



## Water and Sanitation Program

An international partnership to help the poor gain sustained access to improved water supply and sanitation services

# Willingness to Charge and Willingness to Pay: The World Bank-assisted China Rural Water Supply and Sanitation Program

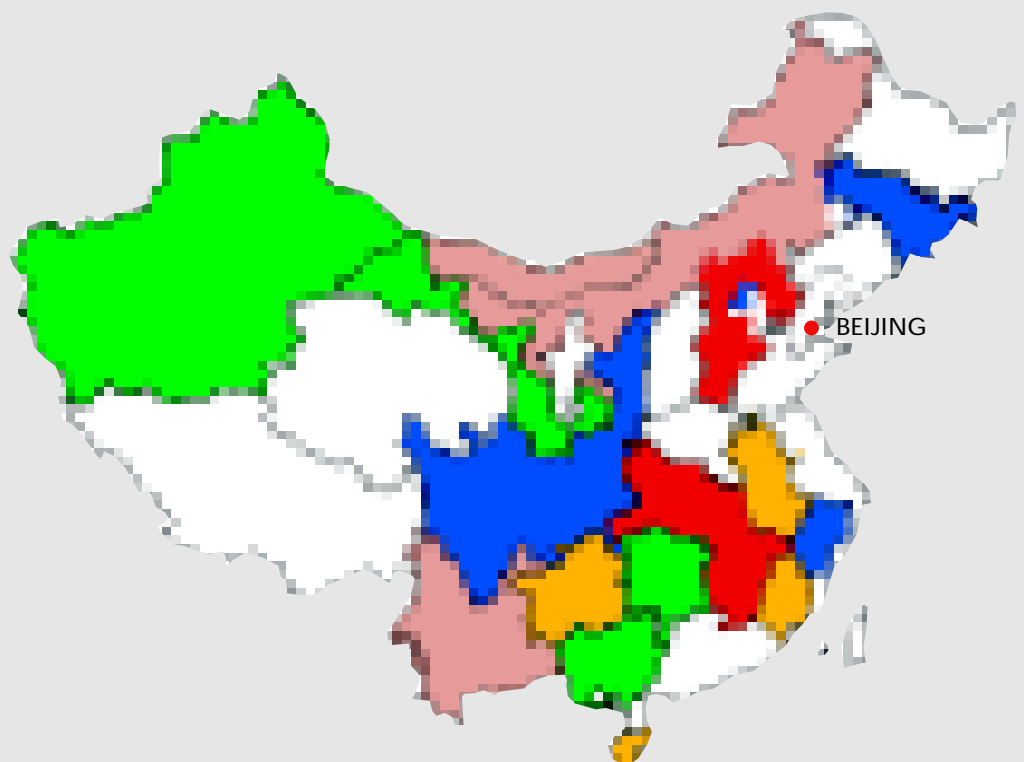
### Introduction

A decade after the international Dublin and Rio conferences of the early 1990s, where the economic value of water gained greater recognition, many developing countries have been struggling to implement higher cost recovery policies in rural water supply (RWS) programs. Even though many countries accepted the principle that the poor were willing to pay for good quality services and therefore should be charged for them, a long history of RWS subsidization posed significant challenges in implementing this policy. In China, however, during the same period and away from the fanfare of international declarations, partial user-financing in RWS had already been implemented for many years by the government. The World Bank-assisted rural water supply and sanitation lending program, which started in 1985, built on this approach and developed a very effective cost recovery policy where the users finance up to 75% of the capital investment as well as the full operation and maintenance (O&M) cost. Clearly, if cost recovery was the mantra of the 1990s, the Chinese were well ahead of the curve.



