

## Summary of the Results of Terminal Evaluation

1. Outline of the Project	
Country: Republic of Mozambique	Project Title: Sustainable Water Supply, Sanitation and Hygiene Promotion in Zambezia Province
Issue/Sector: Water Resources Development	Cooperation Scheme: Technical Cooperation Project
Division in Charge: Group III (Water Resources and Disaster Management), Global Environment Department	Total Cost: Approximately 420 million yen
Period of Cooperation: (R/D: Nov. 30, 2006) Feb. 2007 to Jul. 2011 (4.5 years)	Concerned Organizations in the Partner Country: Supervising Organization: National Directorate of Water (DNA), Ministry of Public Works and Housing Implementing Organization: Provincial Directorate for Public Works and Housing (DPOPH) of Zambezia Province
	Supporting Organization in Japan: None

### 1-1 Background of the Project

The Republic of Mozambique's Zambezia Province is the largest of the country's 10 provinces. However, development of social infrastructure in the province is lagging. The percentage of the province's population that has access to safe drinking water was 16.3% (from contemporary UNICEF materials), which was below the national average of 36.6%. And the death rate among children aged less than five years was 321 in 1,000, which was the lowest among the ten provinces. Japan contributed to a higher water supply rate by building 152 hand pump-type deep wells in eight districts of northern Zambezia Province through grant aid. However, tying the effects of this grant-aid project to better health among residents required ensuring sustainable access to safe drinking water by reinforcing the system for maintaining and managing residents' water-supply facilities, developing sanitation facilities, and improving hygienic practices.

Given this background, the Government of Mozambique requested the implementation of a project to reinforce the maintenance and management system for water-supply

facilities that were constructed with grant aid and to improve sanitation through education on and diffusion of hygienic practices. Receiving this request, JICA dispatched a “water sector project advisor” to Zambezia Province in 2004. This advisor confirmed that there is a need to reinforce the maintenance and management system for water-supply facilities, and consequently JICA dispatched a basic study team in August 2005. The team reached an agreement with the Mozambican side that four of the eight districts that were targeted by the grant-aid project—namely, Mocuba District, Ile District, Gilé District, and Alto Molocue District—would be the focus of technical cooperation. A preliminary study team was dispatched in July 2006 as a step toward implementing the project. This led to an agreement on cooperation between the two sides and the signing of a Record of Discussions (R/D) for the technical cooperation project in November of the same year.

## 1-2 Project Overview

This Project is for the purpose of improving the sustainable use of existing water-supply facilities and hygienic practices in four target districts in Zambezia Province (Mocuba District, Ile District, Gilé District, and Alto Molocue District). It will reinforce government support systems (at the central government, DAS, and district government levels) and implement educational activities concerning the operation, maintenance, and management of water-supply facilities and improved hygiene for the target communities.

### 1-2-1 Overall Goal

1. To reduce water-borne diseases among residents in the target communities
2. To increase the number of operating water-supply facilities in the four target districts of Zambezia Province

### 1-2-2 Project Purpose

Sustainable use of existing water-supply facilities and hygienic practices will be improved in the target districts.

### 1-2-3 Outputs

1. Support systems to promote the maintenance and management of water-supply facilities and hygienic practices are reinforced through collaboration among government organizations (central government, Department for Water and

Sanitation [DAS] of the Provincial Directorate for Public Works and Housing [DPOPH], and district governments).

2. The target communities' capacity to operate, maintain, and manage water-supply facilities are strengthened.
3. Appropriate hygienic practices are promoted in the target communities.

