



Bringing Water to the Poor

Selected ADB Case Studies

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Introduction

Asia is home to nearly two thirds of the world's poor—the people hardest hit by water-related problems that threaten their very survival. They are particularly vulnerable to scarcity, pollution, drought, and flooding, all of which burden their health, productivity, and quality of life. Yet Asia's freshwater supplies are among the world's lowest. Today, the technology and the resources exist to send rocket ships into space regularly, to manipulate satellites hundreds of miles above the earth, and even to remotely control vehicles on Mars. Yet in this thoroughly modern world, hard as it is to believe, one in three Asians still has to walk at least 200 meters to fetch drinking water, and one in two Asian families does not have access to proper toilet facilities. The vast majority of these people—some 90%—live in rural areas, but large numbers also congregate in cities, where polluted drinking water and sewage-choked canals create appalling living conditions.

Assistance in the water sector has been a crucial part of the Asian Development Bank's (ADB) work in its developing member countries (DMCs) since the organization was chartered in 1966. To date, ADB's cumulative financing for water projects has exceeded \$17 billion and accounts for some 20% of ADB's total lending portfolio. ADB water sector projects cover a broad range of activities including: supply and sanitation, irrigation and drainage, flood management, hydropower, watershed and river basin management, inland fisheries, and transport.

In recent years, ADB has restructured its operations to concentrate efforts more directly on reducing poverty in the Asia and Pacific region. All ADB activities—including water sector operations—are now measured by their contribution to poverty reduction. ADB's water policy, "Water for All," recognizes that the voice of the poor in water resources decision making, empowering communities,



and making governance more transparent and inclusive are prerequisites for sustainable and equitable water services.

As the lead agency in the Water and Poverty Initiative—a multiagency partnership forged in preparation for the 3rd World Water Forum in Kyoto, Japan in March 2003—ADB works with collaborating organizations toward the shared goal of improving water security for the poor. The initiative recognizes that water needs are intricately woven through the daily lives of poor communities. It highlights four aspects as critical to improving the lives of poor people in Asia and the Pacific: the availability of water for production and income generation; water, sanitation, and hygiene for health; sustainable environmental management; and vulnerability to water-related disasters.

This publication presents 12 case studies that give an overview of the types of poverty reduction projects ADB is either currently engaged in or has recently undertaken in the water sector. They are taken from a range of ADB's DMCs and cover issues from water supply and sanitation to irrigation and drought relief. They represent a variety of development approaches, including: loans (water supply in the Philippines and Pakistan); technical assistance projects (community awareness and health in Viet Nam), and partnerships (donor cooperation on water supply for Timor-Leste). The cases highlight projects at various stages of completion, including: project design (sanitation in Papua New Guinea); midterm review (water supply and sanitation in Kiribati); complete, evaluated loan projects (irrigation and water supply in the Philippines); and innovative approaches to tackling complex water supply issues (the role of small-scale water providers in serving the urban poor).

ADB is committed to expanding its water sector activities even more to help further global efforts to meet the Millennium Development Goals and the new commitments on water and sanitation made at the 2002 World Summit on Sustainable Development in Johannesburg. To learn more about the ADB water policy and sector activities, visit www.adb.org/water.

1



Ladies First: Accessible Water for Entrepreneurial Women in Pakistan

Background

It can be said that poverty in Pakistan has a woman's face. Among Pakistan's poorer households, the incidence of chronic malnutrition in female members of a family is considerably higher than in other members. These are the same women and children who have to walk considerable lengths daily carrying heavy water pots on their heads to fetch water from a distant pond—water from which cows and water buffalos sometimes bathe. This task becomes especially difficult in bad weather. As this responsibility and other culture-specific restrictions deprive girls of schooling and other opportunities to advance themselves, many Pakistani girls grow up trapped in a web of dependency and subordination because of their low social, economic, and political status in society.

Farzina, a college student from Punjab, recounts: "Girls wanted to go to school, but there was no time. Mothers would say, 'first you must fetch the water, then you can study.'" In Farzina's village, children often spent 5–6 hours a day fetching water.

The children of Sughran Bibi also used to spend much of their day fetching water. Their story is typical in Punjab.

We used to get our water from a pond used by animals. It was so dirty. Then, they dug a well, but we had to line up all day under the sun, to get a little water. The water wasn't good. It was brackish. We didn't have clean water, even for funerals. Many children would get sick with diarrhea. There was cholera in the rainy season and malaria because of the mosquitoes breeding in the stagnant water. And we had no money to go to the doctor. Life was so bad. Some families left the village and moved to the nearby town, Bahawalpur. But now that we have clean water, they have come back. Now I have time for sewing and embroidery. I make clothes that I sell.

Moreover, her children are now going to school.

Through the Punjab Rural Water Supply and Sanitation Sector Project¹ funded by the Asian Development Bank (ADB), the women of Punjab gained easy access to clean drinking water—a radical change that will continue to uplift their lives for generations.

Punjab, the largest province in Pakistan, is home to 62% of the country's total population of 135 million. About 60% of Punjab's 84 million residents live in some 27,000 rural settlements, where only about half of the population has an adequate supply of water. Until recently, the remainder of rural Punjab relied on often distant sources of unsafe water, such as uncovered wells, rivers, and canal or rainfed ponds. As for sanitation, only a little more than 25% of the rural population has access to household latrines. The remainder of the population defecates in open areas, a situation that is particularly difficult for women, as by custom, they can only use the fields either before sunrise or after sunset. Drainage is also very poor in rural areas, and maintenance of drains is commonly neglected. In addition to the obvious unpleasant odors, this results in infestations of disease-bearing insects such as flies and cockroaches—a source of health problems for adults and children alike.

Project Description

Objectives

The Government of Pakistan has been concerned about the inadequate provision of social services, especially in rural areas, for it believes that greater investments in such projects will stimulate productivity, reduce poverty, and promote smaller, healthier, and better-educated families. Nationally, the Government has identified low water supply and sanitation coverage as one of the major issues confronting the water supply and sanitation sector. With the help of the Punjab Rural Water Supply and Sanitation Sector Project, the Government sought to bring safe drinking water and sanitation facilities to poor rural communities in Punjab province.

The overall goal was to build community water supply and drainage facilities in order to reduce poverty and the improve quality of life as well as the living conditions of rural communities in Punjab province, where water is scarce and groundwater, brackish.

¹ Punjab Rural Water Supply and Sanitation Sector Project (Loan No. 1349-PAK [SF]), approved in 1995 and closed in 2002.



Activities

The project provided safe drinking water and drainage facilities to about 800,000 people through simple, low-cost subprojects that used the community-based approach. The primary beneficiaries were women and children from 335 mostly poor and remote villages in Punjab's seven priority districts.²

It was the first project in Punjab to employ a community-based, demand-driven approach, wherein the local people participated from the planning through the construction stage and eventually became fully responsible for operation and maintenance (O&M) costs.

Men and women formed community-based organizations (CBOs) to maintain the water supply distribution system, drains, and oxidation ponds, as well as to promote social development work and livelihood activities. They solicited community donations of land—for the construction of pump houses and oxidation ponds—and earthwork—for paving streets and constructing drains. CBO members also successfully facilitated the collection of tariffs.

Community involvement in project planning, design, and implementation was a key feature of the project. This set the stage for the CBOs' proper O&M of the water supply and sanitation schemes. They were trained to supervise the construction before the subprojects were implemented. Before the subprojects were handed over to CBOs, they were trained in efficient O&M, including financial management, technical operations, and water quality monitoring.

As the primary beneficiaries of the project, women were encouraged to carry out subprojects, operate and maintain them, collect tariffs, and evaluate projects as active participants in CBOs and community development units. Community development unit staff and CBOs were mainly responsible for community benefit monitoring and evaluation, another key feature of the project. This involved the

² Of a total of 34 districts.



Evaluation

collection of baseline data and information on performance indicators, data analysis and evaluation, and the preparation of biannual benefit monitoring and evaluation reports.

A Hygiene Education Program also held 4-day seminars in each village using video and audio clips as well as flip charts to teach men, women, and school-children about proper sanitation and cleanliness. As part of this program, latrines were also sold for about \$12 to be paid in installments under the supervision of CBOs.

Monthly user fees ranged from Rs50 to Rs150³ for piped water and up to Rs20 for gravity-based systems. Community pressure and prompt disconnection of services for nonpayment of accounts generally made tariff collection easy.

Following the provision of clean water, the number of children enrolled in schools increased and community members donated their labor to expand schools.

Since the project was completed, the availability of water has significantly transformed the lives of women and girls in these communities. They previously spent from 2–6 hours a day gathering water, and an additional 5–8 hours a week washing clothes at sources far from their homes and villages.

A survey showed that when relieved of water collection, women become increasingly involved in income generation—the women surveyed said that about 45% of their time saved is used for income-generating activities. Knowing this, some CBOs have started programs such as needlecraft and handicraft. One women's CBO in the north set up a school for girls, employing two female teachers; another provided financial support for women to establish a small flour mill. Still another helped set up a corner grocery store in the village.

Women in Punjab now command an average wage of Rs5 an hour. The monetary value of the time saved could add about Rs135 to Rs337 monthly to household incomes in the project area. Relief from the heavy labor of carrying water home also gives the women more energy. In many villages, households saved money on medicines as a result of improved health.

So far, monitoring of the project has shown impressive results, including a more than 90% reduction in reported water-related diseases, an average increased household income of 24%, and as much as an 80% increase in the school enrollment of children.⁴ The monitoring report also notes a considerable improvement in the local environment (e.g., decreased odors and insects) and fewer sick days reported throughout the community.

Lessons Learned

- To ensure the sustainability of community-based projects, both men's and women's community groups should be involved in planning, design, implementation, and O&M, and CBOs should be trained at an early stage of project implementation.

³ Rs1 (Pakistan rupee) = \$0.0317524, \$1 = Rs31.4937 (1995) ADB. 2002. *Key Indicators 2002*. Manila.

⁴ From the benefit monitoring and evaluation report.



- Subproject selection criteria should be widely disseminated to ensure transparency and proper interpretation.
- The community is often more willing to pay for services than expected.
- The local private sector usually responds well to small rural water supply and sanitation schemes, and these are generally efficient and cost-effective.
- Construction activities should be properly packaged to capture economies of scale.
- More attention must be given to gender considerations as well as to sanitation and hygiene education to achieve lasting results.
- Delays in implementation can be avoided by requesting proforma approval from the planning commission establishing the project management unit, appointing the project director and staff, recruiting consultants, and prequalifying contractors, before the loan takes effect.
- Electrifying the pumping wells in advance would have avoided delays in operationalizing several subprojects.
- To ensure good quality construction and timely completion, payments to contractors should be linked to consultants' verification of the quality of the work.
- Low salaries can result in a high turnover of community development unit staff, which can adversely affect the progress of implementation and the quality of the unit's activities.

Although this project has not yet been evaluated by an ADB postevaluation mission, there are positive indicators of substantial transformation and social upliftment, as well as considerable increases in household income.

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2



Building Gender-Responsive Water User Associations in Nepal

Background

In Nepal, agriculture is the primary mainstay of 80% of the population. Women compose 78% of the agricultural labor force and men 57%. Poverty is widespread, with an estimated 42% living below the poverty line. Farms have an average size of less than 1 hectare (ha) and are mostly highly fragmented (with an average of four parcels) and scattered, creating difficulties in the efficient use of land and farm labor. Men migrate in search of work, leaving women as the primary decision makers in households and farms, especially among low-income households. In an effort to accelerate agricultural production, the Government of Nepal concentrated its efforts on expanding irrigation facilities. But despite increased investment, government-managed irrigation schemes fell far below expectations. The completed infrastructure was neither maintained nor operated efficiently. As a result, the schemes performed poorly and heightened inequalities and inefficiencies in the distribution of irrigation water.

The Government responded in 1992 with a major policy shift focusing on improving management, farmer participation in all stages of project implementation and operation and maintenance (O&M), and transfer of

management to water users associations (WUAs). The intention was to encourage users to take full ownership and responsibility for managing the technical and financial aspects of the lower tiers of the irrigation system. The degree of success, however, has varied. One of the reasons is unequal participation among users, in particular women. Women's roles as irrigators, water users, and farmers have often been overlooked and irrigation interventions based on such an incomplete understanding tend to be ineffective.

