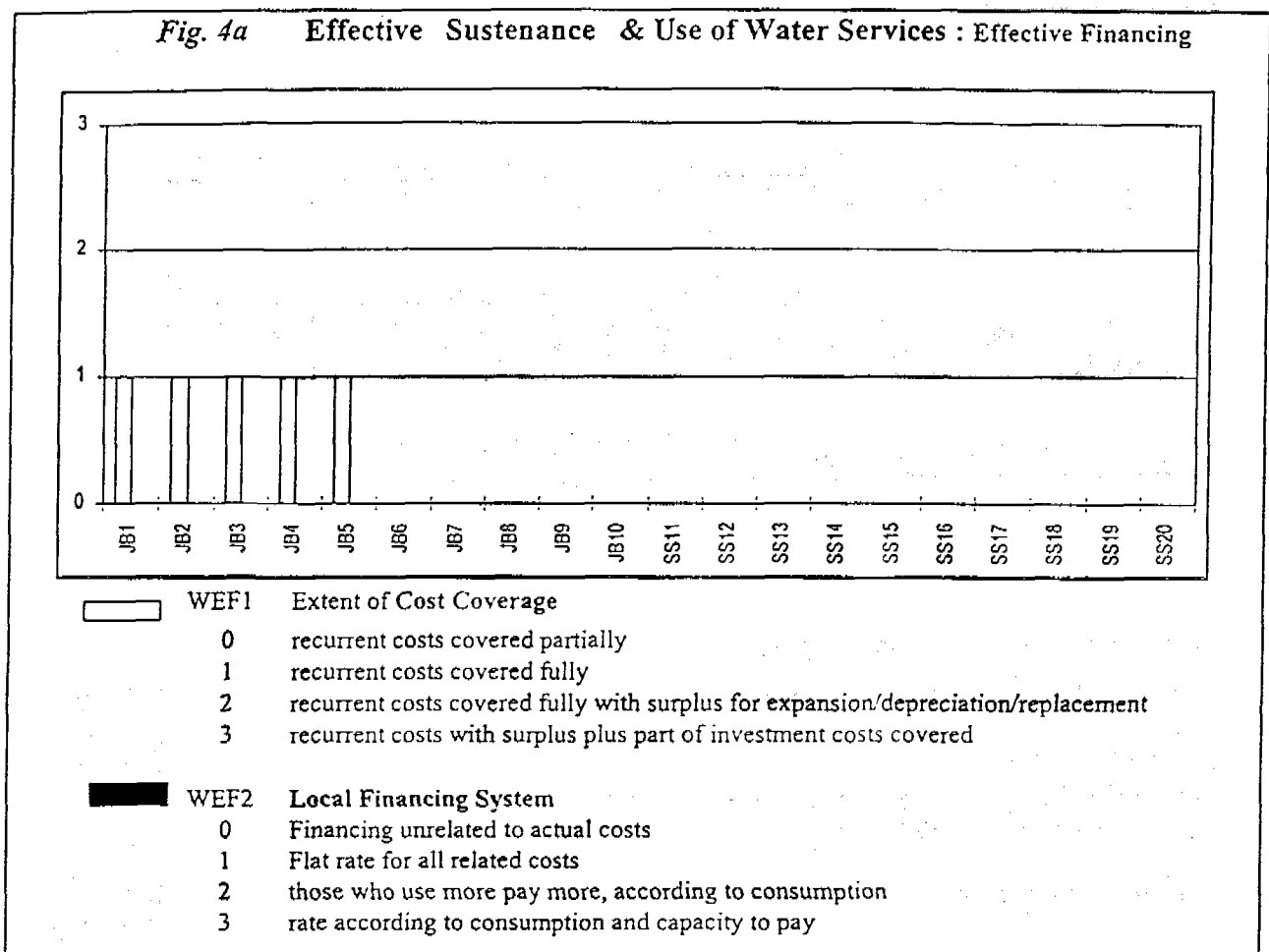
Dugwells (both protected and traditional), and rivers.

to construct, they do not use them. The burden of carrying water from a distance for flushing latrines is not considered worthwhile.

Total Effective use scores were highest for deepwell handpumps and lowest for public rainwater tanks. The rest of the systems were in-between.

### Effective Financing

Sustainability of systems is in part predicted by how well its O&M is financed. The study therefore looked at the extent to which the financing system was covering current costs and if there was any provision being made for future expansion or replacement. (Figures 4a-b).

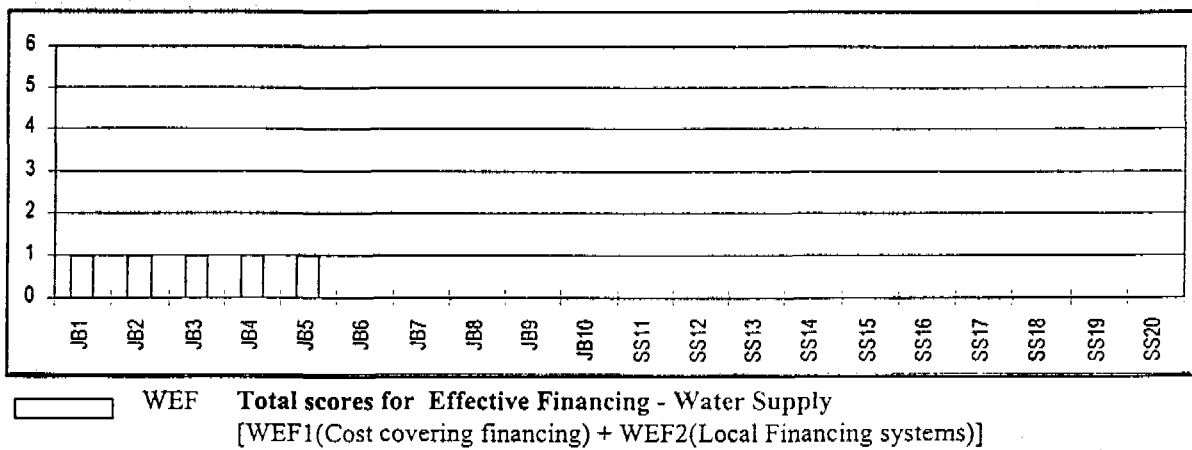


The surprising finding in the study was that, except for the 3 GFS systems, there were no user fees being paid for any water systems. In case of the GFS systems, which charged Rp.2,000 - Rp.2,500 per month per household, less than 20 per cent users were paying it in 2 villages and more than 80 per cent were paying in the third one. When the need for repairs arose, the village leader or "owner of the facility" (owner of land on which it was located) mobilized contributions from users, as and when required. This often resulted in the minimum possible repairs being done, spare parts not being

replaced as often as needed, makeshift repairs such as tying up leaking/broken taps with rubber bands instead of replacing taps. The systems observed were between 3-5 years old, and the need for major repairs has not yet been felt. Users were generally of the opinion that major repairs, if necessary, would be done from "Kas Desa" (village development related funds controlled by the village chief i.e. Kepala Desa).

The financial viability of the systems thus depends on external funds being available and the users are not doing anything to build up local capital for sustaining the services. As the systems get older, the increasing needs for repairs, expansion and finally replacement may not be met.

**Fig. 4b Effective Sustenance & Use of Water Services :  
Total Scores for Effective Financing**



### *Effective Management - Water*

To assess Effectiveness of Management of the sources, the study looked the type of Management Organization system had, its history of Maintenance and Repair, kinds of Operating Personnel available and the Transparency of Financial Management. (Figures 5a-b). In addition, users groups indicated their assessment on group rating scales about the Fairness of Fees and the Effectiveness of Management of the services (Figures 5c-d)

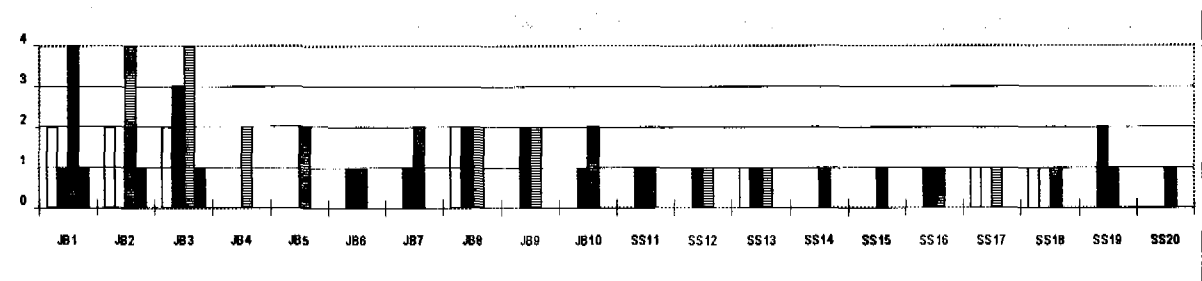
#### *Management Organization*

The WES program guidelines prescribe the formation of Water Sanitation Committee or Water User Groups (*Pokmair, Kelompok Pengguna Sarana*) in every village, through community mobilization. In reality these committees were found to have been appointed by the village head and consisted of existing community leaders and village administration personnel. In many cases they had never been formed. At the time of the study, none of the villages had a formal Water Committee that was active and functional. 4 villages had informal associations of a few users who had assumed the responsibility of managing, by consensus among themselves. This included all the GFS systems and one public rainwater tank. 3 others villages had non functional committees. In the rest of the villages, i.e. 13, water systems were not

managed by any organization. The villagers mentioned that the "owner of the facility" managed the system. This was the household dugwell, or, in case of public facilities, the owner of the land on which the system had been built. The "owner" was usually a rich, powerful man, a member of the village elite, who had voluntarily invested more than average amounts contributed by the rest of the villagers into the construction of the system. This gave him a kind of informal ownership of the system.

An extreme example of this was in *Mekarwangi* village of West Java, where the older *Kepala Desa* who had initiated the GFS system has now been replaced by a new village Chief. The old *Kepala Desa* is a rich, politically active man, who is feared by many villagers. The focus groups reported that he had diverted one of the two main supply pipes from the public GFS system's main collection tank to his own house, where it feeds a huge private storage tank. He then provides connections to other users from his private reservoir and collects fees from them every month.

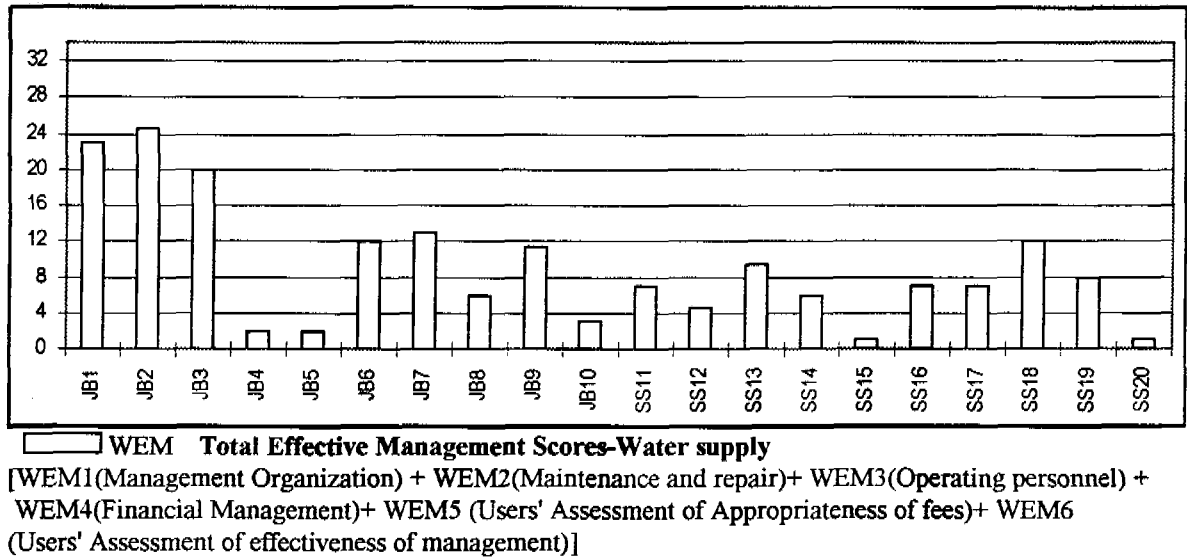
**Fig. 5a Effective Sustenance & Use of Water Services : Effective Management**



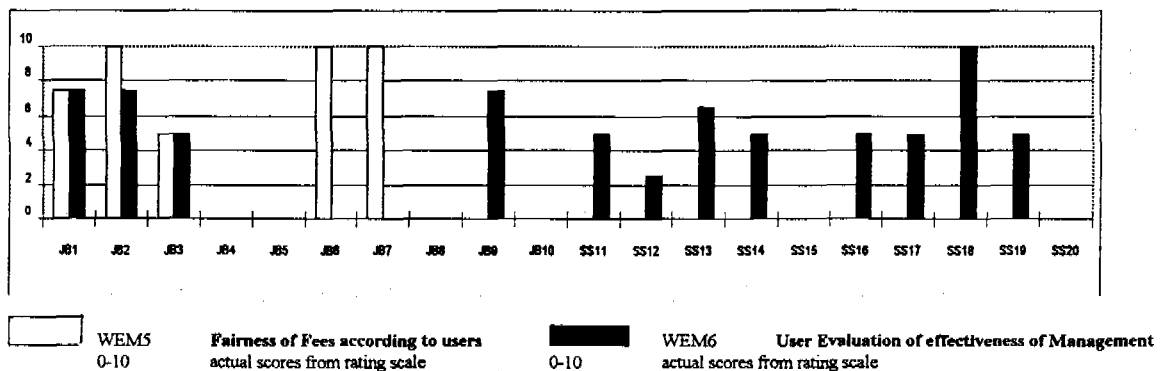
<p><b>WEM1 Management Organization</b></p> <p>0 no water committee</p> <p>1 informal water committee only</p> <p>2 formal water committee exists-not active</p> <p>3 formal water committee exists-active</p>	<p><b>WEM2 Maintenance &amp; Repair</b></p> <p>0 no proven ability</p> <p>1 have successfully made minor repair (small leaks, etc.)</p> <p>2 have successfully made more major and minor repair (new tanks, etc.)</p> <p>3 have extended the system or built other systems elsewhere</p>	<p><b>WEM3 Operating Personnel</b></p> <p>0 there is no maintenance activity/arrangement</p> <p>1 maintenance is done by anyone who wants to</p> <p>2 maintenance is done by landowner/owner of the facility</p> <p>3 maintenance is done by operator (not paid &amp; not trained)</p> <p>4 maintenance is done by operator (paid &amp; not trained)</p> <p>5 maintenance is done by operator (paid and trained)</p>	<p><b>WEM4 Financial Management</b></p> <p>0 no budget and accounting, funds collected as and when required</p> <p>1 systematic budget. &amp; collect, but no accounting for service to users</p> <p>2 systematic budgeting and collection, accounted to some users</p>
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**Fig. 5b Effective Sustenance & Use of Water Services :  
Total scores for Effective Management**



**Fig. 5c Users' Ratings : Fairness of Fees and Effectiveness of Management**



**Maintenance and Repair**

In 1 village out of the 20, the Community has built another GFS system without external assistance, after they got the original one from UNICEF. In 3 other villages they have made major repairs e.g. deepwell pump parts replacement (valve and canvas), and household rainwater tanks being replastered with cement. Minor repairs had been made in 8 villages e.g. cementing of cracks on well walls and flooring, rainwater tank walls, converting broken public taps into direct pipe connections to household storage tanks. No repairs were reportedly made in 8 villages out of 20.

### *Operating Personnel*

In 30 per cent cases, the operator and maintenance-in-charge was the same as the "manager" i.e. the "facility owner". Only in the 3 GFS systems there was a paid operator. He had not received any specific training in O&M. In the rest of the cases operation and maintenance was done by "anyone who was willing to do it", according to the focus groups.

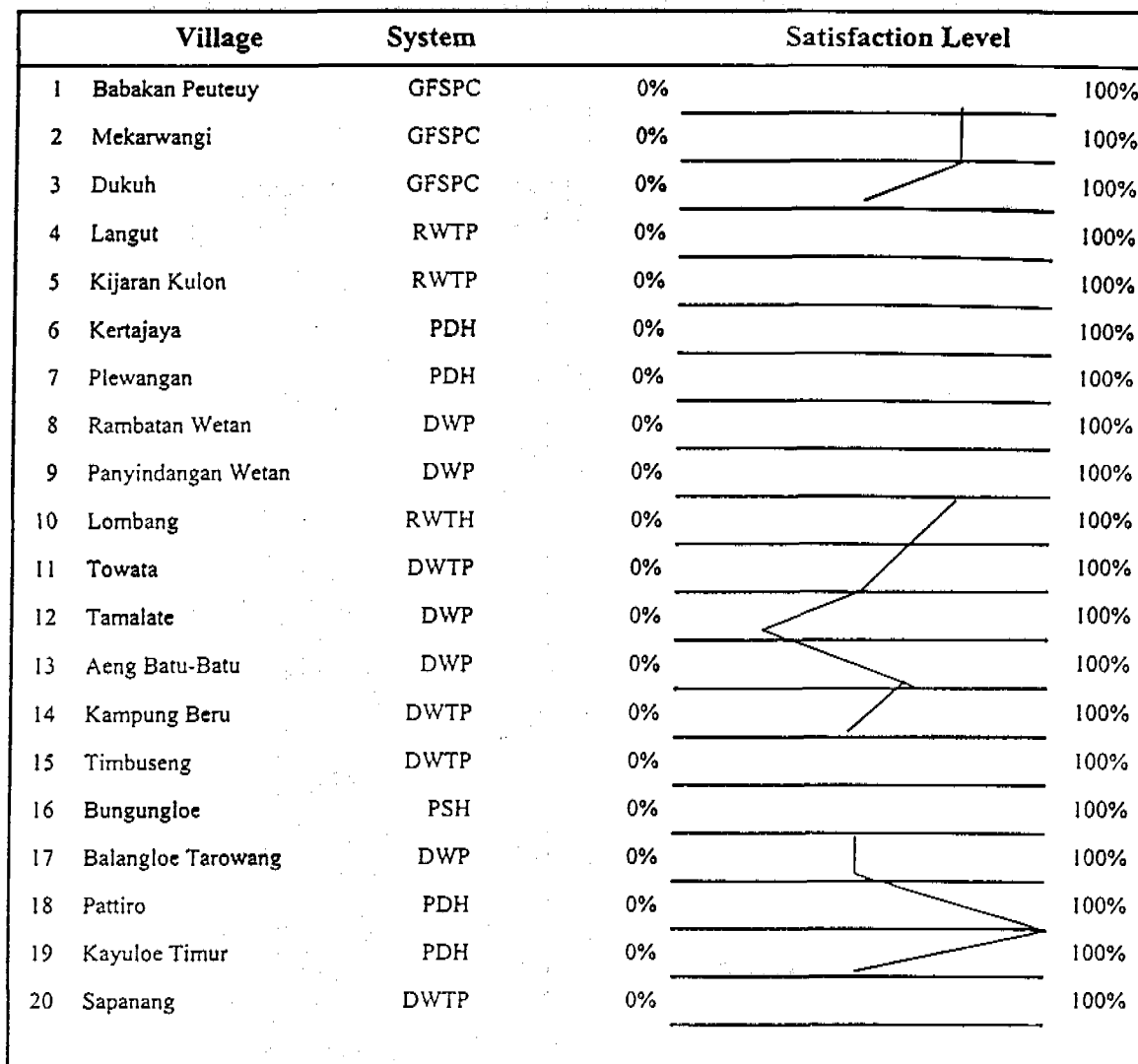
### *Financial Management System*

Except for the 3 GFS systems, there was no regular collection and management of user tariffs. Funds were collected as and when required. There were no budgets and no accounting to the users for funds collected. Even for the GFS systems, there was budgeting and collection, but no accounting to the users. Users who did not pay tariffs due were not subject to any sanctions in 2 villages, where less than 20 per cent of the users were paying regularly.

Users' focus groups were asked to evaluate the efficiency of management of the water facility on a 0 to 100 per cent scale. *Figure 5c* illustrates the spread of scores they gave in different villages. In about half the villages they did not respond, saying that there was no management happening. The rest gave scores between 25 per cent to 75 per cent, the single 100 per cent score being given in a village having good deepwell handpumps (Pattiro, South Sulawesi)

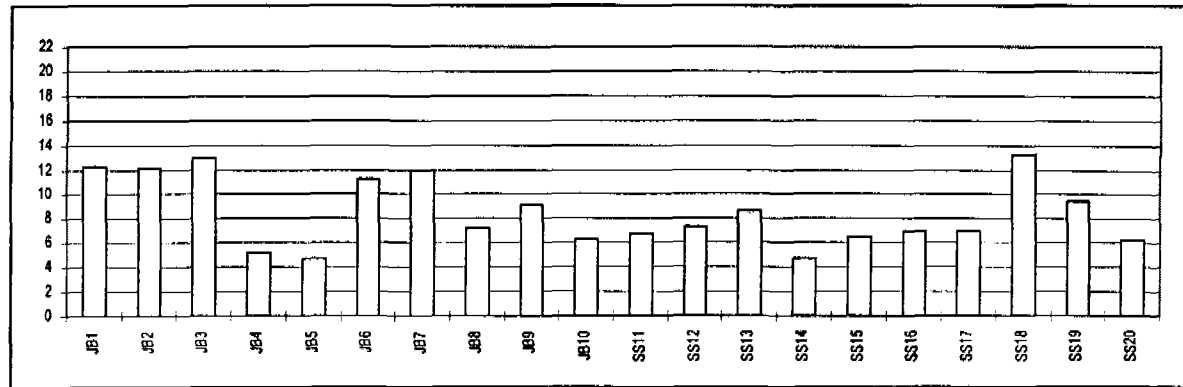
The sum of effective management scores (*Figure 5b*) indicates that in effect, very little management is taking place in all cases except the 3 GFS systems. The latter 3 scored a little over 50 per cent of maximum possible score for Effective Management. This suggests that the systems are probably not seen as highly valued community assets that need to be cared for through organized community effort. It is possible that they are looked upon as private property of individuals or belonging to a few, who tend to take the responsibility of O&M.

Fig. 5d Users' Assessment Of Effectiveness Of Management Of Water Systems



The total scores for Sustenance and Use of Water services is illustrated in Figure 6. The overall scores of all systems vary between 5-13, when the maximum possible score is 20.75, suggesting a 25 per cent to 65 per cent level of effective sustenance and use, with a mean of 8.4 (40 per cent level). The deepwell handpump and GFS systems have the best scores. (Figure 6).

**Fig. 6 Effective Sustenance & Use of Water Services : Total "A" Scores**



Village System			Village System		
JB1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarawang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP

**Aw** Total "A" Scores of Water Service  
 [WFS(Water -Functioning system) + WEU(Water- Effective use) + WEF(Water- Effective financing )+ WEM (Water- effective management)] multiplied by their respective weights.

## Users' Assessments - Sanitation

Effective sustenance and use of Sanitation services was measured using the following indicators divided into 11 sub-indicators:

1. Functioning System in Place	<ul style="list-style-type: none"><li>• Quality of design and construction</li><li>• Environmental soundness of system</li><li>• Effective performance (in keeping with design)</li><li>• Reliable service (usable when needed)</li></ul>
2. Effective Use	<ul style="list-style-type: none"><li>• Access to service</li><li>• Change in Sanitation habit</li></ul>
3. Effective Financing	<ul style="list-style-type: none"><li>• Degree and type of investment by household</li></ul>
4. Capacity for Sanitation Services in Community	<ul style="list-style-type: none"><li>• Technical capacity</li><li>• Monitoring capacity</li><li>• Trends in sanitation coverage</li><li>• Financial management capacity</li></ul>

### *Functioning Systems in Place*

#### *Quality of Design and Construction*

The latrines constructed are in functional state in 18 out of 20 villages. In 2 villages they are yet to be constructed, several years after materials for construction were received (*Langut* and *Kiajaran Kulon*, West Java). This was due to water supply not being available at household level and because many villagers expect to move their homes elsewhere due to a proposed toll road construction through their village. In almost all cases the number now functioning is 10 per cent to 20 per cent lower than the number constructed, due to a variety of reasons such as damage by water buffaloes (walls had not been built), blockage of pans with soil/floodwater sediments, or construction with slabs and rings already damaged at the time of construction (careless transportation by contractors). **In one case however, the presently functioning number of latrines is 4 times that originally constructed. This is in village Dukuh in West Java, where availability of household connections from a good GFS system has stimulated a household demand for latrines.** The latrines in Dukuh constructed by users themselves are of a higher cost and quality than the latrines provided by UNICEF assistance.

Construction faults associated with latrines in 5 out of 20 villages are latrines built at the ground level, without raised platforms, which allows pebbles and soil to fall in and clog pans. In 3 coastal villages, high tides tend to bring feces floating up in the pan. In 3 villages people have cut off the water seal because: a) they considered water in the pan as dirty water or b) they wanted a dry latrine due to unavailability of water for flushing.

#### *Effective Performance*

A pour-flush latrine performs effectively when water for flushing is adequate. In this respect, adequate water for flushing is available in 60 per cent of the villages. Sometimes water is not available to

operate the latrine in 25 per cent villages. It is never available, in 15 per cent villages. When water is unavailable, people return to rivers, irrigation canals or fields to defecate.

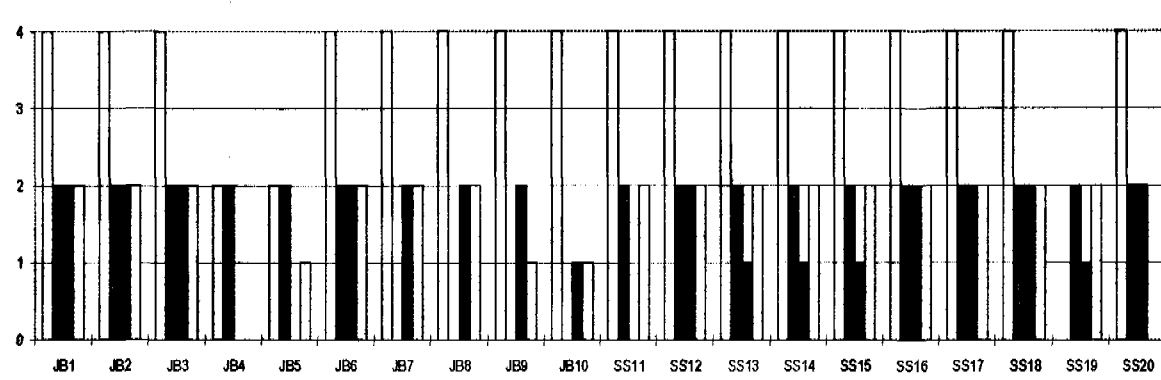
**Environmental Soundness**

In 16 villages out of 20, latrines have been built at least 10 meters or more away from water sources at the advice of the Sanitarian. In 4 villages this was not the case. they were all in West Java. These villages have received stimulant materials from Department of Public Works but not many have constructed latrines. In JB4 and JB5 the bars in the figure below refer to two demonstration units.

**Reliable Service**

In 75 per cent villages the latrines can be used whenever the users need them. In 15 per cent villages they sometimes cannot be used, mainly because of lack of water available for flushing. The rest have not built latrines. (Figure 7).

**Fig. 7 Effective Sustenance & Use of Sanitation Facility & Services: Functioning system**



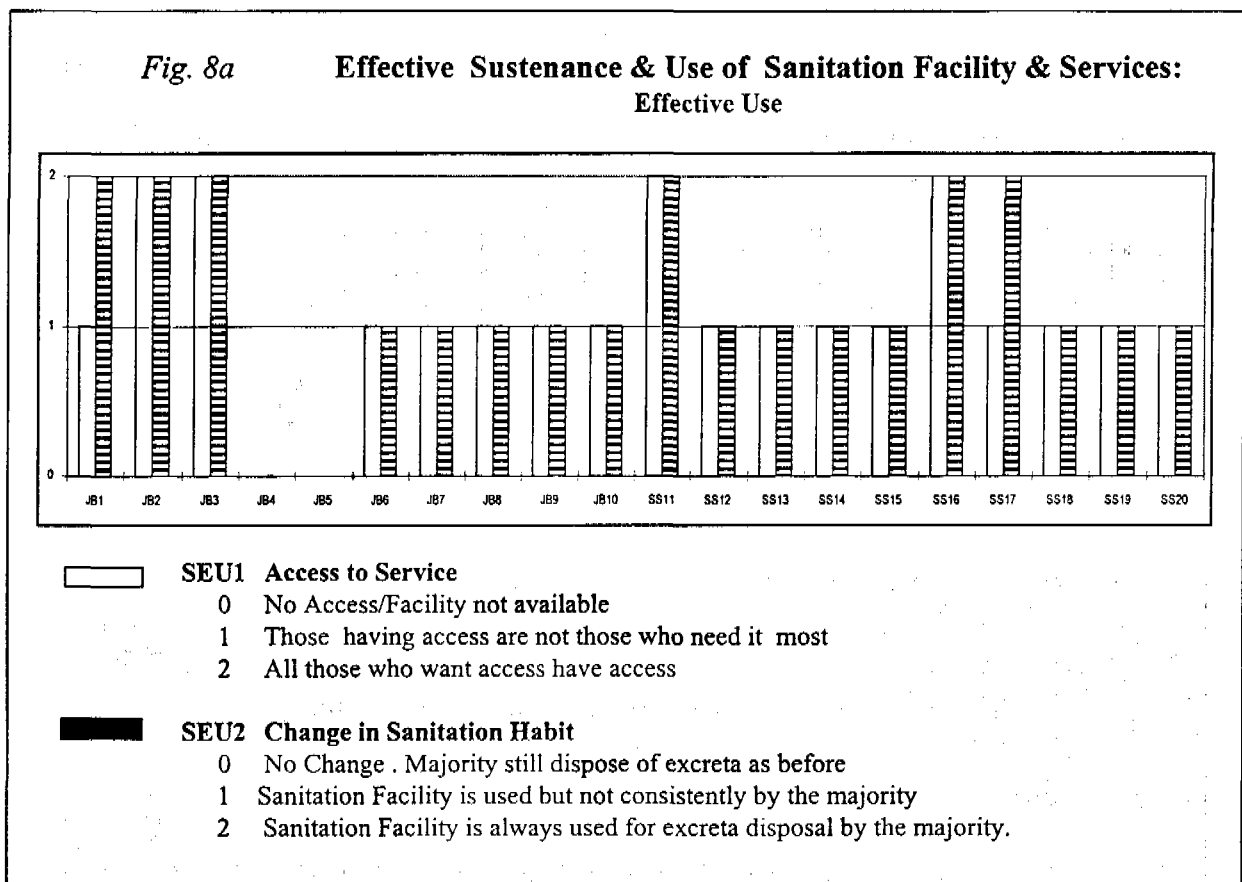
<p>□ SFS1</p> <p>■ SFS2</p> <p>■ SFS3</p> <p>□ SFS4</p>	<p><b>Design &amp; Construction Quality</b></p> <p>Yes No</p> <p>1 0 Functioning system in place</p> <p>1 0 good design, no design/construction fault</p> <p>1 0 good workmanship &amp; materials in construction</p> <p>1 0 construction completed according to requirements</p> <p><b>Environmental Soundness of system</b></p> <p>Yes No</p> <p>2 0 Latrine at least 10 meters or more away from water source</p> <p><b>Effective Performance (since the only design used is a pour flush latrine)</b></p> <p>2 adequate water available to operate in sanitation facility</p> <p>1 Sometimes water is not available/not enough to operate facility</p> <p>0 no water available to operate facility</p> <p><b>Reliable Service</b></p> <p>2 Sanitation facility can always be used, whenever users need to</p> <p>1 sometimes sanitation facility cannot be used when users need it</p> <p>0 sanitation facility cannot be used at all when users need it</p>
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## Effective Use - Sanitation

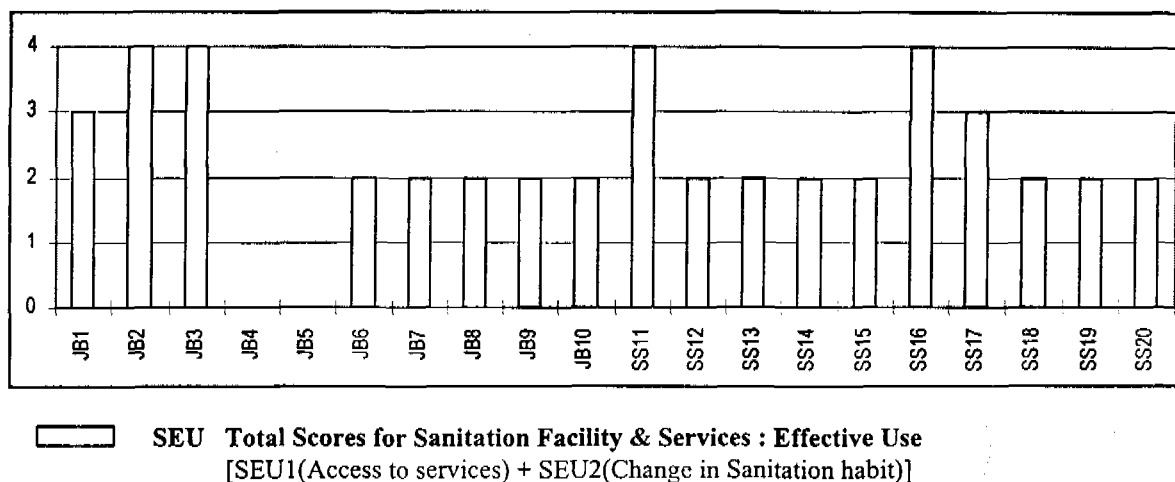
Effective use of sanitation facilities includes access to the services, and consistent, hygienic use by the users. (Figures 8a-b).

### Access to Service

According to the community groups met, in only 20 per cent of the villages all those who want access to sanitation have access. In an overwhelming majority of villages (70 per cent), those who have access are not those who need it most. The poorest households are often those who lack access, since village leaders tend to allocate latrines to households having water supply at household level. Often the poorest are also those least interested in investing in a latrine since they have never before had to pay to defecate and have too many other competing needs for their scarce resources.



**Fig.8b Effective Sustenance & Use of Sanitation Facility And Services :  
Total Scores for Effective Use**



### *Change in Sanitation Habit*

It is a sobering finding that despite 85 per cent of the villages having fully functional latrines, in only 30 per cent villages people are using them for excreta disposal all the time. In as many as 60 per cent villages latrines are used, but not consistently by most of the users. They use latrines when they are at home and water is available for flushing. When they are out working in the fields or forests, and need to defecate, no one comes back home for the purpose. When water is scarce, people either go to public latrines if available, or back to the fields, forest, river, irrigation canals.

The assessment of hygiene awareness levels (Chapter 4) may help explain the situation.

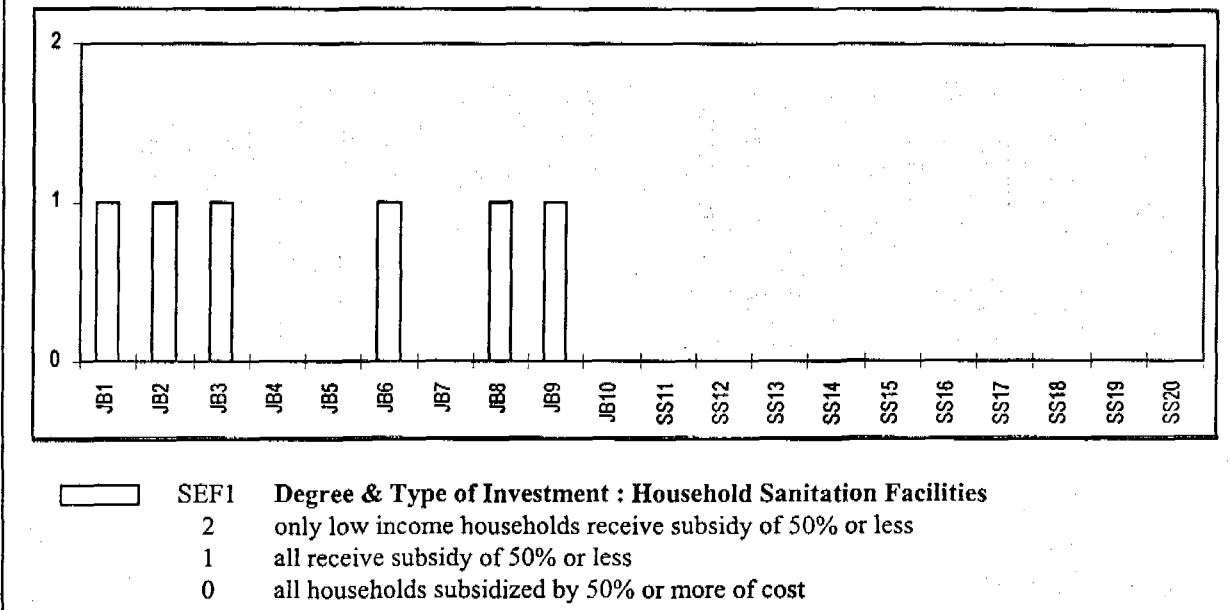
While sanitation coverage of all the villages is considered complete on the records - effective use of sanitation services is occurring in less than one third of the villages. Implications for health impact, or lack thereof are significant.

### *Effective Financing - Sanitation*

UNICEF provides a package of stimulant materials which is expected to leverage community investment in constructing their own latrines. The extent of household investment in relation to the subsidy is a measure of the potential users' interest in getting the facility. The package is same for all beneficiaries, rich or poor and at the time of the study the stimulant was a maximum of 40 per cent of the construction cost. Villagers in only 6 out of 20 villages reported that the subsidy available was less than 50 per cent of the cost. They were all providing construction materials such as sand, bricks, enclosures for latrines, labor for digging pits and variable amount of costs ranging from Rp.3,000 - Rp.15,000 for cement and paying masons. (Figure 9).



**Fig. 9 Effective Sustenance 7 Use of Sanitation Facility & Services :  
Effective Financing**



### *Capacity for Sanitation in the Community*

Effective management for sanitation services in the community calls for skills in construction, monitoring of sanitation coverage and management of financing of the facilities. (Figures 10a-b).

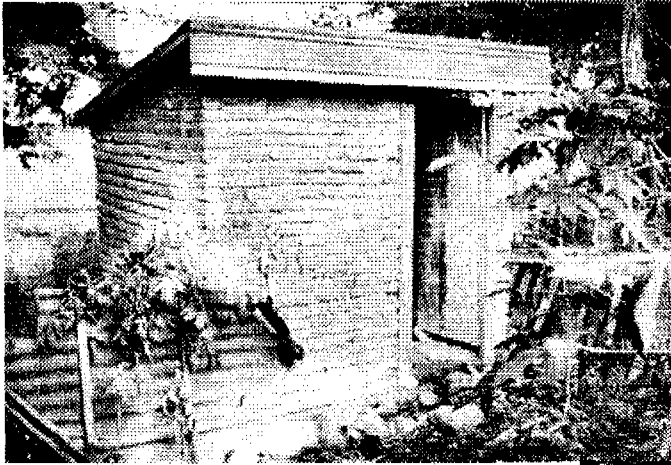
The focus groups reported that in 50 per cent villages there was a local mason capable of constructing at least one type of sanitation facility, Materials were also locally available. These villages were all in West Java.

According to the focus groups there seems to be almost no monitoring of sanitation conditions and practices in the communities. This was unexpected, because UNICEF's program procedures specify annual self-surveys of sanitation facilities in every village. It is possible that these surveys involve only the village/neighborhood leaders and therefore the study respondents did not know about it. Sanitation coverage was perceived to be increasing in 50 per cent of the villages, remaining stagnant in 40 per cent villages and unknown or declining in 10 per cent, in the opinion of the users (and verified from the social mapping exercise in each community).

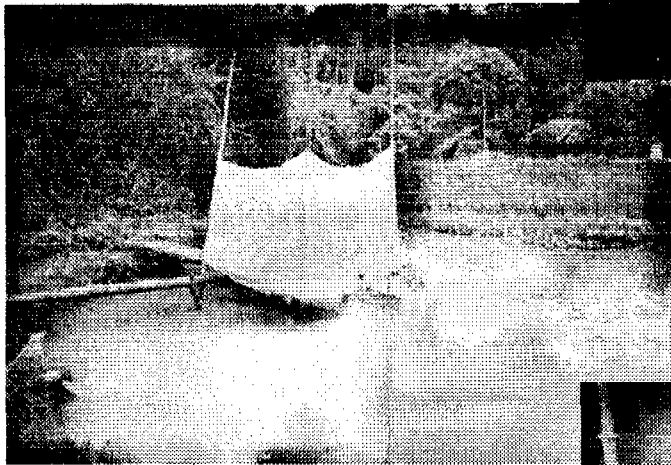
Financial management of sanitation at community level consists of distribution of a standard subsidized stimulant packet in the community, by the village and neighborhood heads. There are no specified allocation guidelines. In 10 per cent villages, guidelines have been formulated by the village leadership.

# WHAT CONSTITUTES "EFFECTIVE USE" OF SANITATION FACILITIES?

Use needs to be *hygienic* and *consistent*.



People use their latrines when  
at home, and water is available.

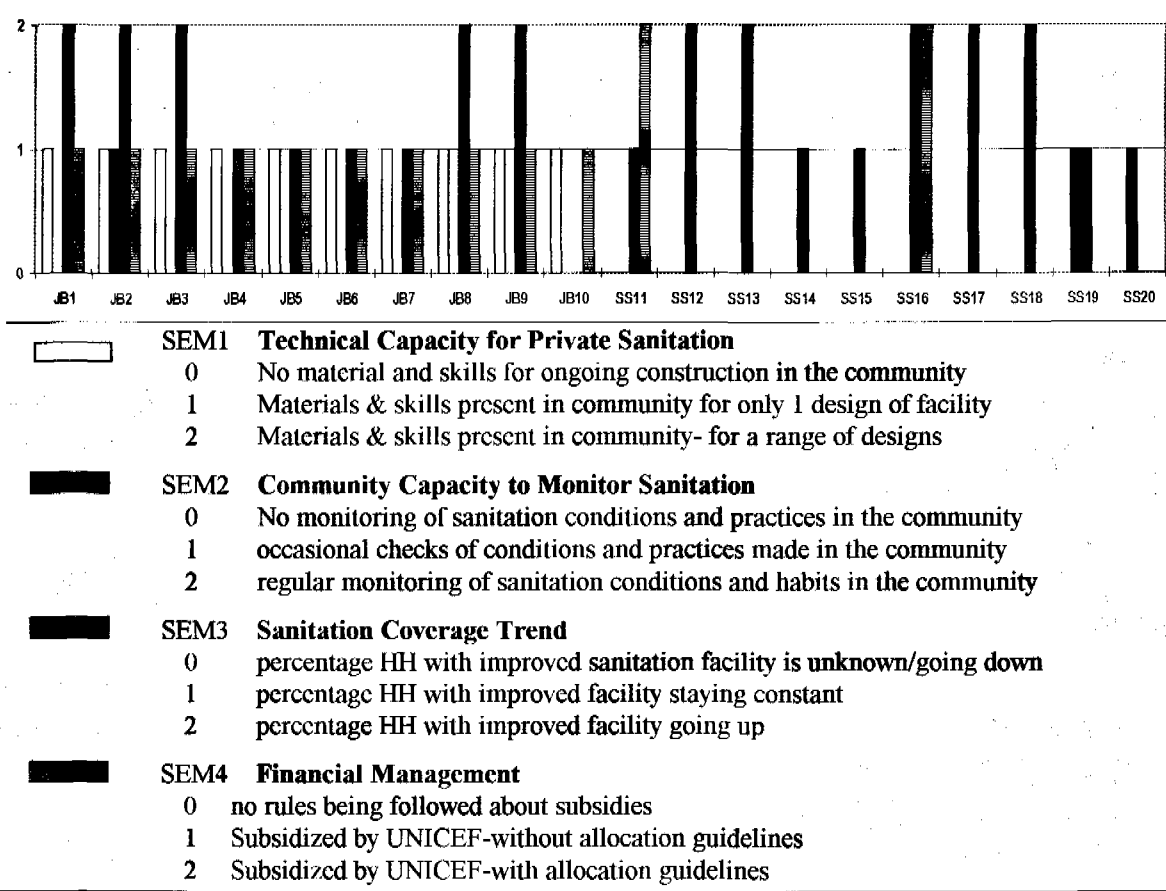


But what happens when they're  
working in the fields?  
Or gathering forest produce?  
Or when children play outdoors?

