

10. Water and Sanitation

10.1. Introduction

Water is essential to human existence. Access to potable water supply is a basic human right and necessary to ensure a healthy population. Provision of safe water supply and sanitation directly serves the objectives of public health by curtailing the spread of vector diseases. The poor are particularly vulnerable when water is either unclean or in short supply. The urban poor spend large part of their income on water from private vendors. In rural areas, fetching water for cooking and drinking, mostly by women, involves lot of time and distance. Insufficient attention to wastewater treatment and disposal is causing severe environmental problems. Continuing urbanization and industrialization have increased water consumption (and correspondingly higher levels of waste), and increasing competition for scarce water resources. Until the water demand is met, the productivity, incomes and health of the poor will continue to suffer. Most of the wastewater is not treated and with the expansion of urban water supply systems without treatment facilities, it will continue to impact the environment adversely.

The development of water supply and sanitation facilities has linkages with growth. Like constructing the planned housing/neighborhood, the advantage in provision of water supply and sanitation/sewerage is that it enhances pro-poor benefits. The water supply and sanitation programs (i) absorb raw labour and unskilled, semi-skilled, and skilled workers; (ii) permit community participation, especially women, and (iii) activates many small-scale mostly self-employed industries of building materials e.g. pipes, pumps, sanitary ware, etc. Indirectly, such programs reduce the spending on health care.

The MTDF aims at sustainable access to the safe clean water supply and hygienic disposal of waste water in both the urban as well as rural areas.

10.2. Present Situation

The per capita water consumption varies greatly in urban and rural areas. In urban areas, more water is used due to easy access to infrastructural network and better socio-economic conditions. In case of rural water supply, there is far lesser wastage in domestic use, yet added quantities are required, inter-alia, for rearing of livestock in villages. Presently, more than 65 per cent of the total population in the country has access to safe drinking water, including 85 per cent persons living in more than 500 urban places including the cities and towns. In rural areas, 55 per cent souls mostly living in about 30,000 large villages are served with planned water supply, while in remaining 20,000 rural settlements the water supply schemes are yet to be developed. Most of the urban water is supplied from groundwater except for the cities of Karachi, Hyderabad and part of the supply to Islamabad, which mainly uses surface water. Rural water supply is mostly from groundwater except in saline groundwater areas, where irrigation canals are the main source of domestic water.

Sanitation facilities (including sewerage in urban areas and drainage in rural areas) are available to only about 42 per cent of the total population, including 65 per cent in urban areas and 30 per cent in rural settlements. With the exception of a few big cities, the sewerage service is almost non-existent, causing serious public health problems. Nearly 45 per cent of all households do not have access to a latrine. Furthermore, only 51 per cent of all households are

connected to any form of drainage (35 per cent to open drain and 16 per cent to underground sewers or covered drains). Only 5 per cent households have access to a municipal garbage collection system. Limited availability of drinking water, its non-judicious distribution and system losses have reached alarming proportions.

Drinking water supply demand is increasing rapidly while the opportunities for further development of water resources or maintaining their use to existing levels are diminishing. The current per capita water availability at 1200 cubic meter per person is low, placing Pakistan in the category of a high water stress country. Similarly, the surface water storage capacity has already lowered. Immediate need is for the development and management of water resources and supply systems, along with the introduction of water-use efficiency, curtailing environmental degradation from water sources, and institutional strengthening. Due to insufficient O&M budget, the completed facilities are deteriorating fast and need major investment for rehabilitation and upgrading. The system losses, including leakages and wastages remain high.

As a result of low tariffs, inadequate cost recoveries and administrative inefficiencies, the financial position of urban water supply and sewerage sector agencies is very poor. Only a few providers in large urban areas generate sufficient revenues to make any contribution to investment. In the medium and small towns these entities typically do not collect sufficient revenue to even cover the operating expenses.

10.3. Issues

Public sector investments in the sector water supply and sanitation sector are inadequate. Pakistan spends around one quarter of a percentage point of its GDP on water supply and sanitation. Sanitary conditions are appalling. Water is a key factor of production in manufacturing industry, power generation, mining and agriculture. It sustains the natural environment which is why it is not only the quantity of water which is critical but its quality also. For this reason, both sanitation services and economic activities which can pollute water and render it unfit for use, must be controlled.

