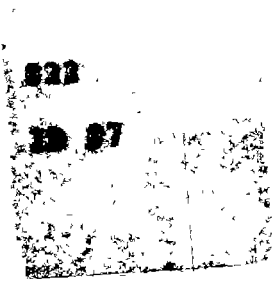


EVALUATION OF

THE INPRES WATER SUPPLY AND SANITATION

PROGRAM

AKADEMI PENILIK KESEHATAN

TEHNOLOGI SANITASI

, JAKARTA

AND

YAYASAN INDONESIA SEJAHTERA

MINISTRY OF HEALTH

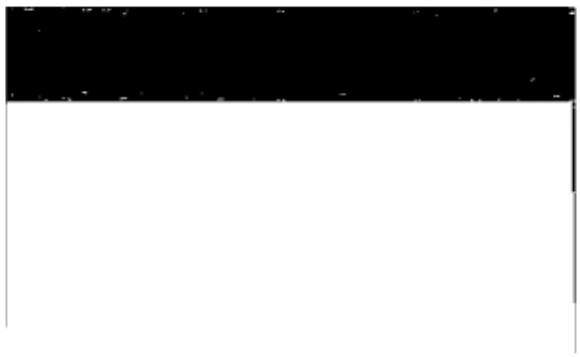
THE GOVERNMENT OF INDONESIA

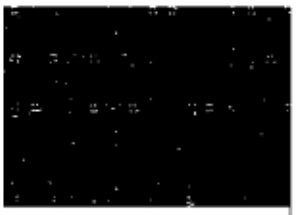
UNICEF AND WHO

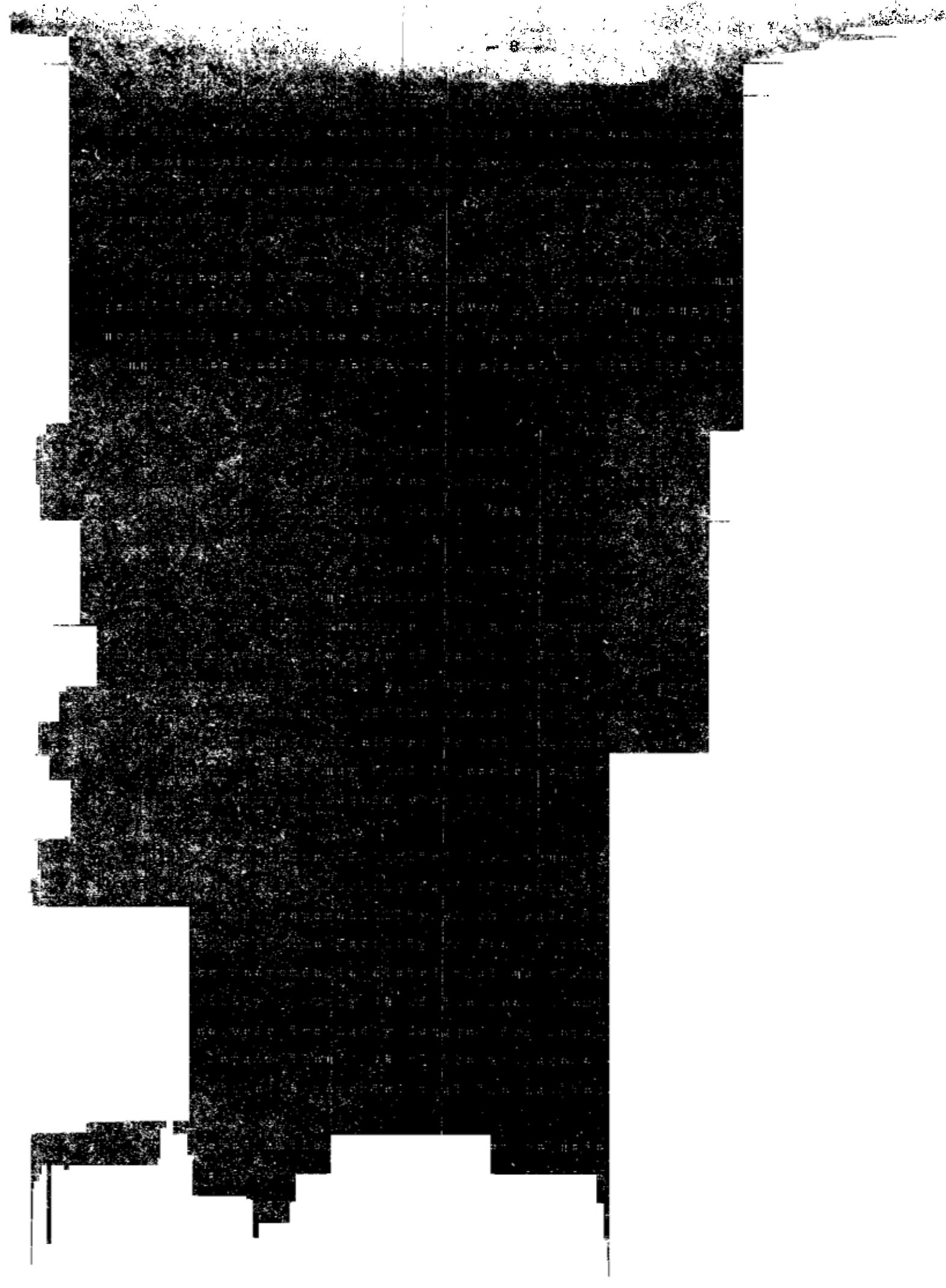
JAKARTA, MAY 1987

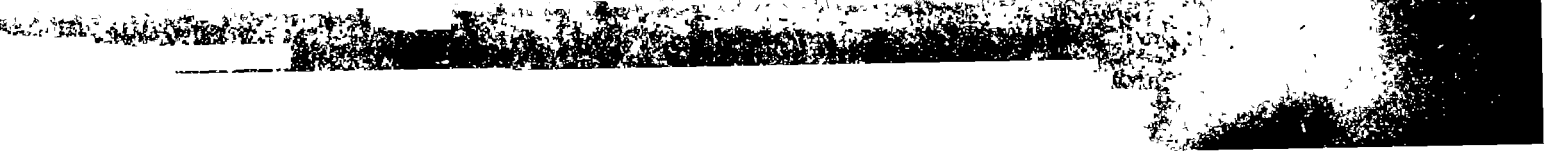
C O N T E N T S

LIST OF GRAPHS









2.0. BACKGROUND and OBJECTIVE

From the Protocol for evaluation of National Rural Water Supply and Sanitation Programme. " One of the major activities developed and implemented by the Ministry of Health to improve the health conditions and maintain social well-being of Indonesian people in rural areas is the programme for the provision of safe water supplies and adequate sanitation. The implementation of the programme has been systematically assisted by the Ministry of Health since the inception of the nation's Five-Year Development Plan (REPELITA) in 1969.

The Rural Water Supply and Sanitation programme(RWSS) as described in Government Regulations No. PP 49/50.51* of 1952 and No. PP 18 of 1953, is the responsibility of Local Government, under the Ministry of Home Affairs. However, because of lack of technical expertise, particularly at the lower levels of Local Government, the Ministry of Health, through its Directorate General of Communicable Diseases Control and Environmental Health (CDC & EH) provides assistance in planning and implementing the RWSS programme and the Ministry of Home Affairs is responsible for implementation, operation and maintenance.

Although the RWSS programme was started in 1969, very little provision was made for programme implementation by the Government in its regular budget until 1974. 1974 marked at the beginning of REPELITA II and the introduction of the the INPRES (Presidential Instructions) funding system. Sizeable funds were made available through Inpres for implementing priority needs in safe water supplies and excreta disposal in rural areas. During REPELITA II and III periods, the total INPRES allocation for RWSS amounted to about Rp. 87 billion, which accounted for about 85% of the total investment in the sub-sector. The remaining 15% of the programme was funded from the national development budget (DIP) and from

* The government regulation No.PP49/50/51 have been replaced by PP No.7/1987.

Local Government resources (APBD). Foreign assistance in RWSS, which was mainly provided by UN and bilateral agencies, was small and added less than 10% to total national investment.

During the Mid-Decade Workshop on Water Supply and Sanitation in November 1985, it became clear to many participants that although RWSS services were being delivered to rural areas by INPRES, little if any solid information was available on actual numbers of facilities functioning, the quality and degree of usage of these facilities, actual coverage and on several " soft " issues regarding operation and maintenance and the utilization and impact of facilities on beneficiaries. This, as well as an informal acknowledgement that INPRES may not be achieving its stated objectives to the degree which would enable Indonesia to meet Decade targets caused concern at Government agencies concerned. As a result, the Government of Indonesia requested WHO and UNICEF to assist the Government in undertaking an evaluation of the National rural water supply and sanitation programme to determine what, if any, action might be required to improve the INPRES programme's performance. In subsequent discussions, it was agreed to conduct the evaluation study in 3 provinces, namely West Java, West Sumatra and Nusa Tenggara Barat (NTB). The cost of the study would be met by WHO for West Java and by UNICEF for West Sumatera and Nusa Tenggara Barat."

Two organisations were contracted to execute surveys of the physical aspects and social aspects of the Inpres Rural Water and Sanitation Programme. The Academy of Health Controllers (APK), Jakarta in co-operation with the University of Indonesia (UI) was given responsibility for assessing physical installation while the Yayasan Indonesia Sejahtera was responsible for the community and social aspects. A Technical Team was appointed by the Director General of PPM/PLP to assist the evaluation teams in the execution of the evaluation (See annex 1 for details). Later towards the end of the study, a consultant was engaged to assist with the final evaluation analysis, execute a desk management survey and draft the evaluation report.

APK-UI team started the preparation of survey in April 1986; much time was spent in drafting the protocol, designing survey instruments and field testing them. The two group of contractors collected the field data during the period 15 Dec. 1986 - 10 March 1987. Data coalation and interpretation was completed by end of April 1987. The third contractor undertook the management analysis in April - May 1987 and prepared the evaluation report.

3.0 Methodology

The Academy of Health Controller (APK) and Yayasan Indonesia Sejahtera (YIS) undertook surveys in West Java, Sumatra Barat, and Nusa Tenggara Barat for all types of water and sanitation facilities. The Academy of Health Controllers team surveyed a greater number of Districts, Sub-District, and Villages to maximise physical sampling of facilities. The Yayasan Indonesia Sejahtera survey was to be a qualitatively oriented and was directed towards assessing social issues and responses. All survey instruments were developed, field tested, revised and finalised with the assistance and guidance of the Technical Team.

The surveyed Districts were selected to include coastal, lowland, and upland villages. The Sub-Districts were selected using criteria to include all types of facilities. A sample was surveyed of all village facilities with the exception of Latrines (Jaga) and shallow well handpumps (SPTDK). 10% of the latrines (Jaga) and 50% of the shallow well hand pumps (SPTDK) were surveyed where the number of facilities exceeded 100. APK-UI visited three provinces, eight districts, 15 Sub-Districts, 167 villages and surveyed a total of 3,077 facilities (See annex 2 for details). The Yayasan Indonesia Sejahtera visited three provinces, seven Districts, 10 Sub-Districts, 34 villages, and surveyed a total of 494 facilities and community user groups.

A random selection of the facilities for latrines and shallow well hand pumps could not be carried out as there were no records kept of actual locations at village or Sub-District level. As a

result, the survey teams had to rely on the memories of the sanitarians (Petugas Sanitasi) or the village leaders (Kepala Desa) to locate the facilities in the field. Furthermore, in many cases when records of the number of facilities installed at the district failed to tally with the Sub-District records, survey teams were forced to rely on the sanitarian and villagers memories to establish the actual number of installations, dates of construction, and location. These verbal reports were followed up as much as possible with visual verification of the facilities themselves.

4.0 Project Planning, Management, Reporting, Budgeting and Manpower

This section covers five topics; management, planning and budgeting, reporting and manpower. Of necessity there is a great deal of overlap in these areas so the distinctions between each of the five parts is not always maintained.

4.1 Management

The Department of Home Affairs, Department of Health, Department of Public Works, and the National Planning Board work together to promote programme objectives. The role of each institution varies by type and level of activity. In a number of instances these roles overlap or are unclear (at least in the field situation). The formal co-ordination within and among agencies is as follows:

From the "Petunjuk Pelaksanaan dan Teknis Pembangunan JAGA dan SPAL" DepKes DitJen PPM & PLP Chapter IV:

A. Officers Role Provincial level

(i) Chief of sub-directorate environmental sanitation (Kepala Sub Dinas Pembinaan Kesehatan Lingkungan)

a. To develop and provide technical guidance for the programme.

b. To monitor and evaluate implementation of the programme, including its development among the people.

c. To increase the intersectoral and interprogramme coordination among the units and bodies involved.
d. To compile the planned programme for the next fiscal year.

(ii) (Chief of sub-directorate community health education) (Kepala Sub Dinas Penyuluhan Kesehatan Masyarakat)

a. To develop extension services for the programme.
b. To develop ways to increase the involvement and initiative of the people in programme.
c. To evaluate implementation of extension in the programme.
d. To do extension for the programme through Mass Media.
e. To increase intersectoral and interprogramme coordination among involved bodies and units.
f. To develop special groups with potential such as school teachers, religious leaders, the scouts, etc to promote the success of the Jaga and Spal programme.
g. Technical development of health extension for Environmental Health Cadres.

(iii) Provincial Development Planning Board (Bappeda)

To coordinate and compile National and Regional Fiscal Plan.

(iv) Regional Development (Bangda), Social welfare (Kesra), Kependudukan dan Lingkungan Hidup.

a. Report to the Governor regarding programme implementation and recommend the programme as one criteria for developing villages.
b. Compile programme implementation reports.
c. Develop programme development.
d. To propose the planned programme for the coming fiscal year.

(v) **Provincial Level Advisory Team for INPRES Health (TIM Pembina INPRES Kesehatan Dati I)**

a. Develop the Program

b. To overcome obstacles in the programme

c. To co-ordinate intersectoral activities in the programme.

B. **(Officers role Dati II)**

(i) **Section Chief Environmental Health (Kepala Seksi Pembinaan Kesehatan Lingkungan)**

Basically the same as (Ai) above but for his region only.

(ii) **Section Head of community Health Education (Kepala Seksi Penyuluhan Kesehatan Masyarakat**

Basically the same as for (Aii) above but for his region only.

C. **Officers role at the sub-district level**

(i) **Chief of Health Centre (Kepala Puskesmas)**

Must actively:

Spread information regarding the Water and sanitation programme to the staff of the sub-district health centre (Puskesmas) as well as to others such as the sub-district level officer: Sub-district head (Camat), (Village development officer (Kepala Urusan Bangdes), Advisory team to the village development council (Pembina LKMD), (Family welfare movement organizer (Penggerak PKK), and others to support the implementation of the programme.

Bring motivation to Government officers, self Help village organizations, local village figures so as to stir implementation and development of the programme. Motivation, and push must be increased to develop consciousnous of the importance of the programme to the health and welfare of the people.

(ii) **Sanitarian**

The sanitarian has a role in technical aspects and educative aspects. He is to develop which are sanitary, well constructed, and use inexpensive (low cost technology).

The type of facility recommended must be suitable to the area. He is to develop villagers to want their own facilities, to use their facilities, to build themselves, and to maintain them.

(iii) Sub-District Head (Camat)

The sub-district head plays a large role in:

- Coordinating various programmes and development in his area.
- Lead in the bringing together.

(iv) Village Development Officer (Kepala Urusan Bangdes)

- Coordinates development in the villages in his area.
- Develop programmes based on the potential of people in the area and from funds from various government sectors

(v) Advisory Team to the village resilience council (Pembina LKMD)

- Organize the people
- Plan peoples programmes and activities
- Develop peoples programmes

The actual physical field work performed in the programme is largely the responsible of the sanitarians. There is a considerable administrative structure above him with, as has been noted, a great deal of functional overlap. As the programme is currently administered, coordination is insufficient. Without greater definition of responsibility the sanitarian and those above may be subject to conflicting instruction and have no clear channel to pursue to request assistance or support.

4.2. Planning and Budgeting

Planning begins fourteen months prior to the fiscal year in which it is to be implemented (hereafter referred to FY minus 14, or FY-14). This is supposed to allow funds to be allocated and disbursed by the beginning of the fiscal year on April first and be ready for use by May first.

The planning and budgeting cycle is described below:
Meeting: Provincial and District Planning Board (Bappeda DT.I and DT.II; February (FY-140). The overall status of the area is discussed by the Provincial and District Planning Board in A February meeting. This meeting is considered the first in the annual planning process.

Village Meeting: April; (FY-12)
Village level meeting is held in April to discuss the needs of the villages. Those participating are the village leader and members of the village resilience council, LSD, and UDKP. A list of proposals is drawn up with potential sources of funds indicated. No formal criteria exist for the development of this list. This list is sent to the sub-district head for consideration in the sub-district level meeting.

