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PUNJAB CLIMATE RESILIENT WASH SECTOR DEVELOPMENT PLAN 2025-35

July 2025

PREAMBLE

The Punjab Climate-Resilient WASH Sector Development Plan (2025-2035) is the result of extensive collaboration, technical expertise, and dedicated efforts from multiple stakeholders. The preparation of this document began in October 2023 and was completed in February 2025, spanning 15 months of extensive consultations, data analysis, and stakeholder engagement. This rigorous process has ensured a comprehensive, evidence-based, and inclusive approach to strengthening WASH services in Punjab. A deep appreciation to Planning & Development Board Punjab, which led this process, ensuring a strategic and evidence-based approach to strengthening the WASH sector. Sincere gratitude to the Secretary P&D Board, Member Urban Development and Local Government, Chief Economist, Chief Environment, Senior Chief of Local Government (with additional charge of Urban Development), and Chief Physical Planning and Housing, along with other staff of P&D Board for their leadership in coordination and facilitation throughout this process. Their proactive engagement has ensured that this plan is aligned with Punjab's development priorities, promoting sustainable and inclusive WASH services.

The valuable contributions of the Housing, Urban Development & Public Health Engineering Department (HUD&PHED), Local Government & Community Development Department (LG&CDD), Punjab Disaster Management Authority (PDMA), Environmental Protection Department (EPD), Irrigation Department, School Education Department, Primary and Secondary Health Care Department, and Social Welfare & Bait-ul-Maal Department are highly acknowledged. Their technical insights and inter-sectoral coordination have been instrumental in linking WASH with climate resilience, public health, and sustainable development.

A special appreciation of Punjab Municipal Development Fund Company (PMDFC), Punjab Saaf Pani Authority (formerly Aab-e-Pak Authority), the Urban Unit, Punjab Economic Research Institute (PERI), design wing of PHED, Environment Protection Authority (EPA) and Punjab Bureau of Statistics (PBS) whose data, technical inputs, and analytical support have been instrumental in strengthening the evidence base of this plan. Their contributions have helped ensure a comprehensive understanding of urban and rural WASH challenges, facilitating informed decision-making. A gratitude to development partners, donor agencies, research institutions, local government representatives, civil society organisations, and community leaders for their active participation and contributions. Their engagement has ensured that this plan is inclusive, community-driven, and responsive to Punjab's diverse WASH needs.

A special note of appreciation goes to UNICEF Punjab for its technical and financial support, particularly Ms. Sabahat Ambreen (WASH Specialist, UNICEF Punjab) and Mr. Nouman Ghani (Social Policy Specialist, UNICEF Punjab), whose expertise and commitment played a crucial role in shaping this plan. Similarly, a special thanks to the AWF (Assessment with Facilitation) Pvt Ltd team, including Mr. Niaz Ullah Khan, Mr. Sajid Zaman and fellows for their dedicated efforts in facilitating stakeholder consultations, data collection, and technical inputs.

This document stands as a testament to collaboration, innovation, and shared responsibility. As Punjab moves into the implementation phase, we call upon all stakeholders to work together to ensure universal access to safe, sustainable, and climate-resilient WASH services, strengthening public health, environmental sustainability, and socio-economic development across the province.

Government of Punjab
Planning & Development Board Punjab

Message from Senior Minister for Planning, Development & Reforms, Government of Punjab

Ms. MARRIYUM AURANGZEB

Punjab today is at a critical crossroads in its development trajectory, facing the dual challenge of building a prosperous, equitable society while responding to the urgent and intensifying impacts of climate change. As a province with over 130 million citizens, we are deeply aware that access to safe water, sanitation, and hygiene (WASH) is no longer a development luxury, but a frontline defence against health crises, climate shocks, and social vulnerability.

The Punjab Climate Resilient WASH Sector Development Plan 2025–2035 is a landmark initiative that reflects our provincial government's forward-looking commitment to invest in systems that are not only equitable and inclusive, but adaptive and resilient. This Sector Development sets a powerful precedent by anchoring WASH services in the broader climate resilience and sustainable development discourse ensuring that every citizen, especially women and children, is protected from the compounded risks of poor WASH access and climate-induced disasters.

This document is a result of extensive technical deliberations, interdepartmental consultations, and field insights that highlight the gaps, opportunities, and urgency of reform. It charts a clear pathway to build resilient infrastructure, localise climate finance, empower institutions, and mobilise communities for sustainable WASH outcomes. Equally important, it embodies our values of inclusivity and accountability, ensuring that the most marginalised are not left behind.

As a government, we are proud to commit ourselves to this vision. I am confident that the Planning & Development Board, in close coordination with PHED, Local Government, WASAs, Environment Protection Department, the Urban Unit, and other key departments, will lead the implementation with clarity and purpose. This Sector Development Plan calls upon all pillars of government to work in synergy to translate strategic goals into scalable action.

I would like to express my deep appreciation to UNICEF for its leadership, sector-wide engagement, and resource support in developing this Sector Development plan through AWF Pvt Ltd. I also thank our development partners including the World Bank, ADB, UNDP, UN-Habitat, WaterAid, WHH, AGAHE, Rural Support Programmes and the private sector for their ongoing collaboration and commitment to inclusive WASH outcomes in Punjab.

Let us treat this Sector Development Plan not as an end, but as a beginning a catalyst for deeper reform, smarter investment, and a collective responsibility to build a climate-resilient Punjab where WASH services protect lives, promote dignity, and fuel opportunity for generations to come.

Message from Chairman, Planning and Development Board, Punjab

Dr. MUHAMMAD NAEEM RAUF

I am pleased to present the Punjab Climate Resilient WASH Sector Development Plan 2025–2035, a strategic framework that provides a robust response to the emerging climate and water security challenges we face as a province. This Sector Development Plan is a testament to the Government of Punjab's growing recognition that resilience is not optional, it is essential for sustaining development gains and protecting public health in the face of worsening climate variability.

This Sector Development Plan is grounded in a solid understanding of provincial realities, including rising temperatures, erratic rainfall, increased flooding, and groundwater depletion. These climate challenges are already affecting millions of citizens particularly in water-stressed rural areas and informal urban settlements compromising their access to safe water, functional sanitation, and disease-free environments. The most affected are our children and women, who bear the disproportionate burden of unsafe or unavailable WASH services.

With this Sector Development Plan, we are taking decisive steps to change that. It identifies core action areas and includes strategic goals to ensure that all new WASH investments, policies, and services are climate-smart, gender-responsive, and financially sustainable. It also promotes innovation while encouraging the use of digital technologies, solar power, rainwater harvesting, and decentralised treatment systems as part of our adaptation toolkit.

A significant strength of this Sector Development is its cross-sectoral approach. It does not treat WASH as the responsibility of a single department, but rather as a shared commitment of government agencies, civil society, academia, and the private sector. It also embraces localisation empowering local governments and service providers to lead planning and delivery efforts.

I would like to take this opportunity to thank UNICEF for its outstanding technical assistance and facilitation during the development of this Sector Development Plan through AWF Pvt Ltd. Their continued support, along with that of our other development partners particularly those working at the intersection of climate and WASH is instrumental in advancing our shared goals.

I call upon all provincial and district institutions to fully align their operations, budgets, and monitoring systems with the strategies outlined in this Sector Development Plan. With strong partnerships and determined leadership, I am confident that Punjab will achieve universal access to climate-resilient WASH services by 2035, setting a national benchmark in sustainable development.

Message from Secretary, Planning and Development Board, Punjab

Mr. RAFAQAT ALI

The Punjab Climate Resilient WASH Sector Development Plan 2025–2035 marks a transformative shift in the way we approach WASH service delivery in our province. This Sector Development Plan responds to the growing understanding that climate resilience, public health, and sustainable infrastructure must go hand in hand if we are to build a future-ready Punjab.

As Secretary of the Planning and Development Board, I am proud of the consultative and evidence-based process that has shaped this document. It reflects the lessons from past programmes, the realities of our districts, and the aspirations of our people especially those who are most vulnerable to climate disruptions and WASH-related inequalities.

This Sector Development Plan provides a detailed roadmap for institutional reform, climate risk mainstreaming, and system strengthening across rural, urban, and peri-urban contexts. It promotes practical tools such as climate-resilient PC-1 appraisal guidelines, performance-based budgeting, and GIS-based planning to ensure that WASH infrastructure is no longer planned in isolation, but as part of a wider climate resilience ecosystem.

Critically, this Sector Development Plan is designed to be implementable. It includes costed strategies, timelines, and monitoring frameworks that will enable departments to track results and course-correct when needed. By improving interdepartmental coordination particularly between PHED, WASAs, Local Government, Health, Education, and the Environment Department, we can ensure an integrated response to both climate and WASH challenges.

This achievement would not have been possible without the dedicated technical support and coordination efforts of UNICEF. I extend my sincere thanks to the UNICEF Punjab and AWF Pvt Ltd teams for their commitment to facilitating workshops, synthesising policy inputs, and ensuring this Sector Development Plan reflects global best practices tailored to local realities. We are also grateful to other development partners and sector stakeholders who enriched the process with insights and shared commitment.

As we move into the implementation phase, the Planning & Development Board will take the lead in ensuring this Sector Development Plan is institutionalised across sectors and integrated into Punjab's development planning and investment cycles. Our vision is clear: a Punjab where WASH services are resilient to shocks, accessible to all, and accountable to the communities they serve. Together, we can make this vision a reality.

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ACRONYMS

ADB	Asian Development Bank
ADP	Annual Development Programme
AQI	Air Quality Index
AQMS	Air Quality Monitoring Stations
ASC	Annual School Census
ASER	Annual Status of Education Report
BHU	Basic Health Unit
CBO	Community-Based Organisation
CGPC	Clean Green Punjab Campaign
CWIS	City Wide Inclusive Sanitation
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
FAO	Food and Agriculture Organisation
FDA	Faisalabad Development Authority
GBV	Gender-based Violence
GDP	Gross Domestic Product
GHG	Greenhosue Gas
GIS	Geographic Information System
GSDP	Gross Subnational Product
HCF	Healthcare Facility
HUD	Housing, Urban Development
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resource Management
JSR	Joint Sector Review
LDA	Lahore Development Authority
LG&CDD	Local Government & Community Development Department
LHV	Lady Health Visitor
LHW	Lady Health Workers
M&E	Monitoring & Evaluation
MCHC	Maternal and Child Health Centre
MHM	Menstrual Hygiene Management
MICS	Multiple Indicators Cluster Survey
MIS	Management Information System
MPI	Multidimensional Poverty Index
MSNS	Multi-Sectoral Nutrition Strategy
NDC	Nationally Determined Contribution
NEQS	National Environmental Quality Standards
NNS	National Nutrition Survey
O&M	Operation and Maintenance
P&D	Planning & Development
PC	Project Cycle
PCRWR	Pakistan Council of Research in Water Resources
PEQS	Pakistan Environmental Quality Standards
PES	Pakistan Education Statistics
PHED	Public Health Engineering Department

PIDA	Punjab Irrigation and Drainage Authority
PLGA	Punjab Local Government Act
PM	Particular Matter
PMD	Pakistan Meteorological Department
PMDFC	Punjab Municipal Development Fund Company
PMIU	Programme Managerial and Implementation unit
PPP	Public-Private Partnership
PRMSC	Punjab Rural Municipal Services Company
PRSWSSP	Punjab Rural Sustainable Water Supply and Sanitation Project
PSLM	Pakistan Social and Living Standard Measurement Survey
PWRA	Punjab Water Regulatory Authority
PWRC	Punjab Water Resources Commission
RHC	Rural Health Centre
SDG	Sustainable Development Goal
SMC	School Mobilisation Committee
SSP	Shared Socioeconomic Pathway
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UC	Union Councils
UHI	Urban Heat Island
UNICEF	United Nations Children's Fund
VO	Village Organisations
WASA	Water and Sanitation Agency
WASH	Water, Sanitation & Hygiene
WASH-BAT	WASH Bottleneck Analysis Tool
WASH-FIT	WASH Healthcare Facility Improvement Tool
WHO	World Health Organisation
WinS	WASH in Schools
WRA	Women of Reproductive Age
O&M	Operation and Maintenance
ODF	Open Defecation Free
P&D	Planning and Development
PATS	Pakistan Approach to Total Sanitation
Pb	Lead
PCA	Principal Component Analysis
PDHS	Pakistan Demographic and Health Survey
PDMA	Provincial Disaster Management Authority
pH	Potential of Hydrogen
PHED	Public Health Engineering Department
PIDS	Participatory Integrated Development Society
PIUs	Project Implementation Units
PKR	Pakistani Rupee
PLB	Pishin Lora Basin
PMU	Project Management Unit
PPP	Public-Private Partnerships
PS	Potential Salinity
PSDP	Public Sector Development Programme

PTSMC	Parent Teacher School Management Committees
PWSNs	Persons with Special Needs
QWASA	Quetta Water and Sanitation Authority
RHCs	Rural Health Centres
RSC	Residual Sodium Carbonate
S4M	Sanitation for Millions
SAFRON	Ministry of States and Frontier Regions
SAR	Sodium Adsorption Ratio
SBKWU	Sardar Bahadur Khan Women's University
SCAP	Sustainability and Climate Change Action Plan
SDGs	Sustainable Development Goals
SDO	Senior Development Officers
SHC	Specialised Health Centre
SHCs	School Health Services
SO4	Sulphate
TBC	Tuberculosis Centre
TDS	Total Dissolved Solids
TH	Total Hardness
THOs	Teaching Hospitals
THQs	Tehsil Headquarter Hospitals
UC	Union Council
UNGA	United Nations General Assembly
USD	United States Dollar
VIP	Ventilated Improved Pit
Vos	Village Organisations
WAH FIT	Water and Sanitation for Health Facility Improvement Tool
WAPDA	Water and Power Development Authority
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organisation
WinS	WASH in Schools
WQI	Water Quality Index
WRRC	Water Resources Research Centre
ZRB	Zhob River Basin

INTRODUCTION

GEOGRAPHY AND DEMOGRAPHY

Punjab, Pakistan's most populous and economically pivotal province, spans an area of 205,344 square kilometres, forming roughly 26 percent of the country's land area. Its strategic position borders Sindh to the south, Balochistan to the west, Khyber Pakhtunkhwa and Azad Jammu and Kashmir to the north, and India to the east. Punjab's landscape, shaped by the Indus River and its tributaries supporting one of South Asia's most productive agricultural regions. The province is mainly on a plain level, while the north-west and extreme south-west comprise of some hilly areas. The Potohar plateau can be found adjacent to the mountains, and the desert belt of Cholistan lies in the Southeast[1]. The province's climate varies from arid in the south to temperate in the north, with hot summers, a monsoon season, and mild winters, making it ideally suited for diverse agricultural production. Geographically, Punjab enjoys a fertile landscape, with the Indus River and its tributaries—the Jhelum, Chenab, Ravi, and Sutlej—flowing through its plains[2]. This river system irrigates large portions of the province, making it one of the most agriculturally productive regions in South Asia. Punjab's climate ranges from arid in the south to temperate in the north, with scorching summers, a monsoon season, and cool winters, conditions ideal for a diverse agricultural output.

The demographic landscape of Punjab has transformed significantly between the 1998 and 2023 population censuses. Punjab's population has grown from 73 million in 1998 to approximately 127 million in 2023, showing a compound annual growth rate of around 2.5 percent. This expansion, reflective of both natural populations increase and rural-to-urban migration, underscores Punjab's role as the demographic heart of Pakistan, housing over half of the national population.

1 Punjab Portal – Geography https://punjab.gov.pk/about_punjab_geography

2 Punjab Portal – Geography https://punjab.gov.pk/about_punjab_geography

Table 1: Population demographics of Punjab province - Population Census 2023

District	Population 2023	Population 2017	Growth Rate	Urban Ratio	Sex Ratio Male to Female
Lahore	13,004,135	11,119,985	2.65	100	112.5
Rawalpindi	6,118,911	5,402,380	2.10	68.8	103.4
Gujranwala	5,959,750	5,011,066	2.94	60.3	103.3
Faisalabad	9,075,819	7,882,444	2.38	48.4	108.9
Multan	5,362,305	4,746,166	2.06	46.6	103.8
Gujrat	3,219,375	2,756,289	2.63	41.1	99.8
Jhelum	1,382,308	1,222,403	2.08	39.2	103.7
Sheikhupura	4,049,418	3,460,004	2.66	38.3	105.6
Hafizabad	1,319,909	1,156,954	2.23	38.2	103.1
Bahawalpur	4,284,964	3,669,176	2.63	37.8	103.1
Sargodha	4,334,448	3,696,212	2.70	37.1	102.5
Okara	3,515,490	3,040,826	2.45	33.8	103.7
Sialkot	4,499,394	3,894,938	2.44	32.9	102.6
Chiniot	1,563,024	1,368,659	2.24	31.5	102.4
Kasur	4,084,286	3,454,881	2.84	30.5	104.5
Attock	2,170,423	1,886,378	2.37	28.7	100.8
Khushab	1,501,089	1,280,372	2.69	27.9	104.8
Bahawalnagar	3,550,342	2,975,656	3.00	27.4	108.3
Sahiwal	2,881,811	2,513,011	2.31	26.3	102.8
Jhang	3,065,639	2,743,526	1.87	26.1	107.2
Chakwal	1,734,854	1,495,463	2.51	25.1	99.2
Rahim Yar Khan	5,564,703	4,807,762	2.47	24.1	108.6
Dera Ghazi Khan	3,393,705	2,872,631	2.83	23.8	101.9
Vehari	3,430,421	2,902,081	2.83	22.8	102.3
Toba Tek Singh	2,524,044	2,190,602	2.40	22.3	105.5
Pakpattan	2,136,170	1,824,228	2.67	22.1	103.3
Mianwali	1,798,268	1,542,601	2.60	20.2	104.3
Nankana Sahib	1,634,871	1,354,986	3.19	19.8	103.6
Muzaffargarh	5,015,325	4,328,549	2.49	18.9	103.2
Mandi Bahauddin	1,829,486	1,594,039	2.33	18.9	100.5
Layyah	2,102,386	1,823,995	2.40	18.4	106.2
Bhakkar	1,957,470	1,647,852	2.92	18	108.0
Narowal	1,950,954	1,707,575	2.25	17.9	104.4
Lodhran	1,928,299	1,699,693	2.13	16.9	107.3
Rajapur	2,381,049	1,996,039	2.99	3.4	103.2

Population Density: Punjab's population density rose considerably, from 356 persons per square kilometre in 1998 to 621.83 persons per square kilometre in 2023, marking Punjab as one of the densest regions in Pakistan. Urbanisation has amplified this effect, with the province's urban population proportion increasing from 31.3 percent in 1998 to approximately 40.7 percent in 2023. Overall, 44.23 percent of the population of the Punjab province is below 18 years, and this is 45.62 percent in case of rural areas and 42 percent in case of urban areas. Below is the overall population with above 18 years' and below 18 years with break-up of males and females followed by for urban and rural areas. Similarly, 51.2 percent are males and 48.8 are females below 18 years.

Figure 1: Overall Population – Census 2023

Division	Category	Total Population	Male Population	Female Population
Punjab	All Ages	127,333,305	65,277,723	62,041,625
	18 & above	71,012,952	36,424,525	34,576,029
	Below 18	56,320,353	28,853,198	27,465,596
Rural	All Ages	75,620,438	38,581,450	37,035,742
	18 & above	41,115,922	20,924,344	20,188,858
	Below 18	34,504,516	17,657,106	16,846,884
Urban	All Ages	51,712,867	26,696,273	25,005,883
	18 & above	29,897,030	15,500,181	14,387,171
	Below 18	21,815,837	11,196,092	10,618,712

Gender Ratio: The gender ratio has remained balanced, although slightly skewed, with approximately 105 males per 100 females in 2023, following historical trends and reflecting the impact of migration patterns, as men often relocate to urban centres in search of employment.

High Growth Districts: Major urban centres like Lahore, Faisalabad, and Gujranwala exhibit some of the highest growth rates, with Lahore's population now surpassing 13 million. This growth is driven by urbanisation, employment opportunities, and improved living standards, attracting migrants from across the country.

Low Growth Districts: In contrast, rural districts such as Bhakkar, Rajanpur, and Dera Ghazi Khan have experienced relatively lower growth rates, reflecting limited industrial development and fewer economic opportunities. These districts remain largely rural, with populations reliant on agriculture and constrained by infrastructural limitations.

ADMINISTRATIVE DIVISION

As per the latest notification (No.479-2024/6904 – DIR(DEV&G) by the Local government of Punjab, Punjab is divided into ten administrative divisions: Lahore, Faisalabad, Gujranwala, Gujrat, Multan, Rawalpindi, Sahiwal, Sargodha, Bahawalpur, and Dera Ghazi Khan, each functioning as a hub for local governance, economic activity, and public services. These divisions encompass 41 districts and, 156 tehsils (sub-districts). This framework of local governance facilitates administrative control and public service delivery across the province's vast territory. The latest Mouza Census 2020 provides detailed insights into Punjab's land units, reporting 26,462 mouzas. These mouzas, which serve as the basic unit for rural administration and land revenue, are classified as follows:

1. Rural Mouzas: 22,508 (85 percent of total mouzas)
2. Urban Mouzas: 1,844
3. Partly Urban Mouzas: 608
4. Forest Populated Mouzas: 14
5. Forest Unpopulated Mouzas: 117

These classifications underline Punjab's predominantly rural composition despite the increasing urbanisation trends in select regions. According to the Punjab Agricultural Survey 2019, 10.3 million hectares was the net sown area, while 2 million hectares was fallow land, and 1.6 million hectares was lying as cultivable waste in different parts of the province for the year 2016-2017 (Punjab Agriculture Statistics, 2019). Being cash crops, which provide a substantial contribution to the national exchequer,

cotton and rice are two of the major crops of the province[3]. Punjab also has more than 48,000 industrial units, where 39,033 are small and cottage industrial units[4].

SOCIO-ECONOMIC INDICATORS OF PUNJAB

Punjab lies at the centre of the national economy and accounts for over 54 percent of the country's annual production of goods and services (White Paper on the Budget, FY 2019-20). The growth in the Gross Subnational Domestic Product (GSDP) of Punjab was slightly higher than the Gross Domestic Product (GDP) of the country from 2010 to 2018. The GSDP of Punjab from this time period has grown at an average rate of approximately 4.7 percent (White Paper on the Budget, FY 2018-2019). 56 percent of Punjab's land is cultivated, producing staples like wheat, rice, and sugarcane that sustain Pakistan's food security. Major industrial cities like Lahore, Faisalabad, and Gujranwala are central to the province's manufacturing sector, with industries ranging from textiles and construction materials to consumer goods. Punjab also houses rich mineral resources, including limestone, coal, and rock salt, primarily in districts like Chakwal and Dera Ghazi Khan.

However, despite its economic strength, disparities exist within Punjab. Urban centres benefit from infrastructure, education, and healthcare facilities (HCFs), while rural areas lag in access to quality services and employment opportunities. Rapid urbanisation has led to challenges such as housing shortages, air pollution, and pressure on municipal services in cities. Moreover, southern districts face higher poverty rates and limited access to healthcare and education, necessitating focused development efforts. Punjab's socio-economic evolution reflects both opportunities and challenges. Urbanisation continues to drive economic growth, while rural development and resource management remain critical to ensuring inclusive progress. With strategic interventions in sustainable development and urban planning, Punjab is positioned to further its role as Pakistan's economic and demographic nucleus.

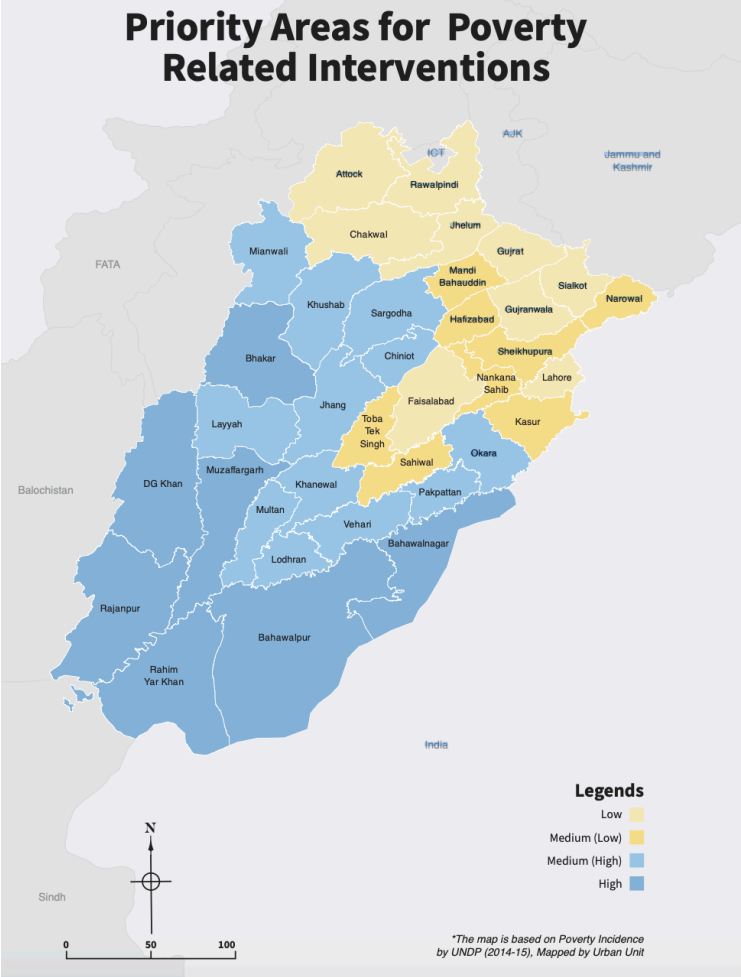
Poverty

Punjab's poverty profile reflects both progress and persistent regional disparities. A study by the Social Policy and Development Centre shows a decline in poverty in both urban and rural areas of Punjab, from 2015-26 to 2018-19 (urban: 36.3 to 33.1 percent and rural 48.6 to 46.6 percent) (Jamal, 2021). However, Punjab continues to face significant intra-regional disparities. According to Multidimensional Poverty Index (MPI) 2014, 43.7 percent of Punjab's rural population lives below the poverty line, contrasting sharply with only 6.3 percent in urban areas, underscoring a rural-urban poverty gap that continues to challenge provincial development goals.

Regional divides within Punjab are equally pronounced, with Southern Punjab experiencing considerably higher poverty levels than its Northern and Central counterparts. This is evident in districts like Rajanpur with MPI incidence of 64.8 percent as compared to 4.3 percent in district Lahore, as reported in MPI 2014. Current conditions highlight that districts in South Punjab consistently lag in essential areas such as education, healthcare, sanitation, and access to safe drinking water, as evidenced by the Social Progress Index[5]. Investing in health, especially in these under-resourced areas, is vital for improving workforce productivity and enhancing physical capacities, including strength and endurance.

3 Punjab Portal – Economy https://punjab.gov.pk/about_punjab_economy
4 Punjab Board of Investment and Trade http://pbit.gop.pk/smeda
[5] The index is based on analysis by the Urban Unit Punjab as shown in Punjab Spatial Strategy 2023

Figure 2: Punjab Poverty Mapping 2014-2015 - Adapted from Punjab Spatial Strategy 2023



The focus of social protection in Pakistan is on protecting the poorest of the poor rather than building a system that protects everyone. Individual benefits and the lifecycle approach are rarely a part of policy discussions. Without a shift away from the poverty-reduction paradigm and towards a universal, lifecycle-based framework, Pakistan will be unable to achieve SDG 1.3[6].

Housing Qualities and Facilities

Housing characteristics significantly influence access to and the quality of WASH services. According to Population Census 2023, in Punjab, 7.23 percent of households live in non-permanent structures (kacha households), while 11.9 percent reside in semi-permanent structures (semi pakka households). Urban areas show significantly lower figures, with only 2.4 percent of households in non-permanent structures, compared to 10.6 percent in rural areas. Similarly, 16.3 percent of rural households live in semi-permanent structures. Regarding housing space, 24.2 percent of households have only one room, and 34.6 percent have two rooms. This issue is more pronounced in rural areas, where 28.11 percent of households have a single room, compared to 18.6 percent in urban areas, as reported in Census 2023. Additionally, 26 percent of households lack a kitchen, with rural households (36 percent) far more affected than urban households (12.75 percent).

6 SDG 1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.

As per Population Census 2023, access to improved drinking water is high, with 96.5 percent of households reporting access, although disparities remain, as rural areas slightly lag behind urban areas, at 96.1 percent and 97.15 percent respectively. However, sanitation remains a challenge, with 9.5 percent of households lacking toilet facilities, a figure that rises to 14.6 percent in rural areas compared to just 2 percent in urban areas. On the other hand, as per the Punjab MICS (Multiplie Indicators Cluster Survey) 2023-24, 99.4 percent of households have access to an improved drinking water source. However, when it comes to sanitation, 6.3 percent of the population still lacks access to proper facilities, with significant disparities between rural and urban areas. While 10.3 percent of the rural population continues to practice open defecation, this figure drops to just 0.6 percent in urban areas.

The disparities in housing characteristics between urban and rural areas highlight critical challenges for the equitable provision of WASH services in Punjab. Non-permanent and semi-permanent structures, predominantly in rural areas, often lack the infrastructure required to support sustainable water and sanitation facilities. Overcrowding in one- and two-room households further exacerbates hygiene risks, limiting the space necessary for maintaining clean and private WASH conditions. The absence of kitchens, particularly in rural areas, compromises food and water safety, underscoring the need for integrated interventions to improve basic household infrastructure. While access to improved drinking water is relatively high, the gap in sanitation coverage remains significant, with a notable portion of rural households still lacking toilet facilities.

Education Attainment

Education is another critical factor affecting WASH outcomes, as awareness and accessibility to these services often correlate with educational attainment, influencing health and social outcomes across generations. Inadequate sanitation facilities often result in school absenteeism during menstruation, negatively affecting girls' education and future economic opportunities. Improved WASH in schools reduces absenteeism and helps close gender gaps in education, enabling broader socioeconomic benefits such as enhanced gender equality and greater female workforce participation.

The Population Census 2023 indicates that 66.2 percent of the population of Punjab above 10 years is literate, with the male literacy rate higher than female at 72 percent and 60.2 percent respectively. 34.3 percent of the population aged 15-49 years have never been to school. 28.7 percent male population between this age group and 40 percent female population between this age group have never been to school. Around 30 percent of children aged 5-16 years are out of the schools.

Figure 3: Summary of Population of Children with Enrolment and Out of Schools – Census 2023

Province/Division	Total	Male	Female	Transgender
Under Five years'	18,309,971	9,358,201	8,951,770	-
Enrolment Primary	15,282,432	7,984,419	7,297,989	24
Enrolment Middle	6,481,465	3,343,253	3,138,137	75
Enrolment Matric	3,725,090	1,887,296	1,837,667	127
Enrolment Intermediate	2,222,542	1,104,180	1,118,281	81
Enrolment Graduation above	2,290,076	1,054,061	1,235,912	103
Out of School Children (5-16)	9,600,164	4,772,207	4,826,873	1,084
Total	57,911,740	29,503,617	28,406,629	1,494

Promoting literacy and education is critical not only for enhancing WASH practices but also for achieving broader health and social outcomes, as educated communities are better equipped to demand, adopt, and sustain WASH services, ultimately benefiting future generations.

School Functionality

Punjab Annual School Census (ASC) 2023-24 indicate that under the School Education Department, Punjab has 48,473 schools, there are 12 schools in Masjid Maktab, 32,344 primary schools, 7,226 middle schools, 8,077 high schools, and 814 higher secondary schools. Notably, the gender disparity in the number of schools is evident, with a higher number of schools catering to females at the primary and middle levels, while males have a slightly higher number of schools at the high level.

