

ASIAN DEVELOPMENT BANK

PPA: INO 26314

PROJECT PERFORMANCE AUDIT REPORT

ON THE

**RURAL WATER SUPPLY AND SANITATION SECTOR PROJECT
(Loan 1352-INO)**

IN

INDONESIA

December 2004

CURRENCY EQUIVALENTS

Currency Unit – rupiah (Rp)

		At Appraisal (Nov 1994)	At Project Completion (Aug 2000)	At Operations Evaluation (Mar–Apr 2004)
Rp1.00	=	\$0.000455	\$0.00012056	\$0.00011621
\$1.00	=	Rp2,193	Rp8,295	Rp8,605

ABBREVIATIONS

ADB	–	Asian Development Bank
BAPPEDA	–	Badan Perencanaan Pembangunan Daerah (Agency for Regional Planning and Development)
BAPPENAS	–	Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BME	–	benefit monitoring and evaluation
CPAO	–	Central Project Administration Office
DGCDCEH	–	Directorate General for Communicable Disease Control and Environmental Health
DGHS	–	Directorate General of Human Settlements
DGRCD	–	Directorate General for Rural Community Development
DGRD	–	Directorate General for Regional Development
DGURD	–	Directorate General for Urban and Rural Development
DPP	–	<i>desa pusat pertumbuhan</i> (growth center village)
DT	–	<i>desa tertinggal</i> (lesser developed village)
EA	–	Executing Agency
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
IA	–	implementing agency
IRM	–	Indonesia Resident Mission
IKK	–	<i>ibu kota kecamatan</i> (district administrative center)
MCK	–	<i>mandi cuci kakus</i> (communal washing, bathing, and toilet facility)
MOH	–	Ministry of Health
MOHA	–	Ministry of Home Affairs
MPW	–	Ministry of Public Works
MSRI	–	Ministry of Settlements and Regional Infrastructure
O&M	–	operation and maintenance
OED	–	Operations Evaluation Department
OEM	–	Operations Evaluation Mission
PCR	–	project completion report
PDAM	–	Perusahaan Daerah Air Minum (regional water utility)
PPAR	–	project performance audit report
PPTA	–	project preparatory technical assistance
RRP	–	report and recommendation of the President
SPAR	–	subproject appraisal report
VAP	–	village action plan
WSS	–	water supply and sanitation

NOTES

- (i) The fiscal year of the Government ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

Director General, Operations Evaluation Department	:	Bruce Murray
Director, Operations Evaluation Division 1	:	Graham Walter
Evaluation Team Leader	:	Walter Kolkma

Operations Evaluation Department, PE-652

CONTENTS

	Page
BASIC DATA	ii
EXECUTIVE SUMMARY	iii
MAP	vii
I. BACKGROUND	1
A. Rationale	1
B. Formulation	1
C. Purpose and Outputs	1
D. Cost, Financing, and Executing Arrangements	2
E. Completion and Self-Evaluation	3
F. Operations Evaluation	4
II. PLANNING AND IMPLEMENTATION PERFORMANCE	5
A. Formulation and Design	5
B. Achievement of Outputs	6
C. Cost and Scheduling	9
D. Procurement and Construction	9
E. Organization and Management	10
III. ACHIEVEMENT OF PROJECT PURPOSE	12
A. Operational Performance	12
B. Performance of the Operating Entity	13
C. Financial and Economic Reevaluation	13
D. Sustainability	13
IV. ACHIEVEMENT OF OTHER DEVELOPMENT IMPACTS	14
A. Socioeconomic and Sociocultural Impacts	14
B. Environmental Impacts	15
C. Impact on Institutions and Policy	15
V. OVERALL ASSESSMENT	16
VI. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS	18
A. Key Issues for the Future	18
B. Lessons Identified	19
C. Follow-Up Actions	20
APPENDIXES	
1. Project Costs as Appraised and Actual	21
2. Operations Evaluation Mission Field Notes	22
3. Supplementary Survey Summary	43
4. Outputs Achieved by the Project	46
5. Project Organization	48
6. Operational Performance	49
7. Summary of Central Project Administration Office Questionnaire Answers	53
8. Housing and Living Conditions	55
SUPPLEMENTARY APPENDIXES (available upon request)	
A. Survey Findings (Jambi Province)	
B. Survey Findings (North Sumatra Province)	
C. Survey Findings (West Kalimantan Province)	

Walter Kolkma (evaluation specialist) prepared this report. Agnes Anabo (senior evaluation officer) supported the study with research assistance in Manila. A staff consultant collaborated in this study: Neil Chadder (water engineer).

BASIC DATA
Rural Water Supply and Sanitation Sector Project (Loan 1352-INO)

Project Preparation/Institution Building

TA No.	TA Name	Type	Person-Months	Amount (\$)	Approval Date
1818	Rural Water Supply and Sanitation Sector	PPTA	46	600,000	23 Dec 1992

Key Project Data (\$ million)	As per ADB Loan Documents	Actual
Total Project Cost	142.0	105.0
Foreign Exchange Cost	38.0	41.6
Local Currency Cost	104.0	63.4
ADB Loan Amount/Utilization	85.0	66.6
ADB Loan Amount/Cancellation		18.4

Key Dates	Expected	Actual
Fact-Finding		18–28 Apr 1994
Appraisal		25 Aug–15 Sep 1994
Loan Negotiations		5–6 Dec 1994
Board Approval		2 Feb 1995
Loan Agreement		6 Mar 1995
Loan Effectiveness	4 Jun 1995	10 Apr 1995
Project Completion	31 Mar 2000	30 Sep 2000
Loan Closing	30 Sep 2000	1 Nov 2002
Months (effectiveness to completion)	58	66

Rate of Return (%)	Appraisal	PCR	PPAR
Economic Internal Rate of Return	14.5 ^a	<5% ^b	Negative

Borrower Republic of Indonesia

Executing Agency Directorate General of Human Settlements in the Ministry of Public Works

Mission Data

Type of Mission	No. of Missions	No. of Person-Days
Reconnaissance		32
Fact-Finding ^c	1	36
Follow-Up Fact-finding	1	9
Appraisal	1	88
Follow-Up Appraisal	1	8
Project Administration		
Inception	1	6
Inception	1	3
Review	4	79
Midterm Review	1	14
Project Completion	1	65
Operations Evaluation ^d	1	38

^a Weighted average economic internal rate of return of sample schemes.

^b The PCR states that, had the Project been implemented as intended, the EIRR would have been 18.0%.

^c This was a follow-up reconnaissance mission, which was upgraded to a fact-finding mission.

^d The Mission comprised Walter Kolkma (evaluation specialist/mission leader) and Neil Chadder (water engineer). A field survey was conducted after the Mission in April–May 2004 by Uzaimah (civil engineer) and Natalia Elok Ardanari (survey specialist).

ADB = Asian Development Bank, EIRR = economic internal rate of return, PCR = project completion report, PPAR = project performance audit report, PPTA = project preparatory technical assistance, TA = technical assistance.

EXECUTIVE SUMMARY

At the start of the 1990s, only 40 million of the 130.5 million of Indonesia's rural population benefited from water supply and sanitation (WSS) services. The Rural Water Supply and Sanitation Sector Project (the Project) had the key objectives of providing safe, adequate, and reliable WSS services to low-income rural villages in Kalimantan and Sumatra through community-based arrangements and supporting hygiene and sanitation education, water quality surveillance, and community management activities. It had an estimated cost of \$142 million equivalent and the Asian Development Bank (ADB) loan of \$85 million became effective on 10 April 1995.

The original brief for the project preparatory technical assistance comprised 250 rural communities, each with a population between 3,000 and 10,000, located in the four provinces of Kalimantan. However, the scope was expanded to be in line with the Government's emerging sector development policy to focus on the less developed villages. By loan approval on 2 February 1995, the project area covered, besides the four provinces of Kalimantan, all eight provinces of Sumatra and targeted 3,000 rural communities with populations ranging from 500 to 15,000. ADB accepted the Government's position that adequate institutional arrangements were in place to administer a project of this increased size and furthermore that the procedures for district support to village development were tried and tested. The provision of WSS facilities was expected to benefit an estimated 3.0 million population.

The Project was completed by September 2000 and the loan closed in November 2002. The Executing Agency submitted a project completion report (PCR) in April 2001, which concluded that in general terms the Project had been successful and in particular stressed that the number of locations at which facilities had been installed had been increased by 35% from the original target and that this had been achieved in spite of only spending 71% of the project funds in dollar equivalent. The number of beneficiaries was estimated at 3.6 million. However, the ADB PCR was not so positive and concluded that water supply service coverage levels were only half of those anticipated and that sanitation effectiveness was only in the order of 20% of that anticipated. The ADB PCR assessed the Project as relevant and appropriately designed but criticized the implementation arrangements. The ADB PCR rated the Project partly successful and recommended that a full technical and financial audit of the Project be undertaken, although without specifying who was to do it. This audit did not take place.

As a conventional financial audit is beyond the Operations Evaluation Department's mandate and capacity, the Operations Evaluation Mission (OEM) concentrated on the verification of the assessments of the two PCRs. The OEM visited 24 communities in three of the 12 provinces covered, conducted a workshop with representatives of other provinces in Jakarta, and supervised domestic consultants in the performance of a follow-up survey of a further 100 randomly selected communities.

The PCR of the Executing Agency reported that water supply systems had been either constructed or rehabilitated/extended in 4,405 locations. However, in 15% of the communities surveyed for this project performance audit report (PPAR), no works had been carried out at all or the works had either been abandoned before completion or had not been commissioned. Similarly, although sanitation modules were reported to have been provided in 4,050 locations, in the 124 communities visited, only two thirds had any form of sanitation facility constructed and only in 1 out of 40, complete modules (a package of public, school, and private latrines, and public washing areas) were still in evidence. In light of the evidence found, the PPAR concurs with the findings of the ADB PCR that there was over reporting of the works constructed.

From observations made in the 124 communities, it can be concluded that the majority of water supply facilities that were constructed are no longer functioning as intended. Less than 4 years after project completion, the use of the facilities relying on spring, river, lake, or groundwater sources averages only 30-40% of their potential and many facilities now lie abandoned throughout Sumatra and Kalimantan. Where rainwater harvesting was the source of water, the situation was rather better as around 70% of the facilities provided may still be working, although the majority of these only serve individual houses rather than the community as initially intended. The situation is similar for the sanitation facilities, as in the 80 communities where some form of facility was constructed, only an estimated 30% were still being used.

Statements made at the workshop by representatives of provinces not visited by the OEM confirmed that project outcomes had been less than successful. In their view, only an estimated 40–60% of water supply facilities were still in use. Taking into account the over reporting of facilities constructed, and the above operational percentages, it is estimated that less than 1 million people within the 4,405 communities may have received a direct benefit from the Project, or 22% of the population, instead of the intended 80%.

While numerous factors contributed to the poor performance of the Project, the two key reasons were the lack of involvement of the community in the planning and construction process and the poor cooperation between the Directorate General of Human Settlements in the Ministry of Public Works (responsible for project coordination and the physical implementation of the works) and the Ministry of Home Affairs (responsible for the community management and WSS institutional development programs). The lack of community involvement and the absence of bottom-up planning was partly due to an insufficient budget (a design issue), but more particularly a result of the continued traditional top-down project implementation style prevalent in Indonesia at the time. The short project implementation period in combination with the increased value of the loan in local currency value after the Asian financial crisis led to a spending rush. Poor water resources engineering, poor facilities design, absence of appropriate construction supervision, and lack of provision for system management and operation and maintenance compounded the problems. In the last 2 years of the Project, implementation capability was severely hampered when responsibilities were delegated to district-level staff who had not been adequately trained for the task.

The Project as a whole is rated partly successful, bordering on unsuccessful. It is assessed as less relevant because, with the implementation modality adopted, more attention was paid to subdistrict capitals than rural communities. The Project is assessed as less efficacious, given the lower than anticipated output and, particularly, use of the output. In addition to the failure of the Project to include the community, the outcomes were too small to allow an overall positive economic and financial rate of return and, hence, the Project is assessed as inefficient. The lack of community training and the generally poor status of the larger scheme-operating authorities result in an assessment that the Project is less likely to be sustainable. One of the few positive aspects of the Project is that water supply schemes reliant on mountain streams and gravity distribution are, as a general rule, still in operation to some degree.

The OEM assessed the institutional impacts of the Project as negligible. Environmental impacts were, more often than not, negative as a result of the poor drainage at public water distribution facilities. On the positive side, the failures of the Project are well known within the sector in Indonesia and have contributed to the refinement of the implementation approach.

The evaluation highlighted several lessons, not least of which is that the sector modality should be utilized with much caution for projects where a new approach to project implementation is being adopted. The supply of WSS services to remote rural communities presents unique technical, implementation, and operational challenges for which appropriate provisions need to be made in advance of construction. ADB should not attempt to implement over-complex technical solutions in small communities, which are beyond the capability of the organizational structure in place. In future WSS projects, ADB should not combine target groups that require different operational modalities. Projects should be either community-based or water authority-based in order to avoid the tendency to focus on the easier to implement, more profitable larger schemes. Standard designs are acceptable in certain circumstances but must not be overutilized if schemes are to remain both appropriate and financially efficient.

Proper assessment of the implementation capacity of the Government at all its levels—national, provincial, and district—is required before embarking on projects of such a large magnitude. Major changes in the project context (such as those stemming from decentralization) would normally need to lead to adjustments in implementation arrangements. Particular care is needed for projects requiring inputs from different agencies. Appropriate task sequencing is required together with project management arrangements that allow full and proper involvement of all stakeholders.

Since many records could no longer be located, it is probably no longer possible to conduct a full audit of the Project. It is absolutely imperative that ADB in future makes sufficient staff and funds available to immediately follow up on requests by project staff for project audits. Lending to executing agencies should not take place until allegations of corruption have been satisfactorily dealt with.

ADB provided TA to strengthen the Inspectorate General to combat fraud and corruption in the operations of MSRI. An action plan to mitigate the risk of fraud and corruption was approved in June 2004. ADB should only prepare a new project with this EA when evidence can be presented that the action plan regarding measures to combat fraud and corruption has been completed successfully. ADB needs to make sure that implementation arrangements can be worked out that prevent the recurrence of the situation found by this PPAR.

ADB should initiate a discussion with the Government in 2005 as to how the facilities created by the Project in Kalimantan and Sumatra can be completed or rehabilitated.

Bruce Murray
Director General
Operations Evaluation Department

I. BACKGROUND

A. Rationale

1. Despite substantial economic growth in the 1980s, at the start of the 1990s only 40 million of the 130.5 million of Indonesia's rural population benefited from water supply and sanitation (WSS) services. Even then, the facilities were generally limited to shallow wells and hand pumps for water supply and pit latrines for sanitation, often poorly maintained and inappropriately located. The rural population not served had to rely on traditional water sources including unprotected hand-dug wells, springs, streams, and rivers together with rainwater harvesting. For sanitation, the population utilized local watercourses and often followed indiscriminate defecation practices.

B. Formulation

2. Having recognized these problems, the Government of Indonesia, through the Directorate General of Human Settlements (DGHS), requested technical assistance from the Asian Development Bank (ADB) to formulate the Rural Water Supply and Sanitation Sector Project (the Project) in February 1991. A technical assistance fact-finding mission visited Indonesia in July 1991. ADB approved a project preparatory technical assistance (PPTA) on 23 December 1992 to investigate the feasibility of the Project.¹ Consultants submitted their report by March 1994 and this led to the design of a project in Kalimantan and Sumatra costed at \$142 million equivalent. Loan negotiations took place during December 1994. ADB's loan for \$85 million was approved on 2 February 1995 and became effective on 10 April 1995. While DGHS had been responsible for previous ADB loan projects, this was the first time that it had been the Executing Agency (EA) for a project specifically targeting rural WSS.

C. Purpose and Outputs

3. The objectives of the Project, as outlined in ADB's report and recommendation of the President (RRP), were to (i) provide safe, adequate, and reliable WSS services to 3,000 low-income rural communities through community-based arrangements; and (ii) support hygiene and sanitation education, water quality surveillance, and community management activities for these communities. Eighty percent of the population of the 3,000 communities were expected to directly benefit from the Project. Project sustainability would be achieved through the development of community awareness and participation in all stages of the Project. The provision of WSS facilities was expected to result in an overall improvement in the standards of health and productivity of the estimated 3 million beneficiaries and to contribute significantly to the reduction of poverty.

4. The Project had three components: Part A—water supply facilities, Part B—sanitation facilities, and Part C—institutional support and project administration. Part A focused on the implementation of subprojects involving the construction of piped and non-piped water supply systems and/or the rehabilitation of existing water supply systems. Typical sources were to include protected spring captions, shallow or deep wells with electric or hand pumps, surface water requiring treatment, and rainwater harvesting. Where piped distribution systems were to be constructed, public hydrants and/or house connections were to be provided. Part B comprised the implementation of subprojects through the construction of public and private

¹ ADB. 1992. *Technical Assistance to Indonesia for Rural Water Supply and Sanitation Sector*. Manila (TA 1818-INO, for \$600,000, approved on 23 December 1992).

latrines via a standard package of works. A typical module for a population of 500 was to include one *mandi cuci kakus* (MCK), or communal washing, bathing, and toilet facility; two school latrines; and 30 family latrines for demonstration purposes. Part C was to provide the support needed to implement the Project through the bottom-up philosophy in a decentralized government system and included implementation assistance at the central, provincial, and district levels; hygiene and sanitation education programs for the communities; water quality surveillance programs and community management; and WSS institutional development programs.