#### 1-2-4 Inputs

- 1) Japanese side (total of approximately 420 million yen)
  - (1) Expert dispatch ("overall/rural water-supply and sanitation/organizational capacity building," "water-supply facility maintenance and management," "social surveys/PCM planning," "GIS," "work coordination"); total 52.73 M/M
  - (2) Third-country training in Brazil
  - (3) Equipment supply (vehicles, motorcycles, bicycles, survey equipment, office equipment, etc.)
  - (4) Local work expenses (approximately 146.73 million yen)
- 2) Mozambican side
  - (1) Allocation of counterpart personnel (26 counterparts)
  - (2) Provision of office space for the Japanese experts
  - (3) Coverage of local expenses: Counterpart salaries and allowances, fuel costs for motorcycles

2. Evaluation Team		
Evaluation Team Members		<p>(1) Leader: Mr. Shigeyuki MATSUMOTO, Director, Disaster Management Division 2, Group III (Water Resources and Disaster Management), Global Environment Department, JICA</p> <p>(2) Rural water supply: Mr. Yosuke SASAKI, Visiting International Cooperation Expert, Global Environment Department</p> <p>(3) Evaluation planning: Ms. Maki YOSHIDA, Disaster Management Division 2, Group III (Water Resources and Disaster Management), Global Environment Department, JICA</p> <p>Senior Volunteers</p> <p>(4) Evaluation analysis: Ms. Nahoko INADA, Consultant, IC</p>

	Net Limited (5) Interpreter: Ms. Sanae TANABE, Japan International Cooperation Center		
Period of Evaluation	January 15 to February 6, 2011	Type of Evaluation	Terminal Evaluation

### 3. Results of Evaluation

#### 3-1 Achievements of the Project

(1) Project Purpose: “Sustainable use of existing water-supply facilities and hygienic practices will be improved in the target districts.”

Indicator 1: The percentage of households using safe water as drinking water in the wet and dry seasons increases from 45.0% and 27.5% in Mocuba District and Ile District, respectively, to 80%, and from 39.2% and 47.5% in Alto Molocue District and Gilé District, respectively, to 70%.

Indicator 2: The percentage of households that engage in appropriate hand-washing increases from 3.6% and 2.5% in Mocuba District and Ile District, respectively, to 40%, and from 12.5% and 1.3% in Alto Molocue District and Gilé District, respectively, to 30%.

Indicator 3: The percentage of households that use toilets rises by 25% in all target communities by July 2009 in Mocuba District and Ile District and by April 2011 in Alto Molocue District and Gilé District.

There is a good possibility that the Project Purpose will be achieved. Indicator 1 has been largely achieved, and Indicator 2 has been achieved in all districts except Mocuba District. Indicator 3 has been achieved. The sustainable use of water-supply facilities has been improved compared to before the Project in terms of shorter facility breakdown times, etc. This has been because the roles and responsibilities of the provincial and district governments and communities have been clarified, and because a spare parts supply network, staff of repair personnel, and monitoring and communication system have been established. Improving hygienic practices are being demonstrated by increased consumption of safe drinking water and appropriate hand-washing as well as decreased outdoor excretion, and by the number of new toilets being constructed, which includes toilets built by residents themselves.

## (2) Outputs

1) Output 1: “Support systems to promote the maintenance and management of water-supply facilities and hygienic practices will be reinforced through collaboration among government organizations (central government, DAS, and district governments).”

Indicator 1: The district governments submit monthly monitoring reports to DPOPH/DAS.

Indicator 2: DPOPH/DAS prepares reports on the operating conditions of water-supply facilities; operation, maintenance, and management; and sanitation improvement in the four target districts each year.

Indicator 3: DAS and district governments prepare yearly activity plans based on the results of monitoring of operating conditions of water-supply facilities; operation, maintenance, and management; and sanitation.

Indicator 4: The time required to acquire spare parts is reduced to within three days in Mocuba District and Ile District by October 2008 and in Alto Molocue District and Gilé District by October 2009.

There is a good possibility that Output 1 will be largely achieved. Community-oriented support and monitoring systems provided by provincial and district governments in which Project C/Ps are assigned improved together with staff capabilities. Submittal of regular reports from district governments to the provincial government, and from the provincial government to the central government, is being conducted largely according to plan. These reports concern not only construction and repair of water-supply facilities but also content concerning their maintenance and management. DAS prepared an annual report in 2010. Moreover, it now has the ability to formulate annual plans based on the regular reports. Additionally, the establishment of a spare parts supply network has shortened the time required to obtain parts.

