Australia Pakistan Water Security Initiative (APWASI)

Policy Landscape of the Urban Water Sector: A Review on Existing Water Policies & Regulations

(Activity 3.1.2)

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List of Acronyms

ccGAP          Climate Change Gender Action Plan  
CCI            Council of Common Interest  
CDA            Capital Development Authority  
FFC            Federal Flood Commission  
GCISC          Global Change Impact Studies Centre  
GESI           Gender, Equity, and Social Inclusion  
HUD            Housing Urban Development  
IRSA           Indus River System Authority  
IWRM           Integrated Water Resources Management  
LG&CDD         Local Government and Community Development Department  
MoCC           Ministry of Climate Change  
MoNFSR         Ministry of National Food Security and Research  
MoPDSI         Ministry of Planning, Development, and Special Initiatives  
MoWR           Ministry of Water Resources  
NCCP           National Climate Change Policy (2021)  
NCS            National Conservation Strategy (1992)  
NDMA           National Disaster Management Authority  
NDWP           National Drinking Water Policy (2009)  
NEP            National Environmental Policy (2005)  
NHWMP          National Hazardous Waste Management Policy (2022)  
NWP            National Water Policy (2018)  
NWSS           National Water Sector Strategy (2022)  
Pak-EPA        Pakistan Environmental Protection Agency  
PCIW           Office of Pakistan Commissioner for Indus Waters  
PCRWR          Pakistan Council of Research in Water Resources  
PHED           Public Health Engineering Department  
PMD            Pakistan Meteorological Department  
SDGs           Sustainable Development Goals  
TMA            Tehsil Municipal Authority  
WAPDA          Water and Power Development Authority  
WASA           Water and Sanitation Authority  
WASH           Water, Sanitation, and Hygiene
Executive Summary

This review report aims to provide a summary of existing water policies and regulations in Pakistan with a specific focus on the urban water context. The review identifies the gaps and overlaps in several existing policies with regard to urban water management and provides recommendations to address those gaps.

This review consists entirely of a desk-based review of the national policies and strategies related to the urban water sector and its relevant themes: Drinking Water Supply; Sanitation; Wastewater Treatment & Disposal; Water Conservation/Reuse; Groundwater Management; Disaster Preparedness; and Climate Change. Gender and inclusion are cross-cutting themes across these domains and their role in the policy and regulatory framework is also assessed.

We have reviewed the following federal policies, regulations, and strategies:

- National Climate Change Policy (NCCP) (2021)
- National Hazardous Waste Management Policy (NHWMP) (2022)
- Pre-Devolution Strategies and Policies
  - National Sanitation (NSP-2006) and Drinking Water Policies (NDRWP-2009)
  - National Environmental Policy (NEP) (2005)
  - National Conservation Strategy (NCS) (1992)

Additional policies and implementation frameworks which mention the importance of water were also reviewed. The complete list of reviewed policies and regulations is shared in detail in Section III.

Key issues and policy gaps are summarized below:

- Lack of policy coherence and harmonization across sectors, including outdated policies which do not consider the present-day context of urban water issues, leads to a gap between policy and practice and implementation.
- General lack of reliable water data to provide more evidence-based and thoughtful water policies and recommendations.
- Gender, equity, and inclusion aspects are often missed in policies; there are not enough “women water champions” included in decision-making.
- Fragmented implementation process which does not consider the role of civil society and the private sector. Failure to understand the role and functions of informal institutions and how they can be included in policies threatens policy feasibility and acceptance at the community level.

Summary of key recommendations:

- Encourage policy coherence through effective cross-sectoral coordination of water needs and use (environment, health, energy, agriculture, industry, city planning, etc.).
- Establish a mechanism for institutional capacity building including data-sharing; transparent monitoring and evaluation; coordination between sectors and departments for proper policy operationalization; and oversight and accountability.
• A comprehensive implementation plan and monitoring framework need to be implemented so that roles and responsibilities among institutions are clearly defined and efforts are not duplicated.

• Water demand management should be integrated with behavioral science to promote water efficiency and conservation among users.

• Water pricing can be introduced as an effective way to conserve and allocate water efficiently.

• Develop a proper regulatory mechanism for safe and proper waste and wastewater disposal and treatment, including sanctions for industries that do not comply with proper waste and wastewater disposal and treatment plans.

• Collaboration with civil society and private sector stakeholders is a must to ensure proper policy and regulatory implementation and legitimacy. Government should create opportunities for cooperation and synergy rather than responding to conflicts among water users.

• Women and other underrepresented water user groups at all levels need to be included in consultation and decision-making.

• Scientific knowledge and understanding can play a key role in guiding water policies. A culture of science and research should be promoted to catalyze evidence-based policy implementation. There is a need for more water data to determine water availability and flow levels; physical, ecological, social, and economic data are also important to determine how communities are using and managing water, which will help inform the adaptive management of the water ecosystem.

Structure of Review

• **Section I** provides a brief overview of Pakistan’s urban water context to set the scene of the existing water situation.

• **Section II** illustrates the governance structure related to the urban water sector at the federal, provincial, and local levels, and highlights key institutions and legislation related to urban water decision-making. This section will give context on how policies and regulations are implemented and who the main actors are.

• **Section III** summarizes and reviews relevant water policies, regulations, and guidelines in the context of urban water themes.

• **Section IV** highlights gaps and overlaps in policies and lists recommendations for improving the urban water management and governance system.
Section I: Introduction

Water is one of Pakistan’s most important natural resources, sustaining the country’s dominant agrarian economy and integral to its growing industrial sector. Pakistan depends on a single source - the Indus Basin - for its water needs, and approximately 95% of water is used by the agriculture sector while the remaining 5% is used for domestic and industrial purposes. Issues of water availability, management, and governance have long plagued the country and continue to be a growing concern, with water availability decreasing and the country inching dangerously close to water scarcity.

1.1. Rapid urbanization increasing in Pakistan

Pakistan is the world’s fifth most populated country with an estimated 230 million people and a projected annual growth rate of around 3%. Despite the reliance on agriculture, rapid urbanization and expanding industrialization are pushing rural to urban migration, with Pakistan having the highest rate of urbanization in South Asia. Around 36% of the population now live in urban areas, with predictions that half of the country’s population will be living in cities within a decade. To put this in the global context, the UN estimates that between 2020 and 2070 low-income countries will exhibit a 76% increase in the number of cities, and growth in city land area will be seen most in low-income (141%) and lower-middle-income (44%) countries. Current trends point to an urban future, and cities are only going to keep growing, along with increased water demand. In Pakistan, water for domestic and industrial sector use may increase to 15% by 2025. Consequently, urban areas have unique water needs and problems related to drinking water, sanitation, wastewater management, pollution, groundwater extraction, and climate change, as compared to their rural counterparts. The urban water sector (including domestic, municipal, and industrial water use) in Pakistan demands critical attention and further examination.

1.2. Urban water management in Pakistan

Pakistan’s growing population is increasing urban water demand and, subsequently, the burden on urban water supply, quality, infrastructure, and management systems. Developing countries like Pakistan are even more at risk of weak urban water systems due to a lack of adequate resources and funding, polluting industries, high levels of groundwater pumping, climate change vulnerabilities, poor municipal planning, and wastewater mismanagement.

Key areas to consider under urban water management include drinking water quality and quantity; sanitation and hygiene; wastewater treatment and disposal; ground and surface water pollution; water conservation and reuse; conserving biodiversity; and disaster preparedness. Climate change, gender and equity considerations, and public health impacts are cross-cutting themes that affect each of these domains.

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5 Ibid.
1.2.1. Community access to basic water, sanitation, and hygiene (WASH) services

In Pakistan, 36% of people have access to safely managed water and 58% access to basic sanitation. There is no data available for % population using safely managed sanitation as per Sustainable Development Goal (SDG) Indicator 6.2.1.