5. The project area covered all four provinces of Kalimantan (Central, East, South, and West Kalimantan) and all eight provinces of Sumatra (Benkulu, D.I. Aceh, Jambi, Lampung, North Sumatra, Riau, South Sumatra, and West Sumatra)—see Map. The 3,000 selected rural low-income communities were expected to include 2,750 *desa tertinggal* (DT), and 250 *desa pusat pertumbuhan* (DPP). DTs are less developed rural communities² and DPPs are rural growth centers, which for the purposes of the Project were defined as communities that exhibited the economic potential to enhance the growth of DTs in their hinterland and had a population of about 2,000 to 15,000. In contrast to the PPTA study, the RRP did not mention *ibu kota kecamatan* (IKK), or subdistrict capitals, as targets of the Project, but they were not explicitly excluded either, as some of these could also be described as being either a DT or DPP.

D. Cost, Financing, and Executing Arrangements

6. The estimated total project cost at appraisal of \$142.0 million equivalent included a foreign exchange cost of \$38.0 million. ADB's loan was to be used to finance the entire foreign exchange cost together with \$47.0 million equivalent of the local currency costs. The central Government and participating provincial and district governments and communities were to fund the remaining local currency costs of \$57.0 million equivalent. ADB financing was, therefore, intended to cover 60% of the total project costs (Appendix 1). The loan was made to the Borrower (the central Government) from ADB's ordinary capital resources.

7. The EA was the then Ministry of Public Works (MPW) through DGHS,³ one of the three directorates general of MPW.⁴ DGHS was responsible for the coordination of project activities at the central, provincial, and district levels and was in charge of the physical implementation of the WSS schemes to be constructed under parts A and B. The Ministry of Health (MOH) through its Directorate General for Communicable Disease Control and Environmental Health (DGCDCEH) was the implementing agency (IA) for the hygiene and sanitation education and water quality surveillance programs. The Ministry of Home Affairs (MOHA) through its Directorate General for Rural Community Development (DGRCD) and its Directorate General for Regional Development (DGRD) was the IA for the community management and WSS institutional development programs. The National Development Planning Agency (BAPPENAS) provided coordination on policy matters together with annual budget allocations. The Ministry of Finance had overall responsibility for project financing.

² As defined by the State Minister of the National Development Planning Agency (BAPPENAS) and the Minister of the Ministry of Home Affairs (MOHA), pursuant to Presidential Instruction S/1993 regarding the intensification of efforts to alleviate poverty. DTs have a population of more than 500 persons.

³ In 2000, DGHS was reorganized to be the Directorate General Urban and Rural Development (DGURD) in the Ministry of Settlements and Regional Infrastructure (MSRI).

⁴ The others being the Directorate General of Highways and the Directorate General of Water Resources Development.

E. Completion and Self-Evaluation

8. The Project was completed by September 2000 and the loan account closed by November 2002. The EA submitted a project completion report (PCR) in April 2001, which concluded that in general terms the Project had been successful and in particular stressed that the number of locations at which facilities had been installed had been increased by 35% from the original target and that this had been achieved in spite of only spending 71% of the project funds in dollar equivalent. The number of beneficiaries was estimated at 3.6 million. The PCR stated that 96% of IKK water supply schemes and 90% of DPP and DT water supply schemes installed during 1995–1998 were still working after 2 years of service. However, the report conceded that the efficacy of the sanitation works was far below that of the water supply schemes and that the quality of works in the DPPs and DTs could have been better. Operational difficulties were being experienced due to poor cost recovery and consequently scheme maintenance was being neglected. The EA's PCR concluded that the community training and support budget had been too low and as a result, the level of institutional development was poor.

9. ADB's PCR⁵ dated October 2002 was based on a PCR mission and a project benefit monitoring and evaluation (BME) report prepared by consultants, which the EA released toward the end of the Project.⁶ The project BME report was considerably more critical than the EA's PCR. It was based on a small survey of 13 IKKs, 12 DPPs, and 25 DTs where facilities were known to have been successfully constructed. Contrary to the EA's PCR, and in spite of the positive bias of the survey, the report concluded that the service coverage levels observed (43% in DPPs and 46% in DTs) did not meet the target figure of 80%. It noted that in the case of piped systems, the population had shown a preference for house connections rather than public hydrants, while in the case of non-piped systems, facilities such as shallow wells and rainwater harvesting tanks had tended to be adopted by individual families rather than used as community property. Benefits of the Project were related to reduced distances to water service points resulting from the installation of piped systems. The benefits of the non-piped systems were reported as limited, as wells were either dry in the dry season or polluted in the wet season and many of the hand pumps were inoperative. The report noted that communities benefiting most were located in the western part of Sumatra in the mountains, where spring water could be utilized under gravity conditions. The benefits of the sanitation component were similarly reported as limited. The project BME report concluded that the desire to carry out work in more locations than originally targeted led to poorly designed, unsustainable schemes. However, although the supporting evidence was limited, the report stated that the incidence of key waterborne diseases had been reduced.

10. On the basis of another small survey carried out by the PCR mission, ADB's PCR considered that the figures in the EA's PCR did not accurately represent the number of facilities actually built. The PCR mission estimated that only 20% of the stated number of private latrines had in fact been constructed; no figure was provided for the water supply facilities. The differences in reported and actual numbers were attributed to a combination of poor commissioning and reporting procedures, poor contract administration, and the possible misuse of funds. The PCR reported problems with community involvement and coordination, leading to many cases in which training did not take place until after the related task had already been

⁵ ADB. 2002. Project Completion Report on the Rural Water Supply and Sanitation Sector Project (Loan 1352-INO) in Indonesia. Manila. The field mission for the PCR took place in March 2002.

⁶ Ministry of Settlement and Regional Development, Directorate General of Rural Development. 2001. *Rural Water Supply and Sanitation Sector Project: Project Benefit Monitoring and Evaluation*. Final Report. Jakarta.

completed. The PCR based its assessment of project efficacy on the project BME and indicated that the percentage of facilities producing intended levels of benefits varied from 50% for larger piped systems to less than 20% for sanitation facilities. The economic internal rate of return (EIRR) was estimated as less than 5%, and the financial internal rate of return (FIRR) as variable for larger piped water supply systems, with only 30% having an FIRR greater than zero. While the PCR assessed the Project as relevant and appropriately designed to address the key issues, it criticized the implementation arrangements and more notably ADB's failure to recognize that problems were being experienced, and to take action, at the time of the midterm review in 1998. In contrast to the EA's PCR, the PCR rated the Project partly successful. Of interest was that the PCR recommended a full technical and financial audit of the Project. Among other things, the PCR recommended the Government to prepare a rehabilitation plan. The Operations Evaluation Department (OED) assesses the PCR as comprehensive and focusing on identification of problem areas and lessons and recommendations; given the format of the PCR, less space remained for a full treatment of outputs and outcomes produced.

F. Operations Evaluation

11. This project performance audit report (PPAR) focuses on pertinent aspects of the Project and presents the findings of the Operations Evaluation Mission (OEM) to Indonesia from 15 March to 2 April 2004. Neither ADB nor the Government had conducted the recommended audit, and a complete evaluation of the thousands of works constructed across the 12 provinces was beyond the means of OED. The OEM visited a sample of communities in 3 of the 12 provinces covered by the Project: one in the region of southern Sumatra (Jambi province), one in northern Sumatra (North Sumatra province), and one in Kalimantan (West Kalimantan province). Mission members inspected the water sources, treatment plants, distribution systems, and sanitation facilities in 24 project communities (8 IKKs, 5 DPPs, and 11 DTs) and held discussions with government staff and community members. A workshop was held in Jakarta on 1 April 2004 in which representatives could compare the OEM findings with the situation in other provinces. Domestic consultants carried out a follow-up survey of a further 100 randomly selected communities (28 IKKs, 29 DPPs, and 43 DTs)⁷ over the period 13 April to 9 May 2004. A focus of the OEM was establishment of outputs produced and the verification of the assessments of the EA and ADB PCRs, which differed considerably (paras. 8–12). Details of the community locations seen by the OEM, site photographs, and field notes are presented in Appendix 2. Appendix 3 summarizes the findings of the follow-up survey. Detailed observations and site photographs can be accessed in Supplementary Appendixes A–C, which are available upon request.

12. The EA's PCR did not include detailed information on which facilities the Project had planned and actually delivered to each community, and this data could not be provided to the OEM before its visit. A spreadsheet of the Project's Central Project Administration Office (CPAO) detailing IKK, DPP, and DT names, and provincial aggregates of the number of facilities constructed, were the key sources of information. This severely hampered the OEM although partial listings were provided in Jambi and West Kalimantan during the visits. Furthermore, the available data contained minor mathematical errors and some inconsistencies.

13. The PPAR is based on a review of the PPTA, RRP, EA's PCR, project BME report, ADB's PCR, ADB files, observations in the field, and discussions with the Borrower, EA, and other stakeholders. Copies of the draft PPAR were provided to the EA and to relevant ADB staff

⁷ 14 IKKs, 11 DPPs, and 17 DTs in Jambi; 7 IKKs, 6 DPPs, and 6 DTs in North Sumatra; and 7 IKKs, 12 DPPs, and 20 DTs in West Kalimantan.

for review. Comments were received from both and these were taken into consideration in finalizing this report.

II. PLANNING AND IMPLEMENTATION PERFORMANCE

A. Formulation and Design

14. The original scope of the PPTA comprised only 250 rural communities, each with a population between 3,000 and 10,000, located in the four provinces of Kalimantan. However, as a result of discussions held during 1992, the geographic coverage was increased to include five additional provinces in Sumatra (Bengkulu, D.I. Aceh, Jambi, North Sumatra, and Riau) and the PPTA final report covered 300 communities, now ranging in population from about 2,000 to 15,000. At this stage, the Project was to include 265 water supply schemes covering 74 larger IKK systems, 133 small IKK systems, 17 systems for 2–4 villages, 15 larger spring systems, and 26 smaller spring systems. The total population targeted was estimated at 1.2 million.

15. The PPTA reported that there was a strong demand for house connections within the villages studied and it also recognized that sanitation would only be effective if the need was embraced by the communities themselves. Sanitation was, therefore, only scheduled for 75 communities. The PPTA final report outlined the key village selection criteria, which included a demonstrable need for water supply, minimum affordability of the population, and the willingness of the community to participate in the operation and management of the schemes. The prime justifications for the Project were the expected improvements in public health, time saving in water collection, and the elimination of the need to boil water (household budget savings). The study concluded that, despite decentralization, implementation arrangements in Indonesia were still highly complex, while institutional systems were weak. Three hundred communities would be the maximum that the Project could serve.

16. Loan reconnaissance and fact-finding missions took place in March and April 1994. Disregarding the warnings of the PPTA, the missions accepted a government request to incorporate an additional 250 IKK schemes, which were originally to have been covered by the third ADB-funded IKK Water Supply and Sanitation Sector Project, which did not proceed. By the time of the ADB management review meeting (June 1994), the scope of the Project had increased to include the provision of water supply to 500 rural communities (200 DPPs and 300 DTs) ranging in population from 1,000 to 15,000 and sanitation to selected communities.

17. The project scope was, however, subjected to further major revisions during the appraisal process in order for it to be in line with the Government's emerging sector development policy, which stressed the need to focus on the less developed villages (DTs).⁸ By the time of the staff review committee meeting on 14 October 1994, the coverage of the Project had increased from 500 to 2,000 communities, comprising 250 DPPs and 1,750 DTs ranging in population from 500 to 15,000. At a preappraisal meeting with the Government on 2 August 1994, ADB had accepted the Government's position that adequate institutional systems were in place to administer a project of this increased size. Furthermore, the meeting concluded that the procedures for district support to village development were tried and tested and that the institutional arrangements had been verified by an ADB field visit. An institutional expert was included in the mission.

⁸ Indonesia's Sixth Five-Year Development Plan (1994/1995–1998/1999) gave high priority to the improvement of water supply facilities in rural communities and low-income groups.

18. Following appraisal, the Government requested that the Project be expanded even further, to include the provinces of Lampung, South Sumatra, and West Sumatra. A follow-up mission concluded once more that the Government's institutional capacity was adequate and that the addition of the three provinces would not pose any major logistics problems. As a result, the number of communities was increased to 3,000 (250 DPPs and 2,750 DTs). The post-appraisal mission report stated that the loan amount would not need to be changed as the number of non-piped systems had been increased at the expense of the piped IKK systems. The final number of IKKs to be included was 70, compared with the 130 anticipated at appraisal.

19. The RRP was based on the PPTA report, but also included the changes in scope that had arisen during project fact-finding and appraisal. The OEM concurs with ADB's PCR that despite the review carried out during appraisal, institutional arrangements had not been taken into account sufficiently for a project of this vast size—even today the second largest loan ADB implemented in this sector in rural areas in Asia—but the RRP can yet be considered as innovative for its time. Measures were included to ensure that a poor-focused, bottom-up community participatory approach was adopted and that project sustainability could be achieved through community training and scheme ownership. The targeted beneficiaries would be involved in the preparation of village action plans (VAPs) and the selection of technology to be adopted. Based on the VAPs prepared, the districts were required to produce a subproject appraisal report (SPAR), which summarized the works proposed, together with an assessment of costs and impact. The use of appropriate technology and the integration of water supply with sanitation were fundamental to the project concepts. In view of the complex nature of the Project, provision was made for a comprehensive review of the implementation arrangements and project start-up experience 1 year after loan effectiveness as recommended by the management review meeting. Assurances included an appropriate provision for a midterm review of all aspects of the Project by the Government and ADB in the third year of project implementation. The assurances did not, however, include the numbers of each type of community to be included in the Project, essential for the rural and poverty-oriented nature of the Project. This would later help explain the increased focus of the Project on IKKs.

20. The Board meeting took place on 2 February 1995. The directors generally appreciated the design of the Project, which had incorporated the lessons from several previous projects in Indonesia. The sector approach was supported, as Indonesia was thought to have built up sufficient experience with the implementation of WSS projects. Some Board members were concerned that the use of 44 person-months of international consulting services in the Project seemed low compared with the 1,884 person-months for local consultants while others argued that it was too high given the significant experience already available in similar projects in Indonesia. Other key concerns included the large number of agencies involved at various levels and, hence, the risk of coordination problems, the large number of rural communities, which would require 600 schemes to be implemented every year, and the lack of clear targets for the midterm review.

B. Achievement of Outputs

21. The sector approach of the Project implies that the actual design of the outputs is conducted after project approval. A total of 80 SPARs were prepared representing each of the districts included in the Project. Each SPAR outlined the works to be carried out in the selected IKKs, DPPs, and DTs. As a general rule, the SPARs did not seek to fully satisfy the water demand of the community but to develop available sources to the extent possible within the allocated budget. A module approach was adopted in which a certain type of facility would be chosen from a selection of predetermined designs. The first SPARs, one for each province,

were prepared in English for review by ADB and all subsequent SPARs were reviewed by the EA. From interviews carried out during the OEM, the conclusion of ADB's PCR is corroborated that there was little involvement of the communities in the preparation of the VAPs and subsequently the SPARs. In other cases, the OEM noted that the district teams had ignored the prepared VAPs and that designs had been imposed without proper consultation with the communities.⁹ Officials reported that in a number of cases, SPARs were not prepared until after construction had commenced and that standard designs developed under previous IKK projects had been adopted in lieu of bottom-up community-led schemes.

1. Part A—Water Supply Facilities

22. Appendix 4, Table A4.1 represents the OEM's best understanding of the approximate number of locations per province where water supply systems were reported to have been either constructed, rehabilitated or extended during the Project. The table shows that the number of IKKs served was reported as 264, DPPs 449, and DTs 3,692, bringing the total to 4,405 locations.

23. The EA's PCR stated that the Project's original plan was to construct schemes in 3,260 villages (not 3,000 as per the RRP): 150 IKKs, 360 DPPs, and 2,750 DTs. The reported figure of 4405 locations, accepted in the ADB PCR, therefore represents an overall increase of 35%. However, the increase in IKK systems (76%) included in the Project was greater than that of either the DPPs (25%) or the DTs (34%). Although the EA's PCR stated that 418 schemes were either rehabilitated or expanded, all of these were at locations where the Project had installed water supply schemes earlier. The EA's PCR indicated that of the total investment in new schemes, 61% was spent on IKKs, 6% on DPPs, and 33% on DTs. With regard to extended/rehabilitated schemes, the distribution of investment was 83% on IKKs, 4% on DPPs, and 13% on DTs. There was thus a clear orientation toward the IKK schemes.

24. Appendix 4, Table A4.2 provides a summary of OEM's understanding of the types of facilities reported as provided. It shows that 141 water treatment plants were reportedly built, as were 269 simple water treatment plants, almost 37,000 house connections, almost 10,000 public hydrants, 273 infiltration galleries, 40 deep wells with electric pumps, over 5,000 deep wells with hand pumps, over 30,000 shallow wells, 814 spring-based gravity distribution systems, and over 6,000 rainwater harvesting systems.

25. Of the 124 communities visited within the time frame of the OEM or the subsequent survey by domestic consultants, six cases¹⁰ were identified in which no works had been carried out at all and a further 13 cases where some works had been constructed but had either been abandoned before completion or had never been commissioned.¹¹ Although the sample is small

⁹ The EA acknowledged that the windfall due to the fall of the rupiah in 1997 led to problems: "The intention of maximizing the use of the loan money within the remaining loan period forced the implementing agencies to use a fast-track approach in most of the construction works and this unfortunately was not adequately supported by intensified preparation of the targeted communities. Community based development approaches tended to be put aside or even ignored and all the attention was merely given to the success of the physical work of the construction" (letter to OED dated 3 September 2004).