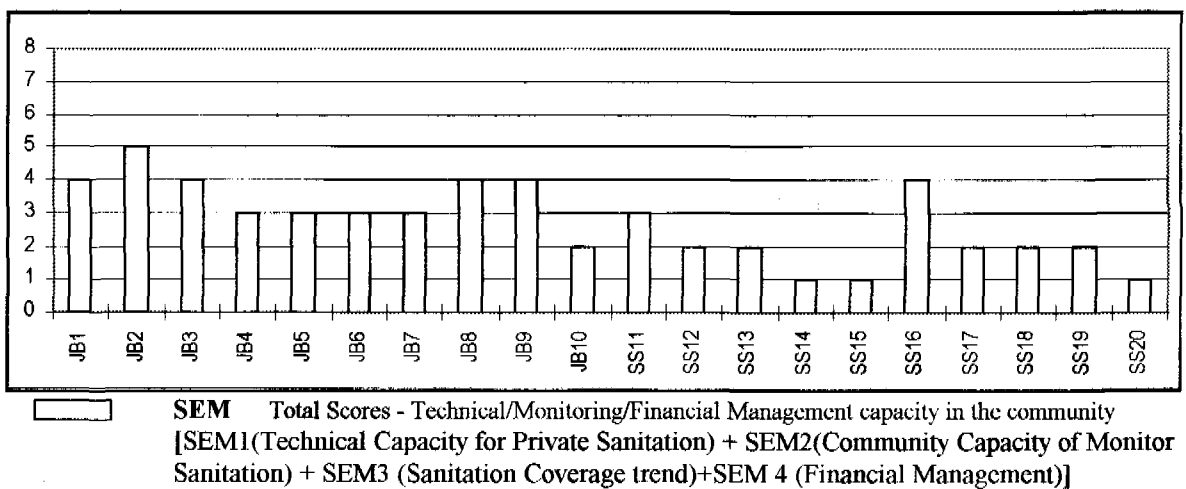
Ponds, streams and bushes are  
readily available alternative  
sites...



**Fig. 10a Effective Sustenance & Use of Sanitation Facility & Services :  
Technical/ Monitoring/ Financial Management Capacity in Community**

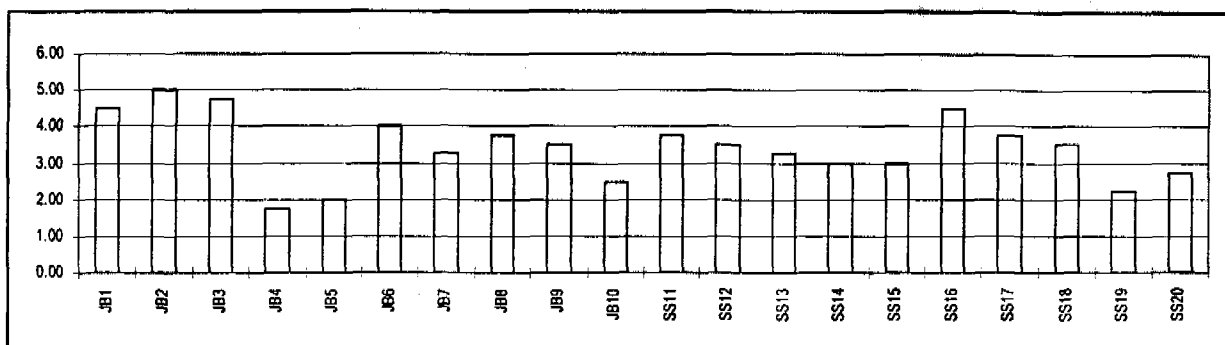


**Fig. 10b Effective Sustenance & Use of Sanitation Facility & Services :  
Technical / Monitoring / Financial Management Capacity in Community**




The summary of total scores for *Effective Sustenance and Use* of sanitation services shows a moderate level of sustenance and use. The maximum score achieved in any village is 5 and the minimum 1.75, out of the maximum possible score of 6. The overall mean is 3.41 .  
(Fig. 11)

**Fig. 11 Effective Sustenance & Use of Sanitation Facility & Services :  
Total "A" Scores for sanitation**



JB1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarowang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP


**Total "A" Scores of Sanitation Facility & Service**  
 [SFS(Sanitation-Functioning system) + SEU(Sanitation-Effective Use)+ SEF(Sanitation-Effective financing) + SEM(Technical/Monitoring/Financial/Management capacity for Sanitation in the Community)] multiplied by this respective weights

## Hygiene Awareness Levels

The study explored existing levels of hygiene awareness among men and women through two PHAST exercises in the village focus groups. The first was a Pile Sorting exercise whereby women's groups sorted a set of 23 pictures showing various hygiene-related behavior into 3 categories as:

- good for health
- bad for health
- not related to health

The resulting frequencies of classification are summarized in the following Table 5 and analyzed for extent of correct classification achieved.

**Table 5** Frequencies of Hygiene Behavior Classification by Women's Groups

Province	Good for health	F	Not relevant for health	F	Bad for Health	F	
West	Hand washing with soap	9	latrine constructed on the river	4	Dug-well located close to the solid waste disposal	10	
	Food covered	9	water pump	3		10	
Java	Hand washing by children	8	latrine construction on the fish-pond	3	un-covered food	9	
	Water-jar covered	8	A child defecating in the yard	3	collect water from the river	9	
	dish washing	7	dish washing	2	defecating under the tree	9	
	collect water using water-jar	5	un-covered water jar	1	A child defecating in the yard	9	
	pouring water using water dipper	4	collect water from water- spout	1	un-covered water jar	8	
	collect water from water-spout	4	collect water from the river	1	cleaning a child with hand after defecating	7	
	cleaning latrine	2	pouring water from water-jar to a glass	1	using river for excreta disposal	7	
	dirt around well	1	A child washes his hands	1	collect water from uncovered water jar	4	
	latrine construction on the fishpond	1	cleaning latrine	1	latrine construction on fish pond	3	
	latrine construction on the river	1					
	collect water from public water tap	1					
	dirty dug-well	1					
	South Sulawesi	boiling water	9	washing hands	6	uncovered food	9
		covered food	9	paddy planting	5	using river for excreta disposal	7
sweeping		8	washing clothes	4	using fishpond for excreta disposal	6	
washing hand with soap		8	cooking	3	lunch/dinner not in a proper place	6	
washing dish		7	cleaning child's buttock	2	drinking water from uncovered glass	5	
covered water-jar		6	wearing shoes climbing stairs	2	uncovered water jar	5	
collect water with water dipper		6	collect water	2	wearing shoes climbing stairs	4	
drinking from teapot		6	bathing	2	not using spoon when we eat	4	
washing child's buttock in the bathroom		5	drinking from water jar	2	drinking from spring	3	
washing hands before eating		5	pick -up water jar	1	putting pail-rope not in proper place	3	
washing clothes		4	Babies sleeping in the bed	1	dug-well polluted	3	
bathing a child		4	eating	1	food with a lot of flies	2	
bathing in the bathroom		4	using shoes in the house	1	babies sleep in an un protected bed	2	
flushing human excreta		2	drinking	1	putting water from dugwell to a bottle	1	
eating using spoon		2	washing dish	1	collect water from polluted river	1	
using mosquitoes net		2	putting water jar on the head	1	using water spout for washing	1	
cleaning village environment		1	Volunteer labor contribution	1			
cleaning a child after defecating		1	cooking/frying	1			

### *Hygiene Behavior Classification*

The results show a high level of awareness (in 17 villages out of 20) of "handwashing with soap" being good for health. Other behaviors classified as good for health were, in the decreasing order of importance, "keeping food covered" (in 18 out of 20 villages), "keeping drinking water covered" (in 14 out of 20 villages), "washing dishes" (in 14 out of 20 villages), "taking water out of pitcher with a ladle" (in 10 out of 20 villages) and "boiling drinking water" (in 9 villages out of 20).

Behaviors classified as bad for health were "keeping food uncovered/exposed to flies" (in 18 out of 20 villages), "defecating in the river" (in 14 villages out of 20) "keeping drinking water uncovered" (in 13 out of 20 villages), "child defecating in the yard" (in 9 out of 20 villages), "collecting household water from river" (in 9 out of 20 villages).

It is worth noting that while open defecation was classified bad for health, "defecating in a latrine" was classified as good for health in only 2 villages out of 20. "Handwashing" was considered "unrelated to health" (!) in 7 villages. So was "child defecating in the yard", in 3 more villages. Moreover, while "handwashing with soap" was considered good for health in 17 villages, "handwashing before eating" was so classified only in 5 villages.

Hygiene education messages about open defecation, handwashing and keeping drinking water covered seem to have made an impact on the people. Whether the awareness is leading to appropriate behavior needs to be explored further with participatory observation. The next exercise was a test of the same.

### *Awareness of Routes of Contamination*

The second PHAST exercise used was a flow diagram that the women's groups created, with pictures they could select from a larger set - to show their concept of how fecal-oral contamination takes place. They then selected pictures of preventive practices that can be used to break the transmission route, and placed them at points they considered appropriate, on the diagram of their creation. The resulting flow-diagrams are attached. (Figures 12a-e).

Analysis of the diagrams show the following about people's awareness (see boxed entry).

# ASSESSING HYGIENE AWARENESS



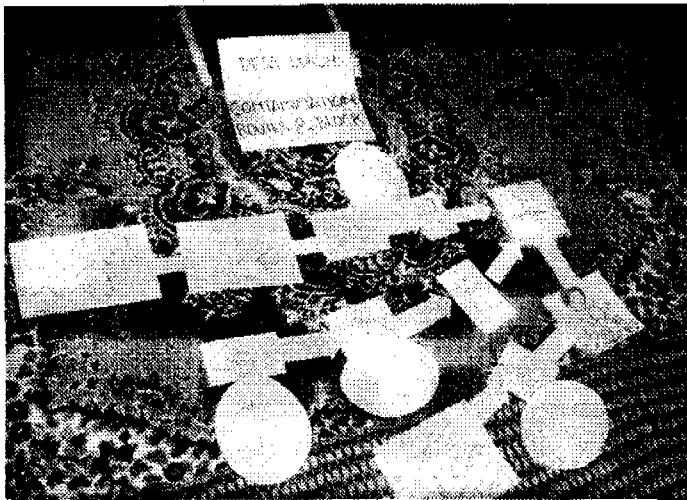
## High awareness of:

- Importance of hand-washing with soap, keeping food and water covered.
- Health hazards of defaecating in rivers.

## Low awareness of:

- Need to use latrines for all human excreta disposal, all the time.

Gaps in people's perceptions about how contamination travels to the mouth- leading to inconsistent practice of good hygiene behavior.



Results of PHAST exercises by a women's group, West Java, to trace awareness of disease transmission routes.



Fig. 12a Women's Groups' Perceptions of Contamination Routes and Blocks  
(Derived from Pictures)

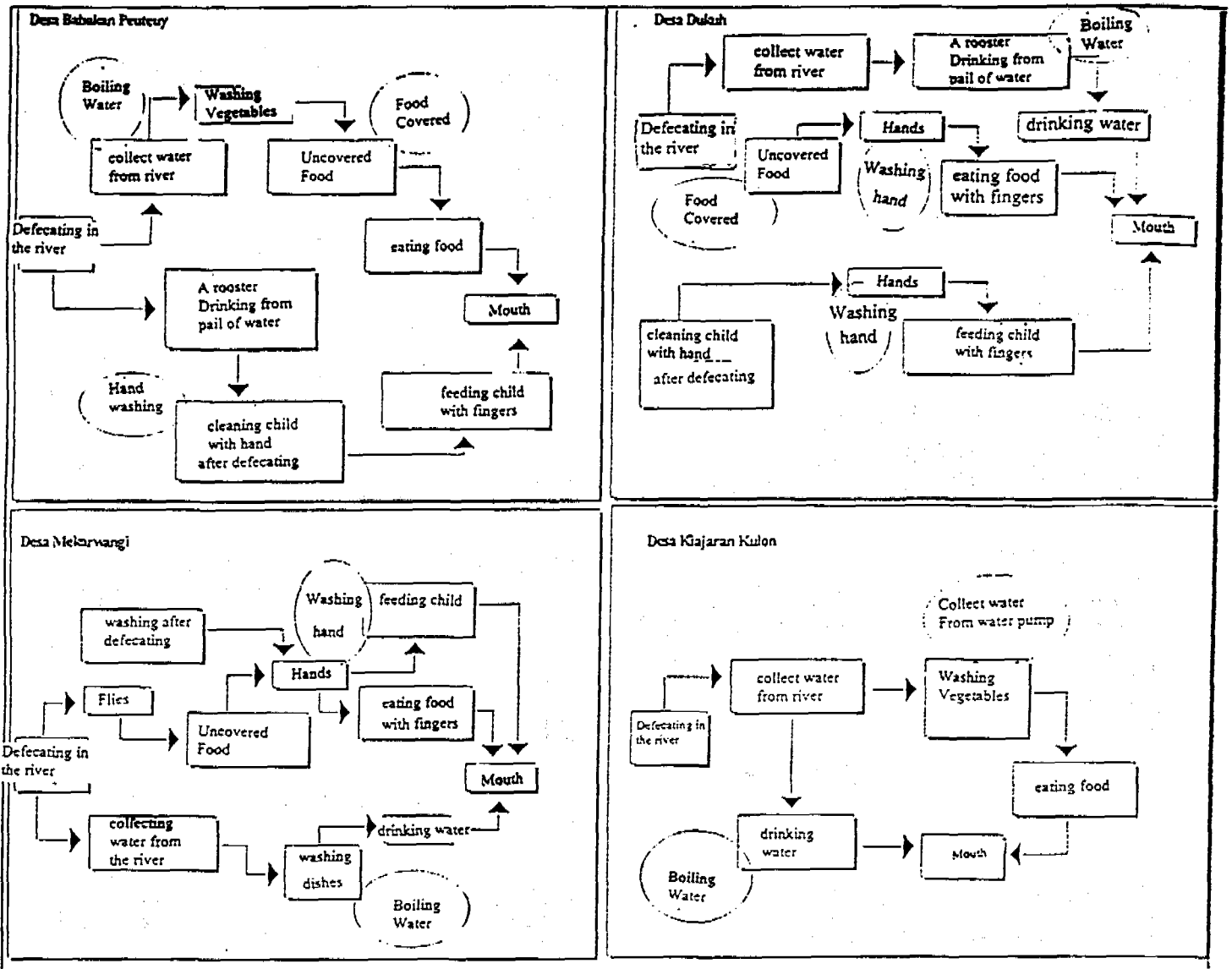




Fig. 12b Flow Diagrams by Women's Groups: Perception of Contamination Routes and Blocks (Derived from Pictures)

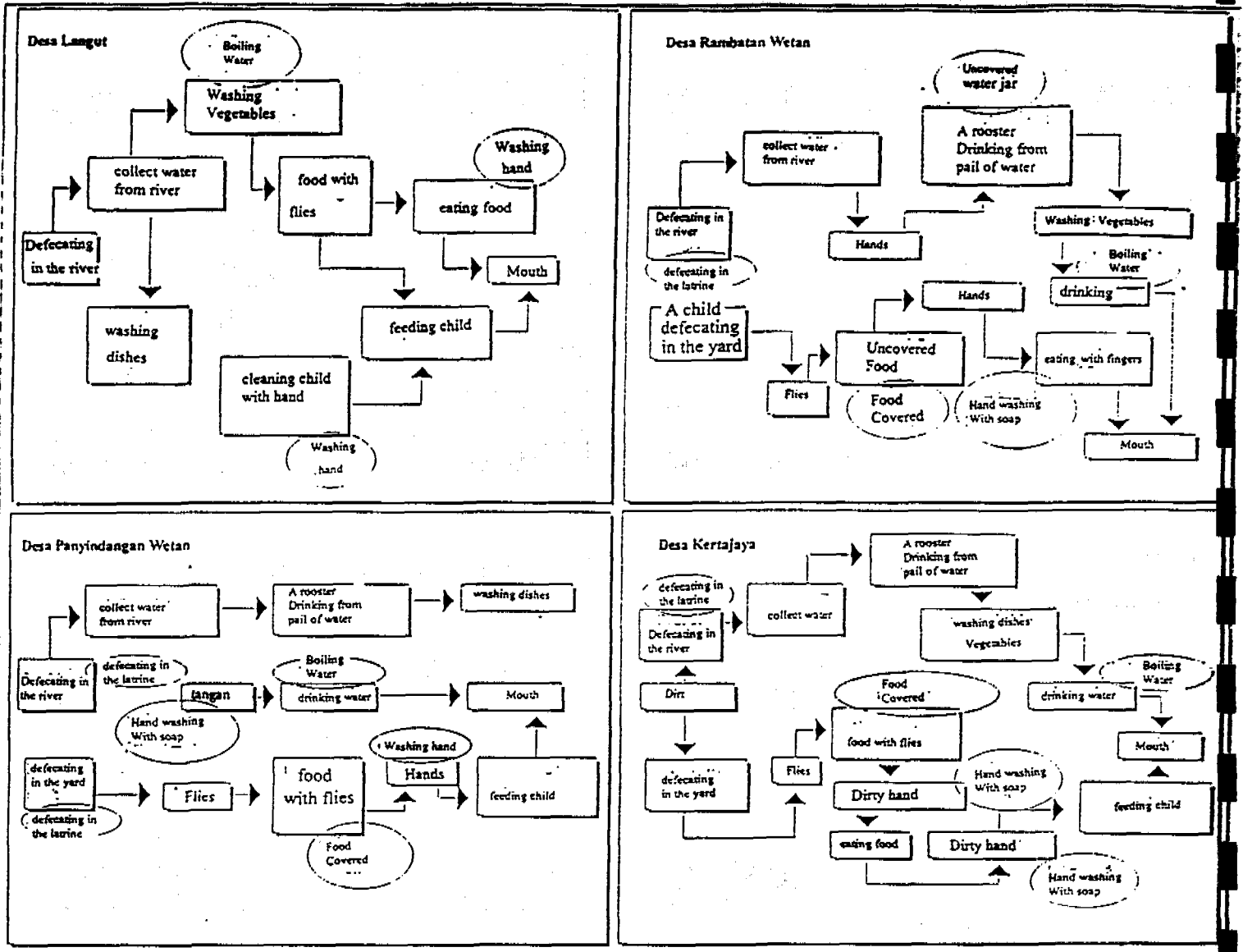


Fig. 12c Flow Diagrams by Women's Groups: Perception of Contamination Routes and Blocks (Derived from Pictures)

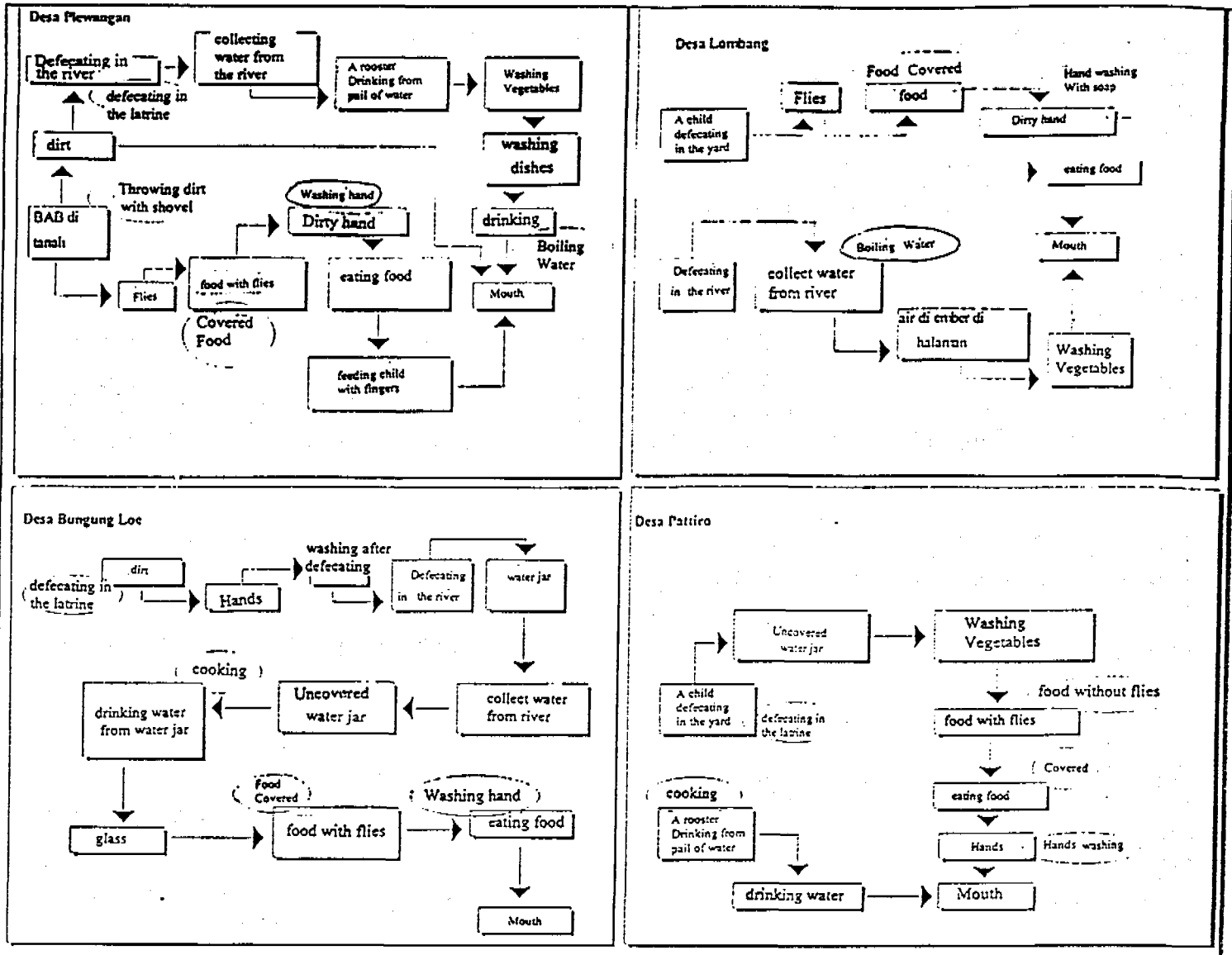


Fig. 12d Flow Diagrams by Women's Groups: Perception of Contamination Routes and Blocks (Derived from Pictures)

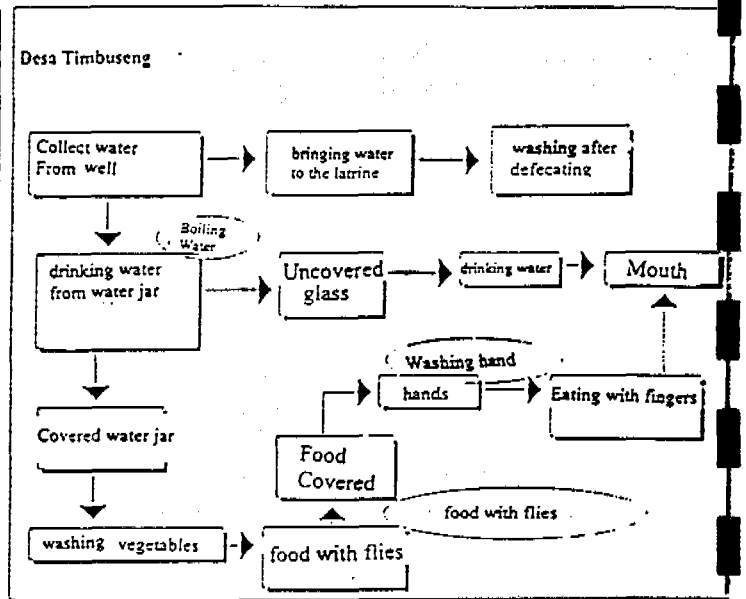
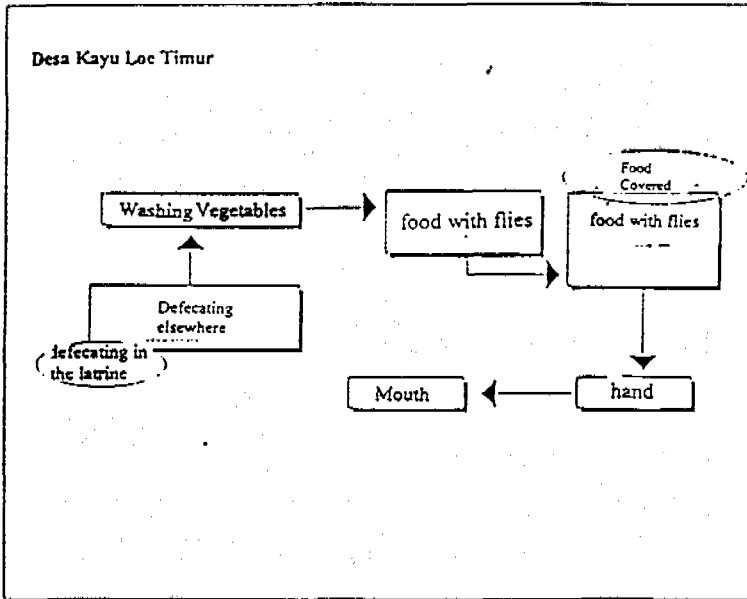
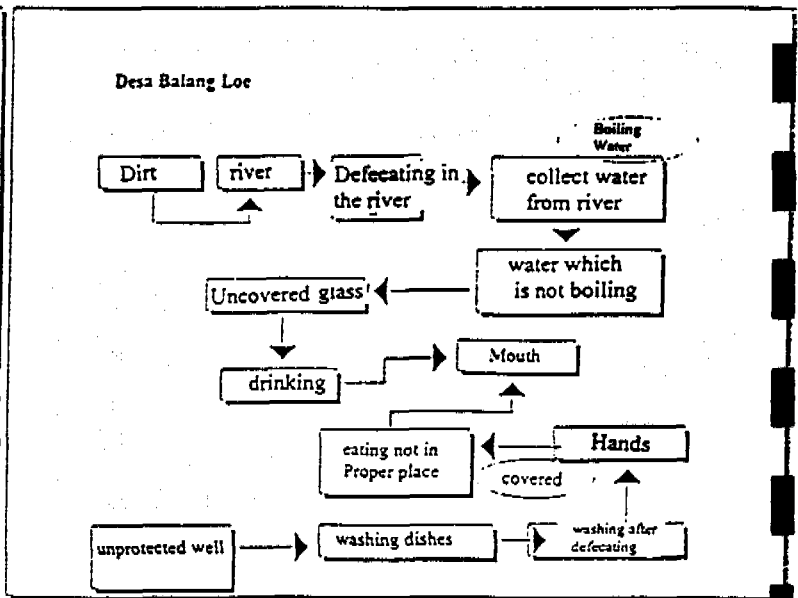
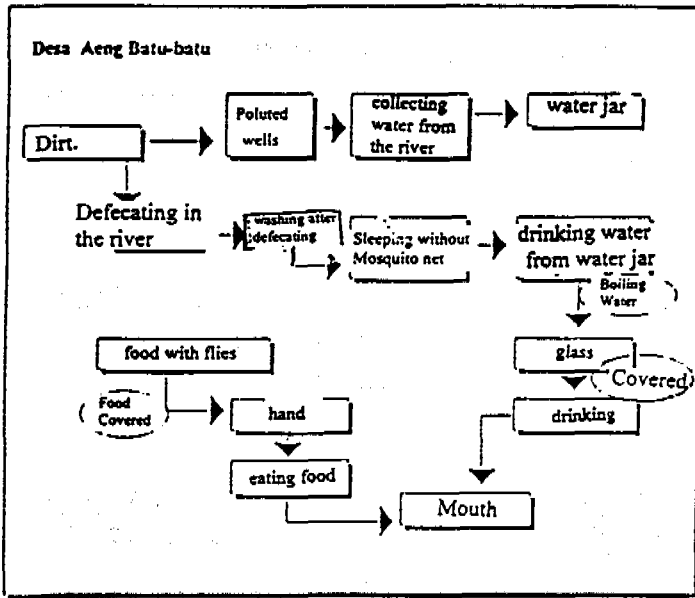
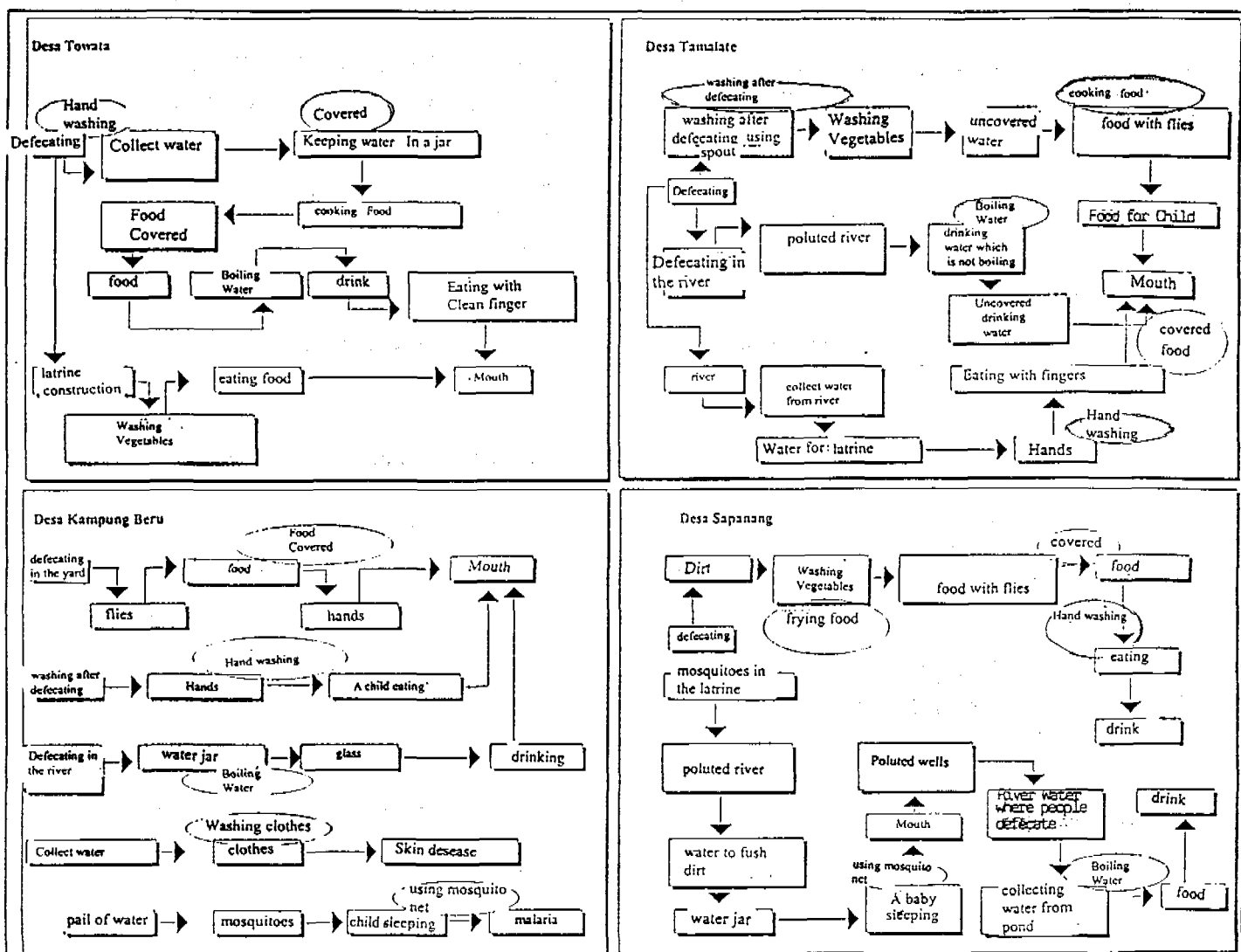


Fig. 12e Flow Diagrams by Women's Groups: Perception of Contamination Routes and Blocks (Derived from Pictures)



Analysis of the diagrams reveals the following about people's awareness of the common routes of fecal-oral contamination :

- The starting Point for contamination was perceived as "defecation in the river" in 55 per cent villages. 'Defecation anywhere else' (except in the toilet, apparently) was the starting point according to the rest.
- Only 10 per cent village groups identified all the three routes by which contamination directly reaches the mouth i.e. food, drinking water, dirty hands. 70 per cent village groups identified at least 2 out of the three and at least 65 per cent identified "hands" consistently.

- **“Handwashing before eating/feeding” and “boiling drinking water” feature prominently among the preventive practices identified in 65 per cent villages. However, “handwashing with soap” was mentioned only in 20 per cent villages.** There were pictures of “handwashing with water only” as well as handwashing with a prominently displayed cake of soap, among the PHAST picture set used for this exercise. The village groups made their own selection based on prevalent practices, with or without soap. There was no prompting.
- **“Defecating in a latrine” as a means of blocking contamination was identified only in 35 per cent villages, although all recognized open defecation as the root of disease transmission.** This finding reinforces findings on effective use of latrines (Chapter 4), where only 30 per cent of village groups reported using latrines for excreta disposal all the time. The rest just use it when at home. “Keeping food covered and protected from flies” was mentioned in 35 per cent villages but “keeping drinking water covered” was reported only in 1 village. **20 per cent village groups did not select “handwashing” at all as a way to block disease transmission.**

Conclusions that can be drawn about people’s awareness of ways to block disease transmission routes are as follows:

1. People know that open defecation causes diseases, but are not fully convinced that the use of latrines will solve the problem. (The flow diagram from village Sapanang actually suggests that water from latrines pollutes the river!).
2. Importance of handwashing is fairly widely accepted. However, it is probably only being done with water. People are not making much of a distinction between washing hands with and without soap. The value-added from the use of soap is possibly not so well known or accepted.
3. The awareness of the three main routes of contamination reaching the mouth needs strengthening. The majority are aware of only 1 or 2 routes.
4. Boiling water for drinking is universally reported as a good preventive practice, but hygienic handling of drinking water after boiling is not consistently practiced. Probing also revealed instances of hot, boiled water being mixed with the unboiled, to cool it for drinking.

Hygiene promotion programs can be made more effective if targeted specifically at the above gaps in people’s perceptions.

**User Community's View of Fecal-Oral Transmission  
Analyzed from Flow Diagrams - PHAST Exercise**

<u>Starting Point for Disease Transmission</u>	<u>Frequency of Village Groups Reporting this, out of 20</u>
Defecation in the river	11
Defecation anywhere/on the ground	4
Defecation ( <i>period</i> )	6
 <u>How Contamination Reaches the Mouth</u>	
Through drinking water and hands	6
Through food and hands	5
Through food and drinking water	3
Through food, hands, drinking water	2
Through food	2
Through food washed in dirty water	1
Not known. Group confused trying to answer	1
 <u>Ways to Block Contamination Route</u>	
Handwashing before eating, feeding	13
Boiling drinking water	13
Defecating in a latrine	7
Keeping food covered	7
Handwashing with soap before eating, feeding	4
Using clean water/handpump water to wash vegetables	3
Cook/fry foods	3
Keeping drinking water covered	1

## Chapter 5

### WSS SERVICES: HOW DEMAND RESPONSIVE

When services are effectively used and sustained, it can be assumed that they are meeting the users' demands, although the extent of demands being met can vary. Moreover, if users' demands are being met sufficiently well, the likelihood of their participating in managing those services would be high. To analyze these relationships, the study attempted to measure how demand-responsive the services built with UNICEF assistance are to the communities they serve. The indicators used for Water Supply were: *demand met for level of service desired* (degree of sharing required); *demand met for different types of uses* of the water from the system; *value placed on the service* by the users, and *consumer satisfaction levels* with quality, quantity and regularity of service.

#### Water Supply Services

Demand Responsiveness of water supply services was measured using the following indicators, further divided into 8 sub-indicators:

- |                                 |   |
|---------------------------------|---|
| Demand Met for Level of Service | <ul style="list-style-type: none"><li>• Level of sharing of facility</li><li>• Extent of ancillary facilities availability</li><li>• Kinds of ancillary facilities</li><li>• Domestic utilization demand met</li><li>• Productive utilization of demand met</li></ul> |
| Demand Met for Value of Service | <ul style="list-style-type: none"><li>• Perceived benefit</li><li>• Cost-benefit perception</li><li>• Consumer satisfaction level about quality/quantity/regularity of service</li></ul>  |

#### *Demand Met for Service Level - Water*

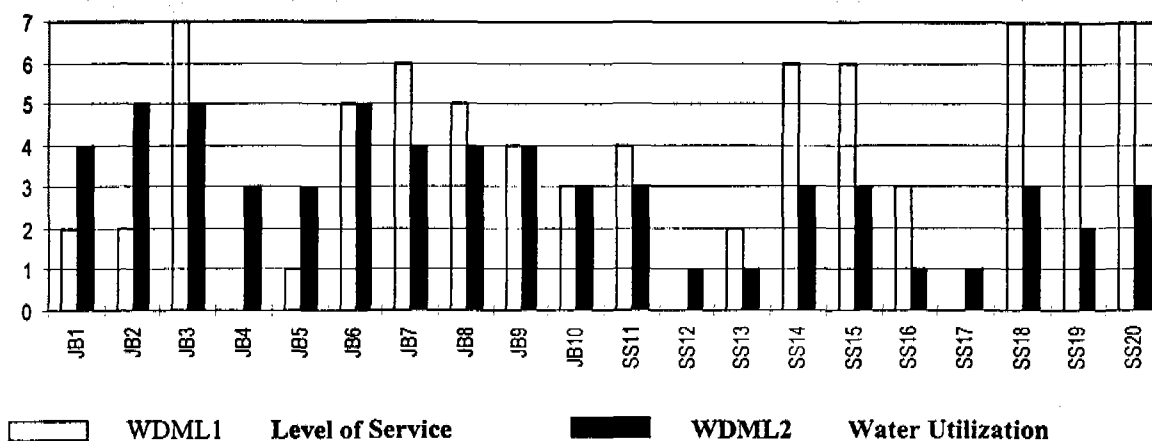
Level of Sharing: 7 out of 20 villages observed had purely public facilities supported by UNICEF. 4 had combinations of public water points and private facilities. 9 had mainly private connections or privately owned facilities. (Figure 13a).

Ancillary Facilities: In 7 villages no ancillary facilities were available. In 8 villages ancillary facilities had been built by individual households, mainly bathing cubicles and washing slabs. 5 villages had public ancillary facilities such as a bathing-washing-toilet complex (MCK) built by the project, or bathing -washing places built by community effort.

A total of 11 villages out of 20 had ancillary facilities for bathing, washing and drainage.

**Water Utilization:** According to the focus groups, none of the systems was meeting 100 per cent of the domestic requirements. 55 per cent of the systems met the requirements for drinking and cooking water (all the GFS and deep well hand pumps systems and some rehabilitated traditional wells). Most of the protected dug wells were meeting requirements for washing and bathing only. In 3 villages water from the system was also being used for small-scale productive purposes such as home industry, besides domestic utilization. These were 2 GFS and 1 deep well hand pump systems. (Figures 13 a and b).

**Fig. 13a. Demand Responsiveness of Water Service :  
Demand Met for Service Level**



**WDML1-a LOS Sharing : Private / Public**

- 0 Public Water System
- 1 Public and private water system combined
- 2 Private Water System/house connections

**WDML1-b Ancillary Facilities**

- 0 No Ancillary Facilities
- 1 Private - ancillary facilities built by individuals for private
- 2 Public - ancillary facilities built by community groups

**WDML1-c Kind of ancillary facilities**

- 0 No Ancillary Facility
- 1 Ancillary facilities - drainage
- 2 Ancillary facilities - for bathing & washing
- 3 Ancillary facilities - for bathing, washing, drainage

**WDML2-a Domestic Utilization demand met**

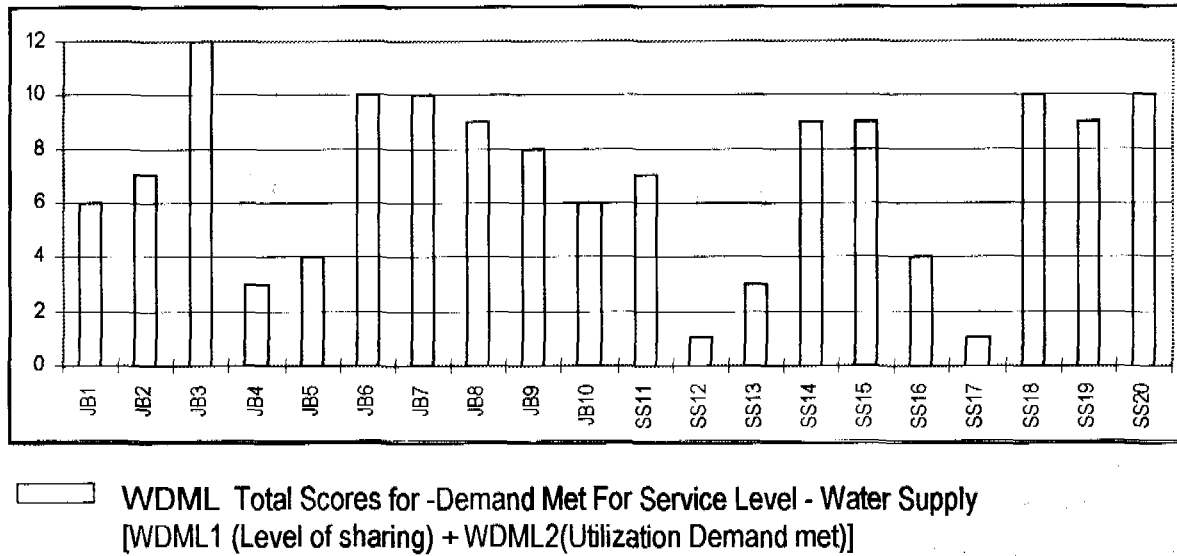
- 3 for all domestic uses
- 2 for drinking & cooking only
- 1 for bathing & washing only
- 0 not meeting any domestic demands adequately

**WDML2-b Productive Utilization Demand met**

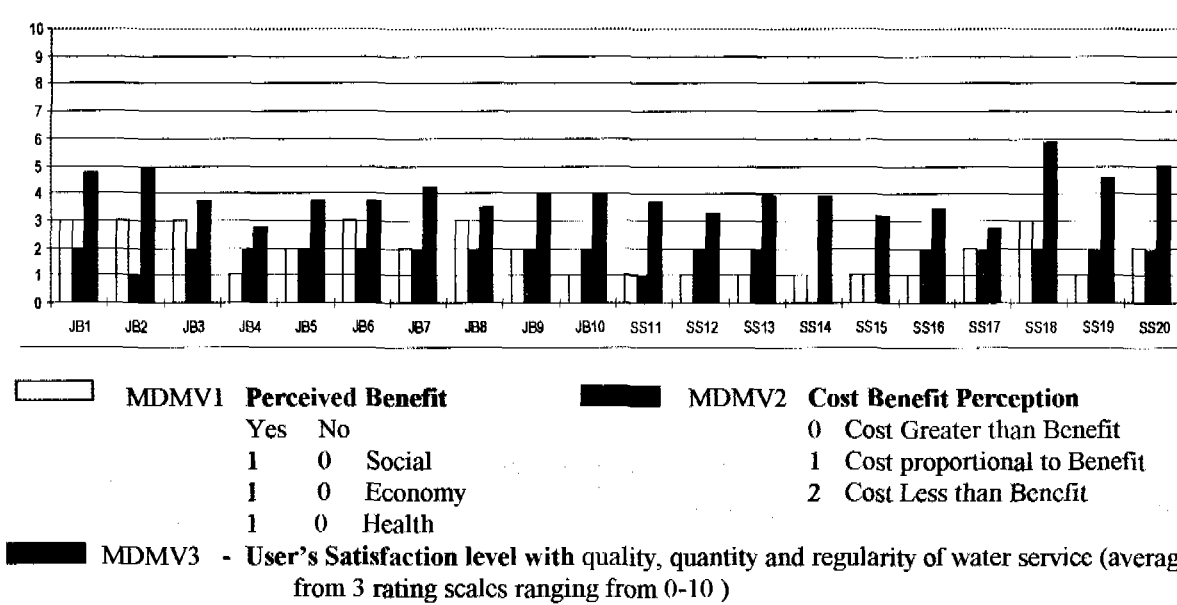
- 2 Productive Utilization of water from system
- 1 No productive Utilization, only domestic use



**Demand Met For Service Level (sum of scoresWDML 1 + 2)**



**Fig. 14a Demand Responsiveness of Water Service : Demand Met For Value of Service**



## ***Demand Met for Value of Service - Water***

***Perceived Benefits:*** Users perceived the service to be of economic value to them in 75 per cent villages, of social value to them in 55 per cent villages and providing health-related benefits in 50 per cent villages. Systems in 30 per cent villages were perceived to be valuable in all the three ways. These were 3 villages with GFS, 2 villages with PDH and 1 village with RWTH systems. (Figure 14 a).