Sub-district level Meeting: May;(FY-11)
A district level meeting (Rapat Kerja Pembangunan Tingkat Kecamatan) is held under the supervision of the District Planning Board. The purpose of this meeting is to develop the district development plan for the coming fiscal year. It is attended by all village leader, Head of the village resilience committee, civil servants in relevant position such as the Chief of sub-district health centre, and the Sub-district head. Inputs consist of the results of the February meeting with the Planning Board, the village recommendations, and suggestions from the Ministry of Finance and National Planning Board. A list of proposed projects from various funding sources results from this meeting. For the clean water and sanitation project proposals concerning piped system and artesian wells are sent to the Office of Public Works. Proposals concerning deepwell and shallow well handpumps, protected springs, dug wells, waste disposal pits, and family latrines are sent to the District level health office for their consideration and evaluation. The proposal in its entirety is submitted to the Bupati and the Provincial Development Planning Board

District Level Meeting: June; (FY-10)
In June The Rapat Koordinasi Pembangunan Dati I is held. This meeting called by the District Planning Board (Bappeda DT II) and chaired by the Bupati. General regional concerns are reviewed.

The meeting is attended by the Sub-district heads, Chief of sub-district Health Centre (Doktor Puskesmas), District Planning Board (Bappeda Dati II), Department of Public Works (Dinas Pekerjaan Umum), and heads of other concerned sectors. The results of the district level meeting and information, received from the Ministry of Finance and from National Development Planning Board (Bappenas) are considered. This meeting produces a project proposal list for Central Government, Regional Government, External, village, and INPRES funding. The clean water and sanitation proposals include the facility designs. This list is forwarded to the appropriate agencies by the District Planning Board (Bappeda TK II).

Provincial Level Meeting; July ;(FY-9)

A provincial level meeting (Rapat Koordinasi Dati I) is held in July by the Provincial Planning Board (Bappeda DT I). The meeting attended by the Governor, District Planning Board (Bappeda DT II), the Administrative Head of District (Bupatis), and heads of the related departments (Dinases) and regional offices, as well as the bureau heads that would be responsible for the projects. At this meeting the annual programme and budget for the entire province is established for consideration at the Regional and national level.

Regional Level Meeting; September; (FY-7)

In September a meeting is held by the Provincial Planning Board (Bappeda DT I) to prepare a programme and project document which is concerned with the problems of the region as a whole.

Central Government Level Meeting; October; (FY-6)

This October meeting is held among officials from the various departments, the Provincial Planning Board (Bappeda DT I) and National Development Planning Board (Bappenas) to develop a programme in line with the current Five-year development plan (Repelita) and which takes into consideration projects already ongoing and which will be continued. Provincial level proposals are revised and amended at this time.

Budget Finalized: February; (FY-2)

At this point INPRES funds are sent to the appropriate bank branch where they can be drawn upon. This is at the district level. Once the INPRES funds are allocated to the district, the Bupati must select a Project Leader (Pimpro) and a (treasurer) Bendaharawan . The Project Leader (Pimpro) in coordination with the Bupati then selects the villages where the facilities are to be installed. The Operational Plan (Rencana Anggaran Biaya Proyek) is then completed by the Bupati and submitted to the Provincial Planning Board (Bappeda DT I) and Bank. Once this is done the money becomes accessable.

4.3 Analysis

(i) After the village level meeting an additional five meetings are held before programme targets and inputs are set. At each of the meetings the original proposals or requests can be changed without further consultation with the villagers effected. Further, after final approval at the highest level, monies are disbursed to the Kabupaten level where the final decision is made by the Bupati regarding which specific villages. Evidently at no point in the process are the villagers themselves again consulted. If the result of this process were only to ensure that village requests fit onto available regional plans, budgeting levels, and national goals there would be no problem. However, one result of this procedure is that the final allocation often bears little relationship to the original request.

Part of the lack of coordination between the planning process and the actual allocation of facilities and funds approved by the Central Government is due to the lack of guidelines for the allcoation of facilities or funds by the Bupati among the villages in his region. Guidelines are needed to ensure uniformity in the allocation procedure and to link the proposed programme to the allocation process.

(ii) The flow of funds budgeted in practice seldom moves according to the official schedule. It was reported that frequently funds are released to the Kabupaten towards the end of the calendar year

(between August and November). As this money must be spent prior to the next fiscal year in April a short time for actual procurement and installation. This in turn means facilities are hastily sited, and may not checked against the formal INPRES specifications before being approved and paid for.

(iii) At work , these two major constraints, changes in villagers requests and late funding can result in inappropriate, poorly built, badly sited facilities placed in villages that don't necesarily want them and did't request them in the first place.

It should be emphasized that the difference between villagers needs and requests and actual facilities eventually provided, as far as the type of facility goes, is the fault of no particular person or agency. It stems from the lack of feed-back mechanisms in the planning and budgeting process and the lack of a link between the plans and the actual allocation of funds or facilities from the district to the villages.

The absence of appropriate feed back mechanisms is, in turn, the result of unclear lines of communication and responsibility below the sub-district level. In the discussion to this point it has been possible to identify the lines of decision making and the person or group rewsponsible. This is true both on the way up, in planning and budgeting process from sub-district to the center, and in dispersal of funds on the way down, from the central government to the sub-district level.

Below that level, however, things become indistinct. It is not clear exactly how the decision to locate a particular hand pump, for example, is made and who makes it. In spite of requirements for formal turning over of facilities to the village it is not clear precisely who is responsible for the facilities once installed. What seems clear, however, is that the villagers are asked to make any shortfalls in funds for that installation and cover the costs of maintenance and repair.

4.4. Reporting and Manpower

All surveys and other information indicate that the reporting procedure as currently used is inadequate. This is evidently

the case both in procurement and installation and in maintenance. There seems to be two reasons for this; unclear or non-existent reporting procedures below the sub-district level, and inadequate manpower at all levels.

4.4.1 Manpower

Neither survey team collected specific data on manpower. The survey team, however, did note, in one specific instance, that in Solok there are 14 Puskesmas and four sanitarian. Survey team further points out that the sanitarian may often find himself doing other work, not his own. The survey team also found that while the sanitarian answers structurally to the sub-district Health and Environment Officer (Seksi Kesling Dati II), he is physically located in the Puskesmas and thus comes under the more direct supervision of the Doctor Puskesmas who will make use of his time in terms of the priorities of the Puskesmas as a whole. The survey team also found that in discussions with the sanitarian that many of them were generally unknowledgable about their area and from this survey team concluded that they did not visit his area often, most likely only at the time the facility was installed.

In summary, in sheer numbers and in terms of management practices, the availability of manpower at the sub-district level appears to be insufficient to meet the objectives of the programme.

4.4.2 Reporting

(i) In keeping with the above remark there is a similar discontinuity in reporting procedures above and below the sub-district level. In fact, one of the most difficult aspects of the survey, as it was conducted in the field, was determining the number of facilities which had been installed and where they were located. Records regarding number of facilities installed differed between district level records and sub-district level records. Records rarely existed in the Puskesmas and no records were kept at the village level. Whilst some form of records existed regarding the number of facilities reported installed no written record existed as to the actual location of the facility.

This lack of information reflects three weaknesses in the system as it is constituted:

- Insufficient trained manpower
- Unrealiable record keeping from the village level upward
- No formal records and assigned responsibilities at the desa level.

(ii) The problem of too few trained people is a familiar one. The sanitarian would normally be responsible for establishing the actual condition of facility in a village. Given the shortage of sanitarians, their diverse duties, and the lack of funds specified for reporting on Inpres facilities, it is little wonder that they seldom actually visit the sites of the facilities they are to report on. In fact below the sub-district level records are general non-existent and knowledge of location or date are only in the memories of those who were there at the time.

(iii) From the sub-district level and up reporting is an excercise in form filling. For any given level of administration, when the level above says that number of facilities have been reported installed, that is the number that will be reported as having been installed. Once this process begins it is circular.

While this is an undesirable process, lack of monitoring and time and money to check actual field conditions makes this difficult to correct.

(iv) Below the sub-district level there are few, if any, formal records kept. the result is a lack of knowledge of status and location of facilities, no supervision of use, maintenance or repairs. Records should be kept at the village level on th date of installation, location current status, and user group responsible for the facilities. maps such as those used by the Family Planning programme could also serve to increase th sense of village participation and involvement.

4.4.3 Analysis

(i) Even given the serious constraints in manpower and funds, there are some inherenet flaws in the procedures currently used in this INPRES programme. Foremost among these is the lack of a clearly demarcated line of responsibility. This holds true for virtually all aspects of programme management but is particularly the case in procurement and reporting. These two areas are singled out because the evidence suggests that they are of particular importance and are closely linked.

(ii) Procurement management, again with the partial exception of those facilities under the jurisdiction of Public Works, lacks a continuous line of accountability. It appears that at no point is any person or office held responsible to see to it that what is ordered and paid for is actually delivered and installed. The result has been that the equipment is sometimes never delivered, or if delivered not installed, or if installed is not the equipment required and paid for.

(iii) If the reporting procedure required an individual to actually inspect what is provided and certify compliance with the original order more efficient procurement would be ensured. Furthermore the number of facilities are not so great that an inventory system could not be set up to provide information on date of order, name of supplier, due and actual delivery date, and so on. This inventory system could be part of a larger management information system which would track the progress of the installation, the location of facilities, and so on.

(iv) In order for this system to function, it would be necessary that existing procedures are followed, that records are kept based on actual field conditions, that monitoring is funded and executed at all levels to increase accountability and thus responsibility as a pre-conditions to this, it will be necessary to impose a moratiorium and do a survey to current conditions to establish a baseline of information regarding the current status of facilities.

(v) Meaningful village participation at all stages of project planning and implementation is a fundamental requirement for the success of the project. There is no necessary relationship between the village proposed programme and t he eventual allocation of facililities by the Bupati. Guidelines are needed for the allocation which will clearly link the village proposed programme to its eventual allocation. Users should be organised into groups, by proximity perhaps, and the facility should be handed over to the group for their common responsibility. Guidelines are also needed for organization of the user groups, to allow for change of membership or relocation of the facility should that become necessary. The sanitarians or other officials could assist repair. Experience shows us that "common properties" tend to be abused and quickly deteriorate.

(vi) Records must be kept at the village level and above. The village level records should include the physical location of the facility as well as the users.

5.0 The Physical Infrastructure

This section concerns the physical status of the facilities installed between REPELITA II and the end of 1986. The general status of the facilities will be described first followed by a review of the facilities by facility type.

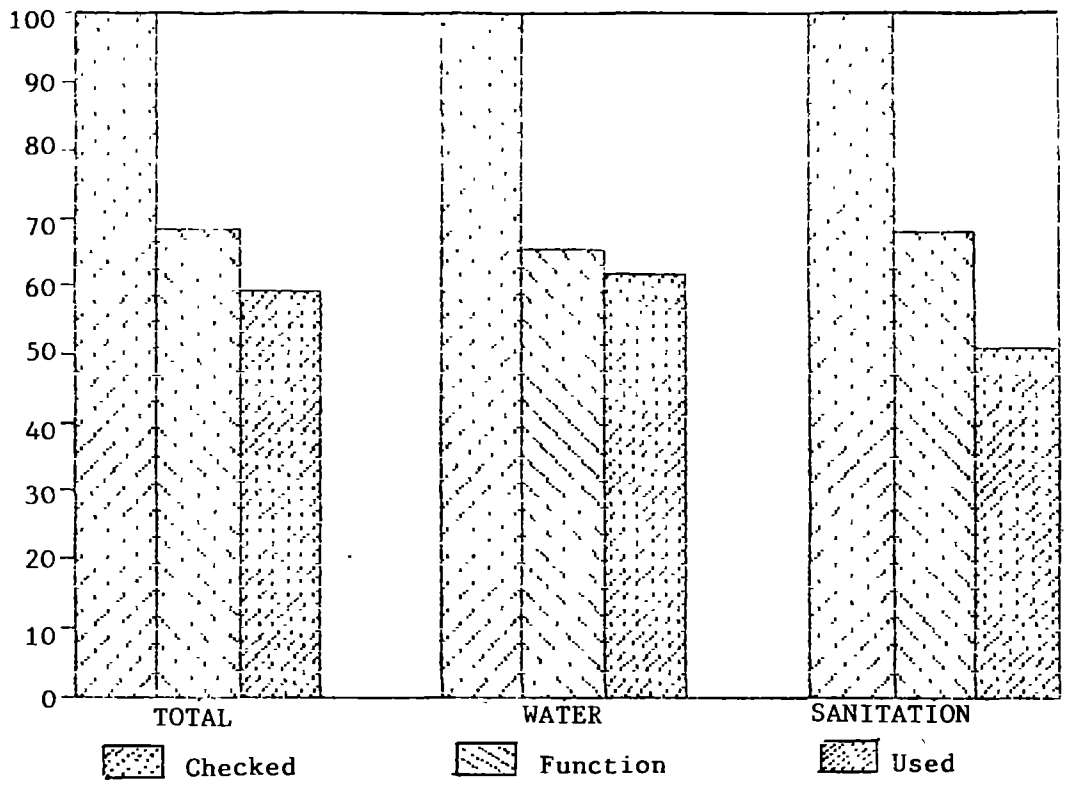
5.1. General Status of Facilities

The survey team surveyed a total of 3077 facilities of which 2092 (68.2%) were reported by users to be functioning and 1823 (59.3%) were used. These comprised water facilities and sanitation facilities. There were 1901 water facilities of which 1294 (65.2%) functioned and 1226 (61.7%) were used; and 1176 sanitation facilities of which 798 (67.9%) functioned and 597 (50.8%) were used. Graph 5.1 shows facilities checked, functioning and used.

The greatest number of facilities checked were installed in REPELITA 3 (51.3%), followed by REPELITA 4 (37.1%), and REPELITA 2 (11.6%). Graph 5.2. showing the distribution of facilities checked

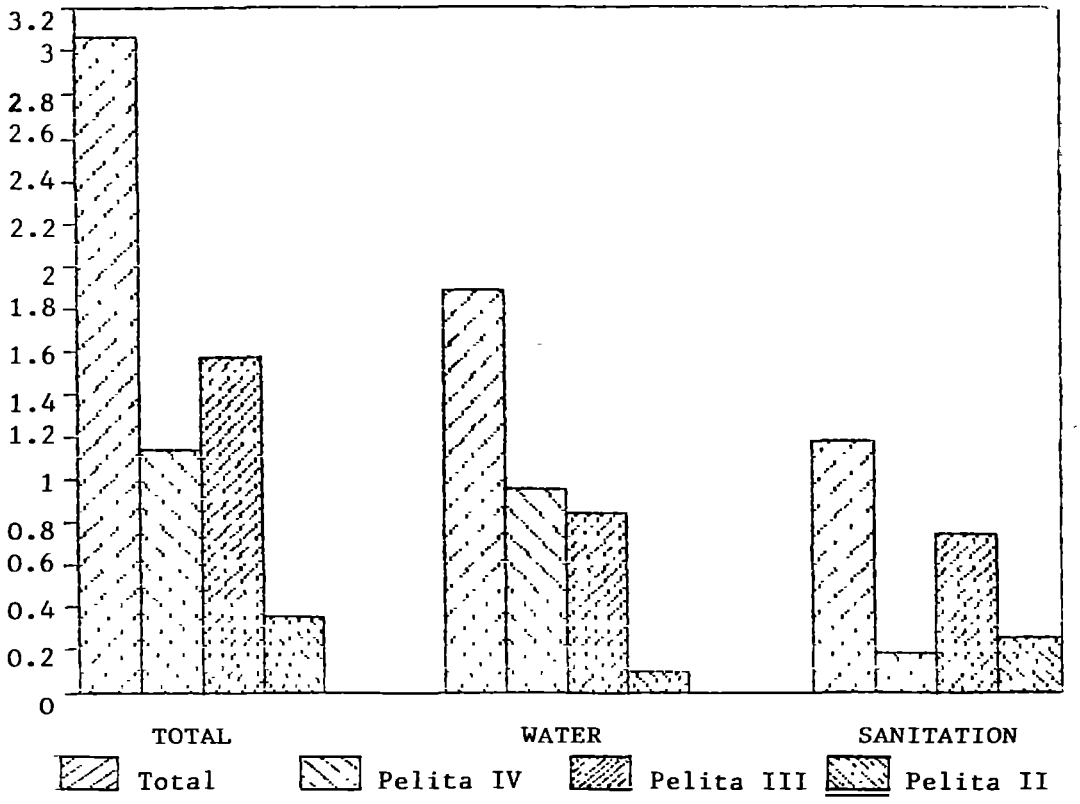
Graph. 5.1

Facilities. Checked. Function and Used



Graph. 5.2

Distribution of Facilities by Pelita



by REPELITA indicates that (84%) of the facilities checked in REPELITA 4 were water facilities, in REPELITA 3 facilities checked were split between water facilities (53.2%) and sanitation facilities (46.8%). REPELITA 2, although small, was oriented towards sanitation facilities (72.4%) rather than water facilities (27.6%).