¹⁰ Simpangan in Jambi; Puang Aja, Rumah Sumbal, and Sibolangit in North Sumatra; and Pesaguan Kanan and Sungai Nanjung in West Kalimantan.

¹¹ In the case of Muara Bulian in Jambi, pipe materials were delivered to the site but were never installed and can still be found in the Perusahaan Daerah Air Minum (PDAM) yard today. In Tarutung, Pamusiran, and Teluk Nilau in Jambi and Pintu Air in North Sumatra, wells or boreholes were commenced but abandoned because no water was found. In the cases of Teluk Pandak and Lubuk Landai Pasar in Jambi and Mariah Banda in North Sumatra, treatment plants were built but never commissioned.

(under 3% of the project communities), in light of the evidence found, the OEM concurs with the findings of the ADB PCR that there was over reporting of the works constructed.¹²

2. Part B—Sanitation Facilities

26. Appendix 4, Table A4.3 represents the OEM's best understanding of the number of locations per province where the Project was reported to have either constructed or rehabilitated/extended sanitation systems.¹³ Roughly 200 IKKs reportedly received sanitation systems, 424 DPPs, and 3,512 DTs; and 114 systems in total were reportedly rehabilitated.

27. Compared with the Government's plans to construct schemes at 150 IKKs, 360 DPPs, and 2,750 DTs, the reported figures represent increases of 33%, 18%, and 28%, respectively. The total figure of 4,136 represents an overall increase of 27%. The EA's PCR reported that 114 schemes were rehabilitated or expanded during the Project although all of these were at locations where sanitation schemes had earlier been installed under the Project.

28. Appendix 4, Table A4.4 provides a summary of the base data of the EA's PCR (corrected for mathematical errors) regarding sanitation facilities provided. Over 69,000 family latrines were reported as constructed, 3,681 MCKs, and 1,641 school latrines. From these numbers it can be calculated that the module approach had not been followed to the letter and, especially, many fewer latrines had been delivered than originally intended (see para. 4). The figures reported by the EA were also reflected in the ADB PCR but it expressed doubts on their validity (para. 10).

29. Of the 124 communities visited for this PPAR, only two thirds had any form of sanitation facility constructed and only two of these (2.5%) were provided with complete modules. MCKs were built in half of the communities visited and school latrines in one sixth. Family latrines were constructed in only a quarter of the villages and even then the number of units was normally far less than the target of 30. Furthermore, the works were often limited to the supply of the pour-flush toilet pan and excluded latrine-building materials as originally intended. Extrapolating what was seen in the 124 communities visited, it can be estimated that a total of approximately 5,200 family latrines, 800 MCKs, and less than 200 school latrines were constructed in the three provinces. By comparing these estimates with the figures presented in Appendix 4, Table A4.4 (15,945 family latrines, 1,273 MCKs, and 446 school latrines), the reported figures do not appear to reflect reality. Hence, the OEM concurs with the contention of the ADB PCR that there was over reporting of the works constructed.¹⁴

3. Part C—Implementation Assistance and Institutional Strengthening

30. The EA PCR stated that \$2.4 million was spent on training, of which approximately \$1.4 million was devoted to the instruction of EA and DGRD staff in the administration of foreign aid projects and other related topics. Less than \$0.5 million was spent on the training of the communities in the preparation of VAPs and even then, much of this was carried out after

¹² In a reaction to a draft provided on 3 September 2004, the Directorate General Urban and Rural Development does not concur with this finding, and stands by its figures. There was no argument on OED's proposed rating, and the letter discusses "the unsuccessful story of the Project."

¹³ The original sanitation modules were (i) for each IKK: 70 family latrines, 2 units of school latrines, 1 unit of public toilets, and 1 unit of solid waste disposal and secondary drainage; (ii) for each DPP: 50 family latrines, 2 units of school latrines, and 1 unit of public toilets; (iii) for each DT: 30 family latrines and 1 unit of school latrines.

¹⁴ See footnote 12.

subprojects had been prepared. A further \$0.5 million was spent on the training of trainers at the district level but very little was spent on WSS institutional development programs within the project communities. The majority of this work was carried out in the last 2 years of the Project once many of the schemes had already been implemented.

31. The low level of training carried out was confirmed in the OEM interviews of government staff and the community members. Much of the training focused on ADB guidelines rather than on WSS systems and many communities did not receive any effective training. While some communities reported receiving some instruction on health education and hygiene issues, the input was limited. No training was carried out in water quality analysis and monitoring.

C. Cost and Scheduling

32. The actual project cost amounted to an equivalent of \$105 million, \$37 million less than the appraisal estimate. Of the total spent, \$41.6 million was foreign exchange cost and the local currency cost was equivalent to \$63.4 million. Of the loan amount of \$85 million, \$66.6 million was utilized and \$18.4 million was canceled. The Project was completed in September 2000, 6 months later than planned, and the loan closed in November 2002 rather than the scheduled September 2000.

33. The cost underrun can be primarily attributed to the Indonesian financial crisis in 1997–98 and the depreciation of the rupiah against the dollar, which decreased the dollar cost of the rupiah expenditures and some of the payments of interest during construction.¹⁵ In September 1998, a request to utilize a further \$25.3 million from the proceeds of the loan for the expansion of the Project to increase the original scope by an additional 746 communities was approved by ADB. However, ADB did not approve a later request for another scope change to utilize the remaining loan funds. On the basis of bid documentation received and checks on prices in the open market, ADB's Resident Mission suspected that funds were being mismanaged at the district level.

D. Procurement and Construction

34. At the start of the Project, the primary responsibility for the provision of WSS and health services lay, to varying degrees, with the provincial and district offices of MPW and other agencies. The provincial offices were responsible for general policy, procurement and contractual activities, work supervision, issuing of payment certificates, and progress reporting to the central Government, while the district governments were responsible for land acquisition and project progress monitoring. Although they had been delegated these responsibilities, both the provincial and district governments continued to look to central government agencies for support and technical advice. Following the enactment of the wider decentralization measures in 1998, the district governments were given full responsibility for project implementation including procurement, issuing of payment certificates, and progress reporting.

35. Procurement of goods and services was to be generally carried out in accordance with ADB's *Guidelines on the Use of Consultants* and *Guidelines for Procurement*. But the transition of procurement responsibility from the provincial to district level was problematic as ADB procedures were not well understood, or appreciated, by the district-level project managers. The latter stages of the Project saw an increase in the number of payment requests that were

¹⁵ In 1996, the average rupiah exchange rate to the US dollar was 2,383; 4,650 in 1997; 8,025 in 1998; and 9,595 in 2000.

rejected by ADB. Typical errors included incorrect timing of advertisements, inappropriate bid evaluations, and award of contracts without even bidding. In many instances the district offices broke down procurement packages to smaller monetary amounts in order to ensure that an ADB no-objection letter would not be required.

36. Insufficient use was made of the communities during the construction process and this led to a lack of local ownership. Many of the communities were either farmers or fisherfolk and did not possess the skills required to carry out construction work. While the Project had made allowance for training, the budget was too small to cope with the large number of project communities that were added to the project scope after completion of the PPTA. As a result, insufficient people received instruction in time. The short construction program dictated that contractors would import the required skills rather than attempt to train and utilize local labor.

E. Organization and Management

37. Organization and management were generally consistent with the agreed arrangements at appraisal but the levels of responsibility changed when full decentralization was implemented in 1998. The project organization structure established by MPW reflected the implementation arrangements at the central, provincial, and district levels and is summarized in Appendix 5. At the central level, CPAO coordinated and monitored all aspects of the Project, provided technical guidance, and trained central, provincial, and district government officials in foreign aid project administration. At that time, technical guidance by central authorities involved the review and approval of designs prepared at all levels of government. CPAO was also responsible for the preparation of audited reports on project expenditure, the procurement of consultants, project evaluation, and liaison with ADB. CPAO operated under the guidance of a steering committee formed by MPW, MOH, MOHA, Ministry of Finance, and chaired by BAPPENAS.

38. At the provincial level, project implementation was the responsibility of a team answerable to the governor comprising the provincial offices of MPW, DGHS, MOH, and MOHA together with the Agency for Regional Planning and Development (BAPPEDA). Project implementation units were not established at this level and staff working on the Project remained in their respective organizations' offices. Consultants were retained to assist in administration duties and were based in BAPPEDA. A similar concept was adopted at the district level although in this case a small project office was established within BAPPEDA district, which coordinated the work of the district offices of MPW, MOH, and MOHA on behalf of the district governor. Consultants were retained to assist with detailed design and project administration duties and again were based in BAPPEDA.

39. CPAO was restricted in its influence due to the devolved nature of project responsibilities. A frustration for CPAO staff was their role in the procurement process, which was limited to overseeing the forwarding of no-objection letter requests to ADB. Interagency cooperation was deficient and the poor communication with MOHA led to difficulties in implementing part C of the Project. Complete financial reports were never submitted but this was primarily due to the failure of MOHA to provide the base data. DGCDCEH, DGRCD, and DGRD-MOHA did not provide progress reports on the health education and community programs.

40. The performance of project staff at the provincial level, but more particularly at the district level, was generally poor. Contrary to the assessment during project appraisal, the districts did not have sufficient management capacity. Former CPAO staff reported that in spite of the focus of the Project on staff training rather than community training programs, staff

training was insufficient. At that time, it was common practice for the district project managers to be replaced after only a year in order to give project opportunities to a larger number of staff. The short tenure of position resulted in a rush to push through supply and construction contracts. This happened at the expense of the required consultation and design procedures and often led to the imposition of standard designs and the prefabrication of facilities. There were numerous cases in which construction work commenced even before designs had been prepared and approved. Training programs for villagers often took place too late, both in VAPs and works. In many cases, the Project's joint operation system, using nonskilled village labor, reduced the quality of constructed works. Villagers trained were often unwilling to work under the Project because of the low pay offered under this system. In the cases where cost estimates were inadequate, contractors built only as many facilities as funds allowed, especially after 1998 when there was a scope addition and the supervision of works by district staff and consultants was lacking.

41. At project preparation, it was envisaged that the requirement for implementation assistance consultants would be equivalent to 1,840 person-months: 390 for implementation advisors at the center, 552 for the provinces, and 898 for the districts. ADB's PCR reported that the actual consultant time was equivalent to 7,383 person-months: 377 in Jakarta, 3,291 in the provinces, and 3,715 in the districts. Some 3,022 person-months were used for designs and for construction monitoring, and 2,577 for technical and monitoring assistance to the districts.

42. The fourfold increase in the number of consultant person-months, both in technical fields and project management, may be partly attributed to the underestimation of the level of assistance required to implement a project of this size and geographic distribution. It was, however, most probably also related to an overestimation of the capabilities of government staff at the provincial and district levels. The latter problem became more significant following the wider decentralization measures of 1998 as district staff were generally less well qualified to perform project implementation tasks. On the other hand, it is likely that consultants were hired who were less qualified than planned for by the RRP, but in greater numbers, to cope with the work. Due to the depreciation of the rupiah in 1997 and 1998, domestic consultants became much cheaper in dollar terms and this ensured that expenditure remained within budget despite the increase in person-months.

43. Interviews with former CPAO staff indicated a general dissatisfaction with the performance of the CPAO consultants, both domestic and international. While the consultants did not fail in any particular task, neither did they excel or make a significant contribution that either markedly changed the outcome of the Project or promoted capacity building within the EA. At the provincial and district levels, the contribution of the consultants was limited and there was a strong feeling of dissatisfaction among DGHS staff with their performance. The most common complaint was that domestic consultants assigned were too young, underqualified, and inexperienced. It is evident that such consultants contributed little to capacity building, as they were not skilled themselves.

44. ADB's administration of the Project did not help. The first inception mission, carried out in December 1995, also covered another project. A second project-specific inception mission was also shared, and was not carried out until 1 year after loan effectiveness. The aide-mémoire for this mission stated that the required comprehensive review to be carried out at the end of the first year of implementation (due in April 1996) would now take place at a mutually convenient time later in the year. In reality the review, a key recommendation of the management review meeting, did not take place until February 1997, almost 22 months after loan effectiveness. The aide-mémoire stated that the Project was being implemented generally

satisfactorily, although some improvement could be made in the design and construction of some structures. The required comprehensive midterm review should have been held in the third year but did not actually take place until October 1998, 41 months after loan effectiveness and at a time when physical progress of the original scope of work was reported at 90%. Despite raising issues concerning the standard of construction, treatment plant design and operation, underutilization of public hydrants, poor locations of MCKs, poor locations of shallow wells, and poor reporting on the institutional development programs, the aide-mémoire concluded that the progress of the Project appeared encouraging. It further stated that the level of community participation was also encouraging. Overall, the review missions appear to have visited only few rural communities over the years.

III. ACHIEVEMENT OF PROJECT PURPOSE

A. Operational Performance

1. Part A—Water Supply Facilities

45. From observations made in 124 communities in three provinces, the OEM found that most of the water supply facilities constructed by the Project are no longer functioning as intended. Less than 4 years after project completion, the average use of the facilities relying on spring, river, lake, or groundwater sources is estimated at only 30-40%.¹⁶ Many facilities now lie abandoned throughout Sumatra and Kalimantan. Where rainwater harvesting was the source of water, the situation was rather better as it is likely that around 70% of the facilities provided are still working. Further observations regarding operational performance of water supply facilities are in Appendix 6, part A.

2. Part B—Sanitation Facilities

46. Observations by the OEM together with those of the follow-up survey team lead to the conclusion that few of the facilities installed are still in operation. In the 80 communities where some form of sanitation facility was constructed, only an estimated 30% are still being used. Further observations regarding operational performance of sanitation facilities are in Appendix 6, part B.

3. Part C—Implementation Assistance and Institutional Strengthening

47. There was a general consensus among former CPAO staff that the Project had provided good experience, which was beneficial to both themselves and the EA as a whole (Appendix 7). All of the CPAO staff remained with the EA, although three of the eight had been transferred to other directorates general and were no longer working in the water and sanitation sector. Only one member of the CPAO team was working on a project. However, despite these changes the experience gained during the Project has been retained.

48. At the provincial and district levels, the institutional memory of the Project was poor. Many staff had moved on to other positions or perhaps careers. In many cases, the current staff had no information as to who had actually worked on the Project. While staff would have developed some skills through working on the Project, the improvements achieved at the

¹⁶ The 124 communities visited amounted to 2.8% of the total number of IKKs, DPPs, and DTs included in the Project, and 9.2% of the number in the three provinces visited. See the tables in Appendixes 2 and 3 for details on utilization.

provincial and district levels were quite limited. Of the provincial staff of MPW or BAPPEDA, only few had received any training during the Project. The majority of skills development came from on-the-job experience. Due to their short rotations in the Project, many staff could not see through a subproject in its entirety. On top of this, the Project's innovative approach was not followed through in spirit, and this also limited the learning experience.

B. Performance of the Operating Entity

49. The intention of the Project that the communities would be involved in all aspects of the Project and would be trained did not happen in practice. Instead many of the schemes, particularly the IKKs, were handed over to the regional water utilities (called PDAMs) to run. The OEM found only a few cases in which the community had a significant input to the system management. Villages were often not prepared to maintain or repair the water supply facilities, in spite of the fact that these had been handed over to them at no cost, as the schemes were not what they wanted, and their operation was viewed as being too complicated. Operation and maintenance (O&M) costs were also sometimes regarded as too high given the small quantity and poor quality of water supplied. As a result, there was a preference among villagers to either look after their own interests via private wells and rainwater collection systems or to pay for a connection to a PDAM-run scheme.

50. DGHS reported that most of the PDAMs in Indonesia run at a loss. With the current low water tariff structures in place and high operating costs, government assistance is required if they are to remain in business. Virtually all PDAM systems that the OEM observed required pumping or treatment work and were running for only 4–12 hours per day to limit expenditure. Expenditure on chemicals was virtually nonexistent and hence disinfection was rarely practiced. Staff were poorly trained and generally had little knowledge of the supply systems under their control.

C. Financial and Economic Reevaluation

51. The RRP did not calculate the Project's EIRR or FIRR, but the PPTA study had assumed an overall EIRR of between 11% and 14%, while taking into account significant economic and environmental benefits from dispensing with the need to boil drinking water available through house connections. Given the frequent lack of chlorination practiced, these benefits were generally not realized. ADB's PCR calculated FIRRs for a sample of IKK piped water supply systems. It indicated a range of FIRR from –43% to 18%, with only one exceeding the weighted average cost of capital. As most of the IKK schemes had been handed to PDAMs, the ADB PCR assessed their net impact on the viability of PDAMs as negative and exacerbating the difficulties experienced by PDAMs after the financial crisis and devaluation of the rupiah. Similarly, the ADB PCR assessed that the EIRR for the Project was less than 5%, given the reduced outcomes observed. This PPAR does not recalculate the Project's FIRR and EIRR. It is assumed that the low outcomes of the Project leave the rates far below their threshold values.

D. Sustainability

52. The low percentage of the constructed works that were still in effective use at the time of the OEM illustrates the poor sustainability of the Project. The failure of the WSS schemes can be attributed to a number of factors including poor water resources engineering, poor design, lack of community involvement and absence of bottom-up planning, poor construction, and lack of provision for system management and O&M. Having made the decision to pass much of the operational responsibility to the PDAMs, the Project should have made sure that they did in fact

have the capacity to run the schemes well. However, no institutional capacity building or staff training was given to any of the PDAMs. While some of the PDAMs were competent, particularly in the Kerinci and Sambas districts, most others were less capable and often only fulfill a water charge collection function and offer poor service to customers. In line with ADB's PCR, this PPAR concludes that nearly all piped water supply systems constructed by the Project will require external assistance to remain viable.