2) Output 2: “The target communities’ capacity to operate, maintain, and manage water-supply facilities will be strengthened.”

Indicator 1: The Water Management Committee submits a monthly monitoring report on the condition of water-supply facilities and operation, maintenance, and management activities.

Indicator 2: An amount of 4,000 MT is put aside to cover facility maintenance and management expenses in Mocuba District and Ile District by October 2009 and in Alto Molocue District and Gilé District by October 2010.

Indicator 3: The time during which water-supply facilities are out of operation is reduced to 14 days per year in Mocuba District and Ile District by June 2009 and in Alto Molocue District and Gilé District by April 2011.

Indicator 4: All maintenance groups (MG) in the target regions conduct monthly interior and exterior inspections of water-supply facilities after 2008 in Mocuba District and Ile District and after 2010 in Alto Molocue District and Gilé District.

There is a good possibility that Output 2 will be largely achieved. Work to strengthen the organization of operation, maintenance, and management of water-supply facilities at the community level has facilitated organized facility management. Communities now have the ability to hold regular meetings of facility users, accumulate usage fees for maintenance, and conduct cleaning and simple maintenance. These achievements are also expressed in various indicators that include submittal of monitoring reports to the provincial government, growing accumulation of funds set aside for maintenance costs, and shorter facility breakdown times. Facility exteriors are checked each day.

Output 3: “Appropriate hygienic practices are promoted in the target communities.”

Indicator 1: The ratio of students to restrooms (toilets) is approximately 150:1 in all target schools by July 2009 in Mocuba District and Ile District and by April 2011 in Alto Molocue District and Gilé District.

Indicator 2: The percentage of students who practice appropriate hand-washing after excretion is at least 50% in all target schools by July 2009 in Mocuba District and Ile District and by April 2011 in Alto Molocue District and Gilé District.

There is a good possibility that Output 3 will be largely achieved. The sanitary environment has been improved at target schools with the continuing construction of storage tanks for rainwater hand-washing and toilets. As a result of educational activities by hygiene extension workers, community volunteers, and teachers and children's groups in schools, the importance of hand-washing with flowing water and excretion using toilets is now understood by residents and children in the target communities. These activities are thus leading to behavioral changes. Indicator 1 has been achieved with the exception of two schools that had a higher than expected number of students, and Indicator 2 has been achieved in all districts except Gilé District.

### 3-2 Summary of the Evaluation Results

#### (1) Relevance

The Project has high relevance.

- The Mozambican side's "Strategic Plan for Rural Water and Sanitation 2006-2015" (PESA-ASR) and "National Rural Water Supply and Sanitation Program" (PRONASAR) call for the achievement of a water supply rate of 70% and sanitation facilities diffusion rate of 50% by 2015 based on the Millennium Development Goals (MDGs) and the transfer of authority to the community level through decentralization of the water-supply business. Thus, the Project is deemed to be in agreement with Mozambique's policies.
- The Rolling Plan for Mozambique within Japan's ODA scheme establishes water supply as a priority sector. In addition, TICAD IV's "Water Development in Africa" calls for the supply of safe drinking water to 6.5 million people. Thus, the Project is consistent with the policies of the Government of Japan.
- The target regions and target communities were selected based on a KAP (knowledge, attitude, and practice) survey and baseline survey that were conducted immediately after the Project's launch. However, sites with inoperative water-supply facilities were also added based on the recommendations of a subsequent advisory study team to allow the handling of various cases. Accordingly, the Project's selection of target groups is appropriate.

#### (2) Effectiveness

The Project has high effectiveness.