In 2018, 44.5% of Pakistan’s total population lived in households with a connection to piped water; 87.4% received basic drinking water services, and 64.9% had a connection to a sewerage system. The urban-rural breakdown of these indicators shows that urban areas fare better than rural ones across the country. The majority of urban households have access to at least basic drinking water, hygiene, and sanitation services, as shown in Table 1. While these indicators have seen improvements over the years, problems with safe and accessible drinking water and sanitation are still prevalent across urban localities.

Lack of funding contributes to weak WASH service provision. Pakistan does not have sufficient funding to support the cost requirements of water supply and sanitation (less than 50% sufficiency for water supply, sanitation, and hygiene). To meet the WASH SDG targets by 2030, Pakistan would need PKR 450 billion annually. For context, the WASH budget for 2019 was PKR 157,258 million. While these numbers may be underreported, there is still a significant gap between current expenditure and what is needed to meet water and sanitation targets.

1.2.2. Drinking water quality and risk for water-borne diseases

Pakistan ranks 80 out of 122 countries in drinking water quality. Research by the Pakistan Council of Research in Water Resources (PCRWR) comparing water samples with the National Standards for Drinking Water Quality showed that 168 out of 435 tested water sources (39%) were safe, while the remaining 267 water sources (61%) were unsafe for drinking. Improvement in safe drinking water supply has been at a snail's pace - safe drinking water supply has only improved by 19% between 2002 and 2020.

<table>
<thead>
<tr>
<th>Drinking water</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic service</td>
<td>52.6</td>
</tr>
<tr>
<td>Limited service</td>
<td>3.8</td>
</tr>
<tr>
<td>Safely managed service</td>
<td>40.2</td>
</tr>
<tr>
<td>Unimproved</td>
<td>3.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hygiene</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic service</td>
<td>90.0</td>
</tr>
<tr>
<td>Limited service</td>
<td>8.0</td>
</tr>
<tr>
<td>No handwashing facility</td>
<td>1.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sanitation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>At least basic</td>
<td>82.3</td>
</tr>
<tr>
<td>Limited service</td>
<td>6.3</td>
</tr>
<tr>
<td>Unimproved</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Data Source: WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation, and Hygiene (washdata.org)

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7 WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation, and Hygiene (washdata.org)
8 Detailed Service Level definitions can be found at https://washdata.org/monitoring
Pakistan has one of the lowest water treatment rates across the globe, with only 1% of domestic and industrial wastewater receiving treatment. Industrial effluent is not properly managed, monitored, or treated. Around 90 percent of toxic industrial and municipal waste is dumped into open drains and filtrated into aquifers. Further, only 57% of urban areas have garbage collection systems. Due to a lack of proper collection and lack of controlled landfill sites, waste is often dumped on streets, open spaces, or in natural streams and canals. This leads to blocked drainage systems and increase in urban flooding and waterlogging.

1.2.3. Sanitation and wastewater treatment and disposal

<table>
<thead>
<tr>
<th>Sub-Component</th>
<th>Rank</th>
<th>EPI Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater treatment</td>
<td>137</td>
<td>0.10</td>
</tr>
<tr>
<td>Unsafe drinking water</td>
<td>151</td>
<td>15.30</td>
</tr>
<tr>
<td>Unsafe sanitation</td>
<td>139</td>
<td>20.90</td>
</tr>
<tr>
<td>Controlled solid waste</td>
<td>117</td>
<td>19.70</td>
</tr>
</tbody>
</table>

Table 2. Environmental Performance Index Sub-Scores in Pakistan (2022)

Data Source: Environmental Performance Index (EPI) (https://epi.yale.edu/epi-results/2022/country/pak)

Pakistan’s Environmental Performance Index (EPI) sub-scores (Table 2) related to wastewater treatment, drinking water, sanitation, and controlled solid waste indicate extremely poor performance across each indicator. For wastewater treatment, a score close to 0 indicates that no wastewater is reported as treated within a country. Unsafe drinking water and unsafe sanitation are measured using the number of age-standardized disability-adjusted life-years lost per 100,000 persons (DALY rate) due to exposure to unsafe drinking water or sanitation, respectively. A score of 100 indicates a country has the lowest DALY rates (≤5th-percentile), while a score of 0 indicates a country is among the highest (≥95th-percentile).

Controlled solid waste refers to the percentage of household and commercial waste that is collected and treated in a manner that controls environmental risks. This metric counts waste as “controlled” if it is treated through recycling, composting, anaerobic digestion, incineration, or disposed of in a sanitary landfill. A score of 100 indicates a country controls 100% of its waste sustainably, while a score of 0 indicates a country fails either to control any of its solid waste or to collect and report data on the fate of its solid waste.

1.2.4. Climate change vulnerability

According to the Global Climate Risk Index 2021, published by Germanwatch Institute, Pakistan is the 8th most vulnerable country globally in terms of climate related challenges including water stress, extreme weather events, and spread of diseases.

Further, Pakistan ranks 146 out of 182 countries (high vulnerability and low readiness) in the Notre Dame Gain Index (ND-GAIN), which captures a country’s vulnerability to climate change and its readiness for adaptive action through public and private sector investment to improve resilience.20 Regional neighbors India and Afghanistan rank 111/182 and 175/182, respectively.

Overall, Pakistan ranks 176 out of 180 countries on the Environmental Performance Index (EPI), which measures the sustainability of countries using indicators on climate change performance, environmental health, and ecosystem vitality.

Climate change affects urban areas significantly. Changes in weather patterns affect water supply, industrialization is increasing groundwater demand, and increased frequency of climate disasters can damage urban infrastructure, displace communities, and negatively impact local economies. Climate change further exacerbates public health issues and inequities, as vulnerable groups (women, children, low-income) are impacted the most and have the least decision-making or adaptation power.

1.2.5. Urbanization and biodiversity loss

Urbanization can undermine biodiversity through natural habitat loss and destruction from resource extraction and food production. The extraction and overuse of natural resources, such as deforestation or groundwater pumping also contribute to greater soil and water pollution. Climate change also drives biodiversity loss, particularly in urban areas which are responsible for more CO₂ emissions than rural areas.21 Biodiversity and conservationism often get overlooked in urban settings due to the pressing challenges of food and water security, safety, and sanitation.

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20 Notre Dame Global Adaptation Index. Available at https://gain.nd.edu/our-work/country-index/
1.3. Urban water situation in twin cities

Like many other cities across Pakistan, Islamabad and Rawalpindi (the “twin cities”) are currently facing serious water-related issues such as poor water supply, sanitation, wastewater, and hygiene. Women, and girls are the most vulnerable to the effects of poor WASH facilities, including vulnerability to violence, especially in disadvantaged urban communities where access to safe water supplies, sanitation facilities, and associated wastewater disposal remains inadequate.22

The key agencies responsible for water governance in the twin cities include Capital Development Authority (CDA), Rawalpindi Development Authority (RDA), Water and Sanitation Agency (WASA) Rawalpindi, Public Health Engineering Department, and Ministry of Water Resources (WAPDA and PCRWR). Diagram 1 in Section II of this report highlights the broader federal, provincial and local authorities responsible for water governance in Pakistan.

