# CHALLENGES AND OPPORTUNITIES IN URBAN WATER SUPPLY IN PUNJAB PROVINCE

By

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## 1. Introduction

This is a paper produced to apprise the situation on **"Challenges and Opportunities in Urban Water Supply in Punjab Province"**. Out of Punjab's total population of 90 million, about 28.17 million people currently live in its urban centers, of these, about 16.74 million live in its nine largest cities.

**Administrative Structure:**

- Province divided into 36 districts & 144 sub districts (Tehsils)
- Districts grouped into 9 divisions
- Only 5 large cities identified as urban centers, other urban & rural settlements grouped into sub districts only

As the Punjab Province is rapidly urbanising, the un-sustainability of large urban centres is also growing as an issue. Punjab's biggest challenge for urban areas is to provide sufficient quantity of a safe and reliable water supply for its inhabitants.

**WATSAN Governance:**

- Provincial Level: Public Health Engineering Department
  Department of Local Government
- Local Governments: Large cities : WASAs
- All other areas: TMAs (Tehsil Municipal Authority)
- Rural Water Supply Schemes: PHED

**Urban WSS Sector**

- 5 large cities (1.9m – 9m) :
- 13 Intermediate cities: (0.25 m - 0.8m)
- 150 + small urban settlements (more than 25k – 0.25m)
- WASA: 5 Large cities (Lahore, Faisalabad, Multan, Gujranwala, Rawalpindi)
- TMAs : All other areas (Including cities like Sialkot and Bahawalpur with a population of more than 0.5m)

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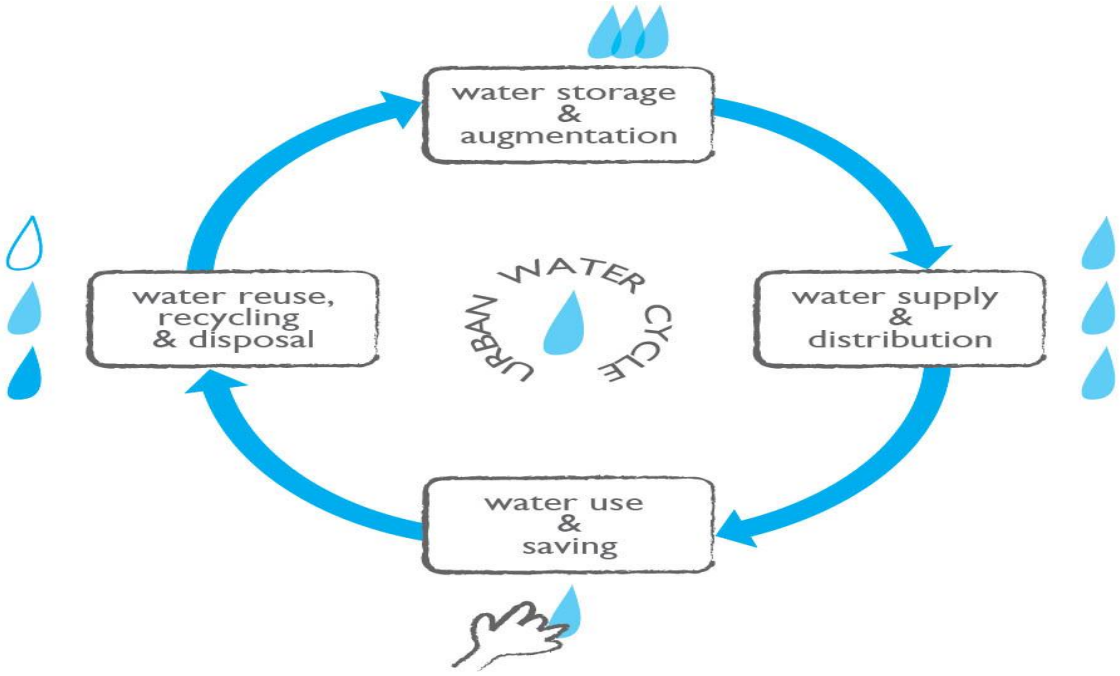
1. Deputy Secretary (Technical) Housing Urban Development & Public Health Engineering Department.