Table 2: Types of Schools by Gender – Annual School Census 2023

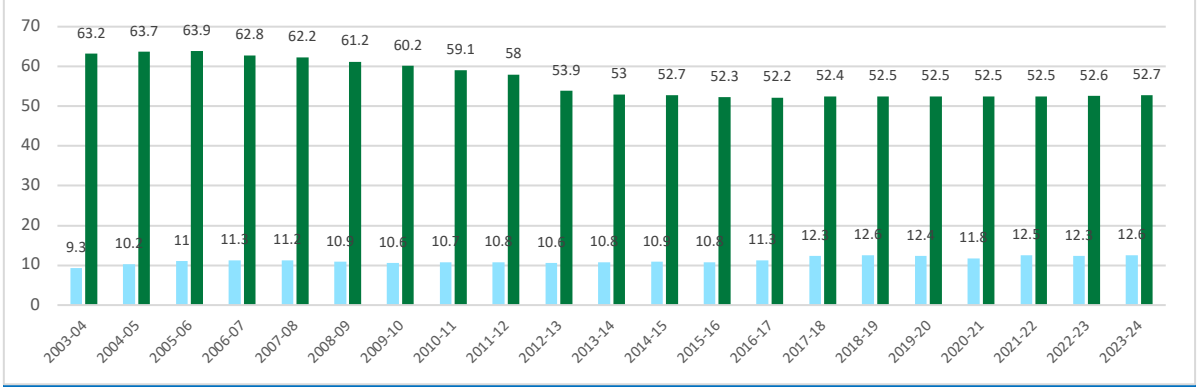
Level	Male	Female	Total
Primary	15,421	16,923	32,344
Middle	2,961	4,265	7,226
High	4,146	3,931	8,077
Higher Secondary	395	419	814
Mosques	12	0	12

Furthermore, 42,502 public schools, which is 88 percent of the total, are categorised as well-constructed (completely solid). However, 5,287 (11 percent) and 512 (1 percent) of the total (5,796 schools) fall under partial solid /partial rough and completely rough[7] category. Punjab's public schools have 282,745 functional classrooms, 13,398 dangerous classrooms (increased due to recent rain/flood), and 3,768 under construction. Open-air class sections total 80,601.

School Enrolment Trends

From 2003-04 to 2023-24, school enrolment in Punjab has generally increased, rising from 9.3 million to 12.6 million. Notably, the trend also highlights a reduction in the number of schools over the years, leading to a higher student-to-school ratio despite the growth in enrolment. The student-to-classroom ratio in Punjab varies by educational level, with 35 students per classroom in primary schools, 38 in middle schools, 47 in high schools, and 53 in higher secondary schools, indicating a steady increase in the number of students per classroom as the level of education progresses, as per the ACS 2023-24.

Figure 4: Trends of Enrolment and Schools Since 2003-04 – Annual School Census 2023



[7] Completely rough refers to muddy construction.

Labour Force Participation

Labour force trends provide insight into the province's economic landscape and resources available for infrastructure improvements. As per the Labour Force Survey 2020-21, the crude participation rate for Punjab reflects consistent trends over the two time periods, 2018-19 and 2020-21. In both years, Punjab's total crude participation rate remained at 34.9 percent, showcasing no significant change in overall economic activity. When disaggregated by gender, males consistently demonstrated a much higher participation rate compared to females. In 2018-19, 50.3 percent of males participated in economic activities, slightly decreasing to 50.1 percent in 2020-21. In contrast, although much lower, the female participation rate showed a slight increase, rising from 19.6 percent in 2018-19 to 19.5 percent in 2020-21. These figures highlight a persistent gender disparity in labour force participation in Punjab, with male participation rates significantly outpacing female rates. Despite minor improvements in female participation, substantial efforts are required to reduce the gender gap and enhance women's economic inclusion in the province. Low labour force participation rates indicate discouraged workers, possibly because of a lack of employment opportunities, whereas a low literacy rate signals a lack of skilled and learned labour force (Siddique & Achakzai, 2022).

Challenges in Child Protection

Child protection remains a critical area of concern in Punjab, as highlighted by several key indicators. As per Punjab MICS 2023-24, around 79.9 percent of children under the age of five have their births registered, yet only 54.9 percent of mothers or caretakers are aware of the birth registration process. This gap in awareness underscores the need for targeted campaigns to educate parents and caregivers on the importance and procedures of birth registration, which is a fundamental step in securing children's legal identity and access to basic rights and services.

The prevalence of violent discipline is alarmingly high as reported in MICS 2023-24, with 83.1 percent of children aged 1-14 years exposed to some form of violent disciplinary practices. Among these, 41.9 percent endure severe forms of punishment, revealing the urgent need to promote positive parenting techniques and enforce laws against child abuse. Child labour remains a pressing issue, affecting 8.1 percent of children aged 5-17 years. This highlights the intersection of poverty and lack of educational opportunities, which force many children into exploitative work environments, depriving them of their right to education and a safe childhood.

Early marriage also continues to impact children, particularly girls. Among women aged 20-49 years, 3.4 percent were married before the age of 15, and 14.5 percent were married before the age of 18. While the prevalence of early marriage is lower among men, 1.1 percent were married before the age of 15, and 4.8 percent before the age of 18, as reported in MICS 2023-24. These figures emphasise the need for robust enforcement of laws prohibiting child marriage and greater efforts to address the socio-cultural factors driving this practice. These indicators collectively underline the need for strengthened child protection mechanisms, increased public awareness, and enhanced legal frameworks to safeguard the rights and well-being of children in Punjab.

Health Indicators

The Punjab MICS 2023-24 provides important insights into child mortality and survival, highlighting significant challenges in neonatal and infant health. The neonatal mortality rate stands at 33 deaths per 1,000 live births, while the infant mortality rate is higher at 49.3 deaths per 1,000 live births. The child mortality rate is relatively lower, at 5.6 deaths per 1,000 children, but the overall under-five mortality rate remains concerning at 54.5 deaths per 1,000 live births. Additionally, 6.3 percent of births in the

province are classified as premature, further emphasising the need for strengthened healthcare interventions. These figures emphasise the importance of improving access to quality healthcare services, including prenatal and neonatal care, to address preventable child deaths and improve survival outcomes.

According to the National Nutrition Survey (NNS) 2018, 36.4 percent of children in Punjab are stunted, 15.3 percent of children are wasted, and 23.5 percent are underweight. 12.1 percent of women of reproductive age (WRA) are underweight, while 25.4 percent are overweight (NNS, 2018).

Between 2007 and 2020, Punjab witnessed significant growth in health infrastructure[8]. The number of hospitals increased from 325 to 390, with the available beds rising substantially from 36,851 to 59,574. Dispensaries also increased in number from 1,260 to 1,411, although there was a decline in the number of beds in dispensaries, dropping from 316 to 89. For Rural Health Centres (RHCs), the number grew from 333 to 358, accompanied by an increase in available beds from 5,866 to 7,182. Similarly, Basic Health Units (BHUs) saw a slight increase in numbers, from 2,529 to 2,587, with an improvement in bed availability from 4,908 to 5,131. Maternal and Child Health Centres (MCHCs), however, decreased from 347 in 2007 to 280 in 2020, with only 19 beds reported in 2020. This data reflects a growing emphasis on improving healthcare infrastructure in Punjab, with significant expansions in hospital services and rural health facilities.

Table 3: Health Facilities in Punjab - Socio Economic Indicators of Punjab at District Level

Institution Type	2007 Institutions	2007 Beds	2020 Institutions	2020 Beds
Hospitals	325	36,851	390	59,574
Dispensaries	1,260	316	1,411	89
RHCs	333	5,866	358	7,182
BHUs	2,529	4,908	2,587	5,131
MCHs	347	-	280	19

As per the data from 2021, Punjab's healthcare sector was supported by a significant number of health personnel across various fields. There were 102,115 doctors, forming the backbone of medical services in the province, along with 11,396 dentists catering to dental health needs. 84,165 nurses provided essential support in hospitals and HCFs, ensuring patient care and management. Additionally, 16,352 Lady Health Visitors (LHVs) played a crucial role in community health, particularly in maternal and child healthcare. 16,944 midwives contributed to safe childbirth and prenatal care, highlighting the province's focus on improving reproductive health services. This diverse workforce reflects the province's commitment to strengthening healthcare delivery across Punjab.

SOCIO-ECONOMIC DYNAMICS AND THEIR IMPACT ON WATER, SANITATION AND HYGIENE (WASH)

Effective WASH practices are deeply intertwined with education, infrastructure, and communal development, reflecting the socio-economic status of households (Raihan, et al., 2019). A variety of socio-economic and demographic factors influence access to WASH services. While these factors differ across countries, common determinants include household income, educational attainment, and geographical location (Kong, et al., 2020). Wealthier households are more likely to access WASH

[8] Socio Economic Indicators of Punjab at District Level (https://www.pbs.gov.pk/sites/default/files/social_statistics/publications/Social_Indicators_of_Punjab_v2.pdf)

facilities due to their financial capacity to invest in infrastructure, such as piped water connections and improved sanitation systems (Dongzagla, 2021). Education also plays a pivotal role; households with higher education levels are typically more aware of the health advantages of improved WASH services and prioritise investments accordingly (Pandey, 2022).

Social identity, particularly in rural areas, further impacts WASH access. Marginalised groups—often delineated by caste, ethnicity, or tribal affiliations—experience systemic barriers that limit their ability to access public WASH resources (Balasubramanya, Stifel, Alvi, & Ringler, 2022). Rapid urbanisation adds to these challenges, especially in cities with insufficient infrastructure to keep pace with population growth. Informal settlements, in particular, are disproportionately affected by inadequate water and sanitation facilities, making these populations highly vulnerable to water scarcity and poor hygiene conditions (Dongzagla, 2021). While socio-economic indicators are fundamental in understanding WASH access, systemic factors such as political commitment and infrastructure investments are equally significant. Inequities in WASH provision not only pose social justice concerns but also hinder progress toward Sustainable Development Goals (SDGs). Achieving equitable access is critical for advancing public health, fostering gender equality and women's empowerment, reducing poverty, and driving economic growth (Dickin & Gabrielsson , 2023). In addition, household WASH conditions have far-reaching implications for health. Inadequate WASH facilities result in increased healthcare expenses and reduced productivity, placing a heavier economic burden on already disadvantaged households (Azeez, Henderson-Mitchell, LaFevor, & Gregg, 2023).

STRATEGIC VISION FOR WASH IN PUNJAB

The Government of Punjab developed the first WASH Sector Development Plan 2014-2024 with the technical support of UNICEF under the umbrella of the Planning and Development (P&D) Board through an extensive consultation process. The document was shared and reviewed at the highest political and policy forums for endorsement before it was formally launched in 2015. The WASH Sector Development Plan proved helpful in creating an enabling environment and setting a strategic vision for WASH in the province, evidenced by many key successes like reduction in open defecation in the province, increase in allocations for WASH, bringing innovations in service delivery models, improved reporting, changes in capacity development methods, etc. The existing Plan ended in June 2024.

Over the last ten years, Punjab has become more vulnerable to climate change, and impacts are visible in terms of compromised productivity and resilience. This has resulted in frequent and high-intensity flooding, unusual rain patterns, drought, smog and vector-borne diseases. Moreover, it has placed a burden on WASH services, damaged WASH infrastructure, and disrupted water supply services in communities. The governance challenge has further weakened the government and community capacities for the provision, access and use of WASH services. In addition, urbanisation and water resource management, including water safety, protection, and quality, are emerging challenges due to natural and human-induced disasters. In the context of SDGs, climate change and circular economy, there is consensus among the stakeholders about the need for the development of a comprehensive WASH Sector Development Plan 2025-35 to address the multifarious challenges by adopting a comprehensive and systematic approach.

A provincial WASH Sector Development Plan holds paramount significance for several interconnected reasons, aligning with global development goals and addressing crucial facets of human well-being. The advent of the SDGs, notably SDG 6, underscores the commitment to achieving universal and equitable

access to safe drinking water and sanitation by 2030. Punjab WASH Sector Development Plan becomes an essential localised strategy to contribute meaningfully to these global targets, ensuring tailored approaches to address specific area and community needs. Beyond its role in meeting global goals, a WASH Sector Development Plan is integral to human development, recognising the direct link between water infrastructure, water services, and improved human well-being (Libanio, 2021). In addressing vulnerable populations, such as women, persons with disabilities and the economically disadvantaged, the WASH Sector Plan allows for targeted strategies, fostering inclusivity and equity in access to essential services. The plan also integrates climate change adaptation measures, recognising Pakistan's vulnerability to climate impacts and ensuring sustainable water management practices. Optimising resource allocation is another compelling reason for a WASH Sector Development Plan.

PROGRESS AND CHALLENGES OF PUNJAB WASH SECTOR DEVELOPMENT PLAN 2014-2024

KEY ACHIEVEMENTS

Policy and Legislative Framework:

1. The Punjab Water Act 2019 and Local Government Act 2019 and 2022, Punjab Water Policy 2018 and Punjab Climate Change Policy 2024 provided a robust foundation for water governance, resource management, and equitable access to WASH services, including climate resilience. These documents provide a sound framework to streamline the WASH sector in the province by suggesting strategies for integration to address key challenges such as water scarcity, quality, and governance inefficiencies by setting clear standards and assigning accountability.
2. Drafting the Punjab WASH Strategy 2020 was a comprehensive roadmap, aligning provincial efforts with the SDGs. The strategy outlined key WASH priorities along with the process of their alignment with development planning.
3. Integration of WASH into the Punjab Growth Strategy 2018 established the role of water, sanitation, and hygiene as critical enablers of economic growth, improving public health and productivity through better services.

Institutional and Organisational Advancements:

1. Through the 6th Provincial Cabinet Meeting 2024, roles were clarified between the Public Health Engineering Department (PHED) and the Local Government & Community Development Department (LG&CDD). These moves significantly reduced overlapping mandates, improved inter-departmental coordination, and enhanced the efficiency of WASH service delivery.
2. Punjab Rural Municipal Services Company (PRMSC) worked to address rural-urban disparities, streamlining service delivery mechanisms in previously underserved areas with a key focus on achieving SDGs and sustainable service delivery through cost recovery approaches.
3. The establishment of the Punjab Aab-e-Pak Authority, renamed as Punjab Saaf Pani Authority in 2024, focused exclusively on improving rural drinking water access, which had been initiated under the Punjab Saaf Pani Company earlier. The Punjab Municipal Development Fund Company (PMDFC) also supported the local government in enhancing its asset management and capacity development to improve WASH service delivery.

WASH in Multi-Sectoral Strategies:

1. Integration of WASH into the Multi-Sectoral Nutrition Strategy (MSNS) recognised the role of clean water, proper sanitation, and hygiene in reducing malnutrition and waterborne diseases. This linkage highlighted the interconnectedness of WASH with public health and nutrition outcomes, and a significant reduction in open defecation in Punjab has been achieved.
2. WASH components were embedded into the Punjab Climate Change Policy and Action Plan 2024, focusing on climate-adaptive infrastructure, water conservation practices, and disaster-resilient sanitation systems.
3. The Punjab Education Sector Plan (2019-20 to 2023-24) and WASH in Schools (WinS) Strategy 2016 integrate WASH as a critical component of school improvement. It emphasises the provision of clean drinking water, functional sanitation facilities, and hygiene education to

create a healthy learning environment. The plan also addresses the need to maintain WASH standards through regular monitoring and capacity-building initiatives.

Infrastructure and Programmatic Successes:

1. Significant progress in wastewater treatment infrastructure: The initiation of over 20 wastewater treatment plant schemes in cities like Lahore, Multan, and Faisalabad are key to safely managing sanitation and strengthening urban sanitation.
2. Expansion of solar-powered water supply schemes, reducing reliance on non-renewable energy sources and improving sustainability in rural areas
1. Implementation of rainwater harvesting systems in Lahore, Rawalpindi, and Murree provided climate-resilient solutions, ensuring water availability during droughts and reducing dependence on traditional energy sources.
3. Donor-funded projects like the Punjab Cities Programme by the World Bank and the Punjab Intermediate Cities Improvement Investment Project by the Asian Development Bank (ADB) are contributing to developing systems and approaches to strengthen municipal governance, enhance infrastructure, and promote sustainable urban development. WASH is an important component of these interventions.
4. The PRMSC, created in 2021, is implementing the Punjab Rural Sustainable Water Supply and Sanitation Project (PRSWSSP), funded by the World Bank and the Government of Punjab to improve rural water and sanitation initially in 2000 villages in 16 tehsils. It extends water supply to underserved villages, establishes sanitation and solid waste management systems, and promotes hygiene through public education.

Technological and Urban Planning Innovations:

1. The Urban Unit utilised Geographic Information Systems (GIS) and other data-driven technologies to create urban master plans that incorporated WASH components, ensuring that infrastructure and services were equitably distributed. The Government of Punjab tasked the Urban Unit to prepare drinking water and sanitation Master Plans for 200 towns in the province, which was a key strategic action from 2014 to 2024. So far, more than 30 towns have drinking water and sanitation master plans, while all others will be completed by 2025.
2. The PMDFC also prepared the asset management system for local governments, including water and sanitation services. Similarly, the Aab-e-Pak Authority, now known as Punjab Saaf Pani Authority, is applying different innovative approaches for cost recovery from filtration plants and developing affordable solutions for using surface water where groundwater is brackish or scarce.
3. Piloting of water metering systems in areas like Johar Town, Lahore and WASA Faisalabad (where 7714 water-metered installed at consumer level) promoted efficient water use, setting a precedent for scaling such innovations across the province. Lahore WASA and other WASAs are also exploring the option of bottled water.
4. Management Information Systems (MIS), which are managed by the HUD&PHED, are vital for WASH service coverage and quality. It helps to streamline data collection, analysis, and reporting across programme areas, enhancing decision-making and programme effectiveness. However, MIS Punjab is not publicly accessible and lacks interdepartmental synchronisation with key entities such as Local Government, WASA, and Municipalities.

WASH in Education and Health:

1. The WASH in Schools (WinS) Strategy and Roll Out Action Plan improved sanitation facilities, clean water access, and hygiene education in schools, fostering better health and academic outcomes for students
2. The Punjab WASH in Health Care Facilities Strategy and Roll Out Action Plan has been developed after an assessment. Similarly, the Health Sector Strategy (2019-2028) incorporated WASH interventions to reduce the incidence of waterborne diseases and improve maternal and child health, particularly in rural and underserved areas.

Sector Monitoring and Coordination:

1. The adoption of the WASH Bottleneck Analysis Tool (WASH-BAT) facilitated a structured approach to identifying challenges and implementing evidence-based solutions at the district and provincial level, such as in Jhang, where focused interventions were developed based on the analysis. Joint Sector Reviews (JSRs) became instrumental in assessing progress, identifying gaps, and promoting collaborative planning across stakeholders.
2. Established the Programme Management and Implementation Unit (PMIU) in PHED to improve inter-departmental coordination, streamline stakeholder engagement, and align initiatives with broader sector goals, but this ended in 2021.
3. Deployment of an IT-based monitoring system for local governments, ensuring real-time tracking of service delivery and accountability.

Sector Efficiency:

1. Urban WASAs energy audits and expansion of solar-powered water supply schemes both in urban and rural areas are gradually introduced, which would reduce reliance on non-renewable energy sources and improve sustainability in rural areas
2. The working ratio, defined as the proportion of operating expenditures to total operating revenues, has improved for WASA Lahore, WASA Multan, and WASA Rawalpindi, where expenditures have now been balanced with revenues.
3. To cope with the energy crisis, 31.8 percent of installations of WASA Faisalabad and 19.8 percent of WASA Gujranwala are shifted to alternative energy sources.
4. Capacity-building initiatives targeted communities, school administrators, and government institutions, equipping them with skills to maintain and operate WASH facilities sustainably. These efforts improved service delivery efficiency and reduced operational breakdowns.

UNDERACHIEVEMENT

Comprehensive Legislation Framework:

1. Multiple legislations for WASH introduced and existed, like the Water Act 2019, Local Government Act 2022, Punjab Environment Protection Act 2012 updated 2020, Punjab Cities Development Act 1979, etc, but lacked a comprehensive act that served WASH.
2. Weak operationalisation of the Punjab Water Commission and Punjab Water Services Regulatory Authority has limited the oversight and regulation of WASH services.

Water Quality Management:

1. Municipal and Industrial discharge, and agricultural runoff have caused significant contamination of surface and groundwater sources. As per MICS 2024, nearly 53 percent of water sources tested for drinking water during the survey had E-coli contamination, and this 76.7 percent at the household levels. Hence, nearly 3/4th of the population in Punjab is using

water sources that are contaminated. remain unsafe, and enforcement of quality standards is inconsistent.

2. Water quality awareness, and testing could not scale up at the level that is required. UNICEF supported the development of draft Punjab Urban Water Safety Strategy which needs to be implemented.

Decline in Access to Piped Water:

1. Access to piped water has declined to 15 percent in 2024 from 19 percent in 2014 showing dismal progress. This is significantly high in urban areas where it has reduced from 39 percent to 18.8 percent. While this has increased in rural areas from 9.7 percent in 2014 to 12.4 percent in 2024.
2. While urban centres have benefited from significant WASH improvements, rural areas remain underserved evident from the fact of 12.4 percent coverage of access to piped water in rural areas compared to 18.8 percent in urban areas.

Waste-Water and Faecal Sludge Management:

1. Though Punjab made a good stride towards safely managed sanitation, less than 50 percent of the population has access to safely managed sanitation services. Only 30 percent of the population has access to sewered sanitation system. Formal mechanism for faecal sludge management system has not been established so far.

Limited Climate Resilience:

1. Despite progress in introducing climate-adaptive measures, vulnerable areas, particularly flood-prone and drought-affected regions, lack comprehensive infrastructure to mitigate climate impacts on WASH services evident from loss of WASH infrastructure in Southern Punjab and water quality due to urban flooding, industrial discharge, etc.

Funding and Sustainability Issues:

1. An increase in funding for WASH has been witnessed but this had been significantly low compared to require for WASH Sector Development Plan need.
2. Further, sustainability and scalability remained challenging due restricted sources like PATS funding and PMU for WASH ended after four years while both projects needed annual recurring support for their sustainability and scaling up.
3. Suboptimal revenue collection by water utilities, coupled with low tariffs, continues to constrain the financial sustainability of the sector.

Monitoring and Coordination Gaps:

1. Despite the introduction of annual WASH JSRs through tools like WASH-BAT, this is not fully institutionalised yet. On the other hand, province-wide monitoring framework hinders the consistent tracking of progress and sector efficiency improvements has not been established.
2. Different WASH related MIS developed–tested but a coordinated centralised WASH MIS in the province is missing that can help to track outcome and outputs.

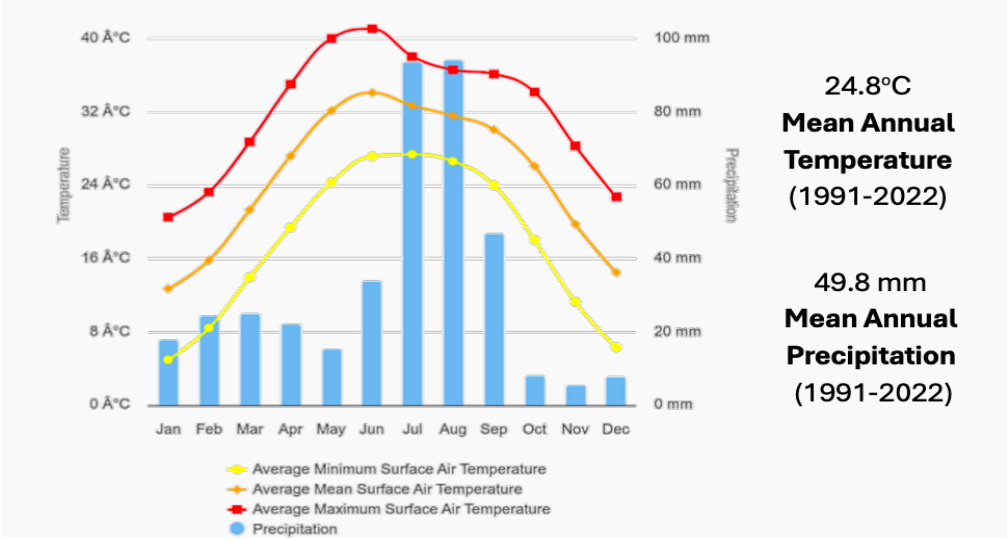
CLIMATE CHANGE AND ITS IMPACT

Climate change refers to long-term shifts in weather patterns and temperatures due to both natural factors and human activities. Climate change has an important effect on food security in Pakistan and carries many challenges. Regrettably, Pakistan has confronted about 150 weather-related occurrences as a direct consequence of climate change. In Punjab, the most populated province of Pakistan, climate change manifests through significant variations in temperature, precipitation, and extreme weather events. The effects are becoming increasingly evident with the intensification of extreme weather events such as floods, droughts, air quality, and heat waves. These environmental changes have profound implications for Punjab's economy, agriculture, public health, and natural resources, especially water, sanitation, and hygiene (WASH) services.

WEATHER PATTERNS AND CLIMATE NORMALS:

Over the past three decades, Punjab has experienced a notable increase in both minimum and maximum temperatures. According to provincial data, the mean annual minimum and maximum temperatures in Punjab (1991–2022) are recorded at 17.1°C and 30.1°C, respectively, with an overall mean of 24.8°C and an average annual precipitation of 49.8 mm.

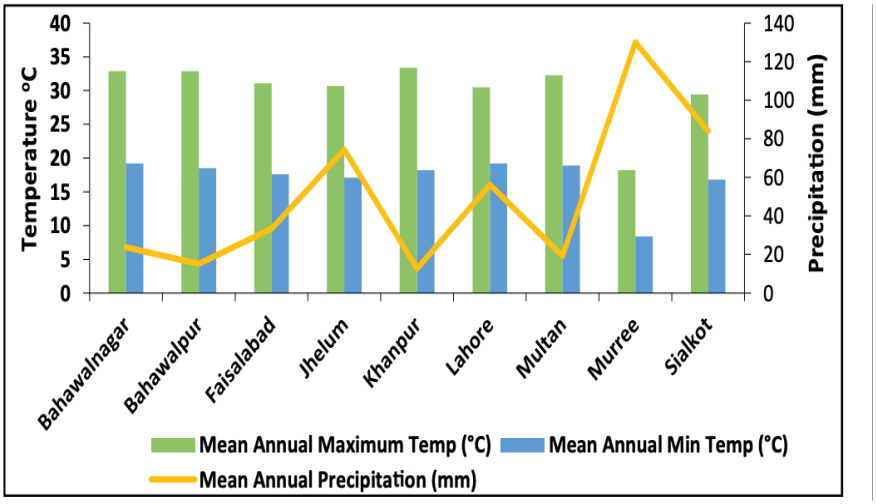
Figure 5: Climate Parameters (Source: Punjab Climate Change Policy 2023)



Rising temperatures have been observed, with increases of 0.97°C in minimum temperatures and 1.14°C in maximum temperatures over the past 30 years[9]. This rise in temperature is not merely an academic concern, it has tangible impacts on the livelihoods and health of millions of people. This has been particularly affecting 57 percent of the geographical area of the province. In South Punjab, an additional 20 days have been added to the annual summer period (Punjab Climate Change Action Plan, 2024). This rise in temperature has significant implications for agriculture, health, and infrastructure resilience.

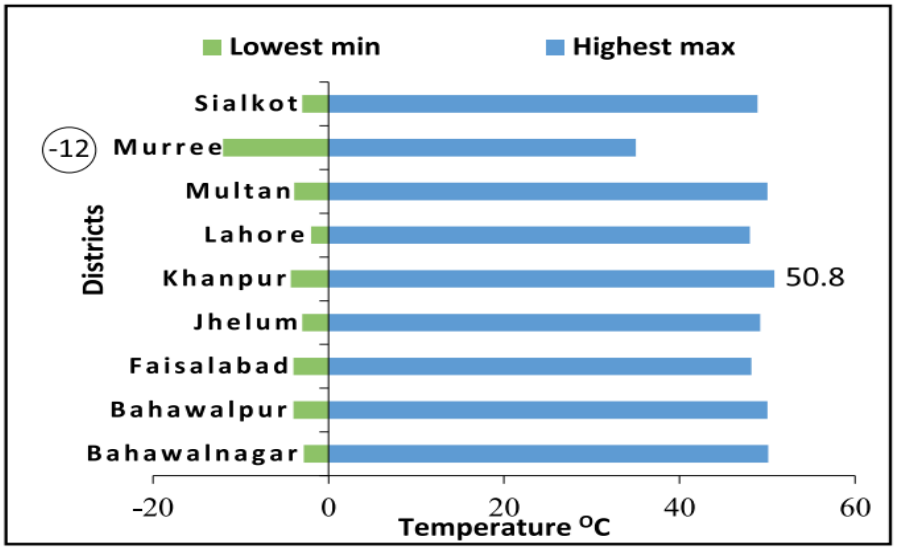
[9] Environmental Protection Agency, Punjab (2023). Punjab State of the Environment Report 2022. Strategic Planning and Implementation Unit, Punjab Green Development Programme, Environment Protection Department, Government of the Punjab, Pakistan. https://epd.punjab.gov.pk/soe/

Figure 6: Climate Normals in Punjab 1991-2020 (Source PSER 2023)



From the 1880s to 2020, the extreme records of minimum and maximum temperatures in Punjab show that the lowest minimum temperature has been recorded to be -12°C (in Northern Punjab), whereas the highest maximum temperature has been recorded to be 50.8°C (in Southern Punjab). The wide gap between these temperature extremes depicts the high variability of temperatures across the province.

Figure 7: Extreme Temperature Records in Punjab from 1880s to 2020 (Source: PSER 2023)



CLIMATE CHANGE SCENARIOS IN PUNJAB

Different scenarios of climate change outline future climate trajectories for Punjab under varying levels of GHG emissions. These scenarios are based on *Shared Socioeconomic Pathways (SSPs).*

Under Low Scenario (SSP1-2.6), global temperature increases are limited due to a strong emphasis on sustainable development, renewable energy adoption, and climate-friendly technologies. By 2030, average temperatures in Punjab are projected to rise slightly, reaching around 26.05°C. By 2050, the temperature would increase to 26.85°C under this scenario, and for Precipitation, the province would

experience fewer severe fluctuations in rainfall patterns, meaning less disruption to agriculture and water resources.

In the Intermediate Scenario (SSP2-4.5), while climate mitigation efforts are undertaken, they are not aggressive enough to meet the goals of the Paris Agreement. Economic and technological progress occurs, but reliance on fossil fuels persists. By 2040, the average temperature in Punjab is expected to rise to 26.64°C. By 2050, it will reach 27.17°C. in terms of impact, the province would face moderate increases in extreme weather events like floods, droughts, and heatwaves. Agriculture and water resources would experience greater stress compared to the low scenario.

Under High Scenario (SSP3-7.0), the world fails to implement meaningful climate policies, leading to significant global warming. There is continued reliance on fossil fuels, high emissions, and a lack of international cooperation on climate mitigation.
By 2030, Punjab's average annual temperature is projected to be around 26.06°C, but it will rapidly increase to 26.88°C by 2050. Punjab would face severe stress on its water resources, agriculture, and public health systems. Floods, heatwaves, and droughts would become more frequent and destructive, severely impacting both rural and urban populations.

Very High Scenario (SSP5-8.5) represents a future with unchecked GHG emissions and no significant efforts to curb global warming. Economic growth is prioritised over environmental sustainability, resulting in massive increases in global temperatures and catastrophic climate impacts. By 2040, Punjab would experience an average annual temperature increase of 26.78°C. By 2050, the temperature will rise dramatically to 27.63°C. The region would experience widespread environmental degradation, frequent and intense heat waves, and significant crop losses. The province would suffer from extreme flooding, exacerbating water scarcity and public health crises. Urban areas, particularly in southern Punjab, would become increasingly uninhabitable due to extreme heat and deteriorating air quality.

