PAKISTAN

Water Supply and Sanitation Sector

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Acronyms and Abbreviations

ADB	Asian Development Bank
ADP	Annual Development Program
AJK	Azad Jammu and Kashmir
BPL	Below-Poverty Line
CBO	Community-Based Organization
CDD	Community-Driven Development
CLTS	Community-Led Total Sanitation
DALY	Disability-Adjusted Life Years
DBO	Design, Build and Operate
DWDO	District Water Development Office
ESGO	Empowerment and Self-Governance Order
FATA	Federally Administered Tribal Areas
GB	Gilgit Baltistan
GNP	Gross National Product
GDP	Gross Domestic Product
GoP	Government of Pakistan
H&PP	Housing & Physical Planning
HQ	Headquarters
HUD	Housing and Urban Development
IBNET	International Benchmarking Network for Water and Sanitation Utilities
ICT	Islamabad Capital Territory
IFAD	International Fund for Agricultural Development
IFGI	Infrastructure for Growth Initiative
IRSP	Integrated Regional Support Program
JBIC	Japan Bank for International Cooperation
JMP	Joint Monitoring Program
KP	Khyber Pakhtunkhwa
KWSB	Karachi Water and Sewerage Board
LG	Local Government
LG&RDD	Local Government & Rural Development Department
LGO	Local Government Ordinance
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MoE	Ministry of Environment
MoF	Ministry of Finance
NRW	Nonrevenue Water
O&M	Operations & Maintenance
OD	Open Defecation
ODF	Open-Defecation-Free
P&D	Planning & Development
PAR	Burkina Faso Management Reform Program
PATA	Provincially Administered Tribal Areas
PATS	Pakistan Approach for Total Sanitation
PCRWR	Pakistan Council of Research in Water Resources
PHED	Public Health Engineering Department
PPP	Public-Private Partnership
PSLM	Pakistan Social and Living Standards Measurement Survey
P-WOP	Pakistan Water Operators Partnership
RWSS	Rural Water Supply and Sanitation
SAFRON	Ministry of State and Frontier Regions
SAP	Social Action Program
SCIP	Sindh Cities Improvement Program
SWA	Sanitation and Water for All
TMA	Tehsil Municipal Administration
TSC	Total Sanitation Campaign
UNICEF	United Nations Children's Fund
WASA	Water and Sanitation Agency
WHO	World Health Organization
WSP	Water and Sanitation Program
WSS	Water Supply and Sanitation
WUA	Water Users Association

Currency Equivalents

US$1 = Pakistan rupee (Rs.) 97.37 (April 2013)
Unless otherwise indicated, all dollar figures in this report are in US dollars.

Executive Summary

Study Objectives

This study assesses the provision of Pakistan's rural water supply and sanitation services, disaggregated by province and region. It is the first comprehensive study that captures both water and sanitation in both rural and urban across the entire country. The study takes stock of the sector across a range of technical, financial, environmental, and institutional dimensions. It identifies the key issues that are holding back the provision of safe and sustainable rural water services and draws on international experience to highlight ways in which other countries have tackled similar challenges. It is hoped that this report's publication will encourage policymakers and opinion leaders to upgrade the importance of the sector and implement the steps required to meet the needs of the entire population for safe water and adequate sanitation.

The sector work comprises three volumes. Volume I provides an assessment of the provision of urban water supply and sanitation. Volume II (this volume) provides an assessment of rural water supply and sanitation. Volume III contains the individual executive summaries of urban and rural water supply and sanitation in each of the country's four provinces and three regions.

Demographics

Pakistan is the sixth most populous country in the world with a population currently (2012) estimated at about 180 million. Its rural population is currently estimated at about 117 million (65 percent) and it is projected to decrease to 50 percent by 2030 as a result of rural-urban migration. This migration is a mix of "natural" migration as a part of the development process and a combination of droughts, floods, earthquakes, and insurgency in some areas which has further forced a movement of large numbers of internally displaced rural populations into urban areas.

Water Resources

The Indus is the country's only major river system, and, should current trends continue, decreasing snowfall in the Himalaya and Karakorum mountains may progressively limit this supply of fresh surface water. Underground water sources are fast being depleted due to unsustainably high withdrawals. The amount of per capita water resources has decreased from 5,300 cubic meters (m^3) in the 1950s to about 1,000 m^3 in 2011, the international definition of water stress. Irrigation accounts for 69 percent of the water used, industry for 23 percent and municipalities for only 8 percent. Surface water supplies are increasingly threatened by wastewater pollution, because only 50 percent of effluents are collected and only 10 percent of those collected are treated. Groundwater is now being over-exploited in many areas, and its quality is deteriorating.

Institutional Arrangements

The 1973 Constitution made the provision of water supply and sanitation services a provincial responsibility. This was further reinforced by the Local Government Ordinance (LGO) of 2001, which promoted the decentralization process and sought the abolishment of the urban-rural divide and as a consequence prescribed the dissolution of rural water and sanitation institutions—Public Health Engineering Departments (PHEDs)—at all levels.

For more than a decade there was partial implementation of the LGO, different provinces implementing it in different ways. There was also partial reversal of the initial steps that had been taken by some provinces. The two models for rural water supply and sanitation (RWSS)[1] service delivery that currently exist are the following:

[1] Under the Social Action Program (SAP), funding was allocated to improve program design and implementation and introduce government funding of basic services in a number of areas including rural water supply and sanitation. The program advocated community management, participation, cost recovery and initiated the flow of resources from government to non-government organizations. Under the SAP, about 1,161 water supply schemes were developed and handed over to communities to manage between1995–2009.

1. Provincial or regional level institutions such as PHEDs in Khyber Pakhtunkhwa, Balochistan, and Sindh develop the schemes and subsequently operate them.
2. In Punjab, AJK, and FATA, provincial- or regional-level institutions such as PHEDs develop the schemes, and they are subsequently operated and maintained by community-based organizations (CBOs).

Neither model adopts a fully decentralized process[2] down to the village or community level, which is becoming a well-accepted model internationally as a means to deliver more sustainable services. The data in this study indicate however that CBO management in Pakistan is widespread and, for example in Punjab, has shown very good financial sustainability with high levels of cost recovery (and in a number of cases revenues exceed operating costs). This is a good foundation on which to build and consideration should be given to reviewing international and regional practice and assessing how they might be adapted to further improve the Pakistani situation.

Another consequence from the CBO model, and not demonstrable to date in Pakistan, is that capital costs of CBO schemes are lower when compared to schemes managed by a provincial or regional entity. When the design and implementation of investment projects are dissociated from their operations and maintenance and when grant financing is provided for all costs, then there could well be an incentive to overdesign schemes to their long-term detriment.

Current Water Supply and Sanitation Coverage and Service Quality

The country is on track to meet the Millennium Development Goal (MDG) target for halving the number of people without access to improved water supply by 2015 but off track to meet the MDG target for access to improved sanitation. Pakistan's rural water supply services in 2010 were on par with India, Nepal, and Sri Lanka at 89 percent (against a 2015 target of 91 percent) and were higher than Bangladesh at 80 percent. Rural sanitation services at 34 percent in 2010 fall short of the 2015 target of 53 percent, are higher than India at 23 percent and Nepal at 27 percent, but are much below Bangladesh at 55 percent and Sri Lanka with 93 percent.

After India and Indonesia, Pakistan is the country with the most people practicing open defecation (OD). The OD rate is 34 percent for the national rural population, while 34 percent of the rural population has access to improved sanitation. In 1990, only 7 percent of the population had access to improved sanitation, so this has been a noteworthy achievement—the largest absolute increase in percentage terms in the region. Credit can go to the Government which has promoted the model of Community-Led Total Sanitation (CLTS) through its Pakistan Approach for Total Sanitation (PATS) program. With the high OD rates, however, it is not surprising to find an infant mortality at an internationally high 70 per 1,000 live births, and child mortality still higher at 86 deaths per 1,000 live births. Diarrhea is estimated to be the leading cause of loss of disability-adjusted life years (DALYs) in Pakistan.

Hours of water service provision are low, typically just one to two hours in the morning and in the afternoon in rural areas. This is caused by power load shedding, which shuts down pumping systems up to 20 hours per day, especially in summers. The option of running standby generators is not exercised, since the service providers cannot afford to pay the costs for doing so. Where systems do function, the supply of water is typically around 45 liters per capita per day.

Water quality is perhaps the biggest short-coming for those people with access to water services. In the studies conducted by Pakistan Council of Research in Water Resources (PCRWR 2008–09), the analysis of water samples collected from the water sources of the functional water supply schemes indicated that 79 percent of the total collected samples are unsafe for drinking. More detailed analysis is required to determine the scale of the challenge, how it might be categorized, and what scalable solutions could be applied to address the issue.

Dysfunctional rural water supply schemes are major issue in the sector. The findings of the PCRWR study found that up to 50 percent are inoperative for a variety of reasons such as mechanical breakdowns, insufficiency of water source, financial difficulties due to consumers' failure to pay user charges, lack of operations and maintenance (O&M) capacity, and community conflict. The root cause is weak governance and institutional arrangements, which give too much attention to asset creation and insufficient attention to asset maintenance and delivery of service to customers.

Cost Recovery

At present, the collection rates of user charges range from 10 percent to 40 percent in all the provinces and regions where O&M of rural water supply sanitation

[2] In a fully decentralized arrangement CBOs would be responsible for all stages of the scheme cycle including design and implementation, as well as for operation and maintenance and cost recovery.

is managed by the provincial or regional departments. The financing gap is being met by subsidies from provincial budgets. Provincial governments finance salaries of staff, electricity, and other operational expenses.

In contrast, CBOs in Punjab, AJK, and GB are managing the water supply schemes quite successfully and are able to meet the operational costs of the schemes, as their revenue collection efficiency is ranging from 70 percent to 100 percent. In many cases, revenues from user fees are greater than their operating costs. These good practice examples demonstrate that it is possible in Pakistan to have users pay for RWSS services.

Capital Investment

Current targets are to provide *equitable, efficient, and sustainable water service* to 93 percent of the population, and *improved sanitation* to 90 percent by the target year 2015 and to ensure that, by 2025, 100 percent of the population will have access to safe water and improved sanitation. Only 0.11 percent of gross domestic product (GDP) had been spent on water supply sanitation each year between 2002 and 2005. Fortunately this situation has been improving and in 2011 the total capital investment and operating subsidies in WSS had reached 0.16 percent of GDP.

Investment needs are difficult to calculate since a large portion should be allocated to the rehabilitation of inoperative existing systems. These rehabilitation needs are unknown as there is no updated inventory of the reasons for the malfunctioning of the inoperative systems. It is likely, however, that investment levels as a proportion of GDP would have to rise closer to 0.5 percent to improve access levels. Latin America invested 0.4 percent of its GDP in the 1970s and managed to raise service coverage and quality substantially.

Recommendations

The starting point toward improving overall sector performance is to initiate a national debate on the challenges in the sector, and to understand the models that might be appropriate to address the challenges. Given that each province or region is now responsible for delivering rural water supply and sanitation services, it will be up to each of them to come up with solutions appropriate to their starting point and their special operating conditions.

The focus will now have to shift to identifying the change agents in rural areas, notably the women, who offer the greatest chances for support of sustainable operations. Each system should become financially sustainable on its own through user charges that cover the full costs of operations and maintenance. In turn, this will require replicating the relatively successful experience from the CBOs in the Punjab, AJK and GB that can help ensure sustainable operations. The shift in thinking will necessarily take time but should start with the implementation in a few areas.

There are a number of evolving practices in the country that appear to offer higher levels of service and sustainability for both water supply (CBOs) and sanitation (the PATS model). These practices should be expanded through defined demonstration projects that integrate water supply and sanitation in one package. There are also opportunities to consider greater use of the local private sector as a way to increase accountability and customer orientation and at the same time create new economic activities. The country can also draw extensively on international experience to inform its own activities and thus speed up the improvement process.

In parallel, governments at the federal and provincial levels need to allocate resources and to determine how those resources can be used to deliver services efficiently and sustainably. This means looking at new ways of service delivery (for example, increased focus on service delivery outputs rather than on inputs) and new ways of sector financing (for example, reform-based incentive financing). This would involve donor coordination to prevent duplication and ensure maximum optimization of scarce resources.

It may be possible to focus on a few actions that would initiate improvements on the ground. They could begin with the following recommendations.

Recommendation One: Roles and Responsibilities of Key Agencies Should Be Clarified and Community-Based Organizations Given the Key Role

The partial implementation of LGO 2001 has resulted in an extended period of uncertainty in the sector. Going forward, based on national and international experience, provincial governments should move toward instituting service provision models that give CBOs the key role in the planning, development and operation of RWSS schemes. Such a reorientation will, however, require that the role of existing province engineering entities evolve from that of asset creators and operators into facilitators and providers of technical and administrative support services that partner with the CBOs. In order to support long-term sustainability of the CBOs it will be particularly important to do the following:

- Establish an administrative backstopping facility in each province to proactively support CBOs in the management of their systems: This would include

ongoing support for training of CBOs and recording and disseminating best practices for rural water supply and sanitation. Such a facility would gradually enhance performance in the systems and could evolve to help with policy and legal reforms, programming, regulation of tariffs, metering and capacity building, and monitoring and evaluation.

- Establish a more formalized technical backstopping facility in each province to proactively support CBOs in dealing with technical challenges in service delivery: This would range from advice on repairs and maintenance through to organizing major rehabilitations of systems.

The clarification and evolution of roles and responsibilities proposed under this recommendation cannot be achieved without the provision of training and capacity building programs to provincial agencies and CBOs. Part of the resources of any national sector program aimed at improving sector performance (see recommendation 2) should therefore be allocated to appropriate training and capacity-building activities. In the case of CBOs, the implementation of such programs must be ensured on a continuing basis, because failure to periodically review structures and operating arrangements (for example, to reflect changes in CBO leadership) can lead to a gradual decline in their performance and effectiveness.

Recommendation Two: Investment Support Programs from Both the Federal and Provincial Levels Should Be Expanded and Focused on the Delivery of Sustainable Outcomes

Governments at all levels must seek to maximize the impact of every marginal penny invested in the sector. This objective can best be achieved through creating national or provincial sector programs that clearly articulate the specific policy goals to be achieved and lay out the conditions of access to investment funding As part of this process, governments should also attempt to introduce elements of results- or reform-based financing.

Such national/provincial sector programs should focus on broadening access to improved and sustainable water supplies (which varies widely across the country and even within provinces), providing access to improved sanitation (following the PATS model but concentrating on areas where access currently is low), and supporting cost-effective rehabilitation of existing but non- or only partially functioning schemes. A key part of these programs would be the introduction of appraisal techniques that take into account the long-term financial and institutional sustainability of proposed investments.

The benefits of bundling investment support into defined sector programs are improved transparency of sector financing, the ability to assess overall sector investment efficiency, and the opportunity to demonstrate a concrete impact on the quality of service delivery. More ad hoc financing approaches that lack clear objectives, criteria, or rigorous evaluation tend to diffuse the effectiveness and impact of investments in the sector.

Recommendation Three: Reinforce Policies of Operation and Maintenance as well as Cost Recovery from User Fees

The high level of non- or partially functioning RWSS schemes is caused mainly by poor institutional arrangements (see recommendation 1) and inadequate cost recovery. Governments should reinforce their existing policies related to cost recovery and sustainability by requiring all schemes to move toward ensuring recovery of O&M costs from user fees within a clearly defined timeframe. O&M cost recovery is recognized internationally as a critical success factor in sustainability of RWSS schemes and is rarely an issue in terms of consumer affordability. When schemes apply for investment support from government, appropriate O&M cost recovery requirements should be included as one of the conditions for the provision of funds (see recommendation 2).

Recommendation Four: Set Up Rural Demonstration Projects

With or without national government financial support, provincial governments should promote the development of programs or projects that draw on the best national and international experiences to showcase how performance and sustainability can be improved. Such a demonstration approach should aim at tackling the challenge of improving access to water supply and sanitation through an integrated model that brings financial and institutional sustainability and improved health outcomes. The projects should consist of a mix of rehabilitation of existing but nonfunctioning schemes and implementation of new schemes. The focus of each province and region might be different. Those with comparatively higher levels of access (such as Punjab) might concentrate on scheme rehabilitation projects, whereas those with lower levels of access (such as Balochistan) might dedicate their attention to the execution of new schemes.

Involvement of local small-scale private service providers could also be helpful in the rehabilitation of existing systems and the implementation and operation of new ones provided that appropriate incentives are put in place. While it is unlikely that small-scale operators

would be able to invest significant amounts of financial resources into system restoration, they could, however, be contracted on a lease basis, with the public sector providing the necessary capital investment resources.