- PHED: For development of new schemes
- Other Players: Cantonment Board, DHA and Private Housing Societies

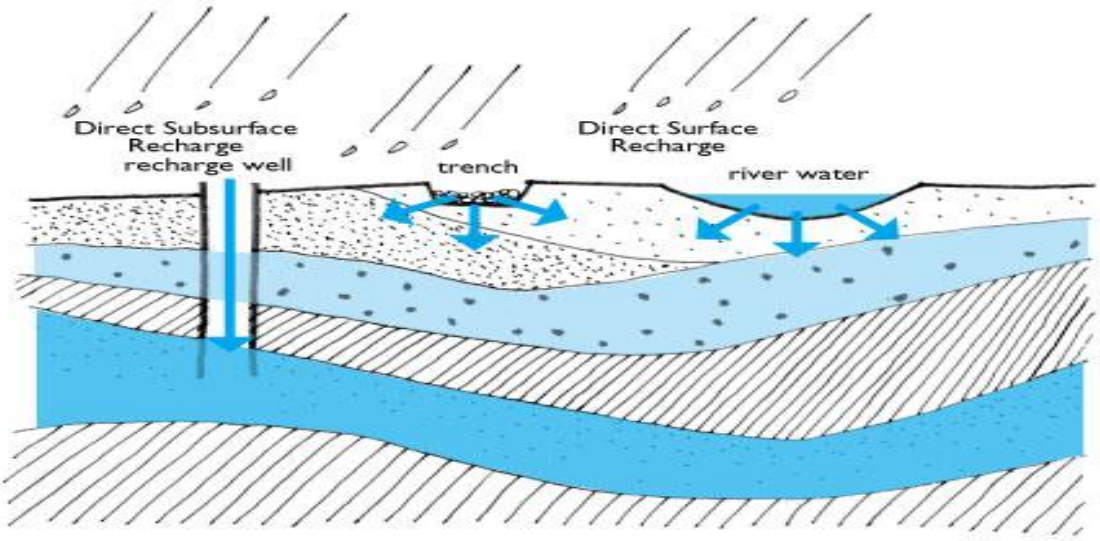
**Urban Approaches**

- Improve access to water supply systems;
- Improve access to adequate sanitation facilities;
- Pro-poor water proposals;
- Social inclusion, participatory approach;
- Demand management;
- Minimize leakage;
- Awareness-raising, education.




The Government of Punjab (GoPb) attaches great importance to municipal services and wishes to improve the provision of Water Supply services in the largest cities of the province. The GoPb is well cognizant of the need, to improve municipal services, through policy, regulation and institutional reforms targeting the urban municipal services providers i.e. Water and Sanitation Agencies (WASAs) in the province. Provincial Government is investigating options for improving efficiency of Water Supply service

providers through reforms, capacity building, public-private partnerships (PPP) and financial incentives including output-based financing Assistance (OBA).




## 2. Baseline information

Baseline information on the performance of Urban Water Supply (UWS) agencies is a key mechanism to identify performance improvement initiatives and measure their impact. But, existing information on the performance of UWS sector in Punjab is largely anecdotal and seldom comparable across cities or internationally and it is hardly available on a regular basis. In general there exist mechanisms and processes practiced by many utilities in Punjab for collection of information on their performance. However, collected information is rarely shared between utilities and in most cases it is for internal consumption of the utility for various purposes. The information is not comprehensive and consistent generally for inter utilities comparison. Moreover, some of the performance indicators used to collect information do not reflect global best practices in the UWS sector, thus making comparability with other developing as well as developed countries difficult. The indicators & definitions against which data is collected are not consistent across the utilities. True costs and revenue information in performance statistics compiled by many utilities is hidden amongst the costs and revenue of the municipality. This makes data collection difficult and requires the development of standard approaches for identifying and allocating the specific costs of service provision. In the longer term, only ring fencing of utility costs and revenues can bring clarity to the situation.