Trend Analysis (PRA tool) was applied to obtain user group women's assessment of their situation before/after the water facility was constructed. It provided the following insights into the perceived benefits:

- a) Users perceived that their health conditions had improved after they started using water from all the GFSPC and PDH systems, and about half the protected dugwells observed. The main improvement was in terms of a three to fourfold reduction in skin problems and diarrhoeal diseases.
- b) In 10 villages out of 20, women users reported improvements in household and personal hygiene due to greater availability of water at home/closer to home. They appreciate being able to bathe more often than once/day, being able to wash clothes more frequently, clean their homes every day instead of twice/thrice a week before the new system was built.
- c) No health benefits were reported by the users of rain water tanks and shallow hand pumps and half of all dug wells.
- d) All the systems had effected savings in terms of time for water collection. The saved time was used for more rest and leisure activities as well as more time being allocated for work in the crop fields/plantations. In only 6 cases out of 20, women users reported using the extra time for income generating activities such as doing piece-rate work at home for garment factories, making and selling snacks, gathering and selling extra fuelwood, taking up part-time work in a food processing factory. **In 1 village the money saved from not having to buy water in the dry season was reportedly being used to send children to school.**
- e) Time saved also meant that children who collected water in many villages, were no longer late for school. Children were found to be responsible for 49 per cent of all water collection in the study villages.
- f) All the users of DWPs, DWTPs, PDHs and RWTHs reported significant savings in energy spent for water collection. The DWPs, RWTHs, GFSPCs and half of all the PDHs had also effectively reduced the distance most users traveled for collecting water.
- g) Other indirect benefits mentioned by women in 4 villages included improved social relations (fewer quarrel for water), more privacy/dignity/comfort at being able to bathe at home, out of the public gaze; greater self confidence due to improved personal hygiene/ cleaner clothes.

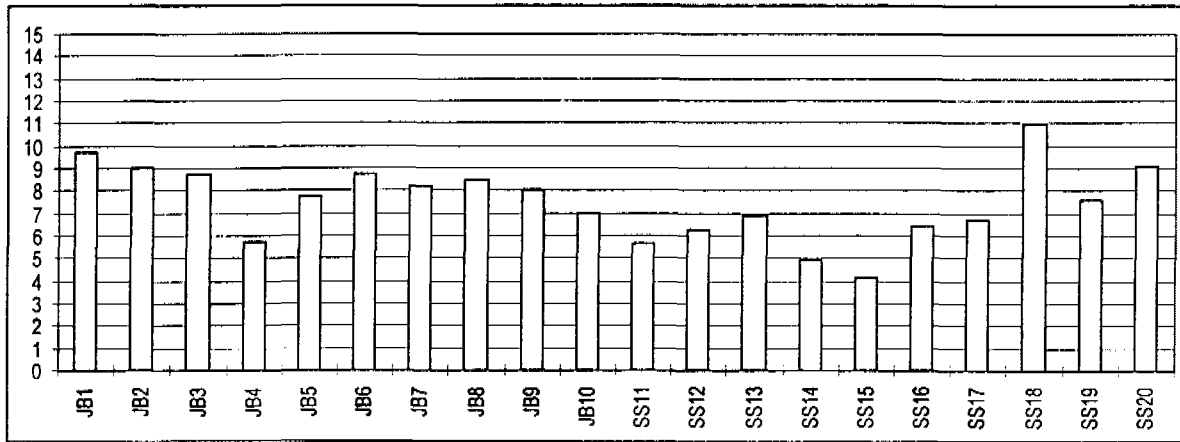
***Cost-Benefit Perception:*** Since most users are not paying user tariffs, the cost to them of the service was limited to their contributes for construction. It was therefore not surprising to find that users in 80 per cent of the villages considered the benefits from the water facility to be higher than the cost to them. Only in 10 per cent cases they thought cost was proportional to the benefit. In another 10 per

cent cases the cost was considered to be higher than the benefits - these were rehabilitated traditional wells in 2 South Sulawesi villages. (Figure 14a).

**Consumer Satisfaction** :Users satisfaction levels with quality, quantity and regularity of water service was measured with the help of rating scales, 2 meters long, drawn on the ground. The two ends of the scale were marked with 0 per cent and 100 per cent, represented with symbolic pictures of complete dissatisfaction and complete satisfaction. respectively. A volunteer from the focus group took up a position on the scale to represent the users' level of satisfaction. He/she moved back and forth on the scale until all were satisfied with the position. The position was marked and measured from the 0 per cent end, to assess the score proportionally on a continuous scale of 1 - 10 points.

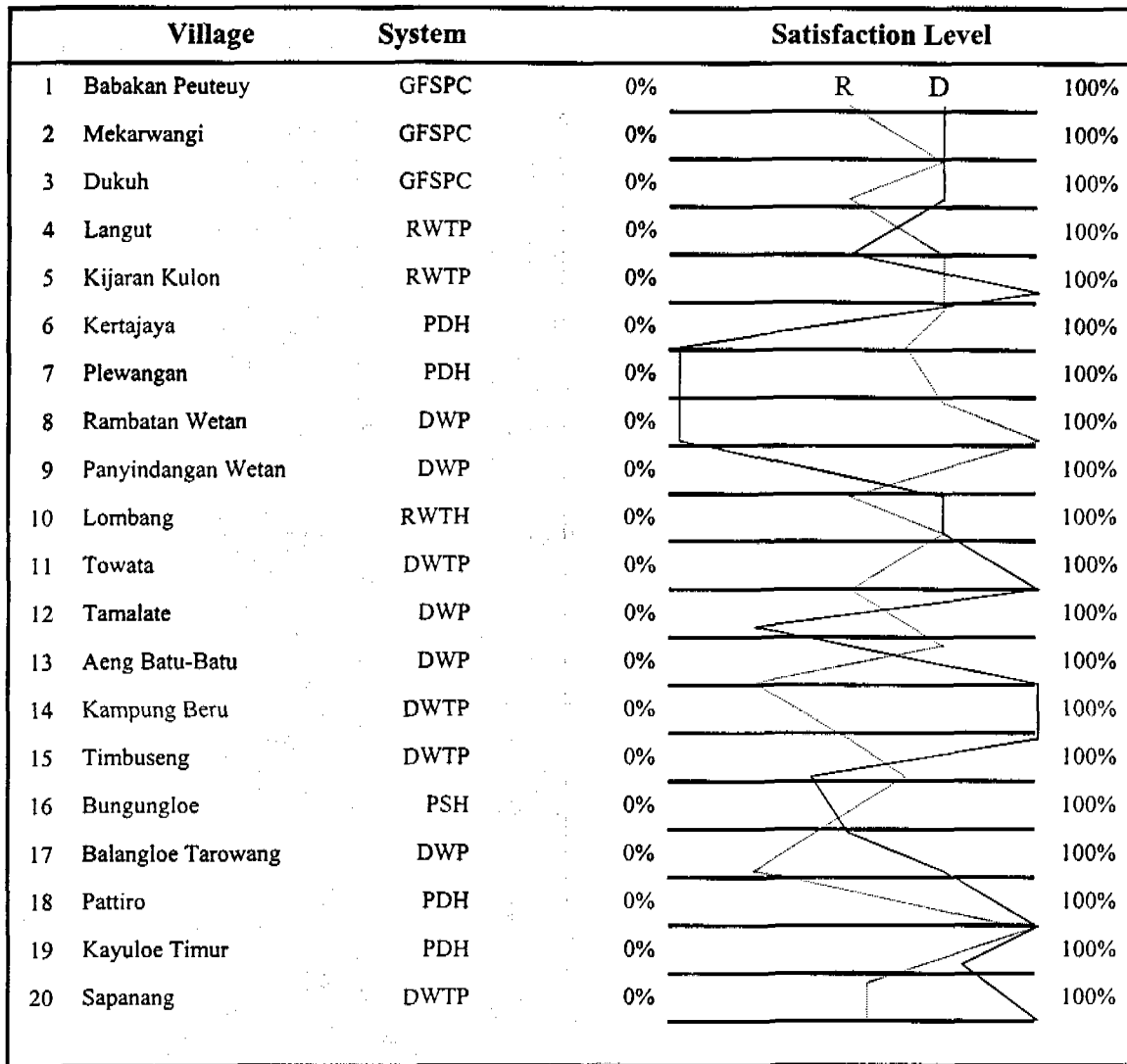
The averaged consumer satisfaction scores (Figure 14a) for the three scales show greatest consumer satisfaction levels in the villages with deepwell handpumps and GFS systems - although the averages were modest; only around 5 out of 10 for GFS and 5.8 out of 10 for the handpumps. Figures 15a-c illustrate the patterns of consumer satisfaction scores in the 20 villages, which varied with seasons.

**Fig. 14b Demand Responsiveness of Water Service :  
Demand Met For Value of Service -total score**



MDMV Total scores for - Demand Met For Value of Service - Water Supply  
[MDMV1(Perceived Benefit) + MDMV2 (Cost Benefit Perception) + MDMV3 (Users satisfaction level with services)]

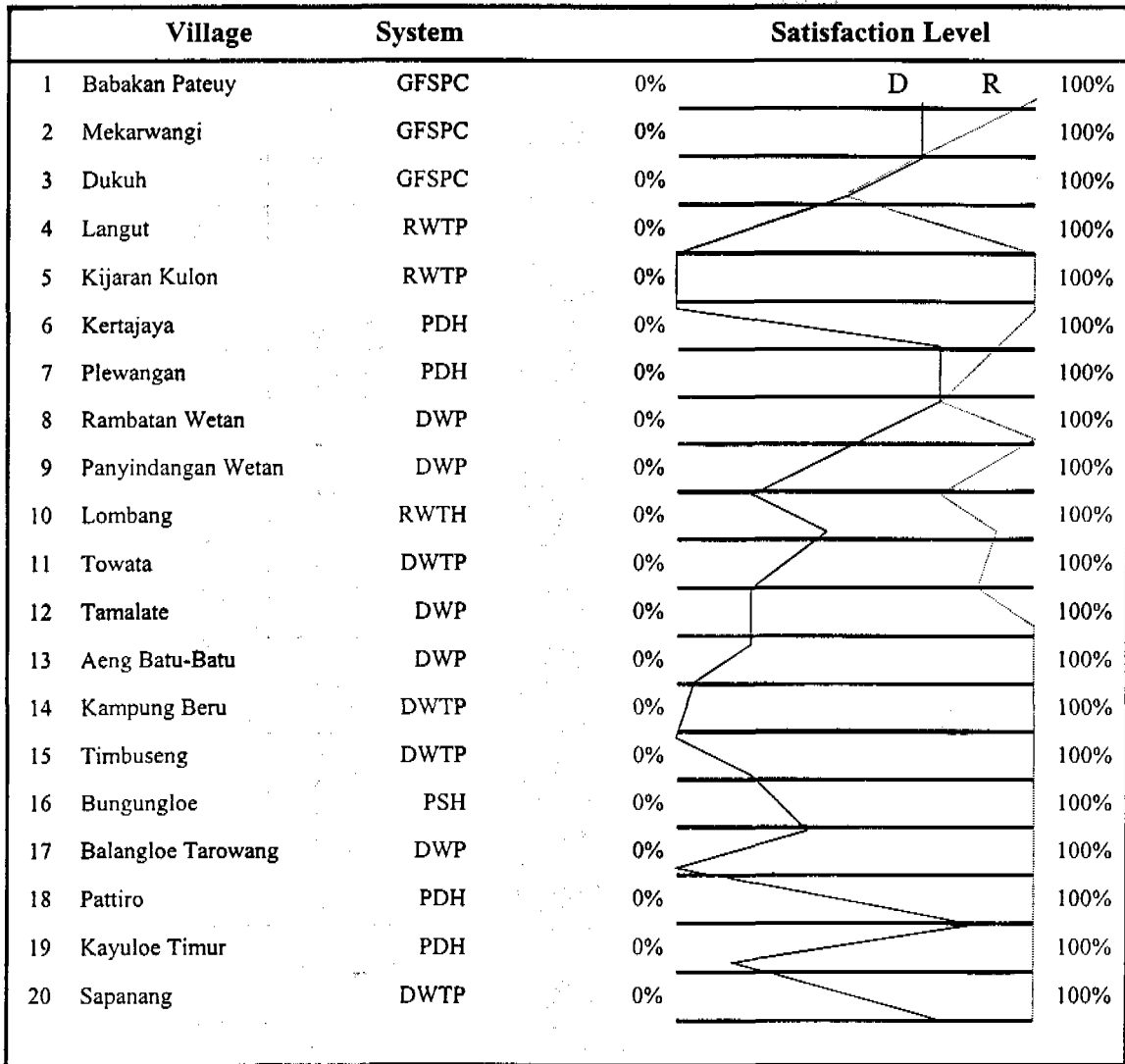
**Fig. 15a Users' Assessment of Quality of Water from Systems**



..... Rainy Season

———— Dry Season

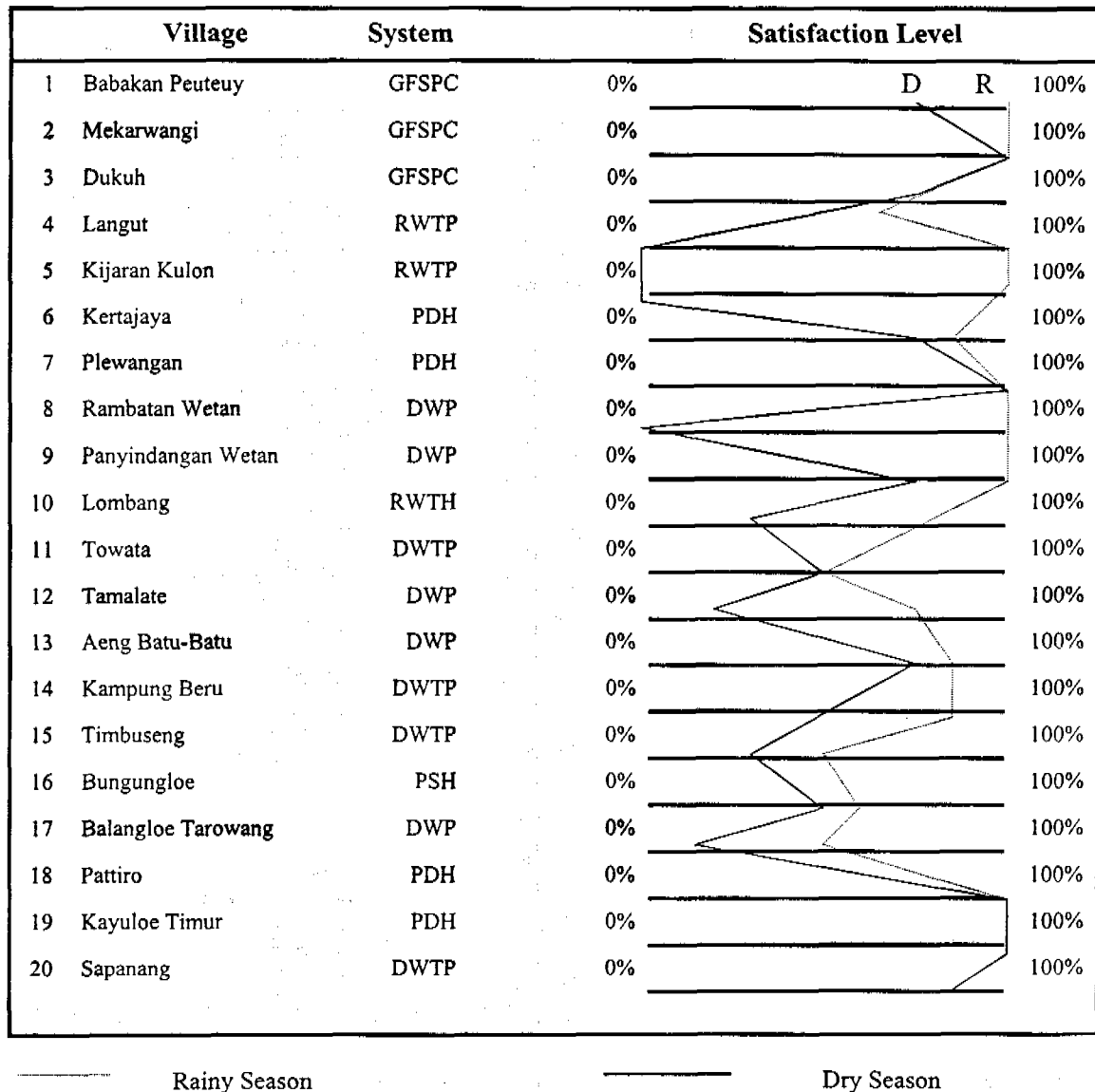
**Fig. 15b Users' Assessment of Quantity of Water from Systems**



..... Rainy Season

———— Dry Season

**Fig. 15c Users' Assessment of Regularity of Water from System**



**Quality of Water:** Consumer satisfaction with quality varied from 20 per cent-100 per cent in the rainy season and from 0 per cent-100 per cent in the dry season. The most satisfying (100 per cent satisfactions level) systems in the dry season (for water quality) were in 2 villages with PDH systems, 2 with DWTP and 1 with RWTP. The least satisfying (0 per cent) were also with 2 PDH systems that provide salty water in the dry season (Kertajaya and Plewangan in West Java). Possibly these are deep well hand pumps installed without drilling sufficiently deeply. In the dry season the villages with rainwater tanks actually got no water from the systems. They bought water from vendors for drinking and cooking and stored them in these tanks.

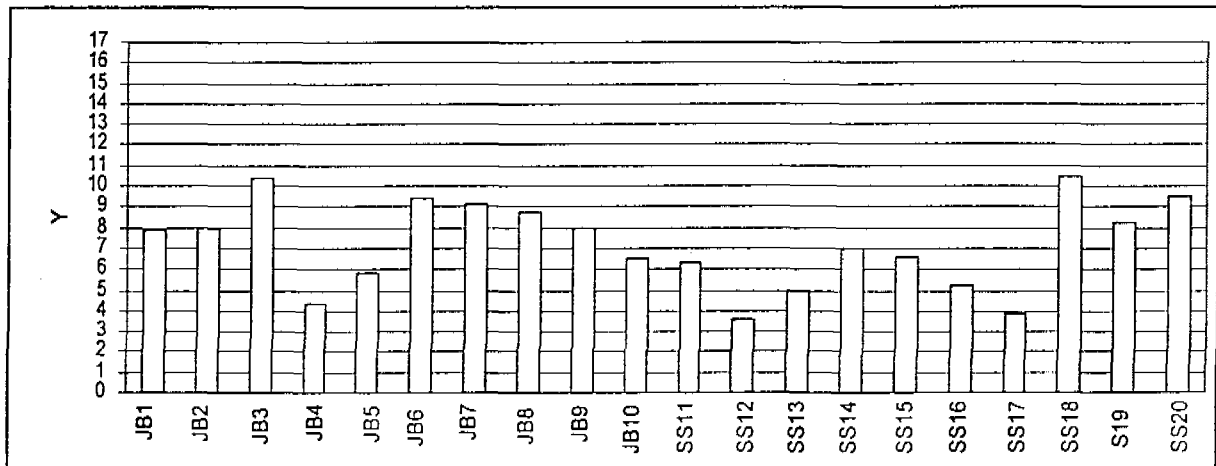
In the rainy season the 5 villages most satisfied with quality were the ones with rehabilitated traditional dug wells (2), public rainwater tanks (2) and GFSPC (1). Those least satisfied were the users of some of the newly constructed protected dug wells (2).

**Quantity of Water:** During the dry season users were least satisfied (scores 0 per cent - 5 per cent) with the quantity of water from the rainwater tanks and most satisfied (scores 75 per cent and above) with the deepwell handpumps and 2 GFS systems. During the rainy season, they were fully satisfied with the quantity of water available from all the systems except one GFS system in village Mekarwangi, which was only partially functional.


**Regularity of Service:** Satisfaction with regularity of service followed the same pattern as for quantity. During the dry season there was no water available in 3 systems (2 RWTP, 1 DWP). Users were most satisfied with regularity in case of all the PDH systems followed by the GFS systems. During the rainy seasons regularity was satisfactory in all the systems, the highest satisfaction being recorded for rainwater tanks, deep well pumps and GFS systems.

The overall picture for demand responsiveness of water services (*Figure 16*) indicates that the water supply services are presently satisfying between 22 per cent - 61 per cent of the users' demands in different villages. The mean score from all villages is 7.2, representing 42 per cent of the maximum possible score. The situation is somewhat more positive in West Java than in South Sulawesi.

**Fig. 16 Demand Responsiveness of Water Service :  
Total "B" Score For Water Supply**



JB1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarawang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP

 Total "B" Scores for Demand Responsiveness of Water Service  
 [WDML1 (Level of sharing) + WDML2 (utilization demand met) + WDMV1 (Perceived Benefit) + WDMV2 (Cost Benefit Perception) + WDMV3 (Users Satisfaction Level)] multiplied by their respective weights.

## Sanitation Facilities

Since the overwhelming majority of sanitation facilities constructed with UNICEF assistance were single pit, pour-flush household latrines, there was no variation in technology or level of service. The extent of demand being met by the latrines was measured by asking user groups about: a) how far the number, location, design and costs were in line with their needs and preferences; b) the benefits they perceived from sanitation services and c) their perceived Worthwhileness of their investment for it.

Demand Responsiveness of Sanitation services was measured using the following 3 indicators:

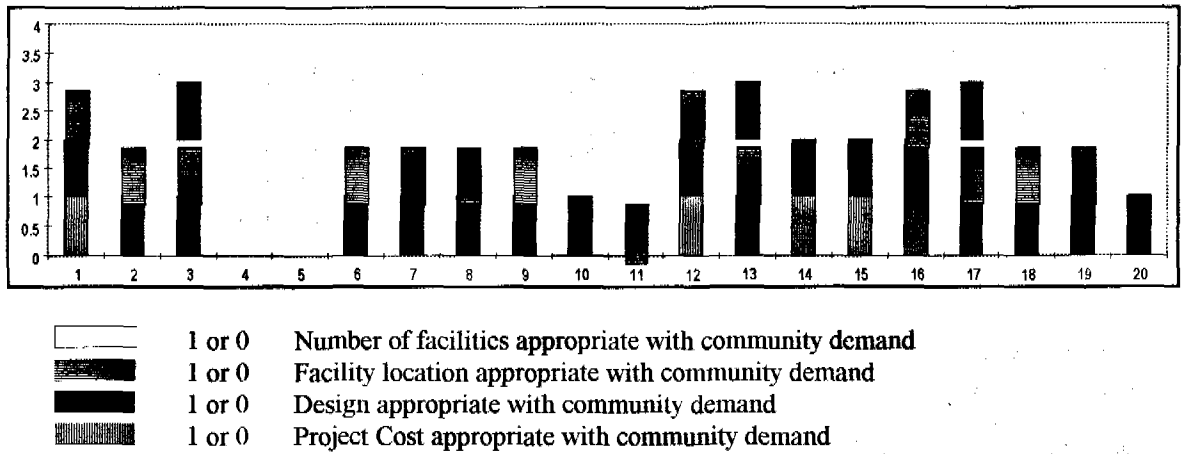
- Demand Met for Number/Location/Design/Cost of Facilities
- Demand Met for Value of Service/Perceived Benefit
- Worthwhileness of Sanitation Facility

### *Demand Met for Number/Location/Design/Cost*

As illustrated in Figure 17a., the number of latrines was perceived as appropriate with community demands only in 25 per cent of the villages. Locations were considered appropriate most of the time (17 out of 20 villages). This was probably due to these being built next to/behind homes, being household latrines. Location was considered inappropriate in 3 villages. One had latrines built close to the river, which got flooded in the rainy season (Sapanang). 2 villages had latrines in coastal areas that reportedly have feces floating up in them during high tides (Aeng Batu-Batu, Tamalate, South Sulawesi). In 70% villages people thought the design was appropriate. Where they did not, they have made their own modifications. In Sapanang (South Sulawesi) water for flushing being scarce, they have cut off the water seal and use the pan as a dry latrine. In Timbuseng and Kampung Beru (South Sulawesi) people did not understand why there was always water in the bowl (the water seal). They considered it dirty water and cut off the neck of the water seal so there would no longer be water in the bowl. In 18 out of 20 villages people thought that cost of facilities was not appropriate. This was connected with the way the decisions to allocate latrines are made in the village. The Kepala Desa divides up the number of latrines offered to a village by the project among the sub-village areas (RTs). The RT heads then decide who will get a latrine depending on criteria such as who has water supply at household level, is not and/or is willing to pay amounts that vary from one village to another. This process gives an impression that everyone cannot get the facility because funds are limited, and often excludes the poorest who tend not to have their own water facilities. Thus, in general, people think that costs of latrines should be lower in order to accommodate more households among the beneficiaries.



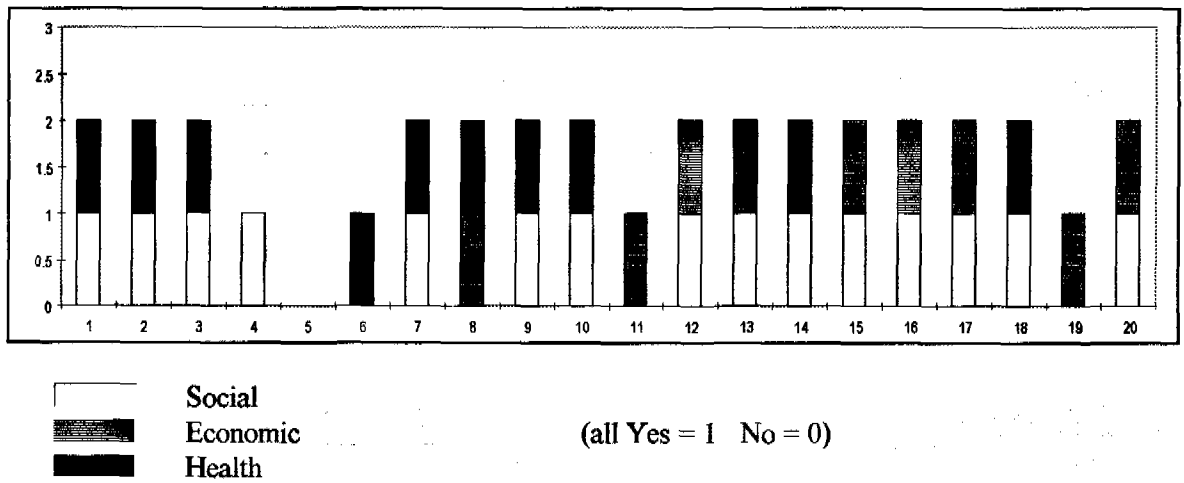
**Fig. 17a** Number / Location / Design / Cost (SDM 1)



**Perceived Benefits**

The most important benefit of latrines, as perceived in 75 per cent villages is the "Social" benefit of having this convenience close to home, specially for use at night, during rainy seasons, for sick people. Women mentioned privacy as the most frequent benefit. Health benefits were perceived in 40 per cent villages, all of which were in West Java, Economic benefits were mentioned in 55 per cent villages and almost all were in South Sulawesi. (Figure 17b)

**Fig. 17b** Perceived Benefit (SDM 2)



**Worthwhileness of Sanitation Facility**

This was assessed only by groups of users of household facilities and shows a fairly high level of consumer satisfaction. 45 per cent village groups who have household latrines think it was a fully (90 per cent - 100 per cent) worthwhile investment. (See summary of Rating Scales, Figure 17c). One

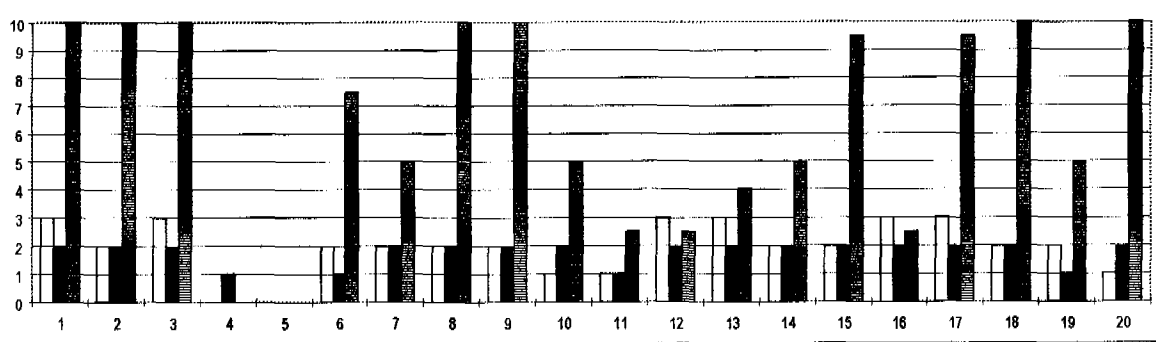
quarter were about 50 per cent – 75 per cent satisfied. One fifth, (all in South Sulawesi) were between 25 per cent – 30 per cent satisfied. They had problems like clogged latrines, latrines built at ground level allowing water and dirt to flow in, lack of water close to homes, no walls around latrines. They were “unwilling receivers” in the first place, used to defecating on the beach, river or crop fields. In the remaining 10 per cent villages (in West Java) they have not yet built their latrines because water sources were far from their homes.

The overall picture is one of high variability of demand-responsiveness of sanitation services in the project villages. The overall mean score from 18 villages where facilities have been constructed, is 2.77, which is 45 per cent of the maximum possible score. Of the two provinces the situation is somewhat more positive in West Java. (Figures 18 and 19). The key to demand responsiveness for sanitation seems to be: a) an assured availability of water near the latrine and b) proper siting and design that prevents unpleasant experience such as flooding and back flow in latrines, which puts off potential users who have yet to acquire their own facilities.

**Fig. 17c Users' Assessment Of Worthwhileness of Sanitation Facility**

Village	WS	Satisfaction Level
1 Babakan Peuteuy	GFSPC	0% 100%
2 Mekarwangi	GFSPC	0% 100%
3 Dukuh	GFSPC	0% 100%
4 Langut	RWTP	0% No latrines built 100%
5 Kijaran Kulon	RWTP	0% No latrines built 100%
6 Kertajaya	PDH	0% 100%
7 Plewangan	PDH	0% 100%
8 Rambatan Wetan	DWP	0% 100%
9 Panyindangan Wetan	DWP	0% 100%
10 Lombang	RWTH	0% 100%
11 Towata	DWTP	0% 100%
12 Tamalate	DWP	0% 100%
13 Aeng Batu-Batu	DWP	0% 100%
14 Kampung Beru	DWTP	0% 100%
15 Timbuseng	DWTP	0% 100%
16 Bungungloe	PSH	0% 100%
17 Balangloe Tarowang	DWP	0% 100%
18 Pattiro	PDH	0% 100%
19 Kayuloe Timur	PDH	0% 100%
20 Sapanang	DWTP	0% 100%

**Fig. 18 DEMAND RESPONSIVENESS OF SANITATION SERVICES :**  
Total scores for Demand Met for Value of Service

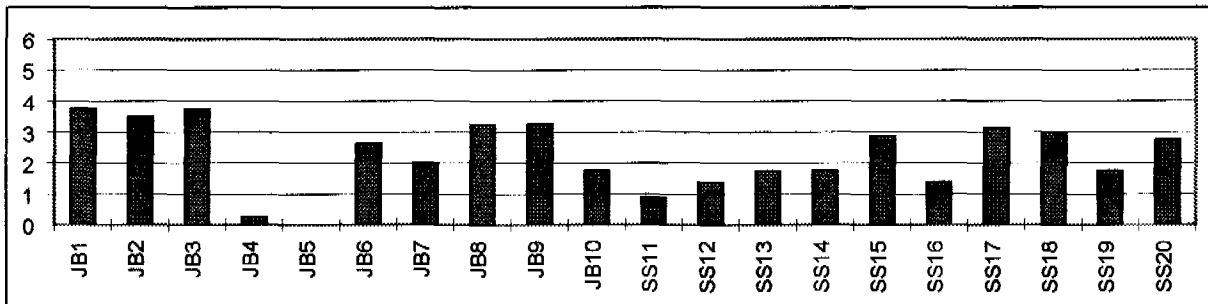


**SDM1 No./Location/Design/Cost**  
 1 or 0 Number of facilities appropriate with community demand  
 1 or 0 Facility location appropriate with community demand  
 1 or 0 Design appropriate with community demand  
 1 or 0 Project Cost appropriate with community demand

**SMD2 Perceived Benefit**  
 1 or 0 Social  
 1 or 0 Economy  
 1 or 0 Health

**SDM3 Worthwhileness of Sanitation Facility to users**  
 Rating Scale 1 - 10

**Fig. 19 DEMAND RESPONSIVENESS OF SANITATION SERVICES:**  
Total "B" Scores for Sanitation



JB1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarawang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP

**(BS) Total "B" Scores for Demand responsiveness of Sanitation service**[SDM1 (No/location/design/cost) + SMD2 (Perceived benefit) + SDM3 (Worthwhileness of sanitation facility to users)] multiplied by their respective weights.

## Chapter 6

### USERS' PARTICIPATION IN SERVICE MANAGEMENT (Sharing of Burdens and Benefits)

The extent to which the user community participates in managing and maintaining services is expected to be a function of how far the service meet their demands. The study looked at how the benefits and the burdens of running the services were being shared, who owned and controlled what and how gender and poverty aspects were reflected in the sharing.

Participation in management of water supply and sanitation services was measured using the following indicators, further divided into the following 11 sub-indicators. Most apply to Water Supply only. Where relevant for Sanitation, scores have been included with scores for Water Supply.

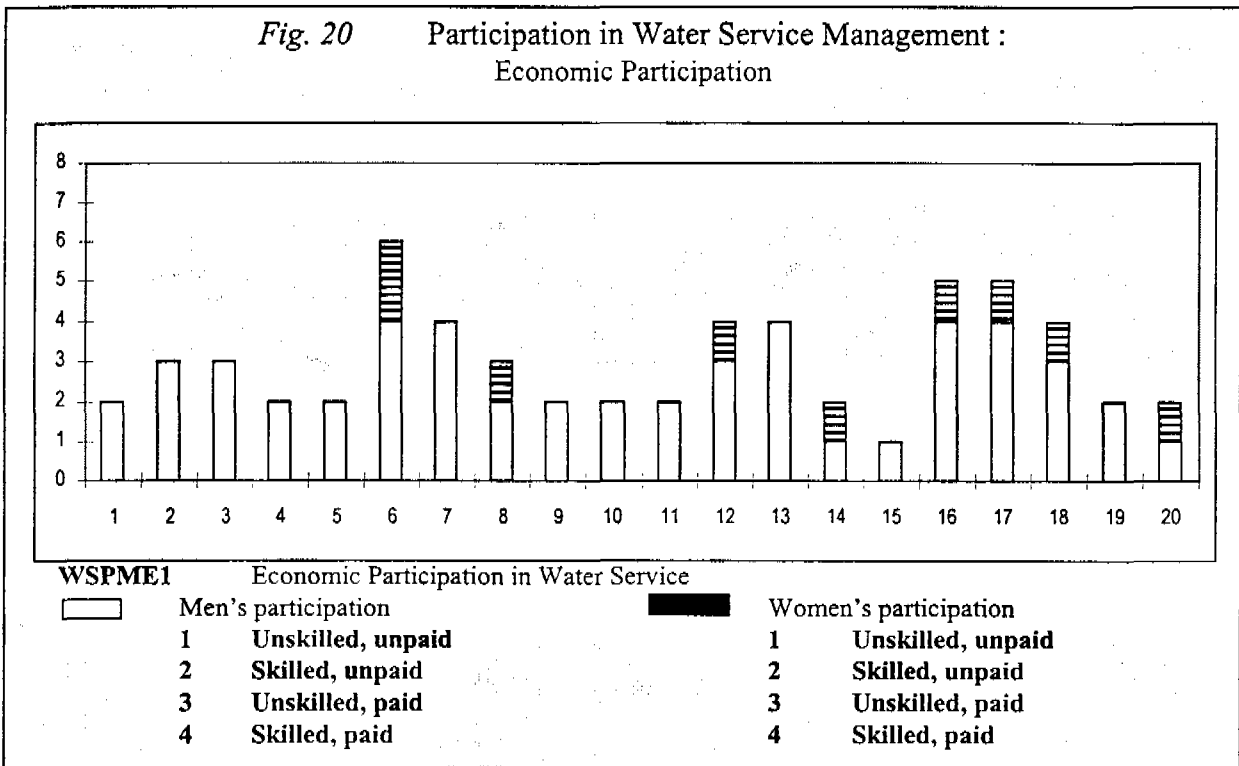
Economic Participation	<ul style="list-style-type: none"><li>• Work done by men and women to keep facilities functioning :<ul style="list-style-type: none"><li>❖ skilled/unskilled work</li><li>❖ paid/unpaid work (Separately for Water and Sanitation)</li></ul></li></ul>
Managerial Participation	<ul style="list-style-type: none"><li>• Women's share in decision-making</li><li>• Users' Knowledge of fees collected: Amount per month</li><li>• Users' Knowledge of fees collected: Where kept and how used</li><li>• Mechanism for financial information sharing with users</li></ul>
Participation in Benefits	<ul style="list-style-type: none"><li>• Comparison of present number of users to planned number</li><li>• Equity in benefit sharing among poor and rich</li></ul>
Perception of Ownership of Facility	<ul style="list-style-type: none"><li>• Who owns facility</li><li>• Legal status of ownership</li></ul>
Perception of Responsibility	<ul style="list-style-type: none"><li>• For operation and maintenance</li><li>• For repairs</li></ul>

## Economic Participation

Work done by both sexes was assessed in terms of skilled, unskilled, paid and unpaid work. (Figure 20). There was a near universal gender division of the work. Men did almost all of the semi-skilled or skilled work for maintaining water facilities, i.e. cement plastering of cracks on floors and walls, greasing of hand pump parts. Men also emptied out rainwater/GFS feed tanks for cleaning annually. These tasks were done with voluntary labor. Actual construction of latrines, tanks, wells were skilled and paid male tasks. **Water supply management thus provided paid work only to men, in 45 per cent villages, whether it was skilled or unskilled work. In contrast, except in one village (Rambatan Wetan), where women did some of the skilled jobs, whatever women did, was always unpaid, voluntary labor.** This includes daily cleaning of water facilities and latrines, participation with men in physical work such as digging wells, carrying soil, cleaning out wells and tanks annually. Another important unpaid work women do is to provide food and drinks to construction/repairing teams of men, which includes village men and outsiders such the contractor's men.

Almost all of the economic participation by user groups men and women was in terms of physical work done to keep systems working.

Fig. 20 Participation in Water Service Management :  
Economic Participation



## Managerial Participation

Three aspects were looked at. The first was *women's participation in decision making*. **Women were not involved at all in community decisions made for water facilities or latrines.** They did not even attend community meetings where such decisions were made. In 2 West Java villages a few women attended meeting, but did not voice opinions or participate in decisions. Women in one single

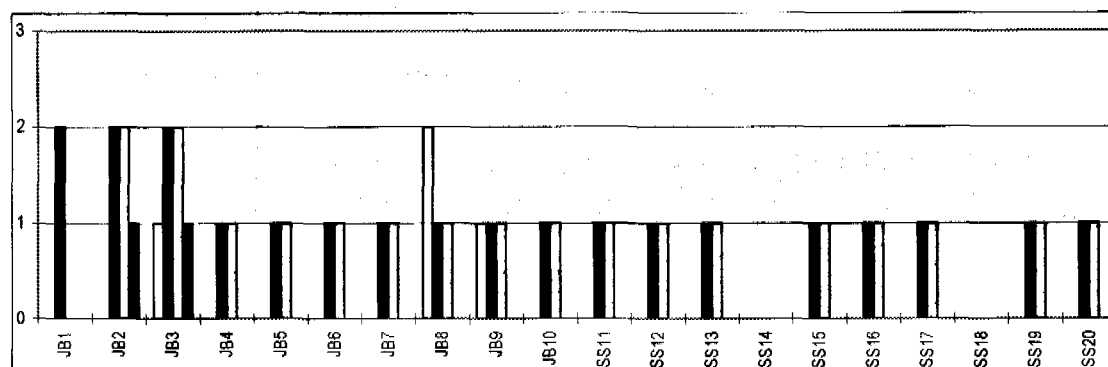
village (Rambatan Wetan in West Java) reported being active in attending meetings and making decisions along with men.

**Knowledge of Fees and Their Usage:**

Users in 2 villages were not sure if there were fees to be paid. In 15 others they reported that there were no fees being collected for usage. Users in the 3 villages reported that they were paying Rp.2,000 - Rp.2,500 per month for usage. These were the villages with GFSPC systems. In almost all cases, special collections were being organized when the need arose for urgent repairs, by the village chief, or the "facility owners".