A more of facilities built during REPELITA 3 functioned (75.0%) as compared to those built during REPELITA 2 (47.9%) and REPELITA 4 (65%). One would have expected a higher percentage of facilities functioning for REPELITA 4 which was true only for the sanitation facilities where 42.8% functioned from REPELITA 2, (72.6%) functioned from REPELITA 3, and 84.1% functioned from REPELITA 4. Water facilities from REPELITA 2 showed 61.2% function, 77.2% from REPELITA 3 functioned, but only (61.34%) from REPELITA 4 functioned. Some problems in the recent implementation of the INPRES RWSS program is apparent. Graph 5.3 shows functionality of facility by REPELITA.

Distribution of Facilities

a. Water

	Checked	% Total
Dug well (SG)	232	12.20
Shallow Well Handpump (SPTDK)	1294	68.07
Deep Well Handpump (SPTDL)	254	13.36
Rain Collectors (PAH)	75	3.95
Spring Protection (PMA)	27	1.42
Piped System (PP)	17	0.89
Artesian Wells (SA)	2	0.11
T o t a l	1901	100.00

b. Sanitation

Family Latrines (JAGA)	1014	86.22
Water Waste Disposal (SPAL)	162	13.78
T o t a l	1176	100.00

Water facilities consist mainly of shallow well handpumps, (68.1%) of all water facilities. Sanitation facilities consist largely of family latrines (86.2%).

One can divide the water facilities into two categories; community facilities such as piped systems, spring protection, and artesian wells and individual facilities such as dug wells, handpumps and rain collectors. All the community facilities checked functioned but constituted less than (2.4%) of the total water facilities. Graph 5.4 shows the percentage function and use of the mass water facilities.

The individual facilities perform as well as the community facilities. The most successfull facility was dug wells which constituted only (12.2%) of all water facilities as (94.0%) of all facilities functioned. Rain collectors constituted (4.0%) of all facilities and (61.6%) functioned. Deep well handpumps constituted (13.4%) of all facilities and (55.9%) functioned. Shallow well handpumps constituted the largest proportion of the facilities (68.1%) and only (65.4%) functioned. Graph 5.5 shows the percentage function and use of the non-mass water facilities.

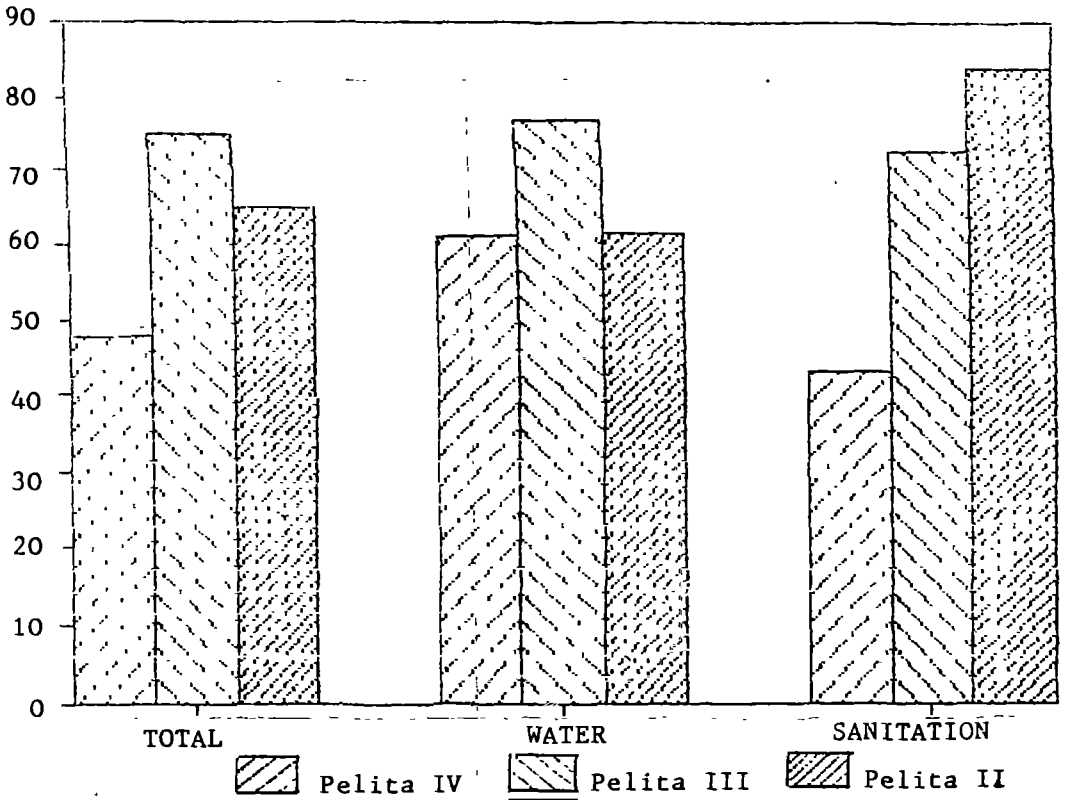
The sanitary facilities appeared more successful than the water facilities although the number of facilities reported as functioning was greater than the number of facilities actually found to be in usable condition. Family latrines constituted (86.2%) of the sanitary facilities and (67.1%) were reported functioning. Waste water disposal constituted (13.8%) and (72.8%) were reported functioning. Graph 5.6 shows the percentage function and use of sanitary facilities.

The drilling component of the program does not appear important to the installation of the handpumps. As many as 61% of the pumps are installed on dug wells and 39% are installed on bored wells of which only 9% are bored by machine. Of the handpumps installed on dug wells only 40% are protected wells.

Increased repair and rehabilitation would increase the life expectancy and coverage of both water and sanitation facilities. For pumps, both shallow and deep, it was found that 33.8% need some repairs and 34.6% need major rehabilitation. Of the family latrines reported as not functioning 15.4% had their pits full which could be cleaned or a new pit could be dug.

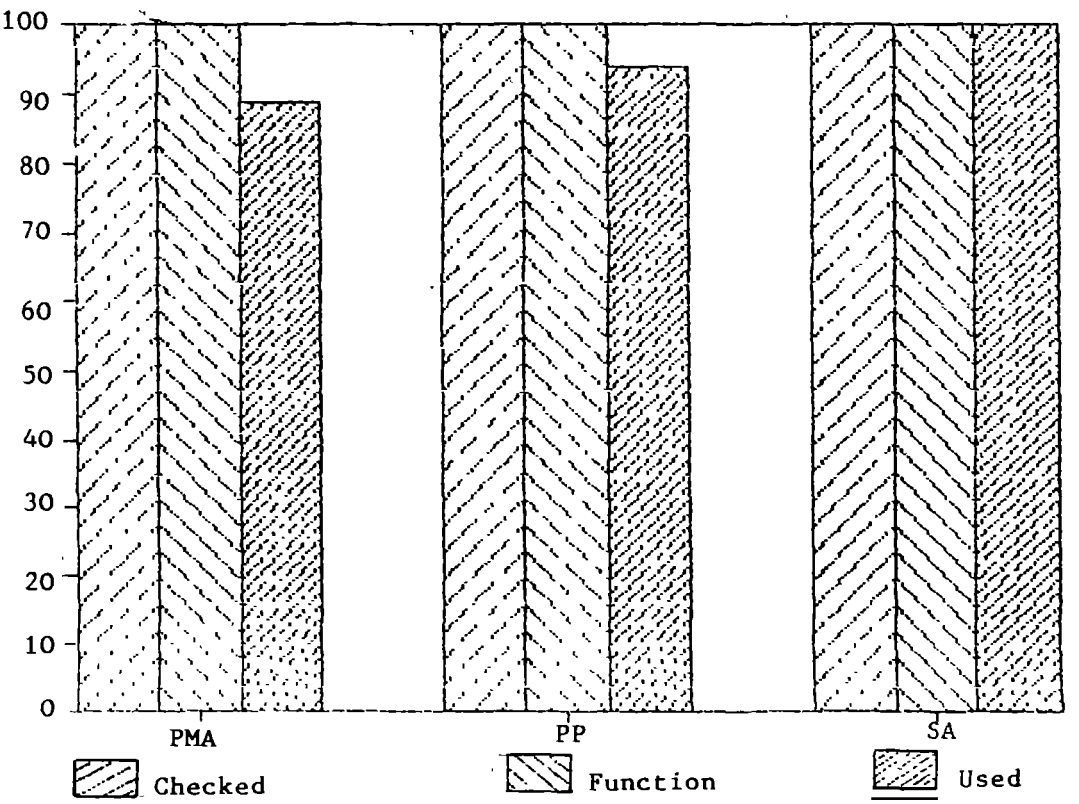
Graph. 5.3

Functionality by Pelita



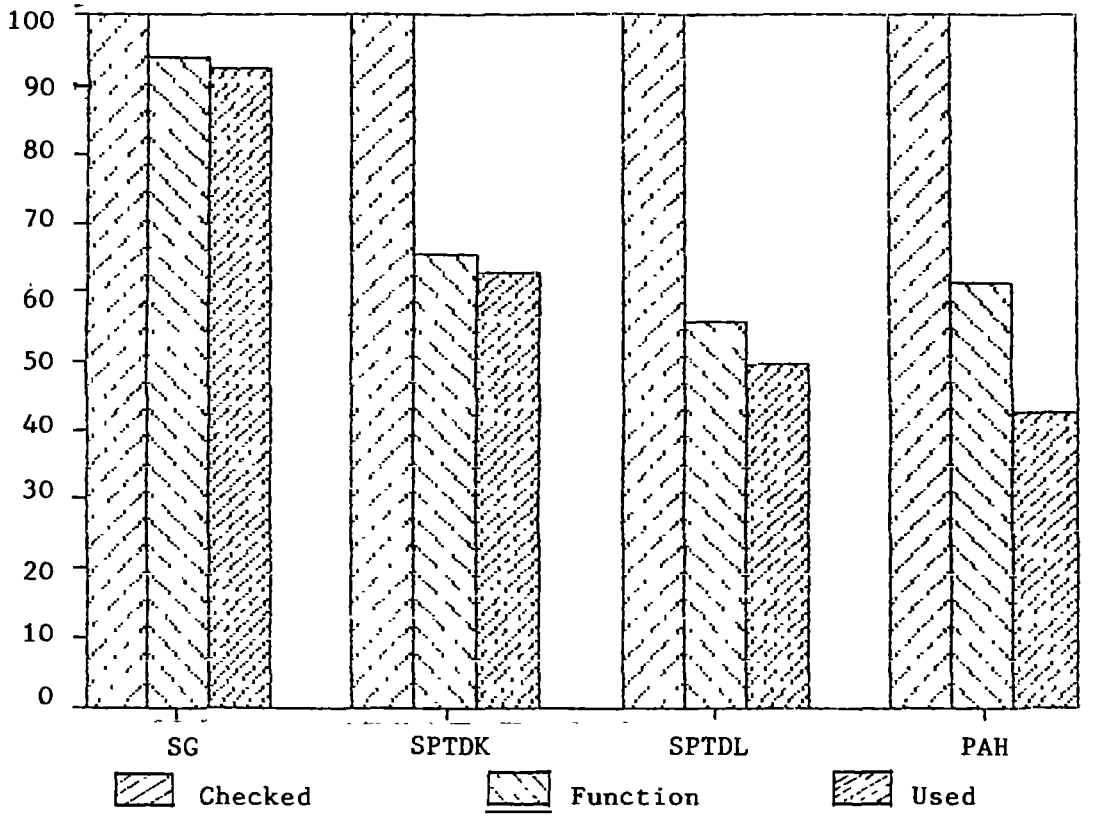
Graph. 5.4

Mass Water Facilities : Function and Used



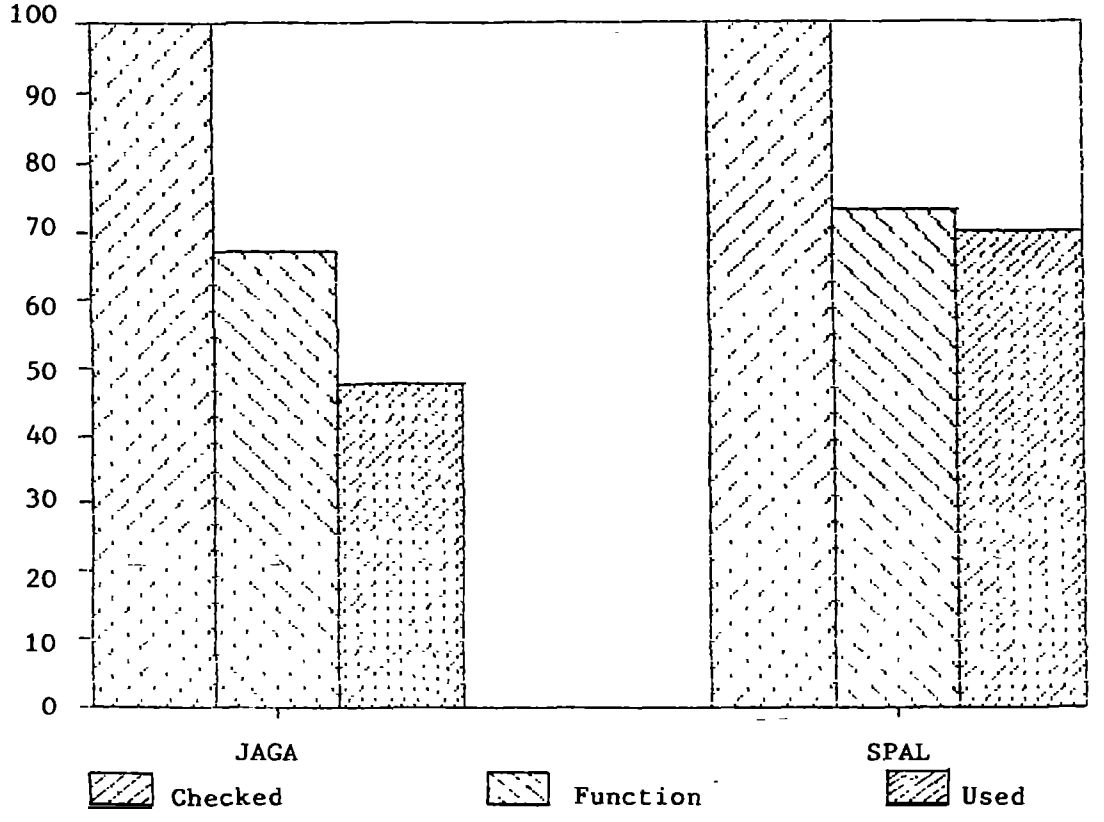
Graph. 5.5

Non Mass Water Facilitites : Function and Used



Graph. 5.6

Sanitation Facilities : Function and Used



5.2 Community Facilities

5.2.1. Piped System

Status of Piped Systems by Province

PROVINCE	CHECKED	FUNCTION CONT.	USED CONT.	NOT CONT	CLEAR WATER
JABAR	5	5	5	0	4
(%)	29.4	100.0	100.0	0.0	80.0
SUMBAR	4	4	3	1	4
(%)	23.5	100.0	75.0	25.0	100.0
NTB	8	7	7	0	7
(%)	47.1	87.5	87.5	0.0	87.5
T o t a l	17	16	15	1	15
(%)	100.0	94.1	88.2	5.9	88.2

Piped systems function well, are used, and provide clear water. One unit provides water for an average of 362 families and provides an average of 214 liters per family per day. Water quality is high.

Status of Piped Systems by REPELITA

	BUILT	FUNCTION	% FUNCTION OF BUILT
REPELITA 2	3	3	100.0
REPELITA 3	12	11	91.7
REPELITA 4	2	2	100.0
T o t a l	17	16	94.1

5.2.2. Protected Springs

Status of Protected Springs by Province

PROVINCE	CHECKED	FUNCTION CONT.	USED CONT.	NOT CONT.	CLEAR WATER
JABAR	6	5	5	0	4
(%)	22.2	83.3	83.3	0.0	66.7
SUMBAR	5	5	5	0	4
(%)	18.5	100.0	100.0	0.0	80.0
NTB	16	14	14	0	14
(%)	56.3	87.5	87.5	0.0	87.5
T o t a l	27	24	24	0	22
(%)	100.0	88.9	88.9	0.0	81.5

Protected springs appear to be very successful in delivering clear water continuously. 88.9% of the facilities constructed function and are used continuously and 81.5% produce clear water.

Status of Protected Springs by REPELITA

	Built	Function	% Function of Built
REPELITA 2	0	0	0.0
REPELITA 3	15	15	100.0
REPELITA 4	12	9	75.0
Total	27	24	88.9

Protected springs are similar to the many of the individual facilities such as deep and shallow well handpumps as fewer of the facilities built during the current planning period function compared to REPELITA 3.

5.2.3. Comparison of Community Water Facilities and Analysis

Comparison of Water Supply Facilities

	Piped System	Protected Springs
Function	16	24
(%)	94.1	88.9
Used	16	24
(%)	94.1	88.9
Continuous Use	15	24
(%)	88.2	88.9
Drinking/Cooking	3	3
(%)	17.6	11.1
All purpose*	12	21
(%)	70.6	77.8
No. families/facility	362	61
No. Liters/Family	214	143
Clear water	15	23
(%)	88.2	85.2

* All purpose means the water is used for drinking, cooking, washing and bathing.