## 3. Water Resources

Pakistan is among the world's most arid countries. Its average rainfall is only 240 millimetres a year. (By contrast, among nations of similar area, Nigeria receives more than 1,500 millimetres, Venezuela more than 900, Turkey nearly 700.) Pakistan's population and economy heavily depend on water from two sources:

3(a) The annual influx into the Indus System, mostly derived from snow melt in the Himalayas. The Indus system includes the Indus, Jhelum, Chenab, and Kabul rivers and also some flows not captured by India of the Ravi, Sutlej and Beas rivers.

3(b) Pakistan's underground aquifers, recharged mostly through its network of canals and partially through some limited structural arrangements like village ponds, and small, medium, and large dams.

**4. Water Distribution and Future Challenges**

4(a) The urban and peri-urban areas of Punjab mostly depend on ground water for their water supply. With growing urbanization the ground water table is declining fast.

4(b) Pakistan highly depends on its single basin. Unfortunately, there is no additional basin from which additional supplies can be transferred to the water-stressed region. The nation possesses no additional water resources. Pakistan, therefore, must better manage the supplies it does have.

4(c) The challenges are real. Pakistan is a water-scarce country with high precipitation variation, high water stress indicators (imbalance between water use and water resources), and high ecosystem deterioration. Trans-boundary aquifer mining and trans-boundary surface water pollution complicate the dilemma. Climate change threatens to make it more acute.

4(d) To meet these challenges, Pakistan must respond in a number of ways. Areas for improvement include efficiency of water use, access to clean drinking water, and maintenance of existing water infrastructure. Pakistan's present water storage capacity must be increased.

There is an overwhelming dependence on ground water in this Province for provision of clean drinking water. There is a very little proportion of our population which is being provided water from surface water and even lesser is reliant on natural springs. The Province does not have major water storage facilities or rain water harvesting systems. While the Government of Punjab is investing more in every subsequent ADP for provision of drinking water to urban populace and the number of urban water supply schemes is increasing, the following issues beset the water sector and need to be addressed:

- Water level depletion due to excessive mining of underground water and decreasing recharge of aquifers due to shortage in the movement of water through river basins.

- Wastage of sweet drinking water as a result of lack of awareness, absence of regulatory frameworks, non-existence of demand management tools like consumer meters and highly inappropriate tariffs.

- Contamination of surface and underground water aquifers due to discharge of untreated industrial, domestic and commercial effluent.

- Increase in arsenic levels and of other contaminants in the underground water aquifer.

- Contamination of urban drinking water due to leakage in over aged water and sewerage pipes.

- Water recharge is also affected by the growing and unbridled urbanization which is resulting in concretization of land.

- Capacity of urban municipal institutions / WASAs at all levels in planning, implementation and monitoring of water supply programmes and sustainable operation and maintenance of water supply systems is deficient.

- Absence of institutional mechanism to generate reliable data on water sector.

- Resource allocation is not based on need assessment, criteria and data.

- Unplanned and adhoc investment in the sector not yielding desired results

However, the sector still faces major challenges. The quality of the services is poor, as evidenced by intermittent water supply in urban areas and limited waste water treatment. Poor drinking water quality and sanitation lead to major outbreaks of waterborne diseases. In addition, many service providers do not even cover the costs of operation and maintenance due to low tariffs and poor efficiency. Consequently, the service providers strongly depend on government subsidies and external funding.

### 4.1 Access

Access to piped water in Punjab's larger cities is estimated to be only about 55%, as many urban settlers rely on individual groundwater sources, which are rapidly being depleted because of poor regulation and monitoring. Despite water production capacities often being sufficient to provide a permanent service, piped water is never distributed on a 24/7 basis and thus is at risk of being contaminated each time distribution mains empty. Given these figure, the MDGs concerning water supply, which give the target of halving the share of people without sustainable access to safe drinking water by 2015, is far away to be achieved with respect to urban water supply. According to the draft "Punjab Drinking Water Policy", Punjab's goal is to provide access to drinking water in an equitable, efficient and sustainable manner by 2020.