Women's roles and responsibilities vary depending on their crop (field or homestead gardening), geographical location, ethnicity/caste, and head-of-household status. Contrary to the prevailing belief that irrigation tasks are confined to men, irrigated agriculture is a joint responsibility of husband and wife. Women are involved in O&M activities at the field channel level. They open and close the earthen outlets to irrigate the fields, weed and de-silt canals, and make minor repairs in rodent-damaged channels. In areas where men have migrated in search of seasonal labor, women also participate in water allocation and distribution tasks. But getting women involved in WUAs has been a challenge. It was not until 1997 that the Government amended the irrigation policy to mandate a minimum woman's representation of 20% in WUAs.

The Asian Development Bank (ADB) provided loan assistance in the amount of \$18.4 million to the Government to refine and institutionalize the transfer of O&M and/or ownership of public irrigation schemes to farmers. The Irrigation Management Transfer Project (IMTP) was implemented from 1995–2003. A small grant-based pilot project from the Gender and Development Initiatives Fund, financed through the Japan Special Fund, was started in 2000 to test how



gender concerns could be effectively addressed in the IMTP. The pilot site selected was Panchakanya, one of the 11 subprojects of the ADB-assisted IMTP.

Project Description

Objectives

Panchakanya, in the Central Development Region of Nepal, was rehabilitated through the IMTP. It was originally built by a local landowner in the mid-1970s. It gets its water from the confluence of five springs, collectively called the Panchanadi. The Government modernized the canal between 1977 and 1979. In the process, infrastructure was rebuilt and absorbed into the domain of the Government, and the management functions of the indigenous WUA were taken over by the Government. Under the IMTP, the management of Panchakanya was formally turned over to the WUA in 1998.

Panchakanya provides irrigation water to 1,200 households living within a command area of 600 ha. The system has a 5-kilometer main canal and nine branch canals. The service area includes 17 settlements that are well connected to the highway by gravel link roads. The valley plains are almost flat, and the climate is subtropical with hot and humid summers and cool dry winters. Rice, maize, wheat, mustard, and pulses are the dominant crops.

Although Panchakanya had been fully turned over to the WUA, it was struggling with a high level of illegal canal cutting and encroachment. The pilot project was developed to test and document ways in which women could better contribute to irrigation management, cost recovery, and improved agricultural production, and to identify strategies for incorporating gender concerns in the remaining subprojects of the IMTP. It was implemented by a nongovernment organization (NGO) for over a year.

Activities

At the start of the pilot project women composed 25% of the WUA, and most felt they had been included simply to meet the Government's mandated quota for women. The challenge was to mobilize beneficiary willingness and support for more effective participation of women in WUA decision making. Women were found to be particularly interested in pursuing technical topics such as water management, cropping patterns, and canal protection. Therefore, to increase understanding of how the irrigation distribution system worked, a three-dimensional model of the Panchakanya system was developed with the participation of female and male WUA members. The group then created a Women's Facilitator Group (WFG) which comprised 23 women leaders and two men representing the main, branch, and outlet canals as catalysts for change. The WFG then identified its own training needs, which included building its technical capacity for canal O&M and water distribution and management, increasing gender sensitivity, strengthening the WFG's organizational development skills, and observing improved farming practices firsthand by visiting agricultural centers, farms, and research stations. After the training the WFG members organized themselves into small groups to motivate women and men throughout the command area to work for more equitable distribution of water.

Evaluation

The pilot project was considered highly successful in securing women's participation in decision making. It demonstrated that the establishment of the WFG is a viable option allowing women to influence strategic planning. It contributed to balancing membership in the WUA main committee and providing critical support to women members, thereby ensuring shared control over decision making. The project assisted the WUA in (i) amending the WUA constitution to allow the membership of wives and adult male and female children of households with landownership certificates; (ii) incorporating the WFG as an organ within the WUA hierarchies; (iii) increasing women's representation in the WUA to a record high of 60% within a year; and (iv) building an additional 500-meter canal, thereby exceeding by 50 ha the total irrigated area that the project aimed to achieve.

However, when the pilot project was midway through implementation, an unforeseen setback occurred. Three influential individuals from outside the command area bought the upstream land where the canal's water sources were located, a stretch of 11 ha, and developed a fish farm. The WUA at the time of management transfer was unaware that the water sources of Panchakanya were located on private land. A land-use decision by the new owners was also a water decision that affected those downstream.





Since the inception of the pilot project, the WUA, with the support and cooperation of its WFG, had improved the physical productivity of the water. It had invested NRs91,719.35¹ in canal cleaning and increased the water supply. The construction of three large fishponds by the new owners had caused the water supply of the system to drop from 915 liters/second to 350 liters/second. These developments threatened to destroy the livelihoods of 1,200 households and nullify the efforts of the pilot project. While the WUA vented its frustration by demolishing a part of the embankment, it pumped water from dug wells into the canal to tide the farmers over during the planting season. This action increased beneficiary confidence in the ability of the WUA to serve its members. After protracted discussions, the WFG and WUA successfully negotiated an acceptable solution with the new landowners. The new owners agreed to divert water to the canal once the fishponds reached an agreed water depth.

At the end of the project, 80% of the households were paying the irrigation service fee, thus demonstrating user interest in sustaining the benefits. There was increased support for regular canal-cleaning activities, thereby reducing O&M costs and improving water productivity. Water theft was controlled as both women and men exerted coordinated social pressure. The project offered new opportunities for women

¹ NRs1 (Nepalese rupee) = \$0.0133424, \$1 = NRs74.949 (2001) ADB. 2002. *Key Indicators 2002*. Manila.

to be represented and resulted in greater equity between the head and tail ends of the irrigation system and improved agricultural production.

The pilot project clearly demonstrated the potential for increasing women's participation. It also confirmed how a program designed to raise the technical knowledge of women can contribute to making women more confident to participate more effectively in mixed groups, and become mainstream participants in the IMTP.

At the individual level, capacity-building training has enabled women to get a firm handle on the irrigation system. This in turn has contributed to building confidence to participate in decision making and speak up in WUA meetings. With support from the WUA, the WFG has participated in discharge measurement and integrated pest management training, demonstrating its capacity to demand services from government district line agencies. In addition, women have undertaken trial agricultural practices, such as switching from mono- to multi-cropping and improving livestock feed, and have established a savings account from which the women can borrow for both production and consumption needs. The WFG has linked with a local NGO for technical support related to agriculture and crop diversification. The WFG's increased organizational capacity also enabled it to play an important role in conflict resolution.

Lessons Learned

- Women need adequate access to information; otherwise they quickly start to fall behind the learning curve.
- Efforts to improve gender responsiveness must be part of an overall process of institutional development so that men understand and support the changes taking place in social organizations.
- Projects that advocate participatory processes need to plan with women, not around them.
- The major lesson for ADB is the need to secure water rights before building any scheme and to make water governance effective.

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3



Bringing Potable Water to the Far-Flung Islands of the Philippines

Background

Rural communities in the Philippine archipelago, particularly those in small island provinces, generally have inadequate access to safe drinking water. On average, two thirds of the population in such areas lack access to potable water. This proportion is markedly higher than the Asian average of one in three people lacking access to clean drinking water. In some Philippine provinces, the reported coverage is even lower.

A typical scene in these islands is women walking to the river, carrying their clothes stacked in a *batya*,¹ with their bar of laundry soap. They walk long distances, sometimes slipping on rocks in the process, but they go on. They wash their family's clothes and bathe in the river. The trip back home is more daunting because the wet clothes are much heavier. Sometimes it is not a *batya* that the women lug around, but two water pails. Other times it is children who

¹ A small tub used for doing laundry.

carry these pails, and whether the water is from the river or a far-away hand pump, vast distances must be traveled. Such weight on fragile bones does proven harm to these growing children.

Project Description

Objectives

To bring water to the underserved rural areas in the island provinces, the Philippine Government developed the Integrated Water Supply Program for 1986–2000, which accorded high priority to serving communities outside major urban areas. The Second Island Provinces Rural Water Supply Sector Project,² funded by the Asian Development Bank (ADB), was designed to help the Philippine Government implement the program. The project aimed at providing safe and easily accessible drinking water to 16 small island provinces.³ About 180 rural municipalities were expected to benefit from the development of 7,800 point source systems, including the construction of 4,000 shallow wells, 3,000 deep wells, and 300 facilities for pumping underground spring water. A total of 500 existing systems would also be rehabilitated.

In the long run, the project sought to improve public health, increase productivity, and reduce the demand for health services. It would also promote systematic, intensified, and sustained institutional development, and upgrade the technical skills of several government agencies' staff. In addition, *barangay*⁴ waterworks and sanitation associations were formed to collect water tariffs and operate, maintain, and sustain the water supply facilities.

An ADB loan amounting to \$24 million was approved in 1990. The Philippine Government provided counterpart funds, while the rural waterworks sanitation associations provided voluntary labor, land, and cash. At the community level, these associations were to own, operate, and maintain the community water systems and derive funds from member contributions or water fees. All beneficiaries were to pay water charges to cover operation and maintenance (O&M) costs, which included minor repairs and depreciation of the pumps.

Activities

Skepticism of government projects and the intentions of government officials, coupled with the belief that the Government should also maintain the facilities it provides contributed to the lack of active community participation in many of the project areas. However, in areas where the communities cooperated and were involved, the project was particularly successful. For example, the local water committee in Purok Guanzon organizes an annual disco during the local fiesta to raise funds for the O&M of hand pump facilities. In Barangay Oringao, Negros Occidental, the *barangay* officials who manage the water system bought water meters in bulk at deep discounts and sold them to the community at P57⁵ a month in 12 installments. Metered use of water is generally efficient.

² Second Island Provinces Rural Water Supply Sector Project (Loan No. 1052-PH[SFI]).

³ Basilan, Batanes, Camiguin, Catanduanes, Guimaras, Marinduque, Masbate, Negros Occidental, Negros Oriental, Quezon, Romblon, Siquihor, Sulu, Surigao, and Tawi Tawi.

⁴ The smallest political unit in the Philippines.

⁵ P1 (Philippine peso) = \$0.036392, \$1 = P27.4789 (1991) ADB. 2002. *Key Indicators 2002*. Manila.



Notable also was the high accountability in areas where hand pump facilities were built on private land. In such cases, the landowners themselves usually handled repairs and routine maintenance. One of them reasoned that: “It is easy to maintain and repair the hand pump—the parts are cheap. I don’t mind doing these tasks because the users in this neighborhood are my friends. We are the ones who use the *bubun* [handpump] anyway.”

Mr. Urcia used to be a water vendor and would spend several hours a day collecting water, and many more hours selling it in the village. Now that water is more accessible to his community, his services are no longer needed, but Mr. Urcia is pleased nonetheless. “Now that I sell fruit instead of water, I have more time for other things, and I don’t have any more backaches. I can spend more time with my old mother and take better care of her.”

Evaluation

By the time the project was completed, the targets for the construction of deep and shallow wells had been achieved and almost all the 500 existing wells had been rehabilitated. The project developed 350 spring water sources, exceeding the original target of 300. Although not required, about 10 rain collectors were also built.

The project aimed to provide 15 liters of water per person per day (lpcd). It reduced the distance that people had to travel for fetching water from an average of 240 meters (m) before the project (40 m more than the ADB goal for the region) to 50 m. Beneficiaries thus had more time for economic activities such as raising livestock and selling local candies. Some households in Guimaras and Quezon reported earning a monthly average of about P500–P2,000 per household from such activities.

Rather than working longer hours on income-producing activities, other households used the time saved to fetch more water. This increased daily

consumption by 15–36 liters per person, resulting in improved hygiene, and fewer cases of water-related diseases such as diarrhea and diseases caused by common viruses.

A survey revealed that roughly 30% of those using public taps complained that the water was unfit for drinking.⁵ This is probably why users in these areas refuse to pay or delay payment; other users are generally willing to pay for quality water services.

In 78% of the cases, the project succeeded in bringing potable water to people at a lower price. Some interviewees indicated that they used to pay P3 per container from water vendors before the project facilities were built. They were thus spending P270 per month.⁶ After the project, the water fees fell to P5–P20 per household per month—a savings of P250–P265 for families whose monthly incomes range from P2,000–P4,000.