THE WORLD BANK

## Project Provinces



## A Supportive Context for Cost Recovery

China differs significantly from most developing countries in that there is little history of the central government providing large subsidies for the financing of rural water supply. Instead, there is greater emphasis on cost sharing by provincial, county and community institutions. This proved to be the ideal context for the Bank to develop a significant cost recovery model in its RWS lending program, where the IDA credit/IBRD loan is ultimately repaid by the end-user, the rural beneficiary. This is rare in Bank lending, in particular for its 'soft' IDA credits. In most Bank-assisted RWS projects, the credit to the central government is 'on-lent' to provincial governments and then passed on to local governments or rural communities as grants. At best there is a nominal capital cost contribution by the users (typically 10% to 15%) and

repayment of the Bank credit is the responsibility of the provincial/central government. In the China RWS projects, however, the end-users are themselves responsible for servicing the Bank debt. On top of this they pay the full cost of O&M.

## Government and Bank RWS Programs

Despite significant gains in coverage over the last 15 years, about 50% of the rural Chinese population still does not have access to safe drinking water. In the Ninth Five-Year Plan, the Government announced its target of providing safe water for 65% of those residing in China's poorest areas. In the Tenth Plan, currently under implementation, the objective is to extend that coverage further. RWS is high priority for the Government, which has received Bank assistance for four successive rural water and sanitation projects

over the last 17 years. The total Bank investment in these four projects is \$628 million, aimed at serving about 23 million people in 18 provinces. The projects have continuously improved in design and policy content, based on lessons learned, both within China and internationally. The first project was not specifically targeted at the poor or based completely in rural areas, but both these policies changed in succeeding projects. Sanitation and hygiene were also introduced in the later projects. One design principle, however, was consistent in all four projects: the water supply service level provided to users in the Bank-assisted projects was significantly higher than that provided in most government-funded RWS programs. While the latter provided a 'basic' level of service, typically through hand pumps, rainwater collection systems and tube wells, the former offered a higher level of service through piped water supply to individual households. It logically followed that the users had to pay more for these improved services.

**Table 1 Bank RWS Lending Program in China**

Year	Bank assistance (in million US\$)	Type of lending instrument	Size of project (in million US\$)	Target beneficiaries (in millions)	Provinces included
1985-90	80	IDA	210.2	6.0	Lianoning, Shaanxi, Sichuan, Zheijiang and the municipality of Beijing
1992-97	110	IDA	189.1	9.0	Guangxi, Yunnan, Hunan, Gansu, Inner Mongolia and Xinjiang
1997-2005	70	IDA	136.7	4.6	Yunnan, Jiangxi, Gansu, Hubei, Hebei and Inner Mongolia
1999-2005	46	IDA (30 m) and IBRD (16 m)	92.0	3.1	Anhui, Fujian, Guizhou and Hainan

# Financing Arrangement

Typically, the Bank finances about half of the capital cost of piped water supply systems installed through the project. For the remaining upfront costs, the provincial and county governments jointly finance 25% and the users contribute 25%, usually in the form of a cash and labor combination. Since the users also service the Bank debt through payment of water tariffs, they effectively finance 75% of the overall investment cost.