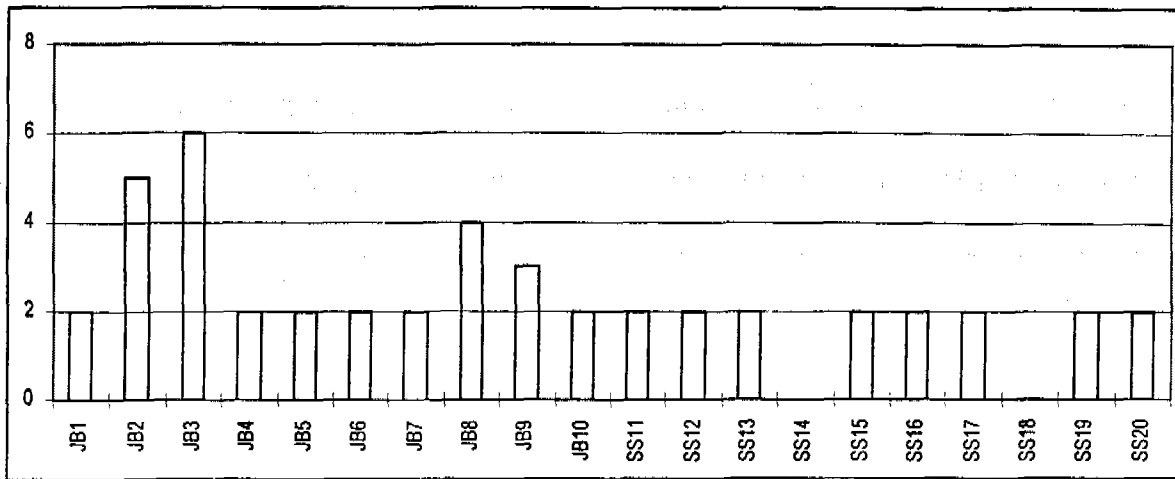
Nowhere did the users know just how much was collected every month or during a special collection drive, nor did they know where it is kept, whether there is a bank account, how much money is available in the fund, or how it is used. They assumed it must be kept somewhere within the village. There is no mechanism to share financial information with users anywhere. In the 2 West Java villages with GFSPC systems, some records exist. But the users have not seen them. What is most curious, is that nowhere have the users ever asked for such information! **They continue to pay when asked by village leaders and never ask questions about the money.** (Figures 21a-b).

**Fig. 21a Participation in Water Service Management:  
Managerial Participation**



- WPMM1 Women's Share in Decision Making**
  - 0 women did not participate in decision-making for water facility
  - 1 women attended meetings about facility, did not participate in decisions
  - 2 women attended meetings, and participated in decision making about water facility
- WPMM2 Knowledge of Fees : Collected per Month**
  - 0 Do not know
  - 1 there are no fees
  - 2 users can answer and specify the amount
- WPMM3 Knowledge of Fees : Where kept and how used ?**
  - 0 Do not know
  - 1 there are no fees
  - 2 users can answer where kept and how used
- WPMM4 Mechanisms Available for Financial Information Sharing**
  - 0 No mechanism available
  - 1 Mechanism exist but not used
  - 2 Mechanism exists and used to give regular information to user

**Fig. 21b** Participation in Water Service Management :  
Managerial Participation Total Scores



**WPMM Total managerial participation Scores**  
 [WPMM1 (Women's share in decision making) + WPMM2 (users' knowledge of fee collected: amount per month) + WPMM3 (users knowledge of fees collected : where kept ? how used ?) + WPMM4 (mechanism for financial information sharing with users)]

## Participation in Benefits

The study explored how the benefits are being shared within the community and whether the extent of sharing has changed over the age of the system.

In all the villages of West Java the present number of users is less than the number originally planned for. This was the assessment of focus groups in all these villages. The reasons seemed to be a complex of socio-political factors (e.g. conflicts between community section leaders, power games) and technical factors (e.g. system capacity declining). Present users were fewer than planned in 3 villages in South Sulawesi. Two villages in the province had equal numbers of present and planned users and 2 others had larger than planned numbers as present users. (Figures 22a-b).

Fig. 22a

Participation In Water Service Management : Participation in Benefits

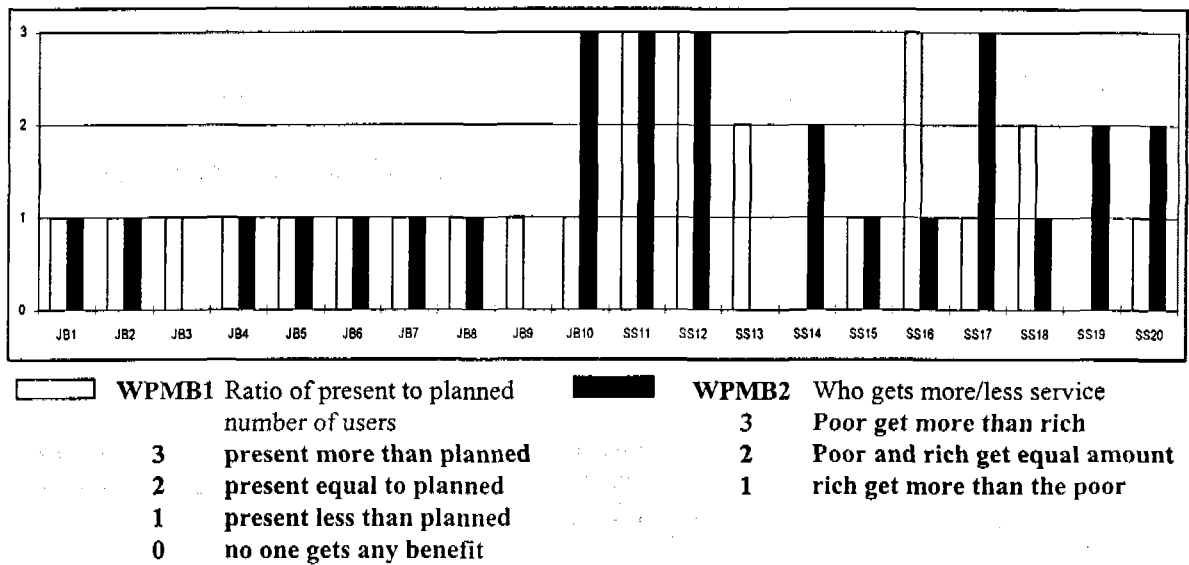
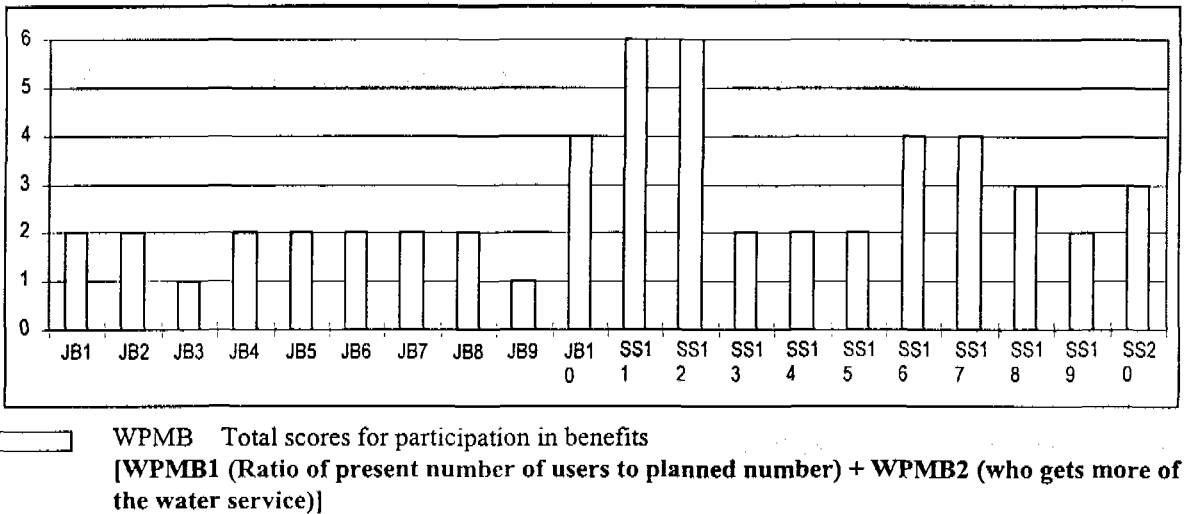


Fig. 22b Participation in Water Service Management : Total scores for Participation in Benefits



In the views of users' groups, the poor were getting more water service than the rich in 4 out of 20 villages. The rich and poor were getting equal service in 3 villages. The rich were getting more service than the poor in 10 out of 20 villages. Most of this happened in West Java. The reasons reported were "the rich contributed more during construction", "the rich are the owners of the land where the facility is built" (so they are supposed to own it), "the rich have large storage tanks in their homes", "the rich have bigger needs as they have to wash their cars"!



*In Mekarwangi village of West Java one of the two main supply pipes of a GFSPC system has been cut off by the previous village chief. He was the village head at the time of construction of the system. He has since been replaced by a younger man. A conflict between the two has led to the older chief connecting one of the two main supply pipes from the public reservoir to a large storage tank built in his own home. From this tank he now supplies water to other users and collects tariff for the service. He is a politically active man, feared by many people and no body dares to complain against him.*

The evidence gathered seems to indicate that the richer minority in the villages tended to acquire greater control of the facilities by volunteering contributions of land and cash in amount larger than the flat rate obligatory for all. They then exploit the flat rate for usage by taking and storing much larger than average quantities of water from the facility, in their private storage tanks. This tendency was observed more in the case of West Java where more villages had piped systems). It is probably more difficult to manipulate dugwell and handpump systems in this manner, which were the technologies used in South Sulawesi.

## Perception of Ownership

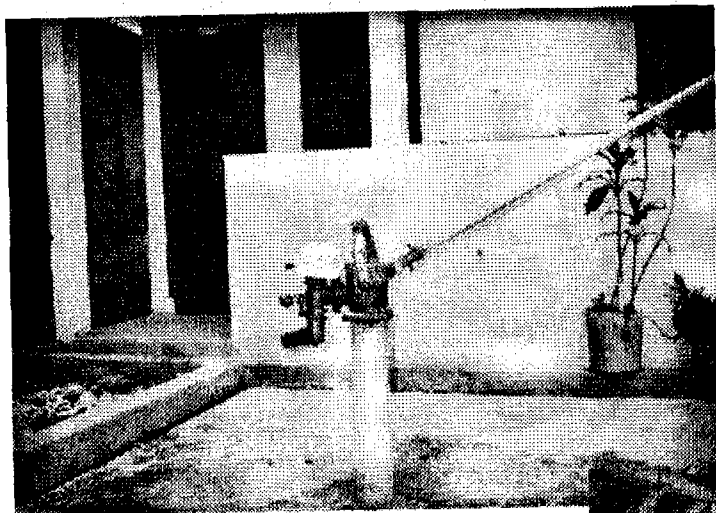
The users' perception of ownership of the facility confirms the above trend. In 15 out of 20 villages they said that the facility was owned by the "landowner/owner of the facility". This included private dugwells as well as public traditional wells, public handpumps and public as well as households rainwater tanks. The 3 GFS systems and 1 RWTP were considered owned by the user group or the village government. Only 1 protected dugwell was considered as owned by the user group. None of the facilities were "legally" owned, i.e. no villager or village government possessed any legal proof of ownership. (Figure 23).

## Perception of Responsibility for O & M and Repair

In reflection of the above situation, the "landowner/owner of the facility" was perceived to be responsible for operation and maintenance in 65 per cent of the villages, and responsible for repairs in 75 per cent of the villages.

The users themselves felt responsible for both O & M and repairs in only 10 per cent of the villages. The village administration was seen as responsible for O&M in 4 villages (all the GFS systems included). However, for repairs the villages administration was seen as responsible only in 1 village out of 20. (Figure 24).

## LOCATION OF WATER FACILITY INFLUENCES PERCEPTION OF OWNERSHIP



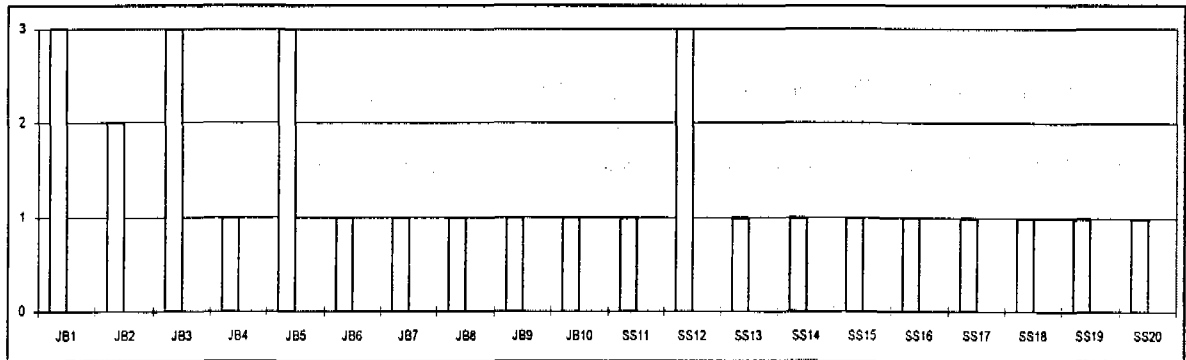
"Community" handpumps located within private homes and yards, West Java.

In West Java, the villagers feel that the richer households are benefiting more than the poor ones from the water facilities constructed by the program.



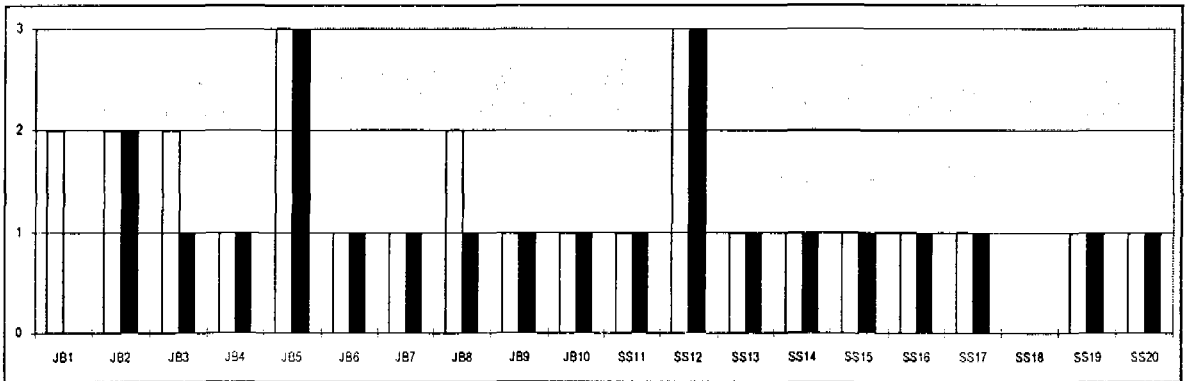
Community handpump located on public land, South Sulawesi. Users in South Sulawesi feel that the benefits of the water facilities are equitably shared by the rich and the poor, or the poor benefit marginally more than the rich.

Fig. 23 Participation In Water Service Management : Sense of Ownership



- WPMO1** Perception about who owns water facility
  - 0 Owned by government/outside agency
  - 1 owned by land owner (on which facility stands), or "facility owner"
  - 2 owned by village government
  - 3 owned by users groups/individual users
  
- WPMO2** Legal Ownership
  - 2 Legal status of ownership exists
  - 0 no legal, ownership status

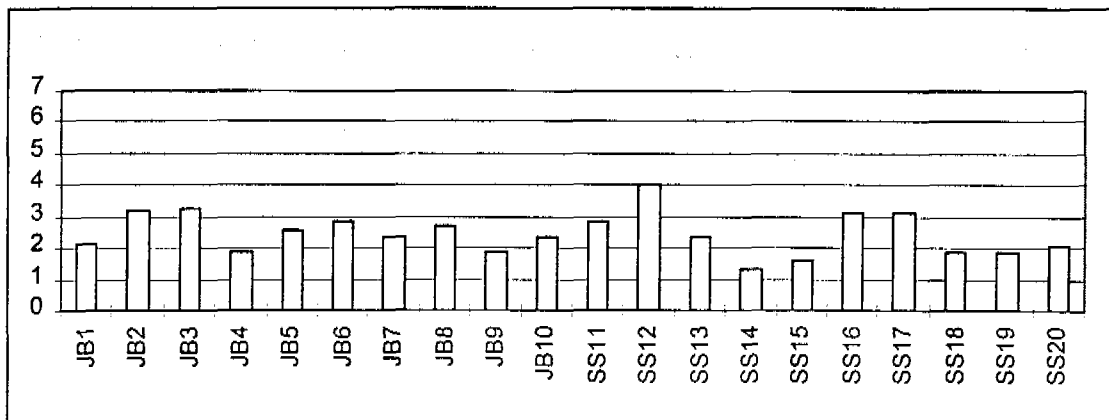
Fig. 24 Participation In Water Service Management: Sense of Responsibility



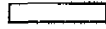
- WPMR1** Who is responsible for O/M
  - 0 Outside agency / government
  - 1 Land owner / owner of facility
  - 2 Village government/LKMD/Kepala Desa
  - 3 Users themselves
  
- WPMR2** Who is Responsible for Repairs
  - 0 Outside agency/government
  - 1 Land owner / owner of facility
  - 2 Village government/LKMD/Kepala Desa
  - 3 Users themselves

This state of affairs indicates a low level of participation both in management and benefit sharing by the poor, and the middle income majority. The control of water systems seems to be assumed by the richer elite in many villages, leading to a declining number of the less rich users over time. It is important to remind ourselves here that this study is not drawing these conclusions from statistical tests, but is summarizing the collective situation analysis by average user groups of poor to middle income categories of villagers. These are the people who are experiencing what they have reported. Their reality counts much more than evaluations done by external surveyors, who might base their conclusions on facts and figures recorded by themselves.

Fig. 25 Participation in Service Management : Total "C" Score



B1	Babakan Peuteuy	GFSPC	SS11	Towata
JB2	Mekarwangi	GFSPC	SS12	Tamalate
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu
JB4	Langut	RWTP	SS14	Kampung Beru
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng
JB6	Kertajaya	PDH	SS16	Bungungloe
JB7	Plewangan	PDH	SS17	Balang. Tarowang
JB8	Rambatan Wetan	DWP	SS18	Pattiro
JB9	Panyindangan W	DWP	SS19	Kayuloe Timur
JB10	Lombang	RWTH	SS20	Sapanang

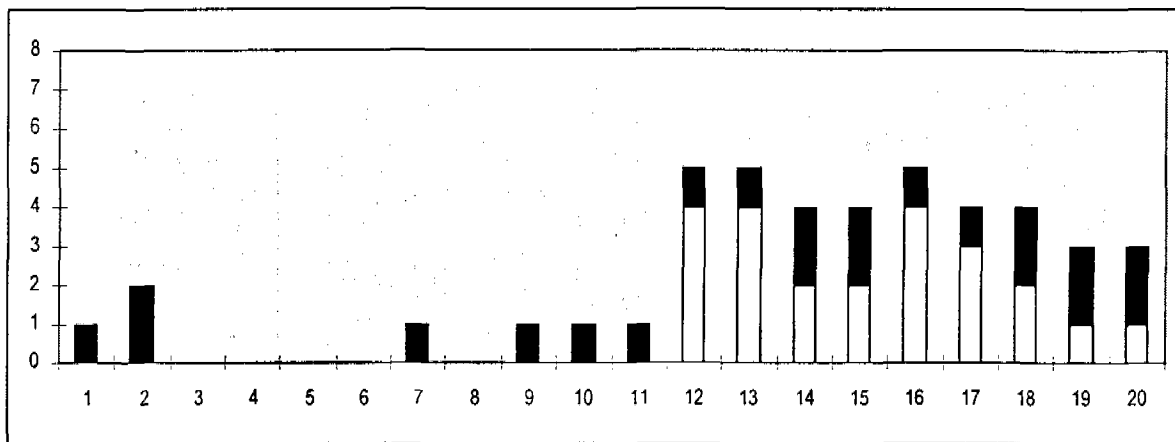
 Cw Total "C" score for participation in Water service management  
 $[WSPME * 0.25 + WPMM * 0.25 + WPMB * 0.25 + WPMO * 0.15 + WPMR * 0.10]$   
 WSPME Division of work to keep service functioning,  
 WPMM Managerial Participation  
 WPMB Participation in Benefits  
 WPMO Perception of ownership of water facility  
 WPMR Perception of responsibility

## Sanitation

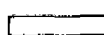
All villages surveyed had only household latrines except one (Aeng Batu-Batu), which had both household latrines and a public latrine + leaching/washing facility. Thus management of the sanitation facility was basically householder's responsibility. Management included daily cleaning which was women's task in half the villages and a shared family responsibility (by men, children) in the rest. Repair and rehabilitation were typically male tasks in all villages where repair/rehabilitation had been undertaken. It was paid work, done by a local mason. (Figure 26).

Construction of latrines was partly paid for-when a mason was involved (always male). Women asked that their contribution of food and drinks for workman constructing/repairing latrines be counted as unpaid, skilled labor. They provided this service in all villages. The single public sanitation facility was managed and maintained by the families living near it, as they were most frequent users of it. Women took care of cleanliness while men undertook repair, making drains, etc. - through an informal agreement among themselves. In sum **Sanitation provided paid work only to men, in 4 out of 20 villages.**

Fig. 26 Participation in Sanitation Service Management:  
Economic Participation



WSPME1 Work done to keep sanitation service functioning



**Work done by men**

- 1 Unskilled, unpaid
- 2 Skilled, unpaid
- 3 Unskilled, paid
- 4 Skilled, paid



**Work done by women**

- 1 Unskilled, unpaid
- 2 Skilled, unpaid
- 3 Unskilled, paid
- 4 Skilled, paid

(These scores are included in the total C scores, under the sub-indicator WSPME)

## Chapter 7

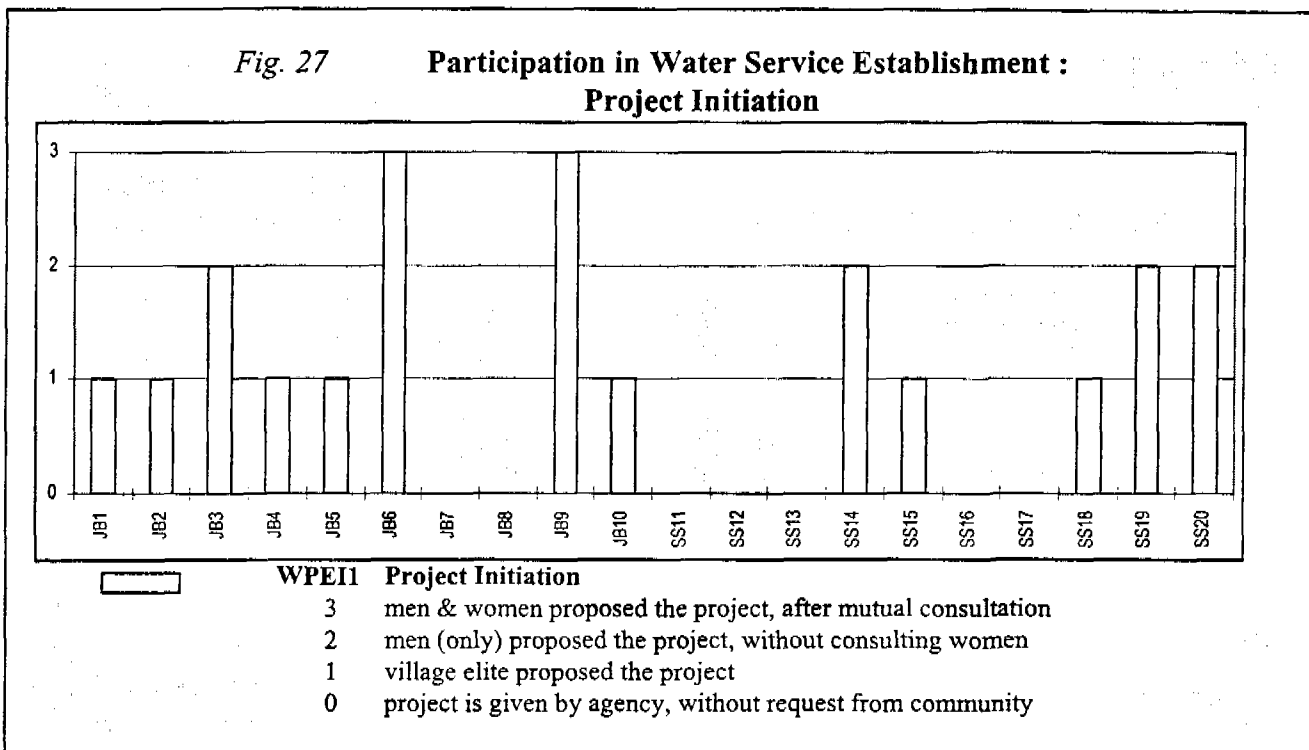
### USERS' PARTICIPATION IN SERVICE ESTABLISHMENT

Users' participation in the establishment of services was measured using the following indicators, further divided into 17 sub-indicators, separately for Water and Sanitation services except in two cases.

Project Initiation	<ul style="list-style-type: none"><li>• Project initiation</li></ul>
Informed Choice (Water and Sanitation)	<ul style="list-style-type: none"><li>• Technology option</li><li>• Level of service option</li><li>• Management organization option</li><li>• Local design of facility option</li><li>• Financing system option</li></ul>
Contribution in Construction (Water and Sanitation)	<ul style="list-style-type: none"><li>• Cash contribution</li><li>• In-kind contribution</li><li>• Type of labor contribution</li><li>• Monitoring and control of finances</li></ul>
Organization of Management (Water Supply Services only)	<ul style="list-style-type: none"><li>• Composition of water committee</li><li>• Roles and responsibilities of committee</li><li>• Legal status of committee</li><li>• Rules and tools of committee</li></ul>
Adhere to Agreed Design & Schedule:	Accountability of contractors <ul style="list-style-type: none"><li>• Accountability to men and women for:</li><li>• Materials</li><li>• designs</li><li>• construction quality</li><li>• construction schedule</li><li>• financial management</li></ul>
Capacities Built to Stakeholders (Water and Sanitation)	<ul style="list-style-type: none"><li>• Who was trained for what</li><li>• Methods of training</li></ul>

## Project Initiation - Water

As it can be seen in *Figure 27*, women users in 7 villages had no idea who proposed the project or thought it was a decision by the government agency to select the village for intervention. In 11 other villages they said that the village head and men leaders had requested it, without women being involved in the process. Only in 2 villages in West Java men and women had participated in discussions leading to the village proposing a water supply project, through the village head and the *Musbangdes* process.



The UNICEF supported PPAB-PLP program has developed a community based self-survey procedure (*Petunjuk Survei Desa Sendiri, Departemen Kesehatan 1995*). It is to be carried out by user communities with reference to national norms/targets for access to and coverage of services. This survey is considered to be the basis of developing annual Village Action Plans for water supply and sanitation. The process has been established formally with publication of guidelines in 1995. For reasons mentioned in Chapter 1, the present study covered villages where inputs have been made earlier than 1995. This is possibly the reason why none of the new processes were encountered in this study.

## Information Dissemination - Water And Sanitation

The usual way for villagers to become aware of a forthcoming water supply and sanitation project in the village was a village meeting where the *Kepala Desa* gave the information to *ketua RTs* (sub-village heads), LKMD members and men, after being informed by functionaries of *Dinas Kesehatan* (Health Department) and Public Works. Women never attended these meetings. They learnt about the project from husbands who went to meetings. Only in 1 village out of 20, the village Women's organization (PKK) had been met by the *Dinas Kesehatan* functionary to give information directly to women.

## Use of Information / Education / Communication (IEC) Materials

UNICEF had made available one set of WES IEC materials for the field teams. Out of the printed materials given, only six were IEC materials, the rest being technical training manuals. These were flipcharts, booklets and guide book for use of flipcharts. These 6 publications were distributed among the 4 field teams. Each team was thus able to show 2 of the materials to respondents in each village to gather information about people's exposure to them. The package included videos which could not be shown due to the unavailability of hardware in the villages. The field teams asked people whether they had seen any films on safe water, sanitation or hygiene, where did they see them and what the film/s conveyed to them. The UNICEF IEC publications shown to the respondents were:

1. *Penyediaan Air Bersih Untuk Pedesaan Buku I* (Clean Water Supply - 2 Flipcharts published in 1982)
2. *Keluarga Sejahtera Berkat Lingkungan Sehat - JAGA & SPAL* (Flipchart on Healthy/prosperous life in clean environment with household latrines and waste water disposal)
3. *Lingkungan Bersih* (Flipchart on Environmental sanitation)
4. *Dari Ujung Kaki* (Brochure on personal hygiene behavior)
5. *Jamban Yang Sehat Mencegah Penyakit* - flipchart, published in 1985
6. *Jamban Keluarga dan Sarana Pembangunan air Limbah* (Flipchart on Why and How aspects of latrine and waste water drainage construction published in 1988)

Out of the above list, the following IEC materials on water and sanitation/hygiene were recalled by users :

<u>Materials</u>	<u>Recognized in</u>
Flipchart --- <i>Keluarga Sejahtera Berkat Lingkungan Sehat</i> (How to Lead a Healthy Life) .....	2 out of 5 villages where shown
Flipchart --- <i>Lingkungan Bersih</i> (Environmental Sanitation) .....	1 out of 5 villages where shown

Also recalled were :

Posters* --- a. <i>Cara Hidup Sehat</i> .....	1 out of 5 villages where shown
b. <i>Kesehatan Lingkungan</i> .....	1 out of 5 villages where shown
c. <i>Pencegahan Penyakit</i> .....	1 out of 5 villages where shown

Film on Clean Water: (not shown by field team)- Mentioned in 1 village by women who had seen it. It was shown by a Family Planning Field Worker (PLKB). It was not possible to ascertain if it was a UNICEF film, as the women could not remember its name or contents.

Demonstration Kit for Health volunteers: (*Alat Peraga Kesling*) 2 PKK members in 1 village in Sulawesi Selatan had seen this during their training in 1995 and found it easy to understand.

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\* Are these UNICEF posters? We do not know. The materials received from UNICEF did not include posters



Since full sets of IEC materials could not be provided by UNICEF for all the field teams, it was not possible to evaluate their exposure properly. The overall response was limited. On an average, one UNICEF IEC materials was recognized, in 5 out of 20 villages. "Never seen before" was the usual response elsewhere. People in these 5 villages had seen them when a Dinas Kesehatan functionary or the Bidan Desa (Nurse-midwife, Health functionary) had demonstrated it to them. Most had only seen it once. Those who had seen them were the 2-5 people from each village that had attended training for being Kader Kesling (Health volunteer). Thus the materials in question had been used as training material rather than IEC materials.

In four villages many people recalled seeing posters on Diarrheal Disease Prevention, Clean Environment and Hygienic Habits, at the Puskesmas (Community Health Center). It is not clear whether the posters were from UNICEF. In the set received from UNICEF for this study, no posters had been included. In one village women mentioned seeing a film on safe water which was shown by the Family Planning field worker (PLKB). When asked about what the posters/flipcharts/booklets/films communicated to them, men and women replied in general terms rather than in terms of specific messages conveyed i.e. "how to live a healthy life" or "how to keep the environment clean".

**The following conclusions and recommendation are made based on the villager's response to IEC materials and existing hygiene and sanitation awareness levels found in the study.**

- a) IEC activities at community level seem to be limited to sessions within training programs for community members in the post construction phase. Public communication events and sessions were rarely reported by community groups although UNICEF funds support film shows and village meetings. These activities are monitored by Departments of Health and Directorate of Water Sanitation and Environmental Health, probably based on recorded numbers of film shows/meetings reported by functionaries. **If UNICEF continues to support IEC activities, it may be more useful to monitor them through community-feedback (as in this study) through participatory monitoring methods incorporated into the government system.**
- b) In many villages which received stimulant packages for latrines, the users had not been prepared and no one had explained how latrines work and why. As a result many recipients had changed the design (cut off the water seal in 3 villages), built latrines at inappropriate locations (low lying land, without platforms-so they flood easily or get clogged with sediments). Some did not construct at all (2 villages) or built no walls, leading to damage by animals. This usually happened because the process did not involve the *Sanitarian* (Health Department's extension worker for water and sanitation) in these villages. Materials were distributed directly by contractors employed by Public Works.

**It would be better to tie the IEC activities more closely and explicitly to the delivery of stimulant packages. At present IEC activities are scheduled at the start of the project, before village plans develop and during post-construction training phases.**

- c) User satisfaction scores and findings on demands being met indicate that health benefits are not perceived by the users as the most important benefits of sanitation. **Privacy, convenience, social status are more important motivators of demand for latrines, specially for women. This motivation potential could be better utilized in UNICEF's WES IEC strategies.**
- d) Behavior change communication requires that user communities begin by collectively analyzing their own water-sanitation related behaviors, to pinpoint behaviors causing risks to community

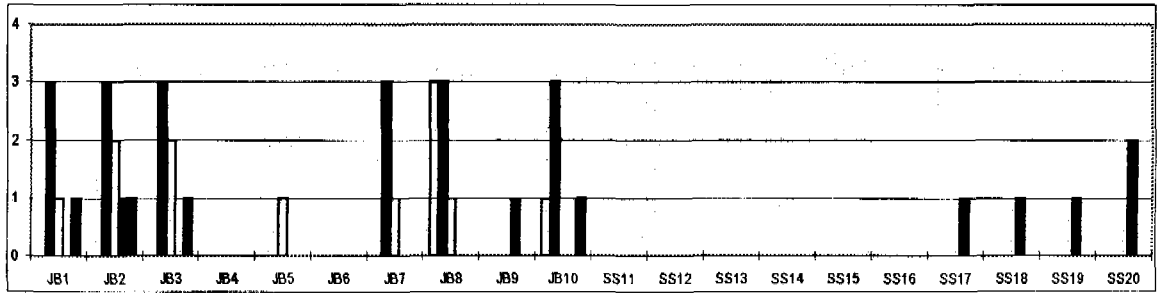
health in their specific communities (e.g. the contamination routes exercise from the PHAST methodology used in this study). A collective consensus needs to develop for behavior changes of specific types, which then can be monitored by the communities themselves.

UNICEF's current IEC activities in WES do not yet include such participatory analyses. The current IEC materials use an "educational" approach that emphasizes one-way transfer of information. **IEC materials could be made more effective if they adopt approaches promoting two-way analysis of problems and identification by communities themselves, of the behavior that can bring about possible solutions.**

## **Informed Choice - Water**

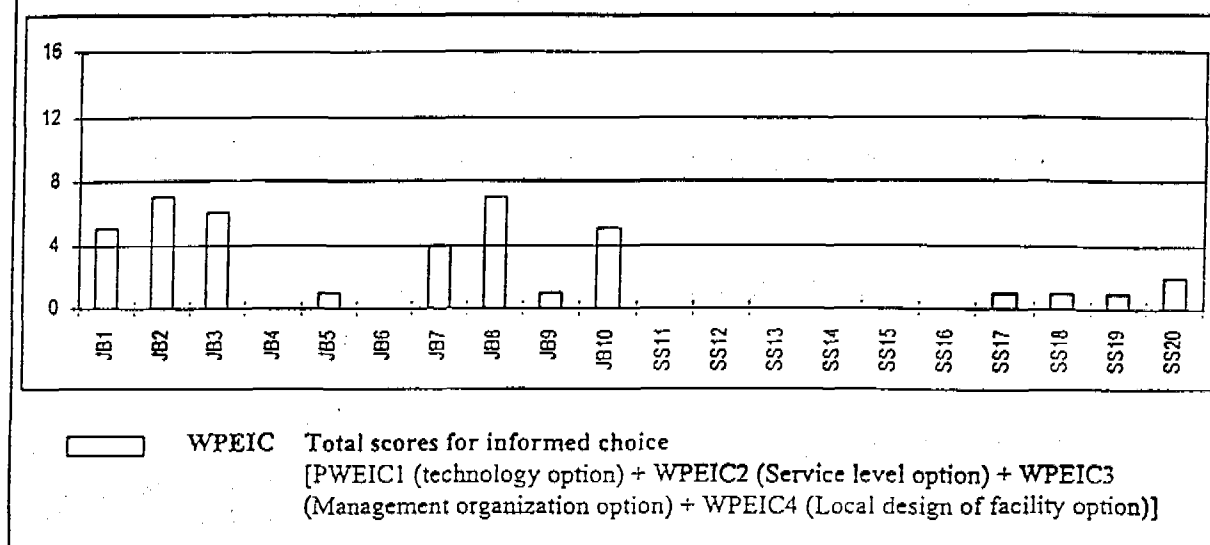
Figures 28 a and b illustrate the situation with reference to the extent of informed choice being made by users for establishing water supply services, which was very limited.

**Fig. 28a Participation in Water Service Establishment :  
Informed Choice**



- WPEIC1 Technology option**
  - 0 no technology option
  - 1 only one technology option feasible (as informed to community)
  - 1 technology option chosen by elite/village chief
  - 2 technology option chosen by men only
  - 3 technology option chosen by community (men and women)
- WPEIC2 LOS Option**
  - 0 no LOS option given
  - 1 Village chief/elite decided LOS
  - 2 Men decided LOS, without consulting women
  - 3 community decided LOS (men and women)
- WPEIC3 Management Organization**
  - 0 no special arrangement, part of general administration
  - 1 local leadership appointed the committee-mostly male elite
  - 2 community chose-without getting information on right and responsibility
  - 3 community chose after getting rights & responsibility related information
  - 4 men/women, rich/poor chose local Mgt. with full information on rights & responsibilities
- WPEIC4 Local Design of Facility**
  - 0 community had no choice & influence on design of facilities
  - 1 local designs were adjusted - if comm. asked but no efforts made to get comm. View
  - 2 Local designs were adjusted within financial margin of project by asking comm.
  - 3 Local designs adjustment option offered, at a cost to users
- WPEIC5 Financing System**
  - 0 Project agency introduced standard financing system
  - 1 project agency helped introduce locally adjusted financing system
  - 2 potential users chose FS - without specific involvement of men/women/poor/rich
  - 3 all users had a voice to choose FS, men/women/rich/poor

**Fig. 28b Participation in Water Service Establishment:  
Total Scores for Informed Choice**



### *Technology Option*

According to women in the focus groups, no option was available to villagers in terms of technology, except in 1 village where the choice was between rainwater tanks (public) and wells (private, household). This was also the only village where women had been consulted for choice of any kind (Rambatan Wetan, West Java). However, men in 3 villages said that up to 2 options were offered. In general, project staff decided the technology to be used and informed the *Kepala Desa* that only X or Y was available. In fact several villages in South Sulawesi had requested piped systems or deep tubewells because their existing dugwells provided salty water. In response they were given more dugwells with UNICEF funds.

### *Level of Service (LOS) Option*

Somewhat greater choice was available for level of service. In 6 out of 20 villages men had participated in deciding level of service i.e. various combinations of public water facilities and house connections/household facilities. All the 6 villages were in West Java. Men's groups decided LOS in 2 villages, the village Head individually did so in 4 others. Project staff decided on behalf of the rest i.e. 14 villages.

### *"Served Area"*

The village areas to be served by the water system were decided in consultation with the potential beneficiary population in 8 out of 10 villages in West Java, but none in South Sulawesi. Overall, this decision was taken by the village head alone in 20 per cent villages, the LKMD in 15 per cent cases and the project staff in 25 per cent cases.

### *Management Organization Option*

The general view of inadequate choice becomes starker when we look at how decisions were made for managing the services. Although UNICEF's program guidelines require the formation of Water Users' Committees comprising both men and women, in 75 per cent of the observed villages no such

committees had been formed. The village head (sometimes along with the other community leaders) appointed male members of the village elite as the Water Committee in 3 villages. Only in 2 villages out of 20, community members were involved in selecting their water committee. These were the villages with GFS systems in West Java.

#### *Local Design Options for facility*

As a rule, users had little say in the design of the facilities constructed. In 5 villages they were able to request modifications and get them implemented e.g. connecting pipes directly to common tanks instead of taps, change the location of common water tanks from locations originally planned by project staff).

#### *Choice of Financing System*

As already described earlier, there is no financing system for most facilities. The 3 GFS systems in West Java are the only exceptions. The village leaders were helped by project staff to establish a flat rate fee to be paid by all users.

It can be concluded that little or no choice was available to user communities in deciding the type and level of service they wanted and how they were to manage and finance it. Whatever choice was available was exercised by the village chief on behalf of all users. In the absence of other water sources, such a situation may still elicit community effort for sustaining services provided with UNICEF assistance. However, the study shows that UNICEF assisted services form a part of the larger picture whereby most villages have 3-4 different sources of water from several projects, (e.g. from PLAN International, IWACO, SIPAS, BKKBN, AMD) or traditional sources such as *pancuran* (bamboo pipes leading from springs), dugwells and rivers.

Under such circumstances community interest in sustaining new facilities that do not necessarily reflect their preferences is likely to be limited.

## **Contribution in Construction**

#### *Type of contribution*

Contributions required from the community varied with the kind of technology used. Cash contributions were requested as a flat rate enrollment fee of Rp.40,000-Rp.50,000 per house connection, for the GFS systems. Rainwater tanks required contribution of land. Wells required contribution of labor for digging, land and materials like sand and bricks. Installation of handpumps was paid for by the community in some villages but not in others. Curiously, in 60 per cent villages in West Java users were required to contribute cash for construction whereas only 20 per cent had to do so in South Sulawesi. Construction materials and land were contributed by users in more than half the villages. Labor was also contributed in 12 out of 20 villages. In all the cases it was unpaid labor.

Labor in the above case means physical work such as digging, moving materials and soil, clearing land, laying pipes etc. This does not include to customary provision of food by village women to people from agency/contractor engaged in construction in the village. This is voluntary work done by women as instructed by the Kepala Desa and men leaders. Women are not compensated for the food substances and the skilled labor in preparing it. This should count as contribution in construction.

One interesting fact that came to light was that in some villages the richer households had an option to contribute more than the obligatory amount (flat rate) of cash - and materials and did so. This

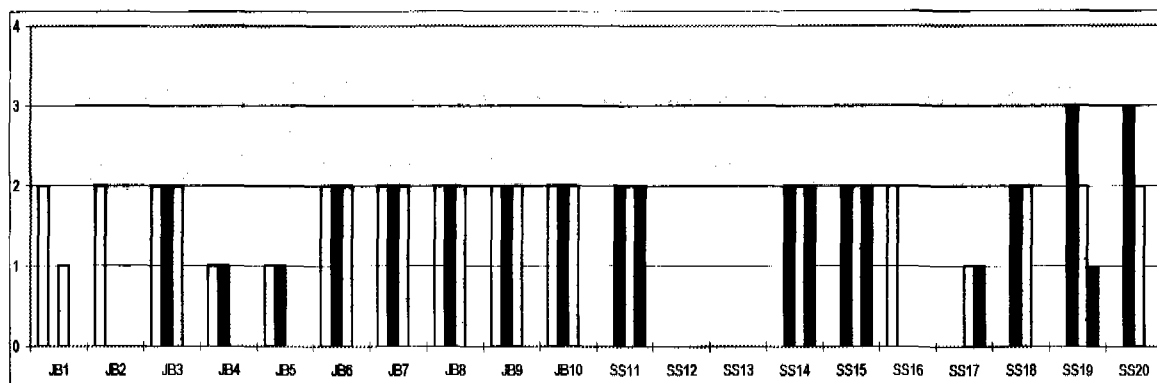
investment was later translated into a higher level of control and usage of the facility by these households - leading to an informal "ownership" of the facility by them.

Curiously, while every village in West Java required cash contribution, only 1 out of 10 did so in South Sulawesi.