While 94.1% of the piped systems and 88.9% of the protected springs are reported as functioning, only 70.6% of the piped systems and 77.8% of the protected springs provide water for drinking, cooking, washing and bathing. The piped systems reach an average of 362 families and the protected systems reach an average of 61 families. Coverage could probably be increased through expansion of the existing system.

5.3. Individual Facilities

5.3.1. Dug Wells

Status of Dug Wells by Province

PROVINCE	CHECKED	FUNCTION	USED CONT.	NOT CONT.	CLEAR WATER
JABAR	95	92	82	7	83
(%)	40.9	96.8	86.3	7.4	87.4
SUMBAR	44	37	34	1	23
(%)	19.0	84.1	77.3	2.3	52.3
NTB	93	89	84	6	88
(%)	40.1	95.7	90.3	6.5	94.6
T o t a l	232	218	200	16	194
(%)	100.0	94.0	86.2	6.9	83.6

A total of 232 dug wells were checked by the survey team. Overall 218 (94%) were reported to be functioning, 200 (86.2%) were in use continuously, and 194 (83.6%) produced clear water. Dug wells performed the best in NTB where 89 (95.7%) functioned, 84 (90.3%) were in continual use, and 88 (94%) produced clear water. In JABAR 92 (96.8%) were reported functioning, however, fewer 82 (86.3%) produced water continually and 83 (87.4%) produced clear water than in NTB. SUMBAR had 44 dug wells of which 377 (84%) were reported functioning, 34 (77.3%) produced water continuously, but only 23 (52.3%) produced clear water.

Protected and Unprotected Dug Wells

PROVINCE	NOT PROTECT	PROTECTED	TOTAL	FUNCTION	CLEAR WATER
JABAR	21	74	95	92	83
(%)	22.1	77.9	40.9	96.8	87.4
SUMBAR	11	33	44	37	23
(%)	25.0	75.0	19.0	84.1	52.3
NTB	47	46	93	89	88
(%)	50.5	49.5	40.1	95.7	94.6
T o t a l	79	153	232	218	194
(%)	34.1	65.9	100.0	94.0	83.6

More than half the dug wells surveyed (65%) were protected wells. Biological testing would be needed to determine the impact of protection on water quality.

Frequency of Breakdown of Components of Dug Wells :

PART	BROKEN	% TOTAL
Cover	204	87.9
Drainage	88	37.9
Lining	33	14.2
Platform	20	8.6
Wall	20	8.6
T o t a l	232	100.0

Distance from source of pollution :
According to Standards 150 (64.6%)
Not According to Standards 82 (35.4%)60.

Physical inspection of the dug wells revealed that 87.9% of the well covers were not functional, broken or missing. The drainage system was not functional for 37.9% of the cases inspected. The lining was not functional for 14.2% of the cases. The platform and walls were broken in 8.6% of the cases. The location of the well in 82 (54.9) cases was less than 10 meters from a source of pollution. Non functioning covers and linings and wells built too close to a source of pollution may indicate that the dug wells may not be meeting the safe water health objectives of the program fully.

Distribution of Dug Wells by REPELITA

REPELITA	BUILT	FUNCTION	% FUNCTION
REPELITA 2	0	0	0.0
REPELITA 3	92	85	92.4
REPELITA 4	140	133	95.0
T o t a l	232	218	94.0

The age structure of the dug wells surveyed is fairly new and the percent functioning high. Dug wells do not appear to lose function quickly. The difference in percent functioning between REPELITA 3 (92.4%) and REPELITA 4 (95.00%) is not significant.

5.3.2. Shallow Well Handpumps

Status of Shallow Well Handpumps by Province

PROVINCE	CHECKED	FUNCTION	USED CONT.	NOT CONT.	CLEAR WATER
JABAR	450	257	223	15	197
(%)	34.8	57.1	49.6	3.3	43.8
SUMBAR	159	80	66	9	50
(%)	12.3	50.3	41.5	5.6	31.4
NTB	685	509	481	18	492
(%)	52.9	74.3	70.2	2.6	71.8
T o t a l	1294	846	770	42	739
(%)	100.0	65.4	59.5	3.3	57.1

The survey team checked a total of 1294 shallow well pumps in NTB, JABAR and SUMBAR . Of those, 450 (34.8%) were installed in JABAR, 159 (12.3) were installed in SUMBAR and 685 (52.9%) were in NTB. 509 (74.3%) of the wells functiond in NTB, 257 (57.3%) functioned in JABAR and 76 (47.8%) functioned in SUMBAR. Overall, 846 (65.4%) of the shallow well handpumps checked, functioned.

The survey team found 481 (70.2%) of the wells in NTB were used continuously and 492 (71.8%) produced clear water. In JABAR 23 (51.7%) of the wells were used and 197 (43.8%) produced clear water. In SUMBAR, 66 (41.5%) of the wells were used continuously and 50 (31.4%) produced pure water. Overall 770 (59.5%) of the wells were used continuously and 739 (57.1%) produced clear drinking water.

Frequency of Breakdown of Pumps Parts
(Shallow Well Handpump:)

PART	BROKEN	% TOTAL
Cylinder	310	24.0
Footvalve	1206	93.2
Riserpipe	331	25.6
Pump Head	319	24.7
Platform	979	75.7
Drainage	418	32.3

1294 facilities inspected
Distance from source of pollution

According to Standards	450	(34.8%)
Not according to Standards	844	(65.2%)

Most common types of damage include the valve which was found to be non-functioning in 93% of the cases inspected and damaged platforms which were found in 76% of the facilities. Cylinders, riser pipes and pump heads were not functional in roughly 25% of all cases. The handpumps were located within 10 meters of a source of pollution in 65.22% of the cases checked.

Details of Breakdown by Pump Type

	CHECKED	NOT FUNCTION	% NOT FUNCTION
Dragon	427	186	43.6
Bandung	142	42	29.6
Other local	725	215	29.3
T o t a l	1294	443	34.2

The Dragon pump had the highest failure rate (43.6%) of all the shallow pumps checked. The Bandung pump did not appear, from this survey, to perform better than other local brands (29.6% failure). Dragon pumps comprise 33% of all pumps installed.

Shallow Well Handpump :
Brand Distribution by Province

PROVINCE	DRAGON	BANDUNG	OTHER	TOTAL
JABAR	157	121	172	450
SUMBAR	133	1	25	159
NTB	137	20	525	682
T o t a l	427	142	722	1291
(%)	33.0	11.0	56.0	100

In SUMBAR 133 of 159 (84%) of the pumps are Dragon pumps and thus one would expect a higher rate of non-functioning pumps than in JABAR where 157 (35%) are Dragon pumps or in NTB where 137 (20%) are Dragon pumps. NTB, in fact. had a significantly higher rate of funtioning pumps (73.3%) than JABAR (53.8%) or SUMBAR (47%). A large number of pumps (56.0%) installed do not follow the specification

Shallow Well Handpumps installed: on dug wells, manually bored wells and machine bored well

	ON DUG WELLS			ON BORE HOLES				
PROVINCE	UN.PROT	PROT	TOT	MANUAL	MACHINE	TOT	Total	Function
JABAR	27	59	86	331	33	364	450	257
(%)	31.4	68.6	19.1	90.9	9.1	80.9	34.8	57.1
SUMBAR	43	93	136	7	16	23	159	80
(%)	31.6	68.4	85.5	30.4	69.6	14.5	12.3	50.3
NTB	119	443	562	75	48	123	685	509
(%)	21.2	78.8	82.0	61.0	39.0	18.0	52.9	74.3
Total	189	595	784	413	97	510	1294	846
(%)	24.1	75.9	60.6	80.1	19.9	39.4	100.0	65.4

In JABAR 364 (80.9%) of the shallow handpumps were on bored wells. However, 331 (90.9%) of the bored wells were bored manually. Of the remaining 86 wells, 59 (68.6%) were protected and 27 (31.4%) were unprotected. In SUMBAR and in NTB the greater proportion of the wells were dug wells. In SUMBAR 23(14.5%) of all wells were bored and of these 7 (30.4%) were manually bored and 16 (69.6%) were machine bored. The remaining 136 (85.5%) of the total

wells were dug wells of which 43 (31.6%) were unprotected and 93 (68.4%) were protected. In NTB, 123 (18%) of all wells were bored. Of the bored wells, 75 (61%) of the bored wells were bored manually and 48.8 (39%) were bored by machine. 562 (82%) of the wells were dug wells of which 443 (78%) were protected and 119 (21.2%) were unprotected. Overall, 784 (60%) of the wells were dug wells of which 595 (75.9%) were protected wells; 510 (39.4%) of the wells were bored of which 413 (80.1%) were manually bored. Of the total 1294 shallow well handpumps surveyed. 846 (65.4%) functioned. 97 (19.9%) were machine bored.

There is very little machine boring of wells. Most pumps are placed on dug wells or on manually drilled wells. 97 (7.6%) of the 1294 wells surveyed were machine drilled, of these 33 were in JABAR, 16 were in SUMBAR and 48 were in NTB. This suggest careful review of the funding allocation for procurement and maintenance of drilling equipment.

Shallow Well Handpumps Built by REPELITA

REPELITA	BUILT	FUNCTION	% FUNCTION
REPELITA 2	91	57	62.7
REPELITA 3	554	444	80.1
REPELITA 4	649	345	53.6
T o t a l	**1294**	**846**	**65.4**

It is of some concern that only 53.6% of the facilities installed in REPELITA 4 are functioning. This is indicative of a problem with the execution of the program. Perhaps this is partly due to the higher targets for isntallation set in repelita 4 as compared to those of the previous REPELITAs.

5.3.3. Deep Well Handpumps

Status of Deep Well Handpumps by Province

PROVINCE	CHECKED	FUNCTION	USED CONT.	NOT CONT.	CLEAR WATER
JABAR	74	27	18	0	13
(%)	29.1	36.5	24.3	0.0	17.6
SUMBAR	69	41	25	7	23
(%)	27.2	59.4	36.2	10.1	33.3
N.T.B.	111	76	66	10	71
(%)	43.7	68.5	59.5	9.0	64.0
T o t a l	254	144	109	17	107
(%)	100.0	56.6	42.9	6.9	42.1

A total of 254 deep well handpumps were inspected of which 43% were in NTB. 29% were in JABAR, and 27% were in SUMBAR. Overall 144 of of the total 254 (56.6%) were considered to be functioning.

The hand pumps performed the best in NTB where 68% functioned, 59% of the pumps were used continuously and 64% of the total checked facilities provided clear water. SUMBAR came next with 59.4% of the facilities functioning, 36.2% in continual use, and 33.3% providing access to clear water. JABAR, had the lowest performance of the three provinces. 36.5% of the facilities functioned, 24.3% were in continual use, and only 17.6% provided clear water.

Frequency of Breakdown of Pumps Parts

Part	Broken	% Total
a. Below Ground		
Cylinder	62	24.4
Footvalve	87	34.3
Riser pipe	54	21.3
b. Above Ground		
Pump Body	54	21.3
Pump Head	36	14.2
Platform	52	20.5
Drainage	101	39.8

114 (44.9%) of the handpumps installed were within 10 meeters of the sources of pollution

The drainage system was the most likely above ground component to be broken where 101 (39%) of the 254 pumps inspected were found to have drainage systems which were broken or cracked. The next most likely above ground component to be brokendown was the pump body (21.3%), followed by the platform (20.5%) and the pump head (14.2%). It should be noted that the above ground components are the most easily repaired and replaced.

34% of the handpumps were found to have broken footvalves. 24% were found to have broken cylinders, and 21% were found to have broken riser pipes. These repairs are less likely to be executed as special equipment and skills are required to open the pump as these parts are below the ground.

Deep Well Handpumps Distribution by Brand

PROVINCE	DRAGON	BANDUNG	KORAT	MARK II	BARUNA& OTHER	TOTAL
JABAR	3	22	2	2	44	73
SUMBAR	0	0	1	2	66	69
NTB	0	4	11	17	77	109
T o t a l	3	26	14	21	187	251
(%)	1.2	10.4	5.6	8.4	74.5	100

The distribution of pumps by brand reveal that Dragon and Bandung type, have been installed in 29 (11.6%) cases. Of the 29 pumps installed, 25 of the cases occured in JABAR. JABAR has the lowest functioning rate (36.5%) of the three provinces surveyed. The Korat and India Mark II pumps are pumps imported by UNICEF for their Rural Water Programme and were unintentionally included in the survey.

Deep Well Handpumps placed : on dug wells, manually bored wells, and machine bored wells

PROVINCE	ON DUG WELLS			ON BORE WELLS			TOTAL
	NOT PROT.	PROT.	TOT PROT.	MANUAL	MACHINE	TOTAL	
JABAR	14	7	21	41	7	48	69.0
(%)	66.7	33.3	30.4	85.4	14.6	69.6	27.7
SUMBAR	38	3	41	0	29	29	70.0
(%)	92.7	7.3	58.6	0.0	100.0	41.4	28.1
NTB	80	16	96	13	1	14	110
(%)	82.5	16.5	88.2	92.3	0.9	11.8	44.2
T o t a l	132	26	158	54	37	91	249
(%)	83.0	16.4	63.9	58.9	41.1	36.1	100.0

Most deep well handpumps are placed on dug or manually bored wells. Overall 212 (85.1%) deep well handpumps were placed on dug or manually bored wells and 37 (14.9%) wells are machine bored. In NTB 109 (99.1%) of the wells were dug or manually bored. Only one was bored by machine. In JABAR, 62 (89.8%) of the wells were dug or manually bored. In SUMBAR, 40 (58.6%) of the wells were dug and 29 (414%) of the wells were machine bored.

The drilling component of the INPRES program appears to play a minor role in the development of deep wells handpumps. Wells are more likely to be dug or bored manually. Of the 37 wells which were machine bored, 29 (78.3%) were in SUMBAR, 7 (18.9%) were in JABAR, and 1 was found in NTB. Funding allocations for the purchase and maintenance of drilling equipment should be reviewed carefully.

Deep Well Handpumps Built by REPELITA

PERIOD	BUILT	FUNCTION	% FUNCTION
REPELITA 2	2	0	0.0
REPELITA 3	117	52	44.4
REPELITA 4	132	90	68.2
T o t a l	251	142	100.6

Of the deep well handpumps built in REPELITA 3, only 44.4% function. Of the deep well handpumps built during the current planning period, 68.2% functions. The life expectancy of deep well handpumps is shorter than one would expect.

5.3.4 Rain Collectors

Status of Rain Collectors by Province

PROVINCE	# CHECKED	# FUNCTION	USED CONT.	NOT# CONT.	CLEAR WATER
JABAR	27	24	5	6	10
(%)	36.0	88.9	18.5	22.2	37.0
SUMBAR	24	10	0	9	6
(%)	32.0	41.7	0.0	37.5	25.0
NTB	24	12	1	11	5
(%)	32.0	50.0	4.2	45.8	20.8
Total	75	46	6	26	21
(%)	100.0	61.3	8.0	34.7	28.0

Overall, the rain collectors were reported as funtional in 46 (61.3%) cases, was used continuosly throughout the year in 6 (8%) cases, and provided clean water in 21 (28%) cases. No pattern of reported function and use is apparent amongst the three provinces surveyed. JABAR had a reported functioning rate of 88.9%, used a total of 40.7%, and provided clear water for 37.% of the cases checked. SUMBAR had a reported functioning rate of 41.7% which was closer to the reported use of 37.5%; clear water was provided for 25% of the cases checked. NTB showed a similar pattern to SUMBAR with 50% reported functiong, 42.7% in use, and 28% providing clean water. The disparity between reported function and use in JABAR suggests that rain collectors are less appropriate in JABAR than in SUMBAR and NTB, yet the majority of the rain collectors were installed in JABAR. The criteria for selection of rain collectors must be reviewed since they are the least successful in the area where they are found the most.

Frequency of Breakdown of Rain Collector Components(75 checked)

	NOT FUNCTIONAL	% NOT FUNCTIONAL
Roof catchtment area	12	16
Roof	1	1
gutter material	17	22
Gutter-roof to tank	17	22
Filter	35	46
Tank volume	0	0
tank leakage	42	56
Faucet	15	20
overflow pipe	10	13
Floor	26	34
Inspection Hole	23	30
outlet for cleaning	15	20

The single most important component in the rain collector is the holding tank which in 56% of the cases checked were found to be disfunctional. Poor construction appears to be the major reason why the rain collectors do not function.

Rain Collector Distribution by Repelita

	BUILT	USED
Repelita 2 :	2	0
Repelita 3 :	47	25
Repelita 4 :	26	7
Total	75	32

Of the facilities built during Repelita 3 (53%) are still in use while only 27% of the facilities built during the current Repelita are in use.

Rain Collectors Distribution by type

	BAMBOO CEMENT	FERRO CEMENT	CEMENT	TOTAL
Total	5	66	4	75
%	6.7	88.0	5.3	100.0

The single most prevalent type of rain collector found is Ferro-cement (88%). Since it is the ferro-cement holding tank which is breaking down, careful review should be made of building practices, specifications, and materials used.