Community labor contribution: digging of trench for laying pipeline

# Institutional Arrangement and Fund Flow

## Institutional arrangement

**National level:** The Beijing-based National Project Office (NPO) under

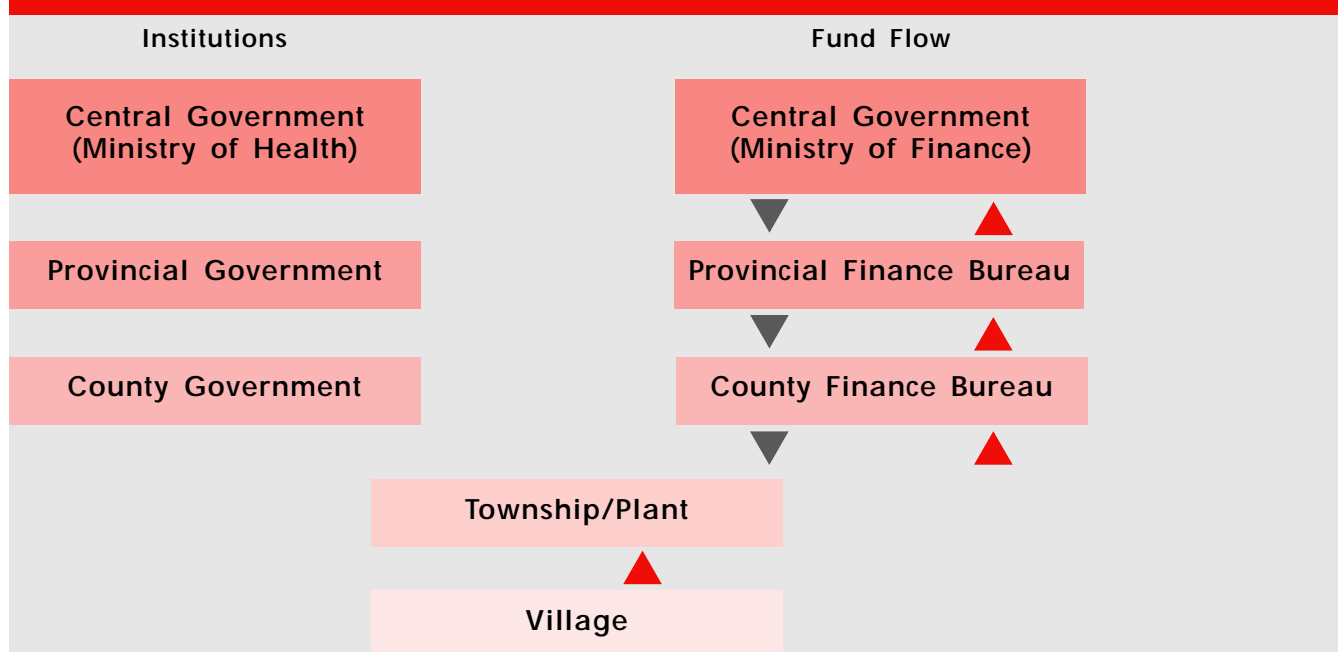
the Ministry of Health plays the role of monitoring, coordinating, training, setting technical standards and managing centralized procurement.

**Provincial level:** Each province has a Provincial Project Office (PPO), usually under the Bureau of Health, performing essentially a coordinating and monitoring role at the provincial level.

**County level:** Each county, which is the equivalent of the local government, has a County Project Office (CPO) under the Bureau of Health. The CPO coordinates, monitors and provides management support to the township water supply plant.

**Township water supply plant level:** The functional level of project

Figure 1 Project Model





Water meter for household connection

management is the township water supply plant. This is headed by a full-time plant manager, who is assisted by other staff members. Many plants are registered as 'enterprises' under the Enterprise Law: they pay tax to the government and prepare annual

accounts and balance sheets. The plant management operates the water supply scheme, which provides piped water supply to individual households in a number of villages.

**Village level:** There are both administrative and 'natural' villages

(habitations), with headmen and village committees, who mobilize communities at the planning stage of the project.

### Fund flow

The fund flow channel is independent of the administrative structure down to the township water plant level, with the credit/loan flowing from the World Bank to the Ministry of Finance at the national level, to the Finance Bureau at the provincial level and down to the Finance Bureau at the county level. The counterpart funds from the provinces and counties also flow through the respective Finance Bureaus. It is at the township water plant level that administrative and financial management merge. The village households' contributions come up to the township plant, which maintains a project account. The township plant then sends the money collected to the County Finance Bureau. Figure 1 (on the previous page) illustrates the institutional and fund flow arrangements.

