WATER

P-NOTES

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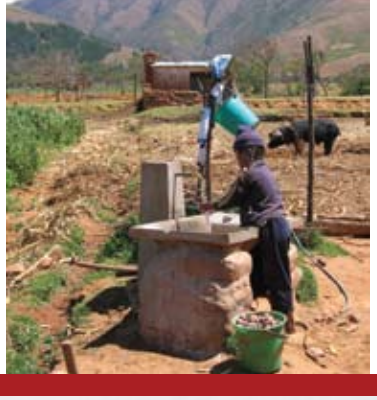

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Post-Construction Support and Sustainability in Community-Managed Rural Water Supply

Water projects in developing countries are inaugurated with great fanfare by the governments, lenders, and sponsors that make them possible; the projects' results, however, don't always receive the publicity of groundbreaking ceremonies. This study reports the findings of a multi-country research project intended to discover how such rural water supply (RWS) systems actually perform. Its emphasis was on how performance was affected by *post-construction support* (PCS) to communities after project completion. Information was collected from households, village water committees (VWCs), focus groups of residents, system operators, and key informants in rural communities in Bolivia, Ghana, and Peru. Approximately 10,000 individuals registered their opinions. The great majority of the systems were found to be performing well; the factors influencing their sustainability should help policy makers, investors, and managers around the globe who plan rural water systems.

Evolving Approaches to RWS Support

Over a decade ago, a number of donors, working with national and regional water resources ministries in developing countries, designed and implemented community-managed RWS programs that incorporated components of a new demand-driven model to improve upon the record of earlier projects that had quickly fallen into disrepair. This new model let households choose technologies as well as institutional and governance arrangements, gave women a larger role in decision making than was customary, and required households to pay operation and maintenance costs and at least some of the capital costs of water services provided.

Few of the RWS programs included the systematic provision of PCS. It was clear that communities needed some level of PCS, such as follow-up training and technical assistance visits by engineers. Two approaches to providing PCS soon emerged. The first was a *demand-driven* approach that ensured the availability of spare parts and technical services, but left responsibility for seeking out and paying for them to the communities themselves. The alternative approach was *supply-driven*, providing communities with unsolicited training, technical assistance, trouble-shooting, and repairs.

The research focused on how supply-driven post-construction support affected system sustainability given a well-designed community-managed RWS program. In all three countries, villages selected had received improved water supply projects three to twelve years earlier. About half the villages were *treatment* villages that received supply-driven PCS as part of the program, the other half were *controls* that had not received such support. Secondary data was used to select districts or regions where the village and household characteristics were similar to the treatment and control villages.

This note presents important information contained in *Post-Construction Support and Sustainability in Community-Managed Rural Water Supply: Case Studies in Peru, Bolivia and Ghana*, edited by Alexander Bakalian and Wendy Wakeman, World Bank – Netherlands Water Partnership, June 2009. Readers may download the complete paper from www.worldbank.org/water.

There were unexpected challenges in all three countries. The research design required that the water systems in some villages be *successes* and others *failures*, in order to have variation in the dependent variable. In fact, far fewer projects were found to be failures in either treatment or control villages than expected, since almost all systems were working properly. Another threat to the research design was the complexity of PCS provision in the study settings. The supply-driven PCS programs were actually demand-driven in practice. Only one program in Ghana received quarterly visits from environmental health assistants to monitor the technical, management, and financial status of their RWS systems; in the rest, when their systems broke down, both treatment and control communities sought out support from nongovernmental organizations, nearby municipalities, or even large commercial enterprises.

Overview of Research Findings

The demand-driven, community-management model seems to be working. Not only were the rural water systems producing water, but almost all households obtained at least some of their water from the systems. The vast majority of VWCs were functioning as planned. Community members felt that they had been involved in the pre-construction planning of their water systems, and more than 90 percent of the focus groups held with village leaders or women reported that the community had been involved in tariff design. In about two thirds of the villages in Bolivia and Peru (though less than half in Ghana), people felt they had been involved in the choice of technology, and slightly less than half of the people in each country felt they had a say in project siting decisions. Communities contributed 5-10 percent of the capital costs of the project, though in many cases labor or land contributions were allowed to substitute for cash.

All piped systems studied in Peru, and all but one in Bolivia, were functioning at the time the research was conducted. In Peru and Bolivia, 93 percent or more of households surveyed had operational taps; in 55 percent of the communities in Bolivia and 76 percent in Peru, all the household taps were working. In 90 percent of the villages in Ghana, all project boreholes were still working. Every household in Bolivia reported using water from the improved water system; in Ghana, the figure was 97 percent, and in Peru 95 percent.

The systems did occasionally break down, but in most cases the VWCs had been able to arrange for repairs. Most villages reported one or more breakdowns in the last six months; in Bolivia, breakdowns were typically fixed in one or two days, in Peru the average was five days, and in Ghana 18 days. Even communities that were not collecting enough revenue to pay operation and maintenance costs found the resources to make repairs. Many of these resources came from outside the community, as governments and NGOs often provided PCS for maintenance. Some services were provided at the community's request, others on the initiative of governments, NGOs or church organizations.

Since most systems were working and repairs were made when needed, levels of household satisfaction were high. On average, 83 percent of Bolivian households reported being *satisfied* or *very satisfied* with their system's operation and maintenance regime, and 78 percent were *satisfied* or *very satisfied* with the performance of their VWC; in Peru, 61 percent of the households reported overall satisfaction with the improved water system; in Ghana, 88 percent of the households reported satisfaction with the repair and maintenance services, and more than 80 percent of the women's focus groups said they were satisfied with the system.