### Monitoring and Control of Finances

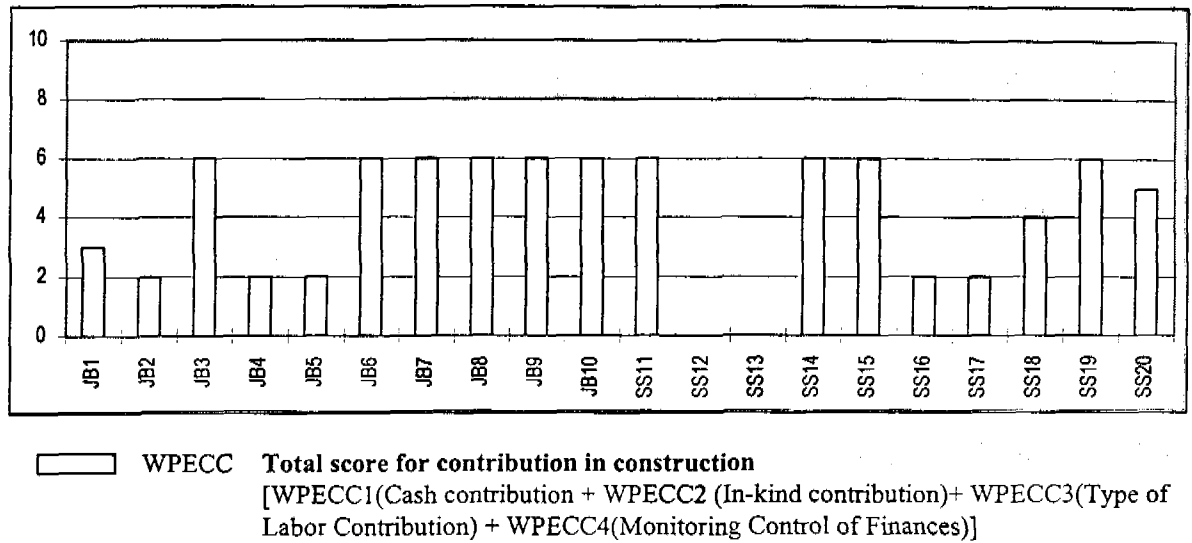
The user community was not involved in monitoring the use of funds for construction except in 6 villages. These were all villages that had dug well or rainwater tanks systems constructed by communities working with contractors. In 3 of those villages the contractor was employed by the community. (Figures 29 a-b).

Fig. 29a Participation In Water Service Establishment:  
Contribution in Construction



- WPECC1 Cash Contribution**
  - 0 No cash contribution
  - 1 the richer contribute more cash if they want
  - 2 Flat rate cash contribution, compulsory for all
  - 3 Flexible cash contribution-rich/poor/flexible timing - jointly decided
  
- WPECC2 In-Kind Contribution**
  - 0 No in-kind contribution
  - 1 the richer contribute in-kind more if they want
  - 2 flat rate in-kind contribution
  - 3 different in kind-contribution by rich/poor - jointly agreed
  
- WPECC3 Type of Labor Contribution**
  - 0 Labor contribution paid for
  - 1 Labor contribution paid less than market rate
  - 2 Voluntary, unpaid labor
  
- WPECC4 Monitoring & Control**
  - 2 done by community
  - 1 done by contractor-community chosen
  - 0 done by contractor employed by outside agency

**Fig. 29b Participation in water Service Establishment:  
Total scores for Contribution in Construction**

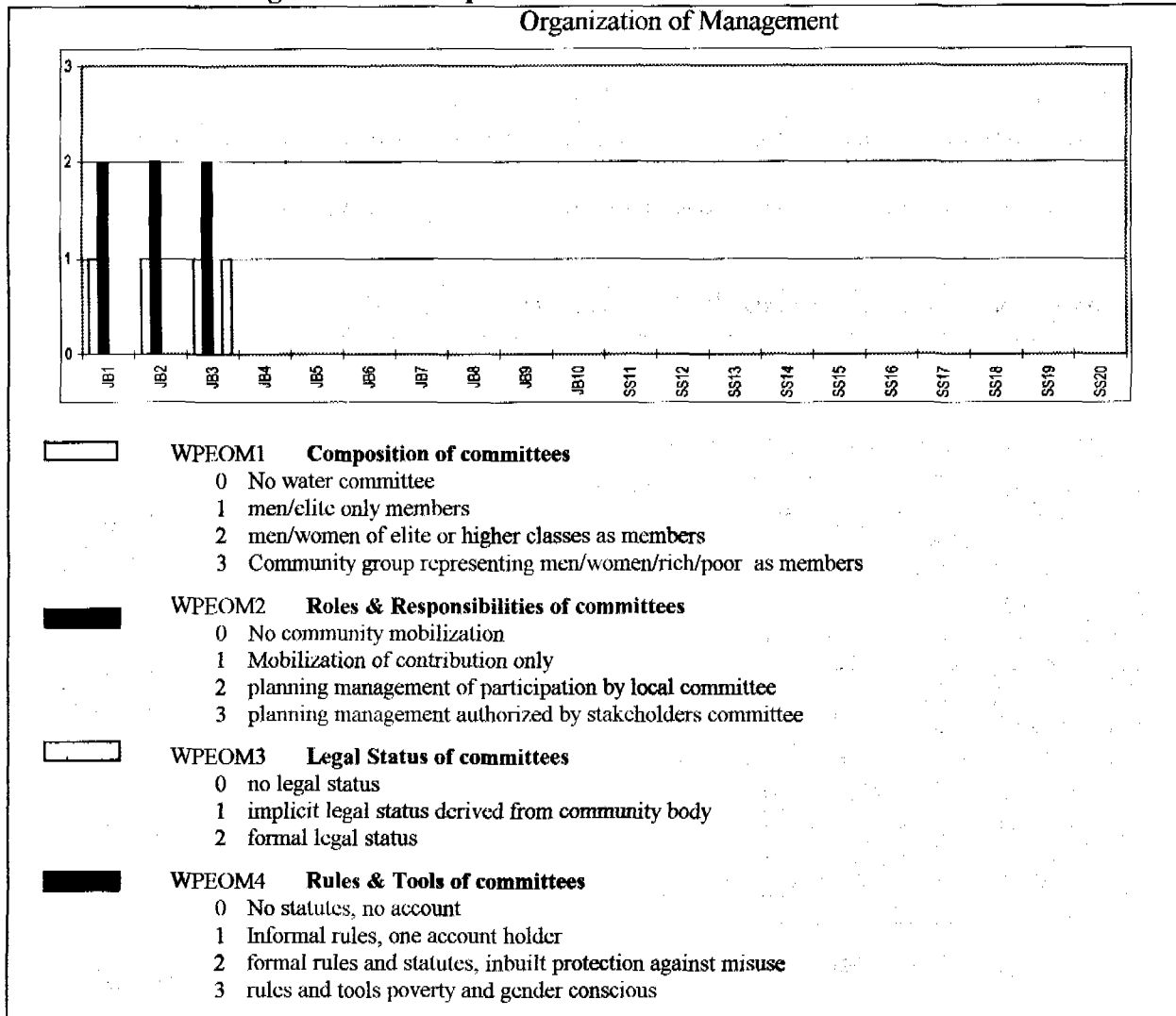


## Organization of Management

The process of setting up an arrangement for managing the services can predict the sustainability of the arrangement. Effectiveness is likely to be influenced by whether or not the arrangement involves a range of all stakeholders and users and whether it possesses mechanisms to make management transparent.

Only 4 villages (1 RWTP + 3 GFS systems) had Water Committees, all consisting of male members from the elite class of the village. They had been appointed to the Committee by the village chief. Their main responsibility was to mobilize contributions for water tariffs, with no management functions such as planning. In 2 of these villages, less than 20 per cent of the users were paying the flat rate fees of Rp.2,000-Rp.2,500 per month. In the third village (Dukuh, West Java) more than 80 per cent paid the tariffs.

**Fig. 30 Participation in Water Service Establishment :  
Organization of Management**



As already described in Chapter 6, formal Water Committees were not established in the rest of the 16 villages, or had been appointed by the *Kepala Desa* but did not function thereafter. In most cases, the owner of the land on which a public facility was built had become the "owner and manager" of it for day-to-day purposes. This was often the *Kepala Desa* or a rich and powerful villager, who had contributed land and some of the construction investment.

Making such a voluntary investment was a way to establish future ownership and control of the water source, as was noted in the section on "Participation in Benefits" (Chapter 6). Individual families maintained their own wells. No rules and statutes exist for any Water Committee.

### **Accountability of Contractors to Community: Water Supply**

Construction by contractors employed by the service providing agency (Public Works or Dinas Health) was the general rule. The village administration (*Kepala Desa, Ketua RT, Kepala Dusun, LKMD*) co-

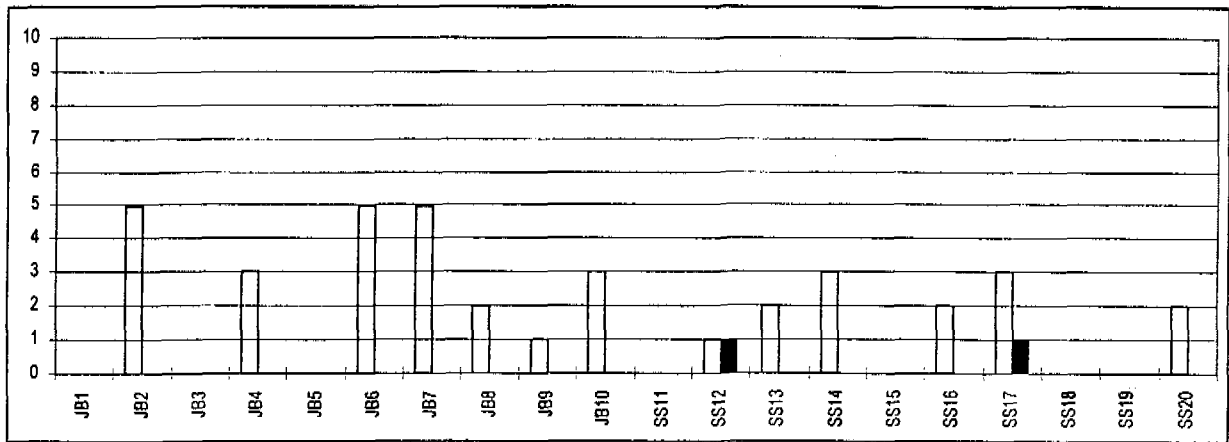


monitored the activities. In these cases there was partial accountability to the village leadership on the part of the contractor. Contractors were not at all accountable to villagers in 35% of the villages and partially accountable in rest of the villages. Only when they were contracted by individual households to construct household wells or latrines they were fully accountable to the villagers.

Users were most often able to participate in monitoring construction according to agreed schedules and materials, and least able to monitor design quality and fund utilization. In spite of monitoring, there was often little control of what the contractor did, as the contractor was not paid by the villagers but by the offices of the Public Works or Health departments.

Since women were not *Kepala Desas*, *Kepala Dusuns*, *Ketua RTs*, they could not participate in monitoring of construction activities and contractors were not accountable to them at all. (Figure 31).

**Fig. 31 Participation In Water Service Establishment:**  
**Accountability of Contractors to Community : Adherence to Agreed Design & Schedules**



	<b>WSPEA1</b>	<b>Accountability to Men</b>			
	Yes	No	Partial		
	2	0	1	for materials	
	2	0	1	for designs	
	2	0	1	for construction quality	
	2	0	1	for construction schedule	
	2	0	1	For financial management	
	<b>WSPEA2</b>	<b>Accountability to Women</b>			
	Yes	No	Partial		
	2	0	1	for materials	
	2	0	1	for designs	
	2	0	1	for construction quality	
	2	0	1	for construction schedule	
	2	0	1	For financial management	

## Capabilities Built of Stakeholders (Water Supply and Sanitation)

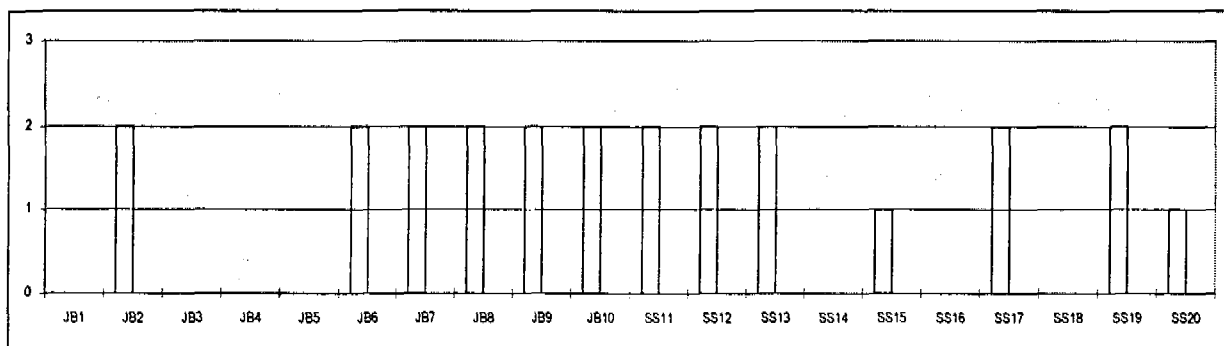
Men and women in 12 out of the 20 villages said that some kind of training had been *provided, mainly by Dinas Kesehatan*. In 10 villages women and a few men working as Kader Kesling (Environmental Health volunteers) had received training in Diarrheal Disease prevention, Environmental Health, "Women and Water". In 7 villages men had been trained in construction of latrines and rainwater tanks and handpump maintenance.

All training done had been single courses. In 5 villages the focus groups reported that it had been only theoretical training (Women and Water, Health and Hygiene related learning). 6 other village groups reported theory and hands-on training for all trainees. These were the O&M related trainings.

This represents the usual situation where men always get trained in technical aspects that can generate future income while women get trained for activities requiring voluntary labor and unpaid work such as hygiene education and maintaining cleanliness of facilities. Behavioral change training is also targeted mainly at women. (Figure 32).

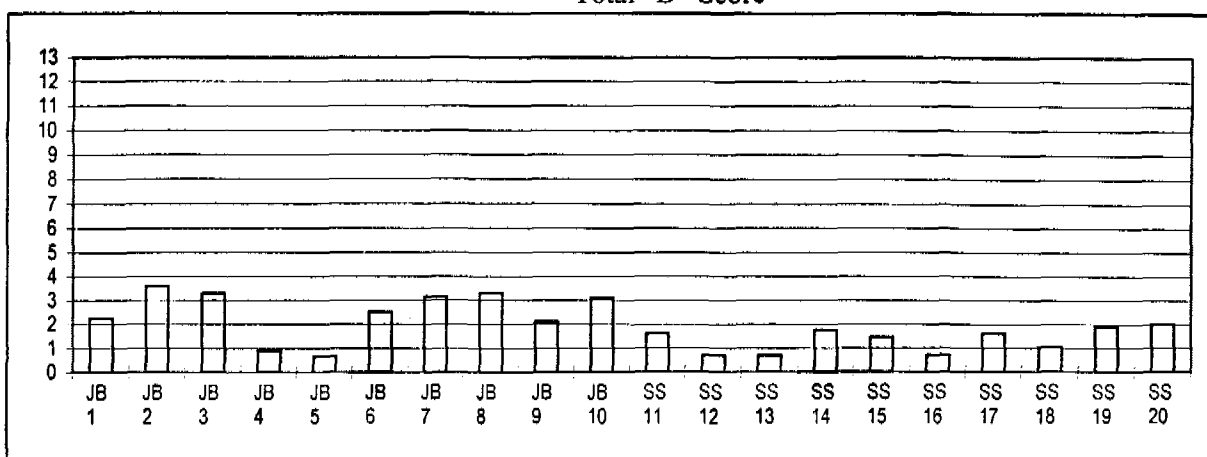
No attempt is being made to ascertain women's interest in technical training. Village Chiefs arbitrarily decide who will go for training, based on traditional work-role divisions i.e. income-generating, construction and technical maintenance work being considered male and unskilled work and voluntary labor being considered appropriate for females.

Fig. 32 Participation in Water Service Establishment:  
Capabilities Built of Stakeholders




- WSPECB Capabilities Built of Stakeholders
- 0 no training
  - 1 training men only for construction maintenance, women only for health/hygiene
  - 2 training men for const. & maintenance, women for health/hygiene, both for management
  - 3 training men + women both for construction, maintenance, health, hygiene + management

**Fig. 33 Participation In Water Service Establishment:  
Total "D" Score**



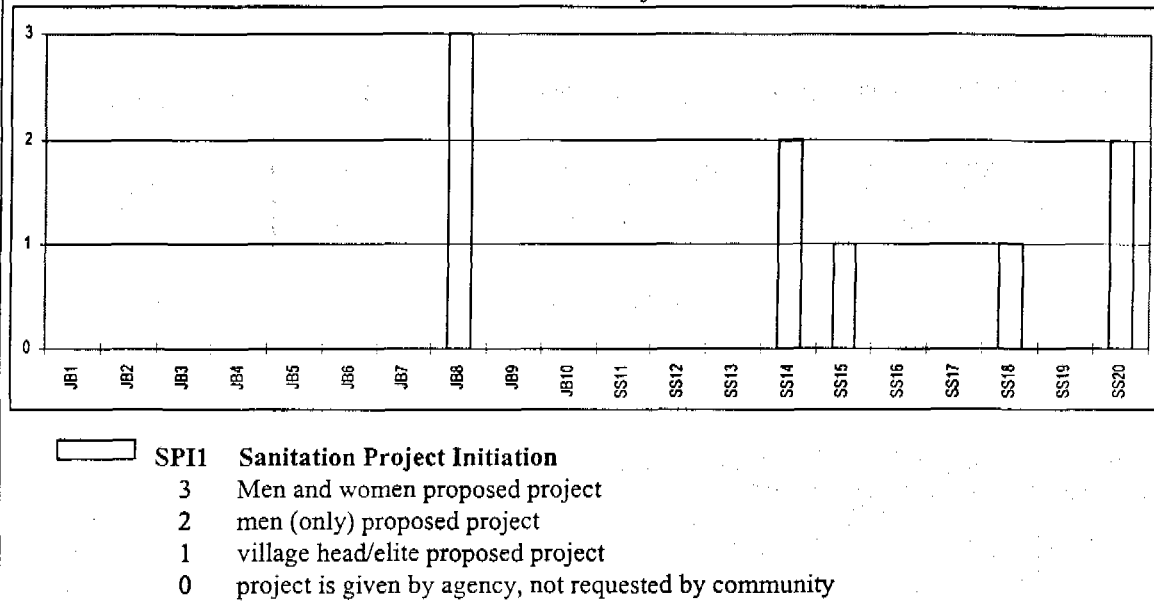
JB1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarawang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP

 **Dw** Total "D" Score for Participation in Water Service Establishment  
 $[WPEI*0.05 + WPEIC*0.2 + WPECC*0.2 + WPEOM*0.2 + WSPEA*0.15 + WSPECB*0.2]$   
 WPEI-Water Project Initiation, WPEIC-Water-Informed Choice, WSPEA-Accountability to Men/women, WSPECB -Capacities built of stakeholders,  
 WPECC - Contribution in Construction, WPEOM - Organization of Management

## Project Initiation - Sanitation

In 15 out of 20 villages there was no request from the villagers for sanitation. Project assistance arrived in the village without prior information or discussion in some cases. The Kepala Desa proposed a sanitation project in 2 villages and men's groups were involved in the process in 2 villages. Only in one village in West Java, both men and women had proposed the project after mutual consultations (*Rambatan Wetan*). In general, therefore, there was little expression of community demand for sanitation. (Figure 34).

**Fig. 34 Participation In Sanitation Service Establishment:  
Project Initiation**



## Informed Choice - Sanitation

### *Technology Option*

There was no technology option as the only design offered by UNICEF was the one-pit-pour-flush type of latrine with a water-seal. In one South Sulawesi village (*Aeng Batu-Batu*) however, focus groups felt that they had been offered options, because there had been a discussion with project authorities about several types of latrines and most users preferred the pour-flush type. They had then formed a group of households that would receive a package of materials for constructing 1 household latrine + rehabilitating 1 traditional dugwell (household-owned), using funds from the project to set up a revolving fund. In places where water supply is not available at the household level, people have not constructed the latrines even though they received pans and rings more than three years ago (*Kiajaran Kulon* and *Langut* in West Java). The rings and cement have been put to other uses and pans stored away. At other villages where water for flushing is scarce, users have cut off the water-seal and installed the pan as a dry latrine.

### *Level of Service Option*

Except in 3 villages where public latrines (MCK) have been constructed as a part of a combined WSS facility, all latrines offered are the household, privately owned ones i.e. one level of service. (Figures 35 a -b).

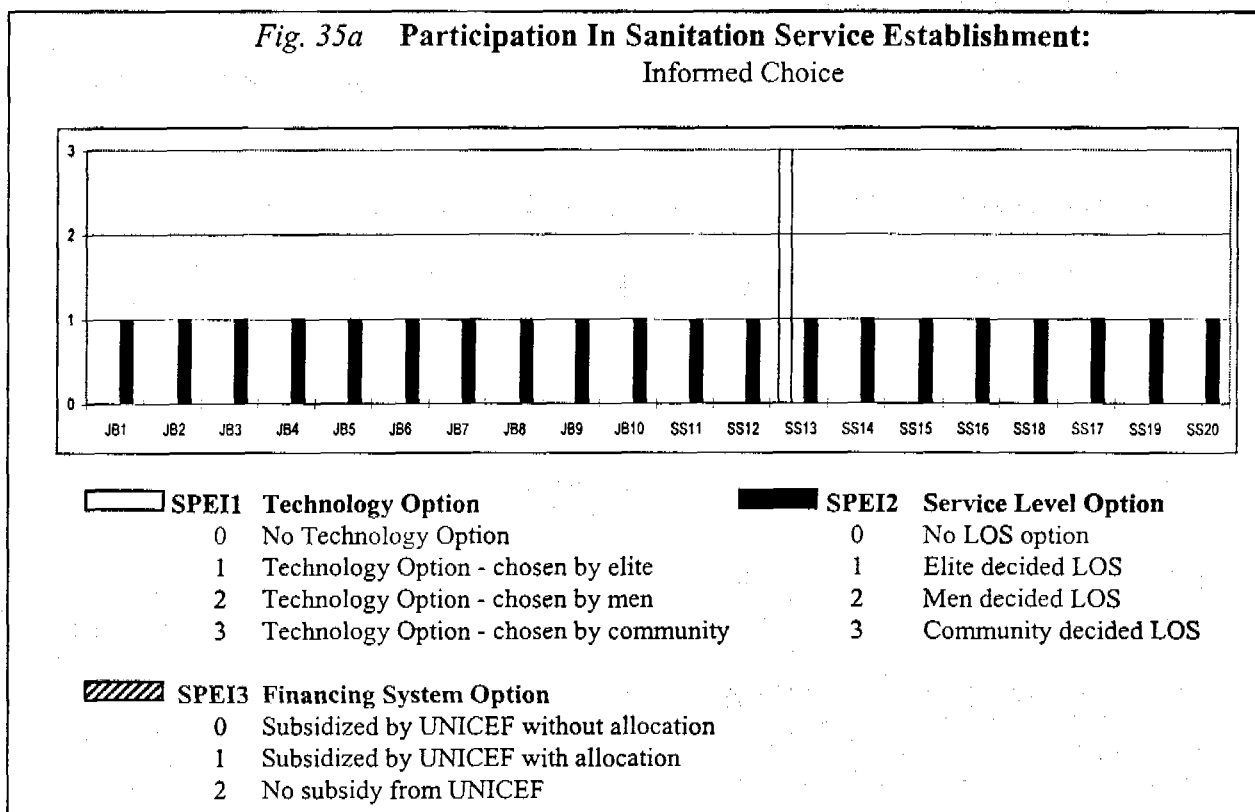
## Contribution in Construction - Sanitation

As summarized in *Figures 36 a-b*, in 50 per cent of the villages no cash contribution was required. In the rest of the villages flat rate cash contributions required from each household varied from Rp.3,000-

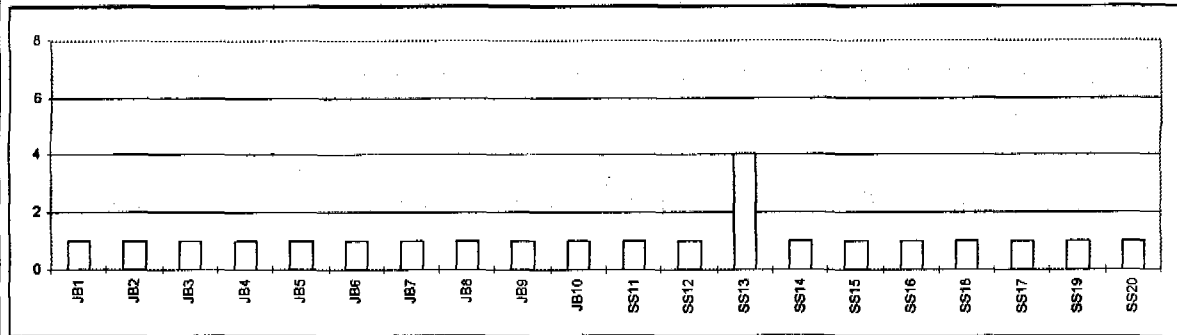
Rp.15,000. Material (sand, bricks, stones, wall/enclosure material) and labor contributions were required in 60 per cent cases. As in the case of establishment of water facilities, for sanitation too cash contributions were required in almost all West Java villages, but only in 1 out of 10 villages in South Sulawesi. It was the same village in both cases (*Bungungloe*). Commonly the user household members monitored the construction, or constructed their own latrines with help of a paid mason in 13 out of 20 villages. Contractors of government agencies constructed the rest. In 3 villages no latrines have yet been constructed 3 years after pans and rings were given because water supply is not available at household level (*Kiajaran Kulon & Langut* in West Java) or because the residents think their home/land might be acquired by the government to build a toll road (*Babakan Pateuy* in West Java).

Adherence to agreed design and schedule for construction for sanitation was fairly good mainly because households often employed their own masons or built facilities themselves. (Figure 37)

Fig. 35a Participation In Sanitation Service Establishment:  
Informed Choice

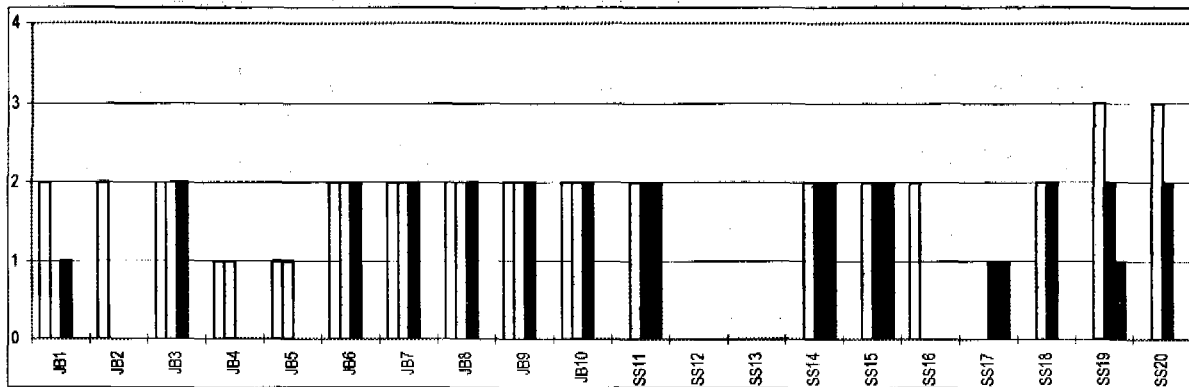


**Fig. 35b Participation In Sanitation Service Establishment:  
Total Scores for Informed Choice**



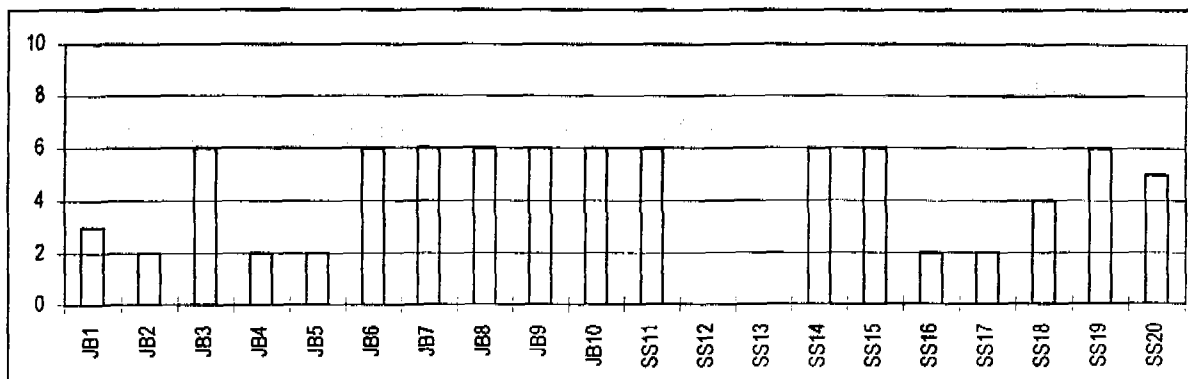
**SPEI Informed Choice - Sanitation Services**  
 [SPEI1 (technology option) + SPEI2 (service level option) + SPEI3 (financing system option)]


**Fig. 36a Participation In Sanitation Service Establishment:  
Contribution in Construction**



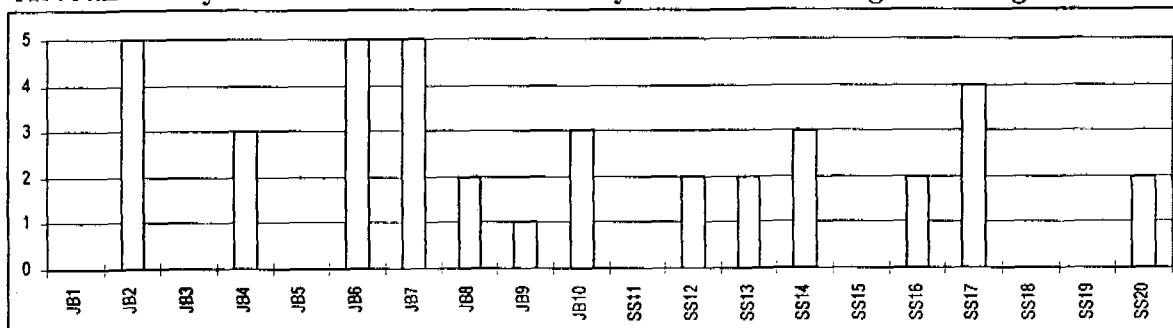
- WPECC1 Cash Contribution**  
 0 No cash contribution  
 1 the richer contributed more cash if they want  
 2 flat rate cash contribution  
 3 different cash contribution by rich/poor, jointly decided by all
- WPECC2 In Kind Contribution**  
 0 no in-kind contribution  
 1 the richer contributed more in kind if they want  
 2 flat rate in-kind contribution  
 3 different in-kind contribution by rich/poor, jointly decided by all
- WPECC3 Type of labor**  
 0 Labor contributed paid for at market rate  
 1 labor contributed paid less than market rate  
 2 voluntary labor, unpaid
- WPECC4 Monitoring & Control**  
 0 done by contractor employed by agency  
 1 done by contractor-community chosen  
 2 done by community



**Fig. 36b Participation In Sanitation Service Establishment:  
Total Scores for Contribution in Construction**



 **WPECC**  
 [WPECC1(Cash contribution)+ WPECC2(In-kind contribution) + WPECC3(Kind of labor contributed) + WPECC4(Monitoring & control)]

**Fig. 37 PARTICIPATION IN SANITATION SERVICE ESTABLISHMENT :  
Accountability of Contractors to Community - Adherence to Agreed Design & Schedules**



 **Accountability to Men**
 **Accountability to Women**  
 [WSPEA1(Accountability to men for materials/ design/construction quality/construction schedule/financial management)+ WSPEA2(Accountability to women for same 5 factors)]

### How Key Decisions About Facilities Were Made

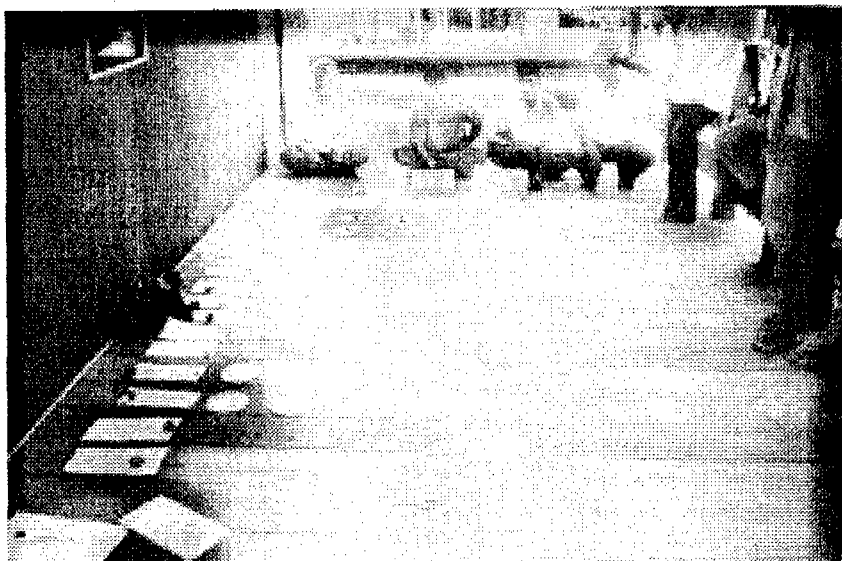
The pattern of decision making was explored with the use of a "Decision Matrix" in every village which is an adaptation of the SARAR Pocket Voting exercise. On the ground a large matrix was drawn, with pictures of individuals/groups who might be decision makers along the horizontal row. Key decisions were written up on cards and the cards arranged down the vertical row. Groups of men and women in villages indicated who was involved in which decision in their village by making entries in the cells of the matrix thus produced. The advantage of doing this publicly (rather than privately as in Pocket Voting) was that the group consensus about what actually happened got recorded, instead of individuals views. If someone made an entry in a column that did not represent the actual situation, others tended to challenge and correct it on the spot.

## HOW WERE KEY DECISIONS MADE?



### **Dominance of the Kepala Desa...**

- Project staff decided technology and level of service for WSS.
- Village chief decided everything else, in consultation with project staff.
- Village council/male informal leaders were consulted about some decisions in half the villages.
- Women were excluded from the process in 19 out of 20 villages.



**Men's group in South Sulawesi preparing a "Decision-Matrix" to show how decisions were made about WSS services in their village.**



### For Water Supply

Tables 5a and 5b show the tally of frequencies from all 20 villages with respect to who was involved in which decisions. The overall picture is one of overwhelming dominance of the *Kepala Desa* (Village Chief) in the making of every kind of decision in both the provinces.

Project staff unilaterally decided the technology to be used and informed the *Kepala Desa* that only X or Y were the feasible choices. For deciding the type and location of the water facility and selecting contractors for construction, the *Kepala Desa* was usually a co-decision-maker with project staff (Dinas Kesehatan and Public Works personnel). He consulted with village men's group/male community leaders in deciding about: *a*) the level of facilities (in 50 per cent villages); *b*) who will be the potential beneficiaries (in 45 per cent villages); *c*) who will contribute what for construction (in 40 per cent of villages) and *d*) who will be members of the Water Committee (in 50 per cent villages). The *Kepala Desa* also usually decided who from the village will receive training offered in construction/maintenance/health & hygiene. He occasionally decided this in consultation with the Health Department functionary (20 per cent villages).

Table 5a DECISION MATRIX West Java

No	Type of Decision											
		1	2	3	4	5	6	7	8	9	10	11
1	Selection of Village for project	5	4							5		
2	Site of facility	7	4	4		2				1	2	
3	Technology choice	4	4	1				2		1		3
4	Level of Service choice	5	3	3	1	2		2		2	1	
5	Who will be beneficiaries	6		4		1		5	1	1	2	1
6	Who has to pay how much for construction	5		3		3		3		1	2	
7	Who should pay How much for use of facility	4		4		2		2		1	3	
8	Who will manage water facility	2		1		2		2			1	
9	Who will be in Water committee	3				6		3		2	3	1
10	Who will construct Facility	4	2	2		2				1		4
11	Who will be trained for what	3	1							3		
12	Who will get latrine facility	6		1		1		6				
13	Who should pay how much to get latrine			1		1		4		1		

Note :

- |                      |                                     |                    |
|----------------------|-------------------------------------|--------------------|
| 1 Village Chief      | 5 men & women group + village Chief | 9 Health Workers   |
| 2 Public Works Staff | 6 Users                             | 10 Village council |
| 3 Men's group        | 7 Hamlet chief                      | 11 Contractors     |
| 4 Women's group      | 8 Sub Village head                  |                    |

**Table 5b DECISION MATRIX South Sulawesi**

No	Type of Decision	Who was Involved in Deciding										
		1	2	3	4	5	6	9	10	11	12	13
1	Selection of Village for project	7	1	2		2		7			3	1
2	Site of facility	8		3		2		5			1	4
3	Technology choice	4		1		2		7			3	2
4	Level of Service choice	3		1		4		7				2
5	Who will be beneficiaries	4		2		2		2				3
6	Who has to pay how much for construction	1				2		1				
7	Who should pay how much for use of facility	1				1						
8	Who will manage water facility	3				3		3				2
9	Who will be in Water committee	1		3	2	4		4		1		3
10	Who will construct facility	1				2		1				
11	Who will be trained for what	8			1	1		2				1
12	Who will get latrine facility	7				1		4				5
13	Who should pay how much to get latrine	1		1		2		1				

Note :

- |                                     |                    |                       |
|-------------------------------------|--------------------|-----------------------|
| 1 Village chief                     | 6 Users            | 10 Village council    |
| 2 Public Works Staff                | 7 Hamlet chief     | 11 Contractors        |
| 3 Men's group                       | 8 Sub village head | 12 Sub district chief |
| 4 Women's group                     | 9 Health staffs    | 13 Chief of hamlet    |
| 5 Men & women group + village chief |                    |                       |

### Sanitation

In case of sanitation facilities, the Kepala Desa decided with heads of RTs/*Kepala Dusuns* (sub-village areas) about who will receive household latrines, given a certain number offered by the project. He usually allocated an arbitrary member to each *RT/Dusun*, with individual households being decided by heads of *RT/Dusuns* (sub-village neighborhoods). The latter distributed the material for latrines (pans, water-seal, cement rings) to households according to a variety of locally developed criteria e.g. those who have water supply at home, those willing to contribute land, materials and labor for digging pits and building walls, those willing to pay amounts between Rp.3,000-Rp.15,000 per latrine, etc. However, in as many as 13 out of 20 villages, men and women's groups reported that no clear conditions/criteria for allocation of latrine materials had been communicated to them or followed consistently. Many people received them without ever asking for them. Because they received the materials, they used them - but not always for constructing latrines.

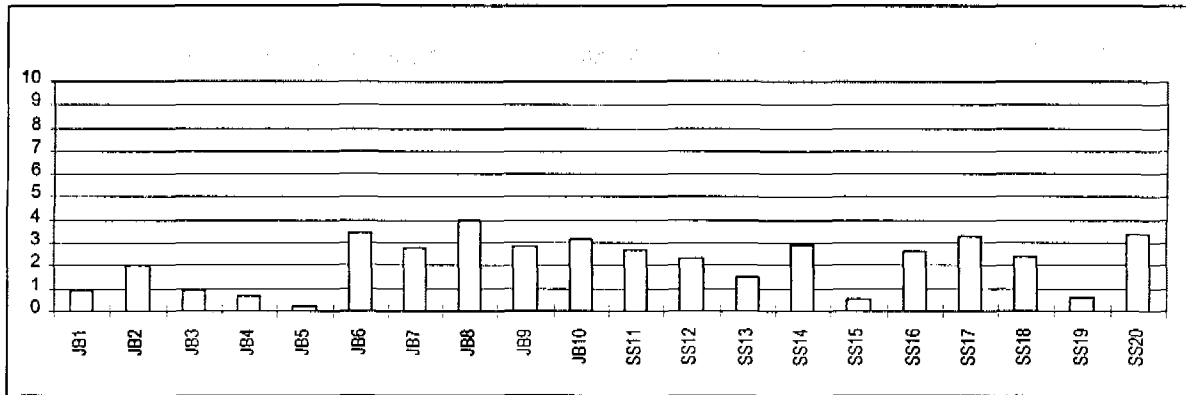
### Complete Exclusion for Women from Decisions

Although this does not come as a surprise, the Decision Matrix illustrated the absolute lack of women's involvement in making almost all the key decisions about water and sanitation facilities in every village. Women reported not being consulted about anything except the level of service (1 village in West Java), formation of water committee (2 villages in South Sulawesi) and selecting female trainees for a Health & Hygiene training program (1 village in South Sulawesi).

To sum up, the participation of users in service establishment has been rather low in all villages. Summated *User Participation* scores show that the even the highest scoring villages fall below 4 out of maximum possible scores of 13 for water supply and 10 for sanitation services. (Figures 33 and 38). The mean user participation scores amounted to about 14% for the establishment of water supply and 21% for the establishment of sanitation services, when 100% represented the maximum possible scores in each case.

Fig. 38

**PARTICIPATION IN SANITATION SERVICE ESTABLISHMENT:  
"D" Score for Sanitation**



B1	Babakan Peuteuy	GFSPC	SS11	Towata	DWTP
JB2	Mekarwangi	GFSPC	SS12	Tamalate	DWP
JB3	Dukuh	GFSPC	SS13	Aeng Batu Batu	DWP
JB4	Langut	RWTP	SS14	Kampung Beru	DWTP
JB5	Kijaran Kulon	RWTP	SS15	Timbuseng	DWTP
JB6	Kertajaya	PDH	SS16	Bungungloe	PSH
JB7	Plewangan	PDH	SS17	Balang. Tarawang	DWP
JB8	Rambatan Wetan	DWP	SS18	Pattiro	PDH
JB9	Panyidangan W	DWP	SS19	Kayuloe Timur	PDH
JB10	Lombang	RWTH	SS20	Sapanang	DWTP



Total "D" Score for Participation in Establishment of Sanitation Service

[SPEI\*0.2 + SPECC\*0.35 + SPII\*0.1 + WSPEA\*0.15 + WSPECB\*0.2]

SPEI- Sanitation Informed choice, SPECC-Sanitation-Contribution in construction,

SPII - Project Initiation, WSPEA- Accountability to men and women

WSPECB - Capabilities built for sanitation

In case of water supply, the areas most lacking in community participation are "Informed Choice" and "Organization of Management Arrangements". The participation scores mainly came from "Users' Contribution in Construction" (which is usually mandatory and prescribed by the village head), and Stakeholders' Capacities Built i.e. participation in some training (which again is at the instruction/recommendation of the village head) and partial "Accountability of Contractors to the Village Men" - for adherence to agreed design, schedule, etc. Another important reason for this low scores for participation is the absolute lack of women's involvement in the process - which is accurately captured by the gender - sensitive scoring system.

In case of sanitation, the areas most lacking user participation are "*Project Initiation*" (most users received latrine stimulants without having asked for them) and "*Informed Choice*" (no technology option or design choice is available - UNICEF assistance is usually for the one-pit-pour-flush household toilet only). Most of the participation scores come from "*Contribution in Construction*" (because the stimulant pays for less than half the cost) and *Capacities Built of Stakeholders* i.e. some training (not demand-based, but prescribed training for which trainees are selected by the village chief).

**People seem to be participating in service establishment without adequate choice and voice in key decisions. Possibly this is the reason for low levels of perceptions of ownership of facilities and responsibility for their sustenance. In the absence of alternative sources, people tend to accept essential services regardless of how they are provided. They do not however assume responsibility for them or take initiatives to keep them going - which has negative implications for longer term sustainability. The program has concentrated on accelerating the coverage of services through self help, but the coverage achieved is unlikely to be sustained in the longer run unless greater attention is paid to the process of providing the services. This study already provides indicators that the majority of users are not involved in managing and maintaining the facilities created and are not building up capital to sustain/expand/replace systems as they wear out.**

For greater sustainability of services, the WES program needs to consider ways to: a) improve informed choice making by a larger majority of village men and women (not just the village leaders); b) offer a wider choice of technologies and levels of services at a range of costs; c) determine levels of subsidies (if at all necessary) and costs based on local demand for services rather than use standard formulae and d) provide services only in response to expressed community demand that is backed by evidence of users' readiness to invest in service creation.