This recommendation complements that of Recommendation Two and indeed could be seen as a forerunner of Province-wide or National Sector Programs. The advantage of demonstration projects is that they can be set up more quickly than broader programs and lessons learnt from the projects can be fed back into the design of the programs.

Recommendation Five: Provide Resources and Organizations to Implement the Sanitation Strategy

The single most important program to improve the rural population's environmental health and support the goals of reducing infant and child morality is to eliminate open defecation, provide latrines that contain excreta, and enhance hygiene education. Without such sanitation and hygiene education programs, the effort to make water supplies more accessible and safer will not produce the expected health benefits.

To this end, additional financial and human resources must be budgeted by governments for scaling up existing sanitation programs (particularly PATS). Such programs need to be responsive to evidence-based analyses and as such should adapt to evolving best practices from around the country.

Recommendation Six: Develop Sector M&E System, Covering Both Functioning and Nonfunctioning Schemes

Preparation of this study highlighted the challenges in accessing readily available, consistent and comprehensive sector data. This creates difficulties for planners and policy makers to make informed decisions on sector direction and priorities. To meet the data needs for the purposes of technical assistance programs, and for investment planning, a provincial/regional level management information system should be established. The system should capture the number and types of schemes; institutions responsible for operation and maintenance; essential data on number of served and unserved households; quality of service; levels of supply; and the financial & operating situation. The information system should coverall RWSS systems including those that operate only partially or not at all—and in the latter cases should document the reasons for non-performance. This would not only provide input to policy changes that might be necessary to improve overall sector performance but would also establish the basis for a large-scale system rehabilitation program (see recommendation 2).

The suggested approach would allow Provinces and Regions to maximize efficiency of water provision (meeting demand at the least possible cost) because rehabilitation of existing but inoperative systems is likely to be the least expensive way of providing improved service to more people.

Recommendation Seven: Begin to Address Knowledge Gaps on Water Quality Issues

There appears to be a significant amount of data on water quality issues in the country. It seems, however that there is no strategy on how to make use of these data. Better compilation and analysis of the data would enable development of appropriate solutions to reduce the high level of bacterial contamination currently found in the water in different parts of the country. An additional result may include the identification of various "public good investments" that address issues that go beyond individual villages, towns, and provinces and need a concerted action at higher levels of government and/or must be dealt with cross-sectorally (for example, through links with irrigation and agricultural practices).

Chapter 1: Country Context

Introduction

Pakistan is the sixth most populous country in the world with a population currently (2012) estimated at about 180 million. Its rural population is currently estimated at about 117 million (65 percent) and it is projected to decrease to 50 percent by 2030 as a result of rural-urban migration. This migration is a mix of "natural" migration as a part of the development process and a combination of droughts, floods, earthquakes, and insurgency in some areas which has further forced a movement of large numbers of internally displaced rural populations into urban areas. This puts pressure on urban receiving areas to provide them with land and basic infrastructure services, create employment opportunities, and meet their food security needs (State Bank of Pakistan 2011).

In May 2011 the Planning Commission prepared the *Framework for Economic Growth*, which emphasizes the need for change through the identification of and advocacy for reforms. The Framework advocates growth through rational infrastructure development, creation of better environmental conditions and addressing the physical, social, land use and other aspects of urban management. Even though the strategy focuses primarily on urban issues, perhaps for the reasons noted above, its overall thrust is to concentrate on the "software" of economic growth—issues of economic governance, institutions, incentives and human resources—an approach that is applicable to both rural and urban areas.

Institutional and Administrative Setup

Pakistan is a parliamentary republic with an elected lower house (National Assembly) and upper house (Senate) and an elected prime minister and president. The country consists of four provinces—Punjab, Sindh, Khyber Pakhtunkhwa (KP), and Balochistan—and four federal territories: Islamabad Capital Territory (ICT), Azad Jammu and Kashmir (AJK), Gilgit Baltistan (GB), and the Federal Administered Tribal Areas (FATA). Each of the four provinces has a constitutional assembly, elected chief minister, and a governor who represents the President in the province.

Punjab is the most populated province, with approximately 45 percent of the country's population. Its capital, Lahore, is the country's second largest city, with a population of 7 million. Five major rivers flow through Punjab. Marked disparities in poverty and economic growth exist within the province. The economic base of the province in the past few decades has shifted from agricultural production to services and manufacturing.

Sindh is Pakistan's southernmost province. The Indus River cuts through the province from north to the south. Its course includes marked disparities in agricultural fertility and access to water. Karachi, with over 13 million inhabitants, is dominant as the economic and political powerhouse of Sindh and is the largest city in the country.

Khyber Pakhtunkhwa is in the north. Peshawar is the capital city, with a population of 1.4 million.

Balochistan is the largest province. Its capital is Quetta, with a population of 0.9 million, but Gwadar, the newest port in Pakistan, serves as the winter capital.

Islamabad Capital Territory is Pakistan's capital city, with a population of 0.7 million. Islamabad is divided into urban and rural areas.

State of Azad Jammu and Kashmir has a parliamentary form of government with its own constitution, flag, president, parliament, high court, and supreme court. Muzaffarabad is the capital, with an estimated population of 0.77 million.

Gilgit Baltistan was created by the Gilgit Baltistan Empowerment and Self Governance Order (ESGO) in 2009. The population is approaching 1 million. The administrative center is the city of Gilgit.

Federally Administered Tribal Areas are a semi-autonomous tribal region comprising seven agencies that are managed by the FATA secretariat.

Rural Demographics

The 2012 total population was approaching 180 million, based on an annual growth rate of 2.7 percent,

with a rural population estimated of about 117 million (65 percent). At current growth rates the population is expected to reach about 210 million by 2020 and 360 million by 2045. Migration from rural-to-urban is estimated to be around 2 percent per year over the past decade, and it is projected that rural population will fall below 50 percent of the country's total by 2030. As seen in table 1.1, the proportion of rural population ranges from a low of 51 percent in Sindh to a high of 98 percent in FATA.

About two-thirds of the rural populations are landless, and agricultural development projects have not had a lasting impact on rural living standards. Rural poverty rates (34 percent) are higher than those in urban areas (19 percent) and roughly 80 percent of the country's poor are inhabitants of rural areas. Average per capita expenditures of rural households in 2004–05 were Rs. 1,260 per month, or 31 percent lower than average urban expenditure at Rs. 1,820 per month.[3] See table 1.2.

National Rural Water Supply and Sanitation Policies

The Government of Pakistan approved the National Drinking Water Policy in September 2009 and the National Sanitation Policy in September 2006. These policies cover both urban and rural sub sectors.

The overall goal of the National Drinking Water Policy is to improve the quality of life by reducing the incidence of death and illness caused by water-borne diseases through adequate provision of safe drinking water to the entire population at an affordable cost and in an equitable, efficient, and sustainable manner. The National Drinking Water Policy focuses on the following:

- The policy asserts that the country will provide safe drinking water to the entire population at an affordable cost in an impartial, efficient and sustainable manner. It seeks to ensure reduction in the incidence of mortality and morbidity caused by water borne diseases.
- The objective is to provide a supportive legal framework that could facilitate sustainable access to and provision of safe drinking water.
- It highlights the constitutional responsibility of the provincial and local governments (towns and tehsil municipal administrations (TMAs) to provide drinking water.
- It underlines that the right to water for drinking takes precedence over rights to water for all other uses (agriculture, industry, and so forth).
- The policy calls for existing inequalities in the provision of safe drinking water to be removed and ensures participation of the vulnerable and poor in decision making for the sector at all levels, recognizing the key role that women and communities play.
- It provides a financial framework within which the provision of water supply can be undertaken in a cost-effective, equitable and sustainable manner and that water treatment will be an integral part of all drinking water supply schemes.
- It also provides a set of policy instruments and strategies to achieve the objectives of the policy.

The National Sanitation Policy aims at providing adequate sanitation coverage, providing an environment necessary for healthy life, and meeting the 2015 Millennium Development Goal (MDG) targets. The primary focus of sanitation is on the safe containment of excreta away from dwellings and work places by using sanitary latrines and the creation of an open-defecation-free

[3] World Bank data 2006.

Table 1.1: Rural Population

Province	1998 Population Census (millions)	Population 2012 Based on Annual Growth Rate Estimate (millions)	Area (thousand m²)	Rural Population (%)
Azad Jammu and Kashmir	2.97	5.33	13	90
Balochistan	6.51	9.71	347	77
FATA	3.14	4.31	27	98
Gilgit Baltistan	2.97	4.25	72	NA
Khyber Pakhtunkwa	17.60	23.28	75	83
Punjab	72.60	93.96	205	69
Sindh	30.00	35.76	141	51
Pakistan Total	**136.70**	**178.70**	**796**	**65**

Source: 1998 Pakistan Census Data, www.census.gov.pk.

Table 1.2: Poverty Incidence by Province

Province	Rural Poverty Incidence (%)	Provincial Capital Poverty Incidence (%)
Punjab	24	18
Sindh	38	10
Khyber Pakhtunkhwa	27	28
Balochistan	51	14

Source: Pakistan - Social Policy and Development Center 2004.

environment. It also provides for the safe disposal of liquid and solid wastes, and promotes health and hygiene practices in the country:

- The prime objective of the sanitation policy is to improve the quality of life of the people and their physical environment.
- It focuses on ensuring an open defecation-free environment; safe disposal of liquid and solid waste; and the promotion of health and hygiene practices to complement the desired objective.
- The policy envisages developing guidelines for the evolution of an effective institutional and financial framework and for linking sanitation programs with environment, housing, water, and city and regional planning policies and programs.
- It encourages mobilizing local resources and discourages foreign loans.
- It supports programs that are implementable within available resources and enhanced capacities of institutions and communities.
- It supports and accepts the role that communities, NGOs, and the formal and informal sectors are stakeholders in sanitation provision.
- The policy emphasizes the development and use of technologies that are simple and cost-effective to install and maintain and ensures the involvement in the planning of sanitation schemes of those departments/agencies responsible for operations and maintenance (O&M).
- Finally, it gives priority to the needs of women and children at all levels of planning and implementation and considers sanitation as a fundamental human right.

[4] National Environmental Policy 2005; National Water Policy; National Drinking Water Policy 2009; National Drinking Water Quality Standards 2009; National Sanitation Policy 2006; Punjab Urban Water and Sanitation Policy 2007; Sindh Draft Sanitation Strategy 2008; Balochistan Sanitation Strategy and Action Plan 2008; Balochistan Sector Strategy for Drinking Water Supply, Sanitation and Hygiene 2006; AJK Sanitation Policy and Strategy 2008; and Draft Northern Areas Sanitation Strategy 2008.

Provincial and Regional Policies

Many provincial and regional policies have been prepared over the decades with an impact on the sector.[4] However, policies have not driven reforms, possibly because of weak implementation capacity. Table 1.3 gives an overview of the policies. Recently, the Government of Sindh approved the *Sindh Sanitation Strategy* in 2011.

National Institutional Arrangements

Prior to the 18th Amendment to the constitution that the National Assembly passed on April 8, 2010, the Ministry of Environment (MoE) of the Federal Government was responsible for policy development and guideline setting in the water and sanitation sectors. With the passage of the 18th Amendment, there is no central ministry with sole responsibility for the water and sanitation sector, although the Planning Commission and the Ministry of Finance (MoF) have an indirect role. The Planning Commission holds the authority to approve provincial development programs and coordinates and approves projects prepared by the provinces that cost more than Rs. 100 million (about US$1million). The MoF allocates resources, is the secretariat of the National Finance Commission, and transfers funds to the provinces.

Local Government, Provincial, and Regional Arrangements

The 1973 Constitution assigned responsibility for the water supply and sanitation sector to provinces and service provision to local governments. Under the Local Government Ordinance (LGO), 2001 there are three tiers of local government in each province: districts, TMAs, and unions. Unions (depending on size and geography) form a TMA; and two or more TMAs form districts (for example, Mardan District in KP has two TMAs, and there are 18 TMAs in district Karachi). Administratively, all TMAs fall under provincial local

Table 1.3: Provincial and Regional Policies for Rural and Urban Water Supply and Sanitation

Unit/Region/Province	Policy/Strategy	Based On	Year	Lead Department	Status
AJK	Drinking Water Policy 2011–25	National Policy	2010	LG	Approved but under retro review by department in 2012 for review
FATA	FATA Drinking Water Policy	Draft KP and national policy	2012	LG	First draft approved
Balochistan	Balochistan Sanitation Strategy and Action Plan	National policies	2008	LG and PHED under a P&D committee	Approved
	Provincial Drinking Water Strategy and Action Plan		2010		
Gilgit Baltistan	Drinking Water Policy and Strategy 2011–25	National Policy	2010	LG	Approved
Khyber Pakhtunkhawa	Khyber Pakhtunkhwa Drinking Water Policy	National Policy	2011	LG and PHED under a P&D committee	Final draft with cabinet for approval
	Khyber Pakhtunkhwa Sanitation Policy	National policy	2011		
Punjab	Punjab Drinking Water Act	Global	2012	HUD & CDD	Draft
	Punjab Drinking Water Policy	National policy	2011		Approved
	Punjab Sanitation Policy	National Policy	2012		Draft
Sindh	Sindh Sanitation Strategy	National Policy	2011	LG	Approved (Rs. 1 billion allocated for rollout)

Notes: LG (Local Government); PHED (Public Health Engineering Department); P&D (Planning and Development).
Source: Data collected from national and provincial governments, 2011–12.

government departments. Districts are the largest in population followed by TMAs and Unions. There are 382 TMAs in the country with 144 in Punjab; 104 in Sindh; 82 in Balochistan and 52 in KP. In addition there is a less active tier of local government called the village councils. TMAs are formally responsible for rural water supply and sanitation services within their boundaries.

In the regions, the PHEDs, local government departments, and the Local Government and Rural Development Department (LG&RDD) work on water supply and sanitation. In AJK and FATA, the community-based organizations (CBOs) are responsible for O&M, and in GB the CBOs are responsible for operations and maintenance of built systems.

The AJK Council plays an important role in resource allocation for all of AJK, including water supply and sanitation. The Ministry of Kashmir Affairs and Northern Area is a federal entity that is involved in both AJK and GB. In the case of FATA, the Ministry of State and Frontier Regions (SAFRON) is the federal-level entity. Its role, however, in water supply and sanitation is limited.

LG&RDD is the administrative department for local governments. In addition to designing and building some small-scale water supply and sanitation schemes, it manages local council service public sector employees, trains local governments, implements some rural development schemes, and in some provinces organizes local government elections. The capacity and authority of LG&RDDs have declined over several decades.

Table 1.4 provides an overview of the institutional arrangements in the sector by province and region. The table includes also the arrangements for urban service provision to provide a complete picture of the institutions at the province and regional level.

This relatively complicated situation was made more complex by the details of LGO 2001, which introduced major institutional reforms in the water and sanitation sector. The ordinance abolished the urban-rural divide and as a consequence prescribed the dissolution of rural water and sanitation institutions (PHEDs) at all levels. Instead, LGO 2001 established TMAs to operate systems in both urban and rural areas. Unfortunately,

certain sections of LGO 2001 relevant to PHED and TMAs are not implemented and hence a completely different situation prevailed on the ground than what was prescribed in the law.

Since there was no PHED operating at any level in the province, staff merged with LG departments and were posted in TMAs. All water and sanitation functions in both urban and rural areas became a TMA function. TMAs were supposed to plan, prepare engineering feasibility studies, design, implement and operate and maintain all water and sanitation infrastructure in the jurisdiction. The elected tehsil council was vested with full powers to allocate financial resources to the sector utilizing its own sources and provincial grants (transferred to TMAs under as a block grant).

The provinces interpreted the PHED dissolution clause differently. Punjab reduced PHED staff by more than 50 percent at the headquarters (HQ) office and transferred all field staff from PHED field offices to TMAs in early 2001 and 2002. Sindh transferred all PHED staff from HQ and field offices to the TMAs' LG Departments. KP merged PHED with the Communication and Works department rather than LG department. In Punjab PHED was subsequently reestablished in 2003, in KP in 2009, and in Sindh in 2010.