## Tariff Setting

**Table 2 Water Tariff Calculation for Beiwan Water Plant (year 2000)**

Design population: 40,520 (3,000 HH connections)
Per capita daily consumption: 28 liters
• Annual water produced: $28 \times 40,520 \times 365 = 414,114$ cu meters
<b>Annual cost</b>
• Electricity: 184,781 Y
• Water source fee: 4,141 Y
• Maintenance: 79,449 Y
• Depreciation: 185,381 Y (3.5% of total investment of 5,296,600 Y)
• Chemicals: 4,141 Y
• Loan repayment amount: 326,992 Y
• Salaries and Welfare: $360 \times 18 \times 12 = 77,760$ Y
• Interest: $(5,296,600 \times 67.91 \times 4\%) = 143,876$ Y
<b>Overheads</b> (i) office, heating, travel, training: 14,400 Y;
(ii) water quality monitoring and lab testing: 1,800 Y
<b>Total annual cost: 1,022,721 Y</b>
$Tariff = 1,022,721 / 414,114 \times 108\%^{**} = 2.67$ Y per cubic meter
Y = Chinese Yuan; 1 US\$ = 8.3 Y
<i>**the additional 8% is due to adding 2% water loss and 6% income tax</i>

The cost of running the water plant as well as the debt servicing cost is met from user collections. The water plant employs bill collectors, typically one per village, and they directly collect water fees from households, each of which has a metered connection. Water tariffs are set by the plant management/County Price Bureau and raised when necessary to cover increased operating costs. The tariff calculation is comprehensive and includes the cost of electricity, salaries, water source fee, depreciation, debt servicing, interest on debt, overheads and tax. An example of the tariff setting calculation from Beiwan water plant in Jinyang county in Gansu province is given in Table 2.

## Cascade of Accountability

The Bank credit/loan made to the central government for a period of 35/20 years is 'on-lent' to the provincial government by adding an additional interest of 3-4% but, interestingly, the repayment period for the province is reduced to 15 years. If the latter falls behind on its repayment to the central government, the Ministry of Finance automatically deducts the debt service amount from routine central government transfers to the province. This pressure to service the debt, to use the words of a World Bank China specialist, "has created a cascade of accountability and responsibility for results, from project managers, who have to collect the levies, down to beneficiaries, who have to pay them".

At the township water plant level, collection of tariffs is taken very seriously indeed. A strong incentive system exists by which the salaries of the plant manager and his staff are tied to their success in collecting monthly payments from users. Salary deductions are made if collections are short of established targets; bonuses

**Table 3 Gansu Province: Second Rural Water Supply Project**

Name of Water Plant	Initial tariff (Yuan per cu m)	Year tariff was increased	Increased tariff	Percentage increase in tariff
Linxia Peiyun	1.3	2000	1.8	38%
Lintao Taoyan	1.3	2000	1.5*	15%
Wuwei Shuang Cheng	1.9	-	-	-
Wuwei Liujiaci Hue	1.5	2000	1.9	27%
Ping Lian Pai Shui	1.6	2000	2.0	25%
Gin Yuan Beiwan	2.3	2000	2.7	17%

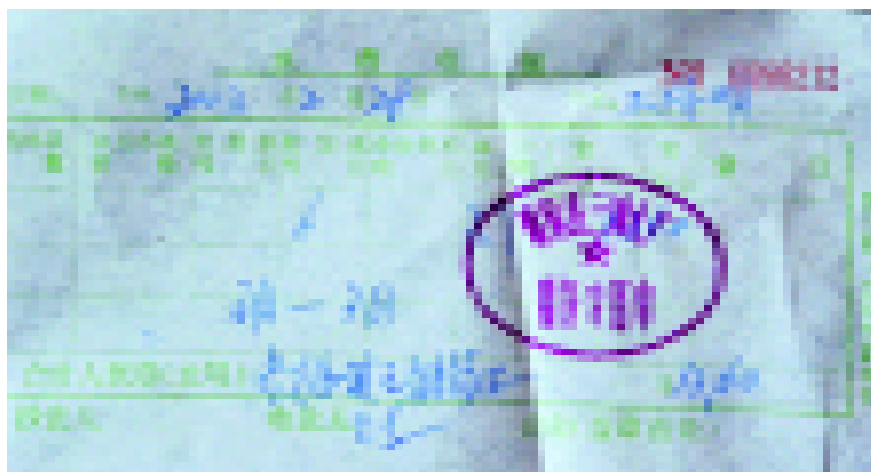
*\*The tariff was again increased in 2002 to 1.8 Y per cubic meter*

are paid if targets are reached within established time frames. Compliance of payment is usually over 90% and in the rare cases of non-payment, household taps are disconnected. When existing tariffs are not sufficient to cover operating costs, they are