1.3.1. Water Supply and Demand

There is a lack of reliable and easily accessible data available with regards to current water supply demand and supply in the twin cities. One study estimates that in Islamabad water demand is 125 MGD while supply is 72 MGD (53 MGD shortage),23 while other research suggests that present water demand in the capital is 246 MGD with only around 45 MGD being supplied (201 MGD shortage).24 Other estimates from the government come from a press release summarizing a meeting between the Federal Minister for Planning, Development, and Special Initiatives, CDA, and PCRWR in July 2021. During the meeting, Federal Minister Asad Umar shared that average demand of water in Islamabad is 246 MGD while only 80 MGD is being supplied (166 MGD shortage) through Simli and Khanpur Dams and 194 tube wells across the capital.25 Data for water supply and demand in Rawalpindi is publicly unavailable. Regardless of the exact numbers between demand and supply, all studies/estimates clearly indicate that current urban water supply is unable to keep up with demand. With a combined population of around 5 million, it is and will become even more challenging to provide a safe and regular water supply to the twin cities.

1.3.2. Sources of water and water supply systems

The main water sources in the twin cities are surface water and groundwater. Groundwater provides over 90% of the drinking water supply. Water is mostly sourced from Simli Dam and Khanpur Dam for Islamabad, while Khanpur Dam and Rawal Dam supply water to Rawalpindi. Currently there are a total of 32 operational tube wells being used across Islamabad.26 An article published in The Express Tribune states

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that at present Rawalpindi has 480 tube wells and 162 water filtration plants being managed by WASA,\(^{27}\) while WASA Rawalpindi’s website lists only 400 tube wells. Between the twin cities, there is a total of 9,170 public and private tube wells and boreholes,\(^{28}\) but these numbers may be underestimates due to the number of illegal wells and bores being used to fulfill residents’ water requirements.

In Rawalpindi, the older water lines constructed during pre-independence are still connected to the current water supply network; these earlier lines are deteriorating, and unable to handle increased water supply, resulting in water loss and leakages\(^{29}\). Further, water lines and sewage pipes run alongside each other with high risk of cross contamination and leakages, and the unhygienic conditions of tube wells and contamination from Nullah Lai, Korang River and Soan River (which carry the waste waster of twin cities) have led to poor water quality, bacterial and chemical contamination of water, and exposure to waterborne diseases.\(^{30}\) In addition, many households install water pumps to extract groundwater for domestic water use and consumption, but there is no regulatory framework to control over-pumping.

### 1.3.3. Groundwater depletion

To meet the future demand of rapid population growth, it is anticipated that the gap between water supply and demand will increase manifold. Consequently, the pressure on groundwater resources, which are already scarce, will also increase. The groundwater depletion in Islamabad is approximately more than 1.0 meters annually\(^{31}\) and in Rawalpindi around 2.5 m per year.\(^{32}\)

Growing population pressure, over-abstraction and climate change have highly depleted groundwater resources, requiring improvement in the management of water resources to avoid further water shortage and to sustain groundwater resources in the twin cities. Ensuring long-term potable water supplies is also a serious matter of concern. There is a need to develop sustainable solutions to meet the domestic water demand in these cities. This includes developing effective groundwater monitoring and usage regulations. In lieu of varying estimates of current water supply, there is dire need for a detailed modeling study of underlying water strata to obtain accurate data on actual groundwater availability.


\(^{30}\) Ibid.

\(^{31}\) According to Muhammad Ashraf, Chairman PCRWR at a media briefing during the inauguration of a groundwater recharge site in Kachnar Park, Islamabad organized by IOM, PCRWR, and WaterAid on June 24, 2022.

Section II: Urban Water Management & Governance Structure

2.1. Institutional Landscape

Various government institutions in Pakistan have water management and governance roles at the federal, provincial, and local levels. The local government can be further broken down into District, Tehsil (sub-district), and Union levels.

The 18th Amendment of the Constitution devolved power from the federal government to the provinces, particularly with social service delivery. Key social sectors which fall under provincial power include health, education, population and social welfare, food and agriculture, human rights issues, climate change, and water and sanitation issues. The Federal Government is responsible for the coordination and international commitments and maintains functions related to water management at various sectoral levels.

The main federal institutions related to water governance and resource development at the national level include: the Ministry of Water Resources (MoWR), The Ministry of Climate Change (MoCC), the Ministry of Health, the Ministry of Finance, the Ministry of Planning, Development, and Special Initiatives (MoPDSI), Ministry of Energy, Power Division, Ministry of National Food Security and Research (MoFSR) National Disaster Management Authority (NDMA), Pakistan Meteorological Department (PMD), and Council of Common Interest (CCI). Within these ministries are departments or wings dedicated to different water domains.

In urban areas, implementing agencies at the provincial and district levels for water and sanitation include: Tehsil Municipal Authorities (TMAs), Local Government and Community Development Departments (LG&CDD), Irrigation Departments, Water and Sanitation Authorities (WASAs), Development Authorities, Housing, Urban Development (HUD) and Public Health Engineering Departments (PHED), Environmental Departments, Health Departments, Finance Departments, and Education Departments (for WASH in schools).

Diagram 1 below summarizes the basic institutional water governance structure at the federal, provincial, and local levels (Note: institutions not related to the different domains of the urban water sector are excluded as this is outside the scope of this review):
Diagram 1. Institutional Water Governance Structure in Pakistan (Urban Water Sector)

Note: Some institutions at the provincial and local levels may be missing; also excluded are development partners, community organizations, or private sector organizations (i.e., non-state actors) which interact with government institutions across various water sector domains (WASH, industry, and agriculture, etc.)
2.2. Policy Landscape

Under the federal and provincial levels are various policy legislations which are directly related to or impact the water sector, which are outlined below. This is not an exhaustive list but gives a good picture of the vast quantity of water-related policies that exist in Pakistan.

Federal policies and regulations seek to understand the growing issue, provide an institutional and legal framework, and develop an action plan with a unified national perspective. These policies lay out a national framework within which the provinces can then draft their master plans for the long-term management and development of the country’s resources.

2.2.1. Federal Level

Current Major Policies
- **National Water Policy (2018)**
- **National Climate Change Policy (2021)**
  - Climate Change Gender Action Plan (2022)
- **National Food Security Policy (2018)**
- **National Hazardous Waste Management Policy (2022)**

Pre-Devolution Policies and Strategies
- **National Water Sector Strategy (2002)**
- **National Drinking Water Policy (2009)**
- **National Sanitation Policy (2006)**
- **National Environmental Policy (2005)**
- **National Conservation Strategy (1992)**

Other policies which touch on the importance of water:
- **Pakistan Vision 2025 (2014)**
- **11th Five Year Plan (Chapter 20: Water; Chapter 23: Environment and Climate Change)**
- **National Security Policy (2022-2026) (2022)**
- **National Biodiversity Strategy and Action Plan (2017-2030)**

These policies provide a situational assessment of water scarcity and security issues in Pakistan and list broad-level strategic areas to focus on. This report does not focus on these policies or strategies in-depth because they briefly touch on the water sector and note similar themes reviewed in detail in the main policy documents.

2.2.2. Provincial Level

The policies, regulations, and action plans from the national level provide a framework for provinces the local level governments to then draft their strategies and plans in line with national objectives. Some of these water-related policies are listed Table 3 below:
<table>
<thead>
<tr>
<th>Province</th>
<th>Water-related legislation (non-exhaustive list)</th>
</tr>
</thead>
</table>
| Punjab                 | - Punjab Water Act (2019)  
- Punjab Climate Change Policy (draft) (2017)  
- Punjab Water Policy (2018)  
- Punjab Sanitation Policy 2017 (draft)  
- Punjab Drinking Water Policy 2017 (draft)  
- Punjab Environmental Protection Act (1997) |
| Sindh                  | - Sindh Water Act (in progress)  
- Sindh Climate Change Policy (approved) (2022)  
- Sindh Sanitation Strategy (2011)  
- Sindh Sanitation Policy (2017)  
- Sindh Drinking Water Policy (2017)  
- Sindh Water Management (Amendment) Act (2018)  
- Sindh Environmental Protection Act (2014) |
| Khyber Pakhtunkhwa     | - KP Water Act (2020)  
- KP Climate Change Policy (2022)  
- KP Sanitation Policy (2011)  
- KP Drinking Water Policy (2015)  
- KP Environmental Protection Act (2014) |
| Balochistan            | - Balochistan Environment Protection Act (2012)  
- AJK Climate Change Policy (2017)  

At the district, tehsil, and union levels are further regulations and guidelines for water-related policies implemented by local government departments. Informal water institutions may also exist at the local level which do not follow any formal regulatory mechanism.
Section III: Review of Policies and Regulations Related to the Urban Water Sector

This section provides an overview of the relevant federal policies and regulations related to the urban water sector. Several existing policies have been summarized based on their connections to urban water themes: Drinking Water Supply; Sanitation; Wastewater Treatment & Disposal; Water Conservation/Reuse; Groundwater Management; Conserving Biodiversity; Disaster Preparedness; and Climate Change. Gender and inclusion are cross-cutting themes across these domains and their role in the policy and regulatory framework is also assessed.