The communities also noted other benefits such as a greater sense of *bayanihan*,⁷ awareness of responsibility for operating and maintaining of the water facilities, self-reliance, and the assurance of having a safe, convenient, and operational water supply system.

In many cases, the schemes did not cover O&M costs and depreciation. Especially in the smaller schemes, where fee collection was inadequate, users contributed money for repairs. However, the Sagay City water district was able to achieve sound management and an improving financial situation. Since 1997, when the current rates were established in 1997, the district has been able to repay an inherited debt of P600,000.

⁵ Because it had a peculiar color or taste or because drinking it made them sick.

⁶ The average household consumes about three 25-liter containers per day, or 90 containers per month, for an average monthly consumption of 2.25 cubic meters.

⁷ A sense of volunteerism among community members aimed at helping each other in time of need.



Lessons Learned

- Greater dialogue with the beneficiaries could have built mutual trust and allowed beneficiaries to express their needs and concerns. Some households may prefer to use a water pump at their doorstep, rather than a house connection because the water pump also gives them a chance to socialize.
- Foresight must be used when designing the water system to avoid the cycle of poor service, dissatisfaction, poor payment, and deterioration. Furthermore, the design and scope of the water systems must also be forward-looking, to accommodate the projected demand of growing populations.
- Creativity and innovation decrease costs. In some areas, bamboo pipes were used in an updated design of a hand pump to bring water to a pig farm. In addition, sap from a local plant was used instead of chemical reagents. These materials are equally effective and can be obtained easily and inexpensively. Such innovation should be encouraged.
- The hand pumps and shallow wells must be built away from septic tanks in the area, and soil conditions must be carefully considered. Reports indicate that septic tanks were constructed (not for this project) without sealed bottoms and using porous concrete blocks, resulting in the pollution of groundwater. The septic tanks must be better constructed, and the public should be taught to maintain these facilities. In addition, the use of dry latrines should be encouraged, as they are easier to manage and do not pollute shallow groundwater sources. The sludge from dry latrines also makes excellent fertilizer.
- End-users should be made aware of the importance of hygiene and the safety of drinking water. They should be informed that the use of open tanks for storage and other practices such as bathing and washing clothes in the river can contaminate their drinking water. Public awareness and education is a critical component of any similar project.
- The public, especially government engineers, should be informed that deep coastal wells are a poor investment as they disturb the balance between freshwater and saltwater, and result in brackish water unfit for consumption.
- To obtain better quality-water, point sources must be tested more frequently. Furthermore, the facilities must be maintained well with to achieve long-term sustainability; quick fixes prove to be much more costly in the long run.

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4



Drought Relief in Uzbekistan

Background

The province of Karakalpakstan, adjacent to the Aral Sea, and the province of Khorezm are located in the driest part of Uzbekistan with an annual rainfall ranging from 70 to 110 millimeters. The water shortage in Western Uzbekistan has worsened over the last 3 decades with the drying up of the Aral Sea.

The Aral Sea began to recede in the early 1960s after the former Soviet Union began a drive to expand agriculture, particularly the growing of cotton crops, in the area. The dry climate made it necessary to divert water from the main contributory rivers, Amudarya and Syrdarya; as a result, their inflow into the Aral Sea decreased. The Aral Sea has shrunk to less than half its original size and only 20% of its former volume. The desiccation of the Aral Sea has resulted in the loss of its fishing, tourism, and shipping industries, and the destruction of the ecosystem of the sea and its deltas. The salty desert that has now been formed produces up to 100 million tons of windblown salt dust contaminating

the surrounding regions of Uzbekistan and Kazakhstan, and further inhibiting agricultural production. Since the mid-1990s, a decline in snow and glacier melt from the surrounding mountains, combined with a reduction in rainfall, has significantly reduced the water resources in the two major watersheds. The Amudarya River in particular has been the main source of fluvial and shallow aquifer abstraction for human consumption and agricultural use in Karakalpakstan and Khorezm, and the reduced volume of flow has resulted in the present drought, the worst in 100 years.

Shortage of irrigation water from the Amudarya River has led to the loss of most of the rice, cotton, and wheat crops in the past 3 years. Irrigation canals, which used to be a main source of raw water for household use, have dried up, depriving many rural households of direct access to safe drinking water, and means of employment, income, and food from agriculture. Families, particularly women and children, now fetch water from distant alternative sources. Drinking water, where available, is often contaminated or of poor quality. Consequently, for the population in the drought-affected areas there is high risk of waterborne diseases and the carcinogenic and immunological conditions brought about by the long-term consumption of high levels of waterborne minerals.

Recognizing the urgency of the problem, the Government of Uzbekistan has embarked on a program for immediate relief (Aral Sea Drought Relief Program) that is receiving extensive support from the international community. In 2001, the Government requested emergency assistance from the Asian Development Bank (ADB) to mitigate the effects of the drought. A loan for \$38 million was approved in May 2002.¹

Project Description

The main objective of the Western Uzbekistan Rural Water Supply Project is to improve the living and health conditions of rural communities in Karakalpakstan and Khorezm. The project will mitigate the ongoing effects of the drought by providing safe and easily accessible water supply, minimizing water wastage, and improving health conditions by supporting the provision of sanitation facilities and encouraging better hygiene. About 700,000 people, of whom 60% are poor, will benefit from the project.

The project will also strengthen institutional capacity to manage potable water resources, to ensure the long-term sustainability of the Government's water supply program in the Aral Sea area.

The project comprises three parts: potable water supply, water conservation and health improvement, and capacity building.

- The potable water supply component involves the development of new systems and the rehabilitation and upgrading of existing facilities. Bulk water pumping and transmission, will be strengthened, new deep boreholes and treatment plants will be provided, and water distribution centers will be rehabilitated or built. The aim is to expand the supply of potable water in districts from a minimum of 12%–85%, reduce losses from unaccounted-for water from over 50%–30%, increase the supply efficiency of bulk water and service delivery, and lower unit costs of production.

¹ Western Uzbekistan Rural Water Supply Project (Loan No. UZB 35496-01).

- The water conservation and health improvement component involves the introduction of water conservation measures, improvements in the sanitation facilities of schools and clinics, and promotion of health awareness related to water and sanitation.
- The capacity building component involves support for project management and institutional strengthening in water supply management.

Lessons Learned Incorporated into Project Design

Learning from the experience of other water supply projects in Uzbekistan and ADB water supply projects in other countries, the project has incorporated the following features in its design:

- A flexible menu of subprojects including both strategic and locally focused works that can be completed within the required time and can be constructed, operated, and maintained by local agencies;
- Participation of stakeholders, such as rural assemblies, women's committees or similar community organizations, in subproject development and possibly in operation and maintenance;
- Information, education, and communication campaigns;
- Coordination of project activities with the central and local governments and international funding agencies under the Government's Aral Sea Drought Relief Program; and
- Training to strengthen institutional procedures and to ensure efficient and speedy procurement.

A participatory approach to the selection, planning, and implementation of subprojects is expected to increase a sense of ownership among beneficiaries, which in turn will improve the operation and maintenance (O&M) of equipment, as well as voluntary water conservation and health measures.

At present, the participation of local communities in Uzbekistan is limited. Top-down approaches are still embedded at all administrative levels of government. The project is structured to increase local responsibility for water supply services by decentralizing implementation and operation and maintenance, and actively involving both local governments and community-based stakeholders.

Cost Recovery

To recover O&M costs, metered charging will be introduced under the project. A tariff structure will be prepared for the subproject districts using a stepped tariff by volume, and a lifeline tariff for minimum consumption to increase affordability by the rural poor. However, since affordability of tariffs is a critical issue in the drought-stricken areas in Karakalpakstan and Khorezm, the Government will continue to subsidize rural water supply until the rural water and sewerage agencies (*Agrovodokanal*) can fully recover the cost of O&M from users.

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5



Community Participation Helps Bring Water to Remote Parts of Nepal

Background

Nepal ranks among the poorest countries in the Asia and Pacific region. Less than 60% of its rural population has access to safe water and less than 20% has access to basic sanitation facilities.

With less than 0.4% of the world's population, Nepal possesses 2.3% of the world's water resources. Despite this abundance of water, the harsh terrain makes access to safe water supply difficult for many. The associated burdens are borne disproportionately by women and children. It is not unusual for women and girls to spend up to 7 hours a day fetching water.

Nepal's far western, midwestern and eastern development regions, where the ADB-funded Fourth Rural Water Supply and Sanitation Project¹ was implemented, are among the most economically backward, remote and geographically disadvantaged areas in the country. Distant springs and streams are the main sources of drinking water. Health conditions are poor, and the incidence of waterborne diseases such as diarrhea is high.

¹ Fourth Rural Water Supply and Sanitation Project (Loan No. 1464-NEP).

Women and girls in the remote Nepali village of Kauwpur used to spend several hours everyday carrying water from distant springs and streams back to their homes. Their life changed dramatically after 20 community taps were built for the 279 households of the village as part of the project. "Women are now spared from having to fetch water from faraway streams and carrying jugs on their heads," say the chairman of the local water users committee (WUC). "We are happy to have a clean water supply, and latrines are fast becoming a common feature in this village," he adds, referring to the 118 latrines that have been built in Kauwpur since the project started.

Project Description



Objectives

The Fourth Rural Water Supply and Sanitation Project was conceived to assist the Government of Nepal in its efforts to reduce poverty in rural communities by improving access to adequate and sustainable domestic water supply and sanitation facilities.

The project proposed to provide water to about 40 districts in the far western, midwestern, and eastern development regions of Nepal. About 1,500 simple, gravity-fed water supply systems would be designed and built in more than 300 subprojects, and about 900 low-cost latrines would be built in schools and health posts throughout the subproject areas. Hygiene education would be promoted in the communities through staff of the Department of Water Supply and Sewerage (DWSS), the implementing agency. The project aimed to achieve greater sustainability by applying a community-based approach to all rural water and sanitation projects and teaching local communities to operate and maintain completed subprojects. Other objectives included the improvement of sector cost recovery and the strengthening of sector institutions like DWSS.

ADB provided a loan of \$20 million to cover 75% of the project costs and the Government of Nepal contributed 13%. The loan took effect at the start of 1997 and was closed in June 2002.

Activities

The project built on the experiences of three previous ADB-funded Rural Water Supply and Sanitation Projects in Nepal. The initial implementation approach was relatively top-down and its sustainability therefore less than satisfactory. Realizing that a more demand-driven approach was crucial to the success of the project, an approach that was driven by the community's needs was introduced and gradually improved in each new project. The establishment of WUCs became a condition for subproject implementation. This improved the level of sustainability dramatically.

Before subproject appraisal, beneficiary communities were encouraged to form WUCs, which then took part in designing, constructing, operating, and maintaining water supply subprojects. Once the projects were completed, the communities assumed responsibility for operating and maintaining water supply systems. From an early stage, beneficiaries learned about their obligations and

duties in ensuring that project goals were achieved. The beneficiaries had to contribute up to 18% of the construction costs, mostly through labor and materials. They also became responsible for operation and maintenance (O&M) once the water supply systems were installed. Each household had to pay a small monthly fee to cover the salaries of village maintenance workers, minor repair costs, and administrative costs of the WUCs.

One of the most important elements of the project was a community education and awareness program, conducted by DWSS staff with the support of local consultants and nongovernment organizations (NGOs). Rural communities, particularly women's groups, WUCs, children, teachers, and health post workers learned the importance of proper hygiene, health, and water use. Local communities were encouraged to build and use low-cost latrines.

A fundamental factor in the success of the bottom-up process was the ability of the implementing agency, DWSS, to change from its conventional role of implementer to that of facilitator. The community-based approach necessitated and influenced this adaptation, which involved a reorientation of staff responsibilities, training in social and management skills, and a change in professional attitudes.

Evaluation

More than 600,000 people living in poor, remote areas of Nepal have benefited from the project. The major benefits include increased water consumption, improved water quality, energy and time savings, and significant health benefits.

The reduction in time spent collecting water from distant springs and streams and the energy saved have resulted in an improvement in the quality of life and health of women and female children.

However, social preparation activities, including awareness campaigns and the training of communities in subproject planning, management, and O&M, have been less successful. As a result, beneficiary communities in many project areas still have low capacity and awareness, and beneficiaries tend to continue to depend on the Government for O&M.