Figure 8: Change in Temperature in Major Cities of Punjab Under Worst Scenario RCP in 8.5°C

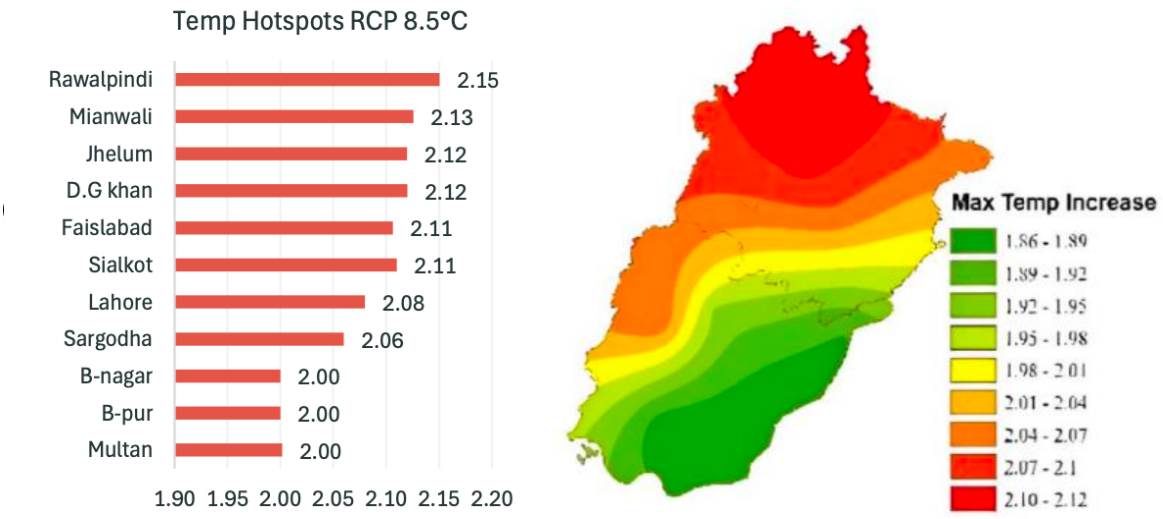
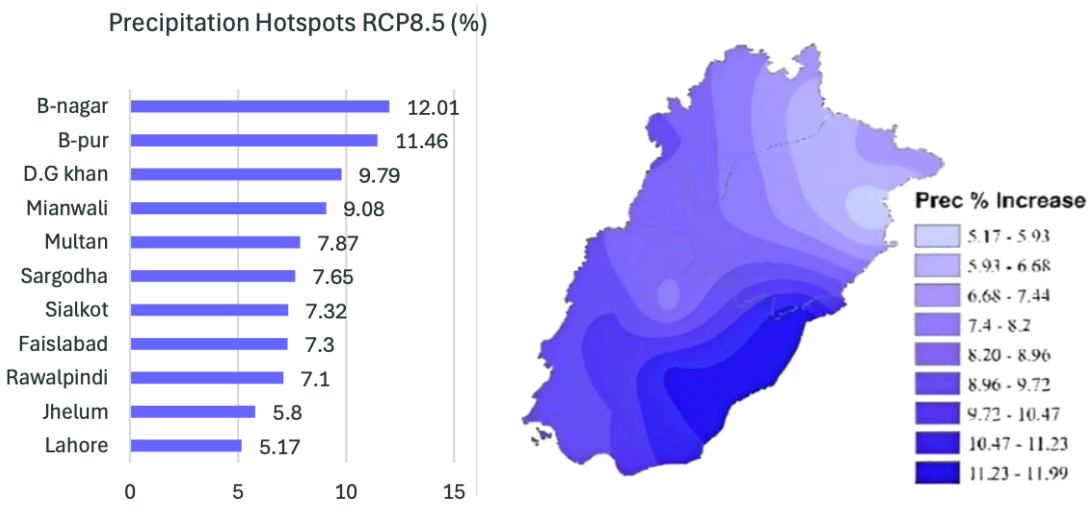


Figure 9: Change in Precipitation in Major Cities of Punjab Under Worst Scenarios RCP in 8.5°C



Under the **Worst-Case Scenario (SSP5-8.5),** several districts in Punjab, including Lahore, Rawalpindi, and Multan, are projected to face a 2°C rise in temperature by 2050. Additionally, cities like Faisalabad, Sialkot, Sargodha, and Bahawalpur are expected to experience precipitation increases of up to 11.46%, potentially leading to severe flooding. These scenarios offer a roadmap of potential futures, depending on the level of global and local climate action taken. Under the low scenario, the impacts on Punjab could be mitigated to manageable levels, while under the high and very high scenarios, the province would face devastating consequences for its agriculture, water resources, public health, and infrastructure.

The year 2022 was one of the hottest on record for Pakistan, with Punjab facing some of the most extreme temperatures. According to the Pakistan Meteorological Department (PMD), several cities in Punjab, including Multan, Bahawalpur, and Sargodha, recorded temperatures exceeding 47°C during the peak of the summer season in May 2022. These temperatures were 3-4°C higher than the historical average for the region. Prolonged exposure to such extreme temperatures had widespread consequences for public health, agriculture, and the region's economy. The Intergovernmental Panel on Climate Change (IPCC) has noted that South Asia is particularly vulnerable to heatwaves due to its geographic location and reliance on agriculture (IPCC, 2022). Punjab, as an agricultural hub, is thus highly susceptible to the negative impacts of rising temperatures. The frequency and duration of heatwaves in the region are expected to increase as global temperatures continue to rise.

FLOODS AND RAINFALL

Flooding has been a recurrent and devastating natural hazard in Punjab, primarily driven by seasonal monsoon rains and glacier melts from the northern regions. Punjab's geographical features, including its vast river systems, make it especially prone to riverine floods. Floods have historically wreaked havoc on agriculture, infrastructure, human settlements, and overall livelihoods. Punjab experiences three types of flooding—riverine, flash floods, and urban floods—each of which has unique impacts depending on the region's topography and infrastructure.

Riverine floods, which are caused by the overflow of rivers, are the most common type of flooding in Punjab. The Indus River and its tributaries (the Sutlej, Chenab, Ravi, Jhelum, and Beas rivers) have historically flooded during the monsoon season, affecting millions of people. In addition, flash floods

are increasingly becoming common in the hilly areas of northern Punjab due to rapid, intense rainfall, while urban flooding affects major cities like Lahore, Faisalabad, and Rawalpindi due to poor drainage systems and rapid urbanisation. As climate change intensifies, the frequency and severity of these floods are increasing, leading to immense socioeconomic losses.

Historically, floods have had a devastating impact on the province. Between 1973 and 2022, more than 863 million people were affected by floods in Punjab, with over 3,000 lives lost (EPA, 2023). The 2010 floods stand out as one of the most catastrophic events, displacing 1.6 million people and causing PKR 219 billion in damages. The agricultural sector, which is the lifeblood of Punjab's economy, was particularly hard hit. Farmers lost vast swathes of crops, particularly wheat, rice, and cotton, as floodwaters inundated fields and destroyed irrigation systems. The economic losses extended far beyond agriculture, impacting infrastructure, housing, and livelihoods.

Figure 10: Flood Hazard in Punjab - Contingency Planning 2022

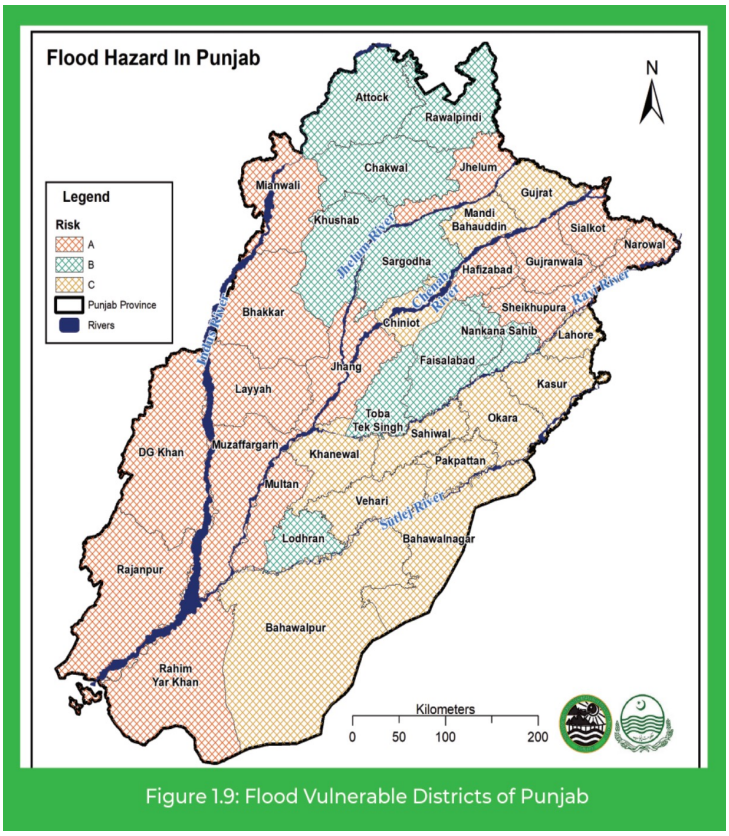


Figure 1.9: Flood Vulnerable Districts of Punjab

For floods, the districts in Punjab have been classified into three categories i.e. High, Moderate and Low. As alluded to in Figure 10, the South Western Districts of Punjab are highly vulnerable, followed by the Northern Punjab district as moderately vulnerable and South Eastern districts are less vulnerable except for some hotspots in the east under the Gujranwala division, which are highly vulnerable. This flood mapping was based on floods of 2010, 2011, 2014 and 2015. A similar kind of pattern has been observed in the 2022 and 2023 floods, where West Southern districts were severally damaged.

The 2022 floods were another brutal reminder of the region's vulnerability. Unprecedented monsoon rains—70 percentage higher than normal—triggered widespread flooding, affecting more than 438,000 acres of agricultural land. Destruction of crops such as wheat, rice, and sugarcane not only deprived farmers of their income but also threatened food security across the province. Livestock, another

crucial asset for rural households, was not spared, with over 733,000 animals lost to the floods (UN-OCHA, 2022). The financial toll was staggering, with direct damages estimated at USD 566 million and longer-term economic losses expected to be much higher. The situation worsened in 2023 when Punjab was hit again by severe flooding along the Sutlej River. The river swelled to its highest level in 35 years, inundating over 545,270 acres of farmland and displacing thousands of people (EPA, 2023).

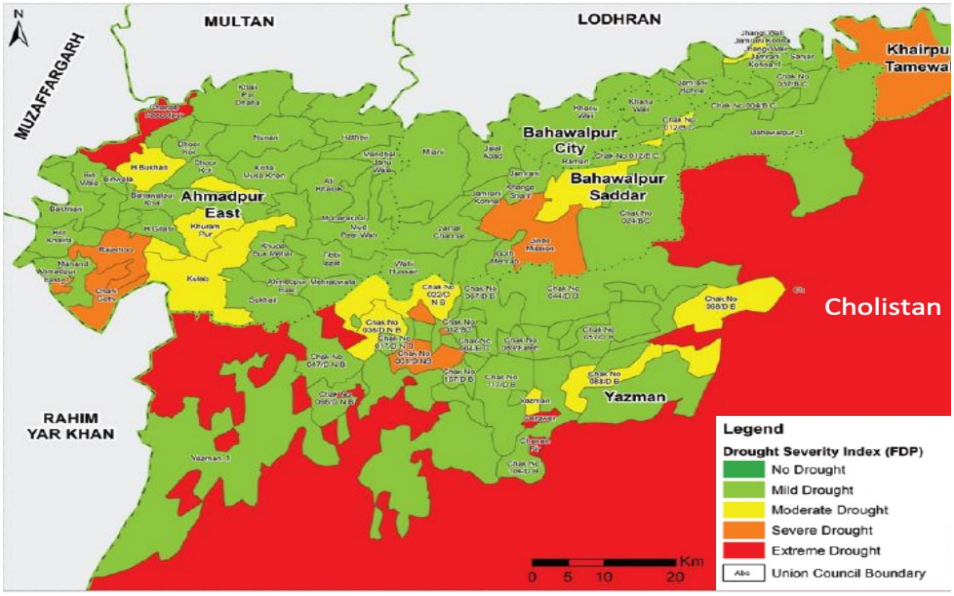
The floods also have dire consequences for public health. Waterborne diseases such as cholera, dysentery, and typhoid are common in the aftermath of floods due to the contamination of drinking water sources. The spread of vector-borne diseases like dengue fever is also exacerbated by stagnant floodwaters, which provide breeding grounds for mosquitoes. As per the report by EPA on Current Condition of Environment after the 2022 floods, there was a sharp increase in cholera cases in Punjab, with over 250 confirmed cases reported between May 2022 and April 2023. These public health crises place additional stress on already overburdened healthcare systems in the province, especially in rural areas with limited access to medical facilities. Floods also lead to large-scale displacement, as families are forced to leave their homes and seek shelter in temporary camps. These camps often lack adequate sanitation facilities, clean water, and healthcare services, further increasing the risk of disease outbreaks. Displaced populations face long-term challenges in rebuilding their homes and livelihoods, with many falling deeper into poverty as a result of repeated flooding events.

DROUGHTS

Droughts in Punjab are characterised by reduced precipitation, water shortages, and increased dependence on dwindling groundwater resources. The frequency and intensity of these droughts have been exacerbated by climate change, leading to severe economic, social, and environmental impacts. Groundwater depletion is especially critical in areas like Lahore, Multan, and Khanewal, where over-abstraction has pushed water tables below critical limits.

Historically, Punjab has faced several severe droughts, particularly in its southern districts, such as Bahawalpur and Rahim Yar Khan, where arid and semi-arid climates make agriculture particularly vulnerable. One of the major droughts occurred in 1999-2000, which severely affected crop production, livestock, and water resources, leading to economic losses amounting to billions of rupees. The reduced rainfall during this period, along with high temperatures, caused a sharp decline in wheat, cotton, and sugarcane yields, further straining the livelihoods of farmers who depend on these crops for their income. The drought conditions also resulted in increased livestock mortality as water sources dried up and fodder became scarce. Livestock losses during such events create long-term economic repercussions for rural households, which rely heavily on cattle for milk, meat, and trade. For example, in 2022 alone, over 205,106 livestock perished due to the combined effects of droughts and floods, highlighting the vulnerability to extreme climate conditions (EPA, 2023).

Figure 11: Drought Severity Index of Cholistan and other areas of Bahawalpur District



Punjab's water scarcity issues are directly linked to recurring droughts. The increasing demand for water in agriculture, combined with reduced river flows and groundwater depletion, has led to a critical situation. Punjab's semi-arid zones experience higher rates of evapotranspiration, leading to greater water demand in fields, which further depletes already scarce water resources. The impact on the agriculture sector is particularly severe as Punjab contributes 68 percentage of the national annual yield of food grains. The reduced availability of water and drought-induced stress on crops has led to an increase in food insecurity, especially in rural areas. Furthermore, the increase in barren land in some regions is an indication of the long-term impacts of drought on land productivity. For example, the vegetation area in the district of Okara decreased from 91.6 percentage in 2002 to 89.3 percent in 2020, highlighting the deterioration of fertile land.

The socioeconomic impact of droughts is profound. Droughts contribute to poverty, migration, and unemployment in rural communities. Farmers, whose livelihoods depend on seasonal crops, face financial ruin during droughts, as they are unable to produce enough to sell or sustain their families. This leads to rural-urban migration as people move to cities in search of work, further straining urban resources. In addition to economic hardship, droughts pose significant public health risks. Water scarcity often forces communities to rely on unsafe water sources, increasing the incidence of waterborne diseases like cholera and dysentery, and poor sanitation during drought periods exacerbates the spread of diseases. A key concern is the contamination of groundwater with arsenic, which affects both drinking water and irrigation, further endangering public health and agricultural productivity.

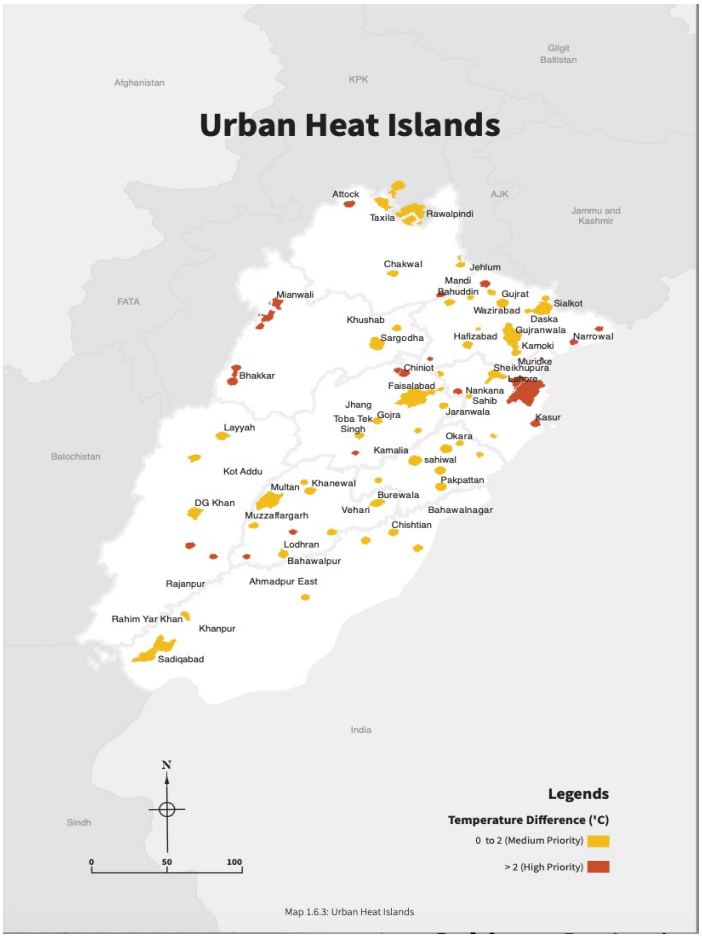
HEATWAVES

Punjab, like much of Pakistan, is experiencing a worrying increase in average temperatures. Rising temperatures, which are linked to global climate change, have become particularly acute in recent years, with the region facing more frequent and intense heatwaves. This situation is exacerbated by urbanisation, deforestation, and the urban heat island effect, especially in major cities like Lahore, Faisalabad, and Multan. Recent data and events highlight the severity of this issue. The 2022 heatwave was particularly severe, affecting millions of people in Punjab. Vulnerable populations, including the

elderly, children, and outdoor labourers, were disproportionately affected. Many outdoor workers, such as construction labourers and farmworkers, were forced to work in dangerous conditions, leading to an increase in heat-related illnesses. The World Health Organisation (WHO) also issued warnings about the potential health impacts of these heatwaves, noting that prolonged exposure to high temperatures could lead to an increase in cardiovascular diseases and other heat-related complications (WHO, 2022). Moreover, the Punjab Health Department reported a significant rise in emergency room visits during the heatwave, particularly in cities like Lahore, where the urban heat island effect exacerbated the already high temperatures.

The Urban Heat Island (UHI) effect is particularly pronounced in Punjab's larger cities, where dense infrastructure and limited green spaces trap heat, causing urban areas to be significantly warmer than surrounding rural regions. Lahore has been identified as one of the most affected cities by this phenomenon. The Environmental Protection Agency (EPA) of Punjab has noted that night-time temperatures in Lahore can be 2-3°C higher than in rural areas, primarily due to the concentration of buildings, roads, and industrial activity that absorb and retain heat. This UHI effect exacerbates the impacts of heatwaves, leading to an increase in energy consumption as residents rely on air conditioning and fans to cope with the heat.

Figure 12: Urban Heat Island- Adapted from Punjab Spatial Strategy 2047 Urban Unit



Rising temperatures also have profound implications for Punjab's agricultural sector, which is crucial to both the province's economy and Pakistan's food security. The Food and Agriculture Organisation (FAO) reported a significant reduction in wheat yields in 2022 due to the extreme heat. Heat stress during the

critical grain-filling period reduced yields by 10-15 percentage in parts of southern Punjab (FAO, 2022). Moreover, rice and sugarcane, two of Punjab's key crops, are also highly vulnerable to temperature extremes. Rice, being a water-intensive crop, faced additional stress as rising temperatures increased evapotranspiration rates, further straining water resources that were already limited due to poor irrigation practices and erratic rainfall. The decline in crop production due to rising temperatures is likely to result in a reduction of wheat production by approximately 6–8 percent and rice production by about 15–20 percent by the end of this century (Naz, Iqbal, & Begum, 2024). A study noted that the increased frequency of heatwaves could reduce the planting window for many crops, further threatening Punjab's agricultural productivity in the coming years (Bal, Rao, Singh , & Prasad , 2025). Recent initiatives by the Punjab government to improve resilience include the promotion of climate-resilient crop varieties, improved irrigation systems, and better urban planning to reduce the UHI effect. These efforts, however, are still in the early stages, and more comprehensive actions are needed to mitigate the long-term effects of rising temperatures on the province's economy and public health (Dr. Ali, Majeed, Saeed, Zulfiqar, & Ashraf, 2023).

AIR QUALITY

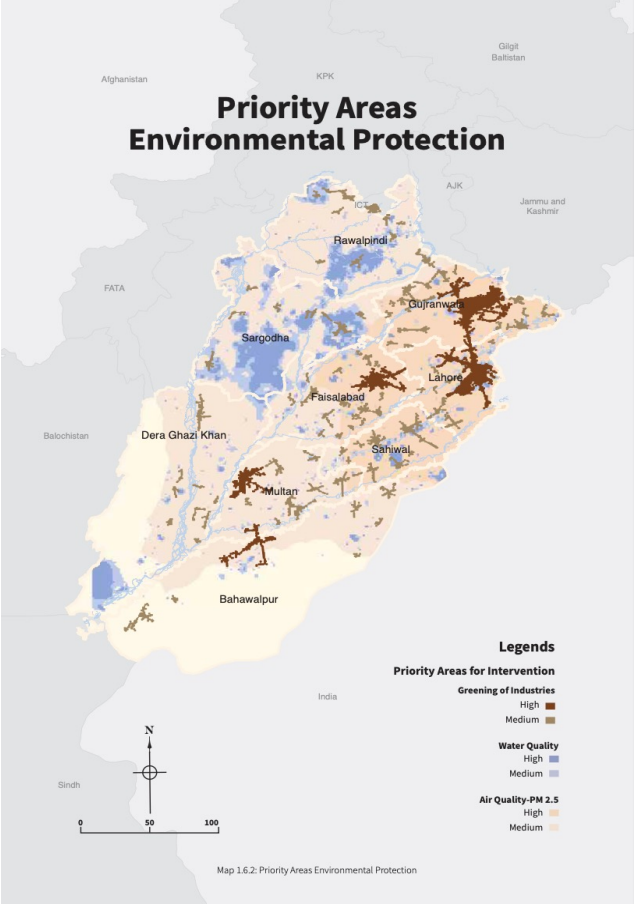
Air quality in Punjab has deteriorated significantly over the past two decades due to rapid industrialisation, urbanisation, increased vehicular traffic, and unsustainable agricultural practices, such as stubble burning. The province suffers from high concentrations of harmful pollutants, including particulate matter (PM2.5 and PM10), sulphur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), and ozone (O_3). These pollutants contribute to severe health problems and environmental degradation. In major cities like Lahore and Multan, air quality frequently exceeds the safe levels prescribed by the Pakistan Environmental Quality Standards (PEQS), especially during the winter months, when smog becomes a persistent problem due to temperature inversions and lower wind speeds (Abbasi, 2020).

Lahore, one of the most polluted cities globally, frequently experiences Air Quality Index (AQI) readings in the "unhealthy" to "hazardous" range during the smog season. As per the latest data of the IQ Air, 20th Jan 2025, Lahore's PM2.5 levels were at 91 µg/m³, more than seven times the acceptable limit of 12 µg/m³ set by the WHO[10]. The worsening air quality has led to a marked increase in public health concerns, particularly respiratory and cardiovascular diseases, affecting millions of people in urban centres. There are several key factors contributing, as alluded to in Punjab Environment Status Report 2023, to the deterioration of air quality in Punjab:

Vehicular Emissions: The rapid increase in the number of vehicles, especially in urban areas, is one of the leading causes of air pollution in Punjab. Older vehicles with poor emission control systems, coupled with the use of low-quality fuel, significantly contribute to the high levels of nitrogen oxides (NOx) and particulate matter (PM) in the air. In 2022, vehicular emissions accounted for more than 43 percentage of the overall pollution load in cities like Lahore and Faisalabad.

[10]Accessed on 20th January 2025 from the Air Quality Index: https://www.iqair.com/pakistan/punjab/lahore

Figure 13: Priority Areas Environmental Protection -adapted from PSP 2047 Urban Unit



Industrial Emissions: Punjab's industrial sector, particularly in urban and peri-urban areas, is a major source of air pollution. Cement factories, brick kilns, and chemical plants are some of the primary contributors, emitting large amounts of PM and gaseous pollutants such as sulphur dioxide (SO_2). In 2022, several industrial units in Punjab were found to be operating without adequate emission control measures, exceeding the PEQS limits for gaseous emissions.

Agricultural Practices (Stubble Burning): One of the major contributors to seasonal air pollution in Punjab is the widespread practice of stubble burning by farmers. After the rice harvest, farmers often burn the residual straw to quickly clear their fields for the next crop. This releases vast amounts of PM and greenhouse gases (GHG) into the atmosphere, exacerbating the smog problem during the winter months. In 2021 alone, stubble burning accounted for nearly 25 percentage of the overall increase in air pollution during the post-harvest season.

Seasonal Smog: The formation of smog, particularly during the winter season, is a recurring issue in Punjab. The phenomenon is driven by temperature inversions, which trap pollutants close to the ground, significantly worsening air quality. Smog not only reduces visibility but also increases the concentration of harmful pollutants like PM2.5 and PM10, posing serious risks to public health. Smog-related pollution is most intense from October to January, with Lahore and surrounding areas consistently recording AQI levels well above 200.

Prolonged exposure to high levels of PM2.5 has been linked to respiratory diseases, cardiovascular problems, and premature mortality. According to WHO data, as per 2022, outdoor air pollution in

Punjab has contributed to a reduction in life expectancy by 7.5 years in Lahore and 4.8 years in Faisalabad between 1998 and 2016. Additionally, the World Bank estimates as of the 2022 that outdoor air pollution in Pakistan causes around 22,000 premature deaths annually, with Punjab bearing a significant portion of this burden due to its high population density and pollution levels. In addition, air pollution imposes significant economic costs. These include healthcare costs for treating pollution-related diseases, productivity losses due to illness, and decreased agricultural yields. A study by the World Bank conducted in 2022, reported that air pollution leads to economic losses equivalent to 5-14 percentage of Pakistan's GDP, with Punjab being one of the most affected provinces. The Government of Punjab has recognised the severity of the air quality crisis and has taken steps to mitigate the impacts of pollution. Key initiatives include the enforcement of the PEQS for vehicular and industrial emissions, the introduction of cleaner technologies in industries, and the promotion of electric vehicles to reduce vehicular pollution. As per the State of Environment Report Punjab, 2023, the government has also launched campaigns to discourage stubble burning by promoting mechanised alternatives and offering subsidies for more sustainable agricultural practices. Additionally, air quality monitoring infrastructure is being expanded, with 30 new Air Quality Monitoring Stations (AQMS) planned across 10 districts in Punjab.

CLIMATE CHANGE AND WASH

Climate change in Punjab has significantly impacted WASH services, exacerbating challenges related to water scarcity, contamination, and sanitation infrastructure. These impacts are evident in the frequency and severity of climate-related events such as floods, droughts, and extreme temperature variations. These factors not only degrade the quality and availability of water but also weaken sanitation systems, leading to public health crises, especially in vulnerable communities.

Water Scarcity: One of the most critical impacts of climate change in Punjab is the reduction in water availability. The increasing temperatures have led to higher evapotranspiration rates, reducing the overall water availability for irrigation and household needs. This situation has led to the over-extraction of groundwater, particularly in districts like Lahore and Multan, where water tables have dropped below sustainable levels. The water shortage in Punjab is compounded by the decreasing per capita availability of water, which has seen a steady decline from 5000 cubic meters in 1951 to just 1100 cubic meters in 2005. This figure is expected to plummet to 8000 cubic meters by 2025, which places the province in a critical water scarcity zone (SOE, 2023). Furthermore, groundwater extraction, which provides around 40 percentage of Punjab's drinking water, is unsustainable, as extraction rates surpass the natural recharge capacity of the aquifers.

Water Quality: The quality of water in Punjab is also a significant concern for WASH services. Industrial effluents, agricultural runoff, and untreated domestic sewage are the main contributors to the contamination of surface and groundwater resources. The Punjab State of the Environment Report highlights that only a fraction of the wastewater generated in major urban centres undergoes any form of treatment before being discharged into water bodies. According to the report, approximately 56.4 percentage of wastewater receives only primary treatment, while only 1.8 percentage undergoes tertiary treatment (Punjab State of the Environment Report, 2023). This untreated wastewater contributes to high levels of water pollution, leading to the proliferation of waterborne diseases and further degrading the quality of water sources. The contamination of water resources is most acute in areas with dense populations and industrial activities. Cities like Lahore and Faisalabad, which host a large number of industrial units, contribute significantly to the pollution of the Ravi and Chenab rivers.

Water quality tests conducted across various districts of Punjab revealed high levels of contaminants, including nitrates, heavy metals, and microbial pathogens, making the water unsafe for drinking and domestic use (Punjab Spatial Strategy, 2047). As reported in state of environment report 2023, 51 percent of the drinking water sources in Punjab are considered unsafe, increasing the risk of waterborne diseases such as cholera, dysentery, and typhoid. Poor water quality, coupled with reduced water availability, has placed immense stress on public health systems, especially in rural areas where access to clean water and adequate sanitation remains limited.

Sanitation Infrastructure: Flooding events, exacerbated by climate change, have caused widespread damage to sanitation infrastructure in Punjab. In the 2022 floods alone, over 467 villages were affected, damaging thousands of homes and contaminating water supplies with sewage and pollutants. This situation has heightened the risk of diseases, as damaged sanitation systems are unable to cope with the increased waste load during and after flood events. Urban areas, in particular, face significant challenges due to inadequate drainage systems that are unable to handle the heavy rainfall and runoff caused by floods. This urban flooding exacerbates the risk of contamination of water supplies with pathogens and chemical pollutants, further compromising the health of residents in affected areas. In cities like Lahore, poor stormwater management during heavy rainfall leads to waterlogging, which overwhelms sanitation systems, leading to outbreaks of diseases such as dengue fever and cholera.

Public Health: Climate change has a direct and severe impact on public health in Punjab, primarily through its effects on WASH services. As water scarcity increases, people in rural and underserved urban areas are forced to rely on unsafe water sources, leading to a rise in waterborne diseases. As mentioned earlier, between May 2022 and April 2023, Punjab reported 250 confirmed cases of cholera, a direct consequence of poor water quality following flood events (Punjab EPA, 2023). Additionally, vector-borne diseases like dengue fever have seen a rise, particularly following periods of heavy rainfall and flooding, which provide ideal breeding conditions for mosquitoes.

Poor Hygiene: Heatwaves, which are becoming more frequent due to climate change, also exacerbate the WASH crisis. High temperatures increase water demand, both for drinking and hygiene purposes, yet the reduced availability of water during droughts forces people to prioritise consumption over hygiene. This lack of adequate hygiene increases the risk of diseases such as diarrheal infections, which remain a leading cause of morbidity and mortality among children under five in Punjab, as per WHO. Children suffering from repeated episodes of diarrhoea are likely to fall behind in school or drop out altogether. Furthermore, it can also cause stunting that currently affects almost 44 percent of children in Pakistan[11].