- The level of achievement is high for almost all indicators of the Project Purpose. Achievement for Output indicators is also high. The following improvements that were achieved through each of the Outputs are leading to expected achievement of the Project Purpose: (1) Appropriate maintenance and management of water-supply facilities by water-supply committees and maintenance groups for sustainable use of water through utilization of existing water-supply facilities; (2) shortening of water-supply facility breakdown times by establishing a spare parts supply network for facilities and building relationships between repair personnel and communities; and (3) implementation of appropriate hand-washing following excretion by residents and construction of toilets. Thus, the Project's effectiveness is recognized
- Factors that contributed to achievement of the Project Purpose included stronger sanitation awareness among residents that resulted from a cholera outbreak in Zambezia Province in 2008, and a President-led "national sanitary environment campaign" that was launched in 2008 to improve sanitary environments and that spurred politicians and the leadership class to get involved.

### (3) Efficiency

The inputs were largely executed according to plan and were utilized efficiently. However, considering the workload and types of duties given to the Japanese experts as well as the vast size of the target region, it is thought that securing greater expert involvement in the first half of the period of cooperation would have made a more efficient Project possible.

- Based on interviews with C/Ps and experts, it is apparent that many high-quality inputs were made at appropriate times, and as a result the Project is being managed efficiently. However there were also a few problematic points. Activities were slightly delayed during the project period's first half due to, among other factors, an insufficient use of Japanese experts and late payments of monitoring costs by the Mozambican side.



- The Project's staged approach, which first placed focus on two districts rather than on all four districts simultaneously, was efficient from the two standpoints to be mentioned in "3-3 Factors promoting the production of effects."

#### (4) Impact

Multiple positive impacts are recognized, and it is anticipated that the Overall Goal will be achieved by 2014.

- The diarrhea rate in the target communities is declining in all districts with the exception of Ile District. Moreover, although the operating rate of water-supply facilities in the target districts is unchanged in two districts, it is improving in the other two districts. Thus, there is a good possibility that the Overall Goal can be achieved; however, initiative on the part of the provincial and district governments will be required here.
- Coordination among the various actors, which include water and sanitation committees, is well demonstrated in the operation, maintenance, management, and monitoring of water-supply facilities and establishment of a spare parts supply network. District C/Ps have shown interest in the spillover effects the above-mentioned coordination mechanism can have on other regions and are providing training to repair personnel in communities outside the target communities. Accordingly, it is possible that water-supply facility operation rates will rise in those communities as well. Here, monitoring of Project activities by district C/Ps is important.
- Regarding reducing water-borne diseases and increasing the number of water-supply facilities, which are indicators of the Overall Goal, there are both impeding and promotive factors existing for each. These factors will be considered at the post-project evaluation stage. For onset of diarrhea, the impact of external factors must be considered in addition to those factors that are targeted for improvement under the Project (namely, water quality, sanitary environments, and hygienic practices). These external factors include: (1) amount of water needed for a sanitary living environment, (2) climate, (3) other diseases that produce diarrhea symptoms, (4) individual immunity, (6) malnutrition, and (8) movement of people carrying disease sources, regardless of their exhibition of symptoms.

- The following can be listed as positive impacts of the Project: (1) growing interest in the Project's hygiene education activities among residents of non-target communities; (2) a detailed activities plan for the water sector formulated by DAS that includes building of a water-supply facility spare parts network and training of repair personnel for a micro-fishing assistance project supported by Norway; (3) application of the school hygiene education program used in the Project in other schools by district C/Ps in the education sector; (4) expanding activities by the water supply and sanitation coordination committee in Alto Molocue District; and (5) a study by the provincial government on utilizing experiences gained from the Project in PRONASAR.
- Project experiences were shared with numerous stakeholders at a seminary organized jointly by DNA, the Japanese embassy, and JICA in August 2010.
- No negative impacts by the Project were found.