5.3.4 Comparison of Individual Facilities and analysis

Comparison of Water Supply Facilities

	SHALLOW WELL HANDPUMP	DEEP WELL HANDPUMP	DUG WELL	RAIN COLLECTOR
Function	846	142	218	46
(%)	65.4	55.9	94.0	61.3
Used	812	126	212	32
(%)	62.9	49.6	91.4	42.7
Continuous	770	109	200	6
(%)	59.5	42.9	86.2	8.0
Drinking/Cooking	140	32	21	22
(%)	17.2	25.4	9.9	68.9
All Purpose *	622	82	176	4
(%)	76.6	65.1	83.0	12.5
No. Families/facility	13	15	14	10
No. Liters/Family	110.0	91.3	184.0	36.6
Clear Water	739	107	194	21
(%)	91.0	84.9	91.5	65.6

* All purpose means the water is used for drinking, cooking, washing, and bathing.

The dug well is the most effective facility installed in terms of function, use, clarity of water, and continuity and volume of water provided. The shallow well handpump is the second most effective facility. The deep well hand pump is third and the least effective facility is the rain water collector.

Rainwater collectors are inefficient and ineffective compared to the other facilities and therefore should be used only where no other alternatives to the provision of safe drinking water exist. Rainwater collectors should only be relied upon for the provision of drinking water as total volume of water delivered per family is too small to be used for other purposes.

The dug well where it can be installed appears to be the most cost effective, trouble free source of water for villagers. While the average number of families covered is one less than for deep well hand pumps and one more than shallow well hand pumps. The 184 liters per family per day provided is nearly double that for the other two sources and comes the closest to meeting desirable levels of clean available water. The dug well has the highest functioning and user rate, requires less repair and maintenance than the other two facilities, and those repairs needed are far more likely to be within the capabilities of the villagers. The disadvantage of dug wells is that maintenance of bacteria purity of the water is nearly impossible and therefore all dug well water must be boiled.

The deep well pumps do not perform as well as shallow well pumps or dug wells and are far more like to require repair. Of the 254 deep well handpumps checked, 143 (56.3%) require repair. As 142 (55.9%) are in functioing order, it appears that once broken a deep well handpump is not fixed.

The drilling program needs review as only 134 of the 1548 (8.7%) deep and shallow hand pumps were installed on wells which were drilled by machine. The demand for and optimal distribution of rigs needs to be studied carefully to ensure that equipment is not idle while ensuring that funds are available for operation and maintenance where the equipment is actually needed.

Particular problems in the implementation of Repelita 4 are demonstrated by the relatively low percent of functioning of facilities installed during this period. This may be because the program was overambitious and overburdened the system, the new policy abolishing the SIAP such that late disbursement of funds meant that the program had to be executed in the last few months of the fiscal year, lack of monitoring and accountability combined with other factors such as those previously mentioned.

5.4. Sanitary Facilities

5.4.1. Family Latrine

Status of Family Latrines by Province

PROVINCE	CHECKED	FUNCTION REPORTED	ACTUAL USE	REPORTED USE
JABAR	497	314	224	301
(%)	49.0	63.2	45.1	60.6
SUMBAR	225	132	95	119
(%)	22.2	158.7	42.2	52.9
NTB	292	234	165	229
(%)	28.8	80.1	56.5	78.4
T o t a l	1014	680	484	649
(%)	100.0	67.1	47.7	64.0

Actual use was determined by the number of facilities inspected which had a functioning pits under the assumption that when the pit is broken or full the facility cannot be used.

The survey team checked 1014 family latrines of which 680 (67.1%) were reported to be functioning by the respondent. When the structures were physically inspected, it was found that only 484 (47.7%) had pits that were usable. Therefore, only 484 (47.7%) of the facilities could actually be used. Overall, the percentage of facilities usable was the same for all three provinces surveyed.

Usability of Facilities by Type

TYPE	TOTAL	USABLE	% USABLE
Water Seal Latrine	872	438.2	50.2
Pit Latrine	103	31	30.1
Cubluk	39	15	38.5
T o t a l	1014	484	47.7

Three types of facilities were installed in the field. The water seal latrine was by far the greatest in number, 872 (86%), and also appeared to be the sturdiest as 50.2% were usable.

The disparity between the percentage reported functioning and the percentage found functioning in JABAR (63.2% : 45.1%) and in SUMBAR (58.7% : 42.2%) was similar however the difference increased in NTB (80.1% : 56.5%). This suggests a reluctance on the part of the caretaker or Penanggung Jawab to report that the facility is not functioning.

Field Observations on Status of Facility
Number of facility components functioning:

LATRINE TYPE	WATER IN BOWL	COVER	FLUSH WATER	WALLS	FLOOR	DOOR	ROOF	VENTILA-TION	LOCA-TION
Water Seal	504	438	364	502	435	430	355	281	515
Pit	0	31	55	60	30	21	43	34	36
Cubluk	0	15	10	16	13	5	11	9	18
T o t a l	504	484	429	578	478	456	409	324	569

Field observations show that the condition of the family latrines are inadequate. Out of the 1014 checked less than 50% showed evidence of use with water in the bowl, had an adequate floor, door, walls, ceiling, or ventilation. Only 56% were built more than 10 meters from a source of water. The 46% of the family latrines thus presented a hazard to village health.

Operation and Maintenance

	Reported functioning but having been full				Reported not functioning	Steps taken to maintain pits		
	Broken	Full	Other	Total	Function	Full	Cleaned	Moved
JABAR	107	12	23	142	314	46	4	42
SUMBAR	50	20	14	84	132	23	2	21
NTB	34	11	8	53	234	49	26	23
T o t a l	191	43	45	279	680	118	32	86
%	68.4	15.4	16.1	100		100	27.1	72.9

Of those family latrines reported as not functioning 43(15.4%) were full. Of those which were reported functioning 118 (17.4%) had been full. In 86 cases (72.9%) the family latrine had been moved and in 32 cases (27.1%) the family latrine was cleaned. In JABAR and SUMBAR villagers were more likely to move the family latrine (91.3%) and in NTB villagers were more likely to clean the family latrine (53.1%). It appears that as much as 15% of the family latrines reported to be non functioning could be restored to use simply if the pits were cleaned or moved.

Community Funded Family Latrines (Swadaya)

Province	Number of Facilities Reported						TOTAL SWADAYA	TOTAL INPRES	% OF INPRES
	1	2	3	4	5	6			
JABAR	21	54	102	100	120	42	439	497	88.3
SUMBAR	8	0	6	0	0	0	14	225	6.2
NTB	12	20	12	24	40	12	120	292	41.1
T o t a l	41	74	120	124	160	54	573	1014	56.5

One of the objectives of the program is for the INPRES family latrine to serve as a model dissemination of family latrine through self-help community programs. This appears to have been most successful in JABAR approximately one family latrine has been built through " SWADAYA " or self-help for each family latrine funded by INPRES. In SUMBAR only 1 family latrine has been built for each 16

INPRES family latrines. In NTB 1 family latrine has been built for three INPRES family latrines. Overall, 1 " Swadaya " family latrine has been built for each 2 INPRES family latrines. The goal of 3 " Swadaya " family latrine to 1 INPRES family latrine has not been met.

Additional Cash Provided by the Village

	NOT PROVIDED	PROVIDED	TOTAL RESPONDENTS
JABAR	337	128	465
(%)	72.5		
SUMBAR	48	174	222
(%)	21.6		
NTB	77	207	284
(%)	27.1		
T o t a l	462	509	971
(%)	47.6		

Average amount provided Rp. 16,470

A significant cash outlay was provided in 462 (47.6%) cases. The average amount was Rp. 16,470. Of the 462 cases, 337 of these cases occured in JABAR. it is notable that JABAR had the highest rate of " Swadaya " to INPRES construction of family latrines as well

Location of Family Latrine

	INSIDE	FRONT	SIDE	BACK	TOTAL
JABAR	100	10	81	271	462
SUMBAR	28	0	16	174	218
NTB	25	11	128	98	262
T o t a l	**153**	**21**	**225**	**543**	**942**
(%)	16.2	2.2	23.9	57.6	100.0

The inside location of 16.2% of the family latrines suggest an urban or semi urban setting for these facilities. Since the population density of JABAR is the highest of the three regions and since 100 of 153 located inside are in Jabar, this is further suggested. the most common location (57.6%) for the family latrine is behind the house.

Number of Families using Family Latrine

	Number of families per latrine							
	1	2	3	4	5	6	More than 6	Total
JABAR	89	43	37	31	45	21	34	300
	29.7							
SUMBAR	103	8	4	2	2	0	0	119
	86.6							
NTB	132	37	18	17	13	5	7	229
	57.6							
T o t a l	324	88	59	50	60	26	41	648
	50.0							

Family latrines are intended for the use of one family. Only 50% of the family latrines reported functioning are in use by one family. The highest rate of one family use is in Sumbar (86.6%) and the lowest rate is in Jabar (29.7%). As the percentage of facilities that are usable is similar in all three provinces, there does not appear to be a strong relationship between the number of families using a facility and its physical condition.

5.4.2. Waste Water Disposal Pits

Status of Waste Water Disposal

PROVINCE	CHECKED	FUNCTION REPORTED	USED
JABAR	57	39	38
(%)	35,2	68.4	66.7
SUMBAR	23	20	20
(%)	14.2	87.0	87.0
NTB	82	59	55
(%)	50.6	72.0	67.1
T o t a l	162	118	113
(%)	100.0	72.8	69.8

Waste water disposal were reported functioning in 72.3% of all cases checked and was reported in use for 69.8% of all cases. The highest rate of functioning and use was in Sumbar where 10 (97%) were reported functioning and in use. In NTB reported functioning

was higher than reported use; 59 (72%) were reported functioning and 55 (67.1%) were reported in use. Jabar, with 57 facilities had 39 (68%) functioning and 38 (66.7%) in reported use.

aste Water Disposal Built and Functioning by REPELITA

REPELITA	BUILT	FUNCTION	% FUNCTION
REPELITA 2	5	0	0
REPELITA 3	53	33	62
REPELITA 4	104	80	77
T o t a l	162	113	70

As with family latrine, facilities built in a higher percentage of facilities built in REPELITA 4 are reported as functioning compared to REPELITA 3.

Waste Water Disposal Functioning of Components

	TOTAL INSPECTED	TRAP BOX	WATER IN BOWL	FILTER	LOCATION OK
JABAR	57	4	10	15	31
SUMBAR	23	15	1	15	5
NTB	82	31	12	18	1
T o t a l	162	50	23	48	37
(%)		30.8	14.2	29.6	22.8

It appears that for sanitary facilities there is a reluctance on the part of the caretaker to admit that the facilities cannot or are not used.

5.4.3. Comparison of Facilities and Analysis

(67.1%) of family latrines and (72.8%) of waste water disposal facilities were reported as functioning by their caretaker (Penanggung Jawab). Actual conditions for the facilities indicate

that only (47.7%) of the family latrines could possibly be considered as functioning. The disparity between reported functioning and actual indicates that, for social reasons, perhaps the caretaker is reluctant to report that the facilities are not or cannot be used.

The low percent of facilities that are actually functional indicate that health education and health awareness must be increased before the sanitation facilities can be expected to be used and maintained. The poor condition of the facilities indicate that villagers do not consider it worth their while to maintain existing facilities although it is well within their reach to do so.

6.0 Community Participation

6.1. Involvement of user groups in planning of facility type and facility location.

One of the objectives of the INPRES RWSS program is to increase the degree of village participation in all aspects of provision of clean water and a healthy environment. Furthermore, the INPRES programme clearly stipulates that users should participate in the planning process though the Village Resilience Committee be actively involved in construction, and bear responsibility for maintenance for all facilities except piped systems and artesian wells.

The following section is based on the experience of the survey team in their discussions and survey of Government Officials, village leaders, and villagers, both users and non-users of facilities. While this section is outline by province, few of the cases illustrated could be considered unique to that province.

In NTB, the neighborhood leader conveys the needs of his area to the Village Resilience Committee meeting where the suggested programme for the entire village is formalized. It is unclear whether in every case the neighborhood leader holds a meeting with the inhabitants of his area to solicit their recommendations for the programme. The suggested programme compiled by the Village Resilience Committee are reviewed in a meeting at the sub-district level.

Village officials commented that they generally received one-third of the total number of facilities requested and, more importantly, that the mix of facilities received sometimes bore little relationship to the one requested. It was felt in some cases that there was little relationship between the suggested programme from the Village Resilience Committee and the suggested programme forwarded to the District Head and the Governor. In general, it was felt that the relationship between the village request and the eventual allocation was not strong.

Once the village is allocated its number and mix of facilities, actual sites for the facilities are selected. The village leader, neighborhood leader, and sanitarian are involved. The village leader divides the facilities amongst the neighborhood, leader takes charge of the final allocations and sites selections. In some cases decisions were reported to be made based on ecnomics consideration such as who could afford to maintain a particular facility and sometimes based on other non-technical considerations.

In SUMBAR, proposals for the large facilities, protected springs, artesian wells, and piped systems, originate from the Puskesmas and are sent directly to the District Health Office. Planning for other facility types begins at the village level. Village officials including the Wali-Wali Nagari (traditional leaders) provided the main inputs. The Village Resilience Committee, Karang Taruna (a youth organization), or other village organizations do not appear to be involved in the process. The suggested village programmes are sent to the sub-district for further processing. Village officials commented on the discrepancy between village requests and their eventual allocation. Rain collectors, reportedly, was a facility seldom requested but often imposed. It should be noted that SUMBAR was the only area where traditional leaders played an important role in.decision making processes in SUMBAR.

Site locations were generally selected by the village leaders and rarely included recommendations or participation of village organizations such as the Village Resilience Committee. In SUMBAR, as elsewhere, facilities were found inappropriate locations, the

most extreme being a well in the middle of a rice field. One village was found in SUMBAR where the villagers participated in selection of locations and the facilities were all in use.

In JABAR, the village head/village Resilience Committee plans the number and types of facilities requested and sends the proposed programme to the Puskesmas. Once facilities have been alllocated for his village, he is notified by the district health office. The village leader then allocates facilities by neighborhood. It is the neighborhood leader who has the final allocation authority and determination of site. The neighborhood may hold a musyawarah (desion making through discussion and concensus) to determine site location, he may solicit requests for facilities, or he may select locations without consultation of potential users. The surveyors were told that facilities were sometimes left in inapproprate locations although removal was usually felt to be possible because of the lack of guidelines for changing location.

Village Perception of Village Participation in Selection of Facility Location (All Facilities)

SELECTION	JABAR		SUMBAR		NTB		TOTAL	
	NO.#	%	NO.	%	NO.	%	NO.	%
Appointed	111	81.0	52	35.1	140	65.1	303	60.6
By Request	3.0	2.0	25	16.9	35	16.3	63	12.6
Consultation	19	13.9	53	35.8	35	16.3	107	21.4
Musyawarah*	4.0	2.9	18	12.2	5	2.3	27	5.4
Total	137	100	148	100.0	215	83.7	500	100.0

* Decision making through discusssion and concensus.
Nos. # - Number of respondents

Similarly, the results of the survey supports the survey team impresssion from their discussion with villagers and village officials regarding involvement of villages in the selection process. Decisions regarding the location of a site were made primarily by village officials rather than by the users. Active user participation in determination of the location of a site is low. Overall, in only 5.4% of the cases were the users involved in

a musyawarah process. Otherwise, facilities were located without prior request or consultation i.e. appointed, in more than half of the cases. This occured most frequently in JABAR (80%) and least frequently in SUMBAR (35%). Where the facility was not given through a top-down process, it was given in response to a direct request or some attempt was made to consult with the user before the decision was made. One direct result as in the case of the family latrine programme, is that facilities are not even installed, let alone used.

Common thread:

1) Little village inputs in planning, process dominated by village leaders.
2) No necessary relationship between the proposed programme and the final allocation.
3.) Site selection is heavily influenced by village leaders
4. Site selection criteria is heavily weighed by non technical factors.

6.2. Involvement of the community by the Puskesmas

Village Perception of Village Preparation

By the Puskesmas (All Facilities)

ACTIVITY	JABAR		SUMBAR		NTB		TOTAL	
	No.#	%	No.	%	No.	%	No	%
Appointed	12	10.9	25	19.8	23	11.0	60	13.5
Meeting	0	0.0	18	14.3	25	11.9	43	9.6
Loc. Survey	6	5.5	31	24.6	35	16.7	72	16.1
Cadre*Exercise	4	3.6	15	29 4	13	6.2	54	12.1
Nothing	88	80.0	15	11.9	114	54.3	217	48.7
Total	110	100.0	126	100.0	210	100.0	446	100.0

* A voluntary village group trained to perform repairs and maintenance.

No.# Number of respondents.

The surveyors impression from interviews with sanitarians was that they were not so very familiar with their areas. The sanitarians admitted that they did not get to the field as often as they would like because they didn't have sufficient funds. The surveyors concluded from their discussions that in many cases a site is visited by a health official only at the time of installation.

Villager perception of their programme preparation supports the above view. Facilities were reported to have been constructed without any prior preparation. In JABAR, 80% of the facilities were constructed without prior preparation, in NTB 54% were constructed without prior preparation, whereas in SUMBAR only 11.9% were constructed without prior preparation. The surveyors felt that the sub district level officials in SUMBAR were particularly active although sorely understaffed and inadequately trained. There were 4 sanitarians for 15 Puskesmas in Solok and they were nurses not trained sanitarians.