MITIGATING THE IMPACT: ADAPTATION AND POLICY RESPONSES FOR WASH

The Government of Punjab has recognised the urgent need to address the impacts of climate change and has initiated several policy measures aimed at building resilience. The Punjab Water Vision 2050 is a comprehensive strategy that focuses on sustainable water management, improved irrigation practices, and the promotion of water conservation technologies, improved hydrological modelling and the equitable distribution of water resources. Similarly, Punjab Climate Change Policy 2023 Action Plan and Punjab Spatial Strategy 2047 underlines key initiatives and strategic actions required to mitigate the impact though necessary policy reforms and adaptation. These efforts are designed to mitigate the effects of climate change on water and sanitation services while improving public health outcomes.

[11] https://www.unicef.org/pakistan/wash-water-sanitation-and-hygiene-0

Below are specific actions identified from Climate Change Policy Action Plan 2023 and Punjab Spatial Strategy 2047

Strengthening WASH Services: One of the critical areas of focus in Punjab's climate adaptation strategy is the improvement of WASH services, especially in rural areas. PRSWSSP aims to expand access to clean drinking water, improve sanitation infrastructure, and strengthen community resilience to climate-induced water scarcity and flooding. The project also emphasises the need for sustainable water management, with a focus on enhancing the capacity of local communities to manage their water resources (Punjab EPA, 2023).

Surveillance for Public Health: Efforts to strengthen public health systems are also underway, with a focus on improving disease surveillance and early warning systems for climate-related health risks. The government is enhancing its ability to detect and respond to outbreaks of waterborne and vector-borne diseases, particularly in flood-affected areas where the risk of disease transmission is highest. In tandem with these efforts, public health education campaigns are being expanded to raise awareness about the importance of safe hygiene practices, the dangers of contaminated water, and the health risks posed by extreme heat and air pollution.

Water Resources and Climate Change: The Punjab Climate Change Policy 2023 acknowledges that climate change significantly impacts water availability, quality, and infrastructure. The policy emphasises adaptive measures to enhance water security, such as implementing integrated water resource management (IWRM), rainwater harvesting, and groundwater recharge. These actions are necessary because Punjab's water resources are at risk due to changing rainfall patterns, increasing temperatures, and over-extraction of groundwater. Specific actions include establishing rainwater harvesting systems in public buildings and installing water quality monitoring stations across major water bodies to ensure safe drinking water and mitigate contamination. The policy also encourages the use of constructed wetlands to treat agricultural and urban runoff, reduce pollution entering water bodies, and improve the safety of water sources used for sanitation and hygiene.

Sanitation and Waste Management: The Punjab Climate Change Action Plan focuses heavily on enhancing waste management systems to improve sanitation and reduce environmental pollution. For instance, it proposes the deployment of floating trash barriers in water bodies to prevent the accumulation of solid waste and plastics, which directly supports better sanitation conditions by controlling water pollution. Additionally, the action plan suggests the introduction of wastewater recycling regulations in industries and developing a wastewater treatment infrastructure to control waterborne diseases and improve sanitation outcomes. Moreover, as part of mitigating the impact of climate change on urban populations, the action plan includes the construction of small dams and community ponds in flood-prone areas, which not only support water availability but also prevent floods that can devastate sanitation infrastructure and spread diseases.

Hygiene and Health: The policy also addresses the direct relationship between climate change and public health by promoting the incorporation of health considerations into climate and disaster risk reduction policies. This includes monitoring and responding to climate-sensitive diseases that often result from inadequate WASH services during climate shocks like floods or droughts. For instance, climate-related increases in vector-borne diseases, heat stress, and waterborne diseases demand a proactive approach to sanitation and hygiene, especially in underserved areas. The action plan

specifically emphasises the need for mobile health units and special climate-sensitive disease monitoring and forecasting systems.

Climate Resilience and WASH Infrastructure: The adaptation strategy within the policy advocates for retrofitting public buildings and sanitation infrastructure to make them resilient to climate-induced disasters. This would involve upgrading drainage systems to handle increased stormwater in urban areas and constructing flood-resistant sanitation facilities in vulnerable zones. Moreover, the policy highlights the importance of water reuse and the installation of constructed wetlands to reduce runoff and ensure the sustainability of water resources.

Chief Minister Punjab Green Credit Programme

The Chief Minister Punjab Green Credit Programme is an innovative initiative aimed at advancing environmental sustainability in Punjab through the utilisation of carbon markets, the establishment of an Emissions Trading System (ETS), and the introduction of a Green Credit Scheme. With a budget of PKR 1 billion, this ambitious project aligns with Article 6 of the Paris Agreement, enabling Punjab to participate in international carbon markets, reduce greenhouse gas emissions, and encourage sustainable practices.

The programme comprises three key components. The first focuses on leveraging carbon credits by identifying and registering projects that reduce emissions, facilitating their monetisation through the development of Project Design Documents (PDDs), validation, verification, and securing Emissions Reduction Purchase Agreements (ERPAs). The second component involves establishing Punjab's first-ever ETS, which will cap emissions and allow the trading of allowances, supported by a robust legal framework, monitoring systems, and market infrastructure. The third component, the Green Credit Scheme, incentivises environmentally positive actions such as water conservation, tree planting, and waste reduction by awarding Green Credits, which will eventually evolve into tradable market instruments. The programme's objectives include improving environmental governance, fostering green investments to reduce pollution, increasing public awareness of sustainability, and promoting research and technology transfer to support environmental protection. A dedicated Project Management Unit (PMU) will oversee the programme, supported by specialists in carbon markets, ETS, and green credits, with consultants engaged to design frameworks and build capacity. A digital platform will facilitate registrations, applications, and evaluations for Green Credits, ensuring transparency and accountability. The programme actively involves individuals, students, and communities in actions such as composting, energy-efficient practices, and community-led environmental restoration.

Expected outcomes include the establishment of a functioning carbon credit market, the development of a legally codified ETS, and the creation of a robust Green Credit marketplace. These initiatives aim to significantly reduce greenhouse gas emissions, enhance community participation, and position Punjab as a leader in climate action. While acknowledging challenges such as potential delays in funding, procurement, or legal approvals, the programme incorporates risk mitigation strategies, including streamlined processes and stakeholder engagement. The Chief Minister Punjab Green Credit Programme represents a

transformative step towards sustainable development and environmental resilience in Punjab, setting a benchmark for climate action in the region.

Strategic Actions for Climate Resilient WASH

Short-Term (1-3 Years)	Medium-Term (4-6 Years)	Long-Term (7-10 Years)
Conduct an audit of WASH infrastructure to identify climate vulnerabilities, including sanitation systems.	Retrofit WASH facilities, including sanitation systems, to improve flood resilience and stormwater drainage.	Develop a province-wide IWRM framework, integrating sanitation for sustainable water management.
Implement rainwater harvesting systems in public buildings such as schools, hospitals, and community toilets.	Scale up solar and alternative energy solutions for WASH facilities, including sanitation systems.	Achieve a 50:50 balance between groundwater and surface water use, with resilient sanitation systems province-wide.
Install water quality and wastewater monitoring stations to reduce contamination risks.	Establish wastewater treatment plants in urban and intermediate cities to promote water recycling and sludge management.	Ensure 100 percent climate-resilient water supply and sanitation coverage by 2034.
Develop early warning systems for climate hazards like floods and heatwaves, and train communities in preparedness.	Encourage industries to adopt treated wastewater reuse and co-finance industrial sanitation projects through regulatory incentives.	Introduce smart water management systems, including digital monitoring, remote sensing, and carbon credit tracking for sanitation.
Launch public awareness campaigns on climate-resilient WASH practices, including safe water storage, sanitation, and hygiene.	Construct small dams, community ponds, and eco-sanitation systems in drought-prone areas to ensure water availability and sanitation safety.	Promote the use of constructed wetlands for natural wastewater treatment and carbon sequestration in urban and peri-urban areas.
Train local government officials and Community-Based Organisations (CBOs) in managing climate-resilient WASH and sanitation systems.	Deploy eco-sanitation solutions in water bodies to prevent contamination during floods.	Align all WASH infrastructure developments, including sanitation systems, with Pakistan's Nationally Determined Contributions (NDCs).
Strengthen disease surveillance systems for climate-sensitive illnesses such as cholera and dengue.	Expand community-led WASH and eco-sanitation initiatives in high-risk areas to ensure local ownership and sustainability.	Expand the use of alternative energy sources to meet 50 percent of WASH and sanitation energy needs.
Assess and document the potential for generating carbon credits through sustainable sanitation projects.	Launch pilot projects to implement carbon credit mechanisms for sanitation initiatives.	Integrate carbon credit trading for sanitation into provincial financing frameworks to attract international investments.
Mobilise climate financing through partnerships with multilateral agencies, focusing on eco-sanitation and waste-to-energy projects.	Establish a dedicated provincial Climate Resilient WASH Fund to support large-scale adaptation and mitigation projects, including sanitation.	Strengthen legislative frameworks to support climate-adaptive WASH and sanitation policies in line with global agreements.
Provide financial incentives to rural households for adopting resilient sanitation solutions like elevated latrines, biogas toilets, and flood-proof septic systems.	Introduce sanitation programmes for peri-urban areas with climate-resilient designs, including systems for composting and reuse.	Develop carbon-neutral WASH systems, integrating renewable energy and advanced waste management for sanitation sustainability.

LEGISLATIONS AND POLICIES

KEY LEGISLATIONS:

There are number of legislations and acts to facilitate the governance of drinking WASH in the province. Of these, two are critical i.e. Punjab Water Act 2019 and Punjab Local Government Act 2022. A detailed analysis of these Acts is given below.

PUNJAB WATER ACT 2019

The Punjab Water Act, 2019, is an essential legal framework that governs water management in Punjab, addressing water resource utilisation, conservation, and quality. The Act directly impacts the availability, quality, and governance of water and sanitation services along with broader water agenda in the province.

Governance and Institutional Capacity: The Punjab Water Resources Commission (PWRC), established under the Act (Section 3), is tasked with coordinating the sustainable use of water resources across the province. The PWRC plays a vital role in ensuring that water use for basic household needs is prioritised over industrial and agricultural consumption during times of scarcity. Meanwhile, the Punjab Water Regulatory Authority (PWRA) is responsible for enforcing water usage regulations and quality standards, particularly for surface and groundwater resources (Section 7). A key challenge lies in the limited capacity of local institutions to enforce regulations effectively. Local government bodies and water service providers often lack the technical expertise, financial resources, and equipment needed to monitor water quality and usage. This gap leads to inconsistent enforcement of WASH standards, especially in rural areas, further exacerbating issues related to access to safe drinking water and sanitation.

Water Supply and Quality: The Act mandates that water undertakers ensure the provision of sufficient and safe water for domestic purposes (Section 15). This is critical for public health, especially in preventing waterborne diseases such as cholera and typhoid, which are common in regions with inadequate water quality. The Act empowers the PWRA to enforce water quality standards (Section 19) and penalise undertakers who supply unsafe water (Section 22). It also prohibits the discharge of industrial, agricultural, or domestic waste into water bodies without prior treatment (Sections 28, 34), aligning with WASH's goals to protect water sources from contamination. However, enforcement remains a significant challenge. The Act relies heavily on local institutions and the PWRA to monitor water quality and carry out inspections. Many local bodies lack the technical expertise and resources necessary for consistent enforcement, leading to gaps in maintaining water safety standards, particularly in underserved rural areas.

Sanitation and Sewerage Services: The Act places a responsibility on sewerage undertakers to ensure a comprehensive sewerage system for proper drainage and treatment of wastewater (Section 30). By regulating the discharge of trade effluent (Section 34), it aims to protect public health and the environment from industrial waste, which can harm sewerage infrastructure and contaminate water sources. The Act, however, lacks specific provisions for the development of sanitation infrastructure in rural areas where open defecation and poor access to sanitation services remain widespread. The responsibility for wastewater management is largely left to undertakers, but there is no clear guidance

on how to develop comprehensive systems that integrate water supply with sanitation services, which is critical for improving service delivery in areas without sewerage infrastructure.

Climate Change Adaptation: The Act emphasises water conservation, particularly during periods of drought (Chapter IX). This is crucial for ensuring that water remains available for essential WASH services, especially as Punjab faces increasing climate-related challenges such as erratic rainfall, floods, and droughts. The Act's promotion of water-saving practices and efficient resource management aligns well with climate adaptation goals. However, the Act lacks specific guidance on building climate-resilient WASH infrastructure. While conservation measures are crucial, vulnerable communities may still face risks without proper infrastructure to withstand extreme weather events. Future revisions to the Act should include clear directives for incorporating climate resilience into water and sanitation systems to ensure long-term sustainability.

Conclusion: The Punjab Water Act, 2019, provides a solid framework for regulating water resource management and quality control in Punjab, aligning with WASH objectives by promoting safe water for domestic use and proper sanitation services. However, there are several areas where the Act could be strengthened to better support drinking water and sanitation services: i) strengthening the enforcement mechanisms, particularly in rural areas, is essential for ensuring consistent water quality and availability; ii) Greater emphasis on developing rural sanitation infrastructure is needed to reduce open defecation and improve access to safe sanitation; and iii) Incorporating climate-resilient infrastructure provisions into the Act would help communities adapt to the increasing impacts of climate change, ensuring the sustainability of WASH services in the long term.

PUNJAB LOCAL GOVERNMENT ACT 2022

The Punjab Local Government Act 2022 introduces a more decentralised approach to service delivery by empowering local governments with significant responsibility for water, sanitation, hygiene and solid waste management services. This framework aims to enhance local autonomy while ensuring improved governance, accountability, and climate resilience in the provision of these essential services.

Governance: The Act fosters decentralisation, giving local governments greater control over water supply, sanitation, and solid waste management. The shift is aimed at addressing local needs more effectively by bringing decision-making closer to the communities being served. Local councils and municipal bodies are now tasked with developing, implementing, and regulating WASH services, with the added benefit of promoting public-private partnerships (PPPs) to encourage innovation and investment in service delivery. While the Act decentralises power, the lack of adequate support and oversight could hinder its full implementation, particularly in rural regions where the capacity for governance is already limited.

Service Delivery: The Punjab Local Government Act 2022 emphasises the need for improved service delivery for WASH and solid waste management. By granting local governments more authority, the Act seeks to ensure that services are tailored to local needs and challenges.

Water Supply: Local bodies are tasked with providing safe and clean drinking water to all residents. They are expected to oversee water infrastructure, maintain regular testing for quality control, and ensure that water sources are protected from contamination. For rural areas, this is particularly important as access to clean water remains a persistent issue.

Sanitation: The Act mandates local governments to develop and manage sanitation infrastructure, including sewerage systems and drainage. The Act further puts emphasis on developing sustainable and resilient sanitation systems, particularly those that can withstand the effects of climate change, shows a forward-thinking approach to public health infrastructure.

Solid Waste Management: Local bodies are now fully responsible for developing comprehensive solid waste management systems. This includes waste collection, transportation, recycling, and disposal. The Act promotes the use of modern technologies to manage waste efficiently, emphasising sustainability and the reduction of environmental pollution through proper waste disposal mechanisms. However, one of the main challenges remains the resource disparity between urban and rural areas. While urban centres may have the capacity to implement modern waste management technologies and infrastructure, rural regions struggle with limited technical and financial resources. To ensure equitable service delivery, local governments in rural areas will need increased funding, technical support, and training.

Accountability: Under the Act, the local governments are expected to maintain transparency by monitoring their performance and providing regular reports on service delivery outcomes. This includes water quality monitoring, sanitation system maintenance, and the effective management of solid waste. The Act also encourages the establishment of public grievance mechanisms, enabling citizens to report service issues and ensuring that local bodies are held accountable for service failures. Moreover, financial accountability is emphasised, with local bodies required to maintain accurate financial records and report on the allocation of resources for WASH services. Additionally, the Act's promotion of PPPs introduces another layer of accountability, as private sector partners will need to adhere to contractual obligations that ensure service quality.

In summary, the Punjab Local Government Act 2022 is a pivotal step towards improving governance, service delivery, and accountability in water, sanitation, hygiene, and solid waste management. It decentralises decision-making and brings service delivery closer to the communities being served, with a strong emphasis on climate resilience and sustainability. However, challenges remain, particularly in ensuring that local governments have the technical capacity and financial resources to carry out their expanded responsibilities.

Table 4: Comparative Analysis of Local Government Acts of Punjab (2001, 2013, 2019 and 2022)

Narration	The Punjab Local Government Ordinance 2001	Punjab Local Government Act 2013	Punjab Local Government Act 2019	Punjab Local Government Act 2022
Preamble	The Punjab Local Government Ordinance 2001 marked a significant step toward decentralisation by giving district governments substantial control over public service delivery, including	The Punjab Local Government Act 2013 reintroduced local government institutions with revised roles and responsibilities, but it re-centralised some key aspects of service management.	The Punjab Local Government Act 2019 attempted to reinvigorate local governance by giving local bodies more authority in service delivery, particularly in WASH and solid waste management. It also promoted PPPs.	The Punjab Local Government Act 2022 is the most recent effort to decentralise power to local governments. It grants local authorities' greater autonomy over WASH services and solid waste management while focusing on

Narration	The Punjab Local Government Ordinance 2001	Punjab Local Government Act 2013	Punjab Local Government Act 2019	Punjab Local Government Act 2022
	WASH and solid waste.			sustainability and environment protection
Water	Local bodies were responsible for planning and managing water supply systems to ensure clean drinking water.	Municipal bodies were made responsible for clean drinking water supply but a limited autonomy for decision-making in rural areas.	Local governments had a stronger mandate to develop water supply and sanitation infrastructure, focusing on expanding sewerage networks in urban areas.	Local governments are now tasked with ensuring regular water quality checks and expanding water infrastructure, especially in underserved rural areas.
Sanitation	They were tasked with maintaining sanitation, including sewerage and drainage systems.	Sewerage systems were to be maintained by local governments, but many rural areas remained underserved.		The Act promotes the development of sustainable sanitation systems with an emphasis on climate-resilient infrastructure, capable of withstanding floods and droughts.
Solid Waste Management	Local governments were responsible for waste collection and disposal	The collection and management of waste were emphasised, particularly in urban areas.	Local governments were responsible for modernising waste management systems, introducing mechanised solutions for waste collection and disposal.	Local bodies have the authority to modernise waste management systems, with a focus on recycling and reducing environmental impact through integrated waste management systems.
Challenge and Differences	The ordinance faced implementation issues, especially in rural areas where local governments lacked financial and technical capacity. After the 2008 elections, local government institutions weakened due to centralised power shifts, causing disruptions in service delivery.	It maintained more control at the provincial level, limiting the autonomy of local bodies. It faced criticism for not empowering local governments sufficiently to handle the growing challenges of urbanisation and rural development.	It introduced more autonomy for local bodies as compared to LG Act 2013, but its implementation faced challenges, especially in rural areas where resources remained insufficient. Capacity gaps also hampered the full potential of the reforms.	This Act prioritises climate resilience in water and sanitation infrastructure through environment protection and conservation measures. This is a key improvement over previous Acts, which did not adequately address environmental sustainability in service delivery. However, election of local bodies is pending.

The transition of local governance in Punjab over the past two decades has demonstrated a gradual shift toward empowering local governments to manage WASH services and solid waste management. The 2001 ordinance marked the beginning of this decentralisation, but it faced significant challenges in terms of local government capacity. The 2013 Act scaled back the autonomy of local bodies, while the 2019 Act attempted to restore some of this autonomy with a stronger focus on infrastructure development. The Punjab Local Government Act 2022 takes the most significant step forward by enhancing local authority, integrating climate resilience, and modernising solid waste management systems. However, the success of the Act will depend on whether local governments are provided with the resources and technical capacity necessary to implement these reforms effectively.

Punjab Water and Sanitation Authority Act 2025

The Punjab Water and Sanitation Authority Act 2025, approved on 29th January 2025, establishes a comprehensive governance and regulatory framework to enhance water supply, wastewater management, and sanitation services across Punjab. The Act seeks to streamline service delivery, enforce environmental compliance, and improve financial sustainability through public-private partnerships (PPPs), tariff reforms, and investment in climate-resilient infrastructure. By aligning with national and provincial policies, the Act ensures efficient water resource management, safe drinking water access, and equitable sanitation coverage. It introduces service quality benchmarks, performance monitoring systems, and financial accountability mechanisms to promote sustainable service provision. The Act integrates climate adaptation strategies, focusing on wastewater treatment, groundwater conservation, and sustainable urban and rural sanitation solutions.

The Punjab Water and Sanitation Authority (PWSA) will function as the central governing body responsible for policy implementation, coordination among service providers, and regulatory enforcement. The Authority will be structured with a Board of Directors, a Managing Director, and district-level implementation units, ensuring decentralised yet coordinated governance. Key functions of PWSA include setting water tariffs, regulating municipal and private water service providers, overseeing wastewater treatment plants, ensuring compliance with environmental standards, and implementing emergency response mechanisms for water and sanitation crises. The Authority will work in close coordination with WASAs, municipal corporations, the Housing, Urban Development & Public Health Engineering Department (HUD&PHED), and local governments to improve efficiency, reduce institutional fragmentation, and ensure service delivery to underserved areas. While the Act aims to enhance institutional governance and financial viability, challenges such as capacity constraints, inter-agency coordination, and revenue generation for long-term sustainability will require continuous policy refinements and institutional strengthening for effective implementation.

OTHER KEY LEGISLATION RELATED TO WASH

Canal and Drainage Act, 1873: The Canal and Drainage Act, 1873 remains a cornerstone law governing the management of irrigation and drainage systems in Punjab. This law was enacted to ensure the equitable distribution of water for irrigation while managing drainage to prevent waterlogging and flooding in agricultural lands. The Act is crucial as it regulates water resources that indirectly affect drinking water supply and sanitation. Mismanagement of drainage systems can lead to water contamination, thus impacting public health, especially in rural areas where water for consumption is often sourced from open canals.

Punjab Irrigation and Drainage Authority Act, 1997: The Punjab Irrigation and Drainage Authority Act, 1997 established the Punjab Irrigation and Drainage Authority (PIDA) to modernise the irrigation system and manage water resources efficiently in agriculture, a sector that consumes nearly 90 percentage of Punjab's water supply. PIDA's role is particularly important for balancing water use between agriculture and drinking water needs. The Act also emphasises sustainable drainage management to mitigate the adverse impacts of improper drainage on sanitation systems. Efficient water distribution practices ensure that there is adequate water for both domestic use and agricultural purposes, reducing competition over water resources.

Punjab Soil Reclamation Act, 1952: The Punjab Soil Reclamation Act, 1952 was enacted to address the issues of soil degradation and salinity that were adversely affecting agricultural productivity in the province. The Act provides legal authority for the government to implement measures for reclaiming saline and waterlogged lands through improved irrigation techniques, drainage, and soil treatment. In relation to drinking water and sanitation, the Act plays an indirect but important role. Waterlogging and improper irrigation can lead to contamination of groundwater sources, which in turn affects the quality of drinking water. Additionally, waterlogged areas contribute to poor sanitation conditions, as stagnant water provides breeding grounds for diseases. The reclamation of such lands helps in reducing water-related diseases and ensures that clean water is available for consumption.

Lahore Development Authority (LDA) Act, 1975: The Lahore Development Authority (LDA) Act, 1975 governs urban planning and infrastructure development in Lahore. The LDA is responsible for creating and maintaining essential services such as water supply, sanitation, and sewerage systems in one of the most densely populated urban areas in Punjab. It focuses on urban development, ensuring that clean drinking water reaches all parts of the city and that effective wastewater management systems are in place. The LDA also ensures that industrial and residential growth is aligned with environmental standards, reducing the risk of contamination of water bodies from urban runoff and improper waste disposal.

Cities Development Act, 1979: The Punjab Cities Development Act, 1979 was a key legislative framework aimed at managing urban planning, infrastructure development, and regulation of services in cities across Punjab. Under this Act, city development authorities were established, such as the LDA and Faisalabad Development Authority (FDA), which were tasked with the comprehensive planning and regulation of urban development. In relation to drinking water, sanitation, and solid waste management, the Act gave these authorities the responsibility for: Ensuring clean drinking water supply to meet the needs of expanding urban populations and; developing and maintaining sewerage systems and sanitation infrastructure, critical for urban health and environmental protection; managing solid waste disposal, ensuring that cities were kept clean and free from health hazards caused by improper waste disposal. Authorities were empowered to create modern landfills and recycling systems. The Act's key focus was on promoting sustainable urban growth by ensuring that adequate infrastructure was in place to support expanding populations, while maintaining public health and environmental sustainability. By virtue of this Act, WASAs have been created in five major cities of Punjab under their respective development authorities

Punjab Environmental Protection Act, 1997 (Amended 2012): The Punjab Environmental Protection Act, 1997 (Amended 2012) provides a legal framework for the protection of the environment, with a strong focus on preventing the pollution of water resources. The Act sets out environmental quality standards for effluents discharged by industries into water bodies, ensuring that surface and

groundwater remain clean and safe for human consumption. It also governs the disposal of hazardous waste, particularly industrial pollutants, to ensure they do not degrade water quality. This law is integral to ensuring sustainable water use for both drinking and irrigation while preventing public health crises arising from contaminated water sources.

Punjab Factories Act, 1934 (Amended 2019): The Punjab Factories Act, 1934 (Amended 2019) governs the health and safety conditions within industrial settings, ensuring that clean drinking water, sanitation facilities, and safe working conditions are provided for factory workers. The Act mandates that factories must provide adequate water supply systems and ensure the proper treatment of industrial waste to prevent environmental pollution. By regulating waste disposal practices, this Act ensures that industries do not discharge untreated waste into local water bodies, safeguarding water quality for surrounding communities. It also promotes hygiene and sanitation within industrial zones, contributing to better health outcomes for workers and the local population.

KEY POLICIES

Pakistan has the national water policy 2018 along the with national drinking water policy 2009 and national sanitation policy 2005 that provides essential guidelines for implementing WASH agenda in the provinces. In 2011, Pakistan adopted 11th Amendment that delegated the policy, planning and implementation work of many social sectors including WASH to the provinces. Since, then Punjab developed a series of policies that have direct and indirect linkages with WASH. Below is an analysis of key policies of WASH in Punjab.

PUNJAB DRINKING WATER POLICY 2011

The Punjab Drinking Water Policy, established in 2011, aims to provide safe and adequate drinking water to all citizens of Punjab, Pakistan. Recognising the essential role of clean water in public health, poverty reduction, and economic development, the policy aligns with national and international commitments, including the Millennium Development Goals (MDGs). It emphasises equitable access, sustainability, and the protection of water resources, while promoting community participation and improved governance.

Key objectives of the policy include ensuring universal access to safe drinking water, particularly for vulnerable and underserved communities, and improving water quality through monitoring and treatment systems to address contaminants such as arsenic, nitrates, and microbiological pollutants. The policy also focuses on the sustainable management of both surface and groundwater resources and advocates for public awareness and education on water conservation and hygiene practices. To achieve these goals, the policy outlines several measures: expanding and rehabilitating water supply infrastructure, especially in rural areas; establishing water quality testing laboratories and routine monitoring mechanisms; strengthening local government bodies and water management institutions; encouraging community involvement in water supply schemes; and developing a regulatory framework to govern water extraction, distribution, and usage, particularly to prevent over-extraction and contamination of groundwater sources.

Despite its comprehensive framework, the policy faces implementation challenges, including limited financial resources, inadequate enforcement of water quality standards, and insufficient capacity at the local government level to maintain infrastructure and services. Rural areas, in particular, continue to struggle with low coverage of safe drinking water, highlighting the need for targeted interventions.

While the policy does not explicitly address climate change, it acknowledges issues related to water scarcity and variability. Incorporating climate resilience measures, such as rainwater harvesting and improved water storage systems, could enhance the policy's effectiveness in addressing emerging threats.

Overall, the Punjab Drinking Water Policy 2011 provides a vital framework for improving access to safe and sustainable drinking water in the province. To fully realise its objectives, greater attention to implementation challenges, enhanced financing mechanisms, and integration of climate resilience are needed. In there hand, this policy needs a revision to align with SDGs.

DRAFT PUNJAB SANITATION POLICY 2015

The Draft Punjab Sanitation Policy outlines 2015 the Government of Punjab's commitment to developing a safely managed sanitation environment for all citizens, contributing to a high quality of life in the province. The policy emphasises the need for comprehensive sewerage systems, proper wastewater treatment, and the promotion of hygiene practices to ensure public health and environmental sustainability. It also highlights the importance of public awareness and education on sanitation and hygiene to support sustainable practices. The policy aligns with national and international commitments, including the SDGs, aiming to achieve universal access to improved sanitation facilities. While the policy provides a comprehensive framework, its successful implementation will require adequate funding, effective stakeholder coordination, and robust monitoring and evaluation (M&E) systems to track progress and address challenges.

PUNJAB WATER POLICY 2018

The Punjab Water Policy 2018 aims to ensure the equitable and sustainable management of water resources to support economic growth, public health, and environmental protection. It prioritises water conservation, improved governance, and climate adaptation, adopting an IWRM approach to address challenges such as population growth, urbanisation, and climate change. The policy also focuses on safeguarding Punjab's water resources from over-exploitation and pollution, ensuring access to safely managed water and sanitation services for all citizens.

For drinking water, the policy places a strong emphasis on sustainable groundwater management, recognising the province's reliance on this resource. It highlights the need to monitor water quality, particularly in areas affected by contamination from pollutants like arsenic and nitrates. The development of master plans for urban and rural water supply systems is a key initiative to ensure long-term access to safe drinking water. These measures aim to protect current and future generations from water insecurity. Sanitation is another critical area, with the policy focusing on expanding urban sewerage systems and ensuring proper wastewater treatment. It promotes separating industrial wastewater from domestic sewage to prevent contamination of drinking water sources. The policy encourages PPPs to finance urban sanitation infrastructure, addressing the needs of rapidly growing cities. However, rural sanitation remains a notable gap, requiring clearer strategies and increased resources to meet the needs of underserved populations.

The policy also recognises the significant impact of climate change on water resources, including increased droughts, floods, and erratic rainfall patterns. It calls for climate-resilient infrastructure such as flood-resistant water and sanitation systems, rainwater harvesting, and water-efficient irrigation

technologies. Despite these initiatives, the policy lacks clear timelines and funding mechanisms, particularly for protecting vulnerable communities from the effects of climate change.

While the policy provides a strong framework for water management, some gaps need urgent attention. Rural sanitation and hygiene promotion require more focus and dedicated resources. Enforcement of water quality standards is weak, especially in rural areas, leaving many communities at risk of waterborne diseases. Additionally, the policy's measures for climate resilience would benefit from concrete timelines and funding strategies. Finally, there is a need for stronger hygiene promotion efforts, including behaviour change communication, to reduce preventable diseases like diarrhoea and improve public health outcomes. Overall, the Punjab Water Policy 2018 offers a comprehensive roadmap for sustainable water resource management. Addressing its gaps will be essential to achieve its vision of equitable access to safe water and sanitation for all citizens.

PUNJAB CLIMATE CHANGE POLICY AND ACTION PLAN 2024

The Punjab Climate Change Policy outlines the impact of climate change on water and sanitation services and proposes strategic actions to make WASH services climate-resilient. It recognises that changing precipitation patterns, higher evaporation rates, and glacier melt will worsen water scarcity. To address this, the policy emphasises water security through IWRM. Key measures include building water storage and distribution infrastructure such as recharging wells, rainwater harvesting systems, and community ponds. The policy also prioritises regulating groundwater to prevent depletion and promote sustainable use.