There were some troubling findings, however. Almost all households reported using the new water systems, but for some this was not their only water source. In Ghana, 38 percent of households were still using water from unprotected sources. The percentages were lower in Peru and Bolivia, but still worrisome. Until households obtain their water exclusively from improved sources, the health benefits of the improved systems will not be fully realized.

Many of the VWCs were found to be in poor financial shape. Households were paying very little for the improved water services. The programs did not require communities to finance the capital costs of construction or provide for capital replacement or expansion; the cost-recovery objective was simply to collect enough revenue from users to pay operation and maintenance costs. A substantial minority of villages were not even achieving this modest objective.

Table 1 *(5.1 in full report)*: **Profile of village water systems and management practices (Note- some numbers missing)**

	Bolivia	Peru	Ghana
Description of the system			
Average years since project completion	7	7	6
Percent of villages with private connections only	73%	100%	0%
Percent of villages with public taps only	4%	0%	100%
Percent of villages with private connections and public taps	23%	0%	0%
Status of the system			
Percent of households with functioning taps	95%	95%	N/A
Percent of villages with all taps functioning	54%	74%	N/A
Percent of villages where all project handpumps are working[a]	n/a	n/a	89%
Percent of villages with functioning systems that had reported a breakdown over last six months	55%	55 %	57%
Average days to repair the system (for villages that had experienced a breakdown)	1–2	5	18
Management structure			
Percent of villages where the committees regularly holds meetings with the community	86%	81%	72%
Percent of villages where the committee members are elected	95%	63%	42%
Percent of villages where the committee members are appointed	3%	15 %	43%
Median number of women in the committee	0	0	3
Percent of villages with no caretaker/operator	3%	2%	18%
Percent of villages with paid caretaker/operator (in villages with a caretaker)	70%	57%	1%
Cost recovery			
Cost recovery mechanisms			
Pay-by-the bucket or volumetric tariff	2%	0%	39%
Fixed monthly fee	89%	82%	54%
Fees vary by HH size	0%	0%	7%
Irregular collections	0%	7%	16%
No revenue collection	9%	11%	13%
Percent of HHs in full sample who use the system that reported paying for water	87%	77%	71%
Median monthly expenditure for water reported among HHs that pay for water (US$)	$0.55	$0.30	$0.16
Percent of committees reporting that HH collections cover operating costs	n/a	50%	51%
Percent of committees reporting that HH collections cover minor repairs	n/a	80%	65%
Percent of committees reporting that HH collections cover major repairs	n/a	12%	30%

[a] 88 percent of the systems in Bolivia were gravity only; the others used pumps. N/A: not applicable

The research found no statistically significant association between technical PCS visits to help with repairs or maintenance and a working water system. Post-construction technical training of system operators or caretakers was positively associated with system performance in both Ghana and Bolivia. In Bolivia, the share of households who were satisfied was, on average, 15 percentage points higher if the village received a PCS visit that provided financial or managerial (though not technical) assistance. There was no evidence that free repairs, technical assistance, or an intensive supply-driven PCS program improved either technical sustainability or household satisfaction.

Implications for Sustaining and Expanding RWS Systems

These findings suggest that communities can and should take full responsibility for their systems. The unsolicited PCS activities that appear most promising are those that help communities to renew and increase capacity, such as post-construction training for system operators and non-technical support visits to help village water committees with administrative functions or water use disputes.

Important puzzles remain. Even those communities whose cost-recovery systems are meeting program objectives are not financially sustainable enough to replace infrastructure as needed or expand system capacity for growing demand. Even though RWS were intended as one-time investments, communities still rely on government and donors for capital subsidies, as well as repairs.

In a significant number of villages, tariffs, if collected at all, are inadequate to cover the costs of major repairs, much less expansion or capital replacement. The research suggests three principal reasons why this is the case:

- Generating substantial cash balances creates problems for the committees. The communities often lack access to convenient, secure banking systems for managing cash. Moreover, many households have little cash to spare, and cash flow is irregular and highly seasonal. People are often distrustful of the accounting and security of cash balances, and committee members may distrust each other or not want the responsibility of securing cash.
- When the committees do accumulate cash balances, villages often want to spend them on other development projects, so funds are often raised only when the need arises.
- Future capital and repair subsidies are frequently provided to villages; in the projects studied, a significant number of VWCs had obtained donations and free spare parts and repairs from a variety of sources.

The Next Step

The water supply systems studied are not financially sustainable without infusions of capital to replace existing infrastructure and provide for growth. It may be that the sector's current capital financing model and the post-construction activities of NGOs and other actors creates a dependancy that undermines the principle of community self-reliance in the post-construction phase and discourages communities from making their own investments in water infrastructure.

The demand-driven community-management planning model has proven its worth, bit it has limits. Financial sustainability in RWS systems requires a new policy model. Methods for achieving better coordination of NGO policies with government and with each other seem especially important. One role for NGOs in the future could be as catalysts for post-construction support, such as training or locally-based models for raising capital, rather than as dispensers of subsidies for communities that cannot manage to repair their own projects. The next step is the design of a policy framework that will enable communities to handle the challenges of system rehabilitation and expansion.

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Water Sector Board

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