### 4.2 Service Quality

Water supply service quality is often inappropriate in urban areas of Punjab as MDG's methodology of only taking into account coverage figures, without attention to adequate service quality.

4.2(i) **Continuity of supply:** Intermittent water supply is common in urban areas. For some cities in Punjab, consequently, consumers use on-site storage mechanisms like ground or roof tanks, or they purchase water from lorry tankers or use shallow wells and rivers. Many privately operated lorry tankers (which may be contaminated) are licensed by water utilities and benefit from the discontinuous water supply.

4.2(ii) **Drinking water quality:** Generally, water pressure is low in urban areas in Punjab water supply systems. Together with leaky pipes, this has led to infiltration of contaminated water. As a result of sewage and industrial waste, which leaked into drinking water through damaged pipes, major outbreaks of waterborne disease epidemics swept the urban cities. In several areas, increased arsenic, nitrate and fluoride contamination has also been detected in drinking water.

4.2(iii) **Waste water Treatment:** What to talk about Punjab according to report only 1% of the domestic and industrial waste water receives treatment, there are three Waste water treatment plants in Islamabad, of which only one is functional. Karachi has two trickling filters, where effluents generally receive screening and sedimentation. Lahore has some screening and grit removal systems, but they are hardly functional. In Faisalabad, there is a Waste water treatment plant, in which Waste water receives primary treatment. In peri-urban and rural areas, Waste water treatment is nonexistent, leading to pollution of surface and groundwater.

### 4.3 Recent Development

It is for the first time that HUD&PHE Department drafted “Punjab Drinking Water Policy” in line with the National Drinking Water Policy (NDWP). In addition, a “Punjab Municipal Drinking Water Act” has also been drafted which will provide regulatory and legal framework for the sector.

### 4.4 Responsibility for water supply

4.4(i) **Policy and regulation:** Drinking water policy is the constitutional responsibility of provincial governments. However, the federal government is involved in policy development and guidelines setting, mostly through the Ministry of Environment. A National Drinking Water and Sanitation Committee was established in 2009 to implement both the National Sanitation Policy and the National Drinking Water Policy. There is no independent regulatory agency in the sector.

4.4(ii) **Service provision:** Since the 2001 Local Government Ordinance, water supply and sanitation services are expected to be delivered by the newly created Tehsil Municipal Administrations (TMAs). At the same time, responsibilities for coordination and joint implementation across TMAs were devolved to District Governments, including City District Governments in the largest cities and Common Districts. However, as indicated above constant challenges in the transition period were reported and provincial Public Health and Engineering Departments (PHEDs) continue to provide water services, especially in rural areas due to lack of capacity of Local Governments.

**4.5 Efficiency**

There is little evidence concerning efficiency in the Provincial water supply sector. However, as mentioned above the Asian Development Bank (ADB) prepared a document, which includes the respective data for the cities of Rawalpindi and Lahore.

4.5(i) **Non revenue water:** The share of non-revenue water (NRW), which is produced but not billed due to several reasons like leakage and illegal connections is estimated at 35% in urban areas.

4.5(ii) **Labour productivity:** There are no updated and precise figures for labour productivity, measured in employees per 1,000 connections. However, the Ministry of Power and Environment indicated a poor performance in the country's major cities. In Lahore and Rawalpindi, labour productivity is indicated lower at 9.5 and 12.7 employees per 1,000 connections, respectively.

**4.6 Financial aspects**

4.6(i) **Tariffs and cost recovery:** Low tariffs, together with poor collection efficiency and overstaffing cause that many urban utilities do not cover the costs for operation and maintenance (O&M). The draft Punjab Drinking Water Policy calls for appropriate user charges, increased cost recovery and cross subsidies. Tariffs are supposed to become differentiated according to the income situation of the respective city and town areas.

4.6(ii) **Investment and financing:** The sector strongly depends on internal and external financing. Government of Punjab's investment in the water supply sector is for the construction and rehabilitation of water supply schemes in urban and rural areas and waste water treatment plants.