In sanitation and hygiene, the policy applies a "climate lens" to WASH strategies to ensure resilience against challenges like floods and droughts. Improved wastewater treatment and reuse are highlighted as essential for maintaining water quality and safeguarding public health, particularly in the face of water scarcity and pollution risks. These measures are designed to protect communities from the dual threats of climate-induced water scarcity and contamination. The policy also focuses on infrastructure resilience, calling for retrofitting public buildings and facilities to withstand extreme weather events. This ensures continued access to safe water and sanitation services during climate disasters. Innovative solutions such as constructed wetlands are promoted to naturally treat agricultural and urban runoff, reducing pollution in water bodies and protecting ecosystems. Monitoring and regulation are key aspects of the policy. It calls for establishing water quality monitoring stations and implementing tiered water pricing to encourage conservation and efficient use. Additionally, regulations for treated wastewater reuse in water-intensive industries are planned to reduce pressure on freshwater supplies, which is crucial for sustainable water management under changing climate conditions.

The Punjab Climate Change Action Plan complements the policy with specific actions for the PHED and the LGCD Department. Both departments are tasked with retrofitting public infrastructure to withstand climate-induced disasters and upgrading storm drainage systems in urban areas to manage flooding risks. They are also responsible for promoting wastewater treatment and reuse, particularly in industries, to reduce freshwater demand. Furthermore, water quality monitoring stations will be established at major surface water bodies to ensure the protection of public health and the environment. Other measures include implementing aquifer storage and recovery technologies to manage groundwater sustainably and developing constructed wetlands to treat runoff naturally before it reaches water bodies.

Strategic Actions for Enhancing Legislation and Policy Implementation in WASH Services

Short-Term (1-3 Years)	Medium-Term (4-6 Years)	Long-Term (7-10 Years)
Strengthen enforcement mechanisms by building the capacity of PWRA and local institutions.	Expand climate-resilient sewerage and solid waste management infrastructure in urban and rural areas.	Develop and operationalise a province-wide IWRM framework.
Revise the Punjab Water Act 2019 and Local Government Act 2022 to mandate climate-adaptive WASH infrastructure	Roll out province-wide digital monitoring systems for tracking water quality, sanitation performance, and compliance.	Institutionalise climate-adaptive planning within all WASH-related laws, aligned with Pakistan's NDCs.
Pilot projects for retrofitting WASH infrastructure to withstand extreme weather events.	Promote PPPs for financing and implementing sustainable WASH infrastructure projects.	Establish a dedicated Climate Resilience Fund for WASH to support long-term adaptation and mitigation projects.
Establish inter-departmental task forces to align efforts across WASH governance bodies.	Provide advanced training on innovative technologies like constructed wetlands and aquifer storage recovery.	Engage international donors and private sector partners to co-finance large-scale climate-resilient projects.
Conduct training for municipal and council staff on water quality monitoring and compliance inspections.	Scale up GIS-based mapping of WASH infrastructure for better planning and resource allocation.	Align WASH services with broader public health policies to address climate-sensitive diseases like cholera.
Introduce tiered water pricing policy and services to encourage conservation and efficient water use.	Scale up water tiered pricing models and approaches across the province both in urban as well rural areas.	Launch targeted public awareness campaigns focusing on water conservation, hygiene practices, and wastewater risks.

INSTITUTIONAL ARRANGEMENTS AND SECTOR COORDINATION

Punjab has a complex and multi-tiered system for managing WASH services. These services are provided through a mix of federal, provincial, district, and community-level institutions, each with specific roles and responsibilities. This system aims to ensure that people across urban and rural areas have access to safe drinking water, proper sanitation, and hygiene facilities, which are vital for health, dignity, and socio-economic progress.

FEDERAL-LEVEL ARRANGEMENTS

At the national level, several federal ministries and organisations set policies, manage finances, and support Punjab in achieving its WASH goals. Along with the Federal Finance division that leads on resource allocations to the province, the Ministry of Planning, Development, and Special Initiatives ensures that national development plans include water and sanitation projects. It aligns Punjab's initiatives with Pakistan's commitment to the SDGs, particularly SDG-6, which focuses on clean water and sanitation. The Ministry of Climate Change and Environmental Coordination plays a vital role in integrating climate resilience into WASH projects in addition to coordination and reporting on drinking water and sanitation part of SDG-6. This ministry addresses issues such as urban flooding, droughts, and the safe use of water resources by providing guidelines and facilitation in accessing climate resilient financing for WASH. The Economic Affairs Division coordinates international grants and loans to fund large-scale WASH projects in Punjab. It works closely with partners such as the World Bank, Asian Development Bank (ADB), and UNICEF to ensure the availability of resources for improving water and sanitation services. The Pakistan Council of Research in Water Resources (PCRWR) focuses on water quality research and solutions such as rainwater harvesting and groundwater management. It provides technical advice to ensure that drinking water is safe and that resources are used sustainably. The

Federal Bureau of Statistics also supports WASH by collecting and sharing essential data for planning and monitoring service delivery.

PROVINCIAL-LEVEL ARRANGEMENTS

At the provincial level, Punjab has several key departments and organisations responsible for implementing WASH services and policies. The P&D Board allocates resources and oversees major water and sanitation projects within Punjab's Annual Development Programme (ADP). This board ensures that projects are aligned with the province's development prioritises and supports donor-funded initiatives. TheLGCD Department has recently been notified as the main planning and management department for WASH services in the province. The LGCD will lead on the need assessments, resource allocation and distribution in addition to monitoring and reporting on WASH. The LGCD also play a central role in decentralised governance. It works with municipal councils and local governments to ensure the delivery of WASH services in towns, villages, and peri-urban areas. Similarly, PRMSC focuses on improving water supply, drainage, and waste management in rural communities under LGCD. The PMDFC strengthens local governments by providing funding and technical support for improving water and sanitation infrastructure in smaller cities.

The Housing, Urban Development, and Public Health Engineering Department (HUD&PHED) is responsible for water and sanitation services in both urban and rural areas, though it oversees WASAs in five major cities like Lahore, Faisalabad, and Multan, which manage water supply and sewerage systems for millions of people. The department has been notified as executing agency for water and sanitation systems to support LGCD. Changes in roles of both departments i.e., LGCD and HUD&PHED are in evolution phase at the time of preparation of this WASH Sector Development Plan. Specialised agencies also contribute to the WASH sector. The Punjab Aab-e-Pak Authority (renamed as Punjab Saaf Pani Authority in 2024) provides clean drinking water through filtration plants in rural and peri-urban areas. The Urban Unit supports WASH planning with innovative approaches like GIS mapping and data analysis to improve efficiency. The Health Department ensures access to safe drinking water and sanitation in hospitals and HCFs. It also works to prevent waterborne diseases. The Education Department leads WinS programmes, ensuring that children have clean water, toilets, and handwashing stations in schools.

DISTRICT AND LOCAL LEVEL ARRANGEMENTS

At the district level, district governments and municipal corporations manage WASH services. Municipal corporations are responsible for water supply, sanitation, and solid waste management in urban areas. Smaller municipalities and municipal committees handle these tasks in towns and peri-urban areas. Development authorities such as the LDA and FDA manage urban development projects, including drainage systems and sewerage networks. WASAs in major cities operate urban water systems and wastewater treatment plants. Cantonment Boards, under the Ministry of Defence, manage WASH infrastructure in military areas and their surrounding populations. These boards ensure that residents of cantonments have access to clean water, drainage, and other essential services. At the grassroots level, Community-Based Organisations (CBOs) and individuals play an essential role in WASH service delivery. CBOs work with local governments to mobilise people and promote safe water, sanitation, and hygiene practices. They are especially important in rural areas where public services may be limited. In many cases, households in peri-urban and rural areas rely on self-provision to meet their water and sanitation needs. This includes installing boreholes, septic tanks, or water filtration systems. Community

participation in WASH planning and feedback mechanisms ensures that services are tailored to the needs of local populations.

CHALLENGES IN INSTITUTIONAL ARRANGEMENTS FOR WASH IN PUNJAB

Punjab's WASH sector faces significant challenges that hinder effective service delivery and equitable access. These challenges include governance issues, infrastructure gaps, limited community engagement, climate vulnerabilities, funding constraints, and social disparities, with varying impacts on urban and rural populations.

A major challenge is the overlapping responsibilities and jurisdictional conflicts between institutions. In urban areas, WASAs, municipal corporations, and development authorities lack clear boundaries, resulting in inefficiencies and accountability gaps. In rural areas, the roles of the LGCD Department and PRMSC overlap, creating confusion in service delivery. These conflicts contravene the Punjab Local Government Act 2019/2022 and the Punjab Business Rules 2011, which advocate decentralised governance and clear mandates.

Infrastructure gaps in rural areas exacerbate access issues, with many villages lacking piped water systems and proper sanitation facilities. Residents often rely on unsafe water sources, exposing them to waterborne diseases like diarrhoea and cholera. While the Punjab Aab-e-Pak Authority has made some progress, logistical and financial constraints leave many communities underserved. Urban centres benefit from advanced infrastructure, deepening the rural-urban divide.

Urbanisation adds pressure to already strained WASH systems in cities like Lahore, Faisalabad, and Multan. Population growth has overwhelmed aging water supply, sewerage, and drainage infrastructure. Informal settlements and slums are often excluded from formal service plans. The Punjab Water Act 2019, which advocates for IWRM, and the establishment of regulatory bodies like the PWRC and the PWRA, has yet to be fully operationalised, leaving the sector underregulated.

Climate change intensifies WASH vulnerabilities. Erratic rainfall, urban flooding, and droughts disrupt water supplies and damage infrastructure. Rural areas face depleting groundwater reserves, while urban centres experience sewer overflows due to inadequate drainage systems. Industrial pollution further degrades water quality, particularly in industrial hubs. The Punjab Climate Change Policy and Action Plan 2022 calls for integrating climate resilience into WASH systems, but implementation remains limited.

Community participation in WASH planning is weak, particularly in rural areas. CBOs lack formal legislative backing and face fragmented support from government institutions. Behavioural change campaigns, crucial for promoting hygiene, are underfunded and fail to reach vulnerable groups like women and children. Though the Punjab Local Government Act 2019/2022 emphasises community engagement, progress in this area has been minimal.

Funding constraints remain a persistent issue. While international donors provide project-specific financial support, systemic challenges such as infrastructure maintenance and service expansion are underfunded. Provincial budgets are insufficient, and smaller municipal bodies face severe resource limitations. Opportunities for PPPs, highlighted in the Punjab Water Policy 2018, remain largely untapped.

Finally, data management and social inequities further impede progress. Gaps in data collection and coordination across institutions hinder evidence-based planning and prioritisation. Marginalised groups, including women, girls, and communities in remote areas, face disproportionate challenges in accessing clean water and sanitation. Gender-sensitive solutions and inclusive governance, as recommended in the Punjab Water Policy 2018 and WASH Strategy 2020, are urgently needed.

KEY INSTITUTIONAL REFORMS FOR WASH: WATER AND SANITATION AUTHORITY 2025

The Government of Punjab introduced Punjab Water and Sanitation Authority Act 2025, notified on 29 January 2029, brings significant institutional reforms to streamline governance, enhance accountability, and improve service delivery in WASH sector. By establishing the Punjab Water and Sanitation Authority (PWSA) as the central regulatory and operational body, the Act aims to reduce institutional fragmentation and improve coordination among WASAs, municipal corporations, local governments, and service providers. This integration ensures efficient water supply management, enhanced sanitation services, and improved wastewater treatment, addressing long-standing service gaps in the province. The Act introduces financial and operational reforms that enable cost recovery, tariff regulation, and public-private partnerships (PPPs), ensuring the long-term sustainability of WASH services. It mandates the adoption of digital monitoring systems, service benchmarks, and environmental compliance measures, enhancing institutional transparency and accountability. The Act strengthens climate resilience in WASH infrastructure, incorporating disaster preparedness, groundwater conservation, and flood-resistant sanitation solutions. These measures empower local governments, improve service efficiency, and contribute to universal access to safe drinking water and sanitation services in Punjab, aligning with SDG 6 and national WASH policies.

Table 5: Institutional Arrangement for WASH

Stakeholder Category	Relevant Stakeholder	Responsibility of Stakeholder	Importance of Stakeholder	Influence and Interest in Reforms
Federal Ministries and Institutions	Federal Finance Division	Leads on fiscal and monetary policy of the country, manages national finance commission, revenue collection and budgetary allocations to federal ministries and provincial finance departments	Very High	Key ministry that regulates division of resources amongst provinces, debt management, allocation of resources under NFC and PSDP
	Ministry of Planning, Development & Special Initiatives	Coordinates national development plans, including those aligned with SDG-6 (clean water and sanitation). Guides WASH investments across provinces.	Very High	Shapes policies and aligns resources to improve WASH systems under national development frameworks.
	Ministry of Climate Change and Environmental Coordination	Coordination for SDG 6 reporting, WASH Cell, and integrates climate-resilient approaches into WASH initiatives. Develops policies to mitigate climate risks such as urban flooding and drought.	High	Collaborates with provincial departments to develop sustainable, climate-adaptive water and sanitation systems in addition to reporting and coordination on water supply, sanitation and hygiene through JSRs, JMP, etc.
	Ministry of Defence	Military cantonment board manages all types of municipal and development initiatives in cantonment areas	High	Support in the identification and development of key social infrastructure and services including water supply and sanitation services in cantonment area
	Federal Bureau of Statistics	Provides census and survey data for monitoring WASH access and identifying service gaps.	High	Generates critical data for evidence-based planning and policymaking.
	Economic Affairs Division	Coordinates foreign grants and loans for WASH. Mobilises resources for Punjab's projects in collaboration with development partners.	High	Plays a key role in negotiating and approving financing agreements with WB, ADB, IDB, and others.
	Pakistan Council of Research in Water Resources (PCRWR)	National body responsible for monitoring and surveillance of water resources including water quality. Conducts water quality testing, rainwater harvesting models, and groundwater studies.	High	Provides services on conducting water quality tests in line with the national water quality standards along with services of technical guidance on rainwater harvesting and ground water modelling in Punjab.
	Pakistan Meteorological Department (PMD)	Provides climate forecasts for WASH planning and disaster preparedness.	Moderate	Assists in creating disaster-resilient WASH infrastructure to address drought and flooding risks.

Provincial Departments/ Agencies	Finance Department	Management of Provincial Financial Resources	Very High	Key player in allocation, approval and release of funds including subsidies and development budget. Interested to reduce subsidies and cost recovery for sustainability of R-WASA
	Planning and Development Board, Punjab	Guides resource allocation for WASH projects in Punjab's ADP.	Very High	Approves budgets for major WASH projects and coordinates with donors to ensure implementation at the provincial level.
	Irrigation Department	Responsible for managing the irrigation system within the Punjab province as well as custodian of Punjab water policy 2018 and Punjab Water Act	High	Responsible for the creation for Punjab Water Resource Commission, PWRA for monitoring and licensing to the service providers and managing overall water resource management in the province.
	Housing, Urban Development & Public Health Engineering Department (HUD&PHED)	Responsible for urban development in Punjab along with provision of drinking water supply services including drainage /sanitation	Very High	Leads urban development plans and endorses operational strategies for water supply and sewerage systems. Also, the administrative department of all urban utilities. PHED approves and endorses all development and operational budgets and strategic actions
	Local Government and Community Development (LGCD) Department	Responsible for identifying and maintaining water supply services and provision of sanitation services under Local Government Act through elected councils	Very High	The elected councils or administrative municipal bodies, including Rawalpindi Municipal Corporation is administratively reporting, to LGCD. Similarly, PMRSC and PMDFC works under the LGCD
	Punjab Environmental Protection Department	Responsible for compliances to Punjab Environmental Protection Act 1997 including national and provincial environmental quality standards of drinking water and municipal affluents	High	The department is responsible for monitoring and ensuring the compliance to environmental quality standards of drinking water and municipal affluents. This includes fines and even closing down the businesses and site
	Health Department	Implements hygiene awareness campaigns and ensures the safety of drinking water and sanitation services in HCFs.	Very High	Directly linked to improving health outcomes by addressing waterborne diseases and sanitation challenges.
	Education Department	Promotes WinS by ensuring access to clean water, toilets, and hygiene facilities.	High	Plays a critical role in improving hygiene practices and infrastructure for schoolchildren across Punjab.

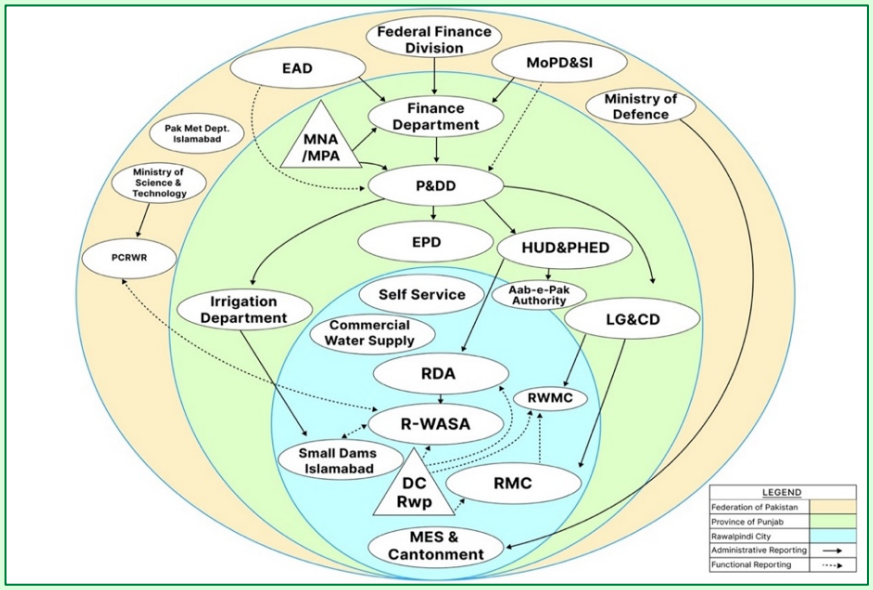
	Punjab Disaster Management Authority	Lead agency on the prevention, preparedness and response to disaster in the province	High	Development of contingency and operational plans to respond to the disasters. Works closely with PHED, LGCD, etc. for water and sanitation services if required in any emergency
	Punjab Municipal Development Fund Company (PMDFC)	Strengthens municipal capacity for urban WASH services and infrastructure financing.	High	Works with municipalities to expand drinking water and sanitation networks in urban areas.
	Urban Unit	Provides technical expertise for urban WASH planning and data-driven policy development.	High	Offers innovative solutions for urban sanitation systems, water metering, and GIS mapping for efficient service delivery.
	Punjab Rural Municipal Services Company	Provides WASH services in rural areas, including water supply, solid waste management, and drainage.	Very High	Facilitates rural-focused water supply and sanitation projects, ensuring equitable access in underserved communities.
	Punjab Aab-e-Pak Authority- renamed as Punjab Saaf Pani Authority	Focuses on providing safe drinking water to rural and peri-urban communities through filtration plants.	High	Expands clean water access, particularly in areas with limited public supply.
	Punjab Women Development Department	Custodian of women rights and gender policy of the province		Punjab Gender policy signifies the creation of separate and dedicated toilets for women in public and workplaces.
	Punjab Bureau of Statistics	Provides MICS data monitoring WASH access and identifying service gaps.	High	Generates critical data for evidence-based planning and policymaking on every three to five years
District and Local Institutions	Development Authorities (e.g., LDA, FDA, MDA, GDA)	Plan and implement urban development projects, including WASH infrastructure in five major cities (Lahore, Faisalabad, Multan, Gujranwala, Rawalpindi).	Very High	Critical for urban infrastructure planning and implementation, especially in expanding peri-urban areas.
	Water and Sanitation Agencies (WASAs)	Operate and maintain water supply and sewerage systems in major urban centres.	Very High	Key operators for urban water distribution and wastewater management, particularly in densely populated areas.
	Municipal Corporations and Committees	Provide urban water and sanitation services, including drainage and solid waste management.	High	Key actors in day-to-day service delivery in cities and towns across Punjab.
	CBOs	Mobilise communities to adopt safe water and sanitation practices in rural areas.	High	Extend WASH access to underserved populations by complementing government-led efforts through grassroots initiatives.

Development Partners	World Bank (WB)	Supports urban sanitation and water supply projects, including the Punjab Intermediate Cities Improvement Investment Programme (PICIIP) and PRMSC initiatives in 2000 villages	Very High	Provides technical and financial assistance for scalable WASH infrastructure projects in urban and rural areas of Punjab especially PMRC initiative of supporting 2000 villages in 16 tehsils of Punjab to develop innovative solutions including behavioural change for tariffs and maintenance.
	Asian Development Bank (ADB)	Funds WASH infrastructure projects focusing on secondary cities and improving municipal service delivery under Punjab cities improvement programme and DREAMS initially focusing on seven cities.	Very High	Drives large-scale capacity building for local governments to strengthen sanitation systems and water supply coverage.
	UNICEF	Worked with Government of Punjab to scale up PATS, WASH in Schools (WinS) and rural sanitation programmes, with an emphasis on behaviour change and sustainability.	High	Extend technical skills and extending necessary advocacy support for generating political will through policy dialogues and evidence generation. Even support government in pooling and mobilising the resources for implementation
	JICA	Assists with urban drainage and water supply systems, particularly in flood-prone cities and support to human resource development for Urban WASH	High	Focuses on building resilience against floods and improving urban sanitation efficiency as well as support to the local government academies of Punjab and Al-Jazari Academy for WASA Staff.
	French Development Agency (AFD)	Finances urban wastewater treatment and energy-efficient water supply projects	Moderate	Provides funding and technical advice for sustainable infrastructure projects.
	GIZ (Germany)	Supports decentralised WASH systems and capacity building for community-led sanitation projects.	Moderate	Provides technical expertise for rural WASH programmes and policy reforms.
	WaterAid	Implements innovative water and sanitation solutions in marginalised communities.	High	Focuses on strengthening community capacity and equitable access to WASH services.
	DANIDA (Denmark)	Funds small-scale sanitation and clean water initiatives in rural Southern Punjab.	Moderate	Targets vulnerable populations with specific interventions for improved water access and hygiene practices.
	FCDO (UK)	Supports hygiene promotion campaigns and gender-focused WASH projects.	High	Integrates women's empowerment into WASH strategies and advocacy efforts.
Research, Commercial,	Universities and Think Tanks	Conduct evidence-based research for policy recommendations and technical guidance on climate-resilient WASH.	Moderate	Provide critical data to inform adaptive and inclusive WASH planning at provincial and national levels.

Communities and Media				
	Commercial Water Supplier	A significant number of water tankers of different size to offer water supply services in the city	High	The prices of commercial water suppliers are extremely high compared to WASA charges. A significant proportion of the population living in underserved areas is dependent upon their water supply services
	Self-Provision by Households	Many households constructed boreholes for water supply	High	Due to limited water supply, many households constructed their own boreholes
	Key Newspapersand Local TV Channels	Creating awareness and underling the gaps in the service delivery and functionality of the systems	High	Highlighting weaknesses in the system, projecting policy flaws and holding governments accountable
	Social and Digital Media	Building critical mass of supporters towards emerging political issues	High	Quick and low-cost outreach making these very popular. This not only saves time but also enables quick feedback

Institutional Arrangements in Rawalpindi City

The delivery of water, sanitation, and drainage services in Rawalpindi involves multiple stakeholders with overlapping roles, creating challenges in governance and coordination. The Rawalpindi Water and Sanitation Agency (R-WASA), under the Rawalpindi Development Authority (RDA), is the primary provider of water supply and sewerage services for the municipal corporation area and 20 peri-urban union councils. Cantonment areas, including Rawalpindi and Chaklala, are managed by their respective boards under the Military Engineering Services (MES) and the Ministry of Defence. Additionally, private water tankers and self-provision through groundwater are prevalent in areas lacking sufficient public water supply. The Rawalpindi Municipal Corporation (RMC), under the Punjab Local Government Act 2019, oversees open drainage systems, while the Rawalpindi Waste Management Company (RWMC) is responsible for desilting major nullahs, except Nullah Lai. Jurisdictional disagreements between RMC and RWMC complicate drainage management. The Small Dams Organisation supplies water to R-WASA through Rawal Dam (23 MGD) and the newly constructed Chahan Dam (6 MGD). However, efforts for groundwater recharge remain inadequate. Organisations like the Punjab Aab-e-Pak Authority focus on rural and peri-urban areas, with limited relevance to Rawalpindi city. International interventions include WWF Pakistan's installation of water filtration and rainwater harvesting systems under the "Australia-Pakistan Water Security Initiative" and UN-Habitat's rainwater harvesting projects in peri-urban union councils. At the provincial level, the Planning and Development Department leads development work, while the Finance Department manages budgets and allocates development funds. Technical support is provided by PCRWR through water quality evaluations and groundwater studies, while the Pakistan Meteorological Department issues weather alerts critical for urban flooding management.



Strategic Action for Institutional Arrangements

Short-Term Actions (1-3 Years)	Medium-Term Actions (4-6 Years)	Long-Term Actions (7-10 Years)
Conduct a detailed institutional mapping to clarify roles and eliminate overlaps among stakeholders at all levels.	Develop an integrated provincial WASH governance framework to align responsibilities and mandates across institutions.	Institutionalise a unified WASH regulatory framework with clear mandates for federal, provincial, and local levels.
Train local government officials and staff in WASH governance, service delivery, and compliance with existing laws.	Build capacity within district and municipal governments to plan and execute climate-resilient WASH projects.	Establish a fully operational and autonomous PWRA for robust WASH oversight.
Strengthen inter-departmental coordination through task forces focusing on water resource management and sanitation.	Expand partnerships with the private sector to promote public-private collaboration in WASH infrastructure development.	Create a centralised data repository for WASH planning and monitoring, integrating real-time digital tools.
Launch public awareness campaigns to educate communities on the importance of WASH governance and their role in accountability.	Roll out provincial WASH digital monitoring systems to track project performance, resource utilisation, and compliance.	Implement long-term strategies for addressing WASH inequalities in marginalised and underserved communities.
Mobilise international donor support for short-term capacity building and emergency WASH interventions in high-risk areas.	Pilot decentralised service delivery models to empower CBOs in managing local WASH initiatives.	Fully implement the Punjab Local Government Act 2022 to empower local councils for autonomous WASH governance.
Conduct workshops for elected local government representatives to promote understanding of their responsibilities in WASH governance.	Design and implement financial models to ensure sustainable funding for municipal and district-level WASH services.	Ensure integration of WASH strategies with Punjab's Climate Change Policy to achieve sustainable, adaptive outcomes.

WATER RESOURCES

Water resources are crucial to Punjab's economic and social well-being, but the province faces significant challenges in managing these resources due to increased demand, over-extraction, and climate change. According to Punjab Water Policy 2018, the Water Stress in Punjab is severe, with a water availability index of 770 m^3/capita/year, significantly below the global water stress threshold of 1000 m^3/capita/year. Punjab relies heavily on two main water sources: surface water from the Indus River system and groundwater. Surface water supports agriculture through the Indus Basin Irrigation System (IBIS), one of the largest irrigation systems in the world. However, water availability is increasingly affected by climate change, leading to more frequent and severe droughts and floods. As a result, the need for improved water resource management and planning has become critical. The total water use across all major sectors in Punjab was 99.86 MAF in 2015, with agriculture being the dominant consumer, using 95.3 MAF or 95.4 percentage of the province's water. The remaining 4.6 percentage (4.56 MAF) was allocated to domestic, industrial, and commercial purposes. Projections for 2025 show that domestic water demand will increase by 0.54 MAF due to population growth, with current consumption at 3.06 MAF. Industrial water use is also expected to grow by 62.7 percent, from 1.50 MAF in 2015 to 2.44 MAF by 2025, with this additional demand likely being met by savings in the agricultural sector. (Government of Punjab, 2018)

Groundwater, which accounts for a significant portion of Punjab's water supply, particularly in urban and peri-urban areas, are under severe stress. The unregulated and excessive extraction of groundwater has led to substantial declines in water tables. Punjab Water Policy 2018 indicates a net over abstraction of 2 MAF groundwater annually in the province. A study titled 'Determining the Sustainability of Groundwater Use in Punjab's Irrigation Canal Commands', conducted by the ADB for the Punjab Irrigation Department from 2007 to 2019, revealed that groundwater levels are declining significantly in 14 out of 25 Punjab's canal command areas. The most severe declines have been observed in Multan region, where groundwater levels are falling at an alarming rate of 0.35 to 0.16 meters per year. This decline is particularly pronounced in the Lower Bari Doab Canal (LBDC) command, where groundwater extraction has greatly exceeded natural recharge, posing a long-term risk to water security. (Prathapar, Hashmi, Hashmi, & Arslan, 2021)

Table 6: Change in Ground Water Table of Canal Command Areas

Sr.	Canal Command	No of Bores	Change (m/year)
1	Abbasia	29	-0.07
2	CBDC	20	-0.26
3	Haveli	20	-0.10
4	LBDC Multan	64	-0.11
5	LDC Lahore	2	-0.13
6	LPC Multan	9	-0.35
7	Maisli	47	-0.08
8	Muzaffargarh	29	-0.09
9	Panjnad	18	-0.10
10	Saddiqia	43	-0.04
11	Sidhnai	47	-0.11
12	Thal	85	-0.06
13	UDC Multan	4	-0.16

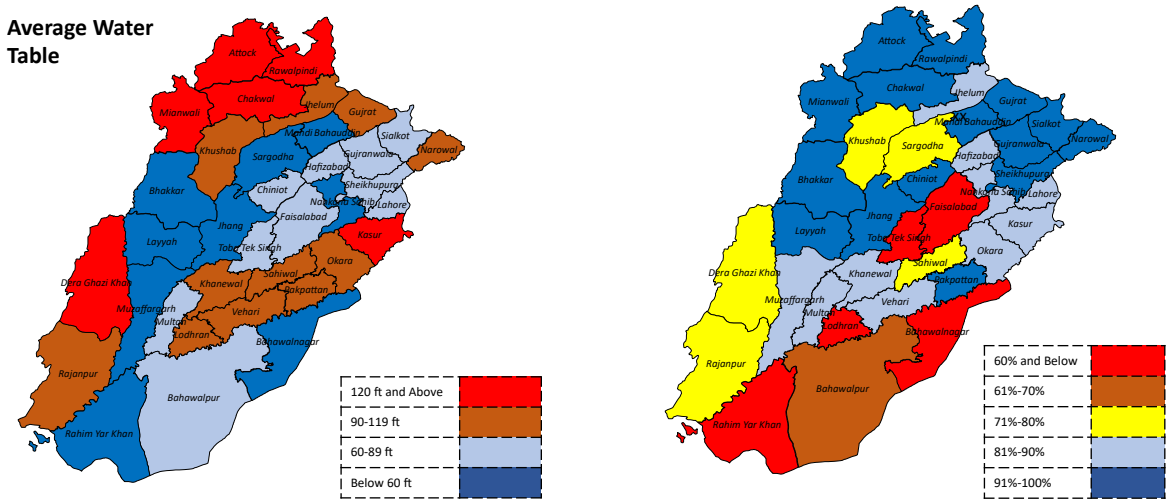
Sr.	Canal Command	No of Bores	Change (m/year)
14	UPC	8	-0.23
15	UJC Sargodha	41	-0.03
16	Fordwah	48	-0.02
17	LJC Sargodha	87	-0.02
18	Marala Ravi	7	-0.02
19	Upper Chenab	47	-0.01
20	DG Khan	38	0.02
21	LCC Faisalabad	47	0.03
22	CRBC	27	0.04
23	Rangpur	14	0.05
24	Qaim	8	0.16
25	Bahawal	40	0.19

Source: Determining Sustainability of Groundwater Use in Punjab's Irrigation Canal Commands from 2007 to 2019

Despite a slight reduction in household groundwater extraction (as reported in MICS2018, which noted a decrease from 73.1 percentage in 2014 to 63.8 percentage in 2018), groundwater remains a primary source in many areas. However, the province is now facing a groundwater deficit of approximately 0.77 billion cubic metres annually, as recharge rates fail to keep pace with extraction (Prathapar, Hashmi, Hashmi, & Arslan, 2021). The situation is further exacerbated by the concentration of groundwater extraction in urban centres like Lahore, where water tables have dropped steadily, causing pumping costs to rise, and affecting both water availability and quality.