#### (5) Sustainability

It is expected that improvements will be seen in the skills and capacities of C/Ps, and that progress will be made in terms of policy, organizational, and financial aspects with the start of PRONASAR. However, to realize this expectation, it will be necessary to take the measures described in "3-6 Recommendations."

- PRONASAR, which was launched in 2010, includes attention to the operation, maintenance, and management of water-supply facilities. In Zambezia Province, three of the Project's four districts are targeted by PRONASAR's first phase. Moreover, provincial and district C/Ps are gaining the attitude needed to fulfill their duties with confidence, and therefore it is possible that they will remain in their current positions. There is also the possibility that PRONASAR will increase its staff. Given these circumstances, the Project is recognized to have sustainability in terms of policy and institutional aspects. Looking forward, the central and provincial governments will need to review the tools, model, educational materials, and experiences that were developed through the Project and analyze their applicability in PRONASAR.
- Funds from PRONASAR are being allocated to Zambezia Province. Thus, the Project's financial sustainability is secured.

- The skills and methods presented by the Project are being accepted by the C/Ps, presented at seminars conducted at the central government level, and recognized as a model that should be applied nationwide. These developments are motivating C/Ps to extend the skills and methods to other regions. In addition, skills associated with operation, maintenance, and management of water-supply facilities have high versatility that makes them applicable by other donors and NGOs. Accordingly, it is possible that the Project can achieve technical sustainability. Realizing this possibility will require continuing on-the-job training at the district C/P and community levels.
- Much of the education activity of the Project is handled by PEC extension workers (extension workers that provide education to residents in line with rural water supply and sanitation) on a contract basis. Because of this, ensuring sustainability will require transferring this activity to district C/Ps. Furthermore, sustainability must be secured by intensively promoting activities in the target districts of Stage 3, where activities begin in the second half based on the Project's staged approach.
- To ensure the continuation of hygiene education at schools, collaboration with C/Ps in the education sector must be reinforced, a positive relationship must be built between schools and the community, and teachers in charge of hygiene education must be trained in preparation for future transfers of teachers in charge to other assignments.

### 3-3 Factors promoting the production of effects

#### (1) Factors pertaining to the plan's content

The use of a staged approach for the Project was effective from the following two standpoints. (1) Due to the vast size of the target districts, simultaneously beginning activities in the four districts would have made visiting all sites equally difficult. (2) Given that a certain of time was required to cultivate C/Ps understanding of the Project and improve their skills, applying the experiences and lessons learned gained up to Stage 2 helped activities in Stage 3 proceed more efficiently.

The prepared model was made more practical with the use of numerous diagrams and illustrations and easier to use by repeatedly modifying it as it was utilized by communities and C/Ps.

The following four factors contributed to shortened inoperative periods for water-supply facilities: (1) building of a spare parts supply network; (2) training of repair personnel; (3) clarification of the division of roles; and (4) use of monitoring sheets.

#### (2) Factors pertaining to the implementation process

Sharing of advice on Project operation and coordination among the implementation actors are taking place at regularly held JCC (once yearly) and PSC (twice yearly). These meetings are confirming the progress of activities with skillful use of PDM and the manifestation of Outputs.

Efforts to persuade district governors, teachers, town mayors, and other leaders to participate in various meetings designed to improve understanding of the Project helped raise awareness and proficiency in each organization.

#### 3-4 Factors inhibiting the production of effects

##### (1) Factors pertaining to the plan's content

None in particular

##### (2) Factors pertaining to the implementation process

Dispatching Japanese experts for longer periods of time during the period of cooperation's first half may have been helpful in more efficiently promoting understanding of the Project and capacity building among C/Ps and concerned actors.

#### 3-5 Conclusion

The Project's implementation is recognized to have high relevance and effectiveness. The inputs were largely executed according to plan and were utilized efficiently. However, the team believes that dispatching Japanese experts for a longer period of time during the first half of the period of cooperation would have made a more efficient project possible. As for Project impacts, multiple positive impacts are recognized, and thus the team anticipates that the Overall Goal will be achieved by 2014. And as for sustainability, is expected that improvements will be seen in the skills and capacities of C/Ps, and that progress will be made in terms of policy, organizational, and financial

aspects with the start of PRONASAR. However, to realize this expectation, the team believes that the measures described in the “recommendations” below will be required.