53. From the engineering point of view, one factor of importance to the sustainability of the water supply systems constructed was land topography. Where mountain springs or streams had been utilized and where water could be distributed under gravity conditions, the basic elements of the systems were, more often than not, still in operation. However, where the source was a lowland river with heavy silt and pollution loads and where water was pumped to distribution, the works were frequently abandoned as a result of poor design, failure of the mechanical equipment, or the high cost of chemicals and electricity. The OEM estimates that around one fourth of the systems were constructed in hilly and mountainous areas.

54. The sustainability of the schemes that were still in operation remained highly dependent on the ability of the communities or the operating PDAMs to implement appropriate O&M programs. As time progresses, more and more schemes may fall into a state of disrepair as pumps, generators, and other equipment break down and are not repaired or replaced. The level of unaccounted-for water was on the rise as more pipes broke and illegal connections were made to the water transmission and distribution mains.

IV. ACHIEVEMENT OF OTHER DEVELOPMENT IMPACTS

A. Socioeconomic and Sociocultural Impacts

55. Statements by representatives of four provinces not visited, made at the workshop held at the end of the OEM, confirmed that project outcomes had been less than successful. In their view, only an estimated 40–60% of water supply facilities were still in use. Taking into account the over reporting of facilities constructed, and the percentage of the works that are still operational, the PPAR estimates that less than 1 million people within the 4,405 communities may have received a direct benefit from the Project, or 22% of the population, instead of the intended 80%. The National Socioeconomic Survey does not confirm the significant improvement in water supply on the two islands over the period 1995–2002 (Appendix 8, Tables A8.1–A8.4) that would have been expected if the Project had been successful. The percentage of rural households with own drinking water facilities went down from 43.9 to 39.3.¹⁷ The percentage with pipe or pump source of drinking water remained stagnant at 9.1 in 1995 and 9.3 in 2002 (this would be in line with the unsatisfactory findings described earlier). All sources combined (piped, pumped, or protected well or spring source), the rural percentage went up from 30.7 to 36.2. The urban percentage went up marginally from 74.0 to 76.6 over the same period. For the whole of Indonesia, the figures were more positive over the period;¹⁸ Kalimantan and Sumatra are clearly lagging behind. The percentage of rural households buying bottled

¹⁷ There was evidence of increased use of cheaply available pumps and filters that were used in conjunction with privately dug shallow wells on compounds.

¹⁸ The percentage of rural households in Indonesia with access to sources of drinking water (pipe, pumped, or protected well, or spring source of water) went up from 54.1 to 64.3. The urban percentages rose from 85.9 to 87.2 (Appendix 8).

water went up from 6.1 to 8.9; judging by its high cost (\$0.20–0.40/liter) and developments in surrounding countries, there may be scope for price reductions and expansion of use.

56. Due to the lack of attention to community mobilization, participation in construction, and O&M, there has been little effect on communities' capacity to organize their own water supply services. Due to the small coverage of the still operational services, the impact of the Project on rural livelihoods has been small as well. As mentioned by the project BME report, the impact of water supply systems may have been largest in the hilly areas, where water supply systems were based on springs and gravity flow distribution systems. On the other hand, some systems are maintained satisfactorily by (subsidized) PDAMs in IKKs.

57. A key objective of building the family latrines under the Project was to catalyze further activity by the community. Eight instances could be found where the desired result was achieved. These included mostly places in West Kalimantan where the current number of family latrines exceeded that constructed under the Project as a result of the community seeing the positive effect of good sanitation practices. The overall statistics for rural Kalimantan and Sumatra were around 43.8% of households having access to own sanitation facilities in 1995, and 49.9% in 2002 (Appendix 8, Tables A8.5–A8.7). For households with toilet facilities, the respective figures were 13.0% and 22.1%, and for households with sewerage and septic tanks 9.7% and 13.9%. However, these increases were smaller than the trend for Indonesia as a whole, so the catalytic effect of the Project should not be exaggerated.

B. Environmental Impacts

58. Due to the poor outcome of the sanitation component, the positive environmental impacts of the Project were limited. There were, however, some distinctly negative impacts. Many public hydrants and other facilities were defective or abandoned, littering the landscape. Of particular concern was the deplorable condition that existed at some of the working public hydrants, taps, and washing/toilet facilities resulting from the poor design and construction of the associated drainage facilities. The OEM observed several situations representing a significant threat to public health through a potential increase in the incidence of malaria, dengue, and hookworm in particular.

59. Other negative impacts of the water supply systems related to the diversion of natural water courses to piped systems without adequate consideration of downstream requirements and the inappropriate disposal of treatment sludge, as was the case at Kota Petai in Kerinci. Positive environmental impacts due to a reduced need for fuel to boil water did not materialize. Where sanitation had been successfully implemented, and indeed developed further by the communities, there was a positive impact resulting from the proper disposal of human waste. Such communities reported a reduction in the incidence of waterborne diseases, although such communities were rare considering the Project's scale.

C. Impact on Institutions and Policy

60. Institutional capacity building was to be a key component of the Project. This impact has been discussed in Section III.A above. DGHS has not managed many other externally funded projects since the completion of the Project. MOHA was insufficiently funded and involved to benefit from the intended experience with community mobilization. The Project did not lead to official policy changes in WSS. However, throughout the OEM, and in particular at the workshop in Jakarta, parties to the Project showed a better understanding of the need for appropriate community involvement in rural WSS projects. The failures of the Project were well known to

many working in the sector and contributed to the refinement of sector project implementation techniques and practices. The lessons have been applied in World Bank¹⁹ projects and have also formed the basis for the preparation of new ADB projects in the sector.²⁰

V. OVERALL ASSESSMENT

61. **Relevance.** The Project's purpose was in line with ADB's country policy and the Government's Sixth Five-Year Development Plan. The Project, however, did not pay sufficient attention to implementation modalities given its large scale. The Project was supposed to be rurally oriented, a term which was not adequately defined in the project documents. The Loan Agreement left too much room for the Project to be implemented mainly in the subdistrict capitals at the expense of the smaller village communities. Given the actual focus on subdistrict capitals during implementation, much of the impact on the poorer rural areas was lost. For this reason, the Project is assessed as less relevant.

62. **Efficacy.** In spite of the Government's claim that the Project served more communities than foreseen at appraisal against a lower cost in dollar terms, this PPAR agrees with ADB's PCR that the effective output was around 30–40% for water supply, and around 20% for sanitation. The module approach was not adhered to: communities were seldom given the choice of a full range of facilities, and usually received only a part of the supposedly integrated set of WSS facilities. The appropriateness and quality of the facilities left much to be desired and training was insufficient. The National Economic Survey does not indicate any significant improvement in WSS services although the survey by domestic consultants did indicate a general belief that the incidence of disease has fallen. For these reasons, the Project is assessed as less efficacious.

63. **Efficiency.** The failure of the Project to involve the community and to successfully complete the institutional capacity-building component had a key impact on the success of the Project. MOHA was responsible for community mobilization but was insufficiently involved, and had insufficient funds for meaningful interventions. VAPs and SPARs were often prepared after provision of the facilities. While CPAO performed to an acceptable level, there was poor coordination between the EA and MOHA, the IA for the community management and WSS institutional development programs. Coordination at the provincial level was adequate but poor at the district level. With the exception of the last year of implementation, ADB failed to monitor and properly direct the Project. The efficiency of investment was low (para. 51). The PPAR also assumes the FIRR to be below the weighted average cost of capital of 3%. In spite of cost savings and completion without delay, the outcomes were too small to allow an overall positive economic and financial rate of return. Overall, the Project is assessed as inefficient.

64. **Sustainability.** As most communities have not been organized or trained and most PDAMs across Indonesia are in a precarious financial situation, the expected level of sustainability for the majority of systems still in operation is low. PDAMs are often covering O&M costs through subsidies. However, some degree of sustainability is expected for those communities in the mountain areas where reliance has been placed on spring and gravity flow

¹⁹ Second Water and Sanitation for Low Income Communities Project (WSLIC-2).

²⁰ TA 4063-INO: *Community Water Services and Health*, for \$1 million, approved on 19 December 2002. This focuses on poor communities and excludes PDAMs. The ensuing project is planned to be with the Ministry of Health. ADB recently started a feasibility study for a project in MSRI focusing on a limited number of PDAMs: TA 4411-INO: *Preparing the Water Supply and Sanitation Project*, for \$900,000, approved on 12 October 2004.

systems and where the degree of system mechanization has been minimized. Overall, the project outcomes are less likely to be sustainable.

65. **Institutional Development and Other Impacts.** The institutional impact of the Project was limited particularly at the provincial and district levels where many staff only worked on the Project for a short time. Due to the excessive reliance on consultants to assist in operational and administrative tasks, there was little organizational capacity development. The Project had very little effect on the capacity of the communities to manage and operate WSS systems. The environmental impact was more often negative than positive. There was no discernible impact of the Project on the level of poverty. Other than providing general lessons, there were no secondary benefits. The impact of the Project is, therefore, assessed as negligible.

66. **Overall Project Rating.** When rated in accordance with OED's standard weighting system,²¹ the Project is partly successful, bordering on unsuccessful.²²

67. **Assessment of ADB and Borrower Performance.** ADB's performance was less satisfactory. The question of project scale was not properly addressed during appraisal and the expansion from an initial 250 communities at PPTA stage to 3,260 communities by loan effectiveness was not properly thought through. ADB only conducted seven missions during the course of project implementation totaling 102 person-days. This was insufficient considering the size and geographic scope of the Project. The requirements to conduct a comprehensive review at the end of the first year of implementation together with a comprehensive midterm review were not met and for this reason, opportunities for changing the course of implementation were missed. Very few sites were inspected over the years. In 2000, when there was evidence that the district governments did not handle their new procurement responsibilities well, ADB started disallowing reimbursement of contracts on the grounds of procedural irregularities. This was appropriate, although it came at a late stage of the Project. A requested scope change from the side of the Government to spend project funds on additional communities was not entertained.

68. The PCR's recommendation to conduct a full technical and financial audit of the Project was only partially followed up.²³ A new Minister for Settlements and Regional Infrastructure requested the Indonesia Resident Mission (IRM) to involve the Ministry's Inspectorate General. All IRM's cases regarding Loan 1352-INO were subsequently submitted to it for further investigation. After some considerable time lapse, this office responded that the cases were not valid. Given lack of human resources and budget at the time, ADB's Office of the Auditor General requested IRM to organize a project audit. For a number of reasons, IRM decided not to do this: (i) IRM had gathered evidence on irregularities from other projects as well, and full audits for all of these projects would have been costly, (ii) many of the files for the Project at the EA had been lost, (iii) a check on the over statement of the facilities created in over 4,000 locations would also have been costly, and (iv) IRM did not feel sufficiently experienced and

²¹ ADB. 2000. *Guidelines for the Preparation of Project Performance Audit Reports*. Manila (Table 1). Available: <http://www.adb.org/Documents/Guidelines/PPAR/default.asp?p=evaltool>

²² On a scale of four categories: highly successful, successful, partly successful, and unsuccessful. In its reaction to a draft of the PPAR, the EA did not dispute the rating.

²³ The PCR (footnote 5) stated in para. 64: "Project Audit. The PCR's field observations showed that constructed facilities were overstated in the Government's PCR. ADB received allegations about malpractices. In some instances, fraudulent procurement processes were identified. Because the overstatement and allegations may involve potential misuse of funds, the PCR recommends that a full technical and financial audit of the Project be carried out."

equipped to lead an audit of such nature.²⁴ ADB suspended the disbursement for another of its loans from June 2002 until November 2002.²⁵ The suspension was lifted after a Memorandum of Understanding was signed, covering the use of Project Management Consultants. Until the time of this PPAR, no other ADB loan has been processed for MSRI, although a feasibility study for a new one was approved in October 2004 (footnote 20).

69. The performance of the EA and IAs were, as a whole, less than satisfactory, particularly after decentralization in 1998. The key problems were related to overall project coordination between DGHS and MOHA and the delegation of responsibilities to provincial and district staff not capable of performing the tasks required. DGHS's submission of a PCR that was at variance with its project BME evaluation report was lamentable. A far too positive account was given of the number and status of the facilities provided. It was also disappointing that the Ministry's Inspectorate General decided not to investigate the indications of irregularities and over statement of facilities, reported to it by IRM.

VI. ISSUES, LESSONS, AND FOLLOW-UP ACTIONS

A. Key Issues for the Future

70. The Project was one of the first of its kind to be carried out in Indonesia and, through its failures, proved to be a learning experience for all concerned. Throughout the OEM, in particular at the workshop held in Jakarta, it was apparent that parties to the Project now have a better understanding of the need for the involvement of the community in rural WSS projects.

71. A significant part of the project effort has gone to waste. Many of the currently operational facilities are in danger of falling into disrepair, even those managed by PDAMs. District plans to correct defective work and to introduce sustainable system management are urgently required, especially for nonoperational and low-operational water supply facilities.

72. There was no clear approach for communities where the water supply systems were run by PDAMs. PDAMs were often forced to take over poor systems that they had not helped plan, design, and implement. PDAMs know the demands of their consumers better than more distant government agencies, and should be involved from the start. For communities not covered by PDAMs, schemes should be simple and be preceded by proper demand analysis and training.

73. The experiences with the Project demonstrate how even thousands of person-months of consulting services may not solve the problem with monitoring of implementation, especially if they are managed by the EA and if no budgets are made available for field visits. Checks on project progress in the field may be better served through limited annual missions by senior consultants contracted possibly directly with ADB or with an organization like BAPPENAS. ADB should play a larger role in developing monitoring systems for the various EAs and IAs, and ensuring the funds allocated are spent on field visits. ADB staff should visit more project sites during field missions. In a country like Indonesia, regular in-depth financial audits may also need to be built into the project management procedures.

²⁴ IRM and DGURD (formerly DGHS) agreed in July 2001 on TA to strengthen the capacity of the Inspectorate General to combat fraud and corruption in the operations of MSRI. The TA was approved 12 March 2002. It produced a review, provided training, and led to a signing of a Memorandum of Understanding between DGURD and ADB on 11 June 2004, supporting improved implementation and an action plan to mitigate the risk of fraud and corruption.

²⁵ Loan1383-INO: Sumatra Urban Development Sector Project, for \$130 million, approved 26 September 1995.

74. ADB has had only a mixed success so far in supporting rural water supply and sanitation across Asia. Alternative delivery modes need to be explored. An OED Impact Evaluation Study in 2002 recommended that potable water from water treatment plants may be delivered more effectively to rural areas when it is distributed in bottles, either by the water supply company or through schemes involving both public and private sectors.²⁶ Consumption of bottled water for lifeline purposes is on the rise in Indonesia, but is much more expensive than in some other countries in the region. The Government should investigate the feasibility of facilitating bottled water production, distribution, and sale by the private sector or PDAMs, to remote populations. When this is kept cheap through ensuring a competitive but regulated and relatively untaxed market, it could be one way of contributing to the achievement of "water for all."

B. Lessons Identified

75. The supply of water and sanitation facilities to scattered populations in poor rural areas often presents difficult technical and organizational issues. This applies to both project implementation and operation of facilities. When rural communities do not express a clear demand for such services, are not part of the design and implementation process, are not trained, and are not willing to pay for a major part of the investment and recurrent operational costs, then efforts are likely to fail. Appropriate organizations need to be built up and strengthened before, or alongside, project implementation.

76. A sector modality should be avoided or the sector project should be kept small in cases where a new approach to project implementation is being adopted, as EA and IA competence is unlikely to be at the required level. An assessment of implementation capacity should be carried out as an integral component of the PPTA and not during project appraisal.

77. Where water supply systems rely on pumping, complex treatment, and household connections, the primary stakeholder should be the PDAM, the regional water enterprise. However, the PDAM needs to be fully involved in design and implementation, and fully responsible for O&M. Community-managed schemes should be limited to the more simplified technologies that preferably depend on high-quality reliable sources and gravity distribution.

78. Future ADB projects in the sector should not combine target groups that require different operational modalities. Projects should either be PDAM focused or community focused, but not both.²⁷ This will avoid the tendency to concentrate on the more densely populated, or more urban, areas where larger construction contracts are required and operational success is easier to achieve, at the expense of the more dispersed rural communities. Linked to this is the lesson that for projects with a clear intention to address poverty in rural areas, use of funds for WSS facilities should follow covenanted thresholds for different sizes of communities.

79. Care should be taken in the adoption of standard designs as the circumstances at each community are unique. While it is reasonable to adopt standard sizes for e.g., public hydrants and water treatment plants to save on design and construction costs, it is not appropriate to adopt a standard depth for either shallow or deep wells as these take no account of the actual hydrogeological conditions that exist. Sanitation modules should not be employed unless based on village surveys that carefully record actual needs or preferences.

²⁶ ADB. 2002. *Impact Evaluation Study on Water Supply and Sanitation Project in Selected Developing Member Countries*. Manila.

²⁷ The design of ADB's proposed projects in the sector is consistent with this recommendation (footnote 20).

80. Proper assessment of the implementation capacity of the Government at all its levels—national, provincial, and district—is required before embarking on projects. Major changes in the project context (such as those stemming from decentralization) need to lead to adjustments in implementation arrangements.

81. For projects requiring inputs from different agencies in a well-defined sequence, critical path analysis is required, and fund allocation should be made to follow the critical path. Project authorities should work on the basis of annually approved district plans. It should not be possible that expenditures are incurred on construction before they are incurred on detailed design and mobilization of the community.

82. A single agency project management unit is limited in its authority over other agencies. Separate project management units in each EA and IA pose coordination challenges. In projects requiring coordination from many different government departments, the central project management unit should preferably include seconded staff from all departments involved.