A summary table at the end of the section will highlight which urban water themes each policy touches upon to provide a visual of areas of intersection between policies.


The National Water Policy aims at restoring and maintaining the health of the environment and water-related ecosystems. It addresses fundamental water management challenges Pakistan faces, including sustainable groundwater use, water data scarcity, service inefficiencies in water delivery systems, stakeholder and end-user engagement, and climate change adaptation.

The NWP has 33 policy objectives to achieve Water Security for Pakistan. Of the 33 policy objectives, 17 are related to urban water issues, management, and governance:

- Promoting sustainable consumption and production patterns throughout the water sector from exploitation to utilization;
- Augmentation of the available water resources of the country through judicious and equitable utilization via reservoirs, conservation and efficient use;
- Improving urban water management by increasing system efficiency and reducing non revenue water through adequate investments to address drinking water demand, sewage disposal, handling of wastewater and industrial effluents;
- Promoting behavioral change to reduce wastage of water by raising public awareness through media campaigns and incorporating water conservation lessons in syllabi/curricula at primary, secondary and tertiary levels;
- Providing food security and expanding water availability to help adapt to climate change, population and other large-scale stresses;
- Treatment and possible reuse of wastewater - domestic, agricultural and industrial;
- Upgrading water sector information systems for improved asset management and to derive evidence and data driven decision making;
- Restoring and maintaining the health of the environment and water related eco systems;
- Flood management to mitigate floods and minimize their damages;
- Promoting appropriate technologies for rain water harvesting in rural and urban areas;
- Regulating groundwater withdrawals for curbing over-abstraction and promoting aquifer recharge;
- Encouraging beneficiary participation and public private partnerships;
- Strengthening and Capacity building of water sector institutions;
- Establishment of Hydro-meteorological disaster risk reduction complied integrated water resources management regime;
- Enhancing water productivity through infrastructure development and adoption of improved technologies in a sustainable manner;
- Climate change impact assessment and adaptation for sustainable water resources development and management;
- Setting major national targets for the water sector including those for water conservation, water storage, Irrigation, water treatment and drinking water.

The NWP further highlights 6 key strategic priorities to be taken up at the Federal and Provincial levels (Summarized in Table 3).

**Table 3. Strategic Priorities and Action Areas of NWP (2018)**

<table>
<thead>
<tr>
<th>Strategic priority</th>
<th>Main action areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation and efficiency</td>
<td>Watercourses lining, groundwater regulation, demand side management of water resources</td>
</tr>
<tr>
<td>Storage</td>
<td>Small, medium, and large dams</td>
</tr>
<tr>
<td>Leveraging technology</td>
<td>Sea water desalinization and water recycling, Remote sensing/GIS based water sector inventory</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>Hydropower, solar energy-driven tube wells Day-time desalinization of seawater</td>
</tr>
<tr>
<td>Integrated Water Resources Management (IWRM)</td>
<td>Revamping &amp; replacement of old irrigation infrastructure by the asset management plan</td>
</tr>
<tr>
<td>Regulatory framework</td>
<td>Regulations to ensure efficient and sustainable utilization of groundwater, industrial uses and wastewater management</td>
</tr>
</tbody>
</table>

**Drinking Water and Sanitation**

The NWP touches on the urban water context by acknowledging the importance of drinking water and sanitation and access to safe and clean drinking water and sanitation facilities, in line with SDG 6. Drinking water and sanitation plans at the provincial levels are to be adopted in line with the National Drinking Water and Sanitation Policies. Urban water management should be integrated into the overall water management of the country. Further, responsibility is given to municipal authorities and industries to treat effluents and hazardous discharge before it is disposed of. Wastewater treatment will be first promoted at a centralized level (in technical terms) and then with time will be decentralized. Financial stability of urban water supply and sanitation systems will be achieved through reduction in wastage, theft and non-revenue water allocation, and 100% metering.

**Urban Storm Management**

NWP highlights that the drainage system of main cities will be upgraded/rehabilitated. Delineation of flood plains will be executed. The capacity of WASAs and other municipal level organizations to address planning, execution, and management of schemes focused on the prevention of urban flooding will be built. In the cities susceptible to urban flooding there will be an installation of early warning systems to make precise forecasts and bio-engineering measures against urban flooding.
**Groundwater**

NWP recognizes aquifers as vital national resources which require protection from unsustainable abstractions and pollution. The policy states that multiple technologies will be developed for sustainable extraction but does not mention what these technologies are. Wherever economically and technically feasible groundwater recharge including artificial recharge will be encouraged, and preference shall be given to investments made in groundwater recharge schemes. By controlling or restricting pumping, secondary salinization will be avoided through the enforcement of a rigid regulatory framework.

**Water Conservation**

Large seasonal and annual variability in freshwater variability makes it compulsory to recharge underground aquifers during surplus water flow periods and floods to be able to use them later. Water conservation plans will include the recycling and reuse of industrial and municipal wastewater after proper treatment at the source along with the promotion of rainwater harvesting technology. Industries will also be required to treat their wastewater and recycling will be encouraged as much as possible.

**Climate Change**

The NWP acknowledges the effects of climate change on water resources. Water storage in carry over surface storages and underground storage are listed as mitigation strategies. The policy specifically states (Clause 8.1.14) that all policy measures will be adopted in line with the National Climate Change Policy.

**Implementation Framework**

To review and coordinate the execution of the National Water Policy, a National Water Council (NWC) and NWP Steering Committee were enacted in 2018 to ensure implementation. To date, only two meetings of the steering committee have been organized, in September and December of 2021.

The Implementation Framework contains 163 interventions required to be adopted by the concerned departments/organizations for implementation in four different timeframes (18 immediate; 71 short term; 58 medium term; and 16 long term) to achieve the national targets by 2030. Immediate projects must be completed within 1-2 years; short-term within the next 2 years (preferable completion by 2022); medium term within next 3-5 years (preferable completion by 2025); and long term measures within 10-years (completion preferable by 2030).

The Implementation Framework does not provide a detailed timeline, milestones, or indicators of success. Up to 10 implementing institutions are listed under each intervention thematic area, but no further guidance on roles and responsibilities and the exact coordination mechanism to be used between institutions for effective implementation.

### 3.2. National Climate Change Policy (NCCP) (2021)

The National Climate Change Policy (NCCP) of Pakistan aims to ensure that climate change is mainstreamed in the economically and socially vulnerable sectors of the economy and steer Pakistan towards climate compatible development. The main objectives of the NCCP are:

- Sustained economic growth addressing climate change
• Integrate climate change policy with other inter-related national policies
• Focusing on pro-poor gender sensitive adaptation
• Climate-resilient infrastructure and agriculture
• Impact of climate change on water, food, and energy security
• Minimize the risks arising from extreme weather events
• Cleaner, lower emission and less carbon intensive development
• Achieve the United Nations’ Sustainable Development Goals (SDGs) in the light of its Sustainable Development Report 2020
• Effective use of the opportunities, particularly financial, public and private sector investment in adaptation and mitigation measures
• Enhance the awareness and capacity of relevant stakeholders
• Promote conservation of natural resources and nature-based solutions.