One important result of the project was a gradual change in the implementing agency, DWSS, toward a more participatory approach, although there still remains scope for improvement.

There is also a need to improve the monitoring and evaluation system and the capacity of the government agencies to ensure effective implementation and sustainability.

Lessons Learned

- The decision-making process for projects needs to be embedded in the beneficiary communities. If the communities do not make project decisions, their ownership of the project facilities will be weak, jeopardizing sustainability.
- The "software" component of a project is as important as its "hardware" component. Community information, awareness campaigns and education, particularly of women must be given enough emphasis as well as financial and other support. These efforts need to precede construction activities.



- Monitoring and evaluation needs to be strengthened so that projects being implemented as designed, midcourse corrective actions can be taken, and intended project benefits are achieved.
- The community must be mobilized to contribute project costs. This will strengthen ownership and provide incentives to the communities, the key stakeholders, to seek ways to reduce costs and increase efficiency.
- Benefits in the water sector can be obtained only if sanitation and hygiene education are addressed in an integrated manner.

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6



Partnership: Rebuilding a Nation by Bringing Clean Water to Timor-Leste

Background

In August 1999, the people of Timor-Leste voted for their independence. A month later, mass destruction displaced three quarters of the country's population, destroying most homes and infrastructure. Looting and burning were rampant. Water supply and sanitation facilities were especially impaired. While damage to the main physical assets was limited, office buildings, records, vehicles, and tools were totally destroyed. The urban losses areas were much greater than in rural areas where there was little water supply infrastructure. But even in rural Timor-Leste, there were several reported incidents involving poisoned wells, stolen hand pumps, dislodged pipes, and damaged spring intakes. In towns with public water supply and sanitation systems, vehicles, pumps, and motors were looted. Water treatment plants were damaged. Pipelines, tools, and spare parts were stolen. Storage tanks were torn down. And as homes, stores, offices, and other buildings were burned, water connections, meters, latrines, and septic tanks were either damaged or completely destroyed.

The di Silva family home was one of the many houses destroyed in the village of Poetente. When the violence began, Nataliano di Silva would sneak into the village to get food supplies, while his wife and their four children waited in the jungle for his safe return. They all hoped to live their old lives again one day. But the destruction was so severe that there was no point in going back when the conflict ended. The family had to move to Ermera, where at least there was a school for children, a few hours of electricity a day, and running water. “We use the water for everything—drinking, bathing, washing our clothes, brushing our teeth,” notes Mr. di Silva. “It is our only source of water.”

During the conflict, the water supply in Ermera and nearby villages was disrupted, but the systems have since been rehabilitated and upgraded under the Water Supply and Rehabilitation Project¹ administered by the Asian Development Bank (ADB). Now, cleaner and more abundant water is available at public taps for about 12 hours a day.

Project Description

Objectives

After the referendum for independence, the United Nations Transitional Authority in East Timor was formed to ensure stability, empower a transitional government body, and establish the judiciary, laws, and policies during the 2–3 years before general elections. To help rebuild the country, the Trust Fund for East Timor (TFET) was established with contributions from various funding agencies. ADB and the World Bank were appointed as joint administrators of the fund. A grant of \$4.5 million from TFET for the rehabilitation of Timor-Leste’s water supply and sanitation sector was administered by ADB. This was later supplemented with an additional \$4.5 million in the second phase of the project.

The project sought to provide the people of Timor-Leste with sustainable water supply and sanitation services using appropriate technology and solid management systems.² They were assisted in restoring damaged water supply and sanitation (WS&S) infrastructure and building institutional capacity to manage, operate, and maintain the systems. The project had three components:

- The **Water Supply and Sanitation Sector Management and Investment Program** provided consulting services to assist project management units (PMUs) in program implementation.
- The **Capacity Building and Institutional Development Program** identified and implemented activities that supported physical WS&S construction from conception to post-completion. Stores, generator sheds, workshops, and other WS&S maintenance infrastructure were procured or rehabilitated.
- The **Water Supply and Sanitation Implementation Program** had three subcomponents. The *Quick Response Facility* repaired and rehabilitated water supply systems across the 13 districts of Timor-Leste that needed immediate action. The *Dili Water Supply Repair and Rehabilitation* subcomponent provided materials, equipment, and civil works to support the Dili water supply system and the project funded by the Bank of Japan. Complementary works included

¹ Water Supply and Sanitation Rehabilitation Project Phase 1 (Grant No. 8185-ETM[TF]), approved in July 2000 and completed in December 2001.

² Trust Fund for East Timor Grant Agreement (Water Supply and Sanitation Rehabilitation Project), 24 August 2000.

the repair and rehabilitation of public taps and other water points in Timor-Leste's capital. This subcomponent also administered small local contracts and construction contracts for deep-well drilling. The *District Water Supply Repair and Rehabilitation* subcomponent aimed to address the needs of smaller urban and rural communities by procuring and installing pipes, fittings, pumps, motors, and generators; supplying construction materials and equipment; designing services for small- and medium-scale water supplies; rehabilitating water bores and raw water intakes; and providing support for water quality testing and groundwater pump testing.

Activities

Before the crisis, the water supply system served only 40% of the population in district capitals and 29% in subdistrict towns. The average access to piped water supply was 13%. In Dili, about 8,600 household connections and 270 public waterstands existed. However, people unwilling to pay for low-level water supply service made extensive use of private shallow wells in other urban areas. Only 48% of Timor-Leste's total population of 794,298 had access to potable water. When the hostilities subsided, the availability of functional water and sanitation facilities at the village household level was further reduced to about 10% and 5%, respectively.

With the Water Supply and Sanitation Rehabilitation Project and other donor assistance, emergency system repairs have made significant progress in restoring these



WS&S services. The public water supply systems in each of the district capitals have generally been restored.

One of the many project achievements is the successful *Quick Response Facility*, which built four deep wells in Dili and Suai. It also undertook major repairs on the Viqueque water supply transmission main over the Cuha River and assisted with procurement process for urgent minor works during the government transition stage and for major works of other funding agencies.

About 32,000 persons throughout Timor-Leste's 12 districts have benefited from improved WS&S facilities through the *District Water Supply Repair and Rehabilitation Program*. Bindau Santa Ana and Becora alone had 9,000 beneficiaries. These results were achieved with the help of local and international nongovernment organizations (NGOs), as well as the beneficiaries themselves who lent their time and effort toward the construction and ongoing operation and maintenance of the facilities.

In addition, 4,000 water meters were procured to reintroduce water supply user charges in the area and about 2,000 meters were installed.

Evaluation

All in all, about 96,000 people directly benefited from improved WS&S facilities through the first phase of the project. The second phase is expected to benefit more people. Improved operation of facilities and enhanced human capital from the capacity-building programs are an additional achievement. Furthermore, about 26,100 local people gained an equivalent number of employment days either directly or through contracted activities.

In general, the project has met its objectives. Water supply has improved to the levels that existed under the Indonesian administration. Despite the marked improvement, these levels are still considered inadequate for achieving the country's reasonable public health goals. Sanitation facilities, including wastewater, solid waste, and drainage systems, have not yet been restored to earlier levels, but again, these, too, will require the attainment of standards significantly higher than those achieved under the Indonesian administration.

In many cases, having access to safe water has allowed people to resume some profitable activities. Natalia Gutierrez and her husband, Augustus Suarez Medeira, were traders before the conflict. They collected corn from their neighbors and sold it in Dili, but the turmoil disrupted farming and trade. The family, like the di Silvas, also moved to Ermera. There, Ms. Gutierrez opened a restaurant. "We had to find a different way to survive," she says. "We made more money before. But the restaurant is doing better now, and we make about \$300 a month in profits." The restaurant is simple, furnished only with long wooden tables and benches, but the food is tasty and clean. Though she only has one tap for her home and the restaurant, the running water helps her maintain good hygiene. Without it she may not have been able to run the eatery.

The sustainability of the project's WS&S outcomes now depends on the capacity of the Timor-Leste's Government and WS&S to maintain the infrastructure and systems provided by the project. The evolving political and institutional environment may hamper sustainability. However, extended assistance should make this less likely.

Lessons Learned

- There is still a significant need for external support to the sector. While most water supply services in urban and rural areas have generally been restored to the basic service levels provided during the previous administration, this service still does not meet generally accepted standards. Further improvements are needed to achieve public health, human dignity, and environmental protection goals.
- There is an ongoing need for capacity building at all levels. Support for this effort should be provided at an appropriate pace and time to ensure that the local staff and community gain the required understanding and ownership. Some capacity-building activities may need to be repeated to orient new staff and further reinforce the learning of existing staff.
- Cooperation with NGOs allows effective early access to local experience and knowledge of social and physical conditions. NGO involvement has been crucial to successful implementation because they have the human resources to undertake the work in all rural areas.
- Reducing leakage in existing water systems increases their efficiency and effectiveness, resulting in improved service and reduced costs. The reintroduction of metering and user charges becomes a mechanism not only for generating revenue, but also for promoting efficient water use and reducing waste. Water user charges must be quickly introduced.

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7



Software Enhances Hardware: ■ Community Awareness Supports Water Infrastructure Project in Papua New Guinea

Background

Papua New Guinea (PNG) is the poorest among the Asian Development Bank (ADB)'s developing member countries in the Pacific. About 37% of its population lives below the poverty level of \$350 per year. Most of its 4.5 million inhabitants live a subsistence lifestyle in the rural areas without access to basic services like potable water or adequate sanitation.

In the towns, about 16% of the population is poor, urban water supply reaches only 43% of the population, and sewerage only 20%. As in most developing countries, it is the poor who suffer most from the lack of safe water and offer good sanitation. Although communities rank safe drinking water as their number-one priority,¹ lack of water during the dry season is a very serious and universal problem in PNG. Those without safe water often resort to polluted supplies, thus exposing themselves to the risk of waterborne intestinal diseases

¹ ADB. 2002. *Priorities of the Poor in Papua New Guinea*. Manila.

like diarrhea and typhoid fever. Sanitation is also generally inadequate, and the sewerage systems that do exist mostly serve the developed sections of town. Many residents have a low awareness of good sanitation and hygiene and its efforts on health. In many towns, inadequate sanitation is a source of major health hazards. For many poor communities living in the urban fringes, defecating in open areas is the only option. Human waste often pollutes water sources used for all purposes, while raw or poorly treated sewage flows into watercourses and pollutes beaches and coastlines.

Project Description

Objectives

In November 2000, ADB approved a \$15.3 million loan to the Government of PNG for a project that would provide basic water supply and sewerage to six selected provincial towns.² The project was intended to increase coverage and improve the quality of basic water supply and sanitation services, with the ultimate goal of improving public health and overall social indicators for the population, especially the poor communities of the selected towns. Another objective was to improve the management and coordination of the water supply and sanitation sector by strengthening the capacity of the PNG Waterboard.

When the project was designed, it became increasingly clear that a straightforward infrastructure project would not be enough to improve the living conditions of the urban poor in the project area. To increase the benefits from the loan, and to make it more poverty-oriented, the complementary Low Cost Sanitation and Community Awareness and Health Education (LCS-CAHE) program financed by the Japan Fund for Poverty Reduction (JFPR) was added. The loan took effect in May 2002, but its implementation and that of the JFPR activities has been postponed several times for various reasons. Implementation is now scheduled to start in the first quarter of 2003.

LCS-CAHE Program

The long-term goal of the LCS-CAHE program is to improve the health of the poorer residents of the project towns, and ultimately their standard of living, by lowering health expenditures, increasing labor productivity, and generating more income-earning opportunities. The immediate objective is to provide poor urban dwellers with affordable, environment-friendly, and appropriate sanitation facilities and to bring about positive changes in sanitation behavior.

The LCS component involves the building of low-cost sanitation facilities such as ventilated, improved pit latrines for the 4,200 neediest households in the project towns. The LCS project will provide funds for the construction of the toilets and the beneficiary households will contribute materials and labor to produce a sense of beneficiary ownership. Field visits during the planning period have confirmed that households are prepared to contribute 5%–10% of the construction costs. The LCS will be implemented over a period of 3 years, including an initial pilot-testing period in poor settlements in two of the project

² The Provincial Towns Water Supply and Sanitation Project (Loan No. 1812-PNG(SF)) would create or extend water supply facilities in Kerema, Mendi, and Wabag, and rehabilitate sewerage services and sewage treatment in Alotau, Madang, and Mt. Hagen.



towns. During this pilot phase, workable, socially sensitive, and cost-effective approaches will be developed to provide a model for building a sense of ownership and involvement in the community.