## Chapter 8

### TESTS OF ASSOCIATION AND VARIANCE

This was principally a qualitative study focusing on "Whys" and "Hows" of the situation observed. The purpose was to make available first hand evaluation from the community of service users to the agency requesting an evaluation of its program for them. The indicators and sub-indicators measured have yielded a series of conclusions to this effect. The conclusions appear at the ends of preceding sections in bold font throughout this report. The overall picture was summarized in the format of the Conceptual Framework (*Figure 1*) and the relationships between the different parts of the framework tested statistically, in order to identify major emerging relationships.

The scores for sub-indicators were first added up and multiplied by percentage weights as indicated in the Conceptual Framework. The total scores for the 4 major indicators thus derived were added up for water supply and sanitation in each of the 20 villages, leading to 8 sets of 20 scores each for:

- A. Effective Sustenance and Use of Services (AW - Water; AS - Sanitation)
- B. Demand Responsiveness of Services (BW - Water; BS - Sanitation)
- C. Users' Participation in Service Management (CW - Water; CS - Sanitation)
- D. Users' Participation in Service Establishment (DW - Water; DS - Sanitation)

#### Test of Association

Pearson's Product - Moment correlation was used to test associations of all possible pairs among the scores for A,B,C and D. The results are presented in the following Table. Correlations found significant are illustrated in scattergrams and graphics (*Figures 39,40 41, 42 and 43*). *While interpreting these results it is important to remember the limitations arising from a small sample (20), regardless of the fact that almost all qualifying communities were included, and the data sets being correlated consisted of continuous scores.*

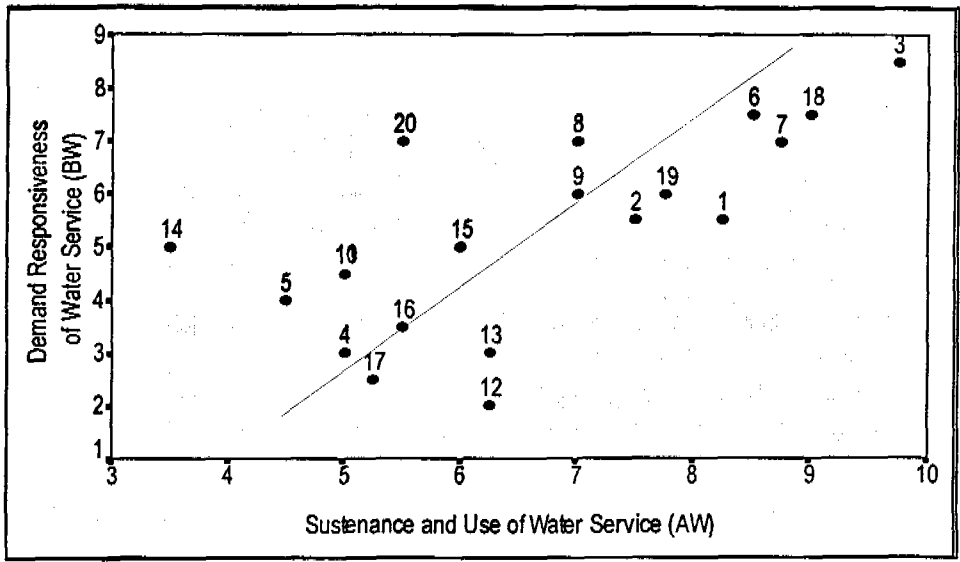
#### CORRELATION COEFFICIENTS

	AW	BW	CW	DW	AS	BS	CS	DS
AW	1.0000	0.6864**	0.1635	0.4701 *	0.5036 *	0.5425 *	-0.2418	-0.0835
BW		1.0000	-0.2235	0.6470 **	0.2862	0.5061 *	-0.4450	0.1643
CW			1.0000	0.0843	0.5012 *	0.0045	0.0218	0.1933
DW				1.0000	0.4199	0.5102 *	-0.5440	0.3317
AS					1.0000	0.6748 **	0.1057	0.3099
BS						1.0000	0.1417	0.3072
CS							1.0000	0.0493
DS								1.0000

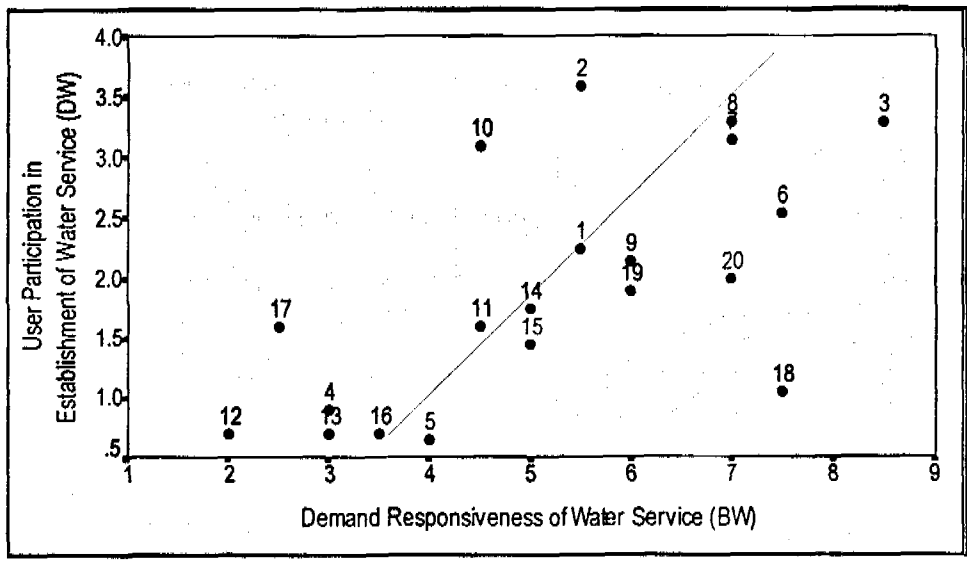
(Note : \* significant at 5% level of error      \*\* significant at 1% level of error)

AW	Sustenance and Use of Water Services	AS	Sustenance and Use of Sanitation Services
BW	Demand Responsiveness of Water Services	BS	Demand Responsiveness of Sanitation Services
CW	User Participation in Management of Water Services	CS	User Participation in Management of Sanitation Services
DW	User Participation in Establishment of Water Services	DS	User Participation in Establishment of Sanitation Services

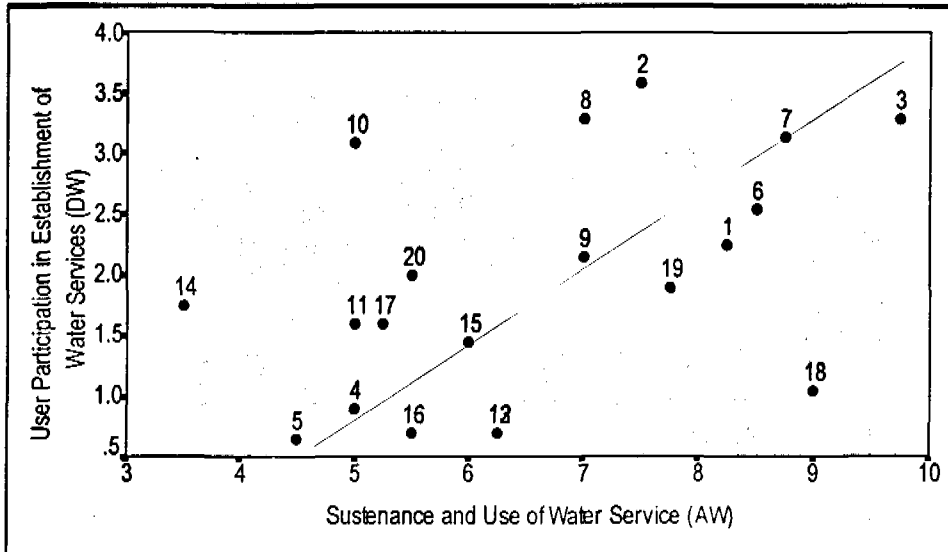
**Fig. 39 - Relationship Of Sustenance And Use Of Water Service To Demand Responsiveness Of Water Service ( $r = 0.686 **$ )**



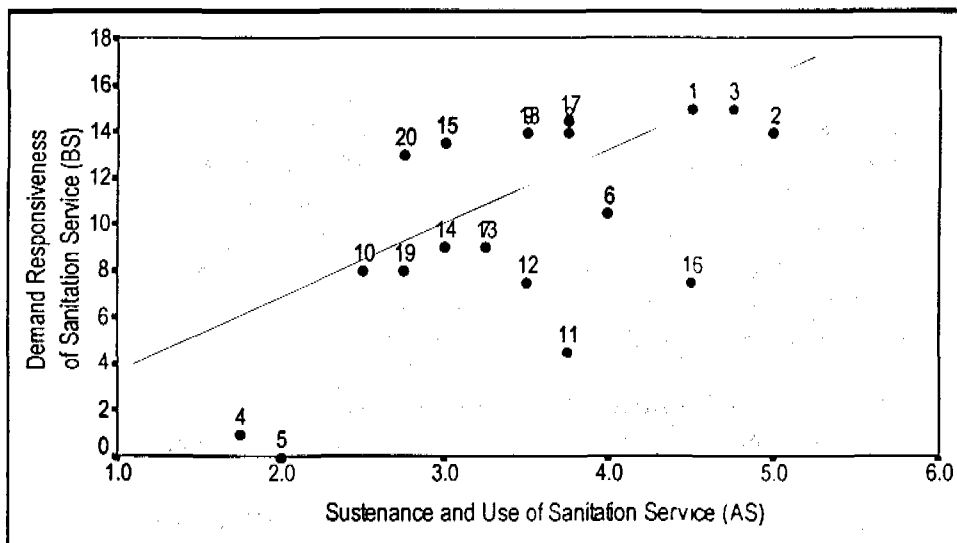
**Relationship Of Demand Responsiveness Of Water Service To User Participation In The Establishment Of Water Service ( $r = 0.647 **$ )**



**Fig. 40 - Relationship Of Sustenance And Use Of Water Service To User Participation In Service Establishment ( $r = 0.47^*$ )**



**Relationship Of Sustenance And Use Of Sanitation Service To Demand Responsiveness Of Sanitation Service ( $r = 0.675^{**}$ )**



### Villages in the Scatter Diagrams

#### West Java (1-10)

1. Babakan Pateuy
2. Mekarwangi
3. Dukuh
4. Langut
5. Kijaran Kulon
6. Kertajaya
7. Plewangan
8. Rambatan Wetan
9. Panyidangan W.
10. Lembang

#### South Sulawesi (11-20)

11. Towata
12. Tamalate
13. Aeng Batu-Batu
14. Kampung Beru
15. Timbuseng
16. Bungungloe
17. Balang. Tarawang
18. Pattiro
19. Kayuloe Timur
20. Sapanang

### Participation - Sustainability - Demand Responsiveness

As can be seen in Figures 39 and 40, 4 of the 5 highest scoring villages for *User Participation in Service Establishment*, (villages 2, 3, 7 and 8) also had high total scores for *Effective Sustainance and Use* as well as high total scores for *Demand - Responsiveness of Services*.

The relationship was more strongly illustrated at the lower end of the scale. The five lowest scoring villages for *User Participation in Service Establishment* (5, 4, 12, 13, 16) had the lowest scores overall for both *Effective Sustainance and Use* and *Demand Responsiveness of Services*.

Both the highest and the lowest scoring villages in terms of participation included a mix of Gravity-fed piped systems, deep handpumps and protected dugwells. This indicates that the type of system/technology did not make much of a difference in Sustainability and Effective Use of the service. **What mattered was the match between what the users preferred and what was finally constructed.** None of these villages had had a say in the type of system to be constructed. Focus groups in 5 villages reported that they had requested assistance for pumped piped systems or deep handpumps but had received protected dugwells instead. (Villages 9, 10, 12, 13, 17). Several others villages reported receiving 30 - 40 per cent fewer facilities than they had proposed/requested.

**These findings and related evidence from the study suggest the presence of high community demand and a willingness to pay for a higher level of service than what is being provided through the WES Program.**

**The potential for greater community investment is not being adequately tapped, due to the absence of mechanisms for a) offering a range of choices for services and b) dialogues with potential client communities to work out, negotiate and agree on prices to be paid, in terms of investment & operation & maintenance. Community participation in the WES program is taking the form of obligatory contributions ordered by the village chief. Contributions of cash, labor and materials, without choice and voice in decisions (Tables 5a and 5b) do not constitute real participation. The outcomes are visible in the low levels of community perceptions of ownership of the facilities and responsibilities for maintaining them (Figures 23 and 24).**



## **Interlinkages Between Demand for Water Supply and Sanitation**

Demand responsiveness, sustenance, effective use and management of water supply services were found to be related to sanitation services, in ways not originally hypothesized in the study. The following observations and *Figures 41* and *42* explain the situation.

**The top scoring villages have several things in common :**

	<b>Villages #</b>
Highest AW Scores (Sustenance + Use of Water Services)	3,18,7,6
Highest BW Scores (Demand - responsiveness of Water Services)	3,18,6,7,8
Highest DW Scores (Users Participation in Service Establishment)	2,3,8,7
Highest AS Scores (Sustenance + Use of Sanitation Services)	2,3,1,16
Highest BS Scores (Demand - responsiveness of Sanitation Services)	1,3,2,17,8,9,18

Villages 1, 2, 3 have Gravity Fed Piped Systems.  
Villages 6, 7, 18 have Deepwell Handpumps. 16 has Shallow Handpumps.  
Villages 8, 9, 17 have Protected Dugwells.

Figures 2c and 2d show most of these systems to be the ones that provide enough water in both seasons (villages, 2, 3, 6, 7, 17, 18)

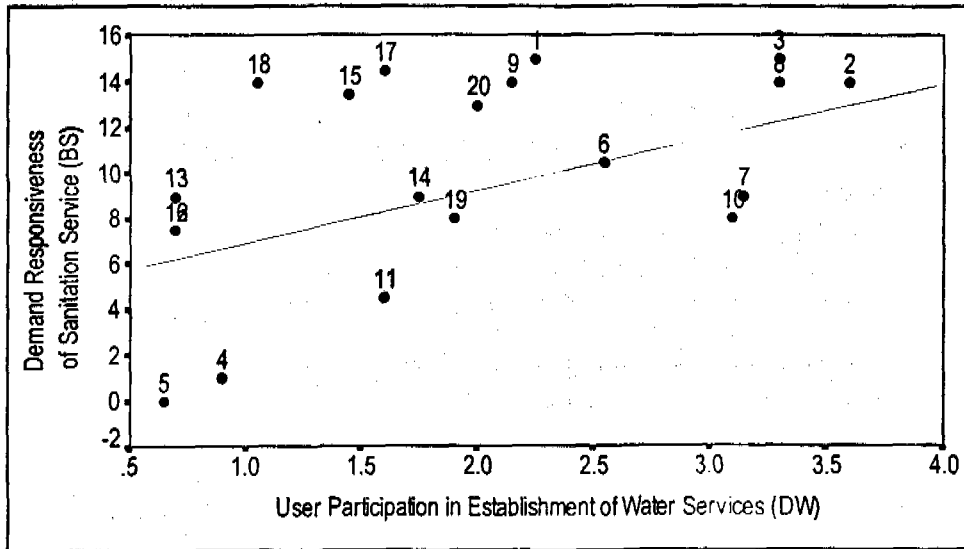
**The lowest scoring villages exhibit a consistent pattern too :**

	<b>Villages #</b>
Lowest AW Scores (Sustenance and Use of Water Services)	14,5,4,10,11
Lowest BW Scores (Demand - responsiveness of Water Services)	12,17,4,13,16
Lowest DW Scores (Users' Participation in Service Establishment)	12,13,16,5,4
Lowest AS Scores (Sustenance + Use of Sanitation Services)	4,5,10
Lowest BS Scores (Demand - responsiveness of Sanitation Services)	5,4,11

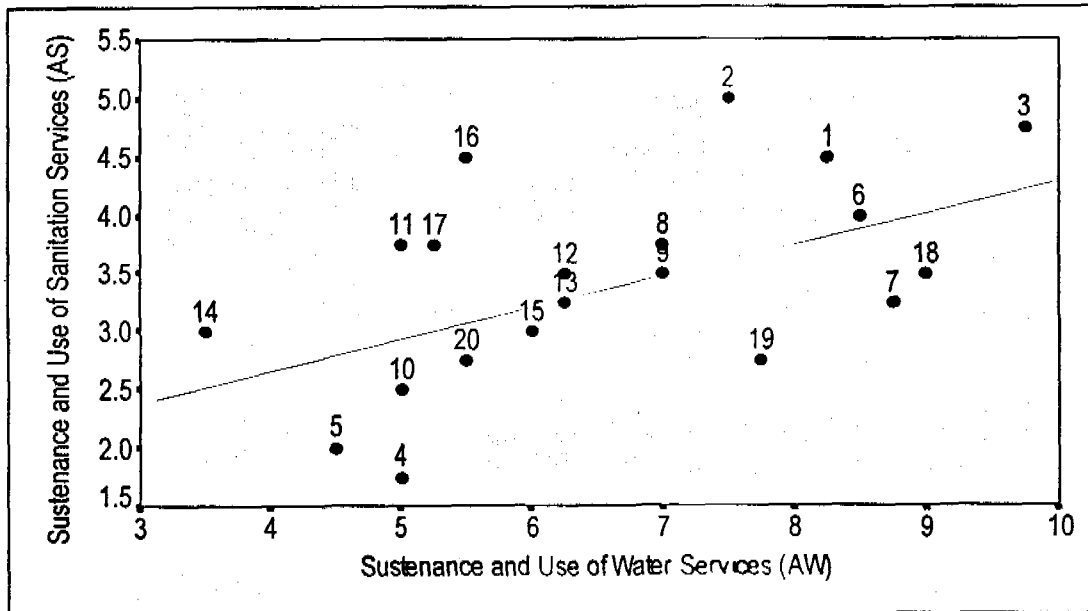
Villages 4,5,10 have Rainwater Tanks  
Village 13 has Protected Dugwells  
Villages 11,14 have Rehabilitated Traditional Wells  
Village 16 has Shallow Handpumps

Figures 2c) and d) show that all of these systems deliver insufficient quantities of water and dry up in the dry season. They are also the ones established with the least user participation.

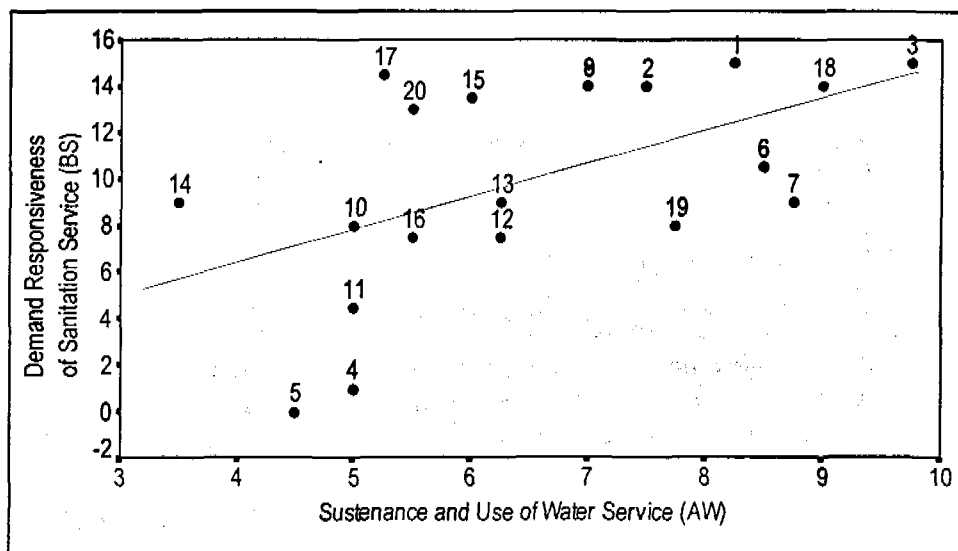
**Fig. 41 - Relationship Of User Participation In Establishment Of Water Services To Demand Responsiveness Of Sanitation Service ( $r = 0.51^*$ )**



**Relationship Of Sustenance And Use Of Water Services To Sustenance And Uses Of Sanitation Facilities ( $r = 0.504^*$ )**



**Fig. 42 - Relationship Of Sustenance And Use Of Water Service To Demand Responsiveness Of Sanitation Service ( $r = 0.543^*$ )**



The results indicate that out of the 20 villages surveyed, the villages with gravity fed piped systems tend to have water supply as well as sanitation facilities that are : a) the best sustained and used; b) the most demand responsive; and c) established with the maximum user participation. The reverse seems to be true for villages with public rainwater tanks.

Deepwell handpumps score next highest in terms of sustenance and effective use of water supply services. However they do not seem to have a comparable impact on the sustenance, use and demand responsiveness of sanitation services in their villages. Protected dugwells do not score as well as GFSPCs and PDHs for sustenance, use and demand responsiveness of water supply services. They however seem to push up the sustenance, use and demand responsiveness of sanitation facilities in their villages.

One explanation seems to be the differences in levels and regularity of service available from different types of water systems.

When users participate effectively in service establishment, they tend to ensure their desired levels of service. The UNICEF project offered only one sanitation option i.e. pour flush household latrine. For this household sanitation facility to be effectively sustained and used, it is essential to have water supply throughout the year, at household level. Villagers do not consider it feasible to carry water for flushing latrines from a source at any distance from their homes. Thus, wherever users had managed to get household connections (GFSPC piped to homes) or a dugwell in their own back/front yard (DWPs), which deliver enough water in both dry and rainy seasons, they had increasingly opted for regular usage of household latrines for defecation.

*The strongest evidence for this comes from village Dukuh in West Java, where the increase in the numbers of household latrines constructed after the project inputs ceased, has been around 400 %. People have built them of their own initiative, without any subsidies, after a good GFSPC system*

has brought a year-long supply of water in sufficient quantities - being piped to a sufficiently large proportion of village homes.

The lesson is clear. Promotion of sanitation coverage/access cannot afford to be independent of the process of providing water. The process of providing water supply has to ensure informed choice by user communities so that they choose to buy and maintain a level of (water) service that enables them to easily sustain and use household sanitation facilities. The types and levels of sanitation service available to them will also influence their choice of water services and vice-versa. The only way to get all this right seems to be to fully inform and consult user communities about their choice at every step in establishing water + sanitation services.

The following hypotheses were validated by testing:

#### Hypothesis 1

- *Effective Sustenance and Use of water supply and sanitation services increases with the extent of Demand - Responsiveness of the Services*

A Significant positive correlations (Pearson's r) found for Water Supply services were 0.686, and for Sanitation services were 0.675, both significant at 1 per cent level.

#### Hypothesis 2

- *Demand Responsiveness of Water Supply Services increases with Users' Participation in Service Establishment*

A Significant positive correlation (Pearson's r) found for Water Supply was 0.647, significant at 1 per cent level. No significant correlation was found in case of Sanitation services

#### Hypothesis 3

- *Effective Sustenance and Use of Water Supply Services increases with Users' Participation in Service Establishment*

A Significant positive relationship was found for water supply,  $r = 0.47$ , significant at 5 per cent level. No significant correlation was found for sanitation.

When the choice of sanitation technology is water-intensive (as in this project), two additional hypotheses can be tested.

#### Hypothesis 4

- *Effective Sustenance and Use of Sanitation facilities increases with :*
  - *Effective Sustenance and Use of Water Supply services* ( $r = 0.504$ , significant at 5% level)
  - *User Participation in the management of water supply services.* ( $r = 0.501^*$ , significant at 5% level)

#### Hypothesis 5

- *Demand responsiveness of sanitation facilities increases with :*
  - *Effective Sustenance and Use of water supply services* ( $r = 0.543$ , significant at 5% level)
  - *Demand-responsiveness of water supply services* ( $r = 0.506$ , significant at 5% level)
  - *User participation in the establishment of water supply services* ( $r = 0.51$ , significant at 5% level)

## What the Tests Imply

The results offer statistical evidence that water supply systems are more effectively sustained and used when they meet more of the users' demands. Water supply services meet more of the users' demands when there is greater participation of the users in service establishment. Greater user participation in service establishment also leads to more effective use and sustenance of water supply services.

A somewhat different picture emerges for sanitation, which appears to be largely due to the technology used for sanitation facilities in the project being highly dependent on the availability of water for proper functioning.

The statistical test results indicate that sanitation services tend to meet more community demands, and are sustained and used more effectively, when :

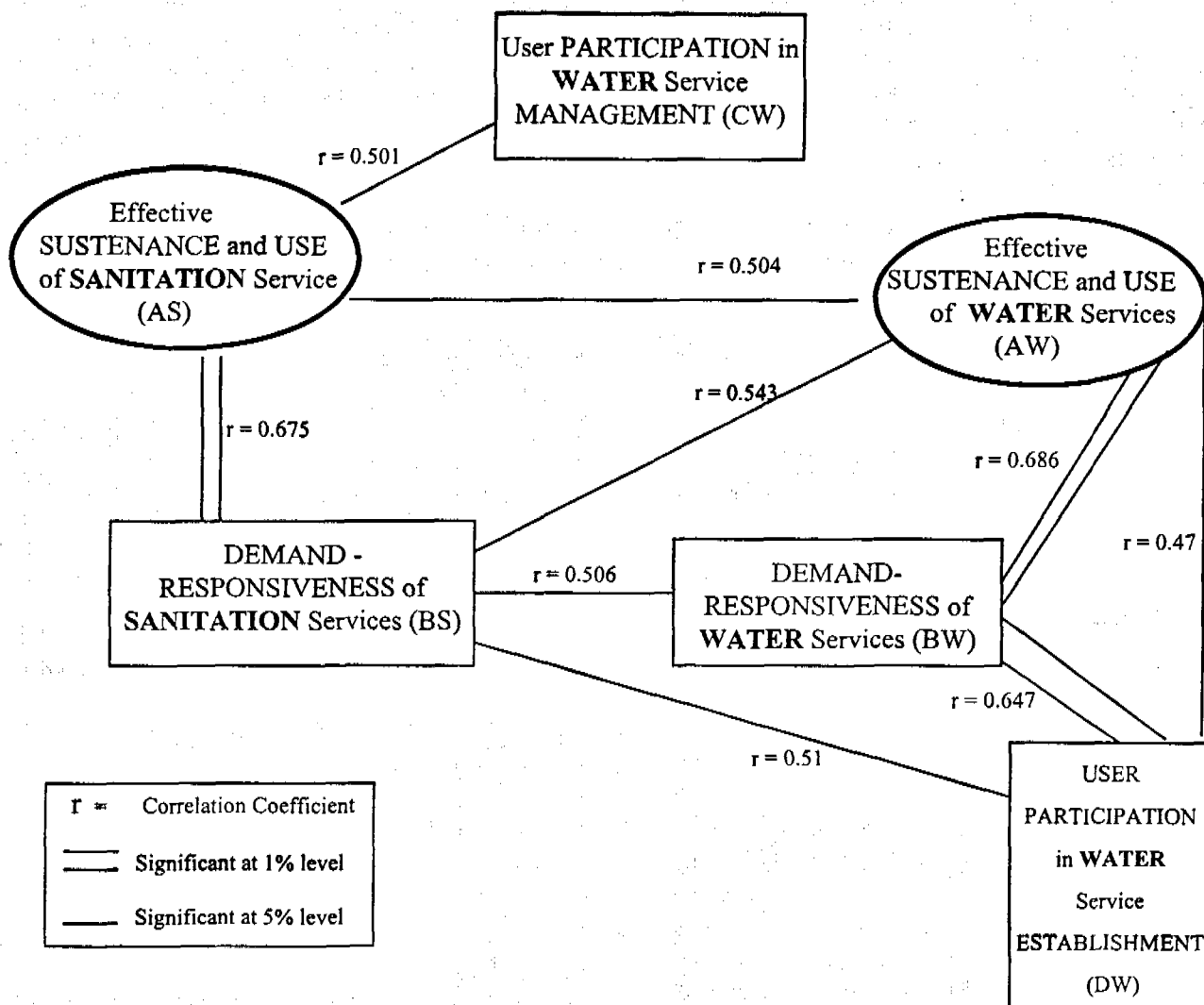
- a) community water supply services meet community demands well
- b) the users can effectively sustain and use their water supply services
- c) the users participate adequately in establishing water supply services
- d) the users participate adequately in managing their water supply services

Thus both the *demand responsiveness* and *effective use and sustenance of sanitation facilities* were influenced by how water supply services were provided, sustained, used and managed in the community.

Although the tests are not proofs of causality, the above results strongly suggest that when the sanitation technologies selected are water-intensive, a) demand for sanitation will tend to rise when the community members can effectively sustain and use their water supply services, through greater participation in the process of creating them. Moreover, existing sanitation facilities will be used and sustained more effectively when users have greater participation in managing their own water supply services (Fig. 43).

These findings have important implications for UNICEF since UNICEF is currently considering a move away from water supply and towards a greater emphasis on providing sanitation services.

**Fig. 43 - Significant Correlations Found Between Major Variables**



### Tests of Variance

Since several technological options were used for providing Water Supply services, Analysis of Variance (ANOVA) was carried out with mean scores for the different types of systems evaluated. For sanitation this was not possible as a single-pit, pour flush latrine was the only option propagated in the UNICEF program.

**ANOVA results showed no significant variance amongst different types of water supply systems for the main dependent variable. Thus, effective sustenance and use of water supply systems did not vary significantly with the type of the system.**

ANOVA results for means of the three independent variables also showed no significant variance among different types of systems for:

- i) demand - responsiveness
- ii) users participation in service management and
- iii) users participation in service establishment

This was not unexpected since all the systems were provided using the same process which did not greatly involve the majority of users in creating or managing the services.

# Technical Assessment Scoring System



## **ANNEXURES**

- A. Technical Assessment Scoring System**
- B. Sequence of Participatory Learning Exercises**
- C. Questionnaires for Community Leaders and Technical Evaluation**
- D. Sample of PHAST Tools Developed**
- E. Sample Outcomes of PRA Exercises**
- F. Terms of Reference**

## Scoring Criteria for Water Supply Systems (technical assessment)

Item	Condition	Score	Score	Criteria
1. System Functioning			2	
	Good	2		If 100% of water systems are functioning
	Fair	1		If more than 50% of water systems are functioning
	Poor	0		If less than 50% of water systems are functioning
2. Water Availability			3	
Rainy Season	Poor	1		If water availability is less than: 3 lpcd for RWTH, 30 lpcd for hand pump/dugwell and 60 lpcd for pipe systems
	Fair	2		If water availability is about: 5 lpcd for RWTH, 30 lpcd for hand pump/dugwell and 60 lpcd for pipe systems
	Good	3		If water availability is more than: 3 lpcd for RWTH, 30 lpcd for hand pump/dugwell and 60 lpcd for pipe systems
Dry Season	Poor	1		If water availability is less than: 3 lpcd for RWTH, 30 lpcd for hand pump/dugwell and 60 lpcd for pipe systems
	Fair	2		If water availability is about: 5 lpcd for RWTH, 30 lpcd for hand pump/dugwell and 60 lpcd for pipe systems
	Good	3		If water availability is more than: 3 lpcd for RWTH, 30 lpcd for hand pump/dugwell and 60 lpcd for pipe systems
3. Water Utilization			12	
Drinking	Rainy season	3		Water is sufficient for drinking in the rainy season
	Dry season	6		Water is sufficient for drinking in the dry season
Washing	Rainy season	2		Water is sufficient for washing in the rainy season
	Dry season	4		Water is sufficient for washing in the dry season
Bathing	Rainy season	1		Water is sufficient for bathing in the rainy season
	Dry season	2		Water is sufficient for bathing in the dry season
4. Physical Condition			4	
	Good	4		RWTH: no cracks on the walls/good water tap, water saving capacity 100%;DWP: no cracks in well lining/washing slab/drain; PDH/PSH: no cracks in the washing slab/drain, handpump functioning well; OFSPC: no leaks in piping network, # of distribution tanks functioning as design, no broken supporting units/spring or water source well protected
	Slightly damaged	3		RWTH: minor cracks on the wall/no leaking tap, water saving capacity 100%;DWP: minor cracks on well lining/washing slab/drain; PDH/PSH: minor cracks on the washing slab/drain, handpump functioning well/minor breaks on short age spareparts; OFSPC: minor leaks on piping network/distribution tanks but the # is still functioning as design, minor breaks/cracks on supporting units/spring or water source well protected
	Fairly damaged	2		RWTH: has cracks on the wall/leaking tap, water saving capacity about 75%;DWP: cracks on well lining/washing slab/drain; PDH/PSH: cracks on the washing slab/drain, handpump functioning well/minor breaks on long age spareparts; OFSPC: leaks on piping network/distribution tanks the # of functioning tanks is less than projected, minor break/cracks on supporting units/spring or spring protector
	Seriously damaged	1		RWTH: has cracks on the wall/broken tap, water saving capacity about 50%;DWP: broken well lining/washing slab/drain effect water quality; PDH/PSH: broken washing slab/drain, handpump not functioning well/broken long age spareparts; OFSPC: broken piping network/distribution tanks the # of functioning tanks is less than 50% than projected, broken supporting units/leaks on spring protector and effect water quality
	Total loss	0		The system is not functioning at all
5. Design Quality			1	
	Design Faults	1		RWTH: saving water capacity is designed less than 3 lpcd per dry season;DWP: well diameter not wide enough which make it difficult for user to deepen the well in the dry season;PDH/PSH: shallow handpump used for deep water table; OFPC: Hydraulic water gradient line not used as base for DED
	Design Faults Exist	0		RWTH: saving water capacity is designed less than 3 lpcd per dry season;DWP: well diameter not wide enough which make it difficult for user to deepen the well in the dry season;PDH/PSH: shallow handpump used for deep water table; OFPC: Hydraulic water gradient line not used as base for DED

Item	Condition	Score	Score	Criteria
<b>6. Contamination</b>			<b>2</b>	
	None	1		RWTII: not covered; PDI/PSHDWP: Distance from closest pollutant less than 10 m, broken washing slabs/drain/Well lining; OFPC: water source unprotected, distribution water tanks uncovered
	Possible	0		RWTII: not covered; PDI/PSHDWP: Distance from closest pollutant less than 10 m, broken washing slabs/drain/Well lining; OFPC: water source unprotected, distribution water tanks uncovered
<b>7. Water Testing</b>			<b>1</b>	
	Regular	1		Water testing done in a regular basis
	Once	1		Water testing done only in the beginning
	Never	0		Water testing never done at all
<b>8. Water Quality</b>			<b>6</b>	
	Color	1		Water contains no color
		0		Water contains color
	Taste	1		Water has no taste
		0		Water has taste
	Turbidity	1		Water clear
		0		Water turbid
<b>9. Land Ownership</b>			<b>1</b>	
	Public	1		Land publicly owned
	Private	0		Land privately owned
<b>10. Facility Ownership</b>			<b>1</b>	
	Public	1		Facility publicly owned
	Private	0		Facility privately owned
<b>11. Repeatability</b>			<b>1</b>	
	Institution & Evidence	1		Institution for WS replication was established and has clear development plans, and Evidence of constructed water systems could be proven
	Institution or Evidence	1		Institution for WS replication was established and has clear development plans, or Evidence of constructed water systems could be proven
	No Institution and no Evidence	0		No Institution for WS replication was established Evidence of constructed water systems could be proven
<b>11. Ability to Operate &amp; Maintain</b>			<b>1</b>	
	Management Workmanship Regularity	2		Communal system (more than 10 hh user): All 3 criteria were proven: 1. Organised WS management system established, 2. Evidence of ability in workmanship (could be the use of outside artisan) and, 3. Has regular user fee collection, maintenance plans Individual system (less than 10 hh user): All 2 criteria were proven: 1. Evidence of ability in workmanship (including the use of outside artisan) and 2. Has regular user fee collection and WS maintenance plans
	Management Workmanship Regularity	1		Communal system (more than 10 hh user): At least 1 criteria is proven: 1. Organised management system established, or 2. Evidence of ability in workmanship (could be the use of outside artisan) or, 3. Has regular user fee collection, maintenance plans Individual system (less than 10 hh user): One of the 2 criteria is proven: 1. Evidence of ability in workmanship (could be the use of outside artisan) and, 2. Has regular user fee collection, maintenance plans
	Management Workmanship Regularity	0		Communal system (more than 10 hh user): None of the 3 criteria were proven: 1. Organised management system established, or 2. Evidence of the ability in workmanship (could be the use of outside artisan) and, 3. Has regular user fee collection, maintenance plans Individual system (less than 10 hh user): None of the 2 criteria is available: 1. Evidence of ability in workmanship (could be the use of outside artisan) and, 2. Has regular user fee collection, maintenance plans
<b>Total</b>			<b>41</b>	

# Sequence of Participatory Learning Exercises

## PROPOSED SEQUENCE OF PRA / PHAST LEARNING EXERCISES

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PILE SORTING ( WHO DOES WHAT )	- Task roles & Water using activities
PILE SORTING	- Gender analysis - Control of resources
WEALTH CLASSIFICATION	- Local criteria to identify rich, poor, in-between households
SOCIAL MAPPING	- Location of water resources / facilities, and all Sanitation facilities Access of rich - poor to services, Services before / after project; intervention Who pays what ( whether linked to differentials in access ) ? Who excluded ? Why ? Defecation sites ? Waste disposal areas ?
PICTORIAL MATRIX ( CHANGE IN USE )	- Water use by source: Before / After project, Reasons
RATING SCALES	- User group views re: Water Services Quality / Quantity / Regularity / Convenience / Fairness of Fees / Management of Water Facility / Cost Effectiveness of Sanitation Facility
TREND ANALYSIS	- Impact on QOL ( Do in a Group for communal facilities, with individuals for household facilities )
HEALTH AWARENESS* ( PHAST - Nurse Tanaka Exercise )	- Common local health problems by age / sex - Awareness of connection with Water Sanitation - Choices being made for curative action at present
PILE SORTING ( Hygiene Behaviour )	- Hygiene practices & awareness, rationale for practices - Key behaviours feasible to promote
FLOW DIAGRAM ( Contamination Routes ) *	- Awareness of local routes of disease transmission - Awareness of key preventive measures - Implications for improving effectiveness of Hygiene promotion
PICTORIAL MATRIX ( Decision Process )	- How key decisions made ( how participatory and gender sensitive )

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- Included only for UNICEF WES Study, Indonesia

### SUMMARY OF RESEARCH TOOLS

<u>TOOLS</u>	<u>NO. USED PER VILLAGE</u>	<u>FOR UNICEF WES STUDY</u>	
		<u>WEST JAVA</u>	<u>SOUTH SULAWESI</u>
1. FGD Guide for Community Leaders and WatSan Committee ( Group Questionnaire )	1	10	10
2. Technical Observation Checklist & Photographs	1 approx. 10	10 100	10 100
3. PRA / PHAST sequence with men's group ( done over 2-3 evenings )	1 set	10	10
4. PRA / PHAST sequence with women's groups ( done over 2-3 evenings )	1 set	10	10
5. Semi Structured Interview Guide ( Household Questionnaires for Individual men and women visited at home )	20 interviews (10 women + 10 men; 8 poor 6 middle 6 rich	200	200

### INDICATIVE WORK SCHEDULE IN A VILLAGE

**DAY 1:** Arrive, introduce purpose, Do 1 ( Community Leaders / WATSAN Committee Group Questionnaire )  
Look at records of Water Committee.  
Arrange for evening meetings starting on Day 1 or 2, in consultation with men & women.

**DAY 2:** Do 2 ( Technical Observation & Photos ) - *Morning*  
Start 3 and 4 ( PRA / PHAST ) with 2 Simultaneous groups - *Afternoon and Evening*

**DAY 3:** Compare notes, Triangulate - *Morning*  
Do 5 ( Household interviews ) - *Afternoon*  
Do 3 PRA / PHAST with 2 Simultaneous group - *Evening*

**DAY 4:** Compare Notes, Triangulate - *Morning*  
Do 5 ( Compare household interviews ) if remaining - *Afternoon*  
Do 3 ( PRA / PHAST remaining ) - *Evening*

## FGD / PRA / PHAST WITH WOMEN

1. Who does what? - PILE SORTING
  - Identify WSS managers
  - Establish need to consult woman more than man

---
2. Control of Resources - Gender Analysis - PILE SORTING
  - Understand Men/Women's status re: decision making
3. Wealth Classification -
  - Identify poorest households, richest, households, in between households
  - Get Women's and Men's criteria. .... Then continue

---
4. Social Mapping
  - Identify W & S facilities
  - Access of poor /rich to facilities
  - Which one serves how many ?
  - Criteria for good / bad - W & S
  - Who excluded ? Why ?
  - Ancillary facilities - What ?  
Who build ?

FGD QUESTIONS FOR PAYMENT FOR WATER  
(ASK WOMEN)

---

- a) Do you pay any fees to use the water facility ?
- b) Do all households pay the same amount ?
- c) If not, who pays how much ? Who, in the household, makes the payment?
- d) What are the reasons for difference in fees ?
- e) Did you have to pay anything to become a user ? If yes, how much ?
- f) Are there people who use the facility but do not pay anything ? Why does this happen ?
- g) Are there any rules the users must keep to ? What are they ? What happens if someone violates the rules ?
- h) Do you know if the fees you pay are sufficient for meeting O & M costs ?
- i) Is there any fund for replacing / upgrading / expanding the Water facility ? How is it collected ?
- j) Is this the kind of water facility you asked for ? If not, what kind did you want ?

Why did you finally get this kind ?

---



5. A) RATING SCALES: (Draw scale on the ground, 2 meters long.

Ask group to mark their opinion by consensus)

What is your opinion about the:

a) Quality of the water you get:

Reasons for answer:

b) Quantity of the water you get:

Reasons for answer:

◦ Regularity of service:

◦ Reasons for answer:

◦ Fairness of fees you pay:

◦ Reasons for answer:

◦ Management of the water facility:

◦ Reasons for answer:

## FGD QUESTIONS ABOUT MANAGEMENT OF WATER SYSTEM

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- a) How often did it breakdown in the last one year ?
  - b) What was the problem ?
  - c) How much time lapsed between breakdown and repair each time ?
  - d) Who organized repair ?
  - e) Who paid for it ? How ?
  - f) Is there an arrangement / group of people responsible for management of the water system ?
  - g) Is it currently functional ?
  - h) How many members does it have ? How many women ? How many from the rich / in-between /  
poor households ?
  - i) How were the members selected ?
-

## FGD QUESTIONS ABOUT COMMUNAL SANITATION FACILITY (If any in the Map)

---

- a) Why did this Sanitation facility get built ?
  - b) Who asked for it ?
  - c) Did anyone pay anything to get it constructed ? Who paid, how much ?
  - d) Who uses it ? Who does not ? Why ? ( Refer to the Map )
  - e) Who is responsible for its maintenance ? Do users do anything for maintenance ? If yes, what ?
  - f) Who pays, how much, for using the facility ?
- 

### 5. B) RATING SCALES:

How useful is this sanitation facility to the village ?

Reasons for answer:

---

### 6. WATER SOURCES AND USE                      Pictorial Matrix

Before / After Project

- Ask about seasonal change in use also

## FGD QUESTIONS ABOUT QUALITY OF PARTICIPATION

---

a) Who does what work for keeping Water and Sanitation system working ?