## 5. Sectoral Guidelines for Water Sector Roadmaps

### 5.1 Outcomes to be achieved

1. Urban population with access to safe water supply.

Targets/ (possible milestones/indicator)

- % or total of population served (provide as disaggregated data as possible by type of supply – standpipe, direct water connection, small water provider).
- Target by 2015 – reduce by one half the current portion without access (from Millennium Development Goals)

1a. If possible disaggregate by large urban areas versus towns (approximate population of 10,000<100,000)

1b. If possible disaggregate by the poor without access

2. What is the performance of urban water supply with regard to non-revenue water (and/other performance measures)

Targets (possible/milestones indicators)

- Reduction of non-revenue water or other performance targets
- Timeline for the development of system performance auditing programs and methods.

3. Number of the urban population that is served by autonomous water supply (and sanitation agencies). Autonomous (either municipal or private or mixed) agencies are those not dependent on the government at any level for support, financial or otherwise (except regulatory)

Targets (possible milestone/indicator)

- Actual number of autonomous agencies or cities with autonomous
- % of total population served by such agencies
- % of urban/town centers served by such agencies
- Government strategy and enabling legislation to remove itself from the sector and/or address the enabling environment or decentralization plan to create more autonomous agencies

4. The level of costs recovery (or inversely the level of subsidy to support agencies) for urban water supply (and sanitation) systems (Policy)

Targets (possible milestone/indicator)

- Increased total level of cost recovery in the sector
- Total number or percentage of system that are financially viable without O&M subsidy – similar to number six
- Government plan to phase out subsidies for water system

5. Existence of regulatory capacity and regulatory systems in the province – (Policy)

Targets (possible milestone/indicator)

- Existence of a regulatory body for economic and possible performance regulation for water utilities
- The number of water agencies that are under regulation
- Proposed enabling legislation to create such a body

6. Existence and role of the private sector or public-private partnership in the UWSS sector? (Policy)

Targets (possible milestone/indicator)

Increasing activity by the private sectors UWSS including the following:

- Simple private contracting for technical/construction services
- Existence of private capital for financing
- BOT projects for new water infrastructure
- Management contracts to operate water supply systems
- Contracts to build and develop water supply system
- Full divestiture of water supply system to private operator
- Government plan or enabling legislation to increase the role of the private sector

7. Existence of tariff reforms through its water related projects and programs to modify structures and rates so that they reward conservation and penalize waste – (Policy)

Targets (possible milestone/indicator)

- Charges to the water distribution company from the bulk water supplier sufficient enough to create incentive for reducing systems losses and encouraging conservation among its clients
- Include existence or development of inclining block rate structures for the largest utilities
- Rates designed and high enough to have a perceptible impact on demand
- If a financial regulatory body exists, then conservation pricing is adopted as a part of its methodology for tariff setting.

8. Existence of demand management or conservation measures in the sector (Policy)

Targets (possible milestone/indicator)

- Government technical standards for water efficiency in water using devices – toilets, showerheads, etc.
- Public awareness and education campaign for customers

- Investment by government or industry in water conservation
- Integration of conservation and demand management into overall water sector planning

**5.2 For Good water governance we need:**

1. A well thought out Policy
2. A sound regulatory framework
3. Professionalized institutions / organizations
4. Well designed institutional integration
5. Capacity enhancement

**"Punjab Drinking Water Policy"** has been formulated for the reason that the Government of the Punjab is cognizant of its responsibility to ensure provision of safe drinking water for the entire population of the province. The Government of Punjab is, therefore, committed to create an enabling environment for the drinking water sector to ensure reliable, sustainable and affordable drinking water to its growing population. The draft policy document will provide a framework for addressing the institutional, administrative, legal, regulatory, fiscal, social & environmental issues and challenges faced by both its rural and urban population. The **"Punjab Drinking Water Policy"** provides guiding principles under which the efforts of provincial and local authorities shall be planned and coordinated. To keep the policy framework in line with the aims of the federal government, the Government of Punjab has adopted the key principles outlined in the National Drinking Water Policy of 2009. Apart from creating policy coherence, this alignment ensures that the province is playing its part in meeting the requirements of the MDGs within the stipulated timeframe.