The policy measures of the NCCP and recent literature on climate change suggest two principal strategies for developing climate resilience: mitigation, which concerns all policies and actions aimed at reducing the emission of GHGs such as CO₂ or at capturing them in forests, oceans, or underground reservoirs; and adaptation, which seeks adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects. The policy falls in line with Pakistan’s updated Nationally Determined Contributions (NDC) 2021, which reflect enhanced adaptation and mitigation ambitions. The updated NDC also added additional sectors include waste and WASH.

The NCCP recognizes the link between water resources and climate change and acknowledges that climate change affects the quantity of Pakistan’s water resources and induces extreme climate events such as floods and droughts. Water demand will also increase due to climate change, population growth, and increasing economic activity. To address the impact of climate change on water resources, the NCCP highlights the following policy measures to be taken: i) water storage and infrastructure; ii) water conservations strategies; iii) IWRM; iv) legislative framework; v) enhancing capacity; and vi) awareness raising.

**Water Conservation and Recycling**

In terms of the urban water context, the NCCP touches on improving water storage and infrastructure and promoting water conservation strategies, such as local rainwater harvesting measures, groundwater conservation, and avoiding excessive groundwater pumping. The importance of wastewater recycling and treatment and the reduction of wasteful use of drinking and domestic water is also touched upon. It also recognizes the need for disaster preparedness and calls for nature-based solutions and improvement of the storm drainage potential of a mega-urban centers like Lahore and Karachi. The strategies listed are in line with the NWP’s strategies for water conservation and recycling.

**Urban Planning and Waste Management**

In November 2019, the Government of Pakistan initiated the Clean Green Pakistan Movement (CGPM) and the Clean Green Pakistan Index (CGPI) is its main pillar. The CGPI performance indicators include safe drinking water, total sanitation, and solid and liquid waste management/hygiene. Adopting integrated waste management, treatment, and disposal systems is an essential component under this policy theme, especially the installation of wastewater treatment plants.
A Climate Change Policy Implementation Committees will be established at provincial and federal levels to make sure efficient policy implementation and progress. Regular monitoring and reviewing of the National Climate Change Policy will be one of the tasks of these committees.

**Implementation Framework**

Two supplementing documents provide further guidance on implementing the NCCP. The implementation framework lists the implementation schedule for the NCCP strategic areas, including the water sector, industries, and urban planning adaptation and mitigation actions (Sections 4, 13, and 14, respectively), along with the implementing institutions for each action item. As with the NWP framework, these are organized with vague timeframes (priority, short term, medium term, long term).

The Climate Change Gender Action Plan (ccGAP) was launched in July 2022 and provides a gender responsive strategy and framework for implementing the NCCP around the six priority sectors including agriculture and food security, forest and biodiversity, disaster risk reduction, water and sanitation, integrated coastal management and mitigation: energy and transport. Under each strategic priority, the ccGAP includes relevant activities, lead actors, and indicators of success. There is no information on the timeframe for activity completion. However, the NCCP is the only policy that comprehensively includes the needs and priorities of women and vulnerable groups in climate change strategies. No other water-related policies have their GAPs.


The goal of the food security policy is to (i) eliminate hunger, reduce poverty and malnutrition (ii) encourage sustainable food production systems by attaining an average growth rate of 4% per annum (iii) make agriculture climate resilient, productive, profitable, and competitive. The mission and vision are a food secure Pakistan. The policy focuses mostly on the agriculture sector but refers to the effective use of natural resources such as land and water.

**Land and Water Resources Management**

The FSP recognizes growing urbanization in Pakistan and the resulting pressure on water resources. Strategies under the policy to address water scarcity include applying alternate sources of energy and encouraging the use of sustainable solar based pumping systems in shallow water areas. The policy also promotes rainwater harvesting techniques and conserving groundwater through artificial recharge. It calls for promoting compost from city bio-waste and treating sewerage and industrial waste to reduce pollution and other water contaminants which can cause health issues and are disrupting food production systems.

The FSP lists policy measures under various thematic areas but includes no timeframe, indicators, or implementing actors. The NWP acknowledges food insecurity as a threat to Pakistan and recognizes the link between the water-food-ecosystem. Both water and food systems are interconnected - water scarcity affects food scarcity.


The NHWMP promotes a life cycle approach to manage hazardous waste from its generation to disposal in a manner that does not harm the environment. As Pakistan shifts to an industrial-driven economy, the dumping of hazardous waste (HW) and poor management are increasing. The policy aims to tackle
hazardous waste and resulting public health and environmental impacts. This is especially pertinent in the urban water sector.

The objectives of this policy are (i) To promote the implementation of related provisions of the Basel Convention, Minamata Convention, and the Stockholm Convention at the national level (ii) To prevent, minimize and control the generation of hazardous waste (iii) Control the transboundary movement of hazardous waste; (iv) Establish an enforcement mechanism; and (v) Capacity building of all related stakeholders. The policy promotes the reduction, reuse, and recycling of waste and using greener technologies to prevent toxic pollution to the water and environment.

In relation to urban water management, hazardous waste management is a major issue in urban communities. Pakistan does not have a proper mechanism for hazardous waste collection and disposal, especially from HW generated by hospitals, industries, transport, and energy sectors. Even mining and agricultural activities contribute to HW production. Industries dispose of their effluents into nearby streams, rivers, lakes and agricultural fields, which has a negative impact on ground and surface water, human and animal health, and the overall environment. Clause

The industrial sector is an important water user. The NWP recognizes the importance of industry to economic growth of the country, yet industrial expansion must be regulated in terms of environmental impacts and wastewater reuse. Clause 13.4 of the National Water Policy states that industrial units and municipal entities will be required to treat effluents and hazardous discharge before disposal. Clause 15.3 further elaborates that industries will be required to carry-out in-house treatment of wastewater before transferring to municipal sewers. The NHWMP policy provides a comprehensive environmental regulatory framework to manage hazardous waste in the country.

3.5. Pre-Devolution Strategies and Policies

With the passage of the 18th Amendment in 2010, power and policymaking authority was transferred from federal to provincial and local levels of government. Pre-2010 Pakistan had passed several policies which addressed issues of water management. Comprehensive policies have been drafted for decades and have provided a good blueprint for the current water governance landscape. These policies and strategies catalyzed water issues in debate and discussion and led to different projects or initiatives, but they missed an overarching Integrated Water Resources Management Strategy which could promote coordinated development and management of water and land resources in a sustainable and equitable manner. The current NWP addresses these gaps and considers IWRM as its foundational strategy, while also considering the impacts of climate change. Nonetheless, a few of the previous policies and strategies are briefly highlighted below to give context of Pakistan’s water-related policy history and how the water governance landscape has evolved over the years.


The NWSS provides a road map for implementing the NWP and is comprehensive strategy on tackling issues in the water sector. Key objectives of the strategy are (i) Providing water for all (water allocations, water conservation, and additional storage of water); (ii) Improvement of management and institutional capacity; (iii) Poverty reduction; (iv) Improving the involvement of women in water; (v) Improving equity in water distribution; (vi) Enhancing stakeholder participation (Irrigation and drainage); (vii) Domestic water supply and sanitation; (viii) Increasing public awareness, understanding, and information; (ix) Increasing agriculture production and yield; (x) Improving coordination between agriculture and irrigation;
(xi) Executing the National Water Policy; (xii) Enhancing coordination and corporation in the water sector; (xiii) Finances (financial sustainability, focusing investments to the objectives of the strategy, involving stakeholders); and (xiv) Enhancing water quality.