83. Some technical lessons for WSS projects that need to be taken into account when designing similar projects in the future are (i) lowland villages need a different approach from highland villages both in technical and social mobilization terms; (ii) PDAM schemes need a different approach from community-managed schemes; (iii) systems based on pumps/treatment plants need to be avoided in small communities and, if unavoidable, need extra attention; (iv) special attention needs to be given to ethnic and cultural differences between areas in the approach, as some communities need more focus in terms of health and hygiene education, and mobilization; (v) willingness of the community to utilize public hydrants should be fully researched; (vi) house connection-based systems need to be offered, based on the principle of recovery of investment and operational costs by the beneficiaries; (vii) pour-flush sanitation systems should not be provided without a suitable water supply; and (viii) school toilets with a connecting water supply have a higher chance of success than public toilets/wash areas.

C. Follow-Up Actions

84. Since many records could no longer be located, it is probably no longer possible to conduct a full audit of the Project. It is absolutely imperative that ADB in future makes sufficient staff and funds available to immediately follow up on requests by project staff for project audits.

85. The action plan agreed by the Government and ADB in June 2004 to mitigate the risk of fraud and corruption (footnote 24) should be implemented in letter and spirit by early 2005.

86. ADB should only prepare a new project with the EA when evidence can be presented at an early stage ('fact-finding') that the action plan has been completed successfully and implementation arrangements can be worked out that prevent the recurrence of the practices found under Loan 1351-INO. ADB needs to organize a full review of such evidence.

87. A new ADB-supported project, the Community Water Supply and Health Project, is under preparation (footnote 20). This will most likely include a budget for rehabilitation of systems in four provinces, two in Sumatra, and two in Kalimantan. ADB's Social Sectors Division and IRM should initiate a discussion with the Government in 2005 as to how facilities created by the Project can be completed or rehabilitated in other provinces.

PROJECT COSTS AS APPRAISED AND ACTUAL
(\$'000)

Item	Budget At Appraisal			Actual Cost		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
A. Water Supply						
1. Land	0.0	4.8	4.8	0.0	0.0	0.0
2. Civil Works	7.1	47.3	54.4	9.5	29.7	39.2
3. Equipment and Materials	20.2	14.0	34.2	19.8	5.2	25.0
4. Feasibility Studies and Design	0.0	2.9	2.9	0.8	1.0	1.8
5. Work Supervision	0.0	1.4	1.4	0.0	0.9	0.9
6. Incremental Cost	0.0	6.9	6.9	0.0	0.8	0.6
Subtotal (A)	27.3	77.3	104.6	30.1	37.6	67.5
B. Sanitation						
1. Civil Works	0.0	7.9	7.9	0.0	11.6	11.6
2. Equipment and Materials	0.0	3.4	3.4	0.0	0.8	0.8
3. Incremental Cost	0.0	0.7	0.7	0.0	0.7	0.7
Subtotal (B)	0.0	12.0	12.0	0.0	13.1	13.1
C. Institutional Support						
1. Implementation Assistance	0.9	3.1	4.0	0.4	3.0	3.2
2. Hygiene, Sanitation, Water Quality	0.0	0.1	0.1	0.0	0.2	0.2
3. Community Management Program	0.0	4.1	4.1	1.3	1.4	2.9
4. Institutional Strengthening Program	0.0	0.3	0.3	0.0	0.4	0.6
5. Project Administration	0.0	7.1	7.1	0.0	7.7	7.7
Subtotal (C)	0.9	14.7	15.6	1.7	12.7	14.6
D. Interest During Construction	9.8	0.0	9.8	9.8	0.0	9.8
Total	38.0	104.0	142.0	41.6	63.4	105.0

Source: Asian Development Bank. 2002. *Project Completion Report on the Rural Water Supply and Sanitation Sector Project in Indonesia*, Appendix 3. Manila.

OPERATIONS EVALUATION MISSION FIELD NOTES

A. General

1. The Operations Evaluation Mission (OEM) made visits to 24 project communities (8 *ibu kota kecamatan* [IKK] or district administrative centers, 5 *desa pusat pertumbuhan* [DPP] or growth center villages, and 11 *desa tertinggal* [DT] or lesser developed villages) spread across 3 of the 12 project provinces in Sumatra and Kalimantan. During the site visits, the OEM was accompanied by officers of national and provincial offices of the National Development Planning Agency, Directorate General of Urban and Rural Development (DGURD), Ministry of Health, and Ministry of Home Affairs. In Jambi, locations were visited in the districts of Kerinci in the mountains, Sarolangun in the foothills, and Tanjung Jabung in the coastal areas. In North Sumatra, sites were visited in the districts of Langkat, Deli Serdang, Simalungun, and Karo between Medan and Toba Lake. In West Kalimantan, the sites visited were in Kabupaten Sambas located to the north of Pontianak. Most sites were visited on the recommendation of DGURD. The locations of the communities are presented on the three maps on the following pages,¹ indicated with a red dot and a reference number. The findings of the OEM are summarized in the following table:

Table A2.1: Summary Results of Field Survey

Ref.	Province	Kabupaten	Community	Type	Utilization (%)	
					Water	Sanitation
1.	Jambi	Sarolangun	Bangko	IKK	50	—
2.		Kerinci	Siulak Deras	IKK	90	—
3.		Kerinci	Kota Petai	IKK	60	—
4.		Kerinci	Lubuk Paku	DPP	90	—
5.		Kerinci	Pengasi	DT	10	50
6.		Tanjung Jabung	Pematanglumut	DPP	10	10
7.		Tanjung Jabung	Simpangtuan	DPP	—	50
8.	North Sumatra	Langkat	Kwala Begumit	IKK	0	0
9.		Langkat	Rumah Galuh	DPP	50	50
10.		Langkat	Pantai Geni	DT	10	0
11.		Deli Serdang	Batang Kuis	IKK	50	—
12.		Deli Serdang	Pertambukan	IKK	40	—
13.		Deli Serdang	Serdang	DT	90	0
14.		Deli Serdang	Sibolangit	DT	—	—
15.		Deli Serdang	Puang Aja	DT	—	0
16.		Deli Serdang	Rumah Sumbul	DT	—	—
17.		Simalungun	Tiga Dolok	IKK	80	—
18.	Karo	Tiga Binanga	IKK	50	50	
19.	West Kalimantan	Sambas	Bentunai Kuala	DPP	70	100
20.		Sambas	Sebawi	DT	0	—
21.		Sambas	Sakong and Sagatani	DTs	50	—
22.		Sambas	Pagmilang	DT	50	100
23.		Sambas	Sanggau Kulor	DT	40	60
24.		Sambas	Sei Bulan	DT	100	30

— = no facility found, DPP = *desa pusat pertumbuhan* (growth center village), DT = *desa tertinggal* (lesser developed village), and IKK = *ibu kota kecamatan* (district administrative center).

Source: OEM field visits.

¹ Locations of communities visited during the subsequent field survey are indicated with a blue dot and a reference number; the summary findings are in Appendix 3.

2. The utilization column in the above table indicates the approximate percentage of the installed works that are effectively used. The figures presented take into account, not only whether the facilities are actually working, but also the number of hours that they are in operation per day. For example, a treatment plant which is fully functional, but that only operates for 4 hours per day due to the high operation cost, cannot be considered as being effectively used. The percentages only apply to the works that were known to have been installed and do not reflect on the works which were intended to be constructed.

B. Jambi Province

Ref. 1. Bangko (IKK), Kabupaten Sarolangun

3. Provincial government staff advised the OEM that Bangko had been included in the Project and, hence, a brief visit was made to the treatment plant site en route to other project locations. Water from the local river is pumped to the treatment plant, which comprises flocculation, upward-flow clarification, slow sand filtration, and disinfection. The plant is generally in a poor condition and only one of the two clarifiers is currently in operation. Chemical dosing facilities (aluminum sulfate and hypochlorite) are nonoperational. Water is pumped into distribution. The plant only operates for 12 hours per day due to the poor electric supply. Available documentation does not record Bangko as having been included in the Project.



Chemical dosing facilities



Non-operational clarifier

Ref. 2. Siulak Deras (IKK), Kabupaten Kerinci

4. The Project constructed a 5 liter/second (l/s) treatment plant, which collects water under gravity conditions from the local mountain stream and subjects it to slow sand filtration and disinfection. Work was of high quality and both of the 4 meter (m) deep sand filters remain in good condition. The filters are manually cleaned twice per month although to date no new sand has been provided. Disinfection is based on the drip-feeding of calcium hypochlorite solution although it was reported that due to a shortage of chemicals the facilities are not always utilized. The scheme distributes water to 9,000 people via 750 house connections.



Slow sand filters—note good construction



Chemical dosing facilities

Ref. 3. Kota Petai (IKK), Kabupaten Kerinci

5. Water is abstracted from Lake Kerinci via a single low lift pump. The 20 l/s treatment plant comprises flocculation tanks, two upward-flow clarifiers fitted with inclined plates, six rapid gravity filters, and disinfection facilities. Construction work was of high quality and the plant remains in good condition. Each of the filters is backwashed three times per week although unfortunately sludge is currently discharged to a local fish farm, which is not good practice. The high-lift pumping station comprises two pumps designed to work in parallel and as one pump is not currently functioning well, it can be estimated that the overall efficiency of the plant is approximately 60%.



Treatment plant—note site well maintained



High-lift pumps—pump on the left not working

Ref. 4. Lubuk Paku (DPP), Kabupaten Kerinci

6. The water supply system comprises a spring captor and small diameter pipelines distributing water to three public hydrants. It was not clear from the site visit whether the facilities had been rehabilitated after the Project. No sanitation was provided in the village.



Working public hydrant



Working public hydrant

Ref. 5. Pengasi (DT), Kabupaten Kerinci

7. Under the Project, the village was provided with a spring caption, a header tank, and a small diameter gravity distribution system. The original header tank was subsequently rehabilitated utilizing local government funds in 2000/01. A *mandi cuci kakus* (communal washing, bathing, and toilet facility, or MCK) was constructed in the village but was abandoned because it was built at too low an elevation and wastewater would not drain to the local river. However, as a result of the Project, the villagers recognized the benefits of having a public toilet and constructed a new MCK utilizing their own funds. Similarly, the construction of demonstration family latrines was successful as there was a catalytic effect and approximately 150 houses in the village now have their own in-house latrine.



Abandoned MCK



Family latrine

Ref. 6. Pematanglumut (DPP), Kabupaten Tanjung Jabung

8. The Project constructed a spring caption and a diesel operated pump was provided to forward water to a public hydrant located near the village meeting hall. The system broke down after a few years and was not repaired. The hydrant tank was subsequently removed and utilized for rainwater collection by one of the local residents. It was noted that people still go to the spring caption and abstract water manually as it is still one of the best sources of water in the area. Two MCKs were constructed but both have now been abandoned due to the lack of water. One-hundred-fifty basic pit latrines were constructed, but many have now been abandoned. However, there was evidence of a catalytic effect as new latrines have been constructed.



Spring caption and abandoned pump house



New and old pit latrines

Ref. 7. Simpangtuan (DPP), Kabupaten Tanjung Jabung

9. Project documentation indicates that both water supply and sanitation facilities should have been constructed in Simpangtuan. However, there was no evidence of any water supply work having been carried out. An MCK and a school latrine were constructed. While the school latrine is still in use, it is understood from the local population that the MCK was washed away during flooding and was not replaced. There was no evidence of any family latrines having been constructed. The local population is still heavily dependent on the collection of rainwater for water supply and the use of the local river for sanitation and washing.



Rainwater harvesting at the mosque



River-based washing facilities

C. North Sumatra Province

Ref. 8. Kwala Begunit (IKK), Kabupaten Langkat

10. The Project constructed a deep borehole and installed a 5 l/s pump. A concrete header tank was built, together with a high lift pumping station powered by a diesel generator. The generator broke down in 1998 (before the end of the Project) and was not replaced. The pump and riser pipe were removed and the plant has not operated since. Operations staff, who are still in place, reported that high iron concentrations in the water had been a problem. The high-lift pumping facilities included an in-line hydraulic stabilization vessel, which is over-elaborate for a rural water supply project. Although the plant had not been operated for 5 years, the Perusahaan Daerah Air Minum (PDAM) or regional water utility, which is now responsible for the scheme, did not report the fact to project staff. An MCK was constructed in the market adjacent to the plant but is no longer in use due to the absence of water. There was no evidence of any other sanitation facilities having been constructed.



Header tank—riser pipe removed



Abandoned MCK—no water supply

Ref. 9. Rumah Galuh (DPP), Kabupaten Langkat

11. The water supply system as constructed under the Project comprised a spring caption and gravity distribution pipelines supplying 10 public hydrants, each of which served a separate village, and once completed the scheme was handed over to PDAM to run. Unfortunately, the communities were unable to organize themselves to pay the water bill and as a result PDAM turned off the supply and the hydrants now lie abandoned. Villagers reported to the OEM that they had thought that the water would be free. House owners requested PDAM to install connections instead and today 285 customers receive water from the system. Approximately 50% of the community is served. The average consumption per connection is 33 cubic meters (m^3)/month at a charge rate of Rp700/ m^3 . The charge for commercial water usage is higher at Rp1,100/ m^3 . An MCK was constructed but suffered from the same payment issues and it has since been demolished. A school latrine was constructed and is still in use but no family latrines were built.



Abandoned public hydrant



Abandoned public hydrant

Ref. 10. Pantai Geni (DT), Kabupaten Langkat

12. The Project installed a shallow borehole and pump and constructed an elevated tank and gravity water distribution system. The water quality was poor and had a high iron concentration. Furthermore, the community was unable to organize itself to pay for the operation and maintenance costs and as a result most people elected to construct their own private wells. Unfortunately, the water quality from the majority of these wells is no better and while the water can be used for washing, etc., most villagers now rely on the well at the local mosque for their drinking water. An MCK was constructed but is no longer in use due to the lack of water supply. Four communal washing tanks were built but these have also been abandoned. No family latrines were constructed under the Project.



Private shallow well and electric pump



Abandoned washing tanks

Ref. 11 Batang Kuis (IKK), Deli Serdang

13. The Project constructed a 200 m deep borehole and installed a pump, which delivers water to a header tank. A 10 l/s centrifugal pump was provided to forward water to distribution via a hydraulic stabilization vessel. However, a bypass connection is used and water is delivered directly to the distribution system with the header tank and surface pump only being utilized when the demand is high. The system serves only 100 house connections out of approximately 600 houses in the community and typically operates for 10 hours per day. Hours run are dictated by the balance of revenue from water sales versus expenditure on electric. With a connection cost of Rp400,000 and water charges of Rp400/m³, PDAM have failed to encourage the villagers to connect to the system as they are content with their private wells. No MCK or other sanitation facilities were constructed in the village.



Borehole and header tank



In-line stabilization vessel

Ref. 12 Pertambukan (IKK), Deli Serdang

14. From a 200 m deep borehole (5 l/s capacity pump 40 m below ground level) water is delivered to the distribution system via an in-line stabilization tank. A flow meter is installed but it is not working. Disinfection is not practiced. The borehole was sited on the basis of a geophysical survey interpreted by the Directorate General of Human Settlements staff in Jakarta. Three public hydrants were installed but two are not working due to the inability of the community to organize payment of the RP45,000/month social charge. The working hydrant only serves five households. There are 150 house connections in the community of 500 houses and the system operates for 8 hours per day as dictated by the revenue from water sales versus expenditure on electricity. The PDAM charge for water is Rp700/m³. No sanitation facilities were installed in the village.



In-line stabilization vessel



Public hydrant—note the poor drainage

Ref. 13 Serdang (DT), Deli Serdang

15. The village is served by two shallow wells (25 m deep) each with a pump operated by an on/off switch and a public hydrant for water collection. Water is free and, hence, problems have not arisen with the need for the community to collect money. The construction of both hydrants is very poor and the surrounds are rapidly deteriorating. Poor drainage is resulting in bad sanitation conditions in the vicinity of the hydrants. An MCK was constructed in the village but it was so close to one of the shallow wells that it contaminated the supply and is no longer used. There was no evidence of any family latrines having been constructed under the Project.



Public hydrant with poor surround



MCK within 1 meter of a shallow well

Ref. 14 Sibolangit (DT), Deli Serdang

16. Although included in project documentation, there is no indication that any project work was actually carried out at this location. PDAM has recently installed a new spring and gravity system to serve the village.

Ref. 15 Puang Aja (DT), Deli Serdang

17. Although included in project documentation, there is no indication that any water supply work was carried out by the Project. An MCK was constructed but it has since been abandoned due to the bad odor. The village community reverted to using a wash house constructed in 1984. No school latrine or family latrines were constructed.



Abandoned MCK



1984 wash house

Ref. 16 Rumah Sumbul (DT), Deli Serdang

18. Although included in project documentation, there is no indication that any project work was actually carried out at this location. PDAM has recently installed a new spring and gravity system to serve the village.

Ref. 17 Tiga Dolok (IKK), Simalungun

19. The Project constructed a spring caption together with a gravity distribution system and two public hydrants, five metered taps, and 200 property connections. No water treatment or disinfection is practiced. One of the hydrants is still in operation but only serves a few households. The number of house connections has subsequently risen to 529 of which 496 are for domestic purposes. The cost of water is Rp470/m³ for domestic purposes and Rp900/m³ for commercial purposes. There is a demand for further connections but the supply of water is limited to 10 l/s by the small diameter transmission main. No sanitation facilities were constructed.