The lack of clarity as to which agency is responsible in the rural and urban situation has led to unclear institutional responsibilities. As a result, PHEDs are actually operating in rural settings and TMAs ended up in urban pockets. Even though TMAs are legally responsible for

Table 1.4: Institutions at the Provincial and Regional Levels

Province	Urban		Rural		Large Cities	
	Development	O&M	Development	O&M	Development	O&M
AJK	PHED	PHED	LG (policy, planning, allocation)	CBOs	None	AJK
Balochistan	LG&RDD (policy, planning, allocation etc.) PHED undertakes construction	TMA	PHED	PHED/CBOS	LG&RDD	WASAs
FATA	LG Directorate	Town Committees	PHED wing under the Works and Services Directorate	PHED/CBOs	None	FATA
Gilgit Baltistan	PHED wing in Works and Services Department	PHED wing	LG/CBOs	CBOs	None	GB
Khyber Pakhtunkhawa	LG&RDD (policy, planning, allocation etc.) PHED undertakes construction	TMA	PHED	PHED	LG&RDD	Peshawar Municipal Corporation; Peshawar Water Company being established
Punjab	HUD & PHED (policy, planning, allocation). PHED undertakes construction	TMA	HUD & PHED (special PHED wing)	CBOs	HUD & PHED	WASAs
Sindh	LG&RDD (policy, planning, allocation, etc.) PHED undertakes construction	TMA	PHED and LG&RDD	PHED/CBOs	LG	KWSB

Notes: Per the 2001 Local Government Ordinance, there are eight large cities in Pakistan. The Sindh TMA is the Tauluka Municipal Administration. The institutional arrangement in AJK and GB are different from all the provinces.

the sector, they face capacity and resource issues. PHEDs have qualified and skilled engineering staff whereas the TMAs have insufficient skilled staff to help them manage their responsibilities. TMAs were entrusted with many responsibilities with limited financial allocation.

To address this issue, around 2005 policymakers came up with the option of utilizing PHEDs to provide support to TMAs. Since provincial PHEDs had the capacity, it was given responsibility for infrastructure development. TMA areas and post construction schemes were handed over to TMA for O&M.

In December 2009, the law protecting the LGO 2001 expired. Subsequently, the final institutional set up of TMAs, districts, and unions is indeterminate—a situation that will continue until new local government elections are held. All cities and towns have been without elected mayors since March 2010.

Regardless of the above, as of today there are two primary models for RWSS service provision in Pakistan.

1. Provincial or regional level institutions such as PHEDs in Khyber Pakhtunkhwa, Balochistan, and Sindh develop the schemes and subsequently operate them.
2. In Punjab, AJK, and FATA, provincial- or regional-level institutions such as PHEDs develop the schemes, and they are subsequently operated and maintained by community-based organizations.

Both have strengths and weaknesses. The first case is very much a traditional top down, engineering-driven approach in which the systems appear to have been designed and built without previously assessing the capacity, technical, financial, or full commitment of the recipients to ensure adequate operation and maintenance. This can lead to system overdesign, lack of attention to operations, and weak ownership at the customer level.

In the second case the use of CBOs for operation of the systems results in greater ownership at the customer level, and with that ownership a likely increase in sustainability. However, separation of development and operations activities between the PHED/LG and the CBO can mean that development remains engineering driven, requiring the CBOs to take over schemes that may not be the most appropriate for their needs.

Elsewhere in the world the use of CBOs to participate in the planning, design, implementation, and subsequent operation of rural water supply schemes is well established. Box 1.1 gives an example from Bolivia. This approach gives control to the community at all stages of the process. This approach requires an alternative way of working by the provincial and regional entities who will become facilitators and supporters of the CBOs, rather than system developers and operators. Over the long term these provincial and regional entities can become technical back stopping entities to the CBOs.

Box 1.1: Bolivia – Importance of Demand-Driven Community Participation Rural Schemes

Bolivia implemented World Bank–financed rural water supply and sanitation schemes in two ways. First, supply-driven social infrastructure funds were used, and later special rural water supply and sanitation loans were used that stressed community development and training much more than the social infrastructure funds. It was found that the community development approach was superior, as per capita costs were reduced by about 10 percent and sustainability improved as compared to the implementation using social infrastructure funds.

Lesson: The End of Construction Does Not End the Government's Responsibilities

The end of construction often coincides with the end of government involvement in rural water supply and sanitation. In Bolivia, as elsewhere, this break is unfortunate for three reasons: (i) it deprives the village operating committees of a source of technical assistance to optimize operations and service quality; (ii) it leaves unresolved the government's responsibility to regulate the cost and quality of services; and (iii) it means that the opportunity to evaluate and learn from past activities is lost. All three factors are applicable in Bolivia. It was therefore recommended that the government create a proactive system of regulation, which would allow trained staff to visit periodically already constructed systems in order to inform themselves of the quality of service and of operations and amend any deficiencies on the spot. The experience from the United States and from certain African countries with this kind of roaming operational control and support services has been positive.

In addition to the need for technical support, any move toward greater participation by communities also requires support from local governments, which can link RWSS to rural planning and help mobilize related financial or human resources as needed. Box 1.2 illustrates an example of good coordination between RWSS service provision and local government in Malawi.

Besides the government entities there is some private sector participation in the sector, but it is of an informal type in which small private entrepreneurs meet demands that the public service provider cannot satisfy. Such private operators are unregulated, and there is no guarantee that the provided water meets national water quality standards. However, the use of small-scale private operators, as a way to introduce greater autonomy, accountability, sustainability, and service orientation of providers is growing around the world. An example is provided from Burkina Faso (Box 1.3).

Box 1.2: Malawi District Coordination – The Key to Sustainable Rural Water Supply

Many donor-funded water point projects have taken place in the Mwanza District of Southern Malawi. The difference in the sustainability of the projects is staggering when comparing those who coordinated with the District Water Development Office (DWDO) and those who did not. Two examples of donor organizations sidestepping the DWDO yielded low functionality rates due to construction of an inappropriate water point and lack of community training. In 2009, a project constructing three gravity-fed schemes and 70 shallow wells was completed, but only parts of two schemes and less than 50 percent of the shallow wells still function three years later. Another organization brought in a new pump type that cannot be maintained at the community level. Water points constructed by donors through coordination with the DWDO have shown higher functionality rates, as they were implemented within the operation and management system of the district, and took regional characteristics into account.

Box 1.3: Burkina Faso Management Reform Program

In 2000, the water ministry in Burkina Faso developed a new approach to managing rural hand-pumped water points and piped schemes, based on various options for delegating management to private operators. The new design reflected the greater responsibility for water services and water infrastructure maintenance that passed to the communes as a result of government decentralization. The option would be revised to accommodate the even greater role given to the communes by 2004. The two basic options are as follows:

Hand pump maintenance: The commune signs a maintenance agreement with a private individual or firm to handle preventive maintenance and repairs on all the hand pumps within a given area, usually a commune. The contract requires the maintenance operator to pay inspection visits to all hand pumps in a village. The Water User's Association (WUA) also has to pay an annual fee to the commune that covers the cost of the inspection of the visits. To collect the user fees to pay for maintenance, as well as save for eventual handpump replacement, the WUAs hire local handpump caretakers. Thus, most management responsibilities remain with the WUAs, but the functions of preventative maintenance and monitoring have been delegated to the private sector.

Piped schemes and other water point management: Communes request competitive bids from private firms for either affermage or management (no asset replacement responsibility) contracts. Under the affermage contracts, the operators are responsible for replacing assets with a design life of less than 15 years. All management responsibilities are delegated to the winning firm, and the role of the WUA is limited to informing the commune of how well the operator is performing and generally representing the interest of the consumers. The private operator for piped schemes also has authority and responsibility for all public handpumps and open wells in the supply area.

Assistance was provided to test the new management approach in 13 provinces through a program called Management Reform Program. The cooperation agreement was signed in 2002, the main construction period was 2005–2009, and a post construction monitoring phase ended in July 2010. For hand-pumped water points, PAR provided 86 new and 345 rehabilitated points and established a new style of private maintenance contracts in 33 communes. For piped schemes, PAR produced 12 new and 3 rehabilitated schemes through build-operate-transfer contracts under which the private firms will manage operations for 7 years.

A private firm, in partnership with local affiliates, won the contract to build and operate seven of the PAR piped schemes. The experience from the first year of operations was that three schemes did not earn enough revenue to meet running costs, while the other four schemes covered operational costs and set aside funds for piped-scheme replacement. The aggregate operations balance for the seven schemes was about US$14,000, but US$3,000 after provisions for replacement and handpump maintenance had been deducted. The firm attributed the ability to achieve a profit to (i) grouping several schemes in a single contract, (ii) remunerating staff based on performance and benchmarks, (iii) using the latest technology for financial and technical management, and (iv) creating incentives for good quality construction by having the contractor subsequently responsible for operation.

Source: Kleemeier 2010.

Chapter 2: Sector Analysis

Regional and South Asian Comparisons of National Water Supply and Sanitation Coverage

According to the Joint Monitoring Program (JMP) of WHO and UNICEF, Pakistan is on track to achieve the national water supply Millennium Development Goal (MDG) target—reaching 92 percent of the population as compared to the targeted 91 percent—but off track with respect to the national sanitation MDG target (48 percent versus targeted 63 percent). The Pakistan Social and Living Standards Measurement Survey (PSLM) Survey of 2010 estimates access to improved water supply at 91 percent and to improved sanitation access at 78 percent. Open defecation has diminished to 23 percent. The JMP relies on secondary sources to assess countries' progress toward the water supply and sanitation targets. In Pakistan, these sources include the PSLM surveys. The different JMP sources are averaged through a regression/correlation method. Differences between the JMP data and the PSLM, particularly relating to sanitation, highlight possible definitional inconsistencies between the two. As will be seen, these coverage statistics refer to the infrastructure built rather than to the services actually provided.

In the rural subsector the water coverage in 2010 (89 percent) is just below the 2015 target of 91 percent but for sanitation is well below the target with 2010 coverage at 34 percent versus a 2015 target of 53 percent. In both water supply and sanitation the coverage (in total and by type of service) has been improving over time, which is encouraging. Perhaps the greatest improvement relates to the reduction in open defecation. While not formally an MDG target, rural open defecation has more than halved, moving from a very high 72 percent in 1990 to 34 percent in 2010. Much of this improvement was achieved by moving to increase access to improved sanitation facilities rather than simply making upgrades to unimproved or shared facilities, again encouraging. See table 2.1 and table 2.2.

A comparison of JMP coverage data for 2010 between Pakistan and other South Asian countries is provided in table 2.3. This shows that its performance was in line with the general trend for the region. From 1990 to 2010, access to improved rural water increased by 8 percent in Pakistan. In 2010 the country's level of access to improved rural water was 89 percent and similar to that observed in India, Nepal, and Sri Lanka. Over the same 1990–2010 period, access to improved sanitation in rural areas rose from 7 percent to 34 percent in Pakistan, the largest increase in the region in absolute percentage terms. In spite of this improvement, Pakistan still lags well behind the regional leaders of Sri Lanka (93 percent) and Bangladesh (55 percent).

Table 2.1: JMP-Estimated Trends of Water Supply Coverage

Pakistan	Water Supply Coverage Estimates								
	Urban (%)			Rural (%)			Total (%)		
	1990	2008	2010	1990	2008	2010	1990	2008	2010
Improved water	95	96	96	81	88	89	85	91	92
Piped on premises	56	57	58	8	21	23	23	34	36
Other unimproved	39	39	38	73	67	66	63	57	56
Unimproved	5	4	4	8	7	6	6	6	5

Source: UNICEF and WHO 2012.

Water Supply Coverage by Province and Region

In spite of the relatively high national level of access to improved rural water supply, there are large provincial variations. Punjab is well ahead of the other provinces, followed by Sindh. The level of population without access to improved access to rural water service ranges from 7 percent in Punjab to 67 percent in Balochistan (figure 2.1). In terms of population with rural water supply coverage, the high coverage in the Punjab and the relatively high coverage in Sindh are far above the

Table 2.2: JMP-Estimated Trends of Sanitation Coverage

Pakistan	Sanitation Coverage Estimates								
	Urban (%)			Rural (%)			Total (%)		
	1990	2008	2010	1990	2008	2010	1990	2008	2010
Improved facilities	72	72	72	7	31	34	27	45	48
Shared facilities	6	6	6	1	5	6	3	5	6
Other unimproved	14	18	18	20	26	26	18	24	23
Open defecation	8	4	4	72	38	34	52	26	23

Source: UNICEF and WHO 2012.

Table 2.3: Access to Water and Sanitation in the South Asia Region

		Water				Sanitation			
		Urban		Rural	National	Urban	Rural	National	
		Improved		Improved	Improved	Improved	Improved	Improved	Unimproved
Country	Year	Total Improved (%)	Piped on Premises (%)	Total Improved (%)	Total Improved (%)	Improved (%)	Improved (%)	Improved (%)	Open Defecation (%)
Bangladesh	1990	87	26	75	77	58	34	39	33
	2008	85	20	79	81	57	52	53	7
	2010	85	20	80	81	57	55	56	4
India	1990	88	49	63	69	51	7	18	75
	2008	96	48	87	90	57	21	32	53
	2010	97	48	90	92	58	23	34	51
Nepal	1990	96	43	74	76	37	7	10	80
	2008	93	52	87	88	46	25	29	52
	2010	93	53	88	89	48	27	31	49
Pakistan	**1990**	**95**	**56**	**81**	**85**	**72**	**7**	**27**	**52**
	2008	**96**	**57**	**88**	**91**	**72**	**31**	**45**	**26**
	2010	**96**	**58**	**89**	**92**	**72**	**34**	**48**	**23**
Sri Lanka	1990	91	37	62	67	85	67	70	14
	2008	98	65	88	89	88	92	91	1
	2010	99	67	90	91	88	93	92	0
Average of Five Nations	1990	91	42	71	75	61	24	33	51
	2008	94	48	86	88	64	44	50	28
	2010	94	49	87	89	65	46	52	25

Source: UNICEF and WHO 2012.

low coverage provinces of AJK, Balochistan, and KP, the populations of which is much smaller than those in Punjab and Sindh. It is also interesting to observe that Balochistan has both the lowest rural water coverage and also the highest levels of rural poverty incidence (table 1.2), with both likely acting as surrogates for overall development status.

Within those provincial and regional variations the study found that Punjab is the best performing province, with consistently high levels of access across all districts (figure 2.2). Close to 92 percent of the population has access to improved drinking water sources within dwellings and 5 percent within half an hour travel time.

Within the Sindh Province the access of households to improved sources of drinking water varies widely from a low of 17 percent in Tharparkar to a high of 99 percent in N. Feroze (figure 2.3).

Rural Sanitation Coverage by Province and Region

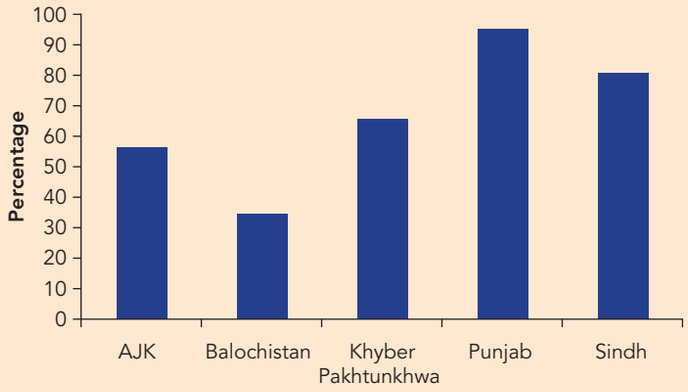
The PSLM figures report rural access to improved sanitation at 89 percent nationally, with Punjab at 68 percent, KP at 79 percent, Sindh at 86 percent, Balochistan at 84 percent, and AJK at 55 percent (figure 2.4). These figures are somewhat difficult to reconcile with each other and with the JMP figures, which indicated access to improved sanitation at just 34 percent in 2010. The reason may be that the JMP bases its assessment on several data sources (including the PSLM) and may be more representative than just one assessment, such as the PSLM. There may also be definitional differences at play.

Quality and Efficiency of Water Services

The coverage figures presented above refer to the infrastructure that has been built rather than to the quality of services actually provided. This subsection drills down to provide an understanding of whether that infrastructure delivers good service to rural residents.