It is of note that location surveys were executed for only 16% of the facilities and cadre training took place for 12% of the facilities.

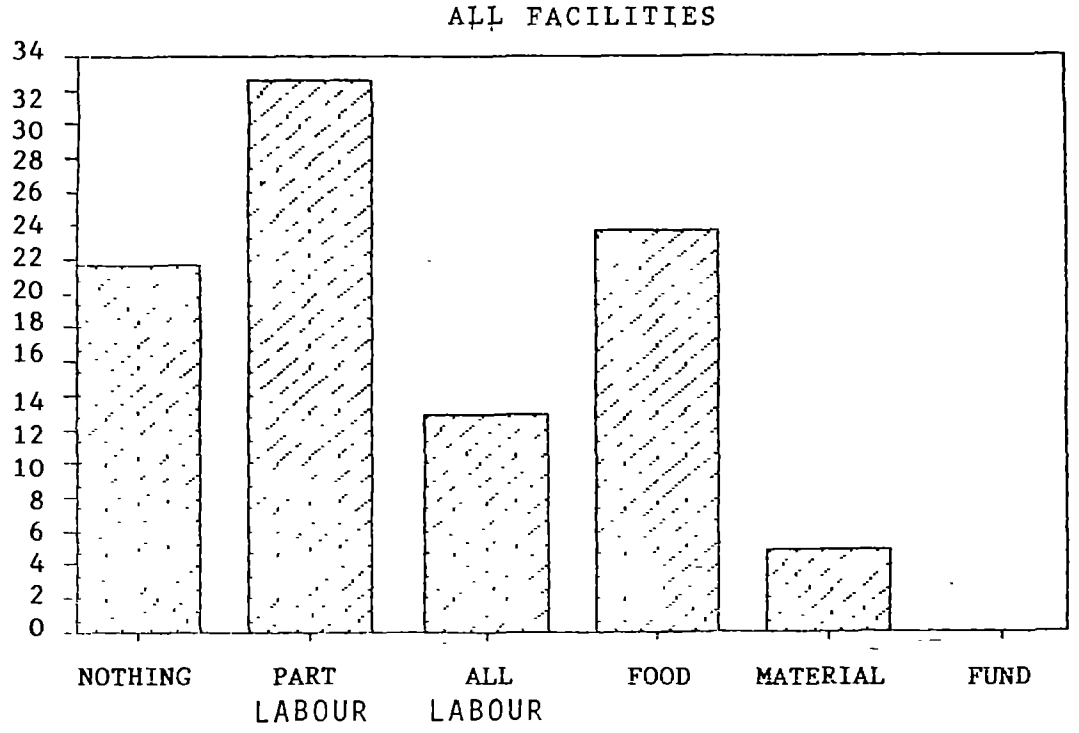
6.3 Village Participation in Construction

Village participation in construction is limited, graph 6.1 shows the overal pattern of village participation. Part labour, that is to say unskilled labour, constituted 33% of the village inputs. The users contributed nothing in 22% of the cases. Food was a major input provided by 24% of the users. All labour, including skilled labour, was provided in only 13% of the cases implying the outside assistance was needed for most facilities. Materials were provided in 5% of the cases. Funds were not important in percentage terms when all facilities are considered together (3%).

JABAR and SUMBAR show similar pattern of village participation, graph 6.2 compares JABAR and SUMBAR with NTB. In JABAR and SUMBAR 28% of users did not participate in construction

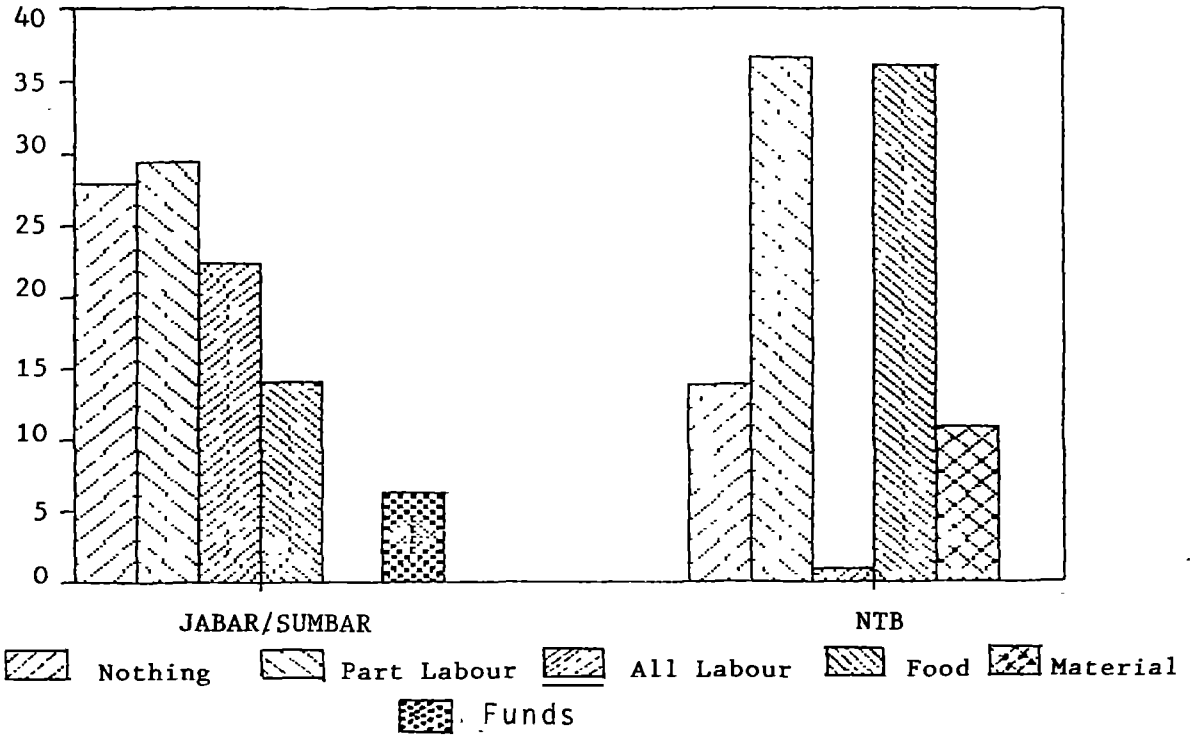
Graph. 6.1

Village Participation in Construction



Graph. 6.2

Village Participation in Construction

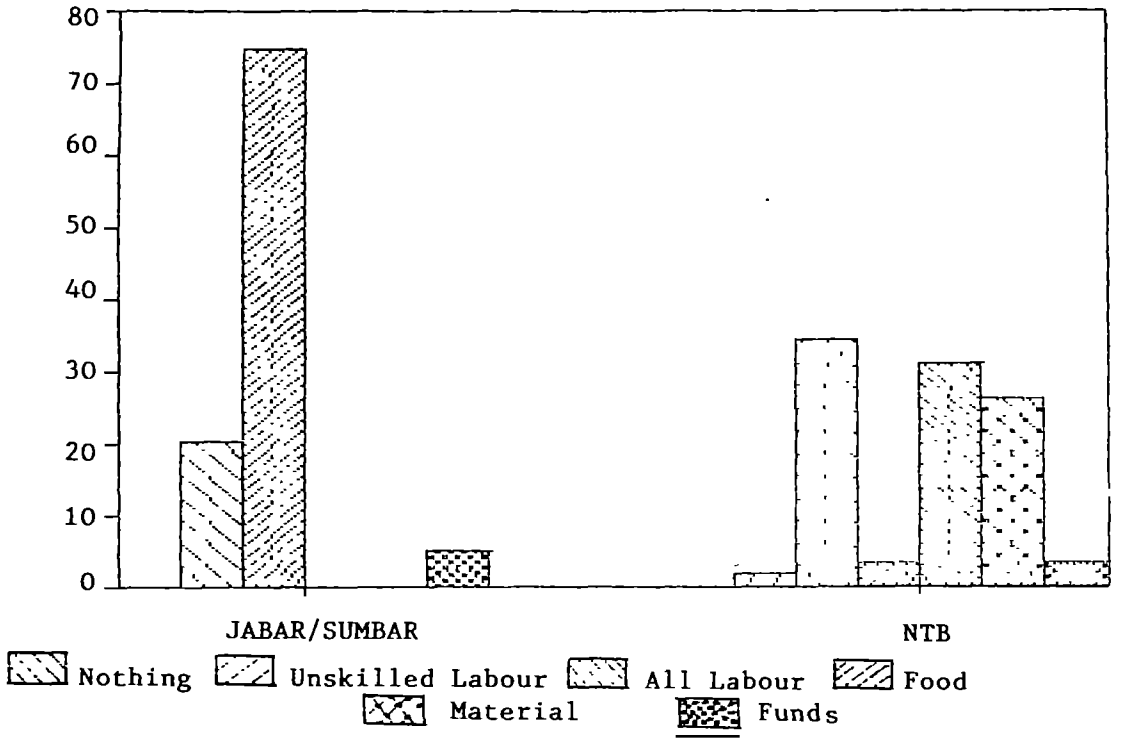


while in NTB only 14% of the users failed to participate. In JABAR and SUMBAR 29% of the users provided part or unskilled labour and 23% provided all labour including skilled labour. In NTB 37% of the users participated in providing unskilled labour while only 2% provided skilled labour. Overall 52% of the users contritubted labour in JABAR and SUMBAR while in NTB 39% of the users provided labour. In JABAR and SUMBAR funds or cash was provided by 7% of the users while in NTB no funds were provided but material were provided by 10% of the users. One major difference between JABAR and SUMBAR villagers often provide all labour including skilled labour while in NTB this rarely occurs. What is suggested here is that either the sanitarians are more active in the installation of facilities in NTB, that more work is done through contract, or both. Village participation differs the most for family latrine/waste disposal and rain collectors between JABAR/SUMBAR and NTB. Two graphs 6.3 on participation in construction of family latrine/waste disposal and graph 6.4 on participation in construction of rain collectors illustrates this difference. Family latrines and waste disposal are constructed almost entirely with village labour including skilled labour while in NTB users provide some labour of which little is skilled. In JABAR/SUMBAR 20% of the facilities are constructed with unskilled village labour, 75% of the facilities are constructed entirely with village labour including skilled labour, and 5% of the facilities are constructed with material inputs from the village. In NTB 2% of the facilities are constructed without user inputs, 33% of the facilities are constructed with some unskilled labour, only 3% of the facilities are constructed entriely with village labour, food is provided in 31% of the cases, materials are provided in 27%, and funds are provided in 3% of the cases. The relatively low labour input for family latrine/waste disposal in NTB merits investigation as the skills necessary for the installation of this type of facility should be well within the reach of villagers.

The graph 6.4 on participation in construction of rain collectors shows that in NTB there is no village participation at all. This indicates that rain collectors are constructed by under contract. In JABAR/SUMBAR 41% of the users do not participate in

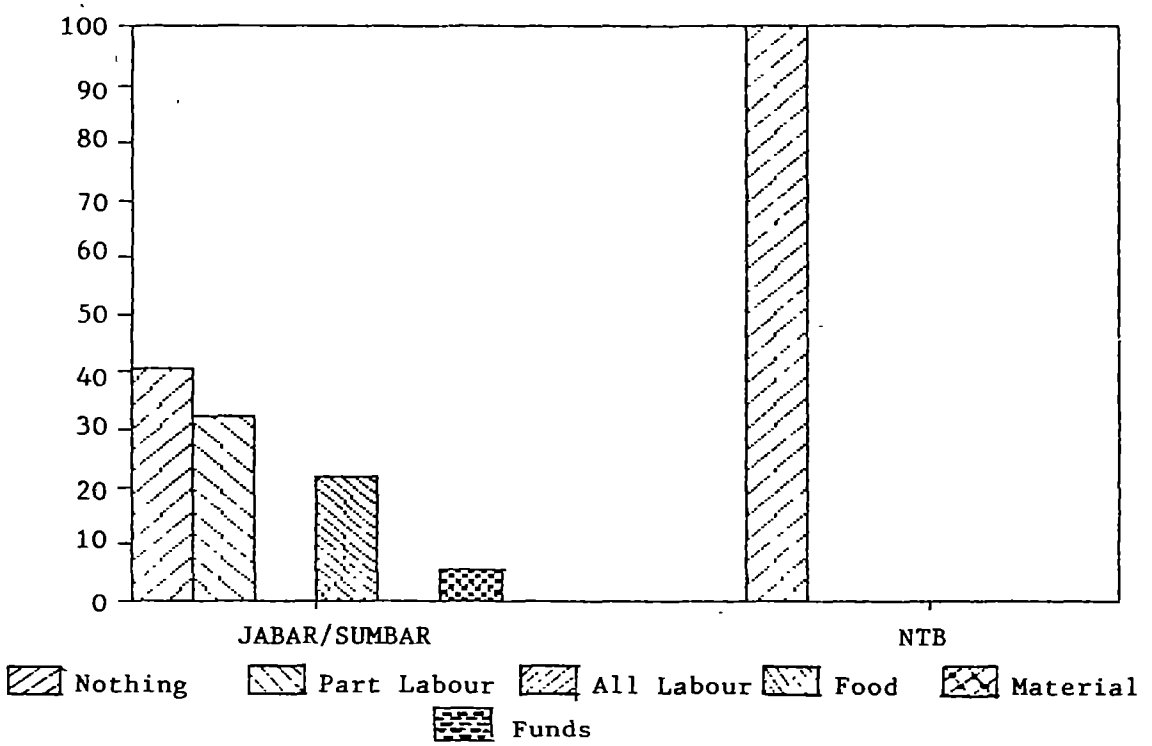
Graph. 6.3

Participation in Construction JAGA/SPAL



Graph. 6.4

Participation in Construction PAH



construction. Participation is limited to 32% unskilled labour, 22% food, and 4% funds. The relatively low labour input and high food and funds inputs suggest that rain collectors may also be installed by contractors.

6.4. Maintenance

According to law all facilities must be formally turned over to the village before responsibilities are assumed for maintenance. the surveyors found in JABAR, only 9% of the facilitie were ever turned over, in NTB 21% of the facilities were turned over. This formal handing over of the facilities to the village was not sufficient by itself to ensure that facilities were maintained. Section 5 showed that SUMBAR and JABAR have a similar level of functionality, 50 and 57% respectively while in NTB 74% of all facilities serveyed functioned. This indicates that there is no direct relationship between handing over and maintenance.

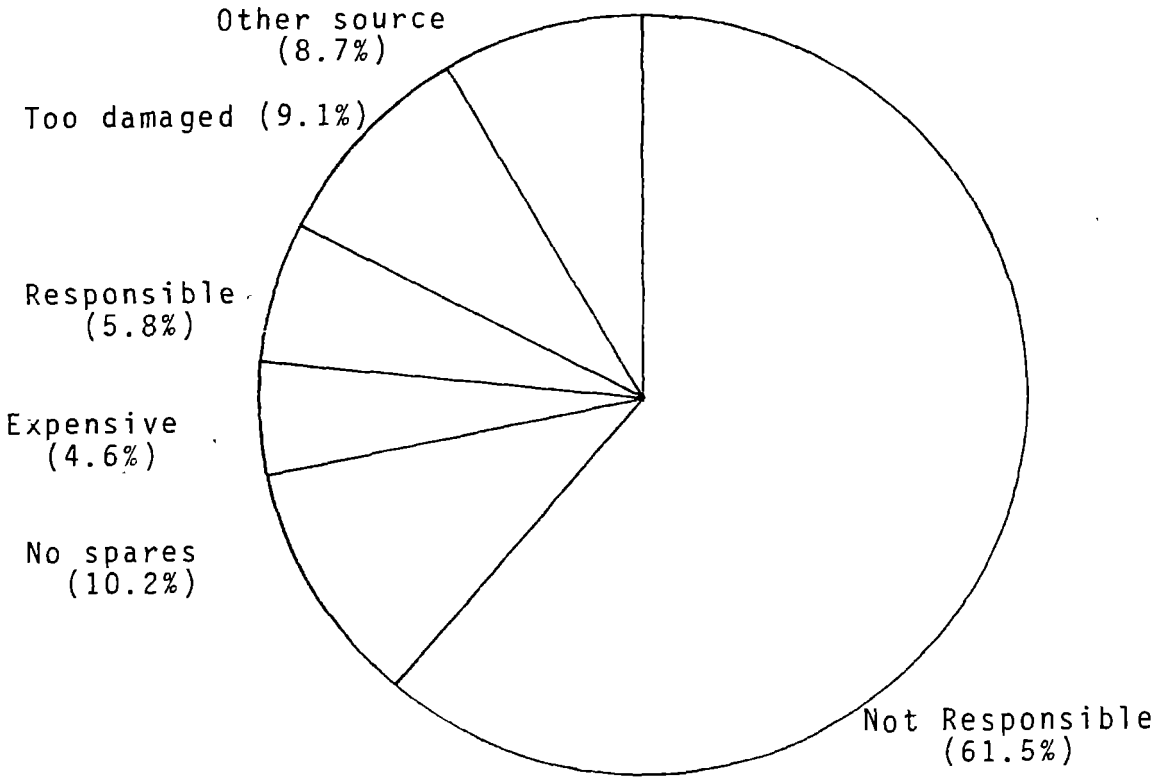
Users were asked what factors prevented maintenance of facilities. The overwhelming response by the users was that they were not responsible for maintaining the facility (61.5%), see graph 6.5 on factors preventing maintenance. While it had been expected that lack of spare parts would be a major factor, no spares was cited as a reason in only 10.2% of the cases. Too damaged and other source were given the same importance as no spares, 9.1% and 8.7% respectively, expensive and government responsibility were cited in 4.6% and 5.8% of the cases. This lack of a sense of responsibility of the part of the users indicates that facilities are viewed as a convenience, that users are not organized as user groups, and that facilities are treated as common properties, to be used by all but belonging to none, as a result the facilities are used as long as they function and then left.