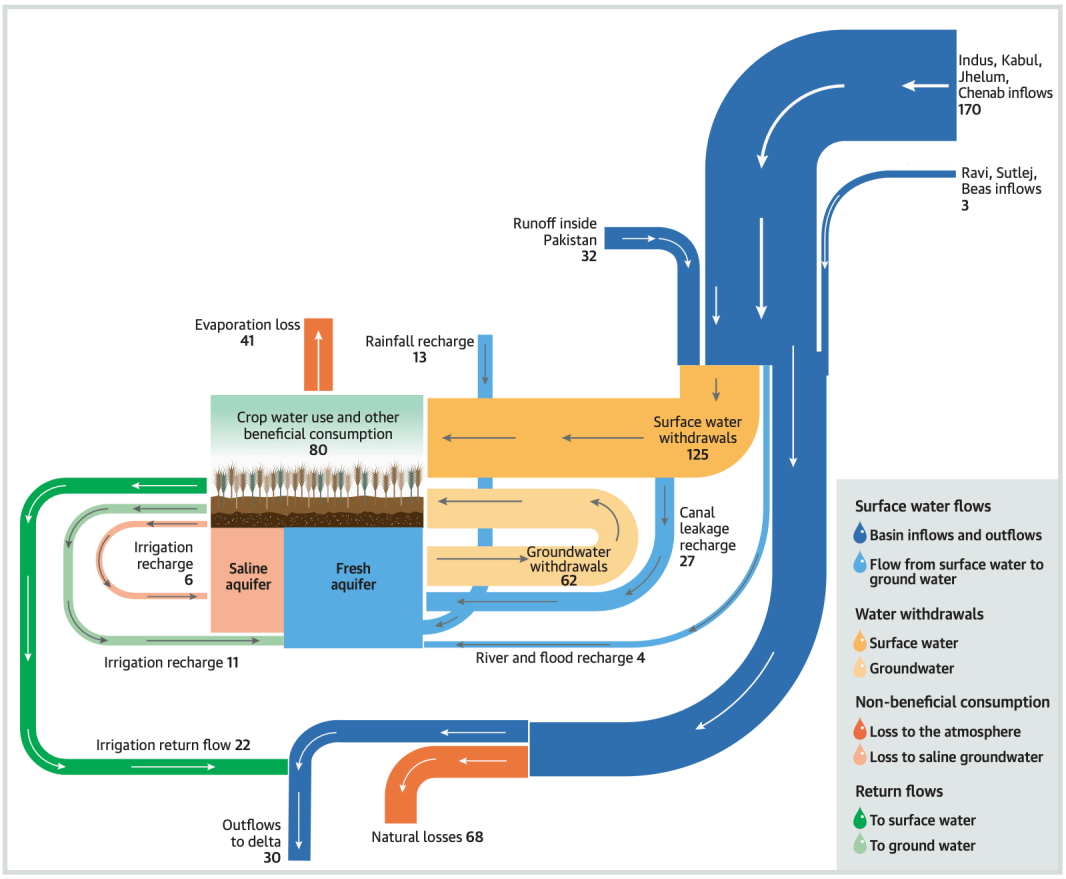
The overreliance on groundwater in Punjab is largely driven by the availability of sweet groundwater and a shallow water table in most districts. According to the Punjab Mouza Census 2020, 31 out of 37 districts in the province have sweet groundwater in over 70 percent of their mouzas. However, districts such as Bahawalpur, Bahawalnagar, Faisalabad, Lodhran, Rahim Yar Khan, and Toba Tek Singh primarily have brackish groundwater. On average, the groundwater table in Punjab is 89 feet deep, but some districts like Attock, Chakwal, Dera Ghazi Khan, Kasur, Mianwali, and Rawalpindi have groundwater depths exceeding 120 feet. In the eastern districts of Punjab, groundwater levels are higher than the provincial average due to minimal river flow following the Indus Water Treaty.

Figure 14: Ground Water Table and Taste in Punjab- Punjab Mouza Census 2020



Groundwater extraction exceeds recharge in many areas, causing declining water levels and the risk of salinisation, in Punjab where excessive pumping brings saline water into fresh aquifers. Irrigation practices also contribute to salt accumulation, adding about 1 ton of salt per hectare annually. This salt originates from both surface and groundwater, posing risks for agricultural sustainability. The challenge is managing both the quantity and quality of water, balancing groundwater use with proper drainage to maintain agricultural productivity and avoid long-term degradation. (Lytton, Ali, Garthwaite, Punthakey, & Saeed, 2021).

Figure 15: Indus Basin Average Annual Water Balance



Source: Groundwater in Pakistan's Indus Basin-Present and Future Prospects 2021 by World Bank Group

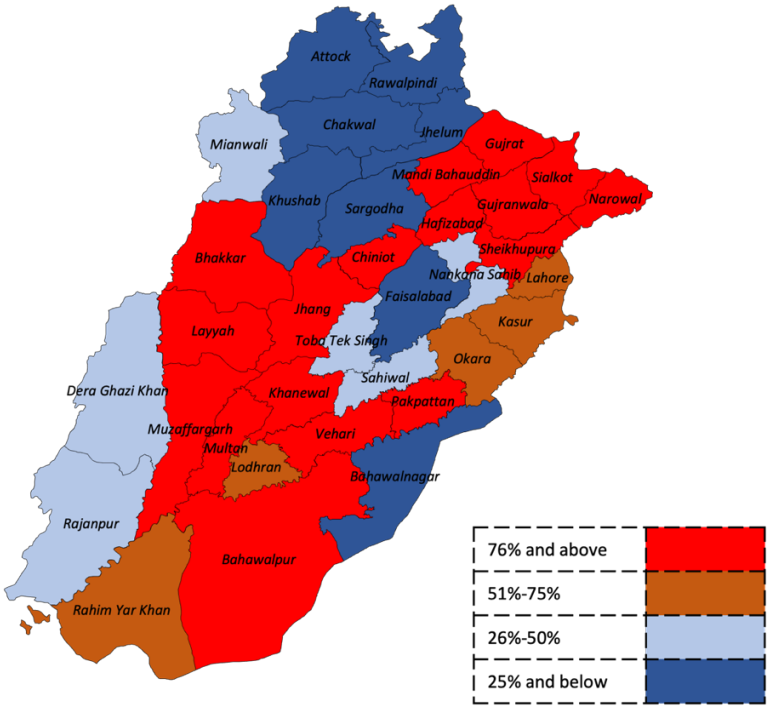
Groundwater salinity is a particularly critical issue in regions like Rechna Doab and the Lower Bari Doab, where over-pumping has drawn saline water into previously fresh aquifers. In areas like these, groundwater's electrical conductivity often exceeds safe thresholds for irrigation, severely affecting agricultural productivity and soil health. Moreover, arsenic contamination, especially in cities like Lahore and Multan, presents a growing public health risk, with concentrations exceeding permissible limits. (Lytton, Ali, Garthwaite, Punthakey, & Saeed, 2021)

Surface water from the Indus River system continues to play a vital role in Punjab's agricultural economy, with the Indus Basin Irrigation System providing the bulk of irrigation water. However, water availability is increasingly unreliable due to the impacts of climate change. More frequent and intense droughts, coupled with erratic monsoon patterns, have reduced the predictability of surface water flows. The situation is made worse by outdated and inefficient irrigation infrastructure, which results in significant water losses. (Lytton, Ali, Garthwaite, Punthakey, & Saeed, 2021).

Use of Water Resources for Water Supply Services in Punjab

According to departmental data from HUD&PHED, the total household water demand in Punjab is 3,213 MGD, with 1,932 MGD sourced from groundwater and 1,281 MGD from surface water. Particularly, districts from Gujranwala, Lahore, Bahawalpur, and Multan divisions rely on groundwater for more than 50 percent of their water supply needs. (Please see Annexure I for Tehsil wise Water Allocation). This substantial dependence on groundwater poses challenges, including aquifer depletion and declining / water tables, while the potential of surface water resources remains underutilised.

Figure 16: Ground Water as percentage of Total Water Use for Water Supply Services



In response to these challenges, several strategic initiatives have been introduced to address Punjab's water challenges. These include the rehabilitation of irrigation infrastructure, the promotion of modern irrigation techniques, and the regulation of groundwater extraction. Additionally, efforts are being made to enhance water quality monitoring systems and implement rainwater harvesting and wastewater recycling projects. However, these efforts need to be scaled up and integrated more effectively into broader water management strategies and plans to address the province's mounting water security challenges. The Punjab Water Policy 2018 provides a comprehensive framework for managing water resources in the province. It focuses on protecting surface water sources from contamination, promoting the use of surface water to reduce reliance on groundwater, and building and maintaining water infrastructure on a financially sustainable basis. The policy also emphasises the need for IWRM practices to address the growing challenges posed by climate change. Furthermore, the Punjab Climate Change Policy 2024 includes guidelines for developing climate-resilient water infrastructure to mitigate the impacts of climate change on water resources.

Case Study: Residential Rainwater Harvesting in Lahore, Pakistan[12]

Lahore, the provincial capital of Punjab and Pakistan's second-largest city, faces acute water scarcity due to rapid urbanisation, population growth, and declining groundwater levels. In response, the Lahore Development Authority (LDA) introduced rooftop Rainwater Harvesting (RWH) regulations in 2014, mandating the installation of RWH systems for residential plots larger than 104 square metres. These measures aimed to alleviate water shortages, recharge groundwater, and promote sustainable water management. However, the uptake of RWH systems in Lahore has been minimal, with only four out of 113 surveyed residential buildings implementing such systems, as reported in a recent study adoption rate stems from several challenges. Firstly, public awareness remains limited, with 72 percent of surveyed residents unaware of RWH regulations or their benefits. Additionally, many homeowners perceive RWH systems as costly, despite their potential to reduce water bills over time. Contractors, often unaware or uninterested in enforcing RWH requirements, fail to inform homeowners. Weak regulatory enforcement by the LDA, coupled with the absence of penalties for non-compliance, has further hindered adoption. Scepticism regarding the effectiveness of RWH systems, particularly given Lahore's seasonal rainfall patterns and concerns over building damage due to seepage, has also deterred residents.

Despite these obstacles, RWH offers considerable benefits. It can recharge Lahore's rapidly depleting groundwater, which is declining by about two feet annually, and mitigate urban flooding during the monsoon season by capturing stormwater. Furthermore, harvested rainwater can be used for non-potable purposes such as gardening and cleaning, reducing the reliance on conventional water supplies. A public awareness campaign should be started to highlight the environmental and financial benefits of these systems. Financial incentives, coupled with penalties for non-compliance, could encourage greater adoption. Providing technical support to contractors and residents would also facilitate compliance. Expanding successful pilot projects, such as the underground rainwater reservoir on Lawrence Road, could serve as a model for wider implementation. In conclusion, while RWH adoption in Lahore remains low, it holds significant potential to address the city's water challenges. With better enforcement, increased awareness, and supportive policies, RWH can contribute to sustainable water management and serve as a model for other cities in Pakistan.

Enhance urban climate change resilience by rainwater harvesting in Rawalpindi

The Pakistan's Adaptation Fund Project is a joint collaboration of the Government of Pakistan, UNHABITAT and the Adaptation Fund. The project, started in 2022, is being implemented in two districts of Pakistan. One of the districts is Rawalpindi, and seven (7) union councils (UCs) of this district are being targeted. Key objective of the project is to improve access of the communities to build their capacities in Rainwater Harvesting through collection and storage at household levels and also to apply the same approach in the Public Buildings, which face acute shortage of water due to droughts and insufficient water management. In addition, project is also undertaking activities related to policy formulation on rainwater harvesting,

[12] Hameed, R., Javed, M., & Nawaz, M. S. (2021). An assessment of adoption of rainwater harvesting system in residential buildings in Lahore, Pakistan. Urban Water Journal, 18(3), 163–172. https://doi.org/10.1080/1573062X.2020.1860239

development of national urban strategy, preparing guidelines on spatial planning and water management strategies in the country. The project also implementing the activities related to capacity building of Government authorities, field implementers, community representatives and civil society organisations in planning, construction, designing and operation of the Rainwater Harvesting facilities and technologies to build the capacities of the stakeholders for broader impacts on climate adaptation and mitigation. The project partners are also organising awareness campaigns, capacity building trainings and workshops for target communities and officials of the relevant departments to enhance their preparedness and awareness levels regarding Rainwater Harvesting and water related Planning and management. The project is implemented through four Government departments and authorities including Ministry of Climate Change, National Disaster Management Authority, Pakistan Council of Research in Water Resources (PCRWR) and Rawalpindi WASA and one civil society welfare trust.

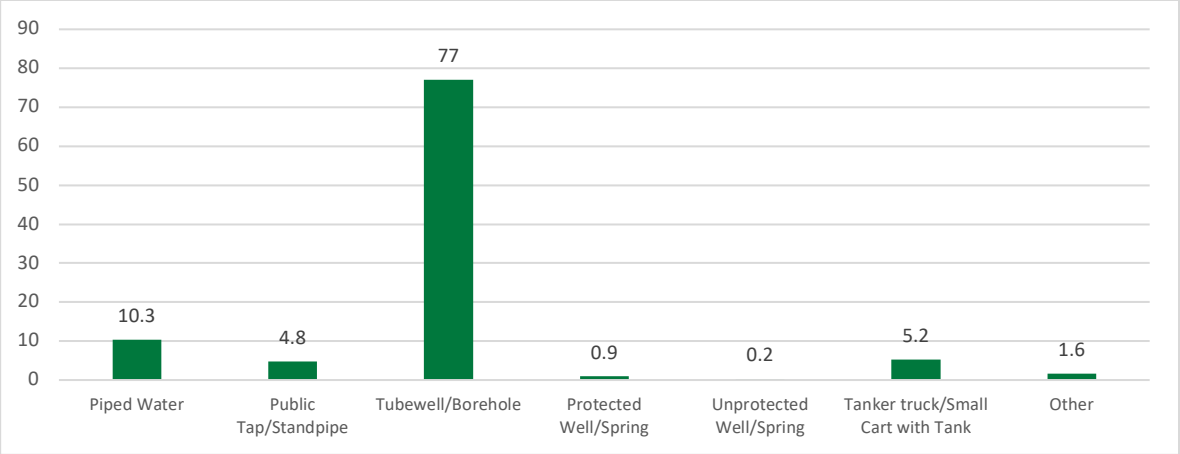
Strategic Action for Water Resources

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Initiate rehabilitation of existing irrigation infrastructure to improve efficiency and reduce water wastage.	Implement IWRM practices across all districts to ensure equitable water allocation.	Achieve a 30 percent reduction in groundwater extraction through enforcement of regulatory frameworks
Promote modern irrigation techniques such as drip and sprinkler systems, particularly in water-scarce areas.	Establish provincial-level water usage planning and forecasting systems for sustainable management.	Implement basin-level water resource management plans incorporating stakeholder input to optimise water use.
Establish and enforce regulations to control excessive groundwater extraction, prioritising high-risk districts.	Expand water quality monitoring systems, particularly in urban and industrial hubs, to prevent contamination.	Fully integrate groundwater recharge initiatives such as aquifer storage and recovery into provincial water management plans.
Conduct groundwater mapping to identify critical depletion zones and create targeted management strategies.	Scale up community-led water conservation initiatives in high-risk climate zones, focusing on rural areas.	Institutionalise a centralised groundwater monitoring authority for data collection, policy enforcement, and resource allocation.
Develop public awareness campaigns on water conservation and climate adaptation measures in WASH practices.	Establish treatment facilities for areas with high contamination levels of arsenic, fluoride, and nitrates.	Ensure that all major urban centres have functional and sustainable groundwater management systems by 2034.
Promote rainwater harvesting systems in urban areas, schools, and public buildings, supported by financial incentives.	Expand wastewater recycling projects across the province to reduce freshwater demand and promote reuse.	Ensure all WASH infrastructure is designed for climate resilience, capable of withstanding extreme weather events.
Incentivise adoption of water-efficient technologies, including water-saving appliances and low-flow plumbing systems.	Establish large-scale constructed wetlands for natural wastewater treatment and conservation in peri-urban areas.	Align all provincial water management strategies with national and international climate change commitments, including the NDCs.

DRINKING WATER

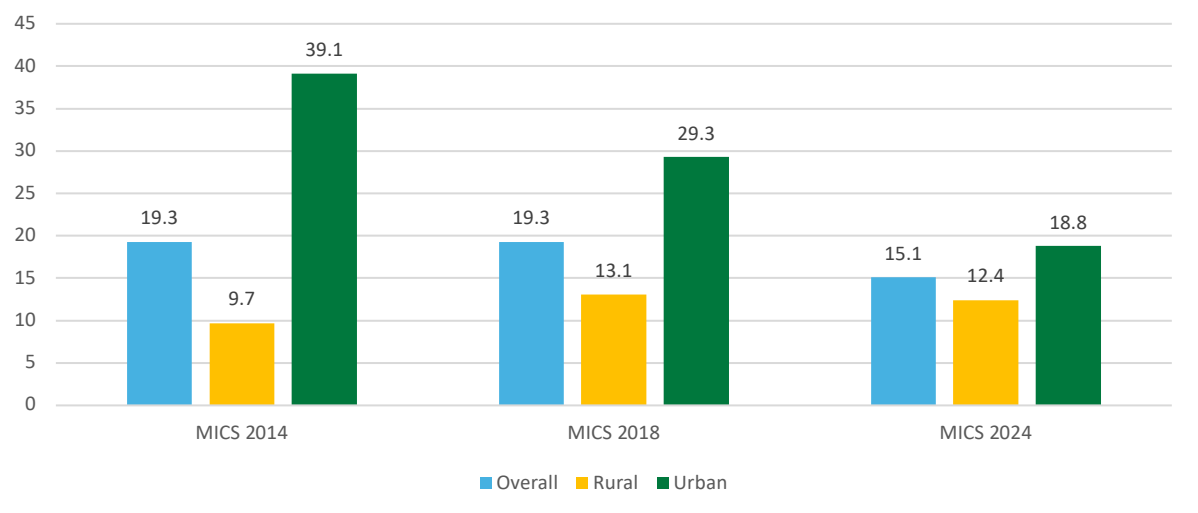
According to the MICS 2024, the predominant source of drinking water for households in Punjab is tubewells or boreholes, with 77 percent of the population relying on these sources. In contrast, only 10.3 percent of households have access to piped water, highlighting a significant gap in the provision of this service. Additionally, 4.8 percent of households depend on public taps or standpipes. This distribution of water sources suggests a reliance on groundwater for most households, while access to more reliable and centralised water distribution systems, such as piped water, remains limited.

Figure 17: Percentage Distribution of Drinking Water Sources – MICS 2024



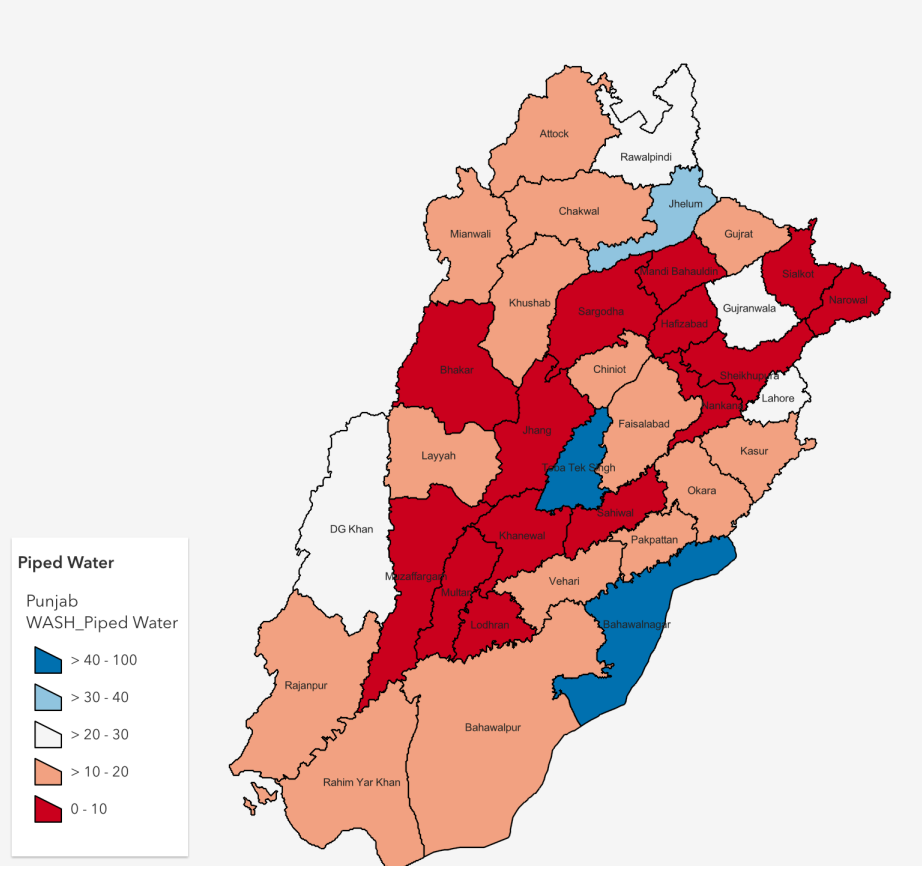
Punjab MICS 2023-24 revealed that only 15.1 percent of the population has access to piped water supply of which only 6 percent have it in premises, and 3.4 percent in the compound. A downward trend is being witness in access to piped water in Punjab as this was 19.3 percent in 2014 and 2018 compared to 15.1 percent in 2024. In case of rural areas, this was increased from 2014 to 2018 from 9.7 percent to 13.1 percent but then declined to 12.4 percent. However, in urban areas there is an alarmingly decline of access to piped water in urban areas from 39.1 percent in 2014 to 29.3 percent in 2018 and then 18.8 percent in 2024. This portrays a clear trend of decreasing dependence on piped water supply.

Figure 18: Comparison of Piped Water Supply in Punjab – MICS 2014, 2018 & 2023



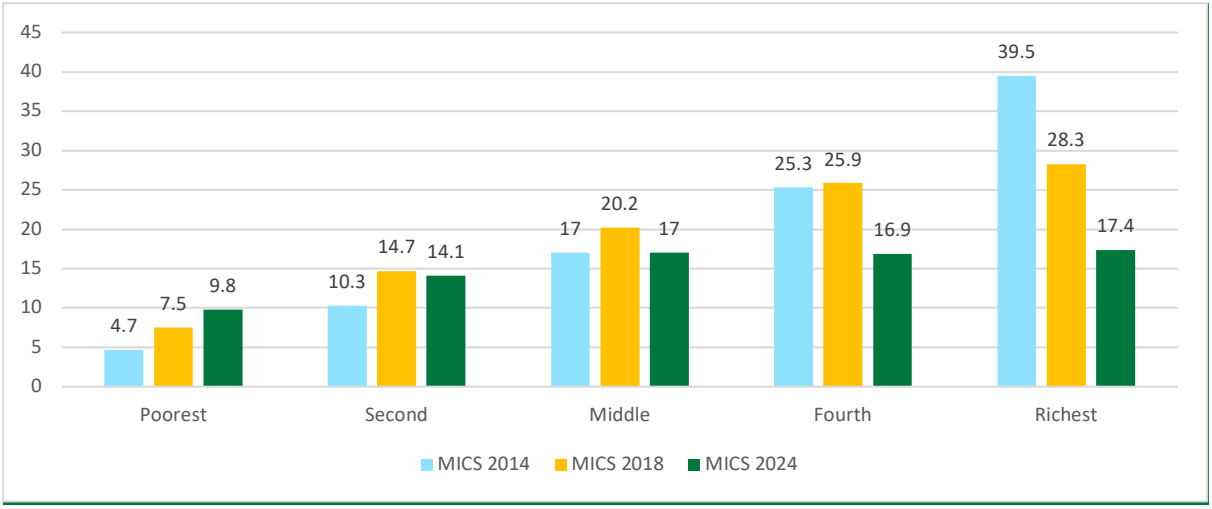
The analysis of piped water coverage across districts in Punjab reveals significant variations, with some districts showing improvements and others experiencing notable declines between MICS 2014, 2018, and 2024. Layyah district demonstrated highest increase, with coverage rising from 1.5 percent in 2018 to 15.8 percent in 2024. Several districts experienced substantial declines, Lahore district, traditionally well-served, experienced a dramatic reduction in piped water coverage, from 64.6 percent in 2018 to 21.8 percent in 2024. Steep declines were observed in Sheikhupura, Mandi Bahauddin, and Nankana Sahib districts from 2018 to 2024.

Figure 19: Piped Water Supply Coverage in Punjab-MICS 2023-24



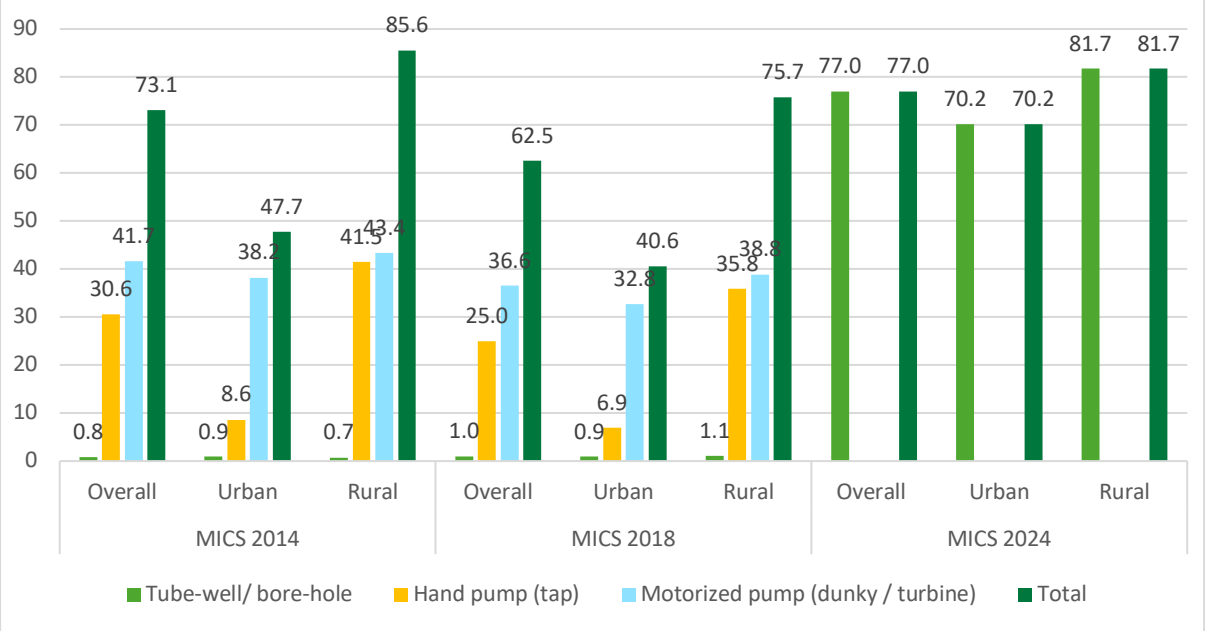
The analysis of piped water access across wealth quintiles in Punjab from MICS 2014 to 2024 reveals a notable shift. The poorest quintile shows a steady improvement, with access increasing from 4.7 percent in 2014 to 9.8 percent in 2024. Similarly, the second quintile experienced a rise from 10.3 percent to 14.7 percent between 2014 and 2018, though it slightly declined to 14.1 percent by 2024. The middle, fourth, and richest quintiles display a significant reduction in access over time. The middle quintile's coverage fell back to its 2014 level of 17 percent by 2024 after reaching 20.2 percent in 2018. The fourth and richest quintiles experienced steep declines, with the fourth dropping from 25.3 percent in 2014 to 16.9 percent in 2024 and the richest from 39.5 percent to 17.4 percent during the same period.

Figure 20: Access to Piped Water Supply in Wealth Quintiles-MICS 2014 vs 2018 vs 2024



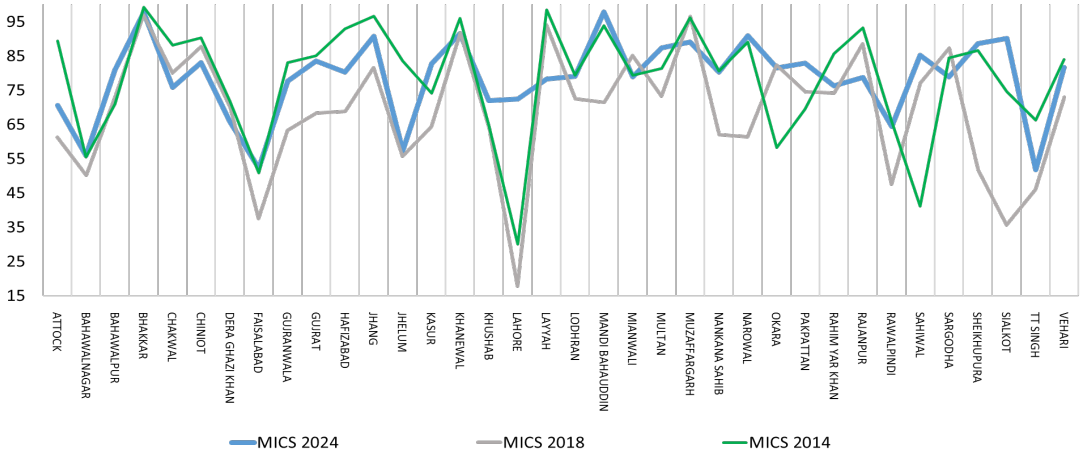
The comparison of MICS data from 2014, 2018, and 2024 highlights a significant shift in water source reliance. There was a decline in usage of ground water source at household level in 2018 as compared to 2014 and 2024. The overall use of groundwater sources, such as tube-wells/bore-holes, handpumps and motorised pumps, has increased from 62.5 percent in 2018 to 77 percent in 2024 with reliance increasing in urban areas (from 40.6 percent in 2018 to 70.2 percent in 2024) while rural areas experienced a decline in overall usage of ground water source at household level (75.7 percent in 2018 to 81.7 percent in 2024).

Figure 21: Comparison of Ground Water Source at Household Level-MICS 2014 vs 2018 vs 2024



The analysis of groundwater source at the household level across three MICS survey years 2014, 2018, and 2024 reveals varied trends among districts during the years. Several districts, such as Lahore, Faisalabad, and Sialkot, exhibited significant increases in groundwater access, with Lahore experiencing the most notable rise from 17.8 percent in 2018 to 72.4 percent in 2024 although it was at 30 percent in 2014. Stability in high usage was observed in districts like Bhakkar and Khanewal, which maintained high percentages above 90 percent across the years.

Figure 22: District Level Household Ground Water Sources in Punjab-MICS 2014 vs 2018 vs 2024



On the other side, the increased percentage of purchasing water through vendor either tanker truck or cart with small tank/drum, between 2014 to 2018 is clearly showing reduced ground water table at household sources. Overall, in Punjab, the water purchase through vendor increased from 4.9 percent in MICS 2014 to 15.5 percent in MICS 2018 while it decreased to 6.4 in 2024. In urban areas the use increased from 10.8 percent in 2014 to 28.5 percent in 2018 while it decreased to 10.3 percent in 2024. In rural areas usage decreased to 3.8 percent in 2024 although it was 7.7 percent in 2018 which had increased from 1.9 percent in 2014.