Before the toilets are installed, CAHE activities will be carried out in the beneficiary communities. The objective of this program is to teach poor households basic hygiene, safe methods of collecting and storing water, environmental health, and the operation and maintenance of various toilet systems. The awareness and education program will entail production of printed materials (e.g., cartoons), focus group meetings, and the use of popular theater and the mass media. About 80% of the beneficiaries of the program will be women, as they have the primary role in collecting water, controlling its use, and looking after sanitation facilities.

Domestic consultants will act as facilitators of the program and, together with the community development officer of the urban settlement, will plan and implement the program activities. Community groups (women's groups, traditional landowner organizations, church networks, nongovernment organizations [NGOs], neighborhood associations, etc.) will help plan, design, and implement LCS-CAHE activities. During project preparation, civic society groups, NGOs, and local communities expressed their firm willingness to take part in project implementation. The program is intended to be a model of partnership building involving the provincial government, urban authorities, and a variety of community-based organizations.

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8



Development Communication Improves Water Project in Vietnamese Towns

Background

Many provincial towns in Viet Nam have grossly inadequate water supply and sanitation facilities. Water supply systems often produce poor-quality water intermittently and at low pressure, posing severe environmental health hazards. Many areas, particularly those where the urban poor live, do not have access to piped water supply, and domestic water sources are often contaminated. Proper sanitation is generally lacking. In addition, most people are unaware of the health hazards related to unsafe water and sanitation.

In 1995, the Asian Development Bank (ADB) signed an \$82.5 million loan agreement¹ with the Government of Viet Nam to improve the water supply and sanitation infrastructure in six provincial towns,² with the ultimate goal of contributing to poverty reduction in those areas.

To optimize the health benefits from the loan, a technical assistance project was designed to set up a community-level mobilization, education, and technical program. The Community Environmental Health Improvements in the Provincial

¹ Provincial Towns Water Supply and Sanitation Project (Loan No. 1361-VIE).

² Long Xuyen, Phan Thiet, Nha Trang, Pleiku, Thanh Hoa/ Sam Son, and Thai Nguyen.

Project Description

Towns Project was implemented in marginal areas of the six project towns, which were mainly populated by low-income families. Most of them were not served by existing water supply systems. Households without piped water used groundwater from shallow dug wells, surface water from contaminated sources, and rainwater. Most families were not connected to the water supply system because of the high cost involved or their distance from the pipes.

Objectives

Because of the low connection rate in the targeted communities, one objective of the project was to establish communication between water supply companies and communities and thus increase household connections to the public water supply. Another main objective was to improve hygiene in the community and households to maximize the long-term health benefits of the expanded piped water supply.

A community environmental health program was to be developed and implemented for target households, particularly women and children, in areas where the risk of disease from the lack of clean water and sanitation facilities was particularly high. Other target areas were schools and public areas like markets.

The project was implemented from 1997 to 2000 by a team of international and domestic consultants. The domestic staff comprised members of the Vietnamese Women's Union, an established mass-based organization operating throughout Viet Nam. The project team in each town consisted of two members of the Women's Union and one person working for the local Center for Preventive Medicine.

Activities

The community was made more aware of hygiene and environmental health through training at several levels. First, the project team trained master trainers. In the project towns team members then trained community-based motivators representing a wide range of organizations including the Women's Union, Youth Union, Fatherland Front, and schoolteachers. These motivators held educational activities in the houses, group meetings, schools, and other public areas. A total of 450 motivators worked with about 36,800 households, or about 200,000 people—one sixth of the total population of the six project towns.

The project developed educational materials such as leaflets, posters, songs, motivator manuals, a cartoon video on fecal transmission routes, and a video on environmental sanitation and hygiene. Additionally, loudspeakers and local radio stations transmitted environmental health awareness messages.

The local teams coordinated their health promotion and disease prevention campaigns with those of the local water supply companies, the Women's Union, and other mass-based organizations and local leaders. The local teams assisted the water supply companies in planning and building model public latrines in poor areas of the project towns and also took part in the upgrading of hygienic latrines in primary schools and kindergartens. The Viet Nam Women's Union supported the establishment of women's savings groups to help households pay



for latrines. Each group had 20 members, who each contributed from VND10,000 to VND20,000³ every month. With this money, the group helped one member of the savings group build a latrine in her house every month until everyone had her own toilet. The project also helped prepare a training course for public latrine cleaners.

To help the urban poor decide to commit household resources to a piped water connection, the project team produced a video with the intention of demonstrating to poor households the medium- and long-term economic benefits of making a short-term investment in safe water supply. A simple budgeting module comparing the cost of purchasing water daily with the cost of piped water was incorporated into the video, which was produced for use by water supply companies, local teams, and motivators in community group meetings.

Project staff were also involved in promoting a scheme whereby water supply companies in most project towns allowed householders to pay for the cost of new connections in installments.

Evaluation

The technical assistance project was considered highly successful since it has contributed significantly to health and hygiene education. It improved the knowledge, awareness, and behavior of low-income households. They gained a deeper understanding of the importance of clean water supply, and general environmental conditions in targeted wards and communes improved.

In nearly all project towns, more people started using piped water in the targeted wards and communes. People came to know how to get access to improved piped water systems and how to maintain them.

All of these effects were achieved in a very cost-effective way—only about \$250,000 of the total contract amount was spent directly on field implementation. This relatively small sum, spread over 3 years, enabled the team to work with about 200,000 people.

The local teams proved to be beneficial links between the water supply companies and the community. The good cooperation between the Women's Union as community educators and motivators, the Ministry of Construction as managers and coordinators, and the water supply companies as technical and financial experts added to the success of the project.

But the project would have been even more successful if the timing of infrastructure construction and public awareness campaigns had been better synchronized: the technical assistance was finished by the time the construction of the water and sanitation infrastructure started.

Project activities have become sustainable mostly because the Viet Nam Women's Union continues to lead in implementing water supply, sanitation and environmental health improvement projects throughout Viet Nam, with a variety of donors and funding sources. The project has provided the Women's Union with new, field-tested educational materials, as well as packaged and tested training courses.

³ VND1 (Vietnamese dong) = \$0.0000906, \$1 = VND11,038.20 (1995) in ADB. 2002. *Key Indicators 2002*. Manila.

The executing agency, the Ministry of Construction, supports the sustainability of the activities developed under the project by planning to make them part of its future efforts.

In the project towns, however, it is still unclear how sustainable the activities will be. What is clear is that local team members are now established as lead resource persons within each project province in the areas of community mobilization and environmental health improvement. They are expected to continue playing lead roles in the implementation of the National Water Supply and Sanitation Program in these areas and it is anticipated that they will be used as resource persons by other aid agencies.

Lessons Learned

- Linking community health and hygiene education to water system construction is highly beneficial to the success of a water supply project.
- Community health and hygiene programs, associated with water supply and sanitation projects, will be more successful and sustainable when they can be implemented by a local professional organization, such as the Viet Nam Women's Union, which is already operating the same or similar types of activities.
- The timing of community-based activities must be flexible enough to adequately support infrastructure improvement.

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9



Kiribati: Water for a Thirsty Atoll

Background

The Republic of Kiribati is one of the most isolated countries in the Central Pacific. Located mostly along the dry belt of the equatorial climate zone, the island chain has exceedingly limited sources of freshwater, which are extremely vulnerable to contamination and are served by highly deficient infrastructure. As demand for adequate water supply and sanitation services has increased along with the population, the capacity of the existing systems has been unduly stretched, causing significant degradation of the environment.

The country is no more than a series of low-lying coral islands and atolls, which form a narrow strip of habitable land consisting of mostly infertile coral sand soils. The habitable land is seldom more than a few meters above the high water mark and is bound on the outside by fringing reefs and on the inside by lagoons. Consequently, Kiribati is vulnerable to severe weather, and even high waves can cause damage, as many of the atolls do not exceed 4–5 meters above sea level.

Water supply for atolls consist of fragile freshwater “lenses,” pockets of freshwater that float on the underlying seawater that permeates through the coral structure. Atolls also typically suffer from prolonged dry periods especially during the El Niño and La Niña climatic events. The rate of water extraction from the lenses and the rate of natural replenishment from rainfall are therefore finely balanced.

When population pressures mount, as they have done in South Tarawa, the stability and sustainability of the lens is threatened and water becomes a scarce resource. In areas of high population density the lenses are also susceptible to pollution from sewage and other contaminants.

The management of Kiribati's freshwater resources has been poor, both on the supply and demand sides, and what is delivered to consumers is still substandard in both quantity and quality. Waterborne and water-related diseases are a major public health hazard, with diarrheal diseases ranked as the third highest cause of illness.¹

The lenses provide the main source of freshwater, and collected rainwater provides the rest. A centralized water system pumps water from the remaining uncontaminated lenses at the northern end of South Tarawa. Increasing population pressure is now creating a serious threat to even these remaining water supply sources, and consequently to the basic health of the population and its social stability.

The government-run piped water supply system only served about 70% of South Tarawa's total population in 1997/98 when the project discussed in this case study was designed. No system of regular maintenance existed, allowing unmeasured amounts of water to be lost through leaky pipes in the transmission system. The sewerage system only served about 38% of the 3,520 households. Sewerage drainage ditches were shallow, generally in disrepair, and ineffective in preventing discharge from returning to the coast. Sewer pipes appeared to be up to 90% blocked by sand and sediment because of neglect and poor maintenance.

Project Description

Objectives

A loan and several accompanying technical assistance (TA) grants were designed by the Asian Development Bank (ADB) to improve the water and sanitation sector, with a focus on health and environmental issues. The objective of the Sanitation, Public Health, and Environment Improvement Project² was to improve the health and well-being of the people of Kiribati by providing a sustained program of improvements in water supply, sanitation services, solid waste disposal, and environmental conservation. Approved in December 1998, the project was implemented through 2003. It is concentrated on the most populated areas of Kiribati, primarily South Tarawa, and selected areas of North Tarawa.

Ultimately, the project will

- improve the quality and availability of safe drinking water
- rehabilitate and expanding the sewerage and sanitation systems
- implement institutional reforms throughout the Public Utilities Board (PUB), and
- promote hygiene and sanitation through better solid waste management

ADB provided a loan of \$10.2 million for the project, which includes

- upgrading of the water supply system

¹ ADB. 2002. *Kiribati: Monetization in an Atoll Society*. Manila.

² Sanitation, Public Health, and Environment Improvement Project (Loan No. 1648-KIR(SF)).

- solid waste management landfills and environmental conservation,
- institutional development, consulting services, and project implementation support,
- upgrading sanitation and sewerage systems,
- housing loans and the supply of plant and equipment for solid waste management refills, and
- a water pilot study.

The Ministry of Finance and Economic Planning is the executing agency.

Activities



A committee was established on the islands of Bonriki and Buota to create a cooperative partnership arrangement between the Government and community groups to address land issues involved in the maintenance of reserve areas around each of the islands' water lenses. Population densities are so high (2,300/km²) on South Tarawa that urban development has begun to encroach onto protected water reserves, where the water lenses are replenished. Some of the lenses that previously supplied public needs on South Tarawa are already so polluted they are no longer safe.

To protect the lenses, the management of the Water Reserves Committee has established 50-meter "setback zones" around each of the water reserves, marked by the construction of a boundary road. These zones were designated as protected, and informal dwellers living inside the 50-meter area were asked to relocate voluntarily. While most of them have done so, a few have been unable to find alternative vacant land. In addition, new migrants arriving from the outer islands are also putting pressure on available open land areas within the protected zones.

TA grants have been provided for training and educating the community to improve its long-term ownership and participation in the sector.³ Nongovernment organizations (NGOs) and community-based organizations such as women's and church groups and cooperatives are being included in sanitation and conservation activities to promote hygiene and public sanitation. Community development and training programs include topics such as the water cycle, water and wastewater management, gardening with wastewater products, and do-it-yourself well and latrine construction. These workshops were held for community groups, schools, women's groups, and local governments.

Staff government agencies and NGOs, teachers, and community leaders have been trained in better water handling, sanitation, and waste management practices. Community members have benefited from educational and promotional materials such as posters, flip charts, manuals, calendars, stamps, videos, and theater plays.