6.5 Organization

This section will discuss the use and maintenance practices, the survey team found in the villages surveyed and will be described per facility.

Graph. 6.5

Factor Preventing Maintenance



6.5.1 Piped Systems

In one village in NTB, village Slokong, sub-district Tanjung, district Lombok Barat, the piped system had not functioned for three months as the water cisterns were cracked, faucets were worn out, and connections between the pipes leaked. The neighborhood leader was the only responsible party evident. The users had made no efforts to organise. Efforts by the neighborhood leader consisted of reporting damage to the sanitarian. The attitude of the villages and the neighborhood leader was to wait for the government to repair the damage.

In one village in SUMBAR, village Tampuniak, users are organised by the village leader, and the system which was installed in 1985 functions and its output is sufficient to meet the all needs of the users. The system, however does not function perfectly, faucets are left open after use by the users.

In the village named Kampung Tengah in SUMBAR, the village head, who was appointed by the BPAM (Regional Water Authority) in Solok has organized the system and has in fact been able to increase coverage.

In JABAR the system was organised by the village leader with a team responsible for collecting money from users and arranging repairs. It was found in some cases to be effective and in other cases not. The system worked best where contributions were mandatory rather than voluntary, althouth there was a tendency to commercialise the system Where contributions were voluntary users tended to abuse the system. In one area the system has stopped working due to conflict over the use of water in the village where the water is collected and the village where the water is used.

6.5.2 Shallow and Deep Well Hand Pumps

In the areas surveyed in NTB, the person responsible for maintenance of the facility always appeared to be the individual

living at the site where the facility was located. This individual appeared in most cases to take responsibility for minor repairs. More serious repairs were reported to the neighborhood leader to be forwarded to the village head to be reported the sanitarians at the Puskesmas.

The sanitarian reports that broken parts are freqeutnly replaced with canibalized parts fron non-funcitioning pumps. parts are usually purchased by villagers, if the cost is below Rp5,000. The sanitarian also reports that pumps are also found used for other purposes such as to support an electric cable and to weight down a fishing tank.

In SUMBAR the users living nearest to the facility assumed responsibility. In some instances those responsible are assigned by letter when the facility is handed over to the users. However, the person responsible or caretaker is not always regarded as able to collect money for repairs or use, whether he is appointed by letter or not. The converse holds as well where the users do not feel themselves responsible to the caretaker. In some cases handing over the facility to specific users has limited use to those users.

In JABAR, the facilities tended to be maintained by the person who owned the land where the facility was located or who lived the closest. Only minor repairs were made by individuals rather than the group of users. In one case the users had organized themselves and had collected money for maintenance, however, their deep well hand pump needed a spare part that was not available so their pump was not working.

6.5.3 Rain Collectors

In NTB rain collectors were only found in one sub-district. The villagers did not use the rain collectors which did not function, said that they were not consulted regarding the facility type at any time, and had they been, they would not have chosen rain collectors. Criteria for location were based on permanancy of the roofing only. One village was found where there were the villagers

said they could use rain collectors in the rainy season when the river water was too turbid for use.

In SUMBAR, the village leader selected sites for rain collectors without consultation with those likely to use the facility. The users did not feel responsible for maintennance and do not make any attempt to improve the functioning of the facilities. The surveyors, for example found three rain collectors in one desa which had never worked and where nobody had bothered to locate the leaks.

In JABAR, the caretaker of the facility was the person on whose property the facility was loated. The caretakers interviewed did not collect money from users nor did they have any thoughts on increasing the water collected in the rainy season by installing more gutters.

6.5.4 Protected Springs

In NTB the families using protected springs have selected a leader or caretaker who is primarily responsible for arranging use of the facility, or to clean the holding tank. In neither facility surveyed had any repair work been done although one had cracked cement walls that dropped pebbles into the water tank.

In SUMBAR the facilities surveyed were operated by an individual or group of individuals appointed by the village head. What has occured, possibly because the villagers were not further included in this selection process, the protected springs has become a business for "certain circles". The facility is then viewed by the villagers as a government programme which is making them pay for water and is only used by the golongan "cukup" meaning those who already have enough.

In JABAR, it was found that where the users were from one neighborhood, the neighborhood leader could organise the users and keep the protected springs functional. However, where the users were from more than one neighborhood, organization became difficult, maintenance was not done, and the facilities became non-functional.

6.5.5 Family Latrine, Dug Well, Waste Water Disposal

All of these facilities are similar in that they involve a small number of users.

In NTB and SUMBAR, facilities not located in public places were well maintained. When the facilities are located in a public area such as on office or school they are not maintained and tend to fill up and/or break down.

The dug wells in NTB were the responsiblity of the family on whose land the facility was located in one village the surveyors found for new wells that had been constructed by the district level health office without informing the Puskesmas thereby bypassing the sanitarian entirely. This had occured in other instances as well as reported by the sanitarian. The surveyors were told that the Health Office had brought its own skilled labour to do the work. The surveyors found that these wells were not constructed in accordance to the suggested specifications and furthermore the quality was not good.

In JABAR, findings were mixed. In sub-district Ciawi all installed family latrines were used by single families and were in good condition. There were no waste water disposal or dug wells. In one village in sub-district Purwadadi, the dug well, waste water disposal, and family latrine were erected as one complex and was maintained by a cadre. Elsewhere in Purwadadi, the family latrines found were not maintained at all. Few waste water disposal pits were observed and of these only one or two were functionally. Type of facility is considered expensive and disposable.

The surveyors noted that in nearly every case the family latrine were used by more than one family. This may be useful in planning future coverage and in providing alternatives to waste water disposal which tend to be too much of a community facility for effective maintenance.

6.6 Health Education

It was the impression of the surveyors that little health education is usually of a comprehensive nature at the village level. Some user education is done by the sanitarian at the time that the facility is installed. Activities to increase user understanding and promote utilization of facilities appear to be minimal. The surveyor questioned village leaders about promotion activities which were reported to take place. Few materials such as posters or books could be found at the village level for promoting clean water and sanitation related activities. The surveyors found that the sanitarian had little educational material which did not appear to be used as the materials could not be readily found by the sanitarian. In JABAR one sub-district health centre had developed its own posters.

This implies that whatever efforts are being made at the central and provincial level to promote health education are not taking at the sub-district and village level. The surveyors felt that the available material was sometimes oriented to a different socio-cultrual set of conditions and educational level than was to be found in the villages. Another problem is that water and sanitation education tends to be presented as part of an integrated health extension package where messages about water are overwhelmed by messages regarding birth control, immunization, and nutrition.

6.7 Analysis

Community participation in the planning process, whether for facility type or location, is minimal. Community preparation is also minimal. Once consequence of this is lack of maintenance by villagers who do not perceive themselves as responsible for the maintenance of the facility.

The surveyors found that community facilities such as piped systems or artesian wells required maintenance by an organized group for long term use. A more sophisticated level of organization required for community facilities was greater than for faciliites

such as family latrine or hand pumps where responsibility for a major repair could not be assumed by an individual. In some cases individuals within the community had the capacity to organize the users and the facility functioned well. In other case, however, users were not organized into a cohesive group and the facilities worked only as long as no relatively major repairs were needed. Outside assistance is needed at the time any public facility is installed to organize users into a group with clearly defined duties and obligations which would include collecting money for maintenance and repair of the facility. This type of assistance could include assisting villagers establish an accounting and record keeping system for the collection and disbursement of funds.

The surveyors found the infrastructure supporting the RWSS programme understaffed. One sanitarian should be located at each Puskesmas but this was not always the case. Not all sanitarians had specific training in sanitation, the sanitarians in Solok were, in fact, nurses. While nurses would be qualified to handle the health education aspects of the programme other aspects of the programme such as installation of facilities become difficult. Furthermore, the santiarians do not have adequate time, money, or materials to be actively involved in facility maintenance, community education and motivation, or assist in planning. Further investment in human resources is required at this level if community participation is to be increased.

7.0 Issues and Suggested Actions

7.1 Programme Planning

It seems that little consideration is given by government planners to the performance of the previous year's RWSS programme. There are few opportunities for including monitored information on programme performance in the next years in the planning process. Once proposals and budgets have been determined at a central level and returned to the districts, a great deal of autonomy remains with Bupati in finalising a RWSS development mix for each village. There are currently no formal Inpres guidelines integrating village requests into the planning, implementation and monitoring process. No procedures exist for considering of original village proposals in the final allocations which come from a District level.

Suggested Actions: Improved monitoring and recording of programme performance is necessary to identify both positive mechnanism and procedure as well as constraints. Records should indicate the number, type location and condition of facilities so that planners can make accurate assessments of needs. Village requests should be included in the planning process to a greater degree and be reflected in final allocations of budget and material assistance. Villagers must be made aware of the links between requests and final allocations and provided with reasons for changes in order that they participate in follow-up activities. This means that final allocations made at a district level must incorporate original requests as much as possible and that a forum should be created where this can occur. Lumpsum allocations to villages should be considered where villagers have made demonstrated financial material and manpower committment to RWSS self help projects.

7.2 Management

The Inpres management is co-ordinated at a central level by the Team Pembinaan which is made up of representatives from participating sectoral agencies. Provincial, District and Sub-District management is provided by agency sectoral staff. There is no management

structure below a Sub-District level. Because of the disbursed management responsibilities below central, there is a characteristic of overlapping responsibility and job assignments. Consequently, there are few clear divisions of responsibility and no way to determine accountability. There is evidence that this has contributed to an inefficient allocation of scarce manpower and resources. Furthermore, this has greatly complicated monitoring and record keeping procedures making follow-up on programme planning and implementation difficult. The complexity of management procedures also makes the co-ordination and timing of programme inputs and activiites difficult. Often when activities are ready for implementation, funds have not yet arrived. Material distribution is affected by similar difficulties. There is no existing system for monitoring various programmeme inputs and activities so that implementation can be scheduled to coincide with their arrival. This has sometime resulted in delays in implementation, loss of manpower and in some cases loss of construction funds at the end of fiscal year.

Suggested Action: Distribution of responsibilities for Inpres RWSS activities should be reviewed and clarified to minimise overlap and duplication of work. Relationships between positions of responsibility should also be clarified to improve and accelerate the flow of information between sectors and levels. This will require a review and possible modification of existing Inpres guidelines to make any suggested changes operational. Greater attention must be given to improving record keeping and in monitoring programme inputs and activities so that realistic planning can be based on prior programme performance and current activities can be scheduled to coincide with the arrival of critical inputs. This will serve to optimise funding, material and manpower resources and improve programme performance. Efforts should be made to improve defining areas of responsibility and linkages below a Sub-District level to ensure that programme resources are implemented according to user needs, requests and programme priorities. This may require allocating more time to sanitarians for community based activities such as village meetings and for construction and maintenance of facilities.

7.3 Maintenance and Rehabilitation

In previous years INPRES RWSS programme made allocations for the rehabilitation of several types of installed facilities - this allocation was dropped during recent budget cuts and responsibility for maintenance and rehabilitation was assigned to the beneficiary communities. Pipe scheme and artesian wells maintenance as assigned to local government. The issue of maintenance and availability of spare parts is fundamental to the continued performance and life of installed facilities and programme service coverage. However survey information on the operation of facilities clearly shows that maintenance is not being carried out. Factors which can be attributed to poor maintenance range from community's lack of responsibility, lack of available spare parts, insufficient training, travel funds and time for sanitarians to perform regular maintenance, poor reporting on facility performance, unavailability of special tools and equipment and a lack of motivation. In some cases Puskesmas, sanitarian and villagers have made salutory efforts in maintaining facilities which has been reflected in continued performance and larger facility life.

Suggested Actions: It is evident that it is a great deal more cost effective to maintain or rehabilitate a facility and maintain service coverage than to install a new one. It is an exercise in futility to attempt to increase service coverage by achieving facility installation targets while at the same time losing coverage because of facility breakdown. It is therefore imperative that INPRES take measures to ensure that this issue is effectively addressed.

In most cases, except for complicated pipe schemes and deep well handpumps, maintenance and repairs of RWSS facilities can be carried out by a sanitarian or trained pump attendants with minimum tools and same spare parts. There is however, a clear need for communites and service staff to appreciate the need for servicing and to assume responsibility to do so. Surveys demonstrated that villagers usually felt little sense of ownership and this could be

improved by formally handing facilities over to villagers following their completion. Ownership certificates outlining responsibilities are also suggested. It should be emphasized that handing over ceremonies and ownership certificates add to but do not replace the sense of ownership and responsibility developed through village participation in the planning and selection process. The formation of identifiable user groups to care for facilities is recommended.

Efforts should be made to provide basic training and tools to all sanitarians and pump attendants so that they may perform simple repair and maintenance tasks. Simple user handbooks or manuals should be provided to the caretakers at the time of construction. Similar books should be distributed throughout the system to staff responsible for this activity. More detailed books should be provided to staff responsible for major more complicated work as in the case of deep well handpumps and pipe schemes.

Spare parts must be made available at a village level. Survey information suggests that few spare parts are available when they are required and that villagers often do not know where to obtain them. Furthermore, spare parts are often not available through the private sector which suggests that manufactures do not produce, distribute or sell them. Few simple spare parts should be provided with each facility when it is installed and be kept by a designated person or user groups.

In order that spare parts can be used, they must also be interchangeable. In the case of locally manufactured handpumps, low procurement costs has necessitated manufactures to adopt cheaper and faster methods of production. This has resulted in poor quality casting, rapid finishing work and poor interchangebility of spare parts. The poor quality of pumps procured for the programme is also reflected in high levels of breakdowns. In addition, data shows that the programme has procured several varities of shallow and deep well handpumps which makes maintenance training and spare part distributed particularly difficult. It is strongly suggested that the programme limit the procurement of facilities, particularly

handpumps to one or two proven models and that the quality procured meet Indonesian Industrial Standards - this alone will have a major positive impact on facility life and the effectiveness maintenance and spare part systems.

There is a role for the private sector in upgrading the quality of produced facilities and spare parts and marketing them in rural areas. Therefore, enforcement of SII standards is necessary to ensure interchangebility.

Survey data clearly indicates that drilling equipment and deep handpump special repair equipment is not being used. This can be attributed to low unit costs, poor or inappropriate equipment, insufficient training, fuels and spare part of any combination of the above.

The INPRES RWSS programme has made a significant investment in drilling equipment and it is clear that more will be necessary if difficult areas are to be served. Further attention must be given to this problem including the possible creation of drilling units with permanently assigned staff and an adequate operating budget. Cureently, drilling equipment is passed from sanitarian to sanitarian and little attention is given to maintenance and spare parts.

7.4 COSTING

The physical conditions of installations themselves and interviews with provider groups and beneficiaries suggests that materials and labour allocations are inadequate, INPRES unit costs are especially important where technical assistance and purchased materials are required as in the case of pipe schemes, rainwater tanks and handpump installation. Unit costs for pipe schemes are fixed although the size of schemes may vary enormously. The hypothesis that savings from small schemes will pay for larger ones appears not to be followed. Low unit costs for pumps installation has resulted in insufficient drilling to adequate depths where

larger aquifers may be found and poor construction of platforms and pump pedestals. The unit cost allocation for latrine installations is fairly constant and can be augmented by beneficiaries.

Suggested Actions: A review of current costs for materials and labour inputs should be undertaken and adjustments made to the facility unit costs if necessary special attention should be given to the unit for pipe schemes which might be based on water flow requirements or pro-rated by the meter. Villagers should be informed in advance of what the unit costs are for allocated facilities so that they may anticipate the required level of their own inputs. Monitoring of unit cost allocations is strongly suggested so that a realistic basis for review can be established.

7.5. Programme Strategy

The facility survey data shows that pipe schemes, artesian wells, protected springs and hand dug wells have very high levels of performance and long life. All of these facilities share the common advantage of being technically simple and having no moving parts. By being simple and passive, little complicated maintenance is required and user groups are able to deal with most small problems as they arise. Pipe schemes, artesian wells and protected springs have relatively high unit cost but this must be measured against the high coverage provided, long life and low recurring costs.