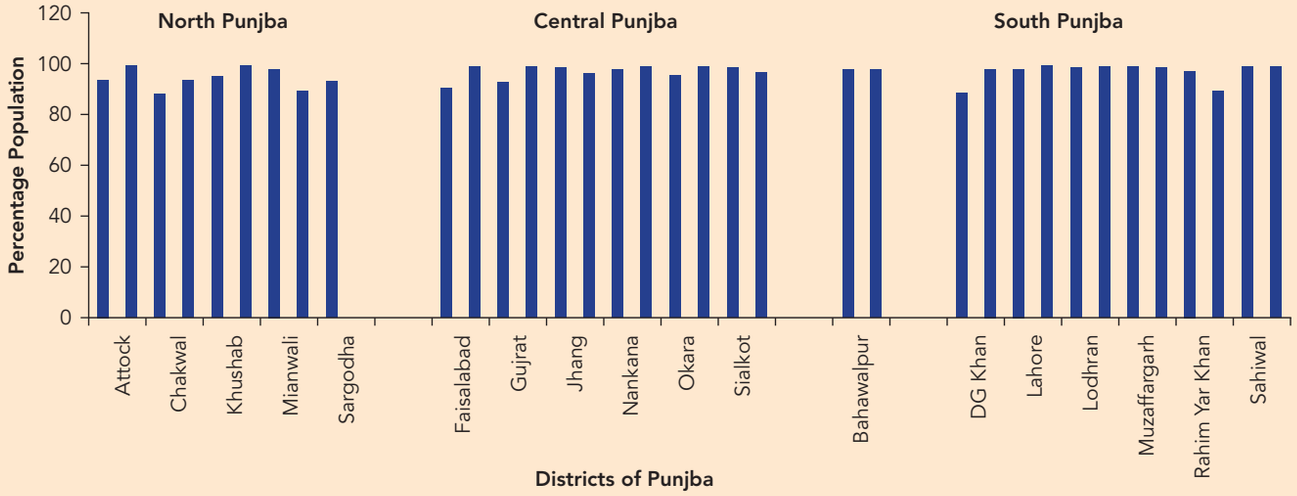
The major method for supplying drinking water to rural residents is hand pumps, providing a point source supply to 38 percent of households. Motor pumps serve an additional 27 percent while about 20 percent of the residents have access to tap water through a pipe network.

Figure 2.1: Rural Water Supply Coverage by Province and Region



Source: GoP 2011.

Figure 2.2: Punjab - Population Having Access to an Improved Source of Drinking Water



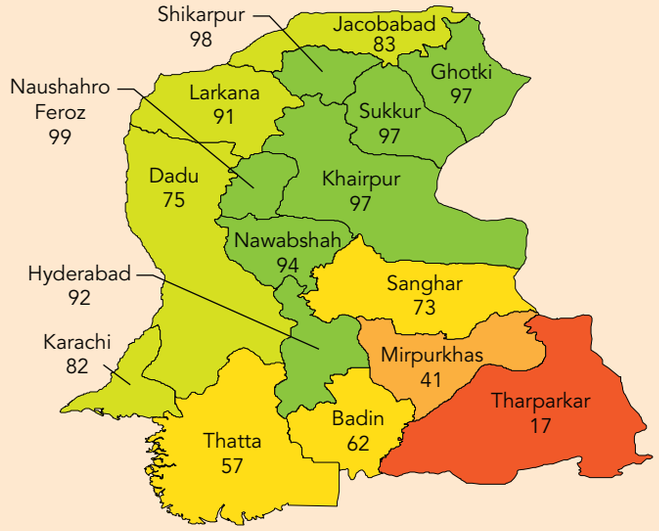
Source: Data collected during field visits 2012.

Figure 2.3: Sindh - Households with Access to an Improved Source of Drinking Water

Percent of households who use the following types of water supply for drinking within 30 minutes from the household.

1. Piped water
2. Public standpipe or tap
3. Borehole/hand pump
4. Protected dug well
5. Tube well
6. Protected spring

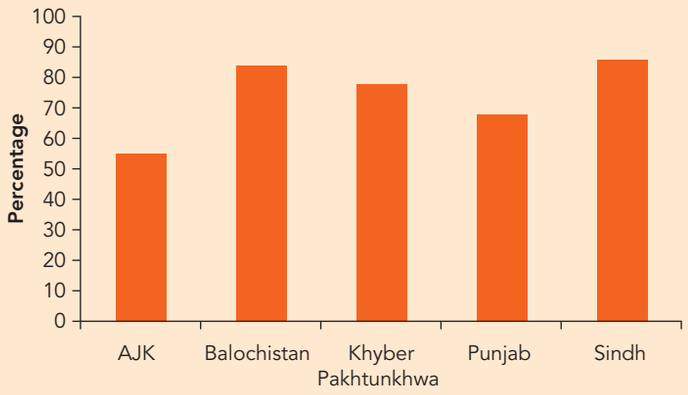
Karachi Towns	
Liaqatabad	99
SITE	98
Landhi	97
Shah Faisal	97
Gulberg	96
Malir	96
Saddar	95
New Karachi	93
N.Nazimabad	93
Liyari	92
Gulshan Iqbal	91
Jamshed Town	85
Korangi	77
Bin Qasim	73
Baldia	68
Orangi Town	66
Gadap	49
Kemari	24



Access Improved Water	
Sindh	80
Urban	91
Rural	73
N. Feroze	99
Shikarpur	98
Ghotki	97
Khairpur	97
Sukkur	97
Nawabshah	94
Hyderabad	92
Larkana	91
Jacobabad	84
Karachi	82
Dadu	75
Sanghar	73
Badin	62
Thatta	57
Mirpurkhas	41
Tharparkar	17

Source: Multiple Indicator Cluster Survey (MICS), 2003-04, Planning & Development Department, Government of Sindh.

Figure 2.4: Rural Sanitation and Coverage by Province and Region



Source: Pakistan Social and Living Standards Measurement Survey (PSLM), 2010–2011.

The remaining 16 percent depend on dug wells and other systems. An interprovincial comparison is provided in figure 2.5. Service continuity is a grave problem because power-load shedding shuts down pumping systems up to 20 hours per day. Actual water supply service in rural areas is typically two to four hours per day: one to two hours in the morning and one to two hours in the evening. Running standby generators is not an option since the service providers cannot afford to pay their costs. For those few systems that operate 16 hours daily, the supply of water is typically around 45 liters per capita per day.

There are a substantial proportion of inoperative rural water supply and sanitation (RWSS) schemes in the country. The proportion of rural schemes that are functional varies considerably from 48 percent in Sindh; 67 percent in Punjab; to 100 percent in Gilgit Baltistan (table 2.4). The large variations may partly be explained by definitional differences of what constitutes functionality. Nationally, 83 percent of the schemes are reported to be functional.

It is important to drill down to understand these relatively high levels of nonfunctioning schemes. Data compiled for the study shows the reasons for the nonfunctionality of rural schemes in Punjab (figure 2.6) and Sindh (figure 2.7).

Among the many reasons for failure, the following can be cited:

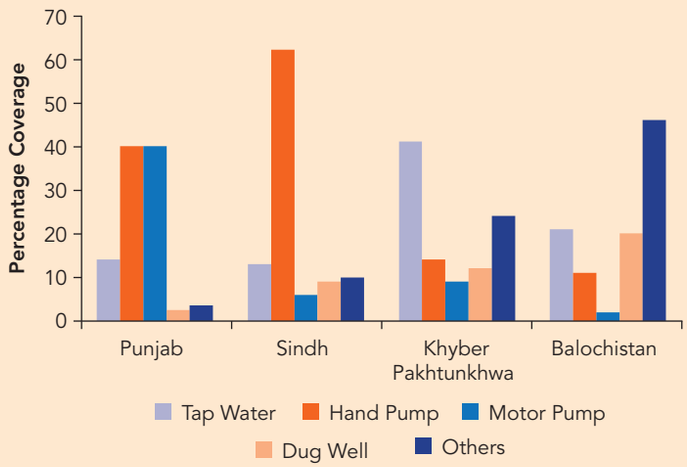
- Lack of appropriate training program on operations and maintenance (O&M).

- Poor or no post construction follow up
- Power tariff increases stretching affordability limits of the communities.
- Source failure due to water draw down.
- Technical failure due to breakdown of transformers, pumps, and so forth (average cost Rs. 100,000 or more).
- Lack of a back up support mechanism to assist with technical repair and availability of financing to fund major repair cost.

Some of the reasons detected are interrelated, for example, the inability to raise revenues and thus the inability to pay for the necessary power to operate the system, fix broken equipment, or replace stolen equipment. Underlying all the individual reasons is the insufficient focus on O&M of what has been built, including (i) insufficient attention to financing of operations and maintenance costs and (ii) the failure to create a backup mechanism of technical excellence that individual operators could benefit from. The incentives for maintaining the existing systems are not as strong as those supporting new projects.

As operational sustainability is the key measure of success of rural water supply and sanitation systems. It is important to reflect on whether the institutional models currently in place in Pakistan are the most effective. This was discussed in chapter 1 of the report, but there is some evidence (table 2.4) to suggest that CBO-operated schemes are more sustainable than those operated by provincial and regional level entities. Certainly international experience points to greater use of CBOs to deliver RWSS services, not just for O&M but in all stages of the scheme cycle. As such there is a need to consider whether the introduction of CBOs into RWSS service delivery needs to be taken even further than current practice in Punjab/AJK/FATA to include scheme development. This would require an evolution in the role of the existing provincial and regional entities from developing and providing service to one of facilitating service delivery and supporting CBOs over the long term.

Figure 2.5: Distribution of Water Sources (Rural)



Source: GoP 2011.

Quality and Efficiency of Rural Sanitation Services

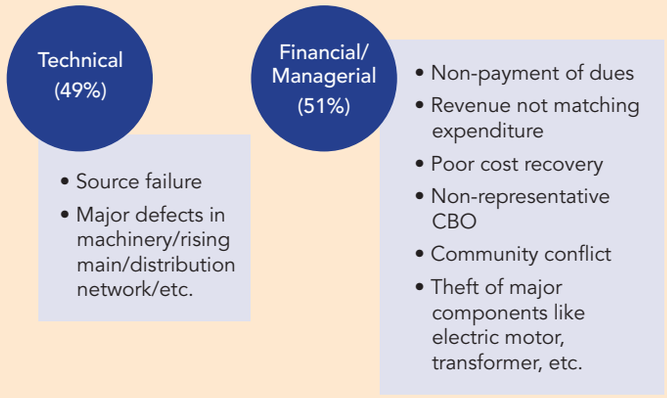
The most prevalent category of rural sanitation (other than open fields) varies between the provinces and the regions, although in none of them does a flush toilet

Table 2.4: Rural Water Supply Systems, Total and Functional

Province/Region	Total number of schemes	Functional Schemes	Number of functional schemes operated by CBOs	Number of functional schemes that are operated by PHED	Share of total number of schemes that are functional
AJK	7,500	7,461	7,422	39	99%
Balochistan	2,353	1,746	1,005	741	74%
FATA	1,507	1,228	NA	NA	81%
Gilgit Baltistan	437	437	437	Nil	100%
Khyber Pakhtunkhwa*	4,056	3,399	1,161	2,238	84%
Punjab	4,058	2,715	2,448	267	67%
Sindh	1,384	666	339	327	48%
TOTAL	**21,295**	**17,652**	**12,812**	**3,612**	**83%**

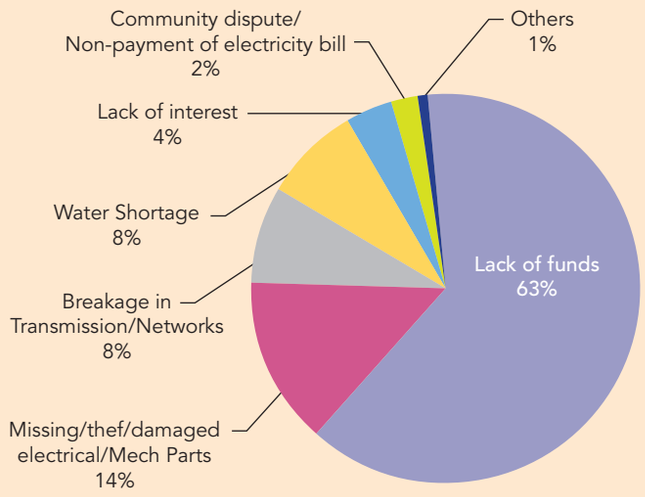
Source: Data collected during field visits 2012.
* O&M of rural schemes are no longer managed by communities.

Figure 2.6: Diagnosis of Failure of Rural Water Supply Schemes in Punjab



Source: Public Health Engineering Department, Punjab 2012.

Figure 2.7: Reasons for Nonfunctioning of Schemes in Sindh



Source: PCRWR Technical Assessment Survey Report on Water Supply and Sanitation for Sindh Province 2008.

connected to a public sewer exceed 8 percent of households. According to data from the Multiple Indicator Cluster Survey (MICS), in AJK and Punjab the *flush toilet with septic tank* is the most prevalent type of rural sanitation, used by 42.8 percent and 38.4 percent households, respectively. In the Federally Administered Tribal Areas (FATA), the most prevalent type of rural sanitation is the *open pit/uncovered pit* used by 14.5 percent of households. In Sindh, the *VIP latrines*, used by 14 percent of the households, is the most prevalent type of rural sanitation. In Balochistan, the *pit latrine* with the slab is the most prevalent type of rural sanitation, used by 18.1 percent of households. In KP, *flush toilets* are used by 46.1 percent of households, but data is not available on how this is divided among *those connected to public sewers, septic tanks and pit latrines* (figure 2.8).

The quality of service in the rural sanitation subsector is best considered in terms of the level of open defecation. Overall the rate of open defecation is 40 million people, 34 percent of the rural population, which gives Pakistan the third largest rate in the world, after India (626 million, 78 percent of rural population) and Indonesia (63 million and 55 percent of rural population). Worldwide, the majority of those practicing open defection (949 million) live in rural areas, and the practice is prevalent in every region of the developing world (figure 2.9). For instance, the proportion of rural dwellers still practicing open defecation is 9 percent in Northern Africa and 17 percent in Latin America and the Caribbean. Open defecation is highest in rural areas of Southern Asia, where it is practiced by 55 percent of the population (figure 2.10).

Differing figures from JMP and PSLM of rural access to improved sanitation are rather difficult to reconcile, as noted earlier. Whichever is more accurate, it is clear that the environmental health situation is seriously deficient. It is therefore not surprising to find high national rates of infant and child mortality. National infant mortality is high at 70 per 1,000 live births, and child mortality is still higher at 86 deaths per 1,000 live births. In comparison Bangladesh, India, Nepal, and Sri Lanka have infant mortality of 38, 48, 41, and 16, respectively, per 1,000. The corresponding numbers for child mortality (before the age of five years) are 48, 63, 50, and 17, respectively, for the comparator South Asian countries. The lowest levels for infant mortality are found in countries such as Singapore and Sweden, with 2 deaths per 1,000 live births. Water, sanitation, and hygiene-related diseases cost the Pakistani economy about Rs. 112 billion (US$1.3 billion) per year in terms of health care costs and lost earnings. According to the PSLM (2010–2011), the costs associated with diarrheal diseases alone are estimated to be around Rs. 55 billion to 80 billion per year. Estimates are that diarrhea with typhoid was the leading cause of loss of disability-adjusted life years (DALYs) in Pakistan (figure 2.11).

There have been some positive sanitation innovations at the grassroots level in Pakistan, such as the Orangi Pilot Project. While the project is an urban initiative, it has demonstrated that it is possible to successfully mobilize the community and build self-financed, self-maintained sewers for over a million people in Karachi. This successful model is now being followed in other parts of Pakistan and internationally in Brazil, Ghana, and Uganda. Along with this well-known project, there are

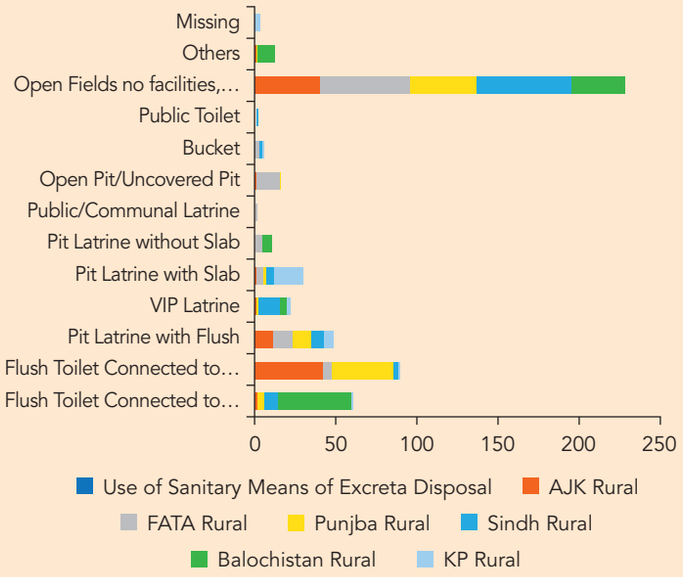
also other good examples, such as the Community-Led Total Sanitation (CLTS) and the Lodhran District Pilot Sanitation Project in rural areas.