Public hydrant—note poor surround quality



Public tap—no surround provided

Ref. 18 Tiga Binanga (IKK), Karo

20. The town is served from a remotely located spring via a 10 l/s capacity transmission main. No water treatment or disinfection is practiced. According to the scheme design, 10 public hydrants should have been constructed but there is only evidence of two, neither of which still work due to problems with the payment of water charges. One tank has been adapted for rainwater collection at a mosque. There is a waiting list for house connections (Rp850,000) but the availability of water is limited by the size of the transmission main. PDAM staff estimate the level of unaccounted-for water to be 30%, of which 40% is due to the nonpayment of bills. The number of connections and tariffs are as follows:

Table A2.2: Connections and Tariffs, Tiga Binanga

Connection To	Number	Price (Rp m ³)
House	1,252	700
Government Office	20	1,050
Mosque/Church	11	450
Commercial	65	1,200
Restaurant/Hotels	55	1,900

m³ = cubic meter.

Source: Operations Evaluation Mission.

No MCK was constructed although a school latrine was included in the Project and is still working to a limited extent. There is no knowledge of family latrines having been installed.



Abandoned public hydrant



Rainwater harvesting using project tank

D. West Kalimantan Province

Ref. 19 Bentunai Kuala (DPP), Kabupaten Sambas

21. The Project constructed a spring caption, located 800 m from the village in the low-lying hills, and a gravity distribution system. However, of the 4,696 m of distribution pipeline installed only 1,500 m are still operational. Two public hydrants were constructed and both are still working, as are eight of the nine public taps. The village is served by 152 unmetered house connections, which are charged a flat rate of Rp3,000 per month. An MCK was installed under the Project and it is still in operation. While no school latrine was constructed, 33 family latrines were built for demonstration. This aspect of the Project was successful as the number of family latrines has now increased to 100 through the self-financing action of the community.



Working public hydrant



Good quality family latrine

Ref. 20 Sebawi (DT), Kabupaten Sambas

22. The Project constructed a simplified water treatment plant that relied on the settlement of water abstracted from the local tidal river during times when the river was not saline. The capacity of the plant was 4 m³/day, which was sufficient for only 12 houses. The plant was operated for two years but was then abandoned by the community due to the high cost of operation—approximately Rp1,600/m³. The key problem was the high cost of electricity which, although from the grid, is diesel generated in this area. No sanitation facilities were constructed in the village.



Treatment plant and tidal river



Abandoned treatment plant

Ref. 21 Sakong and Sagatani (DTs), Kabupaten Sambas

23. Both villages are served by a common river intake and gravity distribution system. The intake is poorly designed as there is no allowance for high flows to by-pass the structure and as a result structural damage has occurred. No water treatment or disinfection is practiced. The project constructed one public hydrant in Sakong but this is not working due to low water pressure. Two public hydrants were constructed in Sagatani. At one, the pressure is low and the community has broken the pipe in order that they may collect water and the other is not working

due to low water pressure. The key reasons for the low pressure, which is continuing to reduce with time, are the illegal connections made to the transmission pipe through the jungle and the 50 house connections, which have been constructed in Sakong village. No sanitation facilities were installed in either village.



River intake—note damage to right side



Broken inlet pipe—note no tap

Ref. 22 Pagmilang (DT), Kabupaten Sambas

24. The village is served by untreated spring water distributed under gravity conditions. Of the five public hydrants installed only one is still working. This is a result of the community's inability to organize the payment of water charges and their preference for house connections (100 have now been installed). Water is provided at a charge of Rp3,000 per month. A public latrine rather than an MCK was installed and it is still operational. No school latrine or family latrines were installed. A drinking water bottling plant is located near to the village, which charges Rp5,000/19 liters.



Working public hydrant



Operational public latrine

Ref. 23 Sanggau Kulor (DT), Kabupaten Sambas

25. The village is served by an intermittent spring and a low pressure gravity distribution system. The source is dry for 1 month per year. Three public taps were constructed by the Project but none are working due to the low water pressure. Approximately 40 house connections have been installed and water is provided free of charge. Most households have their own pumps (cost: Rp270,000) to abstract river water for washing and, hence, reserve the spring water for drinking. The public latrine (located at the village clinic) is working intermittently.

as it uses rain water for flushing. Thirty family latrines have since been constructed by the community using their own resources.



Public tap—not working



Low pressure house connection

Ref. 24 Sei Bulan (DT), Kabupaten Sambas

26. The project provided 16 small capacity fiberglass rainwater storage tanks, which are still operational. A public latrine was provided which is not frequently used due to the lack of water. No other sanitation facilities were included in the Project.



Rainwater harvesting tank



Public latrine

SUPPLEMENTARY SURVEY SUMMARY

Table A3.1: Jambi Province

Ref.	District	Subdistrict	Community	Type	Approximate % of Installed Works That Are Effectively Used		Approximate Population	Who Operates the System?	Is the Demand Satisfied?	Do the People Drink the Water?	Cost of Bottled Water (Rp/l)	Is Public Health Better Now?	Do Women Have More Time?
					Water	Sanitation							
1.	Batanghari	Sakernan	Sakernan	IKK	50	50	4,600	PDAM	Yes	Yes	3,300	Yes	Yes
2.		Muara Bulian	Muara Bulian	IKK	0	—	—	—	No	—	—	—	—
3.		Muara Bulian	Sungai Baung	IKK	20	—	—	PDAM	Yes	Yes	4,000	No	—
4.		Pemayung	Selat	DPP	20	30	2,400	—	No	Yes	3,300	Yes	No
5.		Batin	Aur Gading	DPP	70	100	—	Community	Yes	Yes	4,500	No	No
6.		Batin	Jelutih	DT	100	0	—	Community	Yes	Yes	Not sold	No	Yes
7.		Batin	Koto Boyo	DT	100	0	—	Community	Yes	Yes	—	Yes	No
8.		Pemayung	Kubu Kandang	DT	20	30	1,500	—	No	Yes	—	—	No
9.		Maro Sebo Ulu	Tebing Tinggi	DT	0	10	1,880	—	No	—	3,300	No	No
10.		Batin	Muara Jangga	DT	0	0	—	Community	No	—	—	—	—
11.	Bungo Tebo	Muara Bungo	Muara Bungo	IKK	0	—	—	PDAM	No	—	—	—	—
12.		Tanah Sepanggal	Teluk Pandak	IKK	0	90	3,150	—	No	—	2,500	No	No
13.		Tanah Tumbuh	Pelayang	IKK	30	0	2,600	—	No	No	—	—	No
14.		Tanah Sepanggal	Lubuk Landai Pasar	IKK	0	—	1,500	—	No	—	2,500	—	No
15.		Tebo Tengah	Sungai Keruh	DPP	0	0	3,000	—	No	—	2,500	—	No
16.		Rantau Pandan	Tanjung Agung	DPP	70	0	2,500	—	No	Yes	2,500	Yes	Yes
17.		Pelepat	Senamat	DT	30	50	4,600	—	No	Yes	2,500	Yes	Yes
18.		Pelepat Ilir	Muara Kuamang	DT	50	0	1,200	—	No	Yes	2,500	Yes	Yes
19.		Tebo Tengah	Kandang	DT	50	0	1,500	—	No	Yes	2,500	Yes	No
20.	Kerinci	Kayu Aro	Kersik Tuo	IKK	60	100	8,000	PDAM	Yes	Yes	4,000	Yes	Yes
21.		Kayu Aro	Pelompek	IKK	70	—	4,000	PDAM	Yes	Yes	4,500	—	Yes
22.		Batang Merantin	Pulau Sangkar	IKK	30	—	—	PDAM	Yes	Yes	3,500	Yes	Yes
23.		Gunung Reya	Sanggaran Agung	IKK	70	100	—	PDAM	Yes	Yes	4,500	—	—
24.		Keliling Danau	Lampur Danau	DPP	0	50	—	Community	No	—	—	—	No
25.		Batang Merangin	Pematang Lingkung	DPP	90	0	—	Both	Yes	Yes	4,000	No	No
26.		Kayo Aro	Lubuk Pauh	DPP	0	—	—	—	No	—	—	—	—
27.		Batang Merangin	Tarutung	DT	0	0	—	—	No	—	4,500	—	No
28.		Gunung Kerinci	Tanjung Genting	DT	0	0	—	Community	No	—	5,000	No	No
29.		Gunung Kerinci	Muka Tinggi	DT	0	—	—	Both	No	—	4,000	No	No
30.	Sarolangun	Sarolangun	Pelawan	IKK	60	—	600	PDAM	Yes	Yes	4,000	—	Yes
31.		Sungai Manau	Sungai Manau Kota	IKK	0	—	—	—	No	—	—	—	—
32.		Mandiingin	Gurun Mudo	DPP	0	0	—	Community	No	—	4,500	No	No
33.		Sarolangun	Ladang Panjang	DPP	0	0	2,600	Community	No	—	4,000	No	No
34.		Muara Siau	Tiaro	DT	0	0	—	Community	No	—	5,000	—	—
35.		Pauh	Pamusiran	DT	0	0	—	—	No	—	—	—	—
36.	Tanjung	Tungkal Ilir	Tebing Tinggi	IKK	40	0	20,000	PDAM	Yes	No	2,000	Yes	Yes
37.	Jabung	Tungkal Ilir	Bram Itam Kanan	DPP	20	10	4,000	—	No	Yes	2,500	No	No
38.		Pengabuan	Parit Pudin	DT	0	—	2,000	—	No	—	—	—	—
39.		Pengabuan	Teluk Nilau	DPP	10	10	11,000	PDAM	No	Yes	2,500	Yes	Yes
40.		Tungkal Ilir	Batara Kanan	DT	100	0	1,900	—	No	Yes	—	Yes	No
41.		Merlung	Pulau Pauh	DT	80	50	900	—	No	Yes	2,300	Yes	No
42.		Tungkal Ulu	Lubuk Kambing	DT	50	0	3,000	—	No	Yes	1,000	Yes	No

— = not applicable, DPP = *desa pusat pertumbuhan* or growth center villages, DT = *desa tertinggal* or lesser developed villages, IKK = *ibu kota kecamatan* or district administrative centers, PDAM = Perusahaan Daerah Air Minum (regional water utility company).

Source: Field Survey conducted in April and May 2004 for this Project Performance Audit Report.

Table A3.2: North Sumatra Province

Ref.	District	Subdistrict	Community	Type	Approximate % of Installed Works That Are Effectively Used		Approximate Population	Who Operates the System?	Is the Demand Satisfied?	Do the People Drink the Water?	Cost of Bottled Water (Rp/l)	Is Public Health Better Now?	Do Women Have More Time?
					Water	Sanitation							
43.	Langat	Bahorok	Bahorok	IKK	50	100	43,300	PDAM	Yes	Yes	3,300	No	Yes
44.		Hinai	Cempa	DPP	100	100	2,700	Community	No	Yes	1,500	Yes	Yes
45.		Salapian	Kapras	DT	0	—	600	—	No	—	—	No	No
46.		Salapian	Kuta Gajah	DT	0	—	2,100	—	No	—	—	No	No
47.		Pangkalan Susu	Sei Meran	DT	20	—	1,600	—	No	No	Not sold	No	No
48.		Pangkalan Susu	Pintu Air	DT	0	—	1,600	—	—	—	—	No	—
49.	Deli Serdang	Patumbak	Patumbak	IKK	30	0	—	PDAM	—	Yes	3,300	Yes	Yes
50.		Tanjung Morawa	Tanjung Morawa	IKK	20	—	143,000	—	No	Yes	3,300	Yes	Yes
51.		Pantai Labu	Pantai Labu	IKK	0	—	5,000	PDAM	No	—	4,500	Yes	No
52.		Percut Sei Tuan	Sei Tuan	DPP	20	—	—	PDAM	No	—	4,200	Yes	Yes
53.		Dolok Masihul	Pekan Kemis	DPP	20	—	—	—	No	—	—	—	No
54.		Bandar Khalifah	Sei Sarimah	DPP	30	—	—	Community	No	Yes	—	—	Yes
55.		Kotarih	Gudang Garam	DT	30	—	—	Community	Yes	Yes	—	—	Yes
56.		Kotarih	Biintang Bayu	DT	0	0	500	—	No	Yes	Not sold	No	No
57.	Simalungun	Bosar Maligas	Boluk	IKK	0	100	1,500	—	No	No	3,500	No	No
58.		Tanah Jawa	Blimbingan	IKK	10	—	—	PDAM	No	—	—	—	—
			Tanah Jawa										
59.		Huta Bayu	Huta Bayu	IKK	20	0	—	PDAM	Yes	Yes	4,700	No	No
60.		Pematang Bandar	Mariah Bandar	DPP	0	0	—	—	No	—	5,000	—	—
61.		Silampuyang	Silampuyang	DPP	10	0	1,000	Community	No	Yes	Not sold	—	No

— = not applicable, DPP = *desa pusat pertumbuhan* or growth center villages, DT = *desa tertinggal* or lesser developed villages, IKK = *ibu kota kecamatan* or district administrative centers, PDAM = Perusahaan Daerah Air Minum (regional water utility company).

Source: Field Survey conducted in April and May 2004 for this Project Performance Audit Report.

Table A3.3: West Kalimantan Province

Ref.	District	Subdistrict	Community	Type	Approximate % of Installed Works That Are Effectively Used		Approximate Population	Who Operates the System?	Is the Demand Satisfied?	Do the People Drink the Water?	Cost of Bottled Water (Rp/l)	Is Public Health Better Now?	Do Women Have More Time?
					Water	Sanitation							
62.	Pontianak	Menyuke	Darit	IKK	50	0	5,000	Community	No	No	3,000	No	No
63.		Meranti	Meranti	IKK	0	—	2,500	PDAM	No	—	3,000	No	No
64.		Menyuke	Untang	DPP	0	10	1,600	Community	No	No	4,000	No	No
65.		Siantan	Peniti Besar	DPP	100	—	4,700	—	No	Yes	3,000	Yes	Yes
66.		Sei Kakap	Panggur Kecil	DPP	100	10	10,800	—	No	—	1,500	Yes	—
67.		Sei Kakap	Kalimas	DT	40	20	5,600	—	No	Yes	3,300	Yes	Yes
68.		Sei Kakap	Jeruju Besar	DT	80	0	3,200	—	Yes	Yes	3,300	Yes	No
69.		Ngabang	Nyiin	DT	0	0	—	—	No	No	—	No	No
70.		Ngabang	Engkedu	DT	0	0	1,900	—	No	—	3,000	—	No
71.		Ngabang	Ladangan	DT	0	0	—	Community	No	No	4,000	—	No
72.		Mandor	Bebatung	DT	80	50	1,900	Community	No	Yes	5,000	No	No
73.	Sanggau	Meliau	Meliau	IKK	50	100	—	PDAM	Yes	Yes	4,000	No	No
74.		Balai Batang Tarang	Entikong	IKK	70	100	—	—	Yes	Yes	5,000	No	No
75.		Sekadau Hilir	Peniti	DPP	0	—	3,500	—	No	—	—	—	—
76.		Mukok	Sei Mawang	DPP	50	50	1,300	Community	No	No	5,000	No	No
77.		Sekadau Hilir	Sei Kunyit	DT	0	30	1,400	Community	No	No	4,000	No	No
78.		Belitang Hilir	Sei Ayak III	DT	10	100	4,600	Community	No	Yes	5,000	—	No
79.		Kembayan	Semayang	DT	50	60	2,600	Community	Yes	Yes	4,000	Yes	Yes
80.		Kembayan	Tanjung Bunga	DT	70	60	1,500	Community	Yes	Yes	—	No	Yes
81.		Mukok	Engkodik	DT	70	40	1,600	Community	No	Yes	4,000	—	No
82.		Mukok	Inggis	DT	70	10	2,000	—	No	—	4,000	No	No
83.	Sambas	Sambas	Kartiasa	IKK	50	—	—	PDAM	No	Yes	3,500	Yes	Yes
84.		Tebas	Pangkalan Kongs	DPP	50	—	3,200	—	No	Yes	2,000	—	No
85.		Sei Raya	Karimunting	DPP	10	20	7,900	None	No	Yes	3,000	Yes	Yes
86.		Sambas	Matang Terap	DPP	50	20	—	None	No	Yes	3,300	Yes	Yes
87.		Jawai	Semperiuk A	DPP	90	0	1,700	None	No	Yes	Not sold	Yes	Yes
88.		Sambas	Sei Rampah	DT	90	—	5,200	None	Yes	Yes	3,300	Yes	Yes
89.		Salamantan	Sebau	DT	50	0	1,800	Community	Yes	Yes	Not sold	Yes	Yes
90.		Jawai	Sebaran	DT	50	0	3,200	None	-	Yes	3,300	Yes	Yes
91.		Jawai	Segarau Parit	DT	20	—	2,500	None	No	Yes	Not sold	Yes	—
92.	Ketapang	Simpang Hilir	Teluk Melano	IKK	10	—	14,300	PDAM	No	Yes	2,300	Yes	—
93.		Kendawangan	Kendawangan	IKK	50	—	5,000	PDAM	Yes	No	2,000	Yes	Yes
94.		Teluk Batang	Teluk Batang	DPP	50	—	7,400	None	No	Yes	2,300	Yes	Yes
95.		Sukadana	Simpang Tiga	DPP	50	100	3,900	None	No	Yes	2,000	Yes	Yes
96.		Matan Hilir Selatan	Sungai Nanjung	DT	—	100	5,400	None	No	—	2,000	Yes	Yes
97.		Matan Hilir Selatan	Pesaguan Kanan	DT	—	0	7,400	None	No	—	2,000	Yes	No
98.	Sintang	Tempunak	Nanga Tempunak	DPP	0	—	2,100	PDAM	No	—	4,000	—	No
99.		Tebelian	Kajang Baru	DT	40	50	950	Community	No	Yes	—	—	No
100.		Tebelian	Manter	DT	0	0	1,430	Community	No	No	3,000	No	No

— = not applicable, DPP = *desa pusat pertumbuhan* or growth center villages, DT = *desa tertinggal* or lesser developed villages, IKK = *ibu kota kecamatan* or district administrative centers, PDAM = Perusahaan Daerah Air Minum (regional water utility company).