Handpumps are not as successful and require a higher level of maintenance and spare parts. Causes for lower performance is attributed to the greater technical complexity of the pumps, poor quality of production and lack of maintenance and spare parts. Lack of training in pump installation and repair along with low levels of community involvement are contributing factors. poor pump performance and low rater of repair have led villagers to regard them as temporary conveniences. This is evident on protected wells which have built in covers of have been deliberately broken so that buckets can be lowered in the event of pump failure.

Rain water collection tanks are the least successful of all INPRES water facilities and consequently the least requested. Improper construction and poor maintenance are the major contributing factors.

Suggested Actions: INPRES should focus efforts on simple passive technologies such as pipe schemes, artesian wells, protected springs and hand dug wells. Although these may have initially higher costs, higher levels of performance and coverage will be achieved. Smaller pipe schemes serving smaller or remote communities should also be considered especially if communities demonstrate a felt need and are willing to contribute materials and labour. INPRES should consider limiting models of handpumps and only procuring those which meet SII standards. This will contribute significantly to pump performance and life. Spare parts for handpumps must be made available at a village level and pump attendants should be given periodic training and in-service refresher courses in maintenance. pump siting criteria should focus on installing pumps on hand dug wells but not at the exclusion of drilled shallow and deep wells. User groups should be created and facilities should be formally handed over to them upon completion. It is suggested that communities participate as much as possible in site selection and pump installation to increase interest and knowledge - user groups can and should participate in maintenance and spare part costs and levying water rates by user groups is suggested.

Sanitary Facilities - Data suggests that sanitation facility are not fully appreciated or understood by users. Current INPRES planning procedures for latrine projects takes place without the participation of selected communities. Once facilities are allocated to a village, sites tend to be assigned. Where families have been assigned latrines, maintenance and utilisation is generally poor. Furthermore, villagers are often expected to contribute to the construction costs or with materials but not informed of the allocated unit costs. Contributions towards costs often place latrine facilities out of reach of poorer families who cannot afford cash requirements.

Suggested Actions: An effective sanitation programme linked to a clean water supplies is a fundamental prerequisite to primary health. Water alone will not provide a healthy environment and sanitation should not be regarded as a low priority activity of secondary importance. Human waste polluting water supplies is a major cause of child morbidity and mortality improved sanitation as apposed to improved water supplies, is relatively inexpensive and can be provided with minimal technical and financial inputs, the major constraint however is peoples understanding and acceptance of sanitation projects. For this reason it is strongly suggested that various community organisations as well as government staff promote good sanitation practices and support the construction of family latrines. This can be accomplished by focusing on sanitation issues during village meetings and encouraging families to build and use them. Of equal importance, however, is the need for all government levels, especially central, to advocate and prioritize improved sanitation throughout the Repbulic.

Software - Water and sanitation facilities are often not used where easier alternative options are available. Evidence for this rests with the high level of non-operating pumps and with full latrines no longer in use. Rather than repairing pumps or digging new latrines, villagers often return to previous sources which are often one and the same. Part of the problem is with the lack of villager's sources of ownership and responsibility for facilities but a great deal also lies with a lack of understanding why clean water and improved sanitation facilities are desirable and necessary.

Suggested Actions: It is widely recognised that the application of hardware to development problems is usually insufficient. Pipelines pumps and sanitation facilities may provide potential benefits but these will only be realised if they are used. The most underrated component of many development programmes is training and advocacy. Indeed, developing training curriculums and materials as well as effective advocacy programmes is often more difficult than physically installing facilities. Simply telling user groups to use facilities will not work unless they are also

convinced that there is a benefit and advantage. People usually have very good reasons for maintaining traditional practices and it is, therefore, important to give them better reasons for adopting practices which the programme is trying to implement. For this reason effective software components translates into realistic training programmes which rely more on field practicals than theory. Improved curriculums will be necessary along with adequate training materials and equipment. Training courses must deal with real life issues and approach them under real life conditions. This means more field work and less classroom study. Advocacy is also a very important component which rarely gets fair attention. Advocacy can be provided in many ways and through many factors. However advocacy does not work unless it is available in quantity and understood by the target group. Posters, educational materials, testimonials by politicians and famous people are all potential instruments. Advocacy, however, also requires a high level of professional inputs and adequate testing if it is to be effective, much greater attention should be given by INPRES in developing an effective advocacy programme.

----0000----

T E C H N I C A L T E A M M E M B E R S

SURAT KEPUTUSAN DIREKTUR JENDERAL PEMBERANTASAN PENYAKIT *MENULAR DAN PENYEHATAN LINGKUNGAN PEMUKIMAN*
DEPARTEMEN KESEHATAN REPUBLIK INDONESIA
NOMOR : 246-I/PD 03.04.LP

TENTANG :

PEMBENTUKAN TIM TEKNIS PENILAIAN PELAKSANAAN PROGRAM PENYEDIAAN AIR BERSIH DAN PENYEHATAN LINGKUNGAN PEMUKIMAN INPRES NO.5 TAHUN 1984

Steering Committee:
1. Ir. Sukamto (Ka.Dit.PAIR)
2. Wahyu Widodo DPH (Ka.Dit. PLP)

Chairman : Drs. Suwardi SKM, Msc (was later replaced by Drs. Rushid St. Alamsyah (Dit.PAIR)

Secretary : Slamet Nugroho, DPHI (Dit. PLP)

Members :
1. Ir. Muliadi Widodo (Dit.Jen. Bang.Da)
2. Soeratidjo BE (Dit.Jen. Bang.Des)
3. Drs. Suhartono (Bappenas)
4. Drs. Soetardjo Martono (Dit. PLP)
5. Drs. Rochim Agustjik (Dit. PAIR)
6. Mr. E. Pancaroglu (W.H.O.)
7. Mr. D. Nitipavachon (W.H.O.)
8. Mr. P. Hassrick (UNICEF)
9. Mr. Z. Karim (UNICEF)
10. Dr.S.P. Mathur (UNICEF)

SURVEY AREA

PROVINCE	DISTRICT	SUB-DISTRICT	VILLAGE
1. JAWA BARAT	1. BOGOR	1. CIAWI *	1. CIBEDUG*
			2. CITAPEN
			3. BENDUNGAN
			4. JAMBU LUWUK
			5. MUARA SARI
			6. BANJAR WANGI *
			7. BOJONG MURNI
			8. CILEUNGSI *
			9. SINDANG SARI *
			10. HARJA SARI
			11. CIPAKU
			12. TAJUR
			13. TELUK PINANG
			14. BANJAR SARI
			15. BANJAR WARU
			16. BITUNG SARI
			17. RANCAMAYA
	2. SUBANG	1. CISALAK *	1. SIRAP *
			2. SINDANGLAYA
			3. GARDU SAYANG
			4. CIMEUHMEL
			5. KAWUNG LUWUK
			6. CISALAK
			7. DARMAGA
			8. SUKAKERTI
			9. RANCAMANGGUNG
			10. TANJUNG SIANG
			11. CIBULUH
		2. PURWADADI *	1. PURWADADI TIMUR
			2. PURWADADI BARAT
			3. PASIR BUNGUR
			4. KORANJI
			5. WANAKERTA *
			6. PRAPATAN
			7. SINDANG SARI
			8. PAGON
			9. CIKAUM BARAT
	3. SERANG	1. PAMARAYAN	1. WIRANA
			2. BINONG
			3. PAMARAYAN
			4. MALABAR
			5. SANGIANG

				6. PUDAR
				7. DAMPING
				8. BLOKANG
				9. BABAKAN
				10. BANDUNG
			2. ANYER *	1. BUNIHARA *
				2. TANJUNG MANIS
				3. GUNUNG SUGIH
				4. KOSAMBI RONYOK *
				5. ANYAR
				6. BANDULU
				7. CIKONENG
		4. PADEGLANG	1. LABUAN	1. SUKANEGARA
				2. SUKARAME
				3. SUKAJADI
				4. CARITA
				5. BANJARMASIN
				6. PEJAMBEN
				7. CARINGIN
				8. BANYUBIRU
				9. TELUK
				10. KARANG ANYAR
				11. LABUAN
				12. CIGONDANG
				13. RANCATEUREUP
				14. SUKAMAJU
				15. BANYUMEKAR
2.	SUMATERA-BARAT	1. SOLOK	1. GN. TALANG *	1. PASAR BARU
				2. PASANG USANG
				3. LINJUNG TINGGI *
				4. TABEK GADANG
				5. TANGAH PADANG
				6. OLI JAWI-JAWI *
				7. ARO
				8. TAPI
				9. TABEK PALA
				10. AIR ANGEK SONSANG
				11. PANYALAT CUPAK
				12. BALAI PANDAN *
				13. LAMBAH
				14. LUBUK SELASIH *
				15. KAYU ARO
			2. KUBUNG *	1. BANSA *
				2. KAPALA KOTO
				3. MARKIO
				4. KUBU HARIMAU
				5. DALAM NAGARI *
				6. SALAYO ATAS

				7. SALAYO BAWAH *
				8. MUNGGU TANAH
				9. PASAR JUM'AT
				10. KOTO TUO
				11. KAJAI
				12. BUKIT KILLI TIMUR
				13. HILIR BANDAR
				14. SUBARANG KT. BARU
				15. HALABAN
				16. PANCURAN BARUH
				17. BULAKAN *
			3. KT.SINGKARAK *	1. DATAR TJ. ALAT
				2. BALAI2 KACANG
				3. KOTO BARU TJ.ALAI*
				4. BITEH
				5. PASIR
				6. TAMPUNIK *
				7. KUBANG GAJAH *
				8. PINTU RAYO
				9. KAMPUNG TANGAH
				10. PASIR CIKATAK
				11. SUMAGEK
				12. BALAI MANSIANG
				13. GUCI IV
				14. SARIK
				15. LIMO NINIK
				16. DATA BUNGO
				17. KAPUH
				18. SUBARANG
3.	N.T.B.	1. LOMBOK-BARAT	1. TANJUNG *	1. JENGGALA
				2. SOKONG *
				3. TANJUNG *
				4. PEMENANG BARAT
				5. PEMENANG TIMUR
			2. NARMADA	1. BATU KUMBUNG
				2. LEMBUAK
				3. DASAN TRENG
				4. SEMBUNG
				5. DASAN GRIA
				6. LINGSAR
				7. DUMAN
				8. SIGRONGAN
				9. PRESAK
				10. SEDAU
				11. SESAOR
				12. SELAT
				13. TANAH BEAK
				14. BATU KUTA

2. LOMBOK-TENGAH	1. PRAYA*	1. LENENG 2. AIKMUAL 3. SEMAYAM * 4. PENGADANG 5. BERAIM 6. JURANG JALER * 7. LAJUT 8. JONTLAK 9. PRAYA
	2. JONGGAT	1. UBUNG 2. JELANTIK 3. NYEROT 4. BON JERUK 5. PRINA 6. PUYUNG
3. LOMBOK-TIMUR	1. MASBAGIK *	1. MASBAGIK UTARA 2. MASBAGIK TIMUR* 3. DANGER 4. PAOK MOTONG * 5. KESIK 6. KEMPUNG
	2. AIKMAL	1. LENEK 2. KALIJAGA 3. KEMBANG KERANG 4. AIKMEL 5. KERANG BARU 6. MAMBEN LAOK 7. MAMBEN DAYA 8. WANASABA

*) YIS SURVEY AREA

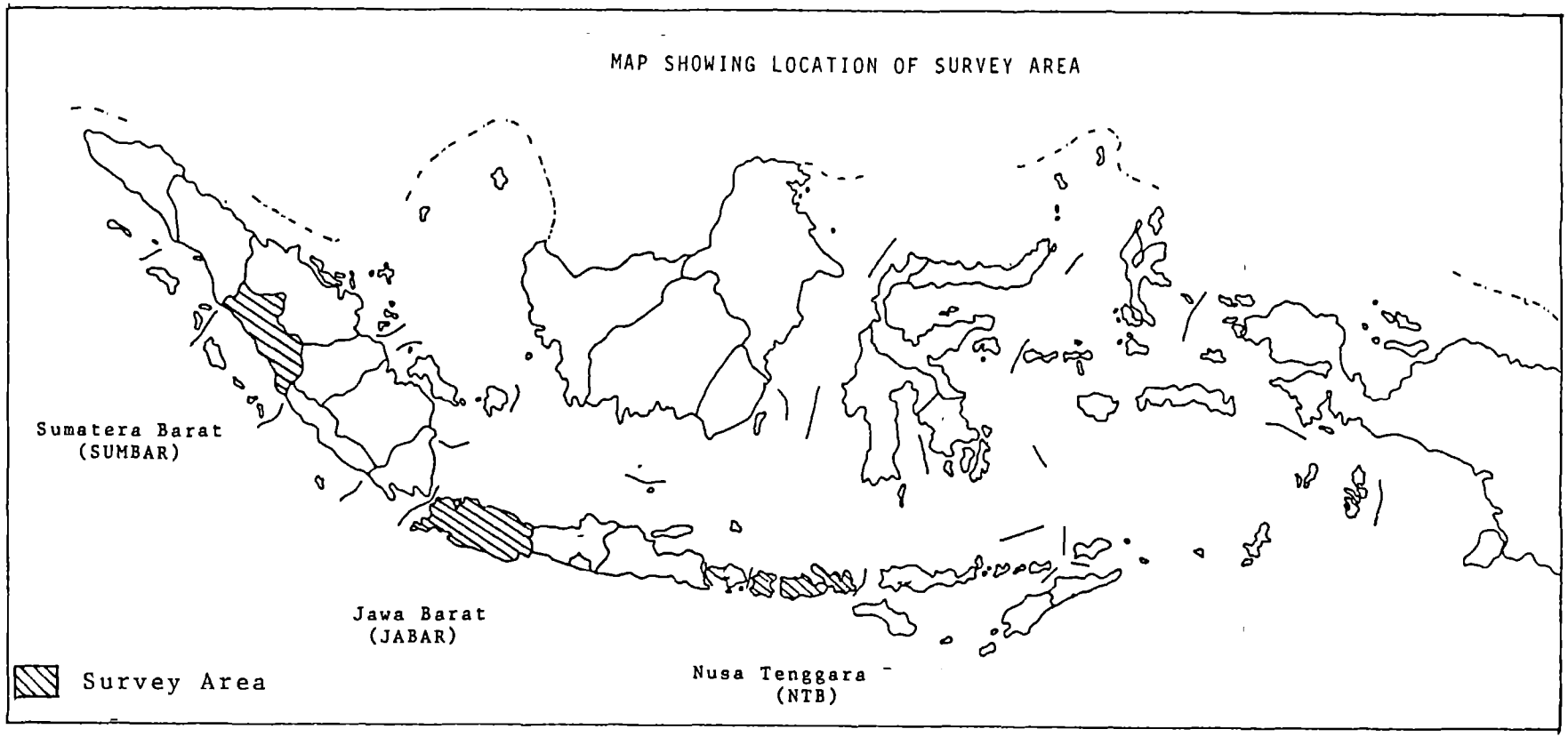
FUNCTION AND USE OF WATER AND SANITATION FACILITIES BY REPELITA

Type of facility	PELITA II			PELITA III			PELITA IV			TOTAL		
	Checked	F	U	Checked	F	U	Checked	F	U	Checked	F	U
Dugwell (SG)	0	0	0	92	85	81	140	133	133	232	218	214
										100.0	94.0	92.2
Shallowwell handpump(SPTDK)	91	57	54	554	444	422	649	345	336	1294	846	812
										100.0	65.4	62.8
Deepwell handpump (SPTDL)	2	0	0	117	52	42	135	90	84	254	142	126
										100.0	55.9	49.6
Spring Capture (PMA)	0	0	0	15	15	15	12	9	9	27	24	24
										100	88.9	88.9
Pipe System (PP)	3	3	3	12	11	11	2	2	2	17	16	16
										100	94.1	94.1
Raincollectors (PAH)	2	0	0	47	39	25	26	7	7	75	46	32
										100	61.3	42.7
Artesian well (SA)	0	0	0	2	2	2	0	0	0	2	2	2
Sub Total	98	60	57	839	648	598	964	586	571	1901	1294	1226
%	100	61.2	58.2	100	78.2	72.1	100	60.8	59.2	100	68	64.5
JAGA	252	110	78	684	499	353	78	71	53	1014	680	484
%										100.0	67.1	47.7
SPAL	5	0	0	53	36	33	104	82	80	162	118	113
%										100	72.8	69.8
Sub Total	257	110	78	737	535	386	182	153	133	1176	798	597
%	100	42.8	30.3	100	72.6	52.4	100	84.0	73.1	100	67.8	50.8
Total	355	170	135	1576	1183	984	1146	739	704	3077	2092	1823
%	100	47.9	30.8	100	75.1	62.4	100	64.5	61.4	100	68.0	59.2
% all facilities up to Rep IV (3077)	11.5	5.5	4.4	51.2	38.4	32.0	37.2	24.0	22.9	100	68.0	59.2

F= FUNCTION, U= USED

SPM/la
0203(p.23)

Annex 4


MAP SHOWING LOCATION OF SURVEY AREA
Sumatera Barat
(SUMBAR)
Jawa Barat
(JABAR)
Nusa Tenggara
(NTB)
Survey Area