The majority of the population in the country is exposed to the hazards of drinking unsafe and polluted water. Based on the National Water Quality Monitoring Programme carried out by the Pakistan Council of Research in Water Resources, the bacterial contamination in 2004 ranged from 48 per cent in Islamabad to 100 per cent in Ziarat. Arsenic testing of drinking water supply across the country has indicated that the districts of Bahawalpur, Lyah, Multan, Rahim Yar Khan and D.G. Khan in Punjab and Dadu, Mirpur Khas, Khairpur, Nawabshah, Shikarpur and Ghotki in Sindh were high risk districts with several areas indicating Arsenic levels at over 50 parts per billion (ppb). The other contamination problems relate to the Nitrate and Fluoride contamination which is more than 10 ppb in several districts including Risalpur, Chakwal, Jhelum, Mianwali, Khushab, Faisalabad, Bahawalpur, Loralai, Ziarat, Mastung, Mirpur Khas and Karachi.

Major issues facing the water supply sector are the (i) absence of an integrated approach, (ii) sub-optimal use of water, (iii) inadequate storage capacity, (iv) extensive system losses, (v) inadequate operation and maintenance and poor cost recovery, (vi) excessive groundwater pumping without recharge, (vii) unsafe disposal of wastewater, (viii) lack of private sector participation, (ix) inefficient institutional capacities, (x) poor linkage among urban and rural water development projects, and (xi) water pollution including metal contamination generating public health hazards.

10.4. Policy and Strategy

The main challenge in Pakistan is to shift the culture from the provision of water and sanitation services infrastructure to provision of reliable sustainable and affordable water supply and sanitation services. The decentralization of service provision can help in the shift.

A National Drinking Water and Sanitation Policy along with the Clean Drinking Water for All Programme, will be launched by the Ministry of Environment as an integral part of the MTDF, focusing on provision of clean drinking water to entire population; improving and expanding delivery of water services ; ensuring conservation of water and increasing system efficiencies ; and to maximize the coverage of sanitation services both in urban and rural areas. The Policy will link the water and sanitation to national development goals and to protect the environment through: (i) improving water and sanitation management to reduce the inefficient use of water, excessive groundwater pumping; and (ii) reducing pollution by urban and industrial users through the on-site or combined wastewater treatment and reuse.

Under the Local Government Ordinance (LGO) 2001, the urban and rural limits have been abolished. The responsibility of water supply and sanitation, as per new institutional arrangement under the LGO 2001, has been devolved to Tehsil Governments. The water supply and sanitation resources will be allocated according to the Water Supply and Sanitation Action Plan, to be prepared by each Local Government in consultation with the respective Provincial Government. Such implementation measures will be adopted by the Local Governments, which along with capacity building of the Tehsil and District Governments would ensure timely implementation of the water supply and sanitation programs and projects.

The success of water supply and sanitation programs would depend on governance issues in the sector, including better management of the scarce water resources at both the individual and collective level. This requires broad range of measures, including proper regulatory frameworks for integrated water resources management and development of improved water service delivery mechanisms, through participatory approaches.

The measures would include (i) improved governance by implementation of the devolution process completely, (ii) supporting social mobilization for effective broad based local community participation and service delivery, (iii) higher budgetary allocations for water supply and sanitation, especially for the less developed areas/regions, (iv) adoption of measures for adequate and equitable distribution, and (v) monitoring and evaluating the outcomes and impacts.

The main aim of the strategy is to improve the performance and utilization of water supply and sanitation systems and reduce financial dependence on the Federal/Provincial Governments by: improving planning and management of capabilities of the involved agencies; by encouraging the involvement of communities; and by promoting community responsibility, particularly for operation and maintenance. The strategy includes (i) adoption of an integrated approach, rational resource use, and the introduction of water efficient techniques, (ii) containment of environmental degradation, (iii) institutional strengthening, capacity building and human resource development, (iv) improving performance and utilization of local systems through better planning, management and community participation; (v) improving quality of and easy access to water supply, especially for women, (vi) improving sanitation through sewerage and drainage schemes, (vii) promoting increased take up of household sanitation, and (viii) improving the understanding of the linkages between hygiene and health through community education campaigns, especially among the women and children.