Source: Field Survey conducted in April and May 2004 for this Project Performance Audit Report.

OUTPUTS ACHIEVED BY THE PROJECT

Table A4.1: Locations with Water Supply Systems Constructed by the Project
(by province)

Province	IKK		DPP		DT		Total	
	New	Rehab/ Ext'd	New	Rehab/ Ext'd	New	Rehab/ Ext'd	New	Rehab/ Ext'd
D.I. Aceh	28	20	38	12	373	56	439	88
North Sumatra	35	6	51	5	385	18	471	29
West Sumatra	24	5	34	9	291	26	349	40
Riau	21	16	28	2	300	10	349	28
Jambi	24	6	45	0	227	2	296	8
South Sumatra	17	5	44	6	422	22	483	33
Bengkulu	16	8	34	4	156	15	206	27
Lampung	10	2	36	7	237	33	283	42
West Kalimantan	19	7	41	0	516	21	576	28
Central Kalimantan	16	11	34	11	187	29	237	51
South Kalimantan	24	8	28	3	376 ^a	2	428	13
East Kalimantan	30	23	36	3	222	5	288	31
Total	264	117	449	62	3,692	239	4,405	418

DPP = *desa pusat pertumbuhan* or growth center villages, DT = *desa tertinggal* or lesser developed villages, IKK = *ibu kota kecamatan* or district administrative centers.

^a In chapter II.4 of the Executing Agency project completion report, this figure is incorrectly reported to be 468 although the column total figure of 3,692 ties in with other tables in the report.

Source: Executing Agency project completion report, corrected for math errors by the Operations Evaluation Mission.

Table A4.2: Type of Water Supply Systems Provided by the Project
(by province)

Province	WTP	HC	PH	IG	SWTP	DWEP	SG	SW	DWHP	RH
D.I. Aceh	19	15,048	1,422	26	31	0	111	5,647	496	128
North Sumatra	20	2,065	1,512	54	33	40	103	820	336	234
West Sumatra	17	3,232	1,563	0	15	0	204	1,618	83	32
Riau	8	2,254	463	72	0	0	55	3,120	82	1,741
Jambi	18	4,848	778	0	0	0	90	3,183	167	305
South Sumatra	11	1,635	1,205	0	4	0	22	4,710	545	127
Bengkulu	9	2,567	327	0	0	0	56	2,144	218	17
Lampung	4	1,391	410	0	0	0	39	3,355	1,330	0
West Kalimantan	8	1,405	716	0	4	0	66	1,946	246	2,046
Central Kalimantan	2	348	39	102	144	0	14	558	398	453
South Kalimantan	11	910	465	19	34	0	54	1,804	1,256	725
East Kalimantan	14	1,215	878	0	4	0	0	1,288	69	381
Total	141	36,918	9,778	273	269	40	814	30,193	5,226	6,189

DWEP = deep well with electric pump, DWHP = deep well with hand pump, HC = house connection, IG = infiltration gallery, PH = public hydrant, RH = rainwater harvesting, SG = spring with gravity distribution system, SW = shallow well, SWTP = simple water treatment plant, WTP = water treatment plant.

Source: Executing Agency project completion report, corrected for math errors by the Operations Evaluation Mission.

Table A4.3: Location of Sanitation Systems Constructed by the Project
(by province)

Province	IKK		DPP		DT		Total	
	New	Rehab/ Ext'd	New	Rehab/ Ext'd	New	Rehab/ Ext'd	New	Rehab/ Ext'd
D.I. Aceh	20	4	34	7	364	33	418	44
North Sumatra	28	1	44	0	338	3	410	4
West Sumatra	12	0	33	3	290	13	335	16
Riau	18	0	28	0	272	0	318	0
Jambi	20	0	41	3	199	1	260	4
South Sumatra	9	0	35	7	412	9	456	16
Bengkulu	15	5	32	1	139	12	186	18
Lampung	7	0	36	0	233	0	276	0
West Kalimantan	17	1	41	0	510	9	568	10
Central Kalimantan	15	0	33	0	181	0	229	0
South Kalimantan	22	0	31	2	370	0	423	2
East Kalimantan	17	0	36	0	204	0	257	0
Total	200	11	424	23	3,512	80	4,136^a	114

DPP = *desa pusat pertumbuhan* or growth center villages, DT = *desa tertinggal* or lesser developed villages, IKK = *ibu kota kecamatan* or district administrative centers.

^a In chapter I of the Executing Agency project completion report, the total number of locations is given as 4,080; whereas in chapter II, a figure of 4,199 is presented. The figure of 4,136 in the above table is based on the Central Project Administration Office's spreadsheet, which indicates the villages in which only water supply facilities were installed.

Source: Executing Agency project completion report, corrected for math errors by the Operations Evaluation Mission.

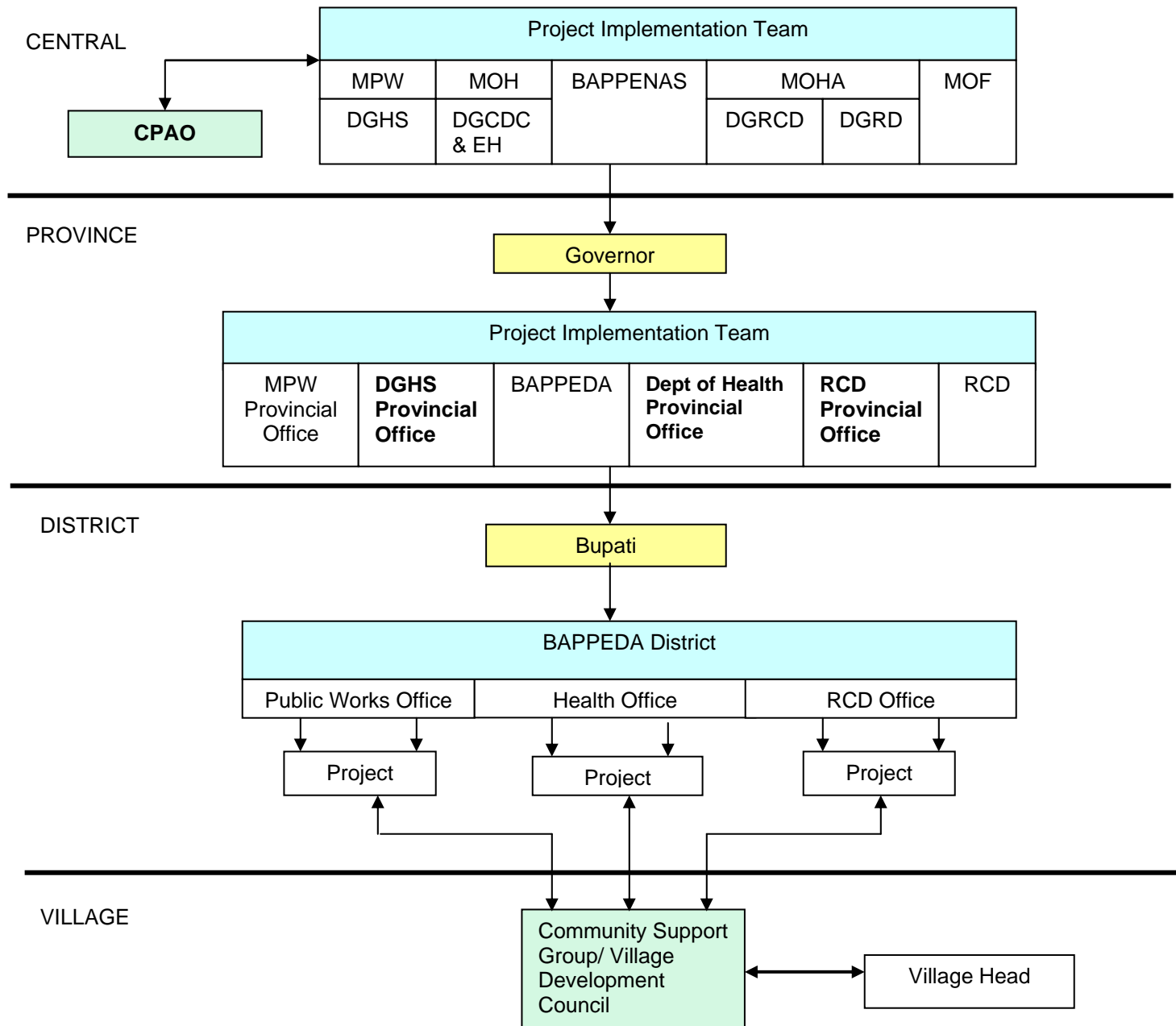
Table A4.4: Type of Sanitation Facilities Provided by the Project
(by province)

Province	Family Latrine	MCK	School Latrine
D.I. Aceh	10,345	639	52
North Sumatra	5,319	654	134
West Sumatra	5,333	263	73
Riau	3,978	264	141
Jambi	3,718	200	125
South Sumatra	5,195	375	172
Bengkulu	909	111	10
Lampung	5,440	328	97
West Kalimantan	6,908	419	187
Central Kalimantan	5,555	73	288
South Kalimantan	10,036	220	320
East Kalimantan	6,303	135	42
Total	69,039	3,681	1,641

MCK = *mandi cuci kakus* (communal washing, bathing, and toilet facility).

Source: Executing Agency project completion report, corrected for math errors by the Operations Evaluation Mission.

PROJECT ORGANIZATION



OPERATIONAL PERFORMANCE

A. Part A—Water Supply Facilities

1. From observations made in 124 communities in three provinces, it has been found that most of the water supply facilities constructed by the Project are no longer functioning as intended. Less than 4 years after project completion, only an estimated 30% of the facilities relying on spring, river, lake, or groundwater sources remain in operation.¹ Many facilities now lie abandoned throughout Sumatra and Kalimantan. Where rainwater harvesting was the source of water, the situation was rather better as it is likely that around 70% of the facilities provided are still working.

2. Hydraulic problems were common, particularly with regard to the undersizing of transmission pipelines or low pressure. The adoption of standard designs for boreholes and water treatment plants often resulted in excessive expenditure on these items and, hence, poor project financial performance. The requirement to send borehole logs to Jakarta for analysis and subsequent design of the screening and pump arrangement, rather than making an on-site decision as the work proceeded, resulted in all boreholes being drilled to a standard depth of 200 meters irrespective of the location of the aquifer. As standard design, all boreholes were fitted with overelaborate head works including redundant in-line hydraulic stabilization tanks.²

3. Where surface water treatment plants were required, the designers frequently opted to install package treatment plants manufactured in Jakarta and shipped to site. Of the seven package plants visited, only four are still in operation and even then only for a limited number of hours per day due to the high operational cost of the system. The adoption of remotely fabricated package plants is not in keeping with the concept of community participation and the use of local labor and materials in the construction of the water supply schemes. Better examples of water treatment plants were found in Kerinci district where high-quality concrete construction had generally been adopted and as a result, the plants were still in good condition and operating well.

4. A common feature of the piped water supply systems was the use of public hydrants to maximize the number of people served, especially for the DPPs (*desa pusat pertumbuhan* or growth center villages), and DTs (*desa tertinggal* or lesser developed villages). Approximately 205 public hydrants or taps were constructed at the communities visited but only 30% of these were still in operation. While partly due to the breakdown of the supply system as a whole, most failures were the result of the operating authorities turning off the supply due to the nonpayment of the water bills. The majority of communities had been unable to organize themselves to deal with this task. If the same situation applies in the other project communities, then there could well be over 6,900 abandoned hydrants across the 12 provinces.

5. Subsequent to the Project, at many of the communities served with piped systems the operating water supply authority, or Perusahaan Daerah Air Minum (PDAM), installed individual connections to those households willing to pay the charges. While this means that the project investment in the water source and distribution system continued to have a value, it also meant that fewer people had access to the water and, in many cases, the coverage of the system has

¹ The 124 communities visited amounted to 2.8% of the total number of *ibu kota kecamatan* (IKK) or subdistrict capitals, *desa pusat pertumbuhan* (DPP) or growth center villages, and *desa tertinggal* (DT) or lesser developed villages included in the Project, and 9.2% of the number in the three provinces visited.

² Good examples can be seen at Batang Kuis and Petumbak in North Sumatra and Pelawan in Jambi.

been reduced in comparison to that originally intended. Even worse, some people who could not afford a house connection could no longer utilize their traditional sources as they had been diverted for the sole purpose of the piped systems.

6. Attention to detail was poor. In particular, it was noted that the majority of taps on public hydrants had been broken off as a result of children using them as climbing frames. The on-site solution has been to utilize poor-fitting wooden plugs or to simply let water flow. Inadequate attention to drainage at public hydrants has led to poor environmental conditions.

7. From the site visits, it is evident that many shallow wells were either badly sited or poorly constructed. A common problem was that wells were constructed in the wet season when the water table was high only to find that in the dry season they no longer contained any water. Others were only dug to a standard depth and never reached the water table even during the wet season. In the 124 communities visited, approximately 265 shallow wells were constructed by the Project of which approximately 150 (56%) have been abandoned.

8. Wellhead works were generally of a poor standard and indeed in the cases of Engkodik, Inggis, and Sei Kunyit in West Kalimantan, construction was not even completed. Due to the failure of the hand pumps provided, none of the 14 shallow wells constructed at Untang in West Kalimantan were in operation until recently when households installed their own electric pumps. In some villages, public wells had been annexed by village heads for their personal use to the exclusion of the community.

9. In the 124 communities visited, approximately 260 small capacity fiberglass or concrete tanks were provided for rainwater harvesting. In the order of 180 were still in use with the remainder having been abandoned, either due to the failure of the support structure or leaks in the containers. While the success rate for this aspect (70%) was certainly higher than for other types of schemes, the majority of the tanks have been provided for the sole use of individual households and not for community use as originally intended by the Project. The effective coverage of the investment is, therefore, significantly below the target figure. In some communities the village heads have dictated that the tanks be located at mosques as a source of bathing water, which is not appropriate in areas of mixed religion.

10. Poor quality construction was a common and a significant factor in the failure of many schemes. Budget stretching often led to the use of poor-quality concrete with low cement content and the surrounds to many public hydrants and taps have already broken up. Pipelines were rarely laid at appropriate depths with adequate protection and as a result water losses were already high due to accidental, or deliberate, breakage. The simplified treatment plant at Nanga Tempunak in West Kalimantan fell down shortly after commissioning because the support structure was too weak. As stated in the Executing Agency's project completion report, all rehabilitation work included in the Project was carried out at sites where systems had previously been installed, a clear indication of poor quality work in the first place. In some villages visited, the facilities constructed under the Project were subsequently rehabilitated using local government funds.

11. A key aim of the Project was to provide safe water supply. Disinfection facilities were only installed at a limited number of sites and, in reality, disinfection was rarely practiced. The only reasonable examples of the bacteriological treatment of water were all in the Kerinci district. There was little evidence that water testing was being carried out at any of the villages and there was virtually no knowledge of water quality issues at the community level.

B. Part B—Sanitation Facilities

12. Observations by the Operations Evaluation Mission together with those of the follow-up survey team led to the conclusion that few of the facilities installed are still in operation. In the 80 communities where some form of sanitation facility was constructed, only an estimated 30% were still being used.

13. The Project failed to construct water supply and sanitation facilities in an integrated manner as defined at project preparation. In most instances, there was little coordination between the water supply and sanitation work effort as some *mandi cuci kakus* (MCK), or communal washing, bathing, and toilet facilities, were located remotely from the community and schools were rarely provided with a water supply. In Jambi, no water was supplied to the MCKs on the basis that they should be located close to rivers and that water should be carried to them in a bucket. No cases were found whereby the villagers were prepared to follow this policy. In some villages comprising a number of separate hamlets, the decision was taken to provide one hamlet with water supply facilities and another with sanitation facilities thereby, in theory, spreading the benefit of the Project. This policy was doomed from the outset as MCKs and pour-flush family latrines simply cannot function without an adequate water supply.

14. Many of the sanitation facilities failed as a result of a lack of cultural understanding on the part of the designers and the failure of the project implementation team to educate the communities. For example, Malayu people do not like to dispose of human waste within the house and require a separate structure to be constructed at least 10 meters away. Preconceived proposals to build in-house toilets were, therefore, rejected. Many villagers did not understand the concept that a water trap is installed in a pour-flush system to prevent the diffusion of bad odors. As a result, there were numerous reports of villagers abandoning their latrine when the water in the trap would not go away, as they thought it was not working. In Jambi, many people simply preferred to use the local rivers and did not employ the new systems constructed.

15. A total of 68 MCKs were identified in the course of the Operations Evaluation Mission and supplementary survey, of which only 19 (28%) were found to be still in operation. Extrapolating these findings to the rest of the Project indicates that there may be over 2,600 abandoned units across the 12 provinces. Those MCKs that were initially provided with an appropriate water source were often abandoned when the water supply system broke down. Others were remotely located due to land availability problems and were never used by the community, as access was too difficult or time consuming. In a number of locations, the MCKs were abandoned because they were too close to the shallow wells constructed under the Project and were polluting the water supply.

16. The success rating for school latrines was higher as of the 20 identified, 8 (40%) were still in use. It is evident that more discussion would have been held in these cases as the latrines were all located on the school grounds but the key problem has been the lack of an appropriate water supply for toilet flushing.