The NWSS touches on strategies for urban water supply and sanitation, industrial water supply and pollution control, and flood protection. The objectives for the urban water supply and sanitation sub-sector are to: (i) Increase coverage to 96% of the urban population with clean water supply; (ii) Increase coverage to 80% of the urban population connected to functional sewerage; (iii) Achieve financial sustainability in all urban water developments; (iv) Achieve full compliance with EPA standards for drinking water; (v) Achieve full compliance with EPA standards for wastewater disposal; (vi) Develop a water quality information management system for data storage and assessment.

The strategy for industrial water supply and pollution focuses on ensuring environmentally sound disposal of all industrial wastewater through regulation by enforcing existing pollution control regulations and standards and introducing a proper institutional framework for monitoring wastewater disposal and quality. It also encourages the use of enacting pollution charges and developing awareness raising campaigns on the importance of pollution reduction.

The strategy for flood protection places priority on densely populated urban centers and calls for proper flood and drought management strategies to be implemented in major cities.

The National Water Sector Strategy is a draft document and still requires formal official government approval.

3.5.2. National Sanitation (NSP-2006) and Drinking Water Policies (NDRWP-2009)

The National Sanitation Policy issues policy guidelines and a broad framework to improve and assist sanitation coverage across the country. The goal of this policy is to reduce the proportion of individuals without sustainable access to improved sanitation by half by 2015, and that by 2025 100% of the population will be served by improved sanitation. These goals have not been met, despite provinces developing their own Sanitation Policies (See Table 3 in Section II).

The objectives of the policy are (i) Open defecation-free environment and the safe disposal of solid liquid, agricultural, industrial and municipal waste; (ii) Connect and integrate sanitation programs; (iii) Facilitate the accessibility of basic level of services in sanitation to all the citizens; (iv) Encourage Community Lead Total Sanitation (CLTS); (v) Guidelines for an efficient financial and institutional framework; (vi) Increase the capacity building of government agencies and other stakeholders; (vii) Establish and implement strategies for integrated management of different types of waste; (viii) Meet regional/international obligations; (ix) Change the behavior and attitude on the use of sanitation; and (x) Enhance community mobilization and mass awareness.

Urban sanitation priorities under the NSP

For all the urban settlements an overall sanitation plan will be created by the Development Authorities, city governments, and TMAs. The supply of safe water and sanitation facilities will be made compulsory for all public facilities. Gravity flow systems will be used for sewage schemes to prevent extra pumping and reduce operational and maintenance costs. An efficient waste management system will be initiated in all health and occupational facilities, the city governments will be responsible for implementing a proper waste disposal system. GIS will be used to make base maps on present settlements and sanitation/drainage
related infrastructure. The majority of these priority actions have not been implemented and there is no mention of timelines and specific indicators of success.

The NDWP was drafted under the MoCC (formerly Ministry of Environment) in line with the provisions of the National Environment Policy and SDG Agenda. Since its drafting, provinces have developed their own drinking water policies (except AJK).

The objectives of the policy are that (i) By 2025 the government will provide access to safe and sustainable drinking water supply to the whole population of Pakistan; (ii) Ensure the conservation and protection of water resources; (iii) Take measures for the safety and treatment of drinking water; (iv) Community empowerment and participation in planning, implementation, monitoring and operations and maintenance of water supply systems; (v) Appropriate and cost-effective technological options; (vi) Increased public awareness; (vii) Increased capacity of line ministries, departments, agencies and organizations at all tiers in planning, implementation and monitoring of water supply programs; (viii) Encourage public-private partnership; (ix) Research and development promotion; (x) and inter-sectoral collaboration.

Priority will be given to water allocation for drinking purposes over other uses. To ensure equitable access, extra attention will be given to eliminate existing disparities in the coverage of safe and clean drinking water and for addressing the needs of vulnerable and poor communities. The existing drinking water supply systems will be rehabilitated and upgraded, and new drinking water supply systems will be established in urban (and rural) areas. Integrated water resource management and community management of local water resources will be encouraged. Groundwater abstraction for multiple purposes will be regulated. For all the water sector projects Environmental Impact Assessments will be carried out. The re-use and recycling of water will be promoted, and water metering will be encouraged.

The NDWP also ensures the participation of women in the planning, implementation, monitoring, operation and maintenance of water supply systems, by recognizing that women are the maintainers of a hygienic household environment and major providers of domestic water supply. Education, critical information, and communication campaigns will be carried out for public awareness.

Both sanitation and drinking water policies are reflected in the overall NWP; while the NWP provides a broader framework to address sanitation and drinking water as part of IWRM, the specific provincial sanitation and drinking water policies go into more detail about these two thematic areas.

3.5.3. National Environmental Policy (NEP) (2005)

The NEP provides a comprehensive framework for combating environmental issues facing Pakistan like air pollution, deforestation, desertification, climate change, pollution of coastal waters and freshwater bodies, loss of biodiversity, natural disasters, and lack of efficient waste management. It also provides orientation for addressing the underlying source of environmental degradation, cross sectoral issues and fulfilling international obligations. The goal of the NEP is to conserve, protect and restore the environment of Pakistan to enhance the quality of life of the citizens through sustainable development.

The objectives of the policy are (i) restoration, conservation, and effective management of environmental resources; (ii) inclusion of environmental considerations in planning processes and policy making; (iii) capacity building of stakeholders and government agencies; (iv) fulfilling international obligations efficiently in line with the national aspirations; and (v) community mobilization and mass awareness.
In relation to the urban water sector, water supply and management and waste management are sub-sectors within the policy. The policy encourages coverage of water supply and water treatment facilities, installation of water treatment plants, low-cost water technologies at the community and household levels, artificial recharge of groundwater, and promotion of water metering to discourage unlimited water for industrial and municipal purposes. For waste management, the NEP encourages strict enforcement of National Environmental Quality Standards and proper recycling and reuse of municipal and industrial waste. The policy also lists actions to protect biodiversity and address climate change impacts on the environment. All provinces have enacted their own Environmental Protection Acts following the guidelines set out in the NEP.

The NWP acknowledges the link between water conservation, reuse, and contamination reduction under the overall IWRM management approach to water governance. The 11th policy objective of the NWP specifically mentions “restoring and maintaining the health of the environment and water related ecosystems.” Protection of wetlands and prevention of sea water intrusion for the sustainability of the coastal environment are also included in the 33 policy objectives. Environmental sustainability is also listed as a key planning principle to be followed in the process of planning, development, and management of water resources at the federal and provincial levels.

Each of these individual policies do not take a systems approach to water governance, meaning there is no synergy of the water-food-land ecosystems and how water is a key link between all. In adapting the IWRM approach, the NWP is intentional in creating this synergy for a more cohesive and sustainable solution for water security across the country.


The 406-page NCS was approved in 1992 and provides a broad framework for addressing environmental concerns in Pakistan. Since its formulation, the NEP and Biodiversity Strategy and Action Plan have been developed which are more recent to the current country context. The main objectives of the NCS are the conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources. It lists 14 priority areas including protecting watersheds, conserving biodiversity, preventing pollution, and managing urban waste.

The NCS highlights the link between environmental issues and urban water management. Untreated urban sewage and unplanned urban development have negative impacts on the environment in terms of polluting freshwater resources and encroaching on land and water bodies.

The strategy summarizes Pakistan’s pollution issues related to poor urban water, waste, and wastewater management. For example, only half of urban excreta is disposed of in sewers, and virtually none is treated before flowing into and contaminating rivers, lakes, and the sea. The Strategy cites the example of the Ravi River downstream from Lahore where pollution had cut fish production by 5,000 tons a year. Further, while urban residents have greater access to piped water, often the water is not safe for drinking and causes gastrointestinal diseases.