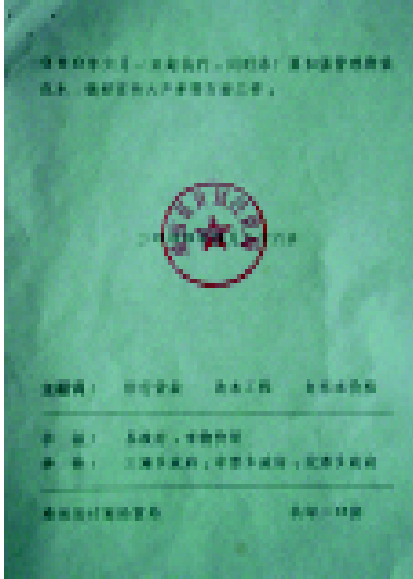
raised. Table 3 shows how tariffs were raised in the six largest water plants in the second RWS project in Gansu province.

## Ability to Pay

Cost-sharing by users promotes financial sustainability of water supply systems, but many observers worry that poor households may not be able to afford cost-recovering tariffs. In most cases, the costs appear to be affordable. Households supplied with water from the project water plants typically consume 3 cubic meters a month. At a tariff of 2 Y per cubic meter, the annual water bill comes to 72 Y. Assuming an annual per capita income of about 2,000 Y in rural China, this works out to 3.6% of annual income. To take the specific example of Jinyuang County in Gansu



Householder's water tariff receipt



Water tariff approval by County Price Bureau, Jinyuan County, Gansu Province

province, the consumers are paying a monthly tariff of 2.1 Y in the year 2002 and consuming 3 cubic meters per month. This works out to an annual expenditure of 75.6 Y. According to the Jinyang County Statistics Bureau, the annual per capita income in the year 2001 was 2,056 Y. Paying 75.6 Y per year is equivalent to 3.7% of a householder's annual income.

A second question often asked is whether the consumers served by the water plants are among the poorer sections of the community. This is the case in most of the counties in the second, third and fourth projects. Poverty was a major criterion used to select provinces and counties for these projects. Within selected counties, denser areas were chosen to make the cost of supplying piped water economically viable, and within the selected villages, the network usually covers all economic sections of the community. For the more remote and less densely populated areas of the project provinces, however, the approach has been to provide hand pumps, rainwater collection systems and small tube wells. Debt servicing is

not passed on to the consumers of these lower-service-level schemes. However, they still have to contribute the full cost of labor (typically 30 to 40% of the investment cost) and operate and maintain the schemes on their own.

## The Regulatory System

From the water plant manager's point of view, the tariff setting exercise is done comprehensively. But how are the consumer's interests protected? To address this issue, China has developed an effective price regulatory system at the county level. Once the proposed tariff has been calculated at the water plant level, it is sent through the CPO to the County Price Bureau for approval. The County Price Bureau reviews the calculation, holds discussions at the water plant and CPO level, then visits the concerned villages and holds public hearings with the consumers to determine the affordability of the new tariff. In some cases, the Price Bureau asks the water plant to revise its tariff. When

the County Price Bureau is satisfied with the proposed tariff level, it recommends it for approval to the County's Standing Committee, headed by the County Magistrate, which takes the final decision. The water plant then proceeds to enforce the new tariff system. It usually takes about three months to get tariff approval from the County Price Bureau.