The team concludes that achievement of the Project Purpose is highly likely, and thus ending the Project according to schedule is appropriate.

### 3-6 Recommendations

#### (1) Short-term recommendations (until completion of the period of cooperation)

- Activities must be implemented with consideration for conditions and issues in each community and district. The following items should be studied in order to ensure sustainability.
  - ✧ Given that the Project’s conclusion will also mean the end of PEC activities (education to residents in line with rural water supply and sanitation), hygiene education activities in communities and schools should be transferred from PEC extension workers to district C/Ps.
  - ✧ Full attention should be paid to activities in the target districts of Stage 3 in order to fully execute the activities that are planned for Stage 3 and achieve Project effects.
  - ✧ The coordinative abilities of water supply and sanitation coordination committees at the district level should be strengthened. For example, hygiene education is being provided at schools, and responsibility for monitoring this activity at schools belongs to education officials. Thus, collaboration in school monitoring by C/Ps in the education sector and C/Ps in the infrastructure sector of the district governments is important from the standpoint of ensuring the sustainability of this activity. Collaboration between the health sector and infrastructure sector is similarly important for hygiene activities in the communities.
  - ✧ A positive relationship between target schools and their surrounding communities should be built. This is effective in preventing theft of water-supply and sanitation facilities and supporting hygiene education at schools.
  - ✧ It has been determined that hygiene education in schools tends not to continue when the teachers in charge are transferred to new assignments. Accordingly, new teachers in charge of hygiene education should be trained in preparation for such cases. In addition, new repair training should take place so that vacancies for repair personnel can be filled.

- ✧ When teachers in charge of hygiene education in schools are posted to new assignments, C/Ps in the education sector should follow the transfer of responsibility for this education between teachers.
  - ✧ Obtaining spare parts should be made easier for communities by incorporating the *localidade* level, which is the level below the district level, into those spare parts supply networks for water-supply facilities that are currently functioning well.
  - ✧ Lessons learned and recommendations should be obtained from those C/Ps who have already begun voluntary efforts to extend the Project's activities to other regions.
- At the end of the Project, it will be important to show concretely the priority of targets (e.g., region, organizations, facilities, etc.) and activities (e.g., monitoring, PEC activity, facility repair, capacity building, etc.) to C/Ps and policy makers.
  - Japanese experts and persons in charge of provincial C/Ps that oversee the database should update the existing water-supply facility inventory and add additional data items (e.g., water-supply facility depth and type, activities of water and sanitation committees, and breakdown times and reasons for breakdown as required). This information will be essential when formulating yearly facility repair plans at the provincial and district levels following the end of the Project.
  - The team recommends that Project personnel and the JICA Mozambique Office should promote sharing of information on Project experiences to stakeholders in the water-supply and sanitation fields. Participants in a seminar held in 2010 showed strong interest in the model and tools that were developed by the Project. Publicity can also provide an important opportunity for highlighting the importance of strengthening the operation, maintenance, and management of water-supply facilities.
- (2) Long-term recommendations (after completion of the period of cooperation)
- The team strongly recommends that provincial and district C/Ps remain in their positions for a certain length of time to ensure the continuation of Project activities as well as community monitoring and supervision. It will also be important for the provincial and district governments to secure the annual budgets necessary to

continue the maintenance and management of water-supply facilities as well as monitoring and supervision of hygiene education activities.