33 This was the statistic at the time of the Strategy development; current statistics may be much greater.
To manage urban waste, the NCS recommends spending PKR 13.35 billion on 4 main programs: (i) garbage collection and disposal; (ii) energy-from-waste plants; (iii) wastewater treatment of livestock farms; and (iv) construction of oxidation ditches and other biological treatment of waste.

3.6. **Additional policies/guidelines which mention the importance of water**

- **Pakistan Vision 2025 (2014)** was rolled out by the PML-N government in early 2014. The 12-year vision has 7 pillars and sets several quantitative targets under each pillar. Pillar IV is Water, Energy and Food Security. The top 5 goals for water security are:
  1. Increase water storage capacity, applicable to the requirements of each province, in line with defined strategic needs and international benchmarks: from currently 30 days to 45 days by 2018, and 90 days by 2025.
  2. Invest in proven methods and technologies to minimize wastage (e.g., in the agricultural and domestic sectors), promote conservation and gain efficiencies through rationalization of pricing.
  3. Enable more effective allocation with direct reference to national & provincial priorities and related social and economic considerations.
  4. Establish institutional mechanisms (e.g., a National Water Commission) to effectively manage all sources of water (surface, subsurface, rain) and their sectoral and regional allocations (agriculture, industry, urban).
  5. Provision of access to a minimum baseline of suitable water to every person in Pakistan.

- **11th Five Year Plan (2013-2018)** (Chapter 20: Water; Chapter 23: Environment and Climate Change): The chapters on water and environment and climate change provide broad thematic strategies for the country to prioritize such as water storage and conservation, flood management, IWRM, water governance, water pollution, and water infrastructure and financing. It also summarizes current and ongoing development projects and estimated costs. The 12th Five Year Plan is in draft form and awaits final approval.

- **The National Biodiversity Strategy and Action Plan (2017-2030)** is to provide a framework for the development of provincial biodiversity action plans and to establish national targets in line with the Aichi Biodiversity Targets (ABTs) and the SDGs. The guiding vision of the BSAP is to provide the benefits of biodiversity and ecosystem services to all segments of society and conserve the rich natural biodiversity heritage of Pakistan. The BSAP acknowledges pollution, water scarcity, and climate change among the list of drivers contributing to biodiversity loss.

- **The National Security Policy 2022-2026 (2022)** is Pakistan’s first national security policy document. It seeks to co-locate Pakistan in emerging global trends and identifies policy objectives and priority areas where Pakistan should invest its national resources to ensure the most beneficial outcomes. The NSP emphasizes the importance of addressing climate resilience and water security as part of what it terms Human Security, and policy objectives under these themes include: improved water storage capacity, sustainable water management, protecting Pakistan’s transboundary water rights, and strengthening robust disaster preparedness, management, and response mechanisms.
3.7. Summary of Policy Review

Based on the desk review of the policies above, Table 4 (below) summarizes the key thematic areas related to the urban water context and provides information on the overlap and alignment of different policies across major urban water management themes.

Urban water sector themes are touched upon in all the policies, with water quality and water use efficiency as top priorities across them all.

The National Water Policy and National Climate Change Policy are the most comprehensive policies which address all major themes under the urban water context. For the most part, however, there is much overlap and similarity between all the policies concerning strategies to improve urban water management and overall goals and objectives.

Generally, across each policy, the implementation framework and mechanisms are very weak. Activities and strategies are listed with vague timelines or none at all. Further, it is unclear at times which implementing institutions will manage the regulations of the policy, and how progress will be monitored.

In terms of gender and equity aspects, the NCCP is the only policy that has a dedicated gender section and supplemental Gender Action Plan which recognizes the different realities of women and other marginalized groups. In the remaining policies, gender aspects are either completely missing (gender-blind) or are briefly mentioned in passing without any details or a clear roadmap on women’s inclusion (gender-neutral).

Overall, each national policy in and of itself is strong content-wise. The water issues of Pakistan are described in detail and solutions are presented. The main issue is the gap between policy and practice. Lived reality indicates that most of these policies have weak enforcement, unclear monitoring frameworks, and poor coordination between key actors.
### Table 4. Summary of Policies Across Urban Water Themes

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Section IV: Gaps and Recommendations for Improving Urban Water Management and Governance System

4.1. Major gaps in policy implementation

Water issues and disputes in Pakistan are chronic. Despite the country having several comprehensive national laws and policies related to water management and governance, there are significant weaknesses in the institutional capacity to properly implement these policies. This is not to say that progress is not being made, but it is disjointed, poorly monitored, and not fast enough to address the current water crisis. Water policies are majority supply-driven and focus on infrastructure rather than demand-driven focusing on IWRM and more efficient use and actual needs. Federal policies have yet to be adopted and implemented in a true sense. The policies themselves may be clear on paper, but they lack a proper implementation and monitoring mechanism.

The management of the water sector in Pakistan is complex as implementation and responsibility span across the jurisdiction of several ministries, departments, and agencies (as illustrated in Diagram I). When there are up to 10 different ministries and associated departments/wings just at the federal level who are all working on water issues, it is no shock that coordination and implementation will be messy. Further, since actual implementation responsibility falls to the provincial and local levels, there are even more communication and coordination gaps. This leads to infrequent monitoring and reporting and a lack of proper accountability among institutional actors.

The following are the major gaps identified in the reviewed policies:

- Horizontal and vertical policy incoherence because the role of stakeholders and implementing institutions are not clearly defined which leads to confusion, communication gaps, and inertia in implementation. Policies list implementing institutions under major activities, but no further demarcation on roles and responsibilities.
- Fragmentation between supply-side and demand-side water policies and proposed solutions, with policies leaning more toward supply-side response (i.e., building new infrastructure versus developing systems to control water demand from across sectors and users).
- Detailed breakdown of the finance, operation, and maintenance costs are not given for many of the proposed infrastructure projects (e.g., installation of tube wells, filtration plants, wastewater treatment plants, etc.). (Note: this information may exist in supplemental or internal government documents which are not publicly available online).
- There is limited discussion on monetary and non-monetary incentives for promoting different water strategies (e.g., water pricing and metering, implementing quality control standards, etc.). For example, the Environmental Policy and Climate Change Policy discuss the importance of water quality and following EPA standards. However, enforcement of these standards is very weak and there is no true punishment for non-compliance. The policies lack further detail on enforcement mechanisms, and it is unclear which institution is managing compliance.
- Some policies have not been updated to take into account climate change affects, such as the National Drinking Water and National Sanitation Policy, which have not been updated in more than 10 years. In addition, some of the strategies suggested related to solar pumping or water recharge
in policies like the NWP are in direct conflict with environmental considerations laid out in the NCCP. When policies have conflicting mandates, it is difficult to know which policy aspect to follow.

- There are still gaps in gender and inclusion being fully integrated into policies; gender aspects are usually an add-on without any guideline or mechanism to truly include women and other groups in decision-making processes.

- A comprehensive monitoring framework is missing to be able to track progress against targets listed in each policy. The timeframes given are vague and the majority of indicators are not SMART indicators (specific, measurable, achievable, relevant, timebound).

- The role of civil society and the corporate sector is missing in relevant water policies. Civil society actors play an instrumental role in water use and management at the community level. The role of the private sector in water management is also growing and private sector stakeholders need to be more involved in policy discussions.

- There are barriers in participatory water governance and management. Water users at the household and community levels are the main end users and most important water stakeholders yet are often left out of policy considerations. Community-based engagement and consultation is often missing during the development of policies or regulations. Decisions are still top-down rather than bottom-up or through co-creation with the communities/end users. This leads to poor buy-in and ownership from communities to adhere to policies/regulations.