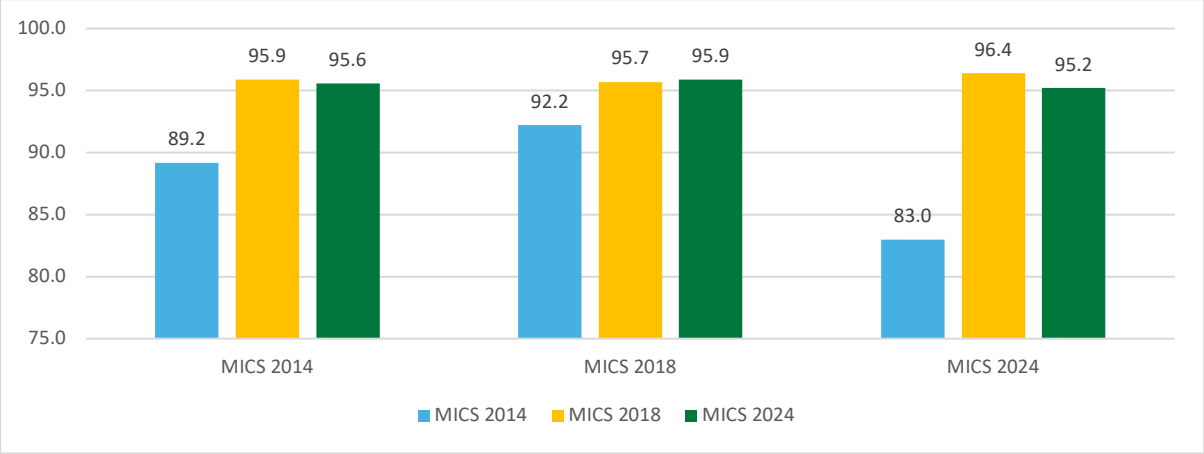
BASIC WATER SERVICES

A comparison of basic water[13] service coverage in Punjab from 2014 to 2024 reveals a steady improvement over the years. In 2014, 89.2 percent of the population had access to basic water services. This figure saw a significant increase, reaching 95.9 percent by 2017-18. However, by 2024, there was a slight decline, with coverage recorded at 95.6 percent.

When examining rural and urban disparities, the data indicates that rural areas had a relatively higher initial access rate in 2014, with 92.2 percent of the population using basic water services. Over the decade, this figure rose to 95.9 percent in 2024, reflecting an overall improvement in rural water supply infrastructure. Conversely, urban areas had a lower coverage rate at the beginning of the period, with only 83 percent of the population relying on basic water services in 2014. However, substantial progress was made, and by 2024, access had increased significantly to 95.2 percent.

[13] drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing

Figure 23: Basic Water in Punjab- MICS 2014 vs 2018 vs 2024



DRINKING WATER QUALITY IN PUNJAB

The significance of water quality cannot be overstated. Limited access to safe and clean water remains a major risk factor for the spread of infectious diseases, including polio, typhoid, cholera, dysentery, hepatitis, and diarrhoea. The scarcity of potable water exacerbates malnutrition, especially among children, further intensifying its impacts (Bensen, 2022). Furthermore, declining water quality also reduces the amount of water available for personal use (Farooq, 2023).

The demand for water in Punjab has surged significantly in recent years due to rapid population growth and declining groundwater levels. This increasing pressure on water resources has not only strained availability but also severely impacted water quality. A substantial portion of the available water is already heavily polluted, and this contamination continues to escalate due to various environmental stressors. The burgeoning population in rapidly urbanising cities places immense stress on freshwater resources. Additionally, unregulated sewage disposal, leachate seepage from poorly designed landfill sites, industrial effluent discharge into waterways, and agricultural runoff introduce large quantities of harmful chemicals into freshwater bodies. These factors collectively degrade the natural environment and further compromise the already fragile water quality in the region (Punjab State of the Environment Report, 2022). According to Pakistan Vision 2025, poor water quality has a direct and very significant impact on the nation's health – with water borne infections accounting for 70 percent of all common diseases impacting the national health.

The water quality issues in Punjab have significant implications for drinking water safety, particularly in areas relying on surface and groundwater sources. The Sutlej River, which flows through Punjab and enters Pakistan near Kasur, is heavily polluted due to industrial and municipal discharges. Effluents from textile factories, sugar mills, leather tanneries, and agricultural runoff containing pesticides and fertilisers contribute harmful contaminants like aldrin and dieldrin. Similarly, the Ravi River, one of the smallest rivers of the Indus system, receives substantial pollution from municipal sewage and industrial waste, making it one of the most polluted rivers in Pakistan. Pollutants such as O,P'-DDD and heptachlor have been detected in the river, further compromising its suitability as a water source. In the Chenab River, agricultural practices, particularly cotton farming, have resulted in contamination by banned pesticides like PPt-DDT, impacting its water quality (PCRWR, Water Quality Profile of Surface Water Resources in Pakistan, 2022), (PCRWR, Monitoring of POPs in Hydrosphere of Pakistan, 2022).

Pesticide Contamination in Punjab's Groundwater

Another study highlighted that agricultural water scarcity and the use of wastewater for irrigation have contributed to malnutrition, loss of income, and a rise in waterborne diseases in Punjab (Mikosch, Berger, Huber, & Finkbeiner , 2021). The extensive use of pesticides in agriculture has significantly impacted groundwater quality in Punjab, Pakistan. Javaid et al. (2023) highlights widespread contamination across the province, particularly in areas of intensive agricultural activity. Pesticides such as neonicotinoids, organophosphates, carbamates, and pyrethroids were found in groundwater samples collected from 15 districts, namely Vehari, Bahawalpur, Bahawalnagar, Khanewal, Multan, Jhang, Faisalabad, Sahiwal, Chiniot, Toba Tek Singh, Rawalpindi, Sargodha, Sheikhupura, Gujranwala, and Lahore. The highest levels of contamination were observed in core agricultural regions, including Vehari, Bahawalpur, Khanewal, and Multan, where cotton farming is prevalent. These areas experienced heavy pesticide use, leading to notable residues in groundwater. The contamination levels varied geographically, with the non-core and marginal areas exhibiting lower but still significant pesticide concentrations. Seasonal variations also influenced contamination, with higher pesticide residues detected during winter due to reduced degradation rates and less dilution from rainfall. Pesticides like thiamethoxam, imidacloprid, and profenofos were frequently found in concentrations exceeding safe limits, posing health and environmental risks. Correlations between pesticide residues and water quality parameters such as pH, electrical conductivity (EC), and temperature was evident. Higher pH and EC values were positively associated with increased pesticide residues, while temperature negatively affected pesticide concentrations, as higher temperatures accelerated pesticide breakdown. The findings emphasise the urgent need for integrated pest management practices, stricter pesticide regulations, and improved monitoring to mitigate the contamination of Punjab's groundwater and safeguard public health.

From a health perspective, the consumption of pesticide-contaminated water poses significant risks. Many of these chemicals are neurotoxic, capable of disrupting neurological functions and causing long-term cognitive and developmental disorders, especially in children. Prolonged exposure is linked to endocrine disruption, liver damage, and increased susceptibility to cancers and reproductive health issues. Additionally, the presence of these pollutants in water affects other lifeforms, including livestock and aquatic ecosystems, which can indirectly impact human health through food chains..

Heavy Metal and Chemical Contamination

Housing Societies in Gujranwala

A report on the drinking water quality in newly developed housing societies of Gujranwala, revealed alarming contamination levels from pesticides, heavy metals, and plasticisers as these societies, have developed on former agricultural lands. The findings showed that while most physio-chemical parameters such as pH, electrical conductivity, and total hardness were within permissible limits, contaminants like lead (Pb) and chromium (Cr) exceeded World Health Organisation guidelines at several sites. Ninety types of pesticides, including herbicides, fungicides, and insecticides, were detected, highlighting extensive agricultural chemical residues in the water. Similarly, plasticisers, used in various industrial applications, were abundantly present. These pollutants have profound implications for public health, particularly for vulnerable populations like children, who face heightened risks of chronic diseases from exposure. The study underscores the pressing need for improved water management practices, regular quality monitoring, and the enforcement of environmental regulations to safeguard groundwater resources. Without such measures, the continued degradation of water quality poses a serious threat to the health and well-being of residents.

Industrial Impacts in Faisalabad

Another study by Rehman, et al. (2022) indicated that industrial activities in cities like Faisalabad have significantly impacted water quality, with untreated effluents and waste entering water bodies. Groundwater near industrial areas often exceeds permissible limits for Total Dissolved Solids (TDS), sodium, and chloride, rendering it unsafe for consumption. Arsenic contamination is another major issue in Punjab, with several districts, including Sheikhupura, Lahore, Gujranwala, and Bahawalpur, showing arsenic levels far exceeding WHO guidelines. Long-term exposure to arsenic poses severe health risks, including cancer and cardiovascular diseases. Similarly, high nitrate and fluoride levels have been observed in rural groundwater, causing conditions like methemoglobinemia (blue baby syndrome) and dental fluorosis. In Lahore, particularly in southern urban areas, water quality issues persist despite pH and hardness levels generally meeting standards. Seasonal variations, such as post-monsoon periods, often lead to increased microbial contamination. Overall, the water quality in Punjab is significantly compromised due to inadequate waste management, poor drainage systems, and a lack of effective treatment facilities (Daud, et al., 2017).

Faisalabad's Groundwater Contamination

Another study assessed the safety and quality of underground drinking water in Faisalabad, revealing significant contamination concerns linked to industrial growth and urbanisation. Water samples from 15 locations were analysed for physical, chemical, and biological parameters. The findings indicated that 46 percent of the samples were unfit for human consumption due to high levels of TDS, total suspended solids (TSS), chlorides, carbonates, and the presence of E. coli. While the pH of most samples fell within permissible limits (6.50-8.50) set by WHO and PSQCA, other parameters were concerning. TDS values exceeded the WHO limit of 500 mg/L in 10 out of 15 samples, with the highest value recorded at 3971 mg/L in Millat Town. High TSS levels were also observed, with the maximum of 61.7 mg/L surpassing the WHO limit of 30 mg/L, primarily in areas like Rezaabad. Elevated electrical conductivity (EC), ranging up to 6.11 ds/m in Usman Town, indicated significant dissolved ion content, attributed to industrial effluents and urban runoff. The study underscores the need for stringent water quality monitoring, improved waste management practices, and the implementation of effective water treatment solutions (Khan, et al., 2024).

Industrial Effluents and Water Pollution in Punjab

In 2022, EPA laboratories in Punjab, primarily in Lahore and Faisalabad, monitored wastewater to evaluate its impact on water resources. The findings revealed industrial effluents as a leading source of pollution, with major contributions from textile factories, sugar mills, and leather tanneries. Effluents from these industries consistently exceeded Punjab Environmental Quality Standards with textile factories showing elevated pH levels and sugar mills recording the highest concentrations of pollutants such as Biological Oxygen Demand (BOD5), Chemical Oxygen Demand (COD), TDS and sulphides. Chloride levels were also significantly higher, reaching 40 times the PEQS limit in tanneries, 7 times in petroleum oil fields, and double in textile dyeing units. These discharges into surface water bodies highlight the urgent need for stricter regulation and improved wastewater management practices to mitigate environmental and public health risks (Punjab State of the Environment Report, 2022).

Arsenic Contamination in Sheikhupura

A study conducted in Sheikhupura highlights the severe risks associated with arsenic contamination in groundwater, which is the primary source of drinking water in the region. Sampling from 20 locations in the southern part of Sheikhupura revealed arsenic concentrations ranging from 2 to 357 milligrams

per litre, significantly exceeding the permissible limits set by WHO (10 milligrams per litre) and Pakistan EPA (Pak-EPA, 50 milligrams per litre). Around 65 percent of the samples exceeded WHO limits, while 30 percent surpassed Pak-EPA standards, posing serious health hazards. The health risk assessment indicated that oral exposure through drinking water is the primary pathway for arsenic-related risks, including non-carcinogenic and carcinogenic effects. Average daily dose (ADD), hazard quotient (HQ), and cancer risk (CR) values for oral exposure were higher than those for dermal exposure (e.g., bathing). The results showed that carcinogenic risk values surpassed the permissible threshold, highlighting a high probability of arsenic-induced cancers such as those affecting the skin, lungs, bladder, and liver.

Physicochemical analyses revealed that while pH levels were generally within acceptable ranges, turbidity and total dissolved solids in several samples exceeded WHO standards, suggesting additional water quality concerns. These factors, combined with arsenic contamination, contribute to a higher prevalence of gastrointestinal diseases, kidney disorders, and cancer among the local population. The study emphasises the urgent need for remedial actions, including the installation of water treatment plants, stricter regulations for water quality monitoring, and community awareness campaigns to reduce health risks (Ehsan, et al., 2020).

Lahore's Drinking Water Issues

The assessment of drinking water quality in two urban areas of Lahore, Gulshan-e-Ravi and Samanabad, revealed significant issues impacting public health. The study analysed key physio-chemical parameters, including pH, turbidity, TDS, dissolved oxygen (DO), electrical conductivity (EC), and hardness. In Gulshan-e-Ravi, most parameters, such as TDS (average 192.5 mg/L) and DO (6.9 mg/L), were within WHO permissible limits. However, the Water Quality Index (WQI) classified the water as "poor" with a score of 59.66, primarily due to aging water pipelines and improper waste disposal. In contrast, Samanabad displayed more severe contamination, with 80 percent of water samples exceeding WHO standards for TDS (average 612.84 mg/L). Other parameters, including hardness and EC, were also above acceptable levels. The WQI value of 77.30 categorised the water as "very poor," and the Synthetic Pollution Index (SPI) highlighted a "highly polluted" status, driven by industrial effluents, low groundwater levels, and outdated infrastructure. These findings indicate significant health risks, including gastrointestinal illnesses, kidney problems, and skin conditions, particularly in Samanabad. The poor water quality stems from urbanisation, insufficient infrastructure maintenance, and inadequate waste management (Latif, et al., 2024).

Heavy Metal Contamination in Multan

Another study conducted in Multan assessed the presence of cobalt (Co) and manganese (Mn) in drinking water collected from tube wells and motor pumps across seven disposal areas. The results revealed that concentrations of both trace metals exceeded the permissible limits set by WHO. The highest Co concentration (0.31 ppm) was found in the New Multan disposal area, while the Suraj Miani disposal area recorded the highest Mn level (0.45 ppm). These values surpass the permissible limits of 0.07 ppm for Co and 0.05 ppm for Mn, posing significant health risks. The elevated levels of these metals are attributed to both natural sources, such as erosion of Co- and Mn-rich soils, and anthropogenic factors, including industrial pollution and improper disposal of wastewater. Drinking water contaminated with high levels of Co and Mn can lead to severe health issues. Prolonged exposure to Mn has been associated with neurological disorders and hepatic encephalopathy, while high Co levels are linked to an increased risk of lung cancer and other systemic health problems. The study highlights the need for immediate remedial measures, including the installation of water treatment systems, the

use of low-cost adsorbents like alumina or bentonite, and enhanced regulatory oversight of industrial effluents. Public awareness campaigns and stricter monitoring of water quality are also critical to ensuring safe drinking water for the residents of Multan. The findings underline the importance of addressing heavy metal contamination in urban water supplies to safeguard public health (Mehmood, Bhatti, Mahmood , Mahmood, & Iqbal , 2020).

E. coli Contamination in Drinking Water

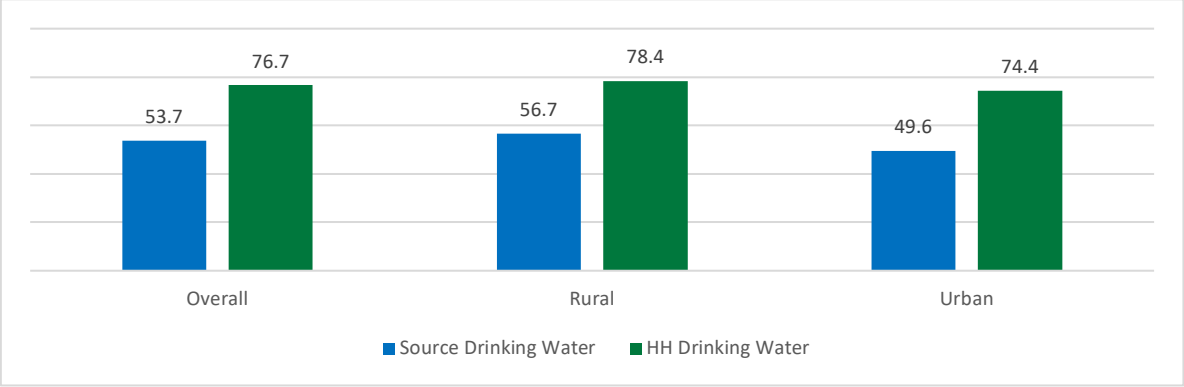
The Punjab MICS 2024 highlights the alarming presence of biological contamination (E. coli) in drinking water across the province, both at the source and household levels.

Overall: Overall, 53.7 percent of the household population is exposed to E. coli contamination at source level14. At the household level, the situation worsens, with a staggering 76.7 percent of the population having E. coli-contaminated water. Alarmingly, 22.2 percent of household level water samples show very high contamination levels (>100 E. coli per 100 mL), 27.6 percent have high levels (11-100 per 100 mL), and 26.9 percent have moderate levels (1-10 per 100 mL) of E. coli contamination. The disparity between source and household water quality is largely attributed to two factors: improved source-level quality due to affordability and access to better options, and contamination at the household level caused by improper handling of drinking water and inadequate infrastructure. This highlights the urgent need to raise awareness about safe water handling and storage practices at the household level.

Rural: In rural areas, E. coli contamination at the source level affects 56.7 percent of the population. Among these, 8.1 percent of households have very high contamination, 17.9 percent experience high contamination, and 30.6 percent face moderate contamination. The situation worsens at the household drinking water level, where 78.4 percent of household members consume E. coli-contaminated water. Of these, 21.3 percent face very high contamination levels, 29.0 percent encounter high contamination, and 25.4 percent consume water with moderate contamination levels.

Urban: In urban areas, E. coli contamination at the source level affects 49.6 percent of the population. Among these, 10.1 percent face very high contamination, 14.3 percent encounter high levels, and 25.2 percent experience moderate contamination. At the household level, contamination rises to 74.4 percent, with 23.4 percent of households having very high contamination, 25.7 percent facing high levels, and 25.4 percent dealing with moderate contamination.

Figure 24: Percentage of Population with E. coli in Drinking Water (MICS 2024)

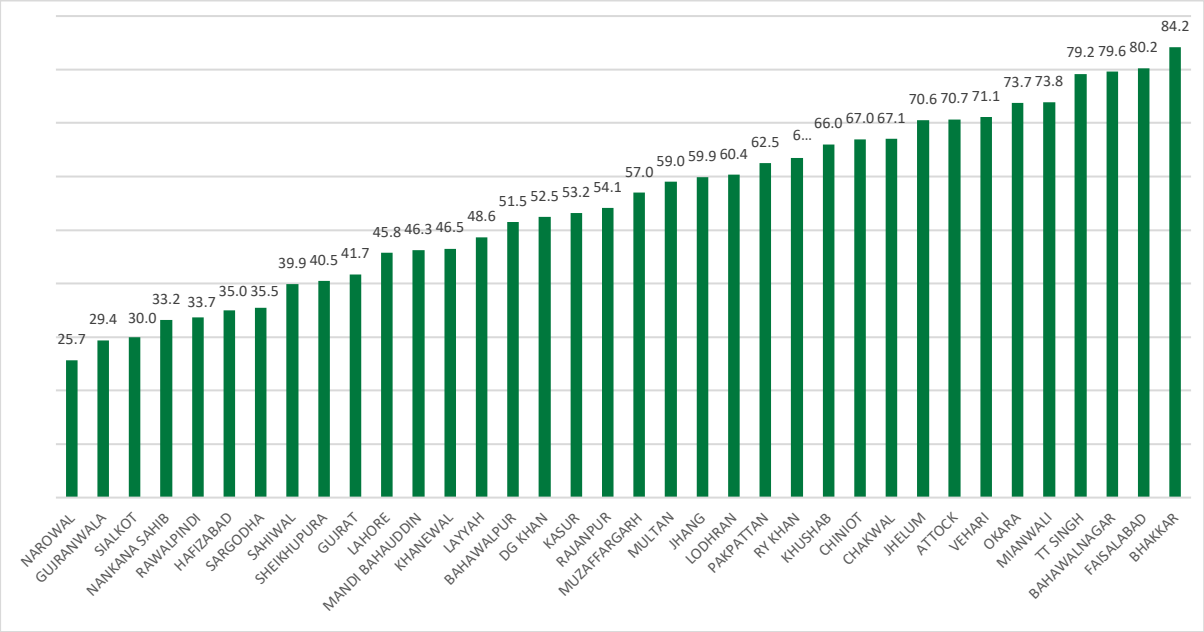


[14] Source water refers to untreated water found at its natural origin, such as surface water (rivers, lakes) or groundwater (aquifers). In contrast, household water is the water available for use at home, whether it comes from a tap, pipe, pump, or is stored in a pitcher for consumption.

Contamination at District Level

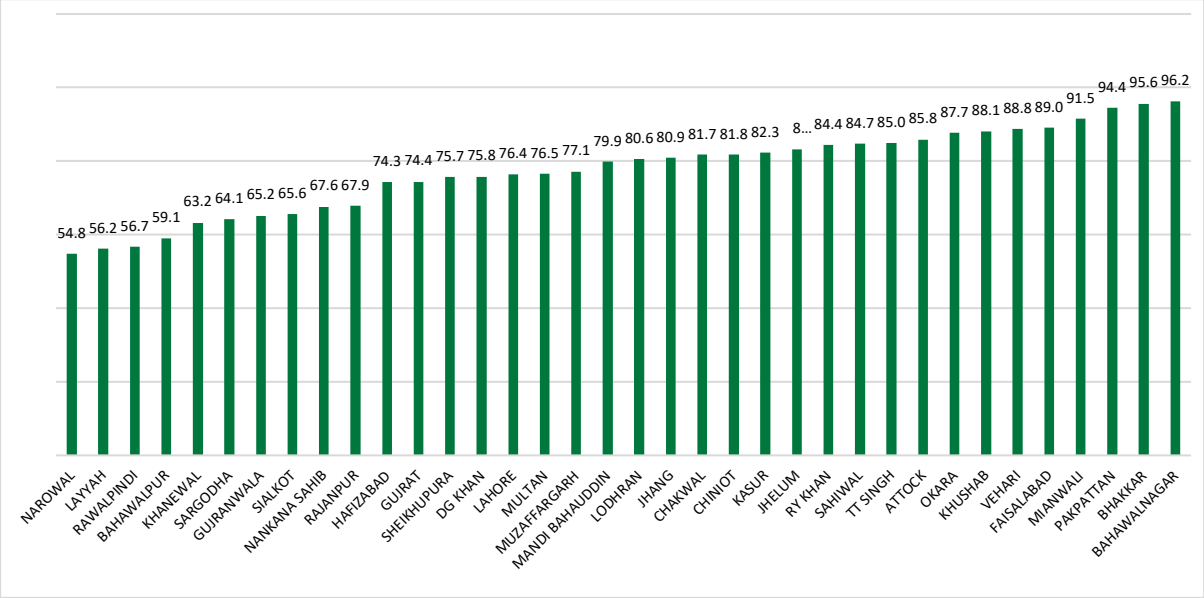
The analysis of E. coli contamination in drinking water across districts in Punjab reveals stark variations in water quality, with some districts experiencing alarmingly high levels of contamination at both the source and household levels. While a few districts demonstrate relatively lower levels of contamination, the overall findings highlight a critical need for urgent interventions to ensure safe and clean drinking water. According to the MICS 2024 data, district Bhakkar records the highest level of E. coli contamination in drinking water at source level, with 84.2 percent of sources affected, followed by district Faisalabad at 80.2 percent. In contrast, district Narowal shows the lowest E. coli contamination, with 25.7 percent of water sources impacted, while district Gujranwala has the second-lowest contamination level at 29.4 percent. A summary of E. coli presence in drinking water at source level across districts is provided below.

Figure 25:Districts with E-Coli Contamination in Drinking Water Source Household Level-MICS 2024



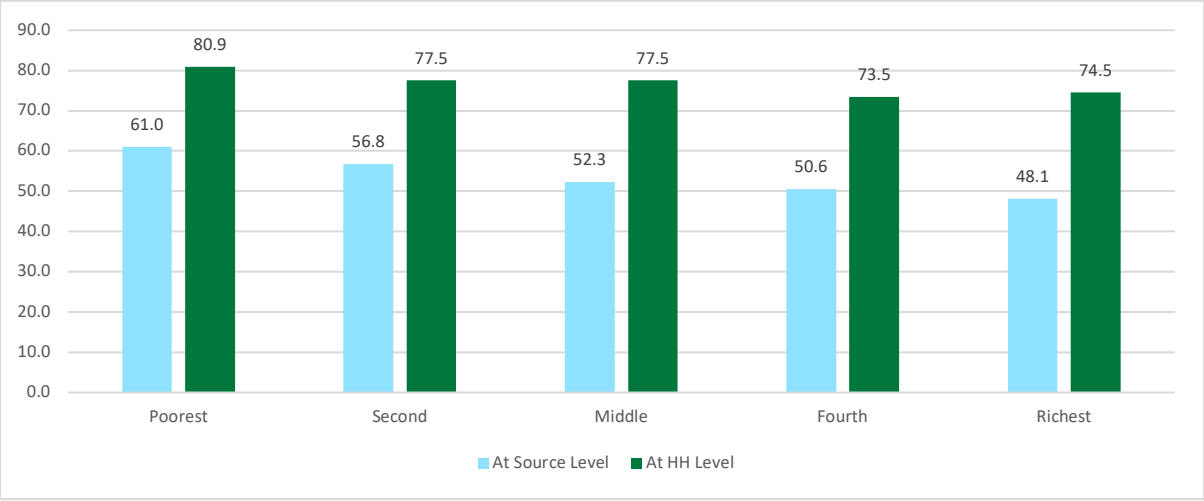
Further analysis of drinking water at the household level in Punjab districts reveals that Bahawalnagar has the highest percentage of E. coli contamination at 96.2 percent, followed by Bhakkar at 95.6 percent. Conversely, the lowest household-level contamination is observed in Narowal, where 54.8 percent of drinking water is contaminated with E. coli, followed by Layyah with 56.2 percent.

Figure 26:Districts with E-Coli Contamination in Drinking Water Source Household Level-MICS 2024



Wealth Index Quintile: Although E. coli contamination is highest among the poorest households at both the source and household levels, the contamination levels in the richest wealth quintile are also alarmingly high, reflecting an overall poor quality of drinking water across all socioeconomic groups. The data from MICS 2024 reveals that 61 percent of the poorest household's face source-level contamination, escalating to 80.9 percent at the household level. Similarly, in the richest wealth quintile, contamination at the source affects 48.1 percent, while 74.5 percent of households consume contaminated water. This trend is consistent across middle wealth quintiles, where household contamination rates exceed 77 percent, further underscoring the pervasive issue of unsafe drinking water regardless of economic status. These findings emphasise the critical need for targeted water quality improvements and contamination mitigation strategies across all wealth groups.

Figure 27: E. coli Contamination based on Wealth Quintiles (MICS 2024)



Groundwater Quality Assessment

In Punjab, PCRWR manages 10 laboratories located in Lahore, Sahiwal, Multan, Bahawalpur, D.G. Khan, Mianwali, Gujranwala, Sialkot, Sargodha, and Faisalabad. These facilities play a critical role in advancing water resource research and ensuring the effective execution of PCRWR's programmes in the

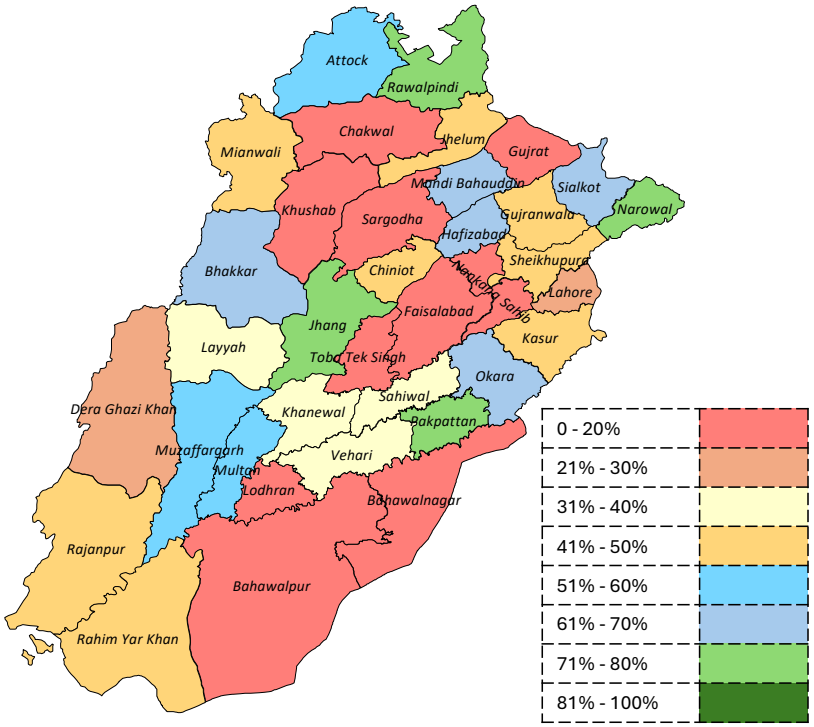
province[15]. The recent assessment conducted by the PHED on groundwater quality in 2023 provides insights into physical, chemical, and bacterial contamination levels across districts.

Overall Analysis

The groundwater quality assessment highlights significant contamination across districts, with only 38 percent of the total groundwater samples collected (2,028 out of 5,319) deemed fit for use, underscoring critical contamination levels. District-wise analysis of the overall groundwater status (evaluated for physical, chemical, and bacterial fitness) reveals that Pakpattan recorded the highest percentage of fit ground water samples, with 78 percent (94 out of 120 samples) fit, followed by Narowal at 76 percent (44 out of 58 samples) and Rawalpindi at 75 percent (151 out of 201 samples).

In contrast, the lowest percentage of fit ground water samples was observed in Bahawalpur and Sargodha, where only 4 percent of samples were considered fit. Gujrat reported the worst condition, with none of the collected samples meeting the criteria for fitness.

Figure 28: Percentage of Ground Water Samples Fit for Consumption (Overall Status)– PHED



District-Wise Groundwater Quality Assessment Across Key Parameters: Physical, Chemical, and Bacterial Contamination

In terms of **physical contamination**, 63 percent of the total groundwater samples collected were found to be physically fit. Several districts demonstrated outstanding results, including Gujrat, Jhang, Layyah, Mandi Bahauddin, and Muzaffargarh, where 100 percent of the groundwater samples were physically fit. District Lahore also performed exceptionally well, with 99 percent of its samples physically fit, followed closely by Nankana Sahib and Sheikhupura, where 97 percent of samples were free from physical contamination. Conversely, district Faisalabad reported the highest level of physical contamination, with only 25 percent of its samples were physically fit, followed by district Khushab, where 38 percent of the collected samples were free from physical contaminants.

[15]Accessed on 7th Feb, 2025, Pakistan Council of Research in Water Resources (PCRWR) https://www.pcrwr.gov.pk/water-quality/#1632138216385-29a2b72c-99b2

Chemical contamination remains alarmingly high, with only 44 percent of the total groundwater samples reported chemically fit, highlighting severe and widespread water quality issues. District Narowal showed the best results, with 95 percent of the samples found chemically fit, followed by Rawalpindi, where 90 percent of the samples met chemical fitness standards. In contrast, district Bahawalnagar recorded the highest level of chemical contamination, with only 9 percent of the samples found chemically fit. Sargodha followed with 12 percent, and Lodhran reported just 17 percent of its samples as chemically fit.