- The team expects all counterpart organizations to continually emphasize the importance of operating, maintaining, and managing water-supply facilities. It also recommends that these organizations provide support that allows C/Ps to engage in continuous monitoring and supervision. It will be important for DAS to explain the importance of this point directly to new leaders whenever there are changes in leadership at the provincial, *localidade*, or community level.
- The funds that communities accumulate for repair of water-supply facilities are intended solely for minor malfunctions. Accordingly, the provincial and district governments will need to handle the repair of major malfunctions and replacement of facilities that are beyond their serviceable life.
- Whenever an NGO or donor drills a new water-supply facility, it will be important for the provincial government to ask that organization to be sure to implement PEC activities. The long-term use of facilities will prove difficult without the establishment of water and sanitation committees and capacity building for facility maintenance and management.
- By eliminating overlap in activities among different sectors and reinforcing water and sanitation coordination committees that are comprised of representatives of the infrastructure, health, and education sectors, it will be possible to realize organized and continuous activity that sustains and improves the quality of efforts to improve sanitation and hygienic practices in communities. Specific examples of efficient approaches include ensuring regular communication among persons in charge, planning of community visits by utilizing opportunities presented by other work activities, and linkage of school events, health activities and water/sanitation promotion activities.
- The team recommends that the central and provincial governments review the tools, model, educational materials, and experiences that were developed through the Project and analyze their applicability in PRONASAR.

- The team recommends that the provincial and district governments place priority on the construction of water-supply facilities in schools as well as sanitation facilities and rainwater collection systems in their annual plans.

### 3-7 Lessons Learned

- The Joint Coordinating Committee (JCC) and Provincial Steering Committee (PSC) can be strategically utilized to promote stakeholders' participation and manifest effects from Project activities. These organizations should be actively utilized as venues for expanding recognition of Project activities and their Outputs by consciously securing the participation of the upper management of administrative organs that need to be informed about the Project's activities as well as important stakeholders. At the same time, consciously creating opportunities for C/Ps to make presentations and engage in discussions in meetings of these organizations and encouraging awareness and appreciation of the Project's activities among those in attendance are effective in fostering a stronger sense of ownership among C/Ps and building enthusiasm for the Project.
- The team observed that the level of achievement of indicators concerning the activities of provincial C/Ps; hygiene education activities at target schools; and improvement of water supply, sanitation, and hygienic practices in the communities tends to match the degree of Project understanding and awareness among people in leadership positions (e.g., provincial governor, teachers, mayors, etc.) and level of proficiency of each organization. Given this, steps to reinforce understanding of the Project among organizational leaders as well as capacity development for awareness-building and organizational reinforcement are required.
- The monitoring model was made practical by using diagrams and illustrations to show relationships among actors and their roles. This easy-to-use model for users was developed by repeatedly modifying it as it was used by communities and C/Ps. Rather than preparing manuals with many pages or highly complete manuals with greater input from expert teams, it is better to place emphasis on preparing easy-to-understand materials by including the views of C/Ps and users.
- The following four factors contributed to shortened inoperative periods for water-supply facilities. Consideration of these factors should prove useful when



designing similar projects that seek to build maintenance and management systems for rural water supply and sanitation.

- ✧ Establishment of a spare parts supply network: Storing spare parts within communities, repair shops, and the provincial government; actively notifying water and sanitation committees and maintenance groups that manage water-supply facilities of places where spare parts can be obtained when needed; and monitoring of inventories and provision of appropriate advice by provincial C/Ps were effective steps.
- ✧ Training of repair personnel: Providing communities with complete information on the repair personnel in charge allowed their maintenance groups to easily and quickly ask for assistance. Moreover, provincial C/Ps monitored the work quality, skills, and capabilities of repair personnel and reflected what they learned on license renewal.
- ✧ Clarification of the division of roles: The Project clarified roles to be undertaken by the communities, districts, and province in maintenance, management, and repair.
- ✧ Use of monitoring sheets: The Project developed a monitoring form that communities can fill out on their own. This promoted collection of statistical materials, ascertainment of current conditions, and information-sharing for quick intervention.

3-8 Follow-up

Not applicable