17. In line with the module approach adopted by the Project, 30 family latrines should have been constructed in each of the 124 communities visited, a total of 3,720. Of the 480 identified, including 150 pit latrines constructed at Pematanglumut (Jambi) in lieu of pour-flush latrines, only 130 (28%) were reported to be still in use. The poor construction record was partly due to the policy in some areas to supply only a reduced number of pour-flush toilet pans and not the materials to construct the latrine. Other communities complained that the module approach was

not appropriate for their village and considered it to be a top-down methodology. In addition, the villagers lacked both the incentive and the skills necessary for the construction task. Most could not spare the time without adequate compensation that was simply not available. Construction training was severely limited by the available budget and was frequently carried out by calling a small number of people per village for central training, which would then be passed on to the rest of the village workforce. As a result, the standard of construction for family latrines was poor.

SUMMARY OF CENTRAL PROJECT ADMINISTRATION OFFICE QUESTIONNAIRE ANSWERS

Question	CPAO				MOH	MPW Province		
	1	2	3	4	1	1	2	3
How many years did you spend on the Project?	3	4	2	<1	5	5	2	4
Have you been promotion since the Project?	No	No	No	Yes	Yes	Yes	Yes	Yes
Were you full time (FT) or part time (PT)?	FT	FT	FT	PT	PT	PT	—	FT
Were you promoted during the Project?	No	No	No	Yes	Yes	No	Yes	No
Were you trained during the Project?	No	No	Yes	Yes	Yes	Yes	No	Yes
Have you been on an ADB training program?	No	No	Yes	Yes	No	No	No	No
Key skills developed during the Project								
Procurement		✓	✓					
Finance/accounting								
Contract management	✓	✓	✓			✓		
Accounting						✓		
Report writing	✓	✓		✓				✓
Language skills (English)	✓	✓					✓	
Communication skills		✓			✓			
Field monitoring/evaluation		✓	✓	✓	✓		✓	✓
Technical skills	✓	✓	✓			✓		✓
Project management skills	✓	✓	✓	✓		✓	✓	✓
Community mobilization skills				✓	✓	✓	✓	✓
Computer/database skills						✓	✓	
Policy making skills				✓		✓	✓	
Were problems caused by a lack of understanding of ADB procedures?	Yes	Yes	—	Yes	Yes	No	No	Yes
Is project work more intensive than other government work?	No	No	—	No	Yes	Yes	Yes	Yes
Was work on the Project more intensive than your present job?	No	No	Yes	Yes	No	Yes	Yes	Yes
Are government salaries adequate for project work?	No	No	No	No	No	No	Yes	No
Did you receive an honorarium?	No	No	No	No	Yes	Yes	Yes	Yes
Did decentralization in 1998 affect your project responsibilities?	No	No	Yes	Yes	Yes	Yes	Yes	No

CPAO = Central Project Administration Office, MOH = Ministry of Health, MPW = Ministry of Public Works.

Continued on next page

Summary of CPAO Questionnaire Answers—Continued

Question	MPW District			BAPPEDA			Consultant	
	1	2	3	1	2	3	1	2
How many years did you spend on the Project	3	3	5	4	2	3	2	3
Have you been promotion since the Project?	No	Yes	No	No	—	Yes	—	—
Were you full time (FT) or part time (PT)?	PT	FT	PT	PT	FT	FT	FT	FT
Were you promoted during the Project?	No	Yes	No	No	No	No	—	—
Were you trained during the Project?	No	Yes	No	No	No	No	No	No
Have you been on an ADB training program?	No	No	No	No	—	No	No	No
Key skills developed during the Project								
Procurement		✓	✓	✓				
Finance/accounting				✓				
Contract management	✓	✓				✓		
Accounting	✓							
Report writing								
Language skills (English)			✓		✓	✓	✓	
Communication skills			✓	✓	✓		✓	
Field monitoring/evaluation		✓		✓	✓			✓
Technical skills		✓						✓
Project management skills	✓	✓			✓	✓	✓	✓
Community mobilization skills	✓	✓	✓	✓				✓
Computer/database skills							✓	✓
Policy making skills	✓			✓	✓	✓	✓	
Were problems caused by a lack of understanding of ADB procedures?	No	Yes	No	No	—	—	No	Yes
Is project work more intensive than other government work?	No	Yes	No	Yes	Yes	Yes	No	No
Was work on the Project more intensive than your present job?	No	No	No	Yes	Yes	Yes	No	No
Are government salaries adequate for project work?	No	No	No	No	—	Yes	No	No
Did you receive an honorarium?	No	Yes	No	Yes	Yes	Yes	Yes	No
Did decentralization in 1998 affect your project responsibilities?	No	Yes	Yes	Yes	Yes	Yes	No	No

BAPPEDA = Agency for Regional Planning and Development.

Source: Questionnaire completed by relevant EA and IA staff during the OEM.

HOUSING AND LIVING CONDITIONS

Table A8.1: Percent of Households with Own Drinking Water Facilities

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	75.6	65.3	67.3	0.0	0.0	0.0	53.8	0.0	53.8
Sumatera Utara	75.7	42.3	55.7	79.0	49.2	62.0	78.6	49.1	61.9
Sumatera Barat	55.8	40.4	44.4	65.8	49.9	54.2	69.5	50.5	56.2
Riau	71.8	60.1	64.2	58.3	53.4	55.5	55.8	42.5	48.7
Jambi	69.4	42.7	49.5	80.0	54.0	61.0	64.0	47.3	52.0
Sumatera Selatan	57.4	39.7	45.1	58.8	47.1	51.0	66.9	43.6	51.5
Bengkulu	61.4	61.3	61.3	68.8	68.4	68.5	76.2	62.1	66.2
Lampung	63.1	66.1	65.6	67.2	74.1	72.7	68.6	72.4	71.6
Total Sumatra^a	66.3	52.2	56.6	59.7	49.5	53.1	66.7	45.9	57.7
Kalimantan Barat	48.7	34.7	37.4	52.5	34.2	39.0	26.8	16.0	18.8
Kalimantan Tengah	57.4	15.6	25.0	64.9	30.0	39.8	66.3	23.3	36.0
Kalimantan Selatan	55.9	26.7	35.1	48.3	29.2	35.8	53.8	28.9	38.3
Kalimantan Timur	61.1	32.0	47.1	60.0	29.5	46.6	58.7	36.3	49.1
Total Kalimantan^a	55.8	27.3	36.2	56.4	30.7	40.3	51.4	26.1	35.6
Total 2 Islands^a	62.8	43.9	49.8	58.6	43.3	48.8	61.6	39.3	50.3
Total Indonesia^b	62.9	39.4	47.5	67.1	45.5	54.6	64.0	43.6	52.7

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).

Table A8.2: Percent of Households with Pipe or Pump Source of Drinking Water

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	47.0	5.3	13.4	0.0	0.0	0.0	57.5	0.0	57.5
Sumatera Utara	52.4	12.0	28.2	58.8	15.3	34.0	55.4	16.6	33.4
Sumatera Barat	54.1	13.2	23.7	56.7	13.3	25.2	54.2	14.1	26.2
Riau	25.4	4.9	12.0	27.7	2.0	13.1	25.9	1.4	12.9
Jambi	43.2	6.7	15.9	42.0	9.6	18.3	40.8	10.7	19.2
Sumatera Selatan	51.9	6.0	19.9	48.0	4.3	18.9	41.6	4.3	17.0
Bengkulu	30.8	8.8	15.1	37.8	10.7	18.3	33.6	5.2	13.5
Lampung	30.9	2.9	7.2	27.4	1.4	6.6	25.9	1.8	7.1
Total Sumatra^a	42.0	7.5	16.9	37.3	7.1	16.8	41.9	6.8	23.4
Kalimantan Barat	32.9	3.4	9.2	39.2	5.7	14.4	27.5	5.7	11.3
Kalimantan Tengah	71.2	5.5	20.3	69.6	9.5	26.3	65.4	9.2	25.8
Kalimantan Selatan	79.6	25.0	40.7	73.7	25.8	42.5	74.2	24.5	43.3
Kalimantan Timur	77.2	14.9	47.1	79.7	8.5	48.5	73.2	18.1	49.5
Total Kalimantan^a	65.2	12.2	29.3	65.6	12.4	32.9	60.1	14.4	32.5
Total 2 Islands^a	49.7	9.1	21.1	46.7	8.8	22.2	47.9	9.3	26.4
Total Indonesia^b	56.4	13.0	28.1	56.5	15.2	32.6	54.5	15.2	32.8

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).

Table A8.3: Percent of Households with Piped, Pumped, or Protected Well or Spring Source of Drinking Water

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	83.4	43.6	51.3	0.0	0.0	0.0	90.4	0.0	90.4
Sumatera Utara	87.3	47.7	63.6	91.2	60.3	73.5	92.2	59.4	73.6
Sumatera Barat	86.8	44.5	55.5	90.3	57.5	66.5	89.0	58.0	67.3
Riau	63.7	24.7	38.2	67.4	26.7	44.2	66.6	27.6	46.0
Jambi	69.5	27.1	37.8	68.7	37.5	45.9	74.7	39.2	49.2
Sumatera Selatan	79.9	32.0	46.5	74.5	50.9	58.7	80.9	44.6	57.0
Bengkulu	70.7	33.1	43.8	91.6	50.3	61.8	75.8	45.4	54.3
Lampung	67.1	37.3	41.8	70.2	49.5	53.6	73.5	56.5	60.2
Total Sumatra^a	76.1	36.3	47.3	69.2	41.6	50.5	80.4	41.3	62.3
Kalimantan Barat	33.8	8.5	13.5	43.8	11.6	19.9	32.9	12.1	17.4
Kalimantan Tengah	82.9	13.1	28.9	80.3	19.2	36.3	76.2	21.1	37.4
Kalimantan Selatan	82.0	30.3	45.2	84.4	41.0	56.1	85.9	35.5	54.6
Kalimantan Timur	80.4	26.5	54.4	83.5	21.0	56.1	80.7	34.8	61.0
Total Kalimantan^a	69.8	19.6	35.5	73.0	23.2	42.1	68.9	25.9	42.6
Total 2 Islands^a	74.0	30.7	43.4	70.5	35.5	47.7	76.6	36.2	55.7
Total Indonesia^b	85.9	54.1	65.1	88.2	64.7	74.6	87.2	64.3	74.6

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).

Table A8.4: Percent of Households Buying Drinking Water

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	37.6	5.3	11.6	0.0	0.0	0.0	61.0	0.0	61.0
Sumatera Utara	41.3	8.8	21.8	56.7	14.0	32.3	53.1	13.7	30.8
Sumatera Barat	43.2	9.8	18.4	52.0	13.4	24.0	49.9	13.4	24.3
Riau	19.2	2.2	8.1	32.9	2.7	15.7	31.6	4.1	17.1
Jambi	38.9	4.5	13.2	42.8	11.4	19.8	43.1	11.9	20.7
Sumatera Selatan	39.8	4.1	14.9	49.2	4.8	19.6	44.9	6.6	19.7
Bengkulu	22.4	9.2	13.0	36.6	10.0	17.5	33.7	9.3	16.4
Lampung	26.3	2.4	6.1	26.8	2.5	7.4	26.4	3.4	8.4
Total Sumatra^a	33.6	5.8	13.4	37.1	7.4	17.0	43.0	7.8	24.8
Kalimantan Barat	28.3	2.3	7.4	41.6	6.2	15.3	31.8	7.3	13.6
Kalimantan Tengah	36.7	3.2	10.8	49.3	8.3	19.8	41.0	5.0	15.6
Kalimantan Selatan	63.7	10.5	25.8	74.4	16.3	36.5	73.1	13.7	36.2
Kalimantan Timur	58.2	13.1	36.4	80.4	9.6	49.4	75.8	18.8	51.3
Total Kalimantan^a	46.7	7.3	20.1	61.4	10.1	30.3	55.4	11.2	29.2
Total 2 Islands^a	38.0	6.3	15.6	45.2	8.3	21.4	47.1	8.9	26.3
Total Indonesia^b	32.7	6.1	15.3	40.9	9.6	22.8	40.9	10.1	23.9

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).

Table A8.5: Percent of Households with Own Sanitation Facilities

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	72.4	40.1	46.4	0.0	0.0	0.0	74.6	0.0	74.6
Sumatera Utara	83.3	47.8	62.0	89.0	61.2	73.1	87.4	57.8	70.7
Sumatera Barat	48.2	20.5	27.6	61.8	30.9	39.4	68.5	36.0	45.8
Riau	78.4	67.6	71.3	81.8	74.0	77.3	83.3	76.2	79.6
Jambi	75.5	41.9	50.4	84.5	43.9	54.8	84.7	57.2	64.9
Sumatera Selatan	66.1	43.5	50.3	72.6	52.3	59.1	82.2	51.5	61.9
Bengkulu	66.6	42.3	49.2	73.8	46.7	54.3	80.2	49.1	58.2
Lampung	68.2	69.5	69.3	75.0	76.7	76.3	79.4	75.9	76.6
Total Sumatra^a	69.8	46.7	53.3	67.3	48.2	54.3	80.0	50.5	66.5
Kalimantan Barat	87.4	37.8	47.6	90.2	45.4	57.0	86.9	47.0	57.2
Kalimantan Tengah	64.2	20.5	30.4	67.4	34.8	43.9	69.5	40.9	49.3
Kalimantan Selatan	60.8	37.2	44.0	69.1	40.8	50.7	71.8	45.2	55.3
Kalimantan Timur	74.0	56.6	65.6	77.5	52.4	66.5	80.2	61.9	72.3
Total Kalimantan^a	71.6	38.0	46.9	76.1	43.4	54.5	77.1	48.8	58.5
Total 2 Islands^a	70.4	43.8	51.2	70.2	46.6	54.4	79.1	49.9	63.9
Total Indonesia^b	62.4	38.4	46.8	69.9	46.5	56.4	70.2	47.2	57.6

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).

Table A8.6: Percent of Households with Toilet Facilities

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	63.2	17.1	26.0	0.0	0.0	0.0	94.4	0.0	94.4
Sumatera Utara	60.3	11.3	30.9	71.4	20.2	42.1	73.9	22.5	44.8
Sumatera Barat	52.4	9.9	20.9	66.3	20.5	33.1	70.7	24.7	38.5
Riau	55.9	11.6	26.9	77.5	20.2	44.9	73.7	26.1	48.5
Jambi	59.2	9.0	21.7	70.7	17.4	31.7	73.9	23.1	37.4
Sumatera Selatan	45.8	11.3	21.7	49.9	22.6	31.7	63.8	15.4	31.9
Bengkulu	67.7	21.3	34.5	82.1	28.8	43.7	87.4	27.5	45.0
Lampung	66.9	18.8	26.2	66.8	24.9	33.3	68.2	31.8	39.7
Total Sumatra^a	58.9	13.8	26.1	60.6	19.3	32.6	75.8	21.4	47.5
Kalimantan Barat	53.8	8.9	17.8	81.2	18.3	34.6	73.1	22.4	35.4
Kalimantan Tengah	47.4	6.9	16.1	51.1	10.9	22.2	64.0	13.5	28.4
Kalimantan Selatan	39.4	11.6	19.6	51.2	19.6	30.6	56.6	24.0	36.3
Kalimantan Timur	59.9	18.3	39.8	73.3	16.8	48.6	76.1	34.7	58.3
Total Kalimantan^a	50.1	11.4	23.3	64.2	16.4	34.0	67.5	23.7	39.6
Total 2 islands^a	56.0	13.0	25.2	61.8	18.4	33.0	73.0	22.1	44.9
Total Indonesia^b	59.0	15.1	30.3	67.3	25.5	43.1	70.0	27.1	46.3

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).

Table A8.7: Percent of Households with Sewerage or Septic Tanks

Province	1995			2000			2002		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
D. I. Aceh	70.5	16.5	26.9	0.0	0.0	0.0	95.2	0.0	95.2
Sumatera Utara	60.8	11.7	31.4	73.2	19.3	42.4	74.8	20.9	44.3
Sumatera Barat	56.6	9.4	21.6	63.2	15.3	28.5	60.5	17.3	30.3
Riau	57.8	8.9	25.8	80.7	16.7	44.2	71.0	18.8	43.4
Jambi	58.2	6.8	19.8	69.1	15.4	29.8	67.0	16.1	30.4
Sumatera Selatan	55.1	10.2	23.8	66.1	21.2	36.2	69.9	12.2	31.9
Bengkulu	55.2	11.2	23.7	63.6	15.3	28.8	62.8	8.5	24.3
Lampung	51.5	9.1	15.5	52.6	14.3	22.0	52.6	17.4	25.1
Total Sumatra^a	58.2	10.5	23.6	58.6	14.7	29.0	69.2	13.9	40.6
Kalimantan Barat	52.6	6.6	15.7	68.7	12.0	26.7	64.8	11.8	25.4
Kalimantan Tengah	38.6	3.3	11.3	47.1	8.6	19.3	55.0	6.2	20.6
Kalimantan Selatan	32.6	7.0	14.3	40.8	12.1	22.1	42.9	11.6	23.5
Kalimantan Timur	58.5	15.1	37.6	62.4	11.0	39.9	69.1	25.5	50.4
Total Kalimantan^a	45.6	8.0	19.7	54.8	10.9	27.0	58.0	13.8	30.0
Total 2 Islands^a	54.0	9.7	22.3	57.3	13.4	28.3	65.5	13.9	37.1
Total Indonesia^b	55.7	12.6	27.5	62.6	20.8	38.5	63.2	20.7	39.8

^a Unweighted by population size.

^b Weighted by population.

Source: National Socioeconomic Survey (SUSENAS).