The concept of CLTS was first introduced in Pakistan in 2003 as a pilot project in Mardan District (now in Khyber Pakhtunkhwa province) by the local NGO Integrated Regional Support Program (IRSP) together with UNICEF. A main objective of the concept is to create open-defecation-free villages through behavioral change in the whole community, rather than to construct sanitation facilities for individual households. Since then, CLTS has spread rapidly in the country and become a main feature of the National Sanitation Policy, which provides financial rewards for defined outcomes. Development agencies began to link their funding and incentives to the open-defecation-free status. The Lodhran Pilot Project (inspired by the Orangi Pilot Project), started in Lodhran District in 1999 and follows a low-cost, community-owned, rural sanitation model based on a participatory approach.

Pakistan Approach for Total Sanitation (PATS) attempts to achieve and sustain an open-defecation-free environment in both rural and urban contexts with a clear emphasis toward behavior change and social mobilization enhancing the demand side of sanitation. PATS is based on the following four key pillars: (i) creating a demand for open-defecation-free communities, (ii) sustaining the demand through supply-side interventions, (iii) promoting participatory health and hygiene practices, and (iv) attaining adequate drainage and wastewater treatment through constructed wetlands. PATS has been built upon the same parameters as CLTS, which was originated by Water Aid Bangladesh and its local partner organization, Village Education Resource Centre, in 1999–2000. PATS is moving away from an approach of shame and disgust toward instilling dignity and respect among the community in achieving total sanitation both at the household and community level toward becoming open-defecation-free communities. PATS emphasizes success through demonstration and availability of appropriate sanitation solutions. There are many lessons in the use of such approaches to deliver improved outcomes within the region; examples from India and Bangladesh are presented in boxes 2.1 and 2.2.

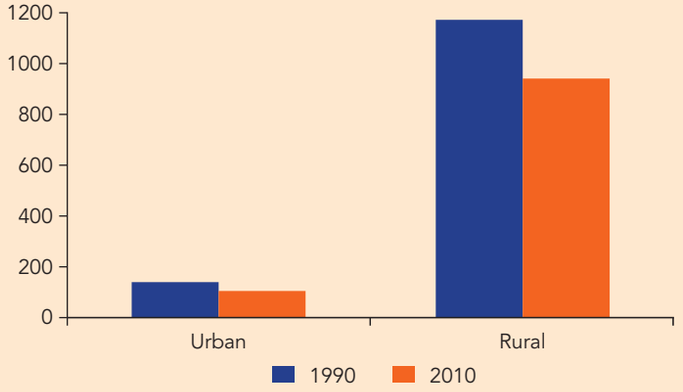
Figure 2.12 shows the improvement in sanitation coverage in Bangladesh, with the required national trend far ahead of the MDG target trend. In addition to the gains in nationwide household access to sanitation, it is estimated that around 30 percent of communities in rural Bangladesh have achieved open-defecation-free status. Though the increase in access to basic sanitation is quite significant, the next challenge will be to sustain the gains.

Figure 2.8: Use of Sanitary Means of Excreta Disposal



Source: MICS data-AJK 2007–08; KP 2008; Sindh 2003–2004; Balochistan 2003–04; and FATA and AJK data collected, 2012.

Figure 2.9: Worldwide Population that Practices Open Defecation

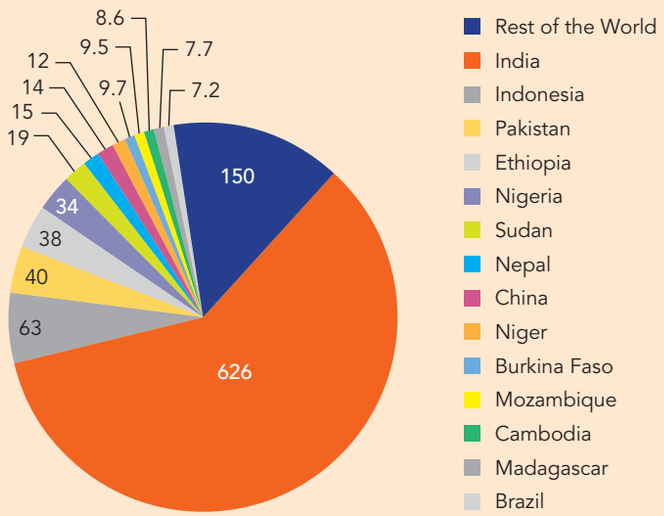


Source: UNICEF and WHO 2012.

Water Resource Quality and Quantity

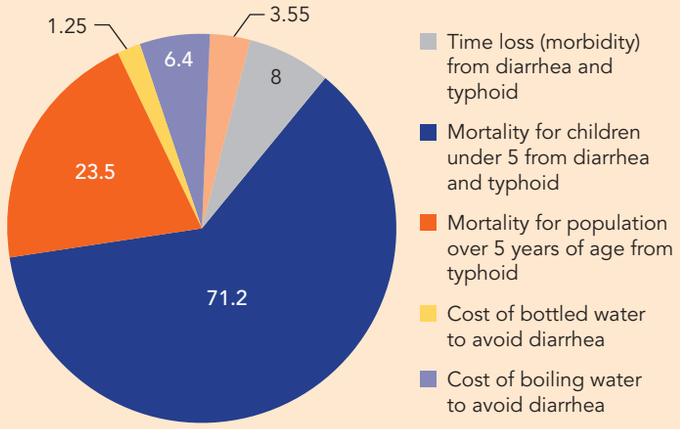
Efficient management of water resources is a major challenge. The Indus is Pakistan's only major river system, and should current trends continue, decreasing snowfall in the Himalaya and Karakorum Mountains may progressively limit its role as the main the supply source of fresh water. Subsurface sources of water are fast being depleted due to unsustainably high with-

Figure 2.10: Countries with the Largest Numbers of People Practicing Open Defecation



Source: UNICEF and WHO 2012.

Figure 2.11: Estimated Cost of Water-Related Mortality and Morbidity (Rs. billion per year)



Source: World Bank 2006.

drawals by all kind of users. The amount of per capita water resources has decreased from 5,300 cubic meters (m^3) in the 1950s to about 1,000 m^3 in 2011, the international threshold for water stress. Irrigation accounts for 69 percent of the water used in the country, industry for 23 percent, and municipalities for only 8 percent. Surface water supplies are threatened by wastewater pollution, since only 50 percent of the wastewater is collected and only 10 percent treated.

Groundwater is now being overexploited in many areas, and its quality is deteriorating. Over the past 40 years, the exploitation of groundwater, mostly by private farmers, has brought enormous economic benefits and groundwater accounts for almost half of all irrigation requirements. Now, however, there is clear evidence that groundwater is being overexploited, yet tens of thousands of additional wells are being put into service every year. In terms of salinity, about 80 percent of Punjab has fresh groundwater, but in Sindh, less than 30 percent of groundwater is fresh. In Khyber Pakhtunkhwa (KP), increasing abstraction has resulted in wells now reaching into the saline layers. Balochistan has saline groundwater.

While salinity is important, and usually obvious to consumers, the bacterial and chemical quality of water cannot be easily judged by eye or taste. In the studies conducted by the Pakistan Council of Research in Water Resources (PCRWR 2008–09), the analysis of water samples collected from the water sources of the functional water supply schemes indicated that 79 percent of the total collected samples are unsafe for drinking. The percentages of safe and unsafe water in different districts of Punjab is shown in figure 2.13 and presented spatially in figure 2.14. It has been found that water of Punjab is unsafe for drinking dominantly because of microbiological contamination, though there is no evidence of physical as well as chemical problems.

Besides the scale of water contamination, table 2.5 assesses the water contamination with respect to drinking water source.

The PCRWR has also carried out a water quality survey in upper KP. Analyses of five districts—Mardan, Buner, Swat, Lower Dir, and Upper Dir—have been conducted. All the samples from Lower Dir and 90 percent from Upper Dir had excessive bacteria and were unfit for drinking. 79 percent, 70 percent, and 75 percent samples from Mradan, Buner, and Swat, respectively, had bacteriological contamination above permissible levels. About 83 percent of samples were not suitable for drinking due to excessive bacteriological contamination. Moreover, an average of about 15 percent had calcium, 17 percent had fluoride, and 14 percent had turbidity with impermissible values.

PCRWR carried out further studies in rural areas of Pakistan that included four districts of KP: Abbottabad, Swat (Mingaora), Mardan, and Peshawar. In these four districts, 1,200 samples were collected from 212 rural union councils. These samples were tested for total coliform, E.Coli, nitrate, total dissolved salts, chloride, iron, turbidity, and sodium. Ninety-seven percent of samples each from Abbottabad and Peshawar and 74 percent of Mardan samples had total coliform contamination higher than permissible values and were unfit for

Box 2.1: India – Maharashtra Total Sanitation Campaign

The Total Sanitation Campaign (TSC) was a nationwide program, primarily funded by the Government of India. Its implementation varied from state to state. The case study focuses on how the TSC was implemented in the State of Maharashtra. The approach combined the promotion of sanitation with small hardware subsidies for the poorest households and monetary rewards for villages that achieved overall cleanliness objectives. Since being introduced in Maharashtra in 2000, the approach incentivized more than 21 million people to adopt improved sanitation. On average, the hardware cost per sanitation solution built was US$208.

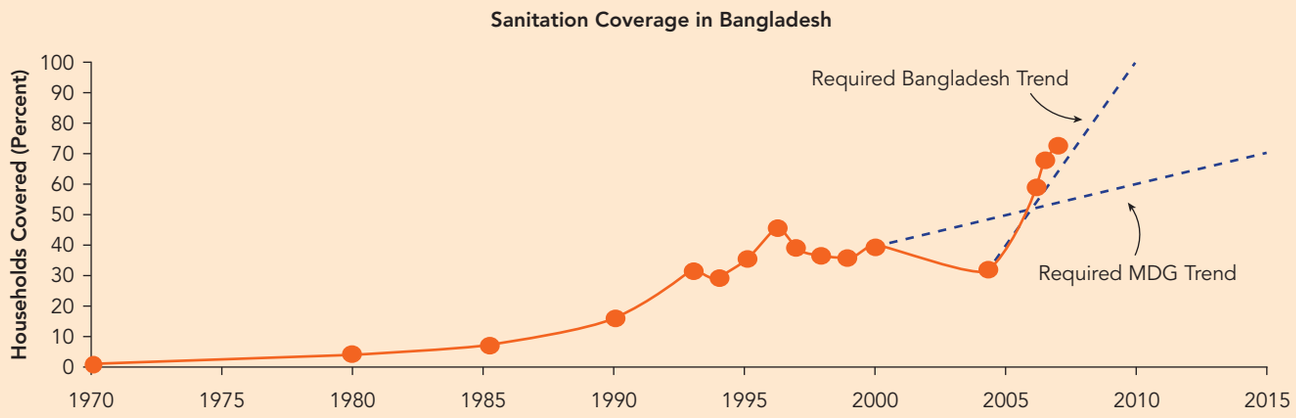
Under the TSC program, software activities were conducted to generate demand and village-level mobilization. Separately from the TSC, monetary rewards were provided to villages that reached open-defecation-free (ODF) status. The Nirmal Gram Puraskar was a national program that provided one-off monetary rewards from the central government to qualifying *gram panchayats* (village-level governments). Payments were based on a set of criteria that included, among others, 100 percent sanitation coverage of individual households and being totally free from open defecation. In addition, the State of Maharashtra introduced a number of state-based campaigns, such as the Clean Village campaign (SantGadge Baba Gram Swachayata Abhiyan) which took place annually and encouraged the maintenance of overall cleanliness in the villages. In total, approximately US$15 was spent on software support per household (including the cost of the financial reward schemes), which represented about 7 percent of total sanitation adoption costs.

Hardware subsidies were provided to below-poverty-line (BPL) households after the villages had been declared ODF. Since they were outcome-based, they were referred to as "incentives" in the TSC guidelines, provided to households "in recognition of their achievements." The initial level of subsidy was Rs. 500 (US$10) per BPL household, although this was raised to Rs. 1,200 (US$24) in March 2006 to reflect cost inflation. The subsidy was initially intended to cover 80 percent of hardware costs but in practice it covered only about 20 percent of hardware costs, since most BPL households chose to invest in a higher level of service than the minimum.

Finally, in some areas access to credit was provided in order to speed up the process of adopting sanitation. In those districts where credit was systematically introduced, it supported stronger demand for sanitation. However, these financial products tended to be more widely available in comparatively richer districts and largely benefited above-poverty-line households in those districts.

Source: Tremolet, Kolsky, and Perez 2010.

Figure 2.12: Sanitation Coverage in Bangladesh



Source: Bangladesh Bureau of Statistics, UNICEF, National Sanitation Secretariat.

Box 2.2: Bangladesh – Community-Led Total Sanitation

As it was in many other developing countries, sanitation was a major challenge in Bangladesh. Up to 2003, sector actors paid relatively more attention on safe drinking water.

In 2003 overall, sanitation access was officially stated at 33 percent for combined rural and urban communities, with growth about 1 percent annually. If such a trend had continued, it would have taken more than 60 years for the entire country to have sanitation facilities.

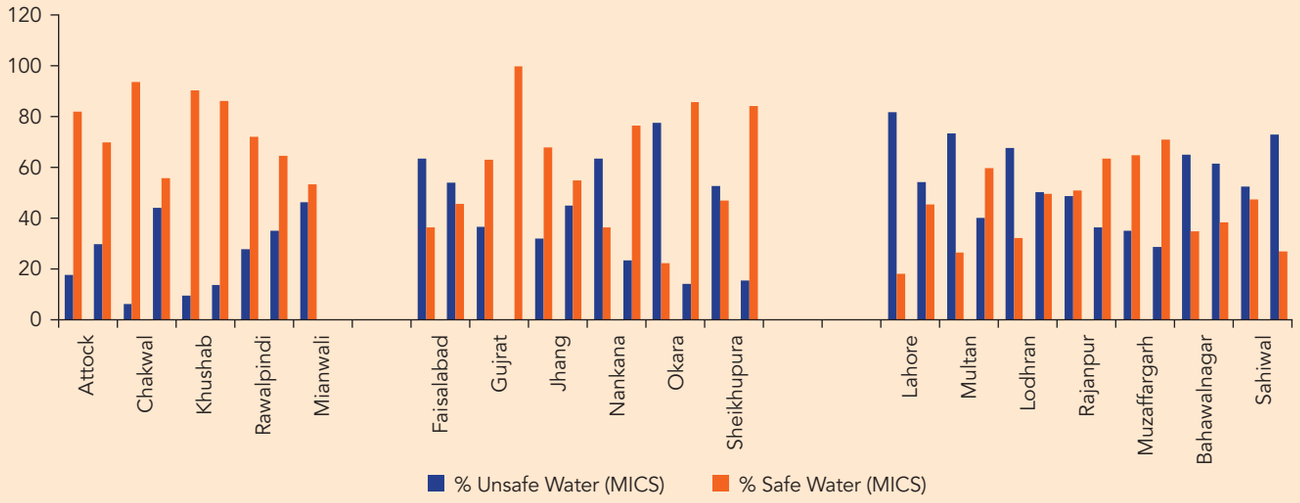
During 1999–2000 WaterAid Bangladesh and its rural partner Village Education Resource Center jointly developed and piloted an integrated, empowering CLTS approach in collaboration with rural communities. The approach is based on the assumption that once the issues have been understood, communities have the commitment and ability to overcome their sanitation problems themselves by encouraging people to live in a sanitary environment (mainly confinement of feces) by constructing latrines using indigenous knowledge and their own resources. It has proven effective in eradicating open defecation in the quickest time without providing subsidies for latrine construction.

By observing the strength of the approach during 2002–03 key sector actors, including donor agencies, were motivated to scale up the CLTS approach in Bangladesh and in the world. Policymakers and practitioners recognized that low-cost, affordable toilets that suit the local conditions of the community offer one means to shifting communities from open defecation to fixed-place defecation. In October 2003, the Minister of Local Government Rural Development and Cooperatives launched a nationwide sanitation campaign, declared October as sanitation month, and also articulated a target of 100 percent sanitation by 2010. The current government revised the target for complete sanitation coverage by the year 2013.

The Government of Bangladesh, with the support of civil society and external partners, has made remarkable progress in improving access to safe water and improved sanitation for its 149 million people. As of 2010, the incidence of open defecation has come down to just 4 percent, primarily as a result of the CLTS movement. But only 56 percent (83 million people) of the population have access to improved sanitation. To achieve its MDG targets by 2015, the Government of Bangladesh has to increase access to improved sanitation for 21 million people.

Source: Water Sanitation Program – Bangladesh.

Figure 2.13: Percentage of Safe and Unsafe Water in Punjab



Source: Punjab Provincial Water Supply and Sanitation Report 2012.