This assistance is designed to maximize the benefits of the project by ensuring that water users understand the water cycle and its importance; providing environmentally sound assistance to anyone wishing to make improvements in

³ Community Development and Participation Initiatives (TA No. 3109-KIR).

wells, rainwater tanks, water purification systems, waste management systems, or latrines; and creating the necessary institutional arrangements to sustain these community development and participation initiatives.

Another TA grant was given to the PUB to improve their efficiency through institutional restructuring.⁴ A program for restructuring the PUB is being carried out and advisory support is provided to improve the administration, management, operation, finance, accounting, and maintenance work of the PUB. A human resource development program has also been prepared and implemented for PUB management and staff, including training in the use of a computerized accounting and financial management system. Reviews and restructuring are being carried out on organizational, training, and salary matters. Consequently, the collection of outstanding debts has improved—in some cases resulting from cutting off power to nonpaying consumers—and the number of permanent staff appointments to the board has increased, while temporary board positions have declined.

Evaluation

Cultural issues have been among the more challenging obstacles to project implementation, mainly because of the extremely cautious nature of Kiribati society, which promotes equality, expects people to be modest and humble, and frowns on self-promotion. This has created some difficulty for the restructuring of the PUB and the resettlement of squatter communities living within the water reserve areas. Government employees in charge of resettlement and restructuring issues fear being viewed as standing out by acting too aggressively or placing themselves above others.

Reform of the PUB has been slow, partly because of past inefficiencies. The previously poor quality of the water supplied has led many people to refuse to pay for service, even to the extreme of damaging or destroying their water meters. Even such extreme actions did not result in interruption of water supply to those households, because of the same culture of caution and equality that led to the PUB's reputation for not following up accounts in arrears. In addition, the confirmation of staffing positions was slow because of a reluctance to make anyone redundant or move staff among departments. New tariffs on water and sewerage were approved, but slow to be implemented.

Although community awareness about environmental issues is thought to have increased as a result of the program, it took longer than expected for people to incorporate the lessons into their way of life. By mid 2003, the Bonriki water reserve was cleared of settlers, except a few households awaiting vacant land nearby, and in the Buota reserve area many people began vacating the 50-meter setback zone. However, the stream of migrants from outer islands moving to Tarawa continued to pressure available land, and newcomers eyed the cleared reserves with increasing interest. The government committee established to manage the water reserves was reasonably effective in resettling the squatters, but progress remained slow, as there is little available land elsewhere.

⁴ Community Development and Sustainable Participation (TA No. 3838-KIR).



While there have been some delays in the initial recruitment and approval of consultants, the physical construction side of the project (the rehabilitation and expansion of the water supply, sewerage, and sanitation systems and the construction of rainwater tanks and latrines) is now progressing as planned.

At this stage it is still too early to judge whether or not the project has been successful. However, public awareness appears to have increased and there has been a positive community response to the project. A pilot water project that involved three villages was very well received when it provided the people with a constant 24-hour water supply. It is hoped that the project as a whole will achieve the same positive outcome.

Lessons Learned

- Loan conditions and understandings need to be compatible with the local culture and its values. Cultural sensitivities are not always fully understood. In this case, allowing more time for personal discussions, negotiations, and restructuring at the start may have minimized delays.
- Demographic patterns must be carefully observed. Tarawa's high migrant population has made it difficult to keep water reserves clear of informal dwellers although a relocation site was identified, as new migrants from outer islands continue to arrive daily and tend to fill any empty space. This migrant population has to be taken into account and a program of formal resettlement investigated.

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10



Let the River Run: Irrigating the Fields of Kabulnan, Philippines

Background

The Philippines faces problems of poverty rooted in highly skewed levels of income distribution and uneven development that have left many areas in the southern island of Mindanao woefully underdeveloped. In the Autonomous Region in Muslim Mindanao (ARMM), the province of Maguindanao is home to the region's largest group of indigenous people, called Maguindanaons, who suffer from widespread, pervasive poverty and underdevelopment. Moreover, military conflicts between the Government and rebel groups have aggravated the situation. The result has been disrupted economic activity, hindered provision of social services, and insufficient development.

The numbers say it all. Before the project, about 80% of the families in Maguindanao lived below the poverty line and one out of three children suffered from moderate to severe malnutrition. The literacy rate in Maguindanao was 47%, much lower than the regional average of 73.5% and the national average of 86%. This resulted from the lack of adequate classrooms, teaching materials, and qualified teachers. In addition, poor living conditions and inadequate primary health care caused a high incidence of waterborne diseases and schistosomiasis.¹ Today, about 76,000 Maguindanaons have better access to irrigation, water, transportation, health, and education services because of the Kabulnan Irrigation and Area Development Project² funded by the Asian Development Bank (ADB).

¹ A parasitic disease caused by contact with infected water.

² Kabulnan Irrigation and Area Development Project (Loan No. PHI 24077).

Project Description

Objectives

The agricultural sector plays a key role in the Philippine economy. In 1989, it accounted for 23% of the gross domestic product and more than half of total employment. In Maguindanao, the agricultural land is estimated at 23,050 hectares (ha). The major arable crops are corn and rice, mainly grown under rainfed conditions. The major tree crop, coconut, occupies about 3,100 ha. Incorporated in the coconut farming system are dispersed intercrops of corn, banana, and coffee.

Before the project, agricultural production in Maguindanao was predominantly at subsistence levels. A low cropping intensity of 146% and a low yield of about 2.0 and 2.05 metric tons per hectare (mt/ha) for rice and corn, respectively, reflected low agricultural productivity. The extensive use of traditional crop varieties, low inputs of fertilizer, and minimal irrigation resulted in a low yield of field crops. Before the project, only 4.2% of potentially irrigable land (500 ha of the 12,000 ha total) was being irrigated through three community systems. The project sought to irrigate the remaining 11,500 ha using water from the Kabulnan River.

ADB provided a \$48 million loan to fund the project, renewing its commitment to develop irrigation systems in rural Mindanao.³ The project area covered 250 square kilometers (km²) and benefited 76,000 people, 93% of whom were indigenous Maguindanao Muslims.

The project aimed to reduce poverty by raising rural incomes through an increase in farm production and productivity, as well as generating other employment opportunities. It also sought to provide Maguindanaons access to better health, nutrition, sanitation, and education as well as contribute to the Government's efforts to improve food security in the country.

To fulfill these goals, the project proposed to: develop irrigation and drainage facilities to serve an area of 11,500 ha; construct or improve rural roads totaling 178 km in length; strengthen agricultural extension services; develop irrigation associations; conserve soil in the watershed; upgrade social infrastructure facilities for health, rural water supply, and education; and improve the capacity of rural women and promote their role in the development process.

Activities

The National Irrigation Administration (NIA) handled the project's irrigation component. It included the construction of irrigation and drainage facilities, land acquisition and titling, procurement of equipment, and the formation and training of irrigator's associations to operate and maintain the irrigation facilities.

The social component was handled by several executing agencies. The Department of Public Works and Highways (DPWH) built roads and improved bridges, provided rural water supply and sanitation facilities, and procured equipment. The Department of Agriculture (DOA) secured farm facilities and managed soil conservation in the watershed. The Department of Health (DOH) improved

³ Since 1969 ADB has funded 13 irrigation projects in Mindanao that have focused on reducing poverty and environmental degradation.



health facilities in the area by building and furnishing *barangay*⁴ and municipal health centers, trained the residents in proper health administration, and implemented the schistosomiasis control program. The Department of Education, Culture, and Sports built and furnished school buildings and training centers, where additional training for teachers was conducted. And lastly, the Department of Social Welfare and Development (DSWD) built a training center for women, fully equipped with materials for vocational training.

After project implementation started in 1992, government support programs poured into the area. Irrigators' associations and multipurpose cooperatives were formed. Various types of technology training⁵ were implemented through the combined efforts of the NIA's Institutional Development Division and the DOA. Livelihood projects were also supported by cooperatives financed by the Land Bank of the Philippines.

During the early years, the local people viewed the project with much skepticism because of substantial delays caused by late fund releases by the Government, problematic contractors, an unstable peace and order situation in the area, as well as heavy rains and flooding. But once the irrigation facilities began taking form in 1994, along with tube wells, roads, classrooms, and health stations, the communities realized the value of the project and increased their participation.

Evaluation

Although delayed, both the irrigation component and the social component were essentially completed. The irrigation and drainage facilities served an area of 9,000 ha, but in 1998 and 1999, rice yields of irrigated farms were comparable only to rainfed areas because farmers had limited knowledge of irrigated farming. They also used low-yield seeds and inadequate inputs. However, after adequate training and the introduction by Philrice of certified seeds in 2001, a major increase of 20–30% was obtained. Further increases in yield are expected with the introduction of NIA's Irrigated Farm Support Program, under which an appropriate mix of certified seeds, fertilizers, credit guarantees, appropriate technology, and agriculture extension services would be provided to the project area farmers. Although the yields in 2001 did not meet the anticipated 4.5 mt/ha, the dry and wet season yields of 3.26 and 3.61 mt/ha, respectively, were considerably higher than the 2 mt/ha yields obtained without the project. In some cases, farmers using appropriate inputs had yields as high as 5 mt/ha.

⁴ The smallest political unit in the Philippines.

⁵ In leadership, financial management, system operation and maintenance, rice production technologies, etc.

With regard to infrastructure, DPWH built or improved 44 km of roads and a bridge. This reduced transport costs for farm inputs and harvests from P50 to P5 per bag.⁶ Now the farmers who could not afford the high cost of transportation have a better alternative to the unstable irrigation embankments that they used as low-cost, temporary roads for transporting farm inputs and sending crops to the market.

To make potable water more accessible to other parts of the project area, 135 deep wells and 317 shallow wells were also successfully built. DOH provided one toilet with septic tank for each school in the project area, along with a health education and training program in hygiene, nutrition, vaccination, and the prevention of communicable diseases. A schistosomiasis control program identified and treated those suffering from the disease. To reduce the rate of new infections, 3,000 household toilets were also improved. In addition, DSWD created a training center for women. In collaboration with nongovernment organizations (NGOs), DSWD trained 1,500 women to improve irrigated and upland crop production practices, as well as to increase livelihood-generating skills,⁷ functional literacy, and community mobilization.

The net incremental benefit—the difference between the net value of crop production with the project and without it is P636.49 million, or about P54,094 per ha. Economic effects per household need further evaluation, but the above numbers indicate that similarly positive results may be expected.

Lessons Learned

Although a formal project completion review will be undertaken later this year, it is clear that considerable benefits have accrued to the local people, including much-improved crop yields, improved transportation, better water supply and sanitation, and reduced health risks. These all contribute to a significant positive impact on the local population, and clearly demonstrate the benefits of proceeding with development projects, even when the peace and order situation hinders development in those areas that need it the most.

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⁶ P1 (Philippine peso) = \$0.036392, \$1 = P27.4786 (1991) in ADB. 2002. *Key Indicators 2002*. Manila

⁷ Sewing, weaving, and the making of indigenous and consumer products.



Water for Slums: ■ Private Sector Participation in Manila

Background

With a population of more than 11 million, Metro Manila is one of Southeast Asia's largest cities. Until recently, more than a third of its residents lacked a connection to the city's aging water network. The urban poor, many of them informal settlers (squatters) on public and private land, made up the vast majority of those not served by the water system. Most poor households were not eligible for water connections because they did not have land titles.

Unconnected households depended instead on public faucets and vendors, or got water from wells or other bodies of water. In 1995, the poor spent up to 20% of their income on water from vendors, who sold lower-quality water at 7.4 times the basic rate charged by the government-owned Metropolitan Waterworks and Sewerage System (MWSS). Until 1997, MWSS was responsible for all water and sanitation services in Metro Manila.

Private Sector Involvement

In the mid-1990s, the Government decided to reorganize Metro Manila's water sector to increase service coverage, improve the efficiency of operations, raise funds to finance major projects, and end government subsidies. Following a competitive selection process, 25-year concession agreements were awarded in 1997 to two consortiums, each a partnership of international and local firms. The Manila Water Company became responsible for the network in the eastern part of the city, while Maynilad Water Services took control in the western zone.¹

The concessions were won on the basis of the largest reduction in tariffs. An increasing block tariff distinguishes between residential, commercial, and industrial customers. In order to charge poorer residential customers less than richer ones, the rate per unit of water rises with total consumption, on the assumption that low consumption is associated with low income.