10.5. Programmes

A major MTFD initiative of the Government is the provision of clean drinking water to cover almost entire population of the country. The water purification plants will be set up, consisting of various stages including pre-filtration works, filtration, purification and ultra-violet dis-infection. This programme would be implemented on fast track basis to complete it by 2008. Three sizes of water purification plants viz 500, 1000 and 2000 gallons per hour capacity will be installed at convenient places including mosques, schools, hospitals, dispensaries, Thanas, petrol pumps and fire stations.

A provision of Rs 6.5 billion has been made under the Environment MTFD's financial outlay to implement the Clean Drinking Water for All Programme. The programme will be implemented throughout the country with participatory approaches and with full involvement of the Local Governments, who will become owners of the water purification plants.

Other national and provincial water supply and sanitation development plans will be prepared and implemented in an integrated manner. In order to optimize the use of water resources through institutional strengthening of water supply and sanitation institutions. The augmentation of District and Tehsil Government's financial capacity for proper operation and maintenance of water supply and sewerage utilities would be focused.

To make the programs people friendly, the rural water supply and sanitation schemes shall be made simple, community-based, and using locally familiar technologies. Preferred schemes to be undertaken are hand pumps, gravity schemes, street pavements and drains that avoid any considerable environmental impacts. Priority would be given to minimizing water losses through wastages and leakages, and rehabilitation of existing networks.

The areas having brackish ground water and scarcity of surface water including Thar and Kohistan shall be considered for drinking water supply through brackish desalination process. The reverse osmosis plants, now available at cheaper cost, would be developed in such areas.

To improve water supply in urban areas, the installation of water meters will be encouraged. The institutional capacity of water supply and sanitation departments/ agencies would be upgraded by recruitment of adequate staff and their training in planning and project implementation, and management and monitoring, and by development of technical and financial skills of beneficiary communities.

There has been little thrust on conserving water. Large quantities of municipal water are used for non-potable uses, while treatment of wastewater and its re-use continue to be neglected. Specific measures will be undertaken by local governments to optimize the available water and to conserve water sources, with strong focus on environmental aspects and maintaining the integrity of water resources base.

The issues of municipal finance for enhancing infrastructure investments, including water supply and sanitation funds will be addressed comprehensively, within the new devolved set-up, where considerable and/or total responsibility has been transferred to the Provincial/Local Governments and the Cities Administrations for the effective and efficient delivery of basic infrastructure and utility services to end-users. In order to establish the Local Governments on a self-sustaining basis, a long term and structured funding programme targeting the Local Governments or water supply and sanitation/sewerage agencies will be

established. Such financing, accompanied with capacity building components shall aim to establish these entities on a financially self-sustaining basis.

To augment the financing capacity at the municipal level for infrastructure projects, consideration will be given to vesting the major cities with the legal power to borrow from the banks/DFIs, or the capital markets, linked to establishing a framework to strengthen their financial position. Within the improving fiscal framework, enhanced infrastructure investment programs could be developed and implemented for major improvements of urban environment in cities.

Recognizing that private sector participation can improve performance and efficiency in water supply and other services in urban areas, modalities for public-private partnerships in the management of physical infrastructure and framework will be developed, for the private sector to provide urban water supply and sanitation infrastructure at a reasonable price and quality. It is envisaged that the Provincial Governments would become real partners with the private sector, minimizing regulatory and control role, creating one window operations where possible, eliminating unnecessary and restrictive laws, and enforcing regulation.