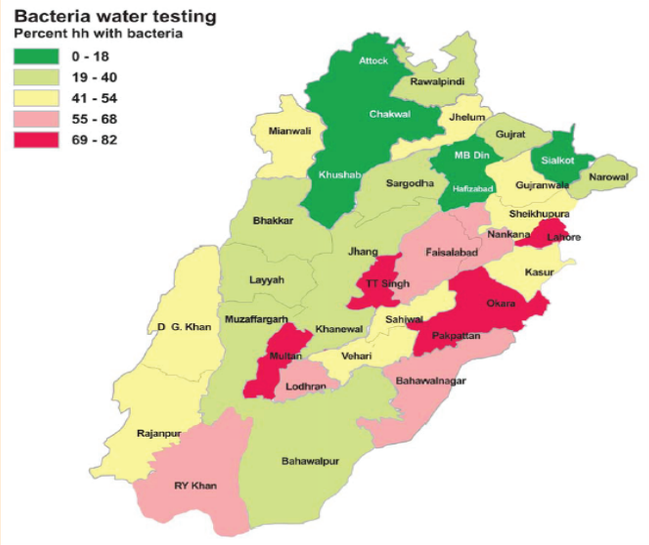
drinking. Eighty-three percent samples from Mingaora rural areas were found unfit for use due to E.Coli with impermissible values. On average, more than 62 percent samples had higher E.Coli contamination while 9 percent had nitrate, 11 percent had iron, and 11 percent had excessive turbidity values. Figure 2.15 gives the summary of results showing the percentages of samples fit or unfit for drinking.

Taken together, these figures are extremely worrying. Unlike urban settings, rural communities typically do not receive water that has been treated in any way. As such it will be important to consider how to address what appears to be massive and countrywide challenge, the impact of which is likely to be poor health outcomes for many of the poorest and most vulnerable.

Operation and Maintenance Cost Recovery

For a service provider to be financially viable from an operational perspective, the revenue collected should be at least equal to its cash operation costs, or, in accounting terms, have a working ratio of not more than 1.0. Otherwise subsidies, which are uncertain in

Figure 2.14: Households with Bacteria in Water in Different Districts of Punjab



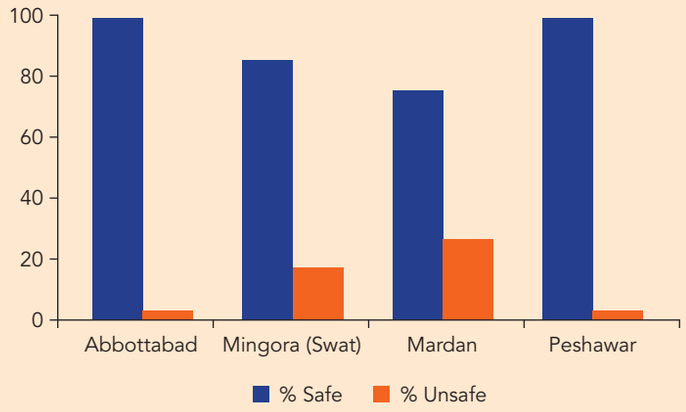
Source: Multiple Indicator Cluster Survey (MICS), 2007–08, Planning & Development Department, Government of Punjab.

TABLE 2.5: Punjab Households by Sources of Drinking Water and Contamination

Main source of drinking water	Percent of households in which water was tested	Number of households	Number of households in which water was tested	Percent of households		
				With bacteria	Withouth bacteria	Total
Punjab	86.7	91,075	78,995	48.8	51.2	100.0
Piped into dwelling	87.8	15,453	13,565	58.2	41.8	100.0
Piped into yard or plot	87.5	367	321	52.5	47.5	100.0
Public tap/standpipe	84.4	2,761	2,330	55.4	44.6	100.0
Hand Pump	85.3	29,425	25,108	41.8	58.2	100.0
Motorised Pump	87.5	34,499	30,195	48.2	51.8	100.0
Protected well within dwelling	84.7	687	582	26.5	73.5	100.0
Unprotected: well within or outside dwelling/ unprotected	86.0	406	349	37.1	62.9	100.0
Tubewell/turbine	88.1	2,785	2,454	73.0	27.0	100.0
Protected: well outside dwelling/spring, rainwater	83.7	769	644	25.3	74.7	100.0
Tanker/Cart with small tank	80.0	661	529	49.0	51.0	100.0
Surface water	70.3	219	154	64.2	35.8	100.0
Bottled/canned water	92.2	1,667	1,537	55.8	44.2	100.0
Others	89.1	1,376	1,226	57.1	42.9	100.0

Source: Multiple Indicator Cluster Survey (MICS), 2007–08, Planning & Development Department, Government of Punjab.

Figure 2.15: Results Giving Percentage of Samples Safe or Unsafe for Drinking



Source: Water quality status in rural areas of Pakistan, PCRWR 2010.

terms of amount and unreliable in terms of timing, are required to meet expenses. Good international practice is to have a working ratio of considerably less than 1.0, so that revenues can finance cash operating expenses, provide for depreciation on fixed assets, and make a contribution to future capital investment.

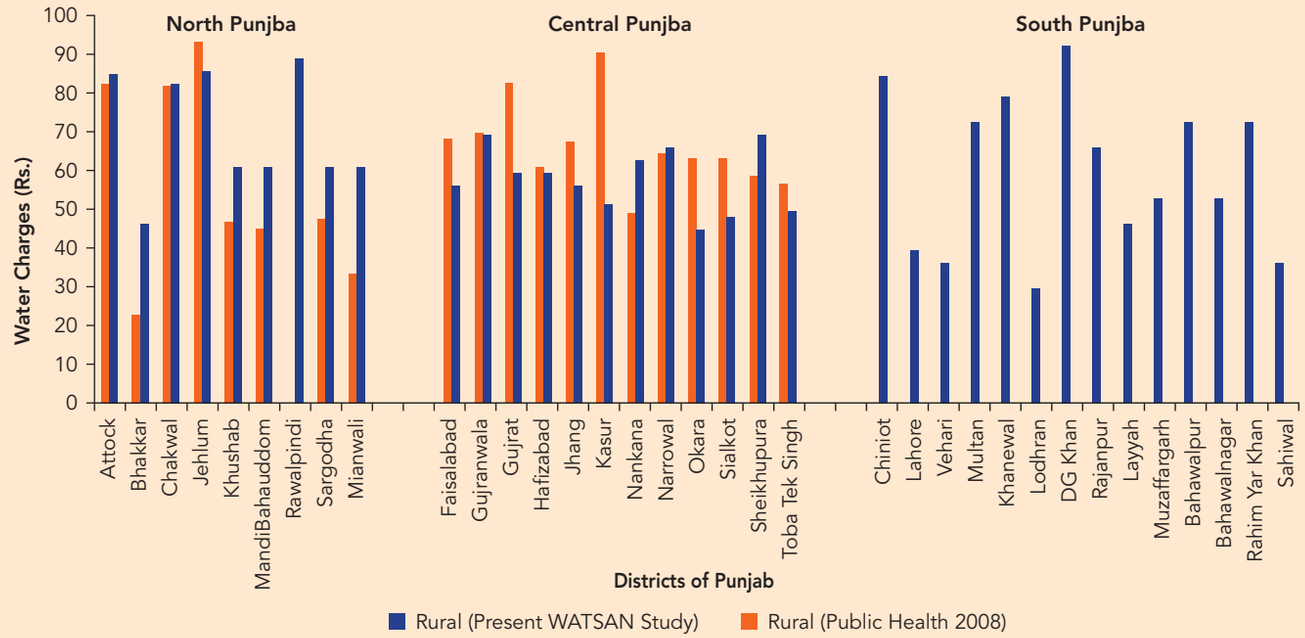
While achieving a working ratio of less than 1.0 requires attention to be paid to both revenues and costs, the latter are relatively modest in most rural schemes, and attention needs to be paid more to the revenue side of the equation, particularly the tariffs and the collection efficiency.

Water consumption in rural areas is unmetered and is charged on a flat tariff basis by CBOs. Monthly tariffs range from Rs. 30 (US$0.32) to Rs. 150 (US$1.6), depending on the size of the holding in the provinces and regions. In Balochistan, the flat tariff is Rs. 50 for domestic and Rs. 100 for commercial buildings. In Punjab, the tariffs of various districts are shown in figure 2.16. These range from Rs. 22 (US$0.23) in Baker to around Rs. 90 (US$0.96) in Jhelum, Kiser, and DG Khan.

In general, little consideration appears to have been given to establishing an equitable tariff system that would generate sufficient revenue to meet operating costs in most RWSS systems. A projection of future operating costs of proposed new systems is not made and no study is undertaken to assess the financial capacity of the communities to meet those costs. In addition, PHED budgets and planning documents make no commitment toward meeting any service delivery or performance-based targets. In the case of FATA, no tariffs are established, and water is supplied free of charge.

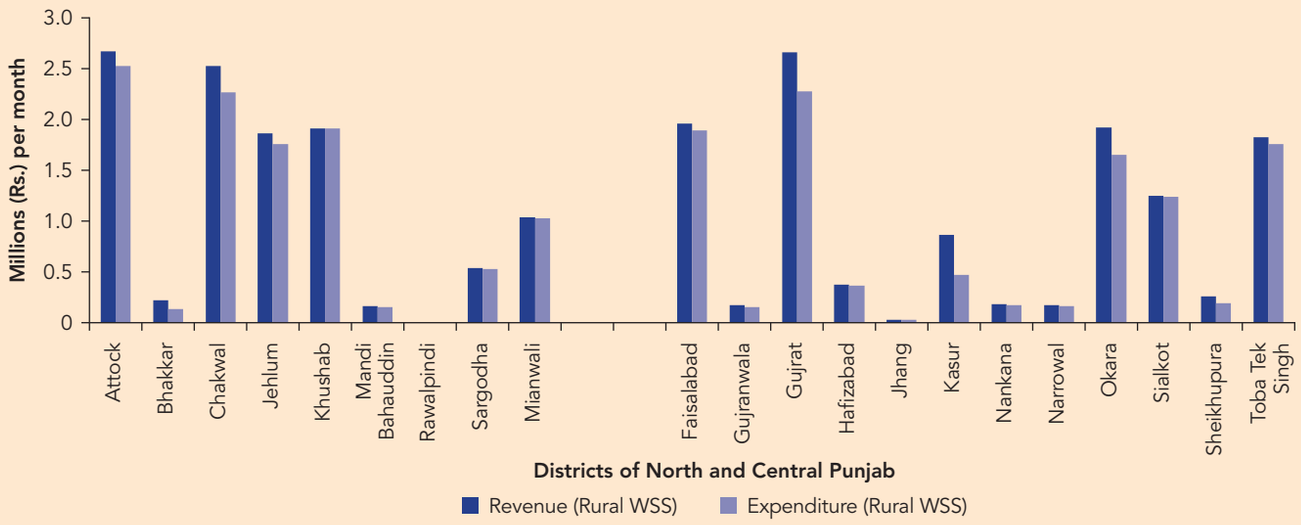
Often, tariffs are established at a rate too low to meet costs, and the position is compounded by erratic billing and poor collection performance. The collection efficiency is 25–40 percent in most of the provinces.

Figure 2.16: Average Rural Water Charges in Punjab



Source: Current study based on the PCRWR 2008–09.

Figure 2.17: Revenue and Expenditure of Rural Schemes in Districts of North and Central Punjab



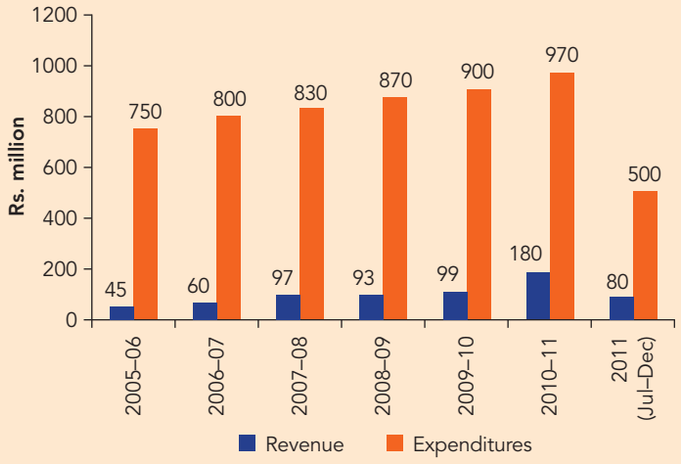
Source: Data collected during field visits 2012.

Collection efficiency is highest in Punjab at 80–90 percent. Punjab RWSS schemes are operated by CBOs, providing further support to the hypothesis that CBO-managed schemes are likely to be more sustainable than those reliant on provincial and regional entities. Twenty districts in North and Central Punjab all are either earning a surplus or breaking even on cash operating costs (figure 2.17).

At the other extreme, in KP, data collected for the past six years show that expenditures have increased from Rs. 750 million in 2005–06 to Rs. 970 million in 2010–11, an increase of about 29 percent in nominal terms (figure 2.18). Revenue collection has also increased from Rs. 45 million in 2005–06 to Rs. 180 million in 2010–11, a 300 percent increase. These increases have resulted in a significant improvement in the working ratio from 16.7 to 5.39 during the six year period. However, this result is far removed from the acceptable working ratio of 1.0 where revenue covers operating costs. Over 80 percent of the operating costs have to be covered by subsidies in 2010–11.

There are clearly good examples in Pakistan with regards to recovery of O&M costs from user fees, as shown in Punjab. As another example, the district of Chakwal also appears to have found a solution to the problem. Six of the seven systems in the Chakwal district are operating and five on these have a working ratio of less than 1.0 (table 2.6). That means that five of the systems collect sufficient revenue to enable them to pay their cash operating costs (figure 2.19). The working ratios range from 1.03 in Wahula to 0.10 in Thoa Bahadur. The tariffs are reasonable and range from a high of Rs. 150 per month in Wahula to about Rs. 80 in Thoa Bahadur (figure 2.20). The results contrast very favorably with the results in KP.

Figure 2.18: Revenue and Expenditure of PHED, KP, 2005–11



Source: Budget Office (South), Data collection from Public Health Engineering (PHED) Peshawar, 2012.

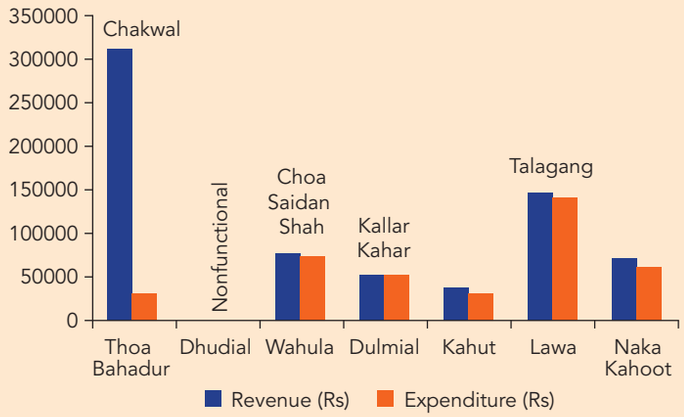
The story of Chakwal success should be an inspiration to civic leaders throughout Pakistan on how to address the urgent problem of inadequate water supply and sanitation systems. It is described in more detail in box 2.3.

Table 2.6: Rural Water Supply Schemes of District Chakwal

Tehsil	Rural WSS	Status	Population	Water Source	Water Charges (Rs.)	Revenue (Rs.)	Expenditure (Rs.)	Working Ratios
Chakwal	Thoa Bahadur	Functional	3,416	Surface Water	80	310,401	30,000	0.10
	Dhudial	Non-functional	18,000	Ground Water	–	–	–	NA
Choa Saidan Shah	Wahula	Functional	8,000	Surface Water	150	75,000	72,500	1.03
	Dulmial	Functional	7,000	Ground Water	125	49,000	47,060	0.96
Kallar Kahar	Kahut	Functional	2,000	Ground Water	100	35,800	28,600	0.80
Talagang	Lawa	Functional	10,150	Surface Water	100	145,000	140,000	0.97
	Naka Kahoot	Functional	6,405	Ground Water	90	68,400	60,000	0.88

Source: Punjab Provincial Water Supply and Sanitation Report 2012.

Figure 2.19: Revenue and Expenditure of Rural WSS of District Chakwal



Source: Punjab Provincial Water Supply and Sanitation Report 2012.

Operating Subsidies and Capital Investment

There is no central organization either at the federal or the province and region level that is monitoring the financial aspects of these organizations. Given the high working ratios of a substantial number of the water supply and sanitation (WSS) organizations, it is likely that a significant amount of local funds are secured to finance these operations. Substantial government and donor funding has been spent on rehabilitation of WSS systems as a result of the 2005 earthquake and major flooding. In the circumstances the level of operational subsidies in particular and capital investment to a lesser extent in the following analysis may be understated.