At the heart of both contracts is an obligation to provide water service to an increasing proportion of residents in exchange for the right to collect revenues. While they contain no specific programs or strategies for reaching the poor, the concession contracts demand an aggressive program of expansion aimed at nearly universal water coverage in the first 10 years. Nonperformance will be met with financial penalties.

Motivated by the prospect of profits and penalties, the concessionaires made significant progress toward their targets during the first 5-year period, and as a result many households have improved water service. As of 2001, the two companies had installed 238,000 new connections, of which 54% were in poor urban areas.

During the early years of the concession, both companies developed innovative strategies for addressing the problems of dealing with the urban poor. They no longer made land titles a condition for installing water connections; instead, they asked the local government to approve the water service installation in a certain community. Poor households were also allowed to pay for the connection fees in installments.

While each concessionaire is required to meet the same standards for *outputs* such as water pressure, continuity, and customer service, technical standards for *inputs* (e.g., construction methods, pipe diameter) are not specified. The concessionaires have interpreted this as a license to innovate, developing special programs to expand the network in poor neighborhoods: the Bayan Tubig (Community Water) project in the Maynilad concession area and the Tubig para sa Barangay (Water for the Community) project of Manila Water.

Bayan Tubig Project (Maynilad)

Under Maynilad's Bayan Tubig scheme, more than 61,370 new connections were installed as of January 2002, accounting for 40% of all new connections. The scheme uses small-diameter pipes to connect households to the water main and assigns maintenance responsibility to customers. In some cases the connection fee has been lowered and customers are allowed to pay it in installments over a period of up to 12 months.

¹ ADB provided a \$45 million loan to Maynilad and arranged further loans from a syndicate of international commercial banks.

Box 1. F. Carlos Water Supply Project (Maynilad)

The F. Carlos community in Baesa, Quezon City, has a resident population of about 6,000. Six public faucets scattered throughout the area provided 40% of the water needs of the community. Residents could only fetch water every other day. They had to queue to collect water and store it in big containers because the water supply was unpredictable. On average, each household spent about P250–P300² a month on water obtained from public faucets.

Water vendors supplied the remaining 60% of the water supply. Households spent from P450–P900 per month for this water. The water vendors got their water from deep wells, as well as from illegal and legal connections. Because of the high cost of water purchased from vendors, people also fetched water from shallow wells and collected rainwater for washing and bathing.

In 1999, a community-based association approached Maynilad, in whose service area the community falls, and requested that water connections be installed. The company then held successive meetings with association members and *barangay*³ leaders to ascertain the extent of the need and the support of the community for the project.

The scheme used in F. Carlos involved the installation of a secondary underground water pipe and its connection to the main existing pipe. From the underground pipe, galvanized pipes were installed above ground leading to a battery of water meters. From the meters, plastic pipes leading to the individual households were installed.

The participation of community residents, who hauled the pipes from the trucks to the streets and pathways, made it possible to complete the project in less than a month. Out of 1,200 resident households, 908 applied for a house service connection, which cost P2,400. A down payment of P200 was required and the balance was payable within 10 months. The water bills now range from P50 to P150 per month.

The benefits for the residents of F. Carlos in terms of access to safe water, convenience, time savings, and lower cost are enormous. But Maynilad has profited as well. Aside from being able to meet its commitment to expand coverage, it also addressed one of the main causes of the high rate of unaccounted-for water. Maynilad was losing as much as 60% of its water due to illegal taps and undetected leakages. By directly supplying poor households, which otherwise depended on vended water, the company was able to reduce a source of illegal connections.

Tubig Para Sa Barangay Project (Manila Water)

By the middle of 2002, 61,000 households had received new connections under Manila Water's Tubig para sa Barangay (Water for the Community) project.⁴ The Manila Water Company is using similar methods as Maynilad to increase connections in poor areas, but the overall approach of its project is more varied, using three different schemes that depend on the situation of a particular area and the demands of the residents.

In the first scheme, each household pays for an individual metered connection. In the second scheme, one metered connection serves 2–5 households, which are responsible as a group for paying the connection charge and monthly charges. The families sharing the mother meter may opt to install individual submeters, with one household acting as the leader, collecting payment and remitting of payment to the concessionaire. The third option is a community-managed water connection.

² P1 (Philippine Peso) = \$0.036392, \$1 = P27.4786 (1991) in ADB. 2002. *Key Indicators 2002*. Manila.

³ The smallest administrative unit in the Philippines.

⁴ Manila Water used the unused balance of two ADB loans to MWSS (Angat Water Supply Optimization and Umiray-Angat Transbasin Project) to procure equipment and materials that were partially used for this project.

Box 2. Community-Managed Water Connection in Barangay 37/38 (Manila Water)

For most of their lives, taking a bath was a luxury for Milagros Quirino and Fely Griarte. For years, the women living in the squatter area of Barangay 37/38 in Welfareville, Mandaluyong City, had to make do with only a few liters of water everyday, bought from a neighbor who owns a deep-water well. About 3,000 families in the neighborhood used to share three deep-water wells. "We often had to get up at 3 a.m. to make sure we would get water," said Fely. "And if there was a power cut and the water pump did not work, we would have to wait another day." The quality of the water was poor and it had to be boiled before use. Connections to the water supply system were not possible because the families living in Barangay 37/38 have no land titles. The residents were delighted when Manila Water staff came to their area in 2000 to introduce their Tubig para sa Barangay project, which no longer requires these documents.

Before planning a project, Manila Water examines the status of a squatter area and makes sure that there is no immediate threat of eviction for its residents. Company staff then explain the project to the community and identify community leaders like Milagros and Fely who help the company in their awareness program.

Because of the layout of the settlement and the desire to reduce costs, a bulk water supply scheme was chosen for Barangay 37/38. It is a miniwater distribution system that serves its members through metered pipes and is billed as a single account with one meter for a group of 20–50 households. Each household is given an individual connection with its own submeter. Group coordinators like Milagros and Fely, as well as 30 other mostly female volunteers in the squatter settlement, are responsible for meter reading, billing, and fee collection for all the member households. "If someone does not pay, I cut off their connection," says Milagros. Group pressure to pay the bill on time is strong because everyone in a water users group suffers if one family does not pay its share of the bill.

The residents of Barangay 37/38 now not only have access to clean water 24 hours a day, the water is cheaper, too. While they used to pay P100 for 1 cubic meter (cm³), the cost is now P15, including P7 set aside for operation and maintenance, requirements, that the group leaders manage.

The project has greatly strengthened a sense of community responsibility for the water supply scheme. Because it is in its own interest to do so, the community reports leakages and illegal connections to Manila Water. Nonrevenue water has thus been reduced. Also, daily quarrels about water are now a thing of the past.

Alternative Water Provision

The concession agreements are written in a way that permits alternative providers to play an active role in serving the poor. While the concessionaires are granted exclusive rights to serve customers in their service areas, in practice they do not prevent local firms from operating. Numerous housing associations, community groups, and at least one local company specializing in water distribution are buying large quantities of network water and selling it to households via subnetworks. Tankers and handcarts also continue to serve off-network markets. One explanation for this situation is that re-sellers of piped water are helping the concessionaires to achieve their coverage targets. Bulk water sales have become an important part of Manila Water's strategy for serving the poor, and do not just achieve its coverage targets. It charges the alternative providers the highest block rate in the residential tariff schedule or the commercial rate, the company's investment in tertiary distribution in such cases is nil. In delegating service delivery to a third party that operates outside the confines of the concession agreement, including the official tariff structure, Manila Water has found a way to profit from a segment of the market where it would otherwise operate at a loss.

Evaluation

Improving the lot of Manila's poor, while not a driving force behind the city's decision to engage the private sector in water distribution, has emerged as a priority for the two concessionaires. Both are making progress toward their coverage targets and have high-profile targets aimed at expanding service in poor areas.

The number of poor households in Metro Manila connected to the water supply system has vastly increased. The households served now have access to safe and better-quality water at a much-reduced cost per cm³. As a result, their consumption of water per capita has increased, their health has improved, they have more time for other activities, and no more quarrels over water. The residents of the poor communities that now have water connections feel they have become a legitimate part of society, receiving the same services that the rest have been enjoying. In many areas, a sense of ownership and responsibility for the water supply has developed.

The benefits to the poor have been realized through the relaxation of earlier stringent technical and institutional requirements, such as the waiving of land title requirement and the new policy of allowing customers to pay their connection fees in installment. In turn, such policies have reduced the cost of connections and paved the way for regularizing illegal connections in squatter communities.

The water companies have also benefited from improving their services to the poor. They were able to approach the coverage expansion targets set in the concession agreement, increase revenues, and decrease nonrevenue water. Other benefits for the water companies include satisfied customers and an improved public image. Another advantage is that the companies do not have to pay excavation permits in many squatter areas because local mayors support the project. Cooperation between staff of the water companies, local officials, and the beneficiaries has generally been good. Staff members of Manila Water are so enthusiastic about the project and the good feedback they are getting from their customers, that they have even volunteered to organize additional welfare activities for the squatter areas.

Private sector involvement in the water sector has generally been beneficial for the poor, but has been a financial challenge for the water companies, especially Maynilad.

Lessons Learned

- Involving the private sector may not in itself necessarily lead to better access and quality of services, but it allows for the formation of innovative arrangements that can facilitate access and improve the quality of services available to the poor.
- Systems run by the private sector appear to be more flexible than publicly operated systems in accommodating a variety of arrangements to suit the specific needs and capacities of low-income communities.
- A number of factors led to greater service expansion in urban poor areas. First, targets were disaggregated by municipality, requiring progress not just in high-demand, high-paying areas. Second, input standards were absent, or at least ambiguous, so that targets could be met in innovative and cost-saving ways. Third, targets could be achieved directly by the concessionaires, or indirectly when a third party distributes the water.

- Private water service companies are less encumbered by bureaucratic requirements associated with having project funds and plans approved by the authorities.
- The involvement of communities in project planning and implementation cultivates in them a greater sense of ownership and responsibility, and the capacity to manage community-based water supply and sanitation systems.

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The Role of Small-Scale Private Water Providers in Serving the Urban Poor¹

Background

Over the past several decades, governments and development agencies have relied on large water utility companies to provide water in urban areas. Unfortunately, although access to water has improved, large percentages of the urban poor remain unserved. Water utilities have been unable to cover the whole population with the existing price strategies and management structures, leaving more than 50% of the urban population in Asia without a connection to a water utility in 2001.² Research in Africa, Latin America, and Asia³ shows that people without access to a connection are concentrated in low-income areas and that a large number of them rely on water delivered by small-scale private water providers (SSPWPs).

¹ This paper was prepared by Herve Conan (ADB consultant) and Maria Paniagua (ADB staff) on the basis of the preliminary findings of the Study on Small Scale Private Water Providers under ADB Regional Technical Assistance (RETA) 6031.

² Piped-water coverage based on connections: Delhi 46%, Dhaka 10%, Karachi 47%, Kathmandu 54%, Manila 32%, Jakarta 31%, Phnom Penh 31%, Ho Chi Minh City 32%, Vientiane 45%.

³ The findings of this research have been summarized in the following papers: Solo, Tova Maria 1998. Competition in Water and Sanitation: The Role of Small-Scale Entrepreneurs. *Public Policy for the Private Sector* Note No. 165. Washington, DC: The World Bank; and Collignon, Bernard and Marc Vezina. 2000. *Independent Water and Sanitation Providers in African Cities: Full Report of a Ten-Country Study in Asia*. Preliminary findings were drawn from the study of eight cities financed by ADB under RETA 6031.

An Asian Development Bank (ADB) survey in eight cities of Asia shows that the presence of SSPWPs varies greatly depending on the city but is always significant where there are low connection rates or where service is available less than six hours per day. Preliminary data indicate that SSPWPs provide water to 6% of the population in Delhi, 10% in Dhaka, 5% in Kathmandu, 36% in Cebu, 19% in Ho Chi Minh City, 44% in Jakarta, and 13% in Ulaanbaatar. In a city such as Jakarta, with a population of 9 million people, this means that about 4 million people depend on SSPWPs to meet their daily water needs. However, the strategies for increasing the participation of the private sector in Jakarta did not consider SSPWPs and their investments are rarely registered in sector statistics on private investment.