The use of sanitary latrines will be promoted in rural areas, as part of an overall health, sanitation and environmental awareness program, especially among the women and young. Adequate provision would be made to meet the cost of hygiene information, education and communication activities under sanitation in low-income areas program. Up to 10 per cent of the budget allocation would be earmarked for this component. Out of this, 5 per cent could be utilized for project management and NGOs involvement. The cost of training of skilled workers should also be met out of this provision and the training should be organized locally with the help of NGOs, training centers and technical institutions.

The policies to transfer operational responsibility for rural water supply schemes to the communities will continue. This is also important as the Provincial Governments can no longer afford to underwrite the rural water sector. If the communities are to be responsible for operating rural water supply schemes, they will also need to be closely involved in all stages of the implementation of schemes, from scheme identification, through planning, design, and implementation to operation and maintenance. It is equally vital that schemes are demand-led, if expectations of community managed schemes are to be realized, without which the sustainability of the schemes cannot be ensured.

In case the Public Health Engineering Departments (PHED) continue with the operation and maintenance of the rural water supply and sanitation schemes, to improve the situation, the revenue collection system will be improved, wastage of water, system leakage and illegal connections reduced and metering of the systems introduced for community users. The operation and maintenance share of PHED budget allocated to water supply, drainage, sanitation and hygiene promotion will be increased. To achieve these objectives, the Government will adopt a uniform water supply and sanitation policy with community participation in identification, planning, design and operation; and funding the O&M costs for existing schemes until their transfer to the communities; besides introducing effective cost recovery mechanisms.

Post-transfer linkages will be established through technical assistance, between the community and the public agency concerned with the water supply and sanitation service delivery. There will also be adequate monitoring systems both at the facility level as well as at

the national level. Also, the issues of any extraordinary repairs that a system may require will be addressed, and also the expansion of existing schemes as communities grow in size.

For developing the capacity of water supply and sanitation sector, additional training centers will be set up all Provinces for the training of all categories of water supply and sanitation technicians/supervisors and construction workforce, besides management professionals for producing skilled qualified manpower for the execution of water supply and sanitation projects, ensuring quality construction for efficient and equitable distribution as well as to minimize water losses.

Engineering services and construction technology will be upgraded to improve productivity and quality and to also ensure the timely completion of water supply and sanitation projects. Also, all public and private water supply and sanitation projects executing agencies and consultants would need to comply with the relevant bylaws, contract documents and guidelines relevant to engineering services prepared by the Pakistan Engineering Council.

The emphasis on water supply and sanitation research on a country-wide basis will be strengthened during the MTDF, with contributions from research institutes and other related organizations. Research activities will include: (a) effective operation and maintenance of water supply systems; (b) improvement of drainage facilities and drainage effluent disposal; (c) maximization of economic productivity of water as the major input; and (d) institutional framework to improve system sustainability.

A water supply and sanitation information system will be developed at the national and provincial level. The information system shall be standardized with a network of data banks and data bases, integrating and strengthening the existing federal, provincial and local level agencies, as well as improving the quality of data and the processing capabilities.

10.6. Targets

Under the Millennium Development Goals (MDG), it is envisaged to halve by 2015, the proportion of people without sustainable access to safe drinking water and to achieve a significant improvement in access to sanitation. This translates to increasing water supply and sanitation coverage to 93 per cent and 90 per cent respectively by 2015. While the water supply and sanitation programmes are being accelerated, there would be some shortfalls in the achievement of envisaged MDG targets of water supply and sanitation coverage. However, the target of regularization of 75 per cent of Katchi Abadis with adequate access to water supply and sanitation will be fully met, by 2010.

Considering the present resource position and sectoral constraints, the safe water supply coverage will be increased from 65 per cent population in 2004-05 (urban 85 per cent, rural 55 per cent) to 76 per cent by 2010 (urban 95 per cent, rural 65 per cent), thereby serving additional 27 million persons in five years. The water requirements in 2005-10 would include (i) 7.8 million acre feet for domestic and municipal and rural potable water supply and sanitation (including incremental net demand of 6.29 million cusecs - urban 1.89 and rural 5.81), to be met from both the ground resources (75 per cent) and surface water (25 per cent); (ii) industrial water requirement of 4 million acre feet, and (iii) 1.5 million acre feet to meet water requirement for environment for the wetland areas, environmental protection, irrigated forestry along railway lines and roads.