The principal source of funding is federal funding from the provincial Annual Development Programs (ADP), with additional funding from the Public Sector Development Program and donor financing. Provincial and regional governments allocate funds through the ADP each fiscal year. The ADP finances 34 sectors including roads, buildings, irrigation, WSS, health, education, agriculture, social welfare, and others. Capital expenditures for WSS are not separate, but funding for both PHED and LG&RD is included under the Physical Planning and Housing Sector allocation. The percentage of provincial and regional allocation of ADP funds for 2011–12 range from 7.6 percent in FATA to about 2.8 percent in AJK and Sindh (figure 2.21). The overall average for the nine provinces and regions is about 5.5 percent. This is a low proportion given the backlog in urgent rehabilitation and needed expansion of the water supply and sanitation systems.

The actual amounts of funds allocated ranged from Rs. 10 billion in the Punjab to about Rs. 200 million in AJK (figure 2.22). This is equivalent to a per capita amount of Rs. 106 (US$1.13) and Rs. 38 (US$0.40), respectively. The total allocation is about Rs. 20 billion or per capita of Rs. 112 (US$1.19).

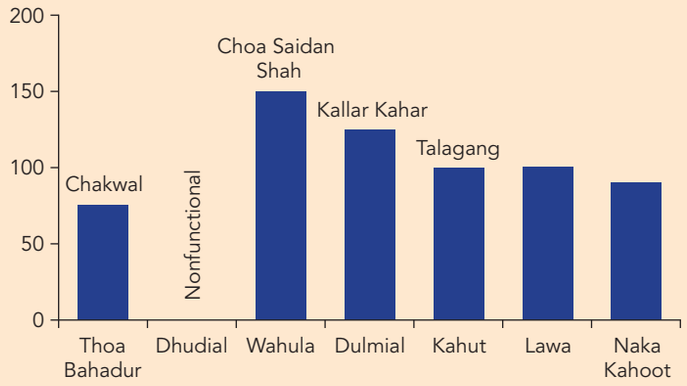
During the 2002–2011 period, the WSS sector received substantial increases in both nominal and real

terms to subsidize its operations and for new capital investment. The funds expended on subsiding operations increased from Rs. 1.7 billion in 2002 to Rs. 9.5 billion in 2011 (figure 2.23). This represents an increase in nominal terms of 460 percent in nominal terms and 250 percent in real terms adjusted by the Consumer Price Index over the 10-year period. The 2011 figure of Rs. 9.5 billion is equivalent to 0.05 percent of GDP of that year.

The funds for capital investment also increased in both nominal and real terms during this decade. The capital investment increased from Rs. 2.9 billion to Rs. 19.0 billion in 2011 (figure 2.24). This was an increase of 555 percent in nominal terms and about 300 percent in real terms. The 2011 investment was the equivalent of about 0.11 percent of GDP in that year. Analysis of the capital investment between urban and rural or between water supply and sanitation is not available. A best estimate of the division of investment between water and sanitation during the period is about 3:1.

The total funds for operational subsidies and capital investment increased by 520 percent, from 4.6 billion to Rs. 28.5 billion during the decade (figure 2.25). This represents an increase of 520 percent nominal terms or 280 percent in real terms. The Rs. 28.5 represents 0.16 percent of GDP for 2011.

Figure 2.20: Water Charges in the Rural WSS of District Chakwal (Rs. per month per HH)



Source: Punjab Provincial Water Supply and Sanitation Report 2012.

Box 2.3: Chakwal District – Formalizing Rural Water Supply Billing Systems

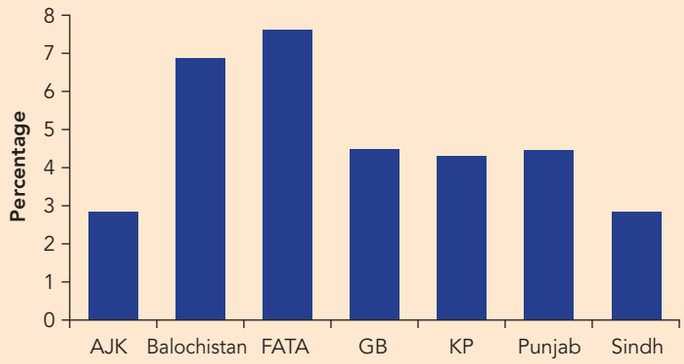
Rural communities have generally considered the provision of safe drinking water the responsibility of the public sector rather than their own. This poses several challenges, not the least of which is the cost-effectiveness and sustainability of water supply schemes. The Punjab Community Water Supply & Sanitation Project, supported by Asian Development Bank, has tested an innovative approach of making communities pay for the water they drink by introducing a formal mechanism for water metering in rural water supply schemes in some marginalized rural communities in Punjab.

The model was piloted in a small village of Varo in the district of Chakwal. Communities were mobilized and introduced to the advantages of water metering, particularly as they concern water conservation and reduction of household expenditures. The project assisted the community in procuring dry water meters from the nearby city of Lahore and trained a person among the villagers as a plumber. This person was made responsible for proper installation of the water meters. The total cost of installation per household ranged between Rs.1,200–1,600, inclusive of the meter cost.

Once the water meters were installed, the community designated office bearers who became responsible for bill collection and the operation and maintenance of the scheme. The bill was collected from each household based on the units consumed, with the price per unit determined by dividing total monthly operating expenses by total number of water units used. The project proved to be a great success. The approach was replicated in two more villages in Chakwal. Majority of communities followed what villagers in Varo did; however the residents of village Balkasar proved to be more innovative when it came to collection methods. The Balkasar community reached an arrangement with the local bank to deposit their bills directly to the bank. The bank charges Rs. 5 per bill as a service charge and the community has also imposed a fine of Rs. 20 per month on late submission of bills. For chronic defaulters, the penalty was disconnection. The concept that was initially applied in three villages of district Chakwal proved to be a winner. It is now being replicated in fifteen more villages of district Chakwal on community demand.

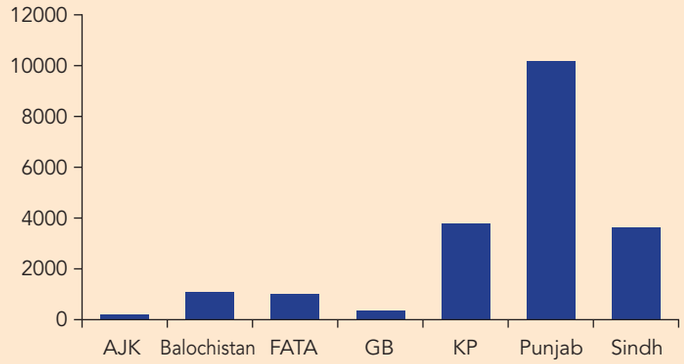
Source: Case study; Successful Rural Water Supply in Punjab, Water Sanitation Program – South Asia Pakistan 2012.

Figure 2.21: Drinking Water and Sanitation Allocations as Proportion of Provincial ADP,2011–12



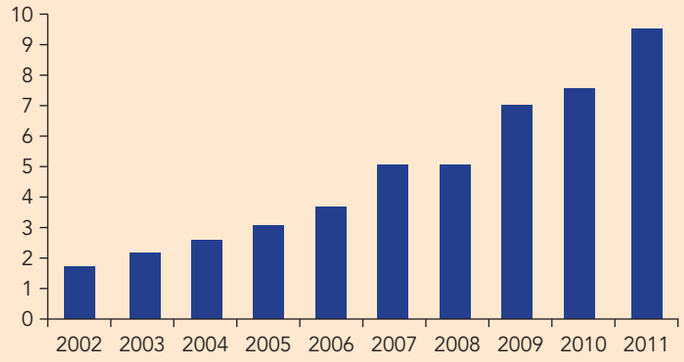
Source: UNICEF 2012.

Figure 2.22: Provincial Allocations for Drinking Water and Sanitation in ADPs, 2011–12 (Rs. million)



Source: UNICEF 2012.

Figure 2.23: Funds for Operational Subsidies, 2002–11 (Rs. billion)



Source: UNICEF 2012.

Future Investment Needs

UNICEF's 2012 report *Sanitation and Water for All* estimated the investment required for the years 2013 to 2015 to achieve Pakistan's MDG for 2015 of 100 percent access to water supply and 67 percent access to improved sanitation. This estimate was adjusted to provide for the provinces and regions of FATA, AJK, and Gilgit Baltistan, which were not included in the original assessment because of lack of data at the time. The calculations were based on a per capita investment cost of Rs. 4,000 (US$42) for water supply and Rs. 4,000 (US$42) for sanitation. The rural water investment was estimated at Rs. 54.09 billion and rural sanitation at Rs. 92.21 billion, giving a total rural requirement of Rs. 146.3 billion (table 2.7). The total investment requirement, including the urban area, is about Rs. 163.00 billion. This is equivalent to about 0.31 percent of annual GDP over the three-year period, with the rural area accounting for about 90 percent of the total. This represents a significant increase in the current investment level in the WSS sector.

A financing plan for both urban and rural WSS for the period 2013 to 2015 is shown in table 2.8. On the assumption that the Government maintains the current level of funds at Rs. 19.00 billion, there would be a financial gap of about Rs. 106.00 billion. If the Government were to meet this shortfall it would require additional finance of about Rs. 35.00 billion per annum or 0.19 percent of GDP. This would represent an increase of about 120 percent on the present level of funding of Rs. 28.50 billion provided to the sector for both subsidies and capital investment. The projected investment requirement would represent funding of about 0.35 percent of GDP. This high level of funding emphasizes the urgency of ensuring that the present operations should be self-financed so that funds presently used for operations could be utilized to meet the urgent investment requirements.

While the above level of investment requirement is very substantial, it is useful to compare this level of investment with that of other countries. Pakistan has invested some 0.16 percent of GDP in the sector in recent years. Countries in the Latin American region invested an annual average of 0.4 percent of their regional GDP during the 1970s—a decade of rapid progress in the water supply and sanitation sector in that region. In the next decade, the 1980s, the regional investment rate for water supply and sanitation dropped to 0.2 percent of regional GDP. Globally, average expenditures in the WSS sector is 0.3–0.5 percent of GDP. It is estimated that between 2000 and 2008 Mexico, Lebanon, and Jordan, for example, spent 0.5–0.6 percent of GDP on the WSS sector (including irrigation and water resources management).

Table 2.7: Projected Capital Investment to Meet the WSS MDG 2015 (Rs. billion)

	2013	2014	2015	Total	Percentage
Urban water	5.05	5.15	5.26	15.46	9
Urban sanitation	0.44	0.45	0.46	1.35	1
Total urban WSS	**5.49**	**5.60**	**5.72**	**16.81**	**10**
Rural water	17.66	18.03	18.40	54.09	33
Rural sanitation	30.11	30.72	31.38	92.21	57
Total rural WSS	**47.77**	**48.75**	**49.78**	**146.30**	**90**
Total WSS	**53.26**	**54.35**	**55.50**	**163.11**	**100**

Source: UNICEF 2012.

Table 2.8: Projected Financing Plan to Meet the MDG 2015 (Rs. billion)

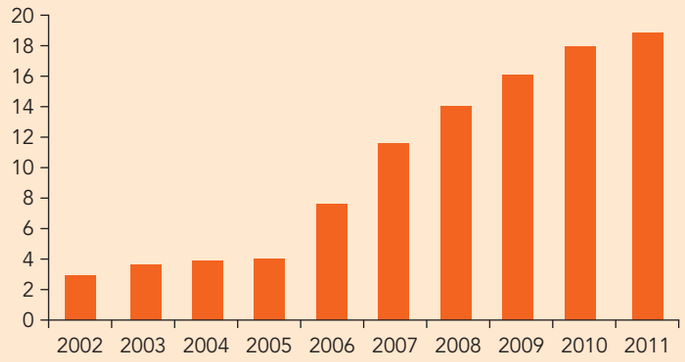
	2013	2014	2015	Total	Percentage
Urban WSS investment	5.49	5.60	5.72	16.81	10
Rural WSS investment	47.77	48.75	49.78	146.30	90
Total WSS investment	**53.26**	**54.35**	**55.50**	**163.11**	**100**
Current investment level	19.00	19.00	19.00	57.00	35
Additional resources required	34.26	35.35	36.50	106.11	65
Additional resources as percentage of GDP (2010)	0.19	0.20	0.21		

Source: UNICEF 2012.

This compares with the 1 percent of GDP suggested by the Human Development Report 2006, and the estimated 2.6 percent of GDP required annually by sub-Saharan Africa countries to meet water MDGs (see figure 2.26).[5]

An alternative is to compare the investment versus projected benefits. The World Bank Water and Sanitation Program (WSP) report on the economics of sanitation indicates that the country loses 3.8 percent of GDP as a result of inadequate sanitation. Against this the current level of investment of 0.16 percent of GDP seems on the low side and the projected level of 0.35 percent would appear to be justified.

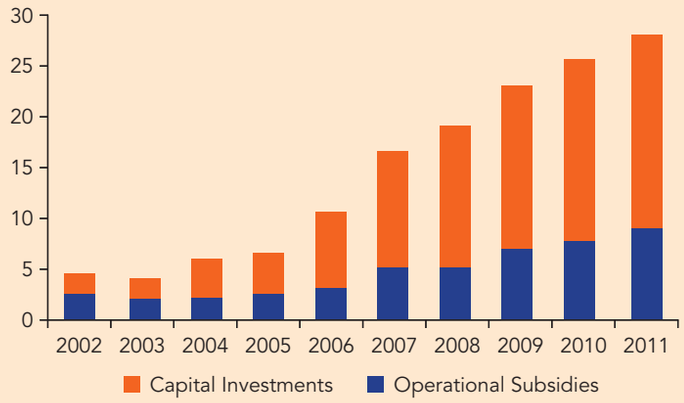
Figure 2.24: Funds for Capital Investment, 2002–11 (Rs. billion)



Source: UNICEF 2012.

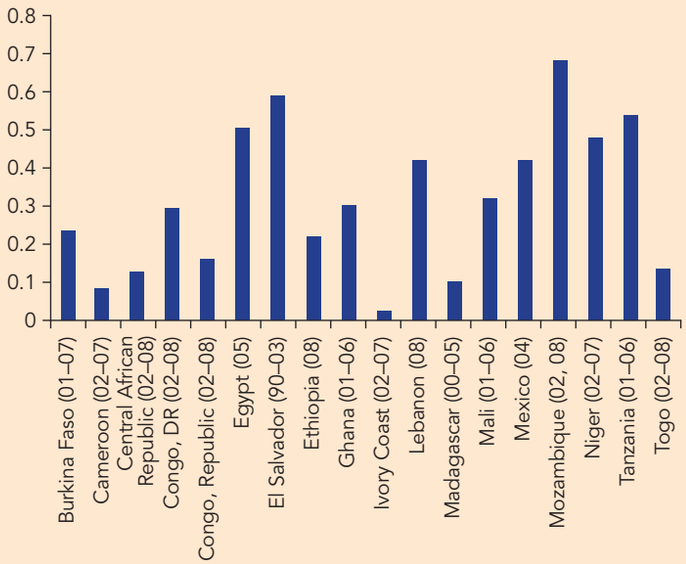
[5] Briceño-Garmendia, Smits and Foster, *Africa's Infrastructure: A Time for Transformation*, World Bank, 2010.

Figure 2.25: Funds for Operational Subsidies and Capital Investment, 2002–11 (Rs. billion)



Source: UNICEF 2012.

Figure 2.26: WSS Expenditure (% of GDP)



Source: Respective countries' Public Expenditure Reviews. Figures are from available years within PER data.

Chapter 3: Conclusions and Recommendations

Conclusions of the Sector Analysis

This assessment of the rural water supply and sanitation situation in Pakistan shows that the sector suffers from poor technical, financial, and environmental performance. This leads to high coping costs for rural residents resulting from the need to secure alternative supplies of water or in the costs of dealing with the health impacts of poor water quality and inadequate sanitation. Changing the currently unsatisfactory provision of rural water and sanitation services will for the most part entail better implementation and use of existing capacity rather than adding more capacity.

The conclusions to be drawn from this assessment can be collected under the following broad headings:

- Partial Decentralization Process
- Sector Governance
- Service Delivery and Efficiency
- Water Quality
- Financial Performance
- Investment
- Sector Financing
- Human Capacity and Professionalization
- Water Resources

Partial Decentralization Process

One of the objectives of the Local Government Ordinance (LGO 2001) was to abolish the urban-rural divide and establish a single institutional framework for water supply and sanitation (WSS) services in both urban and rural areas by transferring the responsibilities previously held by PHEDs to TMAs and putting them in charge of planning and operation of all systems while entrusting management of corresponding financial resources to tehsil councils.