The following are the major gaps in policy governance and implementation:

- Fragmentation and duplication of roles and responsibilities and even overlapping mandates between and among ministries, departments, and between the federal, provincial, and local levels of government have led to a lack of clear reporting lines, a lack of clarity about roles and responsibilities, and thus poor coordination and ownership of legislation.

- Provincial and local levels of government lack the technical capacity and the human resources to properly implement different aspects of water policies. For example, the PHED, TMAs and WASAs may not have the manpower to properly maintain wastewater or sanitation facilities, and they may even lack managerial and financial management skills to implement different policies efficiently.

- There is a lack of sufficient water data and water information management systems within government institutions, and no central national and provincial data repository. This leads to scattered data, lack of updated data, inaccurate water reporting and mistrust in inter-departmental and inter-provincial data sharing.

- General lack of proper funds allocated to the various water sub-sectors, and poor revenue collection. This translates to unrealistic policy mandates which cannot be implemented.

- The weak link with communities (the link between institutions in charge of water service provision and the communities they are meant to be serving) - needs more participatory decision-making and includes GESI aspects. Failure to understand the role and functions of informal institutions and how they can be included in policies threatens policy feasibility and acceptance at the community level.

- State bureaucracy, conflicting political agendas, corruption, and lack of political will contribute to poor implementation of policies and water users questioning the legitimacy of policies. The objectives of policy makers are not always aligned with societal or public interest objectives. Decision-makers may ignore scientific evidence and choose to favor one sector or groups of water users due to personal interests.
• In addition to poor inter-governmental coordination, the roles of the private sector, civil society, non-profit organizations, and other development partners are often unclear and hidden, leading to water-related projects being implemented in silos. Organizations like UNICEF, Water Aid, Hisaar Foundation, HANDS, or other locally based groups have a good understanding of groundwater issues. Often, however, these groups fail to coordinate with one another or participate in knowledge or data sharing. What this means is that there may be strong work happening on water-related issues, but nobody knows who is doing what. This may translate into inefficient duplicated efforts.

4.2. Recommendations for improved water policies and implementation

The following recommendations are proposed to address the identified policy and implementation gaps in national water policies:

*Improving institutional foundation and governance mechanisms:*

1. There is a strong need to conduct a **deep dive review of all water-related policies and identify the overlap between existing policies**. Implementing ministries must be on the same page and a thorough review may mean that policies need to be revised and even combined to create a robust master implementation plan. This plan will need to include clear roles and responsibilities, realistic assessments and targets, and transparent monitoring and reporting processes. Urban water regulations need to work in tandem with rural water regulations and across all sectors (industrial, environment, agriculture, etc.).

2. A completely **independent water monitoring and evaluation (WM&E) unit can be created at the federal and provincial levels to track progress against policy implementation** and force accountability and proper reporting. The WM&E unit would be responsible for developing and maintaining a comprehensive implementation framework (in consultation with respective government stakeholders) which would include SMART indicators, quarterly progress reports, and yearly reviews. The federal WM&E unit would coordinate with provincial units to ensure proper monitoring of data, and that inter-provincial data is being shared openly. It is expected there will be push back but strict enforcement mechanisms or incentives could help.

3. **An institutional mechanism to generate reliable data on the water sector should be established** to allow for accurate information and evidence-based policy and decision-making for government stakeholders. Partnerships with academic and research institutions should be promoted to promote a strong culture of science and evidence. Reporting of data monitoring in a standardized template could be enforced across all relevant ministries and yearly progress reports publicly shared to promote more transparency and accountability among all water users and decision makers.

4. **Gender, equity, and social inclusion (GESI) need to be mainstreamed into decision-making processes.** Stakeholder dialogues, workshops, etc. must include meaningful participation and inclusion of all water user groups. This will require gender sensitivity among government staff, as the water sector is male-dominated and social and cultural norms in Pakistan often disregard the role of women in decision-making and governance. Women representatives need to be invited and actively encouraged to attend and participate in workshops and consultations. For example,
representatives from the National Commission on the Status of Women should be engaged to ensure that regulatory frameworks which are being discussed consider gender and equity aspects. Dialogues and workshops will be framed around the following questions to engage stakeholders in a deeper discussion beyond the technical:

- Which groups will benefit the most from this policy/reform, and which groups may be negatively impacted?
- How can this policy/reform be implemented in a way that reduces inequalities?

Including women and representatives from other minority groups will ensure that water use of all users and sectors is being considered in policy decisions.

5. **Urban water systems must be prioritized equally and planned complementary to rural water systems.** New infrastructure projects or the construction of new buildings and roads need to consider environmental impacts as well as the impact on water supply and demand across different sectors. Further, proper city planning codes must be adhered to which consider sanitation and flood risk management in all new construction. Given that a little over half of the policy objectives listed in the NWP are related to the urban water sector, urban water management should be considered a strategic priority area in the policy (currently not included in the top 6 priority areas).

*Improving technical inputs and social awareness to improve water use and efficiency:*

1. **Water pricing can be introduced as an incentive to conserve and allocate water efficiently.** For example, water meters may be installed, and users charged based on volumetric use rather than a fixed rate. This would encourage less wastage and lead to increased transparency and data on water usage among different users. Recovered funds could then be reinvested into improved infrastructure (leading to improved quantity and quality). This strategy, however, needs to be closely monitored as it can have negative effects. Inaccurate meter readings, damaged/broken meters, bribery of meter readers, and uncaptured water use may cause conflict and inequities in payment.

2. Waste and wastewater treatment must be properly managed and regulated. Informal providers currently dominate the sector, and a proper regulatory mechanism needs to be developed to ensure safe and proper waste and wastewater disposal and treatment. This includes the improvement of existing treatment facilities and the development of new facilities based on stakeholder engagement and urban density factors. In addition, sanctions can be put in place for industries that do not comply with proper waste and wastewater disposal and treatment plans.

3. **Collaboration with civil society and private sector stakeholders** is a must to ensure proper policy and regulatory implementation and legitimacy. Government should create opportunities for cooperation and synergy rather than responding to conflicts among water users.

4. **Water demand management should be integrated with behavioral science to promote water efficiency and conservation among users.** For example, studies have shown that social comparison of water use has been shown to effectively reduce consumption (e.g., monthly water reports of household consumption including a comparison of consumption with households nearby). Behavior change campaigns can also be implemented which promote water conservation during handwashing, laundry, washing dishes, etc., as well as proper waste
disposal. There is a need for a shift toward conservation in social and cultural norms, at the institutional level down to the household level. This could mean installing water saving technology in public spaces or providing incentives to customers for adopting conservation-related behavior.

4.3. Conclusion

Water is a source of life and livelihood for all citizens of Pakistan, and thus, many stakeholders have strong opinions about how it should be managed and governed. Despite multiple policies attempting to ensure proper water resources management, efficiency, and conservation, weak institutions, and lack of coherence between actors is the Achilles heel of effective policy implementation.

Pakistan’s urban water systems are extremely diverse across provinces and municipalities. Where one city might experience issues of flooding, another city may experience water shortage or waterborne disease outbreaks. Thus, urban water issues are contextual in nature and require contextual and cross-sectoral policy solutions.

There is a dire need for institutional coherence, but more importantly, stakeholders and decision-makers must acknowledge the need for institutional coherence and believe that it will improve outcomes. Otherwise, business as usual and siloed decision-making will continue. Policy and technical experts in various departments and ministries in Pakistan must embrace cross-sectoral synergies. Without the awareness that cross-sectoral policy coherence has a substantial benefit for achieving national development goals, policy coherence cannot be achieved. The water sector in Pakistan depends on political will and persistent commitment to a water secure future.
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