"Punjab Drinking Water Policy" articulates the vision of the Government of the Punjab for drinking water, the direction of the Government's planning and investment and institutional reform.

The key objectives of the policy to achieve the vision include:

i. Improving the standards of the public health through provision of improved services backed up by a legal, regulatory and binding framework ;

ii. Laying down a roadmap for mobilization of the resources required to ensure provision of drinking water to all by the target timeline, assigning a priority to un-served and under-served areas of Punjab ;

iii. Focusing on the capacity building of local governments and Private-Public Partnership to improve the operation and maintenance of water supply schemes ;

iv. Mobilizing demand for improved water supply through a communication campaign, which takes cognizance of conservation, demand management, and contamination issues ;

v. Facilitating the introduction and institutionalization of an effective Monitoring and Evaluation System, which includes performance benchmarking in service delivery ;

vi. Ensure protection and conservation of water resources ;

vii. Serving basis for the development of sector strategies, both for urban and rural water sector, to translate policy principles into action.

Salient features of the "Punjab Drinking Water Policy" are as under :

- Providing sustainable access ;
- Facilitating environmental protection and conservation of water resources ;
- Laying the framework for the treatment and safety of drinking water ;
- Building capacity of government and non-government actors to handle water portfolio ;
- Empowering the community to take control of a community asset like water;
- Popularizing cost effective and sustainable technology solutions to local needs.

The key policy principles to be highlighted are as follows:

- Water is a finite and essential resource, the use of which needs to be regulated and measured in order to avoid wastage and misuse.
- Drinking water allocation for domestic purposes will have priority over all other usages.
- Saving underground water aquifer as well as surface water from contamination of all kinds will be given top priority through legislation/regulation as well as increasing public awareness.
- Resource allocation for provision and conservation of drinking water will be based on need based criteria and will be aimed at creating an equitable distribution between urban and rural Punjab. Areas where drinking water is scarce or contaminated will be given priority.
- The community, particularly in rural areas, will be organized and provided administrative, technical and financial backup in order to effectively operate and maintain rural water supply schemes.
- Public service provision institutions (WASAs, TMAs and others) will follow a reform programme which will be based on rationalization of tariff, reduction of inefficiency cost and improvement of service delivery.

- The private sector and non-governmental organizations will be encouraged to develop and implement service delivery models, in line with the objectives and principles of this policy.
- The Policy is a step in the direction to introduce a performance based service delivery culture and releases to service providers (WASAs, TMAs and other public entities) will be linked to achievements to their performance targets set by this Policy and recognition of Community Based Organizations (CBOs) by awarding them performance awards.

Draft **"Punjab Municipal Water Act 2010"** has also been formulated which articulates the commitment to improve quality of life through improved services as water is socially vital economic good and every citizen has the fundamental right to have access to sufficient quantity and quality of water, protection of groundwater aquifer and surface water resources and regulation ensuring effective and reasonable service delivery to the inhabitants of Punjab Province.

The "Punjab Municipal Water Act" has following salient features :

- It provides for the creation of a "Municipal Water Commission".
- The Commission will set overall standards and creates rules for service delivery and services deliverers.
- This Water Act blends the function of Local Government & Community Development Department, Environment Department, Public Health Engineering Department, Community and the private sector with the overall regulatory framework to be provided by the Commission.
- The Water Act also defines crime related to drinking water and penalties thereof.

In the past nobody in Pakistan has developed drinking water act as this is a sensitive subject. Housing, Urban Development and Public Health Engineering Department realizing the need of the day considering protection and conservation of water resources as the water table is depleting and realized that it is the time to sensitize users to rationally use water resources. It is also the right time to ensure water treatment and safety issues especially after promulgation of National Drinking Water Quality Standards.