In reality, this part of the LGO 2001 was never fully implemented by all provinces and regions. In some cases the ordinance was ignored and the status quo maintained. In other cases, first attempts of compliance were abandoned after a while and the status quo reinstated. The currently prevailing discrepancy between the official de jure organization of sector institutions and the de facto arrangements is a fundamental problem for the sector and its future development.

Furthermore, the decentralization process in the rural subsector will need to go beyond the TMA level and reach down to the village level. Active involvement by the village and the community has been demonstrated as an important factor internationally and regionally in the delivery of sustainable RWSS schemes.

These uncertainties about the decentralization process have adversely impacted the RWSS sector for over a decade. Limited improvements can be expected to take place as long as the uncertainty as to who is responsible for what—technically and financially—persists. Decentralization therefore has to be resolved through the preparation and implementation of a new comprehensive framework for sector operations.

Sector Governance

As a combined result of the complicated decentralization process and the legacy of bureaucratic practices inherited from the past, current sector governance is quite weak. Compounding the uncertainty about actual responsibilities, many service providers show a clear lack of autonomy, accountability, customer orientation, or market orientation regardless of whether they operate at the local government or the provincial level. The two models for RWSS service delivery that currently exist are:

1. Provincial or regional level institutions such as PHEDs in Khyber Pakhtunkhwa, Balochistan and Sindh develop the schemes and subsequently operate them.
2. In Punjab, AJK, and FATA, provincial- or regional-level institutions such as PHEDs develop the schemes, and they are subsequently operated and maintained by CBOs.

Neither model adopts a fully decentralized process down to the village level, but the data in this study indicate that CBO management seems to lead to better outcomes than arrangements in which provincial and regional entities have full responsibility. This is revealed both in terms of better functionality (CBO schemes seem to have higher levels of functionality) and financial sustainability (CBO schemes seem to recover more of their costs from user fees). Consideration should therefore be given to reviewing international and regional practices and assessing how they might be adapted to the Pakistani situation. Typically, CBOs are responsible for all stages of the scheme cycle, and costs are recovered from user fees. These CBOs are provided with support from local governments and appropriate technical entities—effectively, a natural expansion of the second model just mentioned.

Another consequence from the CBO model, and not demonstrable to date in Pakistan, is that capital costs of CBO schemes are lower when compared to provincial- and regional-entity-managed schemes. When the design and implementation of investment projects are dissociated from their operations and maintenance, and when grant financing is provided for all costs, then there could well be an incentive to overdesign schemes to their long-term detriment.

Service Delivery and Efficiency

In the rural subsector the water coverage in 2010 (89 percent) is just below the 2015 target of 91 percent, but for sanitation is well below, with 2010 coverage at 34 percent versus a 2015 target of 53 percent. In both water supply and sanitation the coverage (in total and by type of service) has been improving over time, which is encouraging. At the same time, there are significant variations within the country. Access to improved rural water supply varies from 93 percent in Punjab to 33 percent in Balochistan, while access to improved sanitation (based on data from the PSLM) ranges from 86 percent in Sindh to 54 percent in AJK.

There are discrepancies between JMP and PSLM data for service access and service levels for both water supply and sanitation in rural areas. Whatever the value of official statistics and explanations of discrepancies, the fact is that even where systems exist and is in operating conditions service quality is an extremely serious problem. Availability is limited due to intermittent interruptions in power supply, which shuts down pumping plants typically up to 20 hours per day. Running standby generators is not an option, since the service providers cannot afford to pay their costs.

In many areas, water quality is excessively poor due to contamination with human and animal waste, agricultural runoff, and other elements. In the studies conducted by the Pakistan Council of Research in Water Resources (2008–09), the analysis of samples from the water sources of the functional water supply schemes indicates that 79 percent of the total collected samples are unsafe for drinking purpose. Unlike urban settings, rural communities typically do not receive water that has been treated in any way. As such it will be important to consider how to address what appears to be a massive and countrywide challenge, the impact of which is poor health outcomes for many of the poorest and most vulnerable in the country.

There are bright spots, however, and the greatest relates to the reduction in open defecation. While not formally a MDG target, rural open defecation has more than halved moving from a very high 72percent in 1990 to 34 percent in 2010. This is a target that relies less on investment and more on changing behaviors and improving personal and community approaches to hygiene. PATS is an important step in the right direction to address this issue.

Financial Performance

Very few systems recover their costs and are able to ensure the sustainability of their operations. Water in rural areas is charged on a flat fee basis, and the rate of actual collection varies between 20 percent and 40 percent (with the exception of the FATA region, where water is free). This is important, as sufficiency of funds is identified as a critical item in the sustainability of services—with insufficient funds meaning that maintenance and repairs can't be carried out and bills paid to suppliers, particularly power companies. The result is increasing levels of system non-functionality and lower levels of service.

In KP, where there have been improvements in recent years, the user revenues only cover around 20 percent of the operating costs. This leaves the service providers reliant on government subsidies to deliver service, and given that such funds are constrained and often delayed, this inevitably impacts the quality of service. Fortunately there are good examples to be seen in the country, and the prospects for sustainability appear to be better in cases where the systems are run by CBOs. There are examples from Punjab and AJK where the CBOs have been able to recover more than their operating costs from user fees. These practices can be emulated by other provinces and regions.

Investment

The sector relies on grant financing from provincial and national governments and will continue to do so

for many years—although the goal will be to gradually increase the proportion of capital costs financed out of user fees.

The water supply and sanitation sector in Pakistan is investing at a rate of 0.16 percent of GDP annually (2011). Investment rates have to go up to meet the needs of rehabilitation of deteriorated assets, to improve service quality, and to expand coverage in water supply and sanitation.

However, investment that is being made is not being made effectively. The high number of nonfunctioning schemes is one indicator of this. Experience from outside Pakistan also shows that schemes developed by provincial and regional engineering entities are more expensive than those where CBOs are in the driver's seat. In the future, investments need to be prioritized and assessed in terms of their capital efficiency (particularly in regards to size, timing of investment, and assessment of options), sources of O&M costs must be identified, and capacity must be assessed for operations, with CBOs playing an increasingly important role—although with backup from a range of resources to fill gaps in their capacity.

Sector Financing

Whether financing gaps in O&M cost recovery or the creation of new assets, the role of the Government is crucial. However, the Government does not appear to demand much in return for this support: there appear to be few demands for increased service performance or efficiency in return for this funding. The poor governance in the sector only serves to perpetuate this situation.

Revised institutional governance arrangements, as outlined above, increasing the role of the local community, need to be complemented by a revised approach to sector financing. Improved institutional governance without predictable and incentive-based financing will not provide the results that rural dwellers should expect. In this regard it is important that provincial, regional, and national governments, the financiers of the sector, link their financial support to delivery of outcomes in terms of financial performance and service to customers. This should include consideration of the use of results-based financing.

Human Capacity and Professionalization

Whether there is a move to increase participation of communities and CBOs, or continue to work through provincial and regional entities, there is a need to focus on how to build the capacity and professionalization of those institutions. Historically the emphasis has been on creation of assets and not on delivery of service. As a result there is a need to rebalance the excellent engineering skills in the country toward excellence in the management and operation of rural water supply schemes where communities are actively engaged in the process and are part of the delivery chain. This will require a new direction that holds operational management capacity above engineering capacity (in the design and construction of new assets), focuses on asset management over asset creation (in making the maximum use of existing assets before building new ones), and includes the ability to reach out to, and engage with, the community.

This new direction will require investment in training—whether of CBO staff or of provincial and regional entities as they take on new and different responsibilities. The latter two will likely evolve into facilitators, both in the development and operational phases of a scheme, and provide technical backstopping in the long term.

Water Resources

The low levels of collection and treatment of sewage has been highlighted in the complementary urban water and sanitation report, and this is leading to increasingly polluted rivers and shallow groundwater. The latter has an immediate impact on households that rely on such water as an inexpensive source of supply. Groundwater is now being overexploited in many areas, and its quality is deteriorating. The data in this report on water quality are disturbing.

The Indus is the country's only major river system, and, should current trends continue, decreasing snowfall in the Himalaya and Karakorum Mountains may progressively limit this supply of fresh surface water. The conclusion is that action is needed to improve the quantity and quality of water resources in the country.

Recommendations

The starting point toward improving overall sector performance is to initiate a national debate on the challenges in the sector, and to understand the models that might be appropriate to address the challenges. Given that each province and region is now responsible for delivering rural water supply and sanitation services, it will be up to each of them to come up with solutions appropriate to their starting point and their special operating conditions.

The focus will now have to shift to identifying the change agents in rural areas, notably the women, who offer the greatest chances for support of sustainable

operations. Each system must become financially sustainable on its own through user charges that cover the full costs of operations and maintenance. In turn, this will require replicating the relatively successful experience from the CBOs in Punjab, AJK, and GB that can be replicated to ensure sustainable operations.

There are a number of evolving practices in the country that appear to offer higher levels of service and sustainability for both water supply (CBO-based models) and sanitation (the PATS model). These practices should be expanded through defined demonstration projects that integrate water supply and sanitation in one package. There are also opportunities to consider greater use of the local private sector as a way to increase accountability and customer orientation and at the same time create new economic activities. The country can also draw extensively on international experience to inform their own activities and thus speed up the improvement process.

In parallel, governments at federal and provincial levels need to allocate the resources required to deliver the vision, and to determine how those resources can be used to deliver services efficiently and sustainably. This means looking at new ways of service delivery (for example, increased focus on service delivery outputs rather than on inputs) and new ways of sector financing (such as reform-based incentive financing). These changes would involve donor coordination to prevent duplication and ensure maximum optimization of scarce resources.

It may be possible to focus on a few actions that would initiate improvements on the ground. They could begin with the following recommendations.

Recommendation One: Roles and Responsibilities of Key Agencies Should Be Clarified and Community-Based Organizations Given the Key Role

The partial implementation of LGO 2001 has resulted in an extended period of uncertainty in the sector. Going forward, based on national and international experience, provincial governments should move toward instituting service provision models that give CBOs the key role in the planning, development and operation of RWSS schemes. Such a reorientation will, however, require that the role of existing province engineering entities evolve from that of asset creators and operators into facilitators and providers of technical and administrative support services that partner with the CBOs. In order to support long-term sustainability of the CBOs it will be particularly important to do the following:

- Establish an administrative backstopping facility in each province to proactively support CBOs in the management of their systems: This would include ongoing support for training of CBOs and recording and disseminating best practices for rural water supply and sanitation. Such a facility would gradually enhance performance in the systems and could evolve to help with policy and legal reforms, programming, regulation of tariffs, metering and capacity building, and monitoring and evaluation.
- Establish a more formalized technical backstopping facility in each province to proactively support CBOs in dealing with technical challenges in service delivery: This would range from advice on repairs and maintenance through to organizing major rehabilitations of systems.

The clarification and evolution of roles and responsibilities proposed under this recommendation cannot be achieved without the provision of training and capacity building programs to provincial agencies and CBOs. Part of the resources of any national sector program aimed at improving sector performance (see recommendation 2) should therefore be allocated to appropriate training and capacity-building activities. In the case of CBOs, the implementation of such programs must be ensured on a continuing basis, because failure to periodically review structures and operating arrangements (for example, to reflect changes in CBO leadership) can lead to a gradual decline in their performance and effectiveness.

Recommendation Two: Investment Support Programs from Both the Federal and Provincial Levels Should Be Expanded and Focused on the Delivery of Sustainable Outcomes

Governments at all levels must seek to maximize the impact of every marginal penny invested in the sector. This objective can best be achieved through creating national or provincial sector programs that clearly articulate the specific policy goals to be achieved and lay out the conditions of access to investment funding As part of this process, governments should also attempt to introduce elements of results- or reform-based financing.

Such national/provincial sector programs should focus on broadening access to improved and sustainable water supplies (which varies widely across the country and even within provinces), providing access to improved sanitation (following the PATS model but concentrating on areas where access currently is low), and supporting cost-effective rehabilitation of existing but non- or only partially functioning schemes. A key part of these programs would be the introduction of appraisal techniques that take into account the long-term financial and institutional sustainability of proposed investments.

The benefits of bundling investment support into defined sector programs are improved transparency of sector financing, the ability to assess overall sector investment efficiency, and the opportunity to demonstrate a concrete impact on the quality of service delivery. More ad hoc financing approaches that lack clear objectives, criteria, or rigorous evaluation tend to diffuse the effectiveness and impact of investments in the sector.

Recommendation Three: Reinforce Policies of Operating and Maintenance as well as Cost Recovery from User Fees

The high level of non- or partially functioning RWSS schemes is caused mainly by poor institutional arrangements (see recommendation 1) and inadequate cost recovery. Governments should reinforce their existing policies related to cost recovery and sustainability by requiring all schemes to move toward ensuring recovery of O&M costs from user fees within a clearly defined timeframe. O&M cost recovery is recognized internationally as a critical success factor in sustainability of RWSS schemes and is rarely an issue in terms of consumer affordability. When schemes apply for investment support from government, appropriate O&M cost recovery requirements should be included as one of the conditions for the provision of funds (see recommendation 2).

Recommendation Four: Set Up Rural Demonstration Projects

With or without national government financial support, provincial governments should promote the development of programs or projects that draw on the best national and international experiences to showcase how performance and sustainability can be improved. Such a demonstration approach should aim at tackling the challenge of improving access to water supply and sanitation through an integrated model that brings financial and institutional sustainability and improved health outcomes. The projects should consist of a mix of rehabilitation of existing but nonfunctioning schemes and implementation of new schemes. The focus of each province and region might be different. Those with comparatively higher levels of access (such as Punjab) might concentrate on scheme rehabilitation projects, whereas those with lower levels of access (such as Balochistan) might dedicate their attention to the execution of new schemes.

Involvement of local small-scale private service providers could also be helpful in the rehabilitation of existing systems and the implementation and operation of new ones provided that appropriate incentives are put in place. While it is unlikely that small-scale operators would be able to invest significant amounts of financial resources into system restoration, they could, however, be contracted on a lease basis, with the public sector providing the necessary capital investment resources.

This recommendation complements that of Recommendation Two – and indeed could be seen as a forerunner of Province-wide or National Sector Programs. The advantage of demonstration projects is that they can be set up more quickly than broader programs and lessons learnt from the projects can be fed back into the design of the programs.

Recommendation Five: Provide Resources and Organizations to Implement the Sanitation Strategy

The single most important program to improve the rural population's environmental health and support the goals of reducing infant and child morality is to eliminate open defecation, provide latrines that contain excreta, and enhance hygiene education. Without such sanitation and hygiene education programs, the effort to make water supplies more accessible and safer will not produce the expected health benefits.

To this end, additional financial and human resources must be budgeted by governments for scaling up existing sanitation programs (particularly PATS). Such programs need to be responsive to evidence-based analyses and as such should adapt to evolving best practices from around the country.

Recommendation Six: Develop Sector M&E System, Covering Both Functioning and Nonfunctioning Schemes

Preparation of this study highlighted the challenges in accessing readily available, consistent and comprehensive sector data. This creates difficulties for planners and policy makers to make informed decisions on sector direction and priorities. To meet the data needs for the purposes of technical assistance programs, and for investment planning, a provincial/regional level management information system should be established. The system should capture the number and types of schemes; institutions responsible for operation and maintenance; essential data on number of served and unserved households; quality of service; levels of supply; and the financial & operating situation. The information system should coverall RWSS systems including those that operate only partially or not at all - and in the latter cases should document the reasons for non-performance. This would not only provide input to policy changes that might be necessary to improve overall sector performance but would also establish the basis for a large-scale system rehabilitation program (see recommendation 2).

The suggested approach would allow Provinces and Regions to maximize efficiency of water provision (meeting demand at the least possible cost) because rehabilitation of existing but inoperative systems is likely to be the least expensive way of providing improved service to more people.

Recommendation Seven: Begin to Address Knowledge Gaps on Water Quality Issues

There appears to be a significant amount of data on water quality issues in the country. It seems, however that there is no strategy on how to make use of these data. Better compilation and analysis of the data would enable development of appropriate solutions to reduce the high level of bacterial contamination currently found in the water in different parts of the country. An additional result may include the identification of various "public good investments" that address issues that go beyond individual villages, towns, and provinces and need a concerted action at higher levels of government and/or must be dealt with cross-sectorally (for example, through links with irrigation and agricultural practices).

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