(For each type of work ask if it is: Paid / Unpaid. If paid - How much ? For what ?

Skilled / Unskilled

Done by Man / Done by Woman

b) Who is responsible for the water system's functionary ?

c) What are the responsibilities of the users ?

d) What are the responsibilities of the Village Water Committee ?

e) Who decides the rules /sanctions for use of the Water and Sanitation facility ?

f) How are rules / sanctions applied ?

g) Who decide about tariffs, repairs, timings of service ?

h) Do you ( users ) know how much money is collected from all users every month ?

i) Do you know where it is kept ?

Do you ( users ) know how it is used, spent ?

j) How do you know ? What are the ways if sharing financial information ?

- k) Does the Water Committee have a bank account ? How much money is currently in the account ?
- l) How many households currently use this water facility ?
- m) How many households was it originally designed to serve >
- n) Who is benefiting more from the facility ? How and why ? ( W / M / R / P )
- o) Who is benefiting less ? Why ? ( W / M / R / P )
- p) Who owns the water facility ?
- q) Is there legal recognition of ownership ?
- 

## 7. TREND ANALYSIS

( What has changed in your lives after the Water facility was constructed )

After it is done by the women, ask:

- Are these changes some or different for rich and poor households ?
  - Has there been any change in men's levels ? If yes, what ?
  - Any change in children's level ? If yes, what ?
-

8. HEALTH AWARENESS

( Nurse Tanaka Exercise )

° Understand common health problem of different age-sex groups

° Assess awareness of links between health problems and Water & Sanitation

9. HYGIENE BEHAVIOR PILE SORTING

° Identify current understanding of good / bad hygiene

° Understand rationale for good / bad classification

---

10. CONTAMINATION ROUTES  
& BLOCKS ( How diagram )

° Assess existing awareness of fecal-oval contamination routes

° Assess awareness of key preventive practices

## FGD QUESTIONS FOR DECISION MAKING & CAPACITY BUILDING PROCESS

---

### PRE CONSTRUCTION: Information

- a) How / why was this village selected for the Water Supply and Sanitation project ?
- b) Before anything happened, who gave what information about the project, to whom in the village?
- c) How was information given ? What methods / materials were used ?
- d) How consistent was this information with what happened later during project implementation ?
- e) Show each IEC material and ask:

Have you ever seen this ?

What is it ?

What message does this convey ?

When did you first see / hear it ?

How was it used ? By whom ? To whom ?

What do you think of this message ?

### PRE CONSTRUCTION: Information Choice

#### For Water Facility

- f) What types of technological options were offered ? To whom ? By whom ?
- g) What options of services levels were offered ? To whom ? By whom ?
- h) What rules / conditions for participation were conveyed ? To whom ?

- i) Among whom were all these things discussed and agreed ?
- j) What was chosen ( type & level of facility ) ?
- k) What was finally constructed ? If not same as chosen, why ?

For Sanitation Facility

- a) What types of technological options were offered ? To whom ? By whom ?
- b) What options of services levels were offered ? To whom ? By whom ?
- c) What rules / conditions for participation were conveyed ? To whom ?
- d) Among whom were all these things discussed and agreed ?
- e) What was chosen ( type & level of facility ) ?
- f) What was finally constructed ? If not same as chosen, why ?

CONSTRUCTION: Information

- l) Who monitored:

Procurement of materials:

Quality control:

Contracting of construction:

Schedule of implementation as agreed:

- m) Did these things happen as agreed ? If not, why ?



n) Was any training / capacity building experience provided ?

What kind ?

To whom provided ?

How provided ?

o) How were trainers selected for each type of training ?

p) In your opinion, how effective was each type of training ?

q) Were there other methods of building capacity besides training ? If yes, what ?

#### POST-CONSTRUCTION

r) What post-construction support was provided by the service-delivery agency ?

s) In your opinion what has led to the present ( good ? bad ? ) situation regarding:

Financing of Services:

Roles & Responsibilities for Management:

Legal Recognition of Ownership of Facilities:

t) If you had a choice now, would you have chosen the same kind of Water & Sanitation facilities that you have - or something quite different ? If different, what ? Why ?

#### II. DECISION MATRIX

° To understand the pattern of making key decisions for creating the facility

## FGD / PRA / PHAST WITH MEN

### 1. Wealth Classification -

° Identify poorest households, richest, households, in between households

° Get Women's and Men's criteria.  
..... Then continue

---

## FGD QUESTIONS ABOUT QUALITY OF PARTICIPATION

---

a) Who does what work for keeping Water and Sanitation system working ?

(For each type of work ask if it is: Paid / Unpaid. If paid - How much ? For what ?

Skilled / Unskilled

Done by Man / Done by Woman

b) Who is responsible for the water system's functionary ?

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f) How are rules / sanctions applied ?

g) Who decide about tariffs, repairs, timings of service ?

h) Do you ( users ) know how much money is collected from all users every month ?

i) Do you know where it is kept ?

Do you ( users ) know how it is used, spent ?

j) How do you know ? What are the ways if sharing financial information ?

k) Does the Water Committee have a bank account ? How much money is currently in the account ?

l) How many households currently use this water facility ?

m) How many households was it originally designed to serve >

n) Who is benefiting more from the facility ? How and why ? ( W / M / R / P )

o) Who is benefiting less ? Why ? ( W / M / R / P )

p) Who owns the water facility ?

q) Is there legal recognition of ownership ?

---

## 2. TREND ANALYSIS

( What has changed in your lives after the Water facility was constructed )

After it is done by the women, ask:

- Are these changes some or different for rich and poor households ?
- Has there been any change in men's levels ? If yes, what ?
- Any change in children's level ? If yes, what ?

3. HEALTH AWARENESS

( Nurse Tanaka Exercise )

° Understand common health problem of different age-sex groups

° Assess awareness of links between health problems and Water & Sanitation

---

4. HYGIENE BEHAVIOR PILE SORTING

° Identify current understanding of good / bad hygiene

° Understand rationale for good / bad classification

---

5. CONTAMINATION ROUTES  
& BLOCKS ( How diagram )

° Assess existing awareness of fecal-oval contamination routes

° Assess awareness of key preventive practices

---

## FGD QUESTIONS FOR DECISION MAKING & CAPACITY BUILDING PROCESS

---

### PRE CONSTRUCTION: Information

- a) How / why was this village selected for the Water Supply and Sanitation project ?
- b) Before anything happened, who gave what information about the project, to whom in the village?
- c) How was information given ? What methods / materials were used ?
- d) How consistent was this information with what happened later during project implementation ?

- e) Show each IEC material and ask:

Have you ever seen this ?

What is it ?

What message does this convey ?

When did you first see / hear it ?

How was it used ? By whom ? To whom ?

What do you think of this message ?

### PRE CONSTRUCTION: Information Choice

#### For Water Facility

- f) What types of technological options were offered ? To whom ? By whom ?
- g) What options of services levels were offered ? To whom ? By whom ?
- h) What rules / conditions for participation were conveyed ? To whom ?

- i) Among whom were all these things discussed and agreed ?
- j) What was chosen ( type & level of facility ) ?
- k) What was finally constructed ? If not same as chosen, why ?

For Sanitation Facility

- a) What types of technological options were offered ? To whom ? By whom ?
- b) What options of services levels were offered ? To whom ? By whom ?
- c) What rules / conditions for participation were conveyed ? To whom ?
- d) Among whom were all these things discussed and agreed ?
- e) What was chosen ( type & level of facility ) ?
- f) What was finally constructed ? If not same as chosen, why ?

CONSTRUCTION: Information

- l) Who monitored:
  - Procurement of materials:
  - Quality control:
  - Contracting of construction:
  - Schedule of implementation as agreed:
- m) Did these things happen as agreed ? If not, why ?
- n) Was any training / capacity building experience provided ?  
What kind ?                      To whom provided ?                      How provided ?

- o) How were trainers selected for each type of training ?
- p) In your opinion, how effective was each type of training ?
- q) Were there other methods of building capacity besides training ? If yes, what ?

#### POST-CONSTRUCTION

- r) What post-construction support was provided by the service-delivery agency ?
- s) In your opinion what has led to the present ( good ? bad ? ) situation regarding:

Financing of Services:

Roles & Responsibilities for Management:

Legal Recognition of Ownership of Facilities:

- t) If you had a choice now, would you have chosen the same kind of Water & Sanitation facilities that you have - or something quite different ? If different, what ? Why ?

**SANITATION INSERT FOR HOUSEHOLD QUESTIONNAIRE**  
( Ask only households having access to sanitary latrines )

---

Note: Type of latrine \_\_\_\_\_, Family / Communal / Institutional \_\_\_\_\_, Functional / Not Functional \_\_\_\_\_

---

1. Why was this latrine constructed ?
  
2. a. Did someone in the village / household ask for it ?  
  
b. If yes, who within the village / household most wanted it ?
  
3. Who paid for getting it ? From what funds ?
  
4. If household latrine, who within the household uses it ?
  
5. All the time \_\_\_\_\_ ; Sometime \_\_\_\_\_ ; (when ? )
  
6. Who does not use it ? Why ?
  
7. When did you get this latrine constructed ?
  
8. Is this the kind of latrine you wanted ? If not, what kind did you want ?
  
9. Why did you get this kind ?
  
10. How much did you have to pay to get it ? Cash \_\_\_\_\_ ; Labour \_\_\_\_\_ ;  
Materials \_\_\_\_\_ ; Land \_\_\_\_\_
  
11. Who is responsible for keeping the latrine clean ?  
( Observe cleanliness within and around latrine. Look if there is cleaning arrangement or hand-washing facility nearby )



12. What has been your experience of using this latrine so far:

Functioning:

Maintenance:

13. If any problems mentioned, ask what were the causes of the problem/s ?

14. What happened as a result ?

15. How long do you think the latrine will serve your needs ?

16. What do you plan to do when it cannot be used any longer ?

17. If your latrine breaks down / becomes dysfunctional, what would you do ?

( Probe if trained persons and spareparts available for repair, is there willingness to get repair done )

18. Has the latrine made any difference to your life ? To your family's life ?

19. If yes, what ?

20. How worth while was the money / materials / labors you invested in getting the latrine ?

Not at all worth while

Fully worth while

# Set of Questionnaires

### QUESTIONNAIRE FOR COMMUNITY LEADERS/WATER COMMITTEE

Interviewer's Name :   
Project Name :   
Village Name :   
Hamlet Name :

#### Meeting Participants

Head of Village :   
Village Institution :   
Comm. Personage :   
Family Welfare Movement :   
Miscellaneous :   
Men :   
Women :

Remarks : - please explain the Question with (\*) mark in Qualitative Assessment  
- please explain with at least 10 words in the proper line

#### PROJECT PROPOSALS

C1. Why are Water Supply & Sanitation Project be proposed (\*)

\_\_\_\_\_

C2 In what year Water Supply & Sanitation Projects be proposed

C2

C3 Who is proposing the WSS projects (\*)

\_\_\_\_\_

C4 When did UNICEF start to build WSS facilities ?  
(month & year)

C4

C5 When was the WSS finished ?  
(month & year)

C5

#### VILLAGE PRIORITY

C6 Is there any other important facility to be built instead of WSS facilities ?

- a. Yes
- b. No
- c. Don't Know

C6

- C7 What is the priority
- a. Schools
  - b. Place for temporary children/babies care
  - c. Public Medical Services
  - d. Roads
  - e. I don't know
  - f. Neither one
  - g. others

C7

- C8 Are there any other projects offered instead of WSS facilities ? \*
- a. Yes
  - b. I don't know

C8

INFORMATION DISSEMINATION

- C9 How are they getting information (from outside the village) regarding the possibilities of receiving WSS facilities donations? \*
- 

- C10 Where do the funds to built WSS facilities come from ?
- 

- C11 Do you know the rules to get funding ?

- |  |                       |
|--|-----------------------|
| 1. is it necessarily to form a WSS committee | 2. money to be funded |
| 3. to supply materials or land               | 4. labor              |
| 5. to supply a proposal (VAP)                | 6. training           |
| 7. others                                    | 8. nothing            |

- a. Yes (know about > 50% of the current rules)
- b. No (can not mention)

C11

- C12 Is there any discussion about Water Supply Sanitation being held in this village (number of people who involved/participated, please explain in Q.A)

- a. yes, seldom
- b. yes, only once
- c. never

INFORMED CHOICE

- C13 Who is involved in the decision on the water source for WSS projects ?

- a. project staff
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water users

C13

C14a Who will decide Water Supply technology to be used ?

- a. project staff
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water user

C14a

C14b Who will decide Sanitation technology to be used ?

- a. project staff
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water user

C14b

C15a Who will decide on the service level of Water Supply?

- a. project staff
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water user

C15a

C15b Who will decide on the service level of sanitation?

- a. project staffs
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water user

C15b

C16a Who will decide on the Water Supply project's location ?

- a. project staff
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water user

C16a

C16b Who will decide on the Sanitation project's location ?

- a. project staff
- b. head of village
- c. village institution/personage of village community
- d. community personage
- e. water committee
- f. community / water user

C16b

C17 Has the community been informed about the different costs of different choices of service?

- a. yes
- b. no

C17

C18 Are difference in cost for service being considered by the community who will use the facility ?

- a. yes
- b. no

C18

C19a Is there any choice related to the community needs ?

- a. yes
- b. no

C19a

C19b Are there any choices for Sanitation services related to the community's needs ?

- a. yes
- b. no

C19b

C20a If the WS facilities have been built unrelated to the community needs, why are they continuing to build the water supply facilities ? (\*)

- a. they have to
- b. to use the chances
- c. because of good guidance
- d. village decision (government/water supply company)
- e. others

C20a

C20b If the sanitation facilities have been built unrelated to the community needs, why are they continuing to build the sanitation facilities ? (\*)

- a. they have to
- b. to use the chances
- c. because of good guidance
- d. village decisions (government/water supply company)
- e. others

C20b

C21a Does the community know the costs of the water supply facilities project ?

- a. yes
- b. no/wrong  
how much \_\_\_\_\_

C21a

C21b Does the community know the costs of the sanitation facilities project ?

- a. yes
- b. no/wrong  
how much \_\_\_\_\_

C21b

INSTITUTIONAL INFORMATION

C22 Which institution is responsible for water supply facilities (please indicate if it has a legal basis)

\_\_\_\_\_

C23 How many people are members of the water committee?

C23

C24 How many of the members are women ?

C24

C25 How are they being chosen?

\_\_\_\_\_

C26 Are there any rules to handle water supply facilities, if there is an institution or if there is no active institution ?

C27 Was the community asked to participate in the village meeting coordinated by the water supply project staff during the last 6 months:

- a. yes
- b. no

C27

C28 Who is responsible to coordinate public/school latrines ?

- a. formal group
- b. informal group
- c. Individual
- d. others

C28

C29a Did the community know that they were responsible to take care and operate the water supply facilities since it has been constructed ?

- a. yes, everybody know (including the users)
- b. yes, part of them (community personage) know
- c. no

C29a

C29b Did the community know that they were responsible to take care and operate the sanitation facilities since it has been constructed ?

- a. yes, everybody know (including the users)
- b. yes, part of them (community personage) know
- c. no

C29b

### CONTRIBUTION

C31a Does the community pay contribution for water supply facilities ? (\*)

- a. yes
- b. no

C31a

C31b Does the community pay contribution for sanitation facilities ? (\*)

- a. yes
- b. no

C31b

C32a Who participated to pay water supply facilities project ? (\*)

- a. the whole village community
- b. all hamlets who use the facilities
- c. propose water users
- d. there is no one have to pay

C32a

C32b Who are responsible to pay sanitation facilities project ? (\*)

- a. the whole village community
- b. all the village who use the facilities
- c. propose sanitation user
- d. there is no one have to pay

C32b

C33a How is the water supply contribution being decided (mentioned the total number in Q.A) (\*)

- a. same for every family
- b. depend on family economic condition
- c. volunteers
- d. there is no contribution

C33a

C33b How is contribution for sanitation facilities project being decided (mentioned the total number in Q.A) (\*)

- a. same for every families
- b. depend on family economic condition
- c. volunteers
- d. there is no contribution

C33b

C34a In fact, who is paying the contribution for water supply ?

---

C34b In fact, who is paying the contribution for sanitation facilities ?

---

C35a Is there any labor contribution to the water supply facilities (\*)

- a. yes
- b. no

C35a

C35b Is there any labor contribution to the sanitation facilities (\*)

- a. yes
- b. no

C35b

C36a Who are supposed to pay the contribution (water supply) (mentioned the total number in Q.A) (\*)

- a. all member of family in the village
- b. all families in hamlet who use the facilities
- c. all families of prospective users
- d. there is no contribution

C36a

C36b Who are responsible to pay the contribution (sanitation) (mentioned the total number in Q.A) (\*)

- a. all member of family in the village
- b. all families in hamlet who use the facilities
- c. all families of prospective users
- d. there is no contribution

C36b

C37a How are the rules for water supply contribution being made (\*)

- a. all member of family in the village
- b. all families in hamlet who use the facilities
- c. all families of prospective users
- d. there is no contribution

C37a

C37b How are the rules for sanitation contribution being made (\*)

- a. all member of family in the village
- b. all families in hamlet who use the facilities
- c. all families of prospective users
- d. there is no contribution

C37b

C38 In fact, who participate to work

---

C39a Is there any contribution to the water supply facilities project, instead of money and labor ? (\*)

- a. yes
- b. no

C39a

C39b Is there any contribution to the sanitation facilities project, instead of money and labor? (\*)

- a. yes
- b. no

C39b

C40a How much is the total contribution paid to the water supply facilities ? (including money, labor, land)

- a. yes, Rp. \_\_\_\_\_
- b. no

C40a



C40b How much is the total contribution paid to the sanitation facilities ? (including money, labor, land)

a. yes, Rp. \_\_\_\_\_

b. no

C40b

### CONSTRUCTION

C41a Who built the water supply facilities ? \*

a. contractor

b. contractor and the community

c. community

a. others \_\_\_\_\_

C41a

C41b Who built the sanitation facilities ? \*

a. contractor

b. contractor and community

c. community

a. others \_\_\_\_\_

C41b

C42a Did the water committee participate in choosing the contractor which built the water supply facilities project?

a. yes

b. no, choosing by other person

c. no, the systems were built by the community

C42a

C42b Did the committee participate in choosing the contractor which built the sanitation facilities project?

a. yes

b. no, choosing by other person

c. no, the systems were built by the community

C42b

C43a Who did supervise water supply facilities construction ?

a. project staff / supervision consultant

b. head of village

c. village institution/personage of village community

d. community personage

e. water committee

f. community / users

C43a

C43b Who did supervise the sanitation facilities construction ?

a. project staffs

b. head of village

c. village institution/personage of village community

d. community personage

e. water committee

f. community / water user

C43b

C44a Did water committee manage payment processing during construction (such as payment to contractor or supplier)

a. yes

b. no

C44a

C44b Did sanitation committee manage payment processing during construction (such as payment to contractor or supplier)

a. yes

b. no

C44b

**TRAINING**

C45a Is the community willing to build water supply facilities based on knowledge of technical aspects?

- a. yes, themselves without technical assistance
- b. yes, themselves with technical assistance
- c. no

C45a

If yes, from where does the motivation come from? \_\_\_\_\_

C45b Is the community willing to build sanitation facilities based on knowledge of technical aspects?

- a. yes, by themselves without technical assistance
- b. yes, by themselves with technical assistance
- c. no

C45b

If yes, from where does the motivation come from? \_\_\_\_\_

C46 Did the water committee or community get training during project ?

- a. yes
- b. no

C46

mentioned, if applicable ....

No.	Kind	Participants		Target		
		Men	Women	Good	Fair	Bad
	Construction			A	B	C
	O&M			A	B	C
	Adm			A	B	C
	Health			A	B	C
	Organization			A	B	C
	Foreign aid			A	B	C
	.....			A	B	C

If there was training or informal funds, please explain and mention !

**OPERATION & MAINTENANCE PROCEDURES**

C47 Is there any operator ?

- a. yes, formally
- b. yes, informally
- c. no

C47

C48 In fact, who is responsible for operation and maintenance

\_\_\_\_\_

C49 Is the operator on duty \*

---

C50 Is the operator being paid?

- a. yes
- b. no

C50

C51 Is the operator trained?

- a. yes
- b. no

C51

C52 Is there any person appointed who is responsible for administration/finance

- a. yes, formally
- b. yes, informally
- c. no

C52

C53 How far their responsible or action ?

---

C54 Has the operator design construction manual (DEB) for water supply facilities

- a. yes
- b. no

C54

C55 Is the operator/coordinator having technical manual to operate/manage water supply facilities ?

- a. yes
- b. no

C55

C56 Is there any problem for supply of spare parts to support water supply ?

- a. often
- b. sometimes
- c. rarely / never

C56

C57 Is there any problem to have maintenance tools

- a. often
- b. sometimes
- c. rarely / never

C57

C58 Is the administration coordinator paid ?

- a. yes
- b. no

C58

C59 Is the administration coordinator trained ?

- a. yes
- b. no

C59

C50 Who is the owner of water supply facilities ?

- a. village community
- b. government
- c. project
- d. others/don't know
- e. private / family

C50

C61 Is there any technical problem appears while operate water supply facilities (\*)

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C62 Is there any leak of water supply on water supply facilities ?

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C63 Is there any financial problem while operate water supply facilities ? (\*)

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C64 Have the water supply facilities been broken (\*)

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C65 Can broken water supply facilities be repaired

- a. yes, all parts
- b. yes, partly
- c. no
- d. no relation

C65

C66 Who fixed it

---

C67 Did the water quality change after the repair?\*

- a. yes
- b. no

C67

C68 Is water debit getting less since the water supply facilities had been repaired? \*

- a. yes
- b. no

C68

C69 Is water which supplied by water supply facilities enough ?

- a. yes
- b. no
- c. depending on season

C69

OTHERS ASPECTS

C70 Does the community want to pay monthly contribution for housing connection (water supply) ?

- a. yes
- b. no (direct to C80)

C70

C71 How much ?

*(Please notifying if there is payment to PDAM/water company)*

C72 If the contribution was being paid, where they put all the contribution ?

- a. bank
- b. village cash
- c. others .....

C72

C73 Who decided the amount of contribution ?

- a. community
- b. project staffs, other government
- c. coordinator (with/without supervision/guidance)
- d. community and water committee/coordinator
- e. others \_\_\_\_\_

C73

C74 Would you explain contribution/collecting money was being used for what ?

- a. all operational costs
- b. part of operational costs
- c. O&M (including reparation cost)
- d. O&M (development)
- e. O&M and spare-parts replacement

C74

C75 How many (percentage of community) are willing to pay contribution

- a. 1 to 20 %
- b. 21 to 50%
- c. 51 to 80%
- d. 81 to 100%

C75

C76 Was the water supply connection cut if they did not pay the contribution?

- a. yes
- b. no

C76

C77 If there is heavy damaged, from the community got the fund to repair it ?

- a. there is special fund which allocated for repair
- b. village cash
- c. others \_\_\_\_\_

C77

OPERATION & MAINTENANCE FOR SANITATION FACILITIES

C78 Who is responsible for operation and maintenance of sanitation ?

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C79 Please explain operation & maintenance system which executed, is there any contribution, is there trained operator, etc. ?

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C80 Have the facilities ever been damaged seriously ?

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---

C81 How to fixed it ?

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EVALUASI SISTEM AIR BERSIH  
LEMBAR TEKNIS, KEUANGAN DAN LINGKUNGAN

Nama Lembaga: \_\_\_\_\_

A. Data Masyarakat

1. Nama Desa: \_\_\_\_\_
2. Jumlah Penduduk: \_\_\_\_\_
3. Jumlah Rumah Tangga: \_\_\_\_\_
4. Jumlah Rumah Tangga yg. dilayani oleh SGL/Pompa Tangan/PAH :  
\_\_\_\_\_
5. Jumlah Rumah Tangga yg. dilayani PLP : \_\_\_\_\_
6. Klasifikasi kemiskinan/ketertinggalan dibandingkan statistik nasional:  
\_\_\_\_\_
7. Kepadatan pemukiman:  
sangat padat \_\_\_\_\_ padat \_\_\_\_\_ tersebar \_\_\_\_\_
- 8 Jarak dari Ibukota Kabupaten: \_\_\_\_\_ km
9. Jarak tempuh dari Ibukota Kabupaten: \_\_\_\_\_ jam
10. Apakah masyarakat mempunyai jaringan listrik : Ya \_\_\_\_\_ Tdk: \_\_\_\_\_

B. Sarana Air Bersih sebelum proyek dilaksanakan

10. Bagaimana situasinya sebelum proyek dibangun? (isi dengan jawaban yg. tepat).
  - 10a. Sumber air tradisional yg. belum ditingkatkan: \_\_\_\_\_
  - 10b. Sebagian ditingkatkan (mis. perlindungan mata air, pompa tangan) \_\_\_\_\_
  - 10c. SAB yg sempurna (mis. perpipaan, pompa tangan) \_\_\_\_\_

Gambaran singkat tentang sarana air bersih sebelumnya:

C. Diskripsi proyek air bersih:

11. Sistem
  - 11a. Sistem air bersih baru: \_\_\_\_\_
  - 11b. Rehabilitasi atau pengembangan sistem yang sudah ada: \_\_\_\_\_
  - 11c. Penggantian sepenuhnya dari sistem air bersih yg. ada: \_\_\_\_\_

12. Jenis sistim:
- 12a. sistim perpipaan dg.: sumur dalam, pompa submersible, penampung dan jaringan perpipaan \_\_\_\_\_
  - 12b. sistim perpipaan dg: perlindungan mata air atau sumagi, penampungan zir dengan sistim gravitasi: \_\_\_\_\_
  - 12c. SAB tanpa jaringan distribusi: sumur dg pompa tangan \_\_\_\_\_
  - 12d. SAB tanpa jaringan distribusi: perlindungan mata air \_\_\_\_\_
  - 12e. Sab tanpa jaringan distribusi: penampung airhujan \_\_\_\_\_

Gambaran tentang komponen SAB: (.....dg. rinci)

Sumber:  
Sistim pemompaan:  
Penampung:  
Jaringan distribusi:  
Lain-lain:

13. Pelyanan yg disediakan:
- 13a. Kran umum: Jumlah \_\_\_\_\_
  - 13b. Sambungan rumah: Jumlah \_\_\_\_\_
  - 13c. Pompa tangan: Jumlah \_\_\_\_\_
  - 13d. Penampung air hujan: Jumlah \_\_\_\_\_

Pekerjaan tambahanyg. bibangun proyek: jelaskan

D. Biaya Proyek::

Komponen	Jumlah Biaya	Dana dari Proyek	Kontribusi Masyarakat	Lain-lain
14. jumlah biaya	14a	14b	14c	14d

15. Biaya per kapita (berdasarkan cakupan yg. terlayani SAB):
- \_\_\_\_\_



Rincian kontribusi masyarakat:

Percentase dari total biaya: \_\_\_\_\_

Kontribusi utk. sambungan langsung: kontan \_\_\_\_\_

tenaga buruh \_\_\_\_\_

material lokal \_\_\_\_\_

lain-lain \_\_\_\_\_

16. Jumlah kontribusi per kapita: \_\_\_\_\_

E. Mutu air dan perlindungannya:

17. Apakah ada kemungkinan sumber bisa tercemar oleh: (sumber terbuka, kakus, binatang, dsb)? a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

18. Apakah ada upaya untuk melindungi dan melestarikan sumber air?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

19. Adakah sistim klorinasi?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

19a. Jika ya, apakah berfungsi? a. \_\_\_\_\_ b. Tdk \_\_\_\_\_

20. Apakah ada program yg. mengendalikan mutu air dan sampel diperiksa secara teratur?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

21. Apakah ada komponen SAB (penampung, dsb) tercemara karena pengendapan atau oleh binatang? (mis:kepiting, serangga, burung, peliharaan, dsb.)  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

22. Warna: a. berwarna \_\_\_\_\_ b. tidak berwarna \_\_\_\_\_

23. Kekeruhan: a. keruh \_\_\_\_\_ b. jernih \_\_\_\_\_

F. Pengoperasian dan Kondisi SAB

24. Apakah SAB berfungsi/pompa tangan? a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

25. Jika tidak apakah sedang/akan diperbaiki? a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_  
*Jika dijawab Tdk (utk. 24 dan 25) lanjutkan ke pertanyaan #32*

26. Apakah ada kerusakan yg parah dalam konstruksi Perlindungan Mata Air atau sumur?  
(retak, bocor, dsb.) a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

27. Apakah ada kerusakan yg parah pada konstruksi lainnya (penampung air, dsb.)  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

Jawaban 28a-31 utk. sistim perpipaan:

28. Apakah ada kebocoran dalam jaringan distribusi (perpipaan) yang tidak terkubur?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_
29. Apakah banyak kran umum yg. bocor? a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_
30. Jika sistim meteran air digunakan, apakah sebagian besar meteran berfungsi dg. baik?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_
- 31a. Apakah ada tekanan air yg. cukup pada titik terendah dari sistim jaringan perpipaan (jarak yg. jauh dari sumber, lokasi yg. tinggi, lokasi yg. rendah)? a. Ya \_\_\_\_\_  
b. Tdk. \_\_\_\_\_

Pertanyaan 28b-29b hanya utk. pompa tangan:

- 28b. Apakah air sudah mengalir pada gerakan pemompaan pertama?  
a. Ya, semua pompa \_\_\_\_\_ b. Sebagian besar pompa \_\_\_\_\_ c. Tdk \_\_\_\_\_
- 29b. Apakah air mengalir dalam jumlah yg. banyak?  
a. Ya, semua pompa \_\_\_\_\_ b. sebagian besar pompa \_\_\_\_\_ c. Tdk \_\_\_\_\_

#### G. Azas legalitas

32. Siapa yg. pemilik tanah lokasi sumber air?  
32a. Siapa yg. pemilik tanah di lokasi SAB?  
32b. Masyarakat, Panitia Pembangunan SAB, Negara?  
32c. Pemilik tidak diketahui  
32d. Milik pribadi; perlu izin utk. dikunjungi

33. Siapa pemilik SAB (aset)

#### I. Kemampuan teknis operator

Jumlah pengelola (operator, tukang, dsb.) \_\_\_\_\_

38. Apakah pengelola digaji? Ya \_\_\_\_\_ Tdk: \_\_\_\_\_
39. Apakah pengelola dibayar sesuai dg. kemampuannya? Ya \_\_\_\_\_ Tdk: \_\_\_\_\_

40. Apakah pengelola mendapat pelatihan untuk memelihara SAB? Ya \_\_\_\_\_  
Tdk \_\_\_\_\_
41. Apakah anda menganggap bahwa pengelola mempunyai keterampilan yg. cukup  
untuk memelihara SAB?  
Ya \_\_\_\_\_ Sedang-sedang \_\_\_\_\_ Tdk \_\_\_\_\_
42. Apakah operator memiliki peralatan dan sukucadang yg. cukup? Ya \_\_\_\_\_  
Tdk \_\_\_\_\_
43. Jika operator tidak mempunyai peralatan atau sukucadang apakah mereka tahu  
dimana mendapatkannya? Ya \_\_\_\_\_ Tdk \_\_\_\_\_
44. Apakah operator pernah melaksanakan perbaikan besar atau pengembangan yg. luas  
terhadap SAB? Ya \_\_\_\_\_ Tdk \_\_\_\_\_
45. Jika operator tidak mampu memperbaiki/mengatasi satu masalah/kerusakan apakah  
dia tahu kemana mencarinya? Ya \_\_\_\_\_ Tdk \_\_\_\_\_
46. Apakah operator mempunyai rancangbangun SAB? Ya \_\_\_\_\_ Tdk \_\_\_\_\_
- 46a. Apakah operator/pengelola mempunyai petunjuk teknis secara tertulis untuk  
memelihara SAB? Ya \_\_\_\_\_ Tdk \_\_\_\_\_

Analisis mengenai fisibilitas pemeliharaan SAB

- (a) Iuran air bulanan: \_\_\_\_\_  
(b) Jumlah iuran per bulan dari seluruh sambungan rumah: \_\_\_\_\_

J. Fleksibilitas dan keabsahan tarif air:

47. Siapa yg. menentukan tarif air?  
a. Masyarakat \_\_\_\_\_  
b. Masyarakat dan lembaga lainnya \_\_\_\_\_  
c. Sebuah lembaga tanpa masyarakat \_\_\_\_\_  
d. Tidak tahu \_\_\_\_\_
48. Didasarkan kepada perhitungan apa?  
a. biaya operasional SAB \_\_\_\_\_  
b. perhitungan lainnya atau tdk. tahu \_\_\_\_\_
49. Apakah ada penentuan tarif lainnya bagi sesuai dg. jenis pemakaiannya?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_

50. Apakah tarif/iuran pernah disesuaikan dengan kebutuhan operasional?  
a. Ya \_\_\_\_\_ b. Tdk \_\_\_\_\_
51. Untuk pembayaran apa saja iuran/tarif digunakan? (jika pengumpulanya terlaksana 100%)  
a. Operasional, pemeliharaan dan tabungan untuk mengganti SAB \_\_\_\_\_  
b. Operasional, pemeliharaan dan tabungan untuk perbaikan besar SAB: \_\_\_\_\_  
c. Operasional, pemeliharaan tanpa ada tabungan: \_\_\_\_\_  
d. Operation but no maintenance: \_\_\_\_\_  
e. Tidak ada iuran: \_\_\_\_\_
53. Untuk pelanggan baru apakah diharuskan membayar biaya penyambungan?  
Ya \_\_\_\_\_ Tdk \_\_\_\_\_
- K. Pengelolaan Keuangan
54. Apakah tersedia manajer, ahli pembukuan, atau bendahara yg. bertanggung jawab dalam pengelolaan keuangan?  
Ya \_\_\_\_\_ Tdk \_\_\_\_\_
55. Did he/she receive training? Yes \_\_\_\_\_ No \_\_\_\_\_
56. Do you think that he/she is capable of managing the system finances?  
Yes \_\_\_\_\_ No \_\_\_\_\_
57. Apakah ada bank account? Ya \_\_\_\_\_ Tdk \_\_\_\_\_
58. Jika tidak ada bank account, adakah tempat lainnya untuk menyimpan dan mengelola uang tersebut? Ya \_\_\_\_\_ Tdk \_\_\_\_\_
59. Apakah ada pertanggung jawaban keuangan yg diumumkan secara periodik?  
Ya \_\_\_\_\_, Tdk \_\_\_\_\_
60. Apakah keuangan dilaporkan kepada pemakai SAB? Ya \_\_\_\_\_ Tdk \_\_\_\_\_

Lembaran untuk penilaian sistim keuangan (hanya utk surveyor)

PEMASUKAN		PENGELUARAN	
Iuran yg. terkumpul	_____	Gaji	_____
Yg. sedang dikumpulkan	_____	Pekerja harian	_____
Sumbangan rumah	_____	Pemeliharaan	_____
Sambungan baru	_____	ATK	_____
Bunga	_____	Publicity	_____
 		Ongkos administrasi	_____
Sumbangan	_____	Peralatan	_____
Lain-lain	_____	Tansportasi	_____
 		Transfer	_____
Jumlah	_____	Lain-lain	_____
Sisa	_____	Jumlah	_____
Penghasilan bulanan	_____		
Jumlah	_____		
- Pengeluaran	_____		
Jumlah total	_____		

**YANG TERSEDIA**

Kontan \_\_\_\_\_  
Bank \_\_\_\_\_  
Jumlah keseluruhan \_\_\_\_\_

L. Analisis Keuangan

61. Persentase of pembayaran:
- a. lebih dari 90% \_\_\_\_\_
  - b. dari 50 s/d 90% \_\_\_\_\_
  - c. kurang dari 50% \_\_\_\_\_
62. Apakah iuran, yg. terkumpul dapat menutup kebutuhan operasional SAB?  
Ya \_\_\_\_\_ Tdk. \_\_\_\_\_
63. Dengan sumber daya yang ada apakah mungkin kebutuhan untuk operasional, pemeliharaan, perbaikan dan pengembangan SAB dapat terpenuhi? Ya \_\_\_\_\_  
Tdk \_\_\_\_\_

*Jika jawaban utk. pertanyaan 63 adalah tidak, jawab saja pertanyaan no. 64:*

64. Apakah dianggap perlu untuk mengumpulkan iuran dari sumber lainnya untuk memelihara/memperbaiki SAB?  
Yes \_\_\_\_\_ No \_\_\_\_\_

65. Apakah mungkin/mampu bagi masyarakat untuk mengganti sarana secara keseluruhan bila SAB sudah tidak berfungsi lagi? (didasarkan kepada biaya pembangunan dan anggaran penyusutan 10% per tahun? )

Ya \_\_\_\_\_ Tdk \_\_\_\_\_

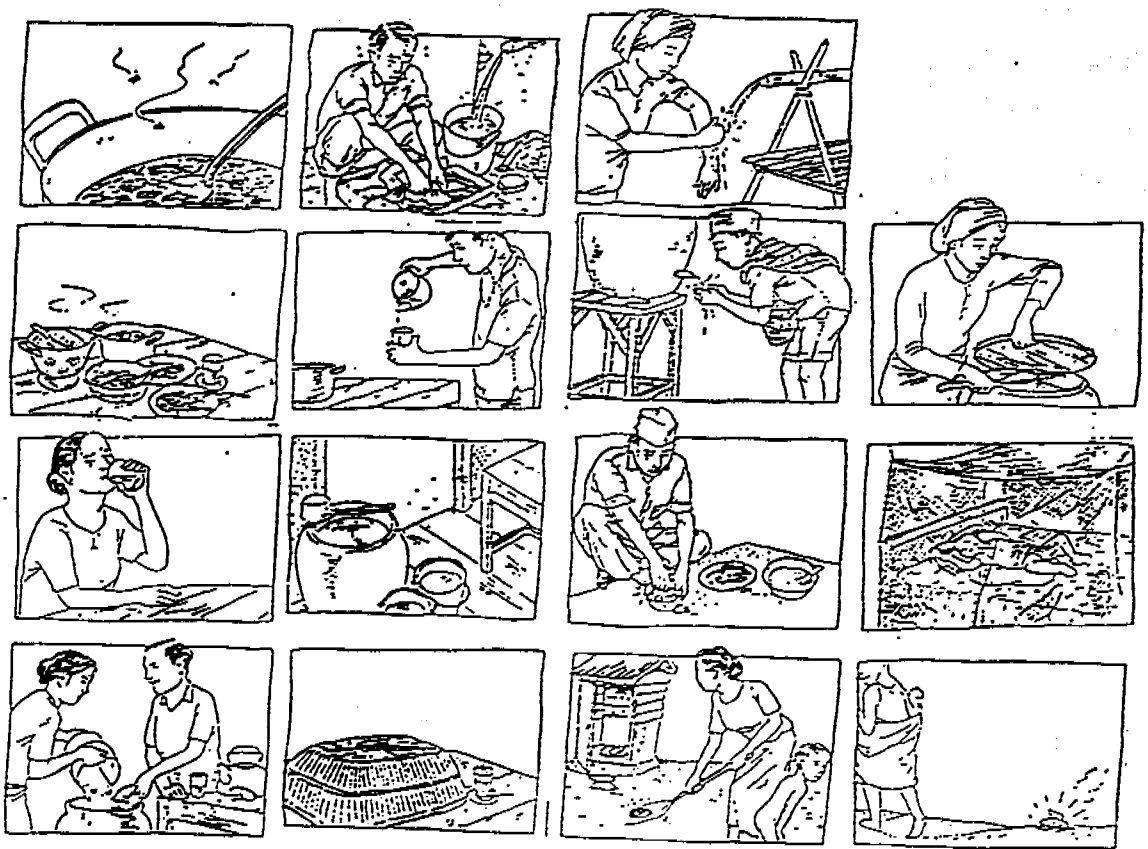
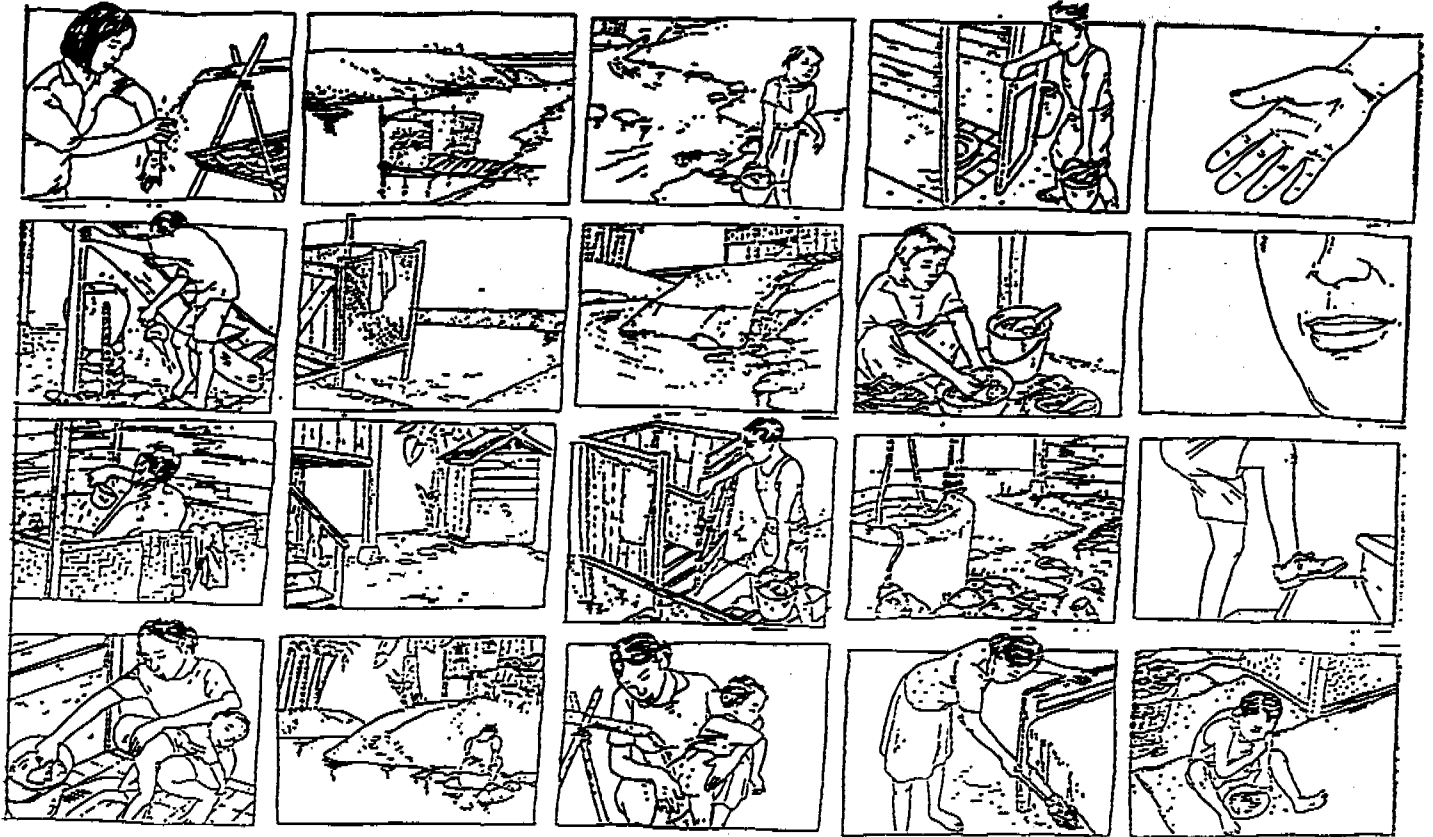
# Sample of PHAST Tools