## Compatibility of the Cost Recovery Policy with the Government RWS Program

In many developing countries, externally funded RWS programs have more stringent cost recovery policies than do RWS programs funded by the government. In the case of China, however, there is little difference between the cost recovery policy of the Bank-assisted projects and that of the



Waiting for water in Gansu province: poor existing systems stimulate demand for higher level of service

regular government-funded RWS programs. Essentially, the national policy is to use government funds for increasing coverage through providing basic levels of service with smaller systems like hand pumps, rainwater collection systems and tube wells. With external funding, such as from the Bank, the policy is to provide, where demand exists, a higher level of service through piped water supply systems. Within the Bank-assisted projects, however, the more remote and scattered areas are provided water supply systems similar to the ones covered under the government programs. The cost recovery policy for the basic level of schemes in both Bank-assisted and Government programs is the same: full labor contribution and full responsibility for O&M.

## Lessons Learned and Emerging Issues

### Consumer voice

Despite the fact that users are financing as much as 75% of capital and 100% of O&M costs, their involvement in project activities is somewhat limited. This involvement is during the early stages of the project cycle, when the project villages, through their committees, have to confirm in writing to the CPO that the users have been consulted regarding the proposed water supply scheme and are willing to contribute their share. Each village committee also includes a member of the Chinese Women's Federation, a national NGO. On the other hand, the users have no real say in the design and management of the asset they are financing. It therefore makes sense to explore how, within the context of



Consumer holding a Water User's Passbook

existing laws, the consumer's voice can be heard with regard to scheme design, construction and management.

### Over-design of water supply schemes

While most consumers can probably afford to pay the present level of water tariffs, as operating costs go up, there is the possibility of increases over the years. This could lead to problems in terms of affordability. Along with raising tariffs, therefore, there is a need to look for other ways

of reducing costs. There is little doubt that many of the water plant schemes are over-designed both in terms of construction standards as well as having surplus capacity. Added to this is the fact that many of the water plants have excess staff. These factors significantly add to both the investment as well as operating cost, which, in turn, adversely impacts on the users, the main financiers of the system. Since construction design standards are set at the national level, this issue needs to be addressed there.



Large water supply plant in Gansu province

## New Management Models

In order to reduce costs and increase accountability to the consumers, it may be useful to experiment with different management models. For example, it could be interesting to examine, within the existing legal framework, whether the water supply plant can become a cooperatively owned enterprise, where the users are main shareholders of the plant. This has been successfully done in the well known milk cooperative institutional model of AMUL, Gujarat, India. The user-stakeholders could then try contracting out the management of the water supply scheme, or both construction and management, to a third party from the open market.

## What Makes the Cost Recovery System Work

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From one perspective, the high cost recovery system in the Bank-assisted RWS projects is rational and logical, but the reality is that nothing even resembling it has been implemented at scale in most developing countries. Clearly, this is not easy to do. So why is it happening in rural China? A combination of general background factors and specific project related reasons is offered to explain this.

### Background factors

- Unlike many other developing countries, China has historically not significantly subsidized rural water supply services. Politicians are willing to charge for water and, having never been 'spoiled' by large subsidies in the past, rural communities are willing to finance most of the investment and the full O&M cost by paying appropriate tariffs.
- The Chinese culture, more so in rural

areas, is generally one of compliance with the law and, as long as the tariff levels are perceived to be appropriate and affordable, the cost recovery policy is unlikely to be challenged.

### Project-specific reasons

- Triggered by the central government demanding and enforcing repayment of the loan, there is a built-in incentive to recover costs, all the way down to the end users.
- The higher level of RWS service offered through the Bank projects is priced using cost-reflective tariffs. Households that receive individual piped water connections are expected – and are willing – to pay more than households receiving lower levels of service.
- Legitimate regulation is practiced, where the County Price Bureaus play the watchdog role and protect the interests of both consumer and provider.

## Can the Financing Policy be Replicated?

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This is a question which many have asked about the Bank-assisted China RWS program. Is the financing policy unique to the Chinese context or can it be applied in other countries? There are no easy answers to this question. Clearly the key to this success story is the government's willingness to price rural water supply services at financially sustainable levels, a condition that is not met in many other countries. Perhaps this case can help demonstrate to decision-makers in other countries that cost recovery in RWS can be realized, even in low income countries.

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