Under the Clean Drinking Water for All Program, the immediate provision of clean water to almost entire population of the country would be ensured through launching a nation-

wide programme of installing the standardized water purification plants at convenient places both in the urban and rural areas.

The current sanitation and sewerage facilities at around 42 per cent population (urban 65 per cent, rural 30 per cent), will be extended to serve additional 3 million households, thus covering 50 per cent of total population (urban 75 per cent and rural 35 per cent) by 2010, along with the development of wastewater treatment units, recycling provisions and conservation measures in urban centers up to district level.

In rural areas, the safe drinking water will be provided in accordance with the stipulated norms on a sustainable basis to all the villages. The stipulated norms of supply in rural areas would be minimum 5 gallon or 20 litre per capita per day safe drinking water within a walking distance of 1.5 kilometer or at the elevation difference of 100 meter in hilly areas (to be relaxed as per the field conditions applicable to arid, semi-arid and hilly areas). At least one hand pump or the spot-source for every 250 persons will be installed. Additional water requirement would be met through the rainwater storage sources. The MTDF's rural water supply and sanitation programs will ensure that all the villages having population of 100 households or 1000 persons and above are served by 2010 with planned drinking water supply alongwith sanitation and drainage schemes on sustainable basis through active involvement of the beneficiary communities, especially the women.

10.7. Financial Outlay

Almost two-third programmes and funding of water supply and sanitation sector would mainly be utilized by the Provincial Governments for undertaking the development programmes of water supply and sanitation in urban and rural areas. Whereas, the Federal Government would finance the implementation of Clean Drinking Water for All Programme through the Ministry of Environment. The MTDF for water supply and sanitation would be continuously refined keeping in view the specific needs and location constraints of each Province/District/Tehsil, and regular monitoring of implementation progress of Clean Drinking Water projects at each Tehsil level.

During 2005-10, separate allocations for the Clean Drinking Water for All Programme under the Environment's MTDF and the other regular water supply and sanitation programmes are made. In case of the regular water supply and sanitation programmes an overall financial outlay of Rs.120 billion is envisaged to achieve the MTDF targets, including Rs 60 billion by the federal and provincial PSDPs, as listed in the Annex-I. In the first year of the MTDF (2005-06), overall Rs. 8 billion will be earmarked in the PSDPs for implementation of the urban and rural water supply and sanitation projects throughout the country.

Remaining Rs 60 billion would come from the private sector as part of the under implementation and new housing schemes in cities and towns, where the provision of water supply with source development, sewerage and drainage are the integral part of urban areas development.

In addition, Rs. 10 billion are allocated for the Clean Drinking Water for All Programme under the Environment's MTDF and Rs. 2 billion have been earmarked in Federal PSDP 2005-06 to immediately commence the implementation of this Programme by the Ministry of Environment.

S. No.	Water Supply and Sanitation Programs	Allocation (Rs in billion)		
		Total	Federal	Provincial
A	Public Sector (Federal and Provincial)	60	22	38
1	Construction of new Rural Water Supply Schemes (in villages/ Provinces).	10	-	10
2	Rehabilitation and Augmentation of Existing Rural Water Supply Schemes in Provinces	6	-	6
3	Completion of Ongoing Mega Water Supply Projects in Karachi, Quetta, etc.	10	10	-
4	New Urban Water supply and sanitation / Sewerage Projects in Provincial Capitals	10	-	10
5	Urban Water Supply Projects with Sources Development for Metropolitan Cities.	10	2	8
6	P/I of Sewage Treatment Plants in Provincial Capitals.	6	-	6
7	Water Supply and Sewerage Schemes in other Towns and Cities.	6	-	6
8	Pilot Projects of Water Conservation and Waste Water Recycling	2	-	2
B	Private Sector	60		
1	Development of internal water supply systems and source development in private housing schemes (secondary and tertiary level)	35		
2	Development of sewerage networks and sewage treatment plants in private housing schemes	25		
	Total Water Supply and Sanitation	120		