Findings

SSPWPs are small or medium entrepreneurs that have made water distribution their main source of income and have generally invested their own capital to start their business. SSPWPs vary but can include managers of water utility standposts, owners of small piped networks, vendors (water carriers, tankers), and resellers. The majority of these SSPWPs remain informal and work without recognition from the local authorities or the water utility. Most of them are close to the area they are serving, and develop their business in a competitive environment, as they do not have exclusive right to provide services. Volumetric rates⁴ offered by SSPWPs are usually higher than those of the utilities, but poor consumers still demand their services because these meet SSPWPs their needs: the services are flexible and immediately available, there are no high connection fees, the management style is adapted to their customer's profile (in particular, periodicity of billing), they use local materials and technology to reduce costs, and they can overcome legal and physical barriers often characteristic of the areas they serve.

The quality of service and price offered by SSPWPs is strongly linked to the water service provided by the utilities and to the water resources and business conditions in the area. The better the service coverage and water availability from the public utility, the smaller the niche market for SSPWPs. Cultural notions also play a role. Where we find a strong tradition of public subsidies or free water to the poor, such as in the case of Delhi, Kathmandu, and Dhaka, the niche market for SSPWPs is very limited despite the low levels of service provided by the utility.

Where the conditions are suitable, SSPWPs have managed to offer a service comparable to that of water utilities. Our research in Asia has identified a number of pioneers that can provide a house connection with service 16–24 hours per day. This is the case of SSPWPs in Cebu, Ho Chi Minh City, and Manila (see boxes 1–3). Investments by SSPWPs can be substantial and can provide service to a significant number of households. In Metro Manila there are SSPWPs that have invested \$350,000 over 5 years to deliver water to about 25,000 households through a house connection or hose, and in Ho Chi Minh City there are SSPWPs that have invested \$80,000 to produce and treat water that is distributed to 400 households through a house connection.

The type of service and investments of these pioneers is significantly different from that of vendors and resellers. Pioneers offer a household connection with hours of

⁴ The volumetric rate is highest for water sold in small quantities (by water carriers, vendors, etc.). Because of the small volume of sales, the profit margin of these small-scale operators amounts to around \$1 per day (the international poverty line).

service similar to those of the utility—the kind of service that most consumers would like to have. They have also developed their own management strategies and implemented technology choices that best suit their clients, thus reducing investment and operational cost per connection. There are indications that the investments by pioneers, although relatively recent, are growing rapidly not only because of increasing demand and willingness to pay, but also because of the slow rate of expansion into these communities by the water utilities. The better the legal environment, the higher the level of service and the level of investment per household served (\$47 per connection in Delhi, where SSPWPs are illegal, versus \$100 in Cebu and \$80 in Ho Chi Minh City, where SSPWPs have received authorization from local authorities). Therefore, it is expected that pioneers will continue to expand and invest in the sector as long as utilities continue to lag behind the growing demand for water connections.

Although sometimes these pioneers are recognized by the local authorities, they rarely have authorization from the existing water utility, and this increases the risk of their investment. In addition, their business is seen by commercial banks as risky (it is often illegal) and nonprofitable (they serve the poor) and their assets are rarely recognized. Consequently, they have limited access to long-term credit and borrow at high interest rates.⁵ The cost of doing business under these conditions is passed on to the consumer and limits the SSPWPs' capacity to expand their services.

Conclusion

Full service coverage by water utilities will not happen within the next decade. We must therefore recognize the role that SSPWPs have and will keep having as major providers of water to poor urban areas, and increase and channel their investment capacity so that they can contribute to the global investment required to reach the Millennium Development Goals set for the water sector. Ultimately, integrating SSPWPs in the water sector investment strategy would accelerate their expansion capacity, allow them to lower their tariffs, and improve the services and choices available to the urban poor.

Recommendations

The following recommendations aim at improving the quality of service and coverage provided by SSPWPs to the urban poor and at increasing total investments in the water sector:

- Provide a *conducive legal framework* that recognizes and encourages greater longer-term investments by SSPWPs, within the context of private concessions and decentralization of services.
- Include SSPWPs in the *water supply strategies* of governments and donors and in the water supply development plans of local authorities and water utilities. Build incentives for SSPWPs to improve their services while respecting their core competencies.
- Facilitate SSPWPs' *access to financial resources* to increase their capacity to invest in the sector and reduce their cost of capital.

⁵ When required, SSPWPs currently obtain credit from informal sources that charge 5%–10% interest per month.



Box 1. Cebu: A Favorable Context for Small-Scale Private Water Providers

Economic growth have put a great strain on Metro Cebu's water supply in recent years. Metro Cebu's water supply is mostly derived from a groundwater aquifer, which is rapidly being depleted. Surface water treatment is an investment that is not in the short-term plans of the government-owned Metro Cebu Water District (MCWD). Consequently, extension of service is not a priority and piped water connections cover only 32% of the population. In Cebu the requirements for a connection to MCWD are numerous and very difficult to meet for most of the 35% of the population living under the poverty line. The requirements are: a \$100 connection fee plus evidence of land title or tax declaration, current residence tax certificate, affidavit of house ownership, plumbing permit, applicant's identification card, and completed application form. These requirements have led to the development of different strategies for providing a house connection to those who cannot afford the connection fee or cannot meet the administrative and legal requirements. Three strategies are discussed below:

1. There are many small-scale systems that use water from a private well equipped with an electric pump and a small water tank. Originally, the owner developed the system for his own needs. However, because of the demand, some neighbors (within a radius of 50 meters) shoulder the expenses for plumbing services, a water meter, and galvanized iron pipes, and for an average cost of \$60 they can have access to water. No specific documents are required by the owner of the system. Each provider serves 100–250 cubic meter (m³) per month to 10–20 households. Customers (neighbors) pay their bill weekly or monthly.
2. Another system consists of a well that feeds into a 15–20 m³ reservoir with a main pipe system bringing water into a neighborhood. The technical standards by the provider are similar to those implemented by MCWD in low-income areas. The water provider extends the network in a radius of 500 meters–1 kilometer in the neighborhood and offers a service comparable to that of MCWD, but does not require any legal or administrative documentation. The customer purchases the needed materials for the connection (pipe, meter) from a hardware store or from the water provider. The connection cost amounts to about \$60, paid by the customers. These providers serve 1,000 m³ of water per month to 100 households. The customers pay their water bill monthly.
3. Some water providers supply water to households 3 or 4 days a week using flexible polyethylene hoses. The source of water is the main distribution line, which is connected to a well. Customers are served on request by a caretaker, who fills the household containers. The system does not have a metering device; the caretaker records the consumption of each customer on individual cards that show the weekly water consumption and are used in calculating the fee charged by the owner. The connection cost is around \$20. These providers serve 500 m³ of water per month to 100 households.

All these operators are operating legally with all the necessary permits, including a local government clearance, an authorization from MCWD, a permit from the National Water Resources Board, and a business permit from the municipality. The tariff charged by these SSWPs is in line with the type of service and the size of the initial investment.

	MCWD	System (1)	System (2)	System (3)
Initial Investment		\$2,000	\$6,000	\$2,000
Connection Fee	\$100	\$60	\$66	\$20
Tariff \$/m³	\$0.24	\$0.5	\$0.8	\$1.00–1.50

The case of Cebu highlights the fact that high connection fees and legal requirements, rather than water tariffs, is the biggest barrier to connecting to the water utility network; and there is a strong demand for water delivered to homes and willingness to pay for this kind of service.

Box 2. Ho Chi Minh City: A Legal Framework for Involving Small-Scale Private Water Providers

The city of Ho Chi Minh has to face two main issues to improve water supply at the city level:

- Shortage of water (around 30%) due to rapid city and economic growth during the last decade. The water shortage is made worse by the increase in technical losses (from 20% to 30% over the last few years).
- The rapid expansion of the city, with large peri-urban and rural areas not served.

Despite investments over the last few years and new water production units, the water utility (Ho Chi Minh Water Supply Company) is always “running after the demand.” Given the low water coverage (more than 55% of the total population does not have access to the water utility service) and the involvement of many local water providers in unserved areas, the municipality realized that the water utility will not be able to serve all the citizens in the next 5–10 years. The municipality therefore decided in December 2001 to develop a legal framework for involving small-scale water providers in the effort to reach the target of the Master Plan 2001–2005: to give access to clean water to 90% of the population.

A regulation “socializing” investments in safe water supply was developed by the municipality and the water utility in 2002 (it is currently being reviewed by lawyers). It is aimed at facilitating the investment of local private companies to

- increase water production,
- improve the level of service in the areas unserved by the water utility, and
- rehabilitate the pipe network in specific areas where water leakage is high.

The local authorities (Department of Public Works, Department of Planning and Investments, People’s Committee of Districts) select the areas for the socialization program and the water utility defines the technical specifications.

This regulation would define

- the different types of investment,
- the procedure for selecting the investors who are shortlisted on the basis of their experience (tendering process),
- the rights (development of a business plan) and responsibilities (clean water, technical standards, monitoring by local authorities) of investors, and
- the handover process at the end of the subdelegation contract (2–5 years) or when the area is reached by the water utility network.

This regulation does not yet include specific and low-cost technology approaches to facilitate services to the poor; SSPWPs still have to comply with the technical standards of the water utility.

The municipality wants to encourage private investment and promote partnerships between the water utility and the local operators. The water utility must support the small entrepreneurs both on technical and administrative aspects and in the procurement of materials (PVC pipes, chemical products, etc.). The small entrepreneurs will benefit from the policy of privilege investment (tax exemption).

In 2002, a pilot project was set up with Hiep An Company, a private company based in District 8, which signed a contract with the water utility to sell it safe bulk water (700 cubic meters/day). Water is pumped from two wells and treated in a water unit. In addition, the company distributes safe water to about 100 households in the neighborhood. Hiep An Company has invested about \$100,000 in this area and is currently studying a new investment (for about \$100,000) in another district including a commercial center and around 200 households.





Box 3. Metro Manila: Small-Scale Private Water Providers Can Reach Big Numbers

Inpart Engineering is a family-run business that provides water in 14 areas of Metro Manila. Its biggest area is in Addition Hills, a long-term squatter area where there were no public utility connections because of the lack of land tenure. Given the demand for a piped system in the area, Inpart signed a build-operate-transfer (BOT) agreement with the local government in 1997 to provide water to 17,000 households. Under this agreement, the local government requested a bulk connection from the public utility and handed it over to Inpart. Inpart agreed to invest in the development of the distribution system, pay the water utility bill, pay 10% of the gross revenue to the local government, employ people from the community, and transfer the system to the local government after 20 years. The initial investment included \$10,000 for the connection to the water utility, the construction of a water tower with a 455-cubic meter (m^3) capacity, and the purchase and installation of 15 1.5-horsepower booster pumps, 750 meters of PVC pipe, 287 mother meters, and more than 50 kilometers of 2-inch distribution pipes. A total investment of about \$134,000 was made in less than 6 months.

Inpart's distribution and management system works as a pyramid. Inpart distributes water from the water tower to 287 mother meters, each of which is connected to one distribution pipe managed by one water manager from the community. Each manager is responsible for one main distribution line and one master meter, branching out to household pipes and meters. The manager sells water to about 100–200 households through a household connection to the line or by hose into a 200-liter container. Customers with a connection pay \$0.70 per m^3 to the water manager, who reads the meter daily, while those served by hose pay \$1.32 per m^3 . A household connection is free, but the customers have to provide their own meters and pay a plumber for the installation (\$12–\$15).

The water manager reads the water meters, bills clients daily, and keeps 20% of the total sales as his salary. Inpart also reads and bills the water managers daily. Any meter reading discrepancies or water losses are immediately evident and it is in the interest of each water manager to avoid illegal connections or water losses. Because of the presence of the water manager in the community, most of the distribution hoses are not buried, and this helps in identifying illegal connections and losses. Inpart's costs include monthly maintenance, electricity bill, salary for three full-time employees, 10% of gross sales to the local government, payment to the water utility, and cost of capital. The cost of capital is very high because no commercial credit is available. Inpart borrows from different sources, and interest rates vary from 10% to 20% per month, with a 30–90-day payment period.