# Hygiene Behaviour

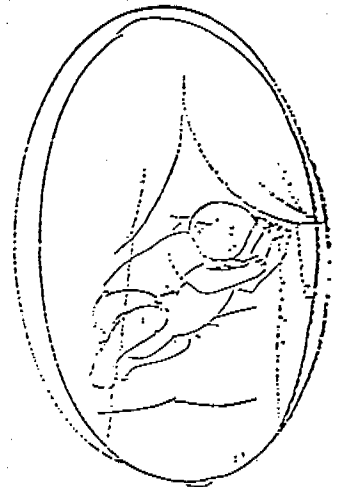
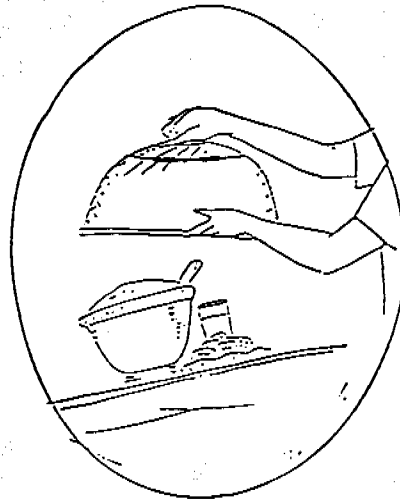
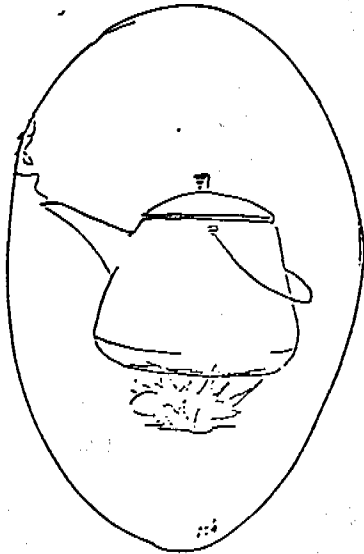
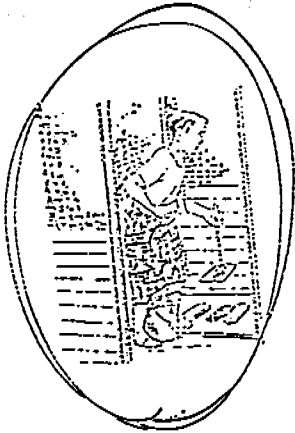
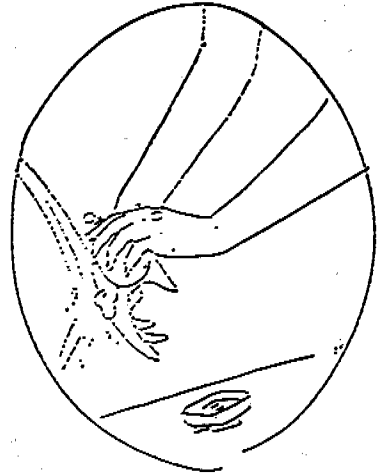
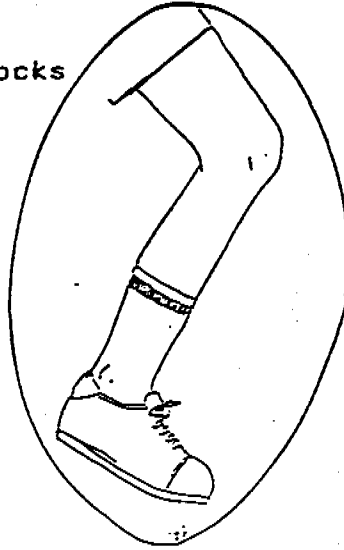
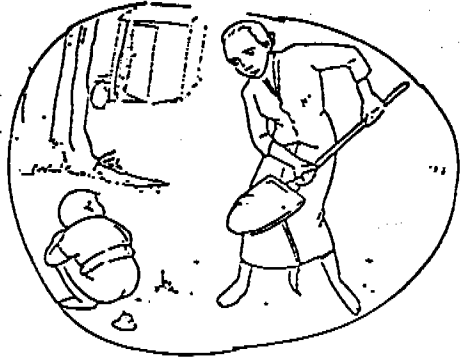




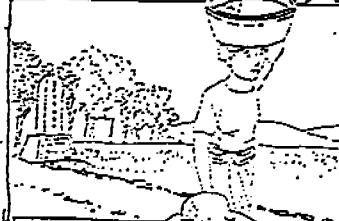
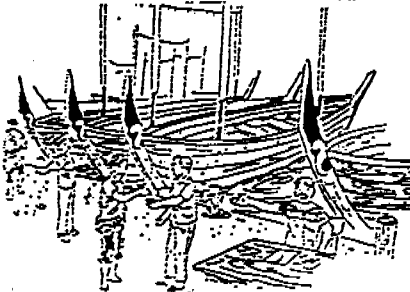
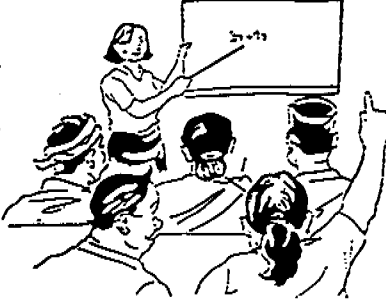
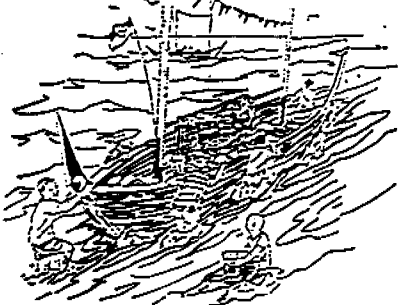
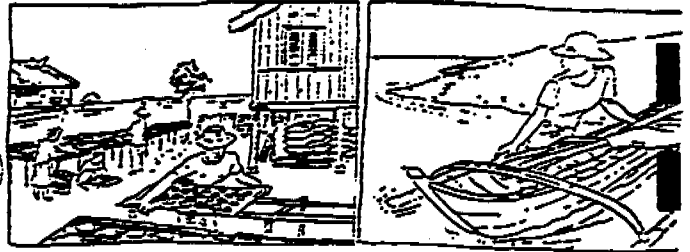
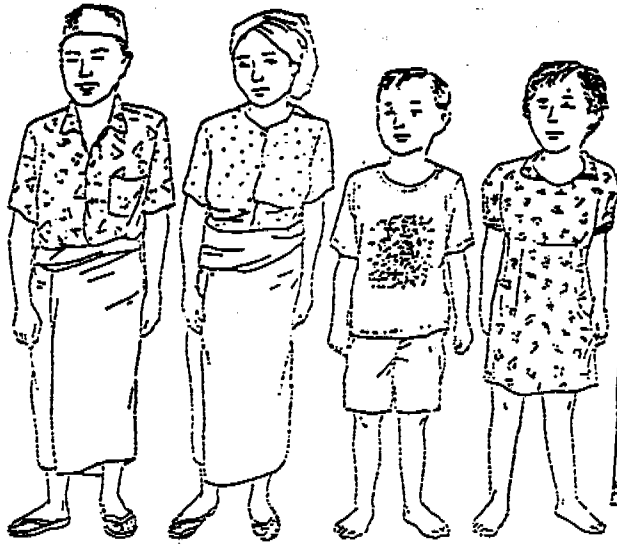
# Contamination Route



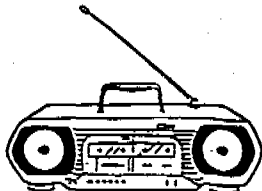
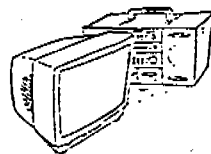
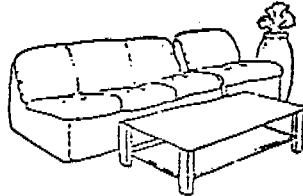
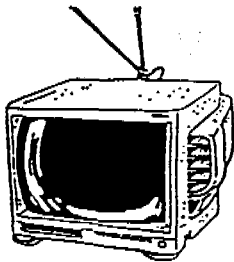
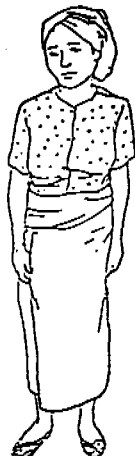
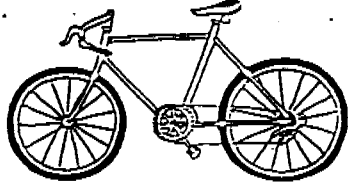
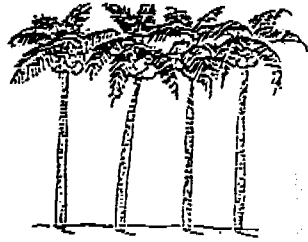
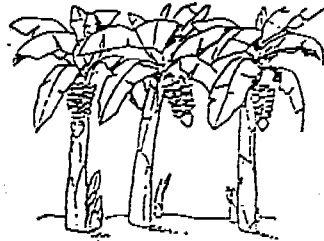
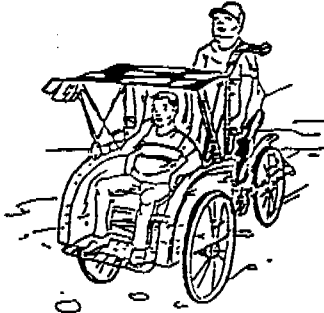
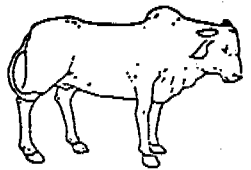
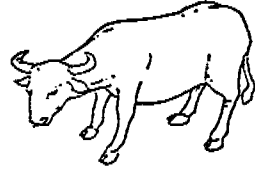
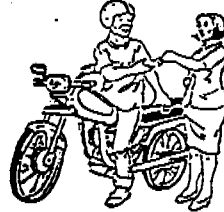
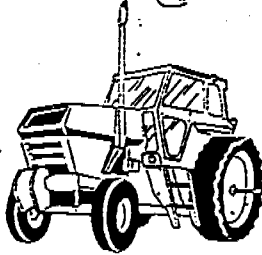
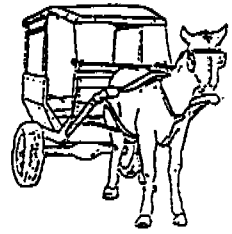
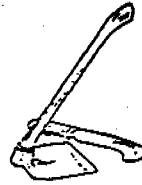
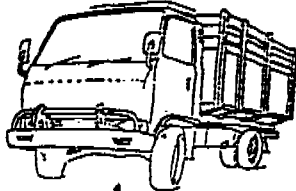
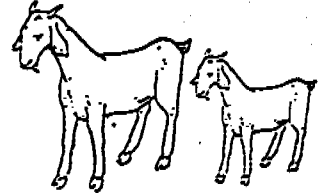
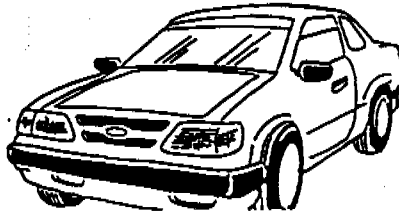
Contamination Route Blocks



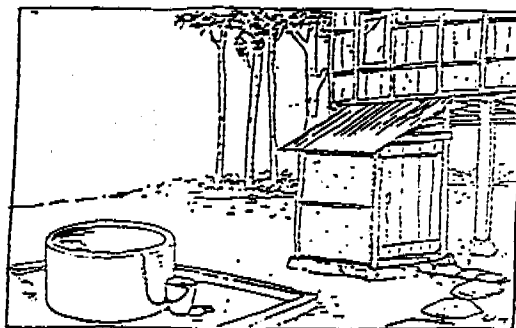
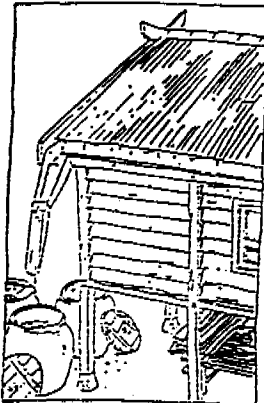
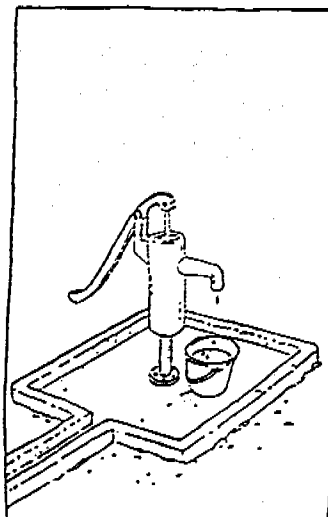
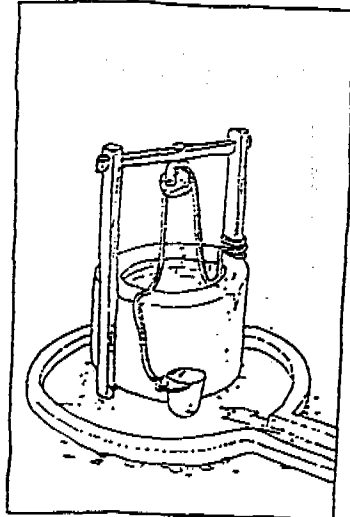
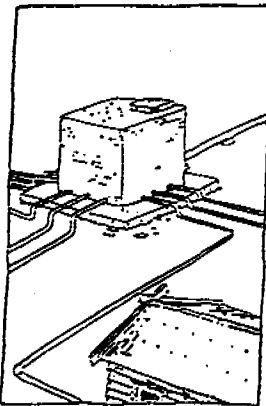
# WHO DOES WHAT ?



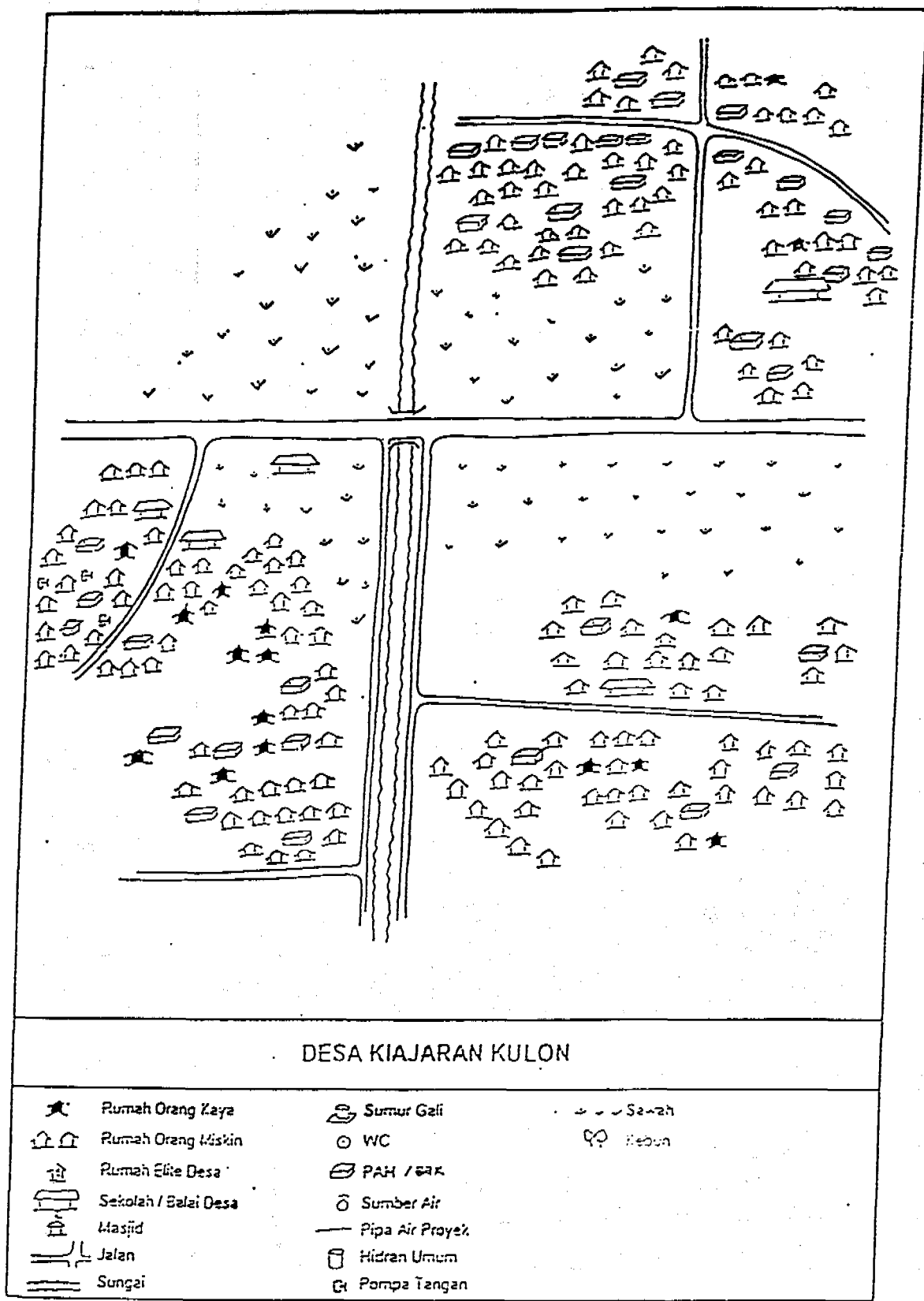
# Gender Analysis : Control of Resources

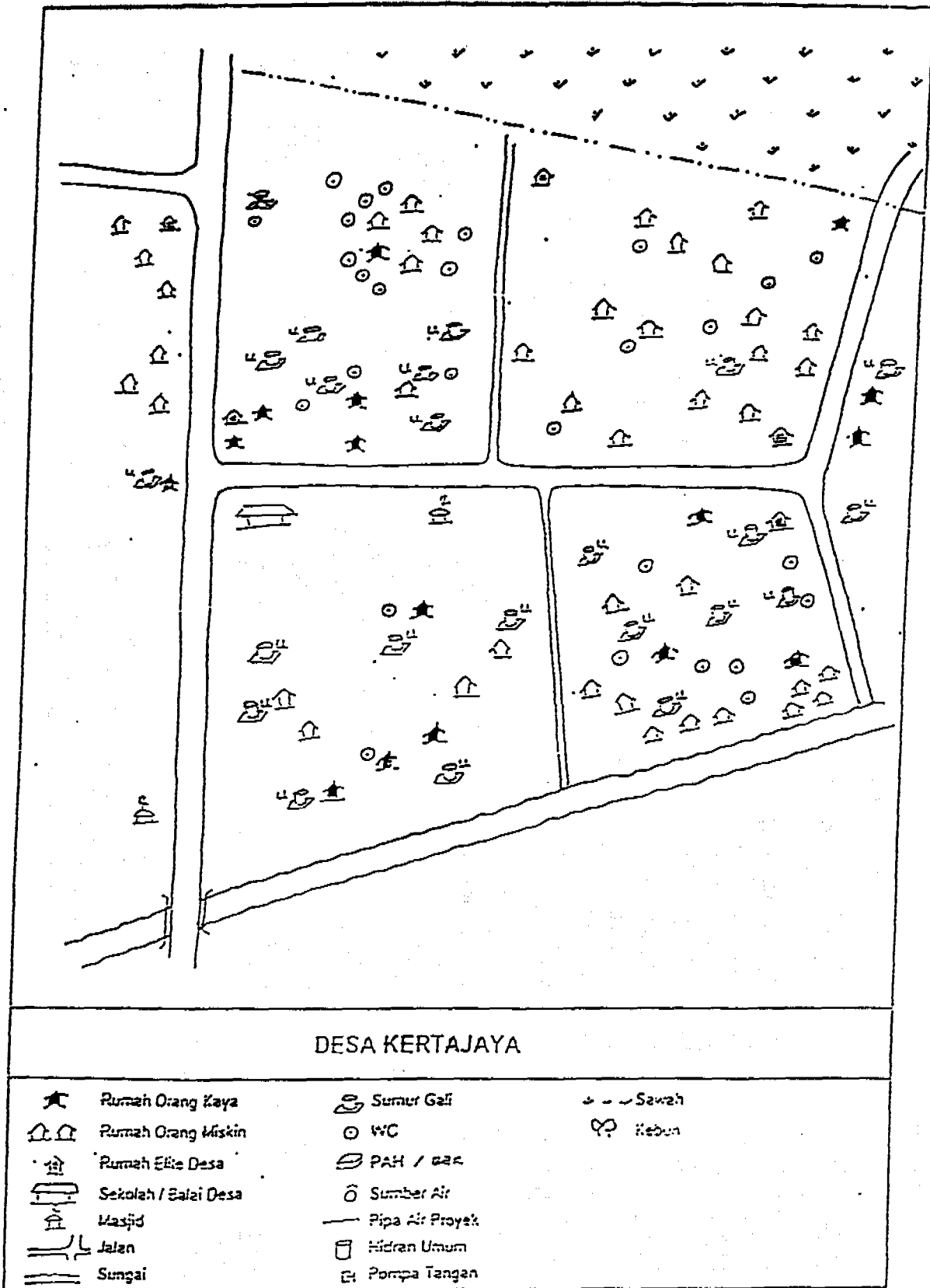


# Decision Matrix

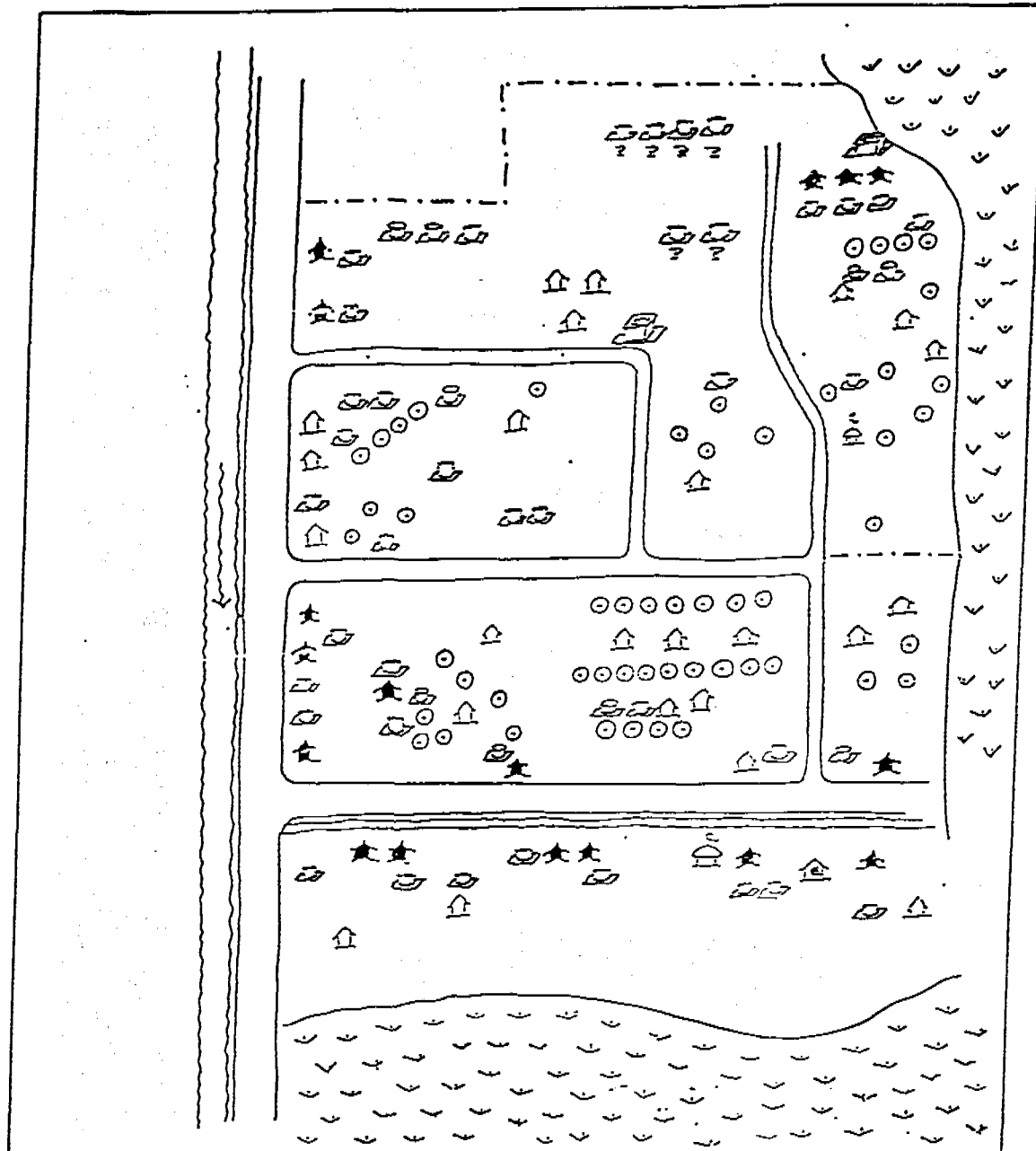


# Sample of PRA Outputs



















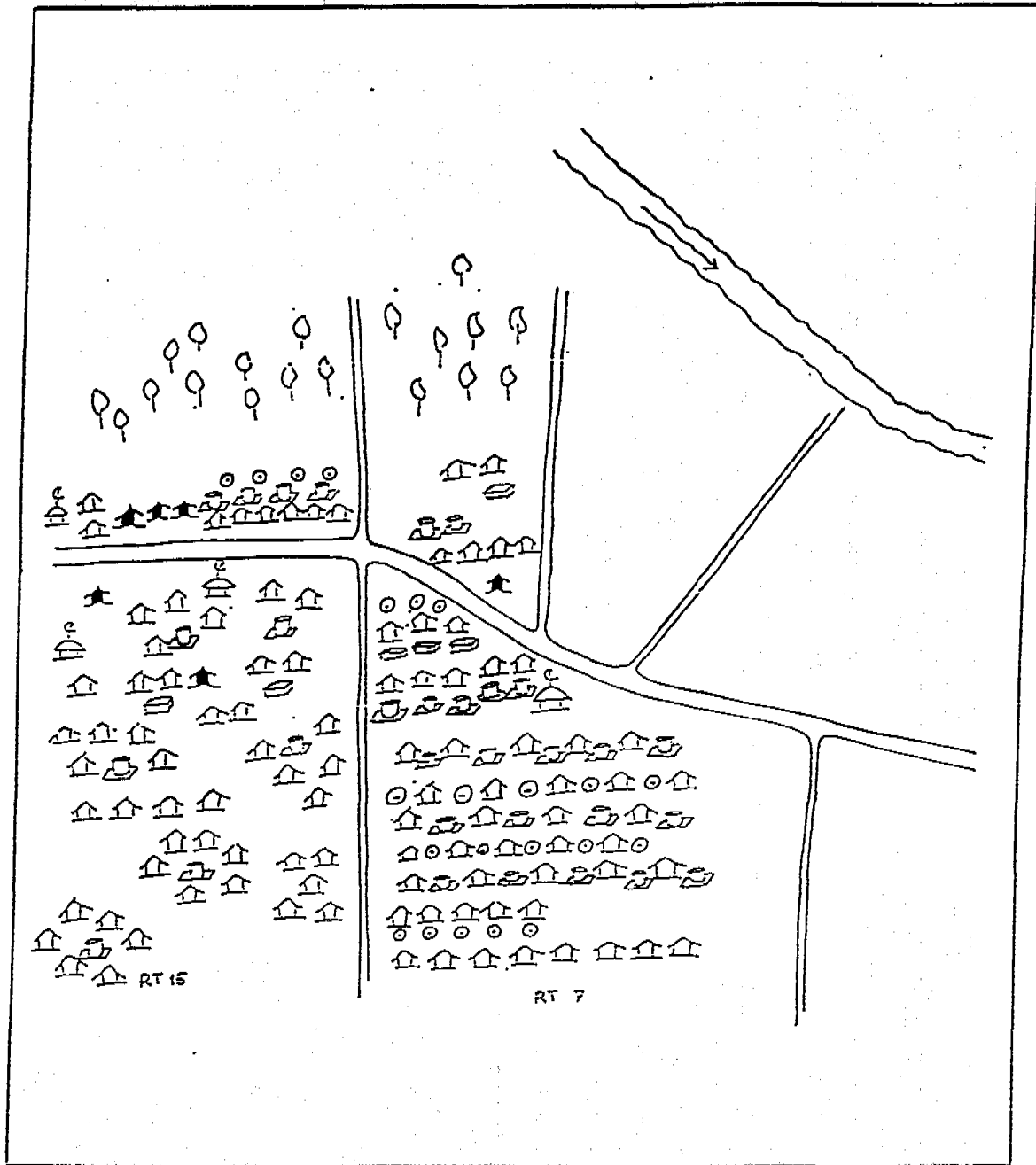






DESA PLEWANGAN

	Rumah Orang Kaya		Sumur ter		Sawah
	Rumah Orang Miskin		WC		Kedondong
	Rumah Elite Desa		PAH / BAK		
	Sekolah / Balai Desa		Sumber Air		
	Masjid		Pipa Air Proyek		
	Jalan		Hidran Umum		
	Sungai		Pompa Tangan		



DESA RAMBATAN WETAN

Rumah Orang Kaya	Sumur Gali	Sawah
Rumah Orang Miskin	WC	Kebun
Rumah Elite Desa	PAH / Pak	
Sekolah / Balai Desa	Sumber Air	
Masjid	Pipa Air Proyek	
Jalan	Hidran Umum	
Sungai	Pompa Tangan	

TREND ANALYSIS

Village : Balangloe Tarowang  
District : Jenepono, South Sulawesi

No.	Topic	Before Project Execution	After Project Execution
1	Time to collect water	0.8	0.2
2	Cueing	0.9	0.1
3	Learning (time & man power)	0.25	0.75
4	Working	0.3	0.7
5	House cleaning	0.25	0.75
6	Health Condition	0.8	0.2
7	Diarehea	0.8	0.2
8	Clothes cleaning	0.25	0.75
9	Distance	0.9	0.1
10	Using of water	0.2	0.8
11	To the market	0.25	0.75
12	Quarrelling	0.9	0.1
13	Loose of Energy (tired)	0.7	0.3
14	Sight seeing & to market	0.4	0.6
15.	Sweeping the floor	0.3	0.7

Remarks :

A

- Cueing time is assumed for all kind of wells, because this trend analysis came from group opinion
- Cueing time is assumed equals (before & after UNICEF funds), they carried the water from one well, after UNICEF project, UNICEF funded to build some wells, so the number of source is increased. People did not cue for water anymore.

B

Quarelling were frequently happened before, because somebody tryed to pass the cueing or somebody carried much water than everybody. They were afraid, the water was not enough for everybody.

### TREND ANALYSIS

Village : Tamalate  
District : Takalar, South Sulawesi

No.	Topic	Before Project Execution	After Project Execution
1	Time to collect water & cueing	0.85	0.15
2	Distance	0.9	0.1
3	Energy (man power)	0.7	0.3
4	Watching the TV	0.2	0.8
5	Cueing	0.85	0.15

**Remarks :**

Community doesn't have any changes based on Water Supply funding project.  
Community has an advantages based on Sanitation funding project.

- Before project is executed, they were having their faeces anywhere. Through Unicef, they understand why they have to have faeces in the proper places, because of their health reason.
- Inhabitant in general do not feel the effect of UNICEF fund for water supply. The facility was built for the "superior level".

### TREND ANALYSIS

Village : Aeng Batu-Batu  
District : Takalar, South Sulawesi

No.	Topic	Before Project Execution	After Project Execution
1	Time to collect water	0.7	0.3
2	Distance	0.75	0.25
3	Energy (to collect water)	0.7	0.3
4	Watching the TV	0.7	0.3
5	Cooking	0.2	0.8
6	Take a rest	0.2	0.8
7	Tired	0.75	0.25

**Remarks :**

There is no change. Unicef assistance are not enough to fulfill the demand, so the community using another facilities, especially for their drinking water.

Which facilities do they use for drinking ?

- Unicef's water supply facilities can not supply the community demand, because :
  - the facilities do not working properly or do not working at all
  - water from some facilities can not been using for drinking water
- Community collect their water supply from sources which is not funded by Unicef, such as private well, hand pumps, electric pump water, buy marketed water.

### TREND ANALYSIS

Village : Bungungloe  
District : Jenepono, South Sulawesi

No.	Topic	Before Project Execution	After Project Execution
1	Time to collect water	0.7	0.3
2	Distance	0.6	0.4
3	Energy (to collect water)	0.6	0.4

Remarks :

- the energy been used for collecting water is still high, because they still collecting water for drinking
- There is no change for water demand. The water debit is very low when dry season and dirty during rainy season, ground water source is rather difficult to find, a lot of hand-pump are broken.

From Unicef ?

- Facility funded by Unicef (water hand pumps) are broken, and lack of spare parts. Community can not use the facilities for their needs such as :
  - bathing, cleaning been collected from non-Unicef sources, but the quality is not good enough during rainy seasons, the water is not clean, and in dry season irrigation canals is leak.
  - drinking : non unicef sources are located in the middle of rice fields.

# Terms of Reference

## TERMS OF REFERENCE

### Study of Community-Based Approaches Utilized in Selected Water Supply & Sanitation Projects in Indonesia

#### I. INTRODUCTION

Access to clean water and safe waste disposal continues to be a major problem for a large portion of Indonesia's population. The most recent estimates are that 63% of the population has access to safe water and 53% has access to adequate sanitation facilities. These figures, however, do not reflect the regional disparities existing within the country. In many rural areas, the situation is considerably worse than the national statistics indicate. Moreover, water-and-sanitation-related diseases are still highly prevalent in Indonesia. Amongst children under five years old, there are approximately 25 to 35 million episodes of diarrhoea each year. Diarrhoeal diseases also account for the second leading cause of death among children under five.

The government of Indonesia (GOI) has made continuous efforts to improve the water and sanitation situation in the country since the Pelita I (Indonesia's first five-year development plan). The water & sanitation sector's development has evolved over the years, both institutionally and programmatically. Beginning with Pelita V (1989-1994), implementation of water and sanitation development has been conducted with greater intersectoral cooperation, involving the following agencies:

- DG Cipta Karya, Ministry of Public Works construction of WES facilities and other technical aspects
- DG Communicable Disease Control-Environmental Health: water quality surveillance and environmental health education
- DG Bangda institutional development
- DG PMD: facilitation of community participation.

The GOI's earlier focus on pure service delivery has now shifted toward an emphasis on community-based approaches, particularly in regard to rural water supply and sanitation projects. In selected regions, communities have become increasingly involved in such projects, facilitated by the government. With this approach, it is expected that communities will develop a strong sense of ownership of the project, an indispensable element of sustainability. Most rural water supply and sanitation projects in Indonesia now recognize the importance of community participation and have to some extent adopted a community-based approach. Some examples of how communities are involved in these projects are as follows:

- During the planning stage, village self surveys and meetings are organized in order to help communities identify their water supply and sanitation needs. Proposals are developed based on the outcomes of these surveys and meetings and are then assessed for possible assistance from either the GOI's INPRES budget (grants from central government to the region, based on Presidential instruction) or foreign funding sources.



- During the project implementation period, communities are encouraged to contribute both financially and in-kind. Do it-yourself and affordable technologies are available in order to facilitate this Cost reduction has been achieved through on-site production carried out by local masons and locally available materials.
- Subsequent operation and maintenance of the facilities are entrusted to communities through the established "Users' Groups"

Gender issues have also become important elements of many projects. Gender is taken into account in order to ensure that women are major stakeholders and able to participate in the overall operation of the project, particularly decision-making.

Numerous projects, both large and small scale have been implemented and received funding from either the GOI or foreign assistance sources. Many projects are currently on-going and represent a great deal of variation regarding approach and unit cost. The present time is considered opportune for conducting a study which examines the various community-based approaches incorporated by projects in order to identify the relative strengths and weaknesses of each.

## II. PURPOSE

The primary purpose of this study is to review the experiences of selected rural water supply and sanitation projects in implementing community-based activities. This exercise should include, but not be limited to, assessing specific strategies and gathering information regarding lessons learned, identified constraints, specific activity costs, comparative cost-effectiveness, sustainability, and replicability.

The results of the study should provide adequate information to generate specific recommendations for the GOI. Recommendations should indicate the most appropriate and effective principles and best practices for the implementation of rural water supply and sanitation projects in Indonesia' range of geographic, cultural, and socio-economic conditions.

In addition, the study should be designed so that it can be subsequently used as a tool for future monitoring and evaluation of UNICEF WES projects in Indonesia. The instruments developed and methodology utilized should be such that it is replicable, and in order to facilitate future evaluation exercises of UNICEF WES projects.

The evaluation of UNICEF supported WES activities in selected areas can also be used for comparison with WES activities supported by other major agencies e.g. the World Bank, AusAID, to compare the impact related to different programming approach.

## III. SCOPE

The study should evaluate the cost, coverage and effectiveness of selected rural water supply and sanitation projects with the following specific areas of analysis. The following list is by no means exhaustive and consultants are invited to suggest additional topics and more specific aspects of what could be included for analysis.

### ***Community Level***

- What the community had to do exactly in order to be included in a project: who represented the community in the planning dialogue; what proportion of men and women participated in the needs assessment and decision-making process regarding technological options, cost sharing arrangements, etc.;
- Community involvement practices utilized, and community management and acceptance of O&M responsibilities;
- Financial control and management, government vs. private sector management and implementation;
- Perceptions of the level of service, water quality and quantity, system reliability, capital and recurrent costs paid by communities, both planned and implemented self-financing system expansion.

### ***Institutional***

- Comparison of various institutional arrangements among projects to elicit lessons learned from each;
- Adequacy of training programs to meet areas of key skill shortages in counterpart agencies;
- Mechanisms to facilitate project handover to GOI (in the case of foreign assisted projects) and to maximize the involvement of local government.

*(RWSG-EAP clarified that these aspects would be assessed so far as they apply in the WES Program only in this study, and only at the community level, as this is a community participatory evaluation. An institutional assessment using different methods will be required to address the other institutional levels. Comparison of different institutional arrangements will be done as a separate exercise, combining data from other project evaluations currently under way).*

### ***Technology***

- Appropriateness of technologies for on-going operation and maintenance
- Replication capability by both communities and government

### ***Cost***

- Cost estimation for specific items and activities at community level
- Inter-project construction cost comparisons

### ***Health & Environment***

- Appropriateness of a technology and location to ensure optimal use of sanitation facilities
- Community hygiene awareness levels and adequacy of hygiene education programme
- Appropriateness of the mix of interventions to maximize health benefits

### ***Gender Issues***

- Capacity of projects to involve women effectively in all aspects of project planning and implementation from both a project participant and beneficiary perspective.

## Programs & Projects to be Included in the Study:

### *On-going Projects*

#### 1. UNICEF-Supported WES (Water & Environmental Sanitation) Program:

UNICEF's continuing program of assistance in water and environmental sanitation currently targets 64 districts in 7 provinces. Improvement of dug wells, spring protection and family latrines are the main technological options with the facilities to be constructed by the communities with minimal technical and financial support from government. In areas where water sources are more than 200 meters away, new facilities are promoted. UNICEF has promoted the stimulant approach as a motivational tool for communities to build their own facilities as a strategy to achieve the widest possible coverage towards universal access.

#### 2. WSSPLIC (Water Supply & Sanitation Project for Low Income Communities):

This World Bank-funded project started in 1993/94 for a period of five years, cover provinces: North Sulawesi, Central Sulawesi, South-East Sulawesi, NTT, Maluku and Central Java. The project includes the following components: water supply, sanitation, hygiene/sanitation education, training and institutional/community development, support for project planning and implementation, and project management. The implementation strategy is based on targeting poor, under-served villages, community participation, demand-driven interventions, cost recovery, programmatic or structures learning approaches, and use of NGOs. The project institutionalizes "village action planning", as the process for needs identification and improvements programming.

#### 3. RWSS (Rural Water Supply & Sanitation Project):

This Asia Development Bank-supported project is modeled after WSSPLIC, targeting 350 villages in Kalimantan and Sumatra.

*Note: The World Bank is currently conducting a study with some similar objectives regarding 4 projects including WSSPLIC and RWSS. It has been agreed that the results of these studies could be made available to UNICEF in order that the study for which this TOR is intended (the UNICEF supported study) will no longer have to include the aspects already covered in the World Bank study. It has also been suggested that the P3WK of the Bandung Institute of Technology (ITB), the group conducting the field investigations for the World Bank study should be involved in the UNICEF supported study.*

## IV. METHOD & DURATION

Completing the study will require the following:

- A one-day briefing by BAPPENAS and relevant central GOI agencies for study team members in Jakarta.
- Approximately two weeks for review by all team members of relevant documentation and preparation of field investigation.
- A four to six week mission including field investigations and consultation with GOI officials and donor agencies as appropriate.
- Approximately two months for analysis of findings and preparation of draft report.

- A one-day workshop to present findings.
- Finalization of reporting requirements, an approximately 1 to 2 week period.
- Total time needed for completion of the study will be approximately 4 months.

## V. STUDY TEAM

It is expected that the study will involve a team of consultants responsible for developing the methodology and the necessary instruments; guiding the field investigations, analyzing results of investigation and report preparation. It is envisaged that a team(s) of field investigations could be recruited from relevant universities (perhaps ITB and/or suitable universities). It is also expected that a senior official from BAPPENAS will participate in the study.

*The Consultant Team for the Study may include the following:*

- Team Leader cum Technical/Engineering specialist - will be responsible for managing the conduct of the study, developing an effective working relationship with project personnel and GOI officials, planning and coordinating the work program of team members and ensuring the quality of the study outputs.
  - Community development specialist
  - Hygiene/gender specialist
- A mix of above mentioned areas of expertise should be ensured in the study team.

## VI. REPORTS

The results of the study should be presented in a final report containing an executive summary, and explanation of the analysis procedure, explanation of the overall findings, and conclusions. Also to be included are separate annexes describing the findings on each project.

## Appendix

There are currently other RWSS projects on-going in Indonesia such as:

### 1. AusAID supported Water & Sanitation Projects:

AusAID has been one of the major bilateral donors, which has provided continuing assistance in water supply and sanitation mainly in the eastern provinces. There are two major projects currently on-going. These are the Flores Water Supply & Sanitation Reconstruction and Development Project (five districts in the Flores Island in NTT), and the East Timor Water Supply and Sanitation Project covering two districts, Dili and Covalima, in the province. The NTB Environmental Sanitation and Water Supply Project covering the six districts of the provinces was recently completed (1995). The three projects emphasize community participation and provide extensive facilitation, including the appointment of community facilitators in the selected villages.

**2. Various NGO Initiatives**

According to the Director of Water Supply & Sanitation Projects, since 1977 about 200 projects have been undertaken by Indonesian NGOs. These projects, generally small and for a short duration, are funded through community contributions, foreign donors or regional government budgets. The community facilitation aspects are usually the strengths of such projects. Yayasan Dian Desa and Yayasan Bina Swadaya are two prominent NGOs with long experience in rural water supply projects, while CARE is well-known as the big name among international NGOs, dedicated to promoting community-based approaches in rural water and sanitation. CARE has been implementing a number of WSS projects funded by CIDA.

**3. The GOI's INPRES (Instruksi Presiden) Program**

The INPRES Program for WES involves the above-mentioned three ministries. In addition to being utilized as counterpart budget for foreign-funded projects, the INPRES budget is also utilized for various rural water supply and sanitation projects. This type of project is usually referred to as a *Pure INPRES Project*, managed at the district level.

### **RWSG-EAP Team:**

- |                         |  |
|-------------------------|--|
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| 6. Jana Halida Uno       | Surveyor           |
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| 8. Kasomi                | Surveyor           |
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