Regarding **bacterial contamination**, districts Jhang and Rahim Yar Khan demonstrated excellent results, with 100 percent of the samples free from bacterial contamination. They were followed by Toba Tek Singh, where 95 percent of the collected samples were bacterially fit. On the other hand, district Gujrat presented a highly concerning situation, with none of the samples meeting the criteria for bacterial fitness. Similarly, district Nankana Sahib reported only 9 percent of the samples as bacterially fit, followed by Sargodha at 12 percent and Bahawalpur at 14 percent.

Table 7: Percentage of Ground Water Samples Fit for Consumption – PHED

District	Physical	Chemical	Bacterial
Lahore	99%	57%	33%
Kasur	52%	44%	91%
Sheikhupura	97%	64%	60%
Nankana Sahib	97%	21%	9%
Sargodha	66%	12%	12%
Bhakhar	82%	77%	77%
Khushab	38%	32%	65%
Mianwali	79%	47%	84%
Gujranwala	86%	83%	47%
Narowal	86%	95%	76%
Sialkot	81%	81%	74%
Gujrat	100%	88%	0%
Hafizabad	84%	67%	84%
M.B. Din	100%	81%	76%
Rawalpindi	90%	90%	80%
Chakwal	46%	20%	52%
Jhelum	93%	82%	66%
Attock	83%	58%	67%
Faisalabad	25%	24%	87%
Jhang	100%	75%	100%
T.T. Singh	57%	22%	95%
Chiniot	92%	50%	72%
Sahiwal	54%	43%	84%
Okara	69%	65%	94%
Pakpattan	81%	78%	91%
Multan	75%	58%	92%
Vehari	40%	30%	69%
Lodhran	55%	17%	77%
Khanewal	54%	41%	75%

District	Physical	Chemical	Bacterial
D.G. Khan	46%	35%	63%
Layyah	100%	38%	88%
Muzaffargarh	100%	63%	89%
Rajanpur	55%	49%	84%
Bahawalpur	48%	38%	14%
Bahawalnagar	60%	9%	40%
Rahim Yar Khan	44%	44%	100%

A comparison between the PHED groundwater quality testing conducted in 2023 and the MICS 2024 data on E. coli contamination at the source level reveals a significant difference in findings. The PHED data indicates that 75 percent of the collected samples were free from biological contamination, whereas the MICS 2024 results show 43.6 percent of household population without E-Coli in drinking water source. Further analysis of district shows that PHED reports that 100 percent of the ground water samples in Jhang and Rahim Yar Khan are free from biological contamination, on contrary MICS 2024 reports 40 percent household population in Jang and 46 percent in Rahim Yar Khan have source water without E-Coli. This suggests that departmental data reports a higher percentage of water safe from biological contamination compared to the MICS assessment.

Figure 29: District Wise Analysis of Drinking Water Free from E-Coli/Biological Contamination at Source Level – PHED Vs MICs

District	PHED		MICS	
	Percentage of Water Sample Free from Bacterial Contamination	*Total Samples*	*Percentage of household members without E. coli in source water*	*Number of household members*
Attock	66.7	36	29.3	590
Bahawalnagar	40.4	208	20.4	1048
Bahawalpur	13.7	73	48.5	1159
Bhakhar	76.6	77	15.8	529
Chakwal	52.0	50	32.9	465
Chiniot	71.9	64	33.0	441
D.G. Khan	62.7	407	47.5	931
Faisalabad	86.7	743	19.8	2621
Gujranwala	47.2	36	70.6	1860
Gujrat	0	90	58.3	956
Hafizabad	84.2	57	65.0	338
Jhang	100.0	201	40.1	848
Jhelum	65.9	44	29.4	381
Kasur	91.2	136	46.8	1145
Khanewal	75.2	314	53.5	893
Khushab	65.0	60	34.0	398
Lahore	33.0	103	54.2	3840
Layyah	87.9	149	51.4	543
Lodhran	77.3	75	39.6	524
M.B. Din	76.3	59	53.7	537
Mianwali	84.0	75	26.2	444
Multan	92.5	372	41.0	1419
Muzaffargarh	88.8	224	43.0	1485

District	PHED		MICS	
	Percentage of Water Sample Free from Bacterial Contamination	*Total Samples*	*Percentage of household members without E. coli in source water*	*Number of household members*
Nankana Sahib	9.2	87	66.8	444
Narowal	75.9	58	74.3	543
Okara	94.0	267	26.3	977
Pakpattan	90.8	120	37.5	618
Rahim Yar Khan	100.0	86	45.9	645
Rajanpur	84.1	289	66.3	1768
Rawalpindi	80.0	30	36.5	1539
Sahiwal	84.0	175	60.1	762
Sargodha	12.0	50	64.5	1227
Sheikhupura	59.6	99	59.5	1171
Sialkot	74.2	31	70.0	1319
T.T. Singh	94.8	134	20.8	734
Vehari	69.2	240	28.9	917
Grand Total	75.4	5319	46.3	36061

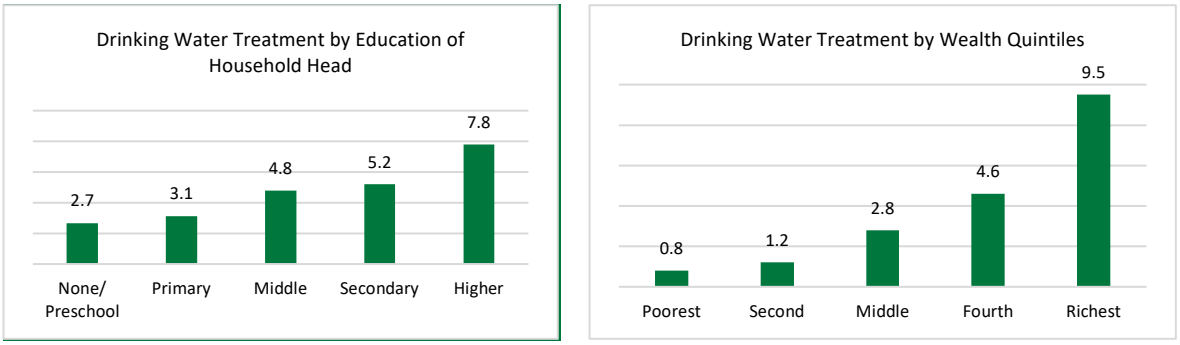
Drinking Water Treatment at Household Level

Access to safe drinking water remains a critical challenge in Punjab, with the vast majority of households consuming untreated water. According to the Punjab MICS 2024, only 3.8 percent of households treat their water before use, exposing the rest to potential health risks. The situation is particularly alarming in rural areas, where just 1.9 percent of households adopt any water treatment methods, compared to 6.5 percent in urban regions.

Drinking water treatment is strongly influenced by both the education level of the household head and the household's economic status. Data from MICS 2024 highlights significant disparities in water treatment practices based on these factors. Education plays a crucial role in determining whether a household treats its drinking water. The findings indicate that households where the head has attained higher education are considerably more likely to engage in water treatment, with 7.8 percent of such households taking measures to ensure safe drinking water. In contrast, only 2.7 percent of households where the head has no formal education, or has only attended preschool, practice water treatment. This suggests that awareness, knowledge of waterborne diseases, and an understanding of proper treatment methods are more prevalent among those with higher education levels.

Similarly, household wealth is a key determinant of drinking water treatment. According to MICS 2024, the wealthiest households are far more likely to treat their drinking water, with 9.5 percent doing so. This stands in stark contrast to the poorest households, where only 0.8 percent undertake water treatment. The gap between income groups is also evident in the middle quintiles. For example, in the fourth quintile, only 4.6 percent of households treat their water, highlighting a significant disparity even among relatively better-off households. The ability to afford water treatment solutions, such as filtration systems or bottled water, may contribute to this divide, as wealthier households have greater access to such resources.

Figure 30: Drinking Water Treatment by Education and Wealth Quintile



Draft Punjab Urban Drinking Water Safety Strategy

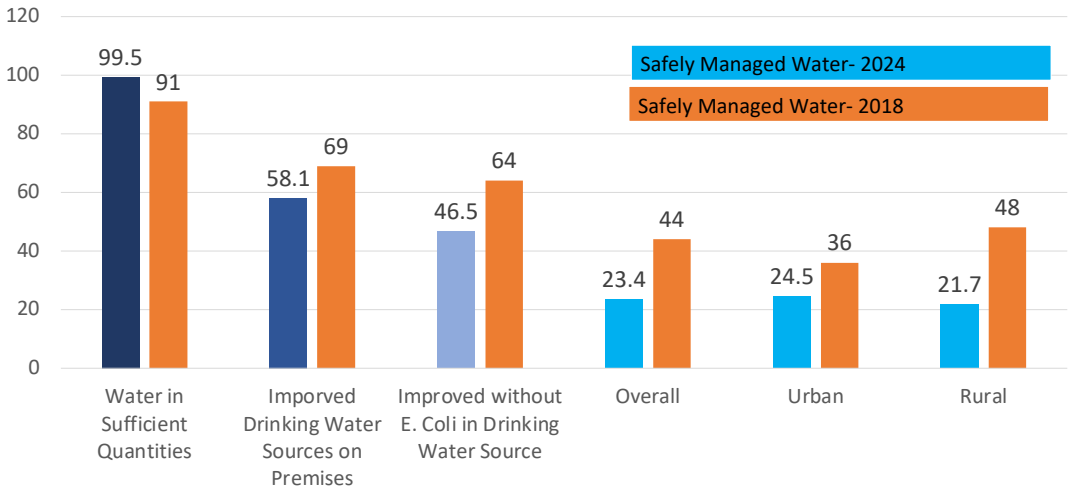
The draft Punjab Urban Drinking Water Safety Strategy 2023 offers a detailed framework to ensure the provision of safe and sustainable drinking water in urban Punjab. Developed by the HUD&PHED with support from UNICEF and AWF Pvt. Ltd., the strategy focuses on strengthening institutional capacities, implementing risk-based management systems, and engaging communities to safeguard water quality. The strategy's objectives include enhancing leadership and governance in the drinking water sector, developing water safety management systems to ensure microbiological and physicochemical quality, and improving monitoring and surveillance mechanisms. It also aims to promote community awareness and minimise risks at the household level. Aligning with global and national frameworks such as the WHO's Water Safety Plans (WSP) and the Punjab Water Policy 2018, the strategy seeks to achieve sustainable water safety practices.

Targeting urban utilities like WASAs, the strategy prioritises coordination between government bodies, communities, and development partners. It emphasises building the capacity of local authorities and institutions to implement and monitor water safety systems effectively. Implementation is planned in phases, focusing on immediate actions (2023-2025), medium-term objectives (2026-2027), and long-term goals (up to 2030). It includes governance reforms, risk-based management through WSPs, enhanced monitoring infrastructure, and community engagement for awareness and behavioural change. The strategy promises significant benefits, including reduced waterborne diseases and improved public health. It promotes sustainability by creating resilient water management systems and strengthening institutional frameworks. By aligning with SusSDGs 6.1 and 6.2, the strategy ensures safe water access and sanitation for urban communities in summary, the Punjab Urban Drinking Water Safety Strategy adopts a comprehensive approach to address water quality challenges, ensuring better health outcomes and sustainable urban development.

SAFELY MANAGED DRINKING WATER

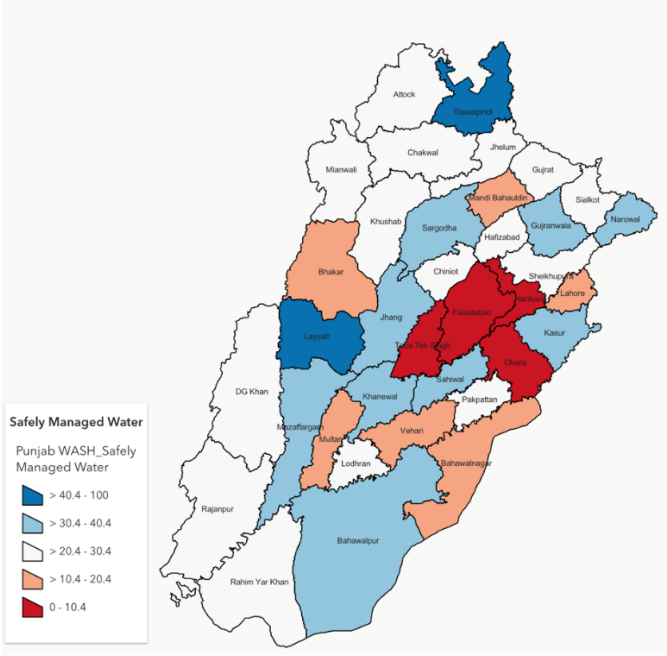
Considering the SDG indicator of safely managed drinking water, defined as water sources that are on premises, free of E. coli, and available when needed, the percentage of households meeting this standard has also decreased. In 2018, 43.7 percent of households had access to safely managed water. This percentage dropped significantly over the years, reaching only 23.4 percent by 2023-24, indicating that while water availability may have improved in some areas, the quality and reliability of the water supply are concerning.

Figure 31: Safely Managed Water-MICS 2024 and MICS 2018



Only 2 out of 36 districts reported an increase in access to safely managed water in 2024 as compared to 2018. More than 50 percent of the districts (20 districts) in Punjab are below the provincial coverage for safely managed drinking water services (23.4 percent). In 2024, the highest percentage of safely managed water was reported in Rawalpindi, at 46.9 percent, while the lowest was reported in Bhakkar at 15.8 percent. When comparing the change from 2018 to 2024, the most significant decline was observed in Bhakkar, where the percentage dropped from 70.1 percent in 2018 to 15.8 percent in 2024, marking a significant decrease.

Figure 32: Safely Managed Drinking Water Services at District Level-MICS 2024



DRINKING WATER LADDER

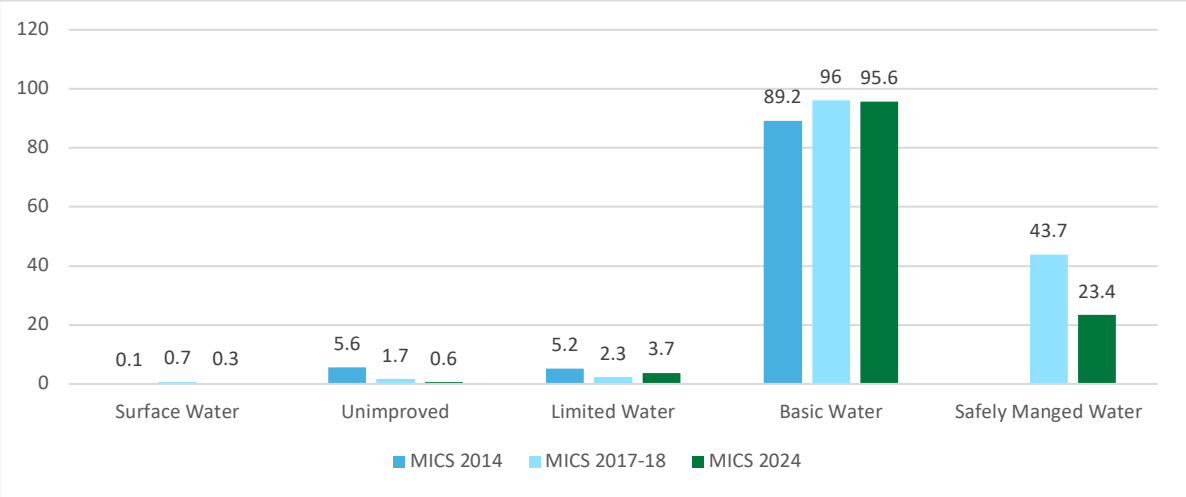
Over the years, drinking water services in Punjab have exhibited fluctuating trends. The reliance on surface water was minimal at 0.1 percent in 2014 but increased to 0.7 percent in 2017-18. However,

by 2024, this figure had declined again to 0.3 percent, indicating a reduction in dependence on surface water sources.

The use of limited water services has shown a downward trend, decreasing from 5.2 percent in 2014 to 3.7 percent in 2024, suggesting an overall improvement in water accessibility. Similarly, access to basic water services saw a notable rise from 89.2 percent in 2014 to 96 percent in 2017-18. However, by 2024, this slightly declined to 95.6 percent, indicating a minor setback in the expansion of basic water services.

A concerning trend is observed in the availability of safely managed water, which has declined significantly. In 2017, 43.7 percent of the population had access to safely managed water, but by 2024, this figure had dropped to 23.4 percent[16]. This sharp decrease highlights challenges in maintaining water services and underscores the need for targeted interventions to enhance water safety and management across the province.

Figure 33: Drinking Water Ladder in Punjab – MICS 2014, MICS 2017-18 & MICS 2024



Strategic Actions for Access to Safely Managed Water

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct an updated mapping of drinking water sources to identify areas with critical access gaps and contamination levels.	Expand the piped water network in urban and rural areas, prioritising high-need districts, with a target to increase coverage by 20 percentage.	Achieve universal access to improved drinking water sources across the province, focusing on safely managed water as per SDG 6 standards.
Launch pilot projects for community-managed water supply schemes and water safety planning in underserved areas to promote ownership and sustainability.	Develop integrated water resource systems to ensure reliable water supply, including multi-source options such as groundwater, surface water, and rainwater.	Implement district-wide infrastructure for multi-source water systems, ensuring redundancy and resilience in water supply against climate shocks.
Scale up solar-powered water supply schemes in drought-prone regions to ensure sustainable and energy-efficient solutions.	Establish water filtration plants in all major urban centres and 30 percent of rural districts, prioritising areas with high contamination levels.	Deploy advanced treatment technologies, such as reverse osmosis plants, in contamination-prone districts, ensuring water quality compliance.

[16] Punjab MICS 2014 did not include water quality testing, thus, coverage of safely managed drinking water services for 2014 is not available.

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct public awareness campaigns on the consequences of over-extraction and contamination of groundwater resources.	Develop a provincial groundwater monitoring system with real-time data on usage and quality to guide regulatory actions.	Fully operationalise a centralised groundwater authority to oversee abstraction, recharge, and quality standards across all districts.
Promote rainwater harvesting in urban areas through financial incentives and mandatory rainwater harvesting infrastructure in new constructions.	Scale up wastewater recycling projects for non-potable uses in agriculture and industry, targeting a reduction in freshwater demand by 15 percentage.	Ensure that all WASH infrastructure is designed and retrofitted for climate resilience, including flood-proof and drought-resistant systems.
Set up mobile water quality testing units to provide immediate monitoring and testing capabilities in areas with high contamination risks.	Develop and enforce water quality improvement programmes, including filtration plants and awareness campaigns in contamination hotspots.	Ensure all urban and rural water supply schemes meet WHO and SDG standards for water quality, with regular audits to maintain compliance.
Train local government officials and CBOs on water quality monitoring and early identification of contamination risks.	Introduce district-level water quality monitoring labs, covering both physical and chemical contaminants, with accessible reporting systems.	Establish an integrated province-wide water quality management system, using digital platforms to track contamination sources and mitigation efforts.

SANITATION

The municipal sanitation system can be further segregated into three stages i.e., household toilet, sewerage and drainage network and wastewater disposal and treatment. The Punjab WASH Sector Development plan 2025-35 is providing a detailed road map for each of the stages. The review of sanitation related mid-term plan is presented accordingly as in below.

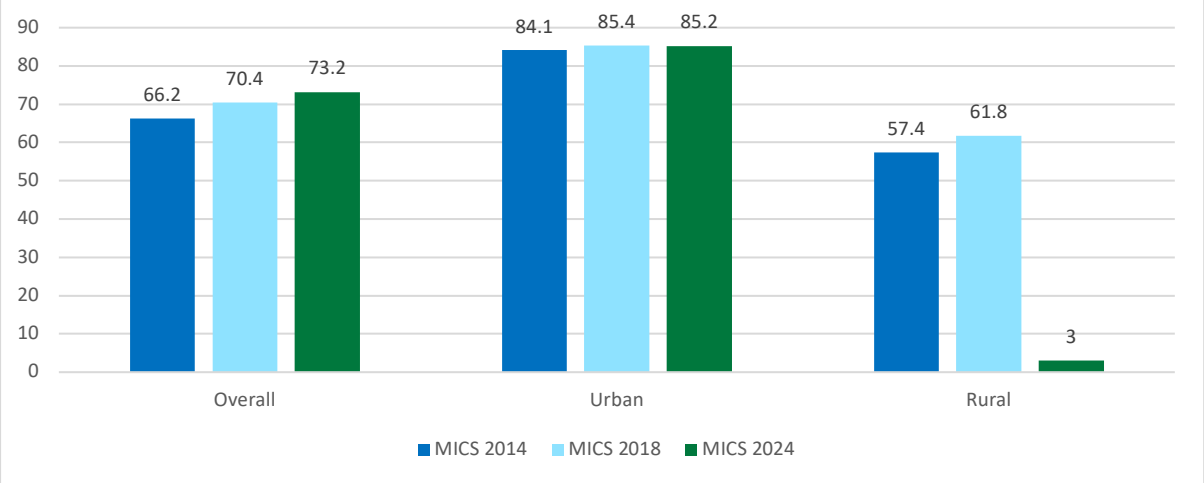
HOUSEHOLD TOILET

The analysis of sanitation data from 2014 to 2024 reveals notable improvements in Punjab. The availability of household toilets increased significantly from 82.5 percent in 2014 to 93.2 percent in 2024. This growth was gradual, reaching 87 percent by 2018 and continuing upward. Improved sanitation coverage also substantially progressed, rising from 75.2 percent in 2014 to 80 percent in 2018 and 87.3 percent in 2024. Open defecation practices have diminished significantly over the decade, dropping from 17.5 percent in 2014 to 13 percent in 2018 and further to 6.3 percent in 2024.

BASIC SANITATION SERVICES

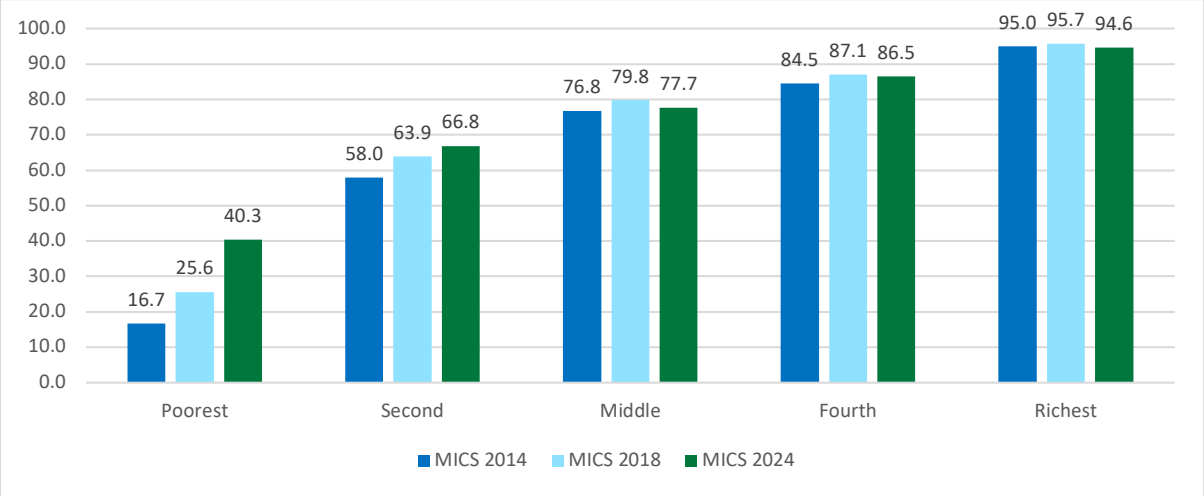
According to the Punjab MICS 2017-18, basic sanitation services coverage was 70.4 percent. This marked a slight improvement from 2014, though it also highlighted an increase in shared facilities, particularly in rural areas. Recent data from MICS 2023-24 shows further progress, with basic sanitation coverage in Punjab rising to 73.2 percent. However, urban-rural disparities remain stark. Urban areas now have a higher basic sanitation coverage of 84.2 percent, compared to 65.5 percent in rural areas.

Figure 34: Basic Sanitation Services in Punjab- MICS 2014 vs 2018 vs 2024



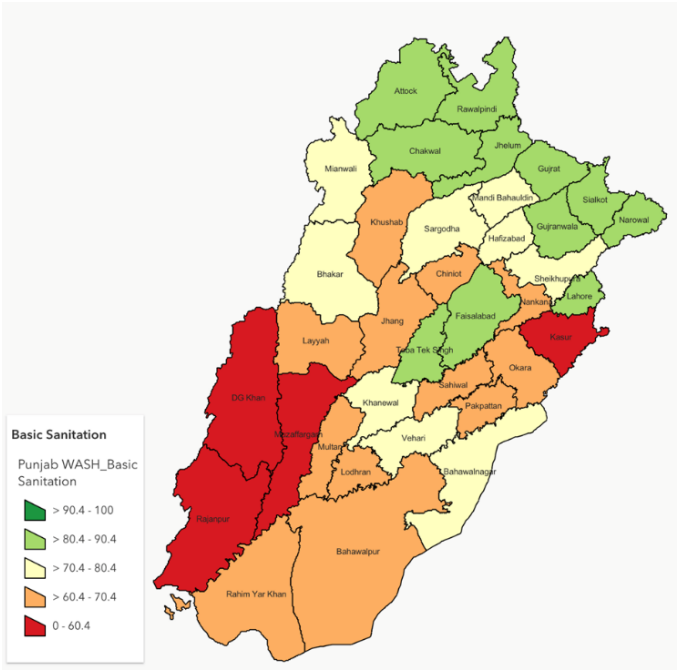
Wealth-based disparities in access to basic sanitation remain significant in Punjab, with substantial improvements observed over time. In the poorest quintile, access to basic sanitation has increased from 16.7 percent in 2014 to 25.6 percent in 2018, and further to 40.3 percent in 2024. The second quintile has seen an increase from 63.9 percent in 2018 to 66.8 percent in 2024, while the middle quintile's access has improved from 79.8 percent in 2018 to 77.7 percent in 2024.The fourth quintile has reached 86.5 percent in 2024 with a decline form 87.1 percent in 2018, while the richest quintile enjoys access at 94.6 percent, a slight decline from 95.7 percent in 2018.

Figure 35: Wealth Quintiles Based Access to Basic Sanitation Services- MICS 2014 vs 2018 vs 2024



District wise analysis of basic sanitation coverage shows that Rawalpindi has highest basic sanitation with 89.8 percent followed very closely by Lahore, Toba Tek Singh and Jehlum with 89 percent basic sanitation services present. In contrast, district DG Khan has the lowest coverage with only 33.2 percent of the districts have basic sanitation services available.

Figure 36: District Wise Access to Basic Sanitation-MICS 2024

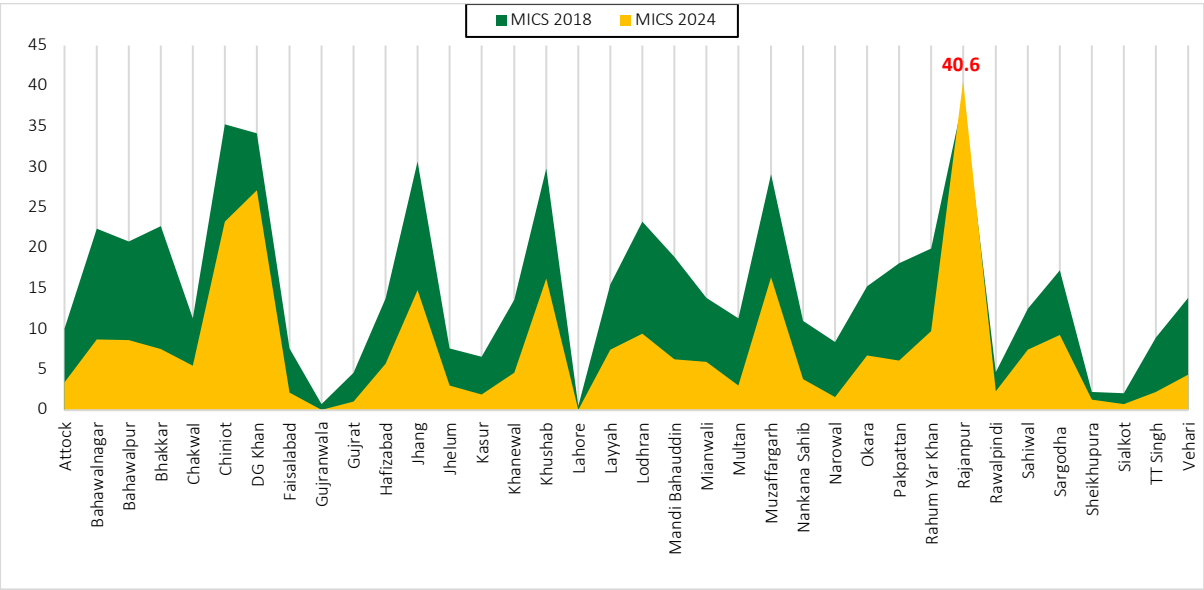


OPEN DEFECATION

The district wise comparison of open defecation rates between MICS 2018 and MICS 2023-24 highlight significant progress across Punjab, although substantial challenges remain in certain districts. The district with the highest open defecation rate in 2024 is Rajanpur at 40.6 percent, a slight increase from 38.4 percent in 2018; the only district where open defecation has increased during the period. This has been largely due to floods of 2022 that devastated nearly 70 percent infrastructure of Rajanpur. Gujranwala and Lahore district report 0 percent open defecation in 2024, from 0.8 percent and 0.5 percent in 2018, respectively. Significant improvements were observed in Jhang district, where open

defecation dropped from 30.7 percent in 2018 to 14.8 percent in 2024. Bhakkar district also experienced notable reduction, with rates falling from 22.7 percent to 7.5 percent. Overall, 35 out of 36 districts recorded reductions in open defecation rates. Despite this progress, 6 districts still report rates above 10 percent.

Figure 37: Open Defecation Trends in Districts of Punjab-MICS 2018 vs 2024

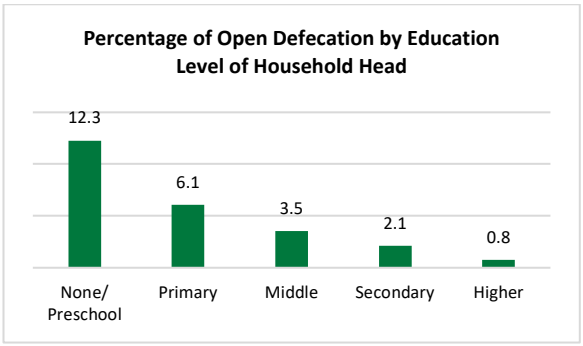


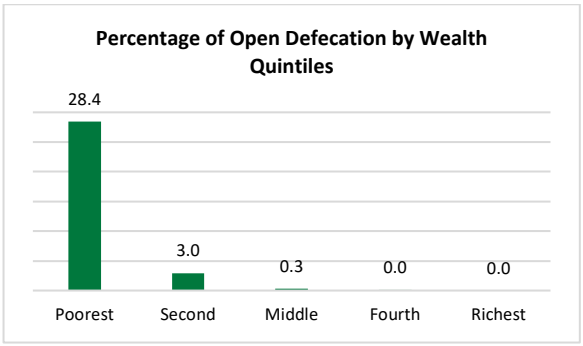
Open Defecation by HH Head Education and Wealth Quintiles

Further analysis of MICS 2024 reveals a strong correlation between open defecation, the education level of the household head, and household wealth. Open defecation is significantly more prevalent in households where the head has no formal education or only attended primary school, with a rate of 12.3 percent, compared to just 0.8 percent in households where the head has received higher education.

Furthermore, wealth also plays a crucial role in the prevalence of open defecation. According to MICS 2024, 28.4 percent of households in the poorest wealth quintile engage in open defecation. However, this percentage drops sharply to 3 percent in the second quintile. In contrast, no households in the fourth and richest quintiles practice open defecation.

Figure 38: Open Defecation by HH Head Education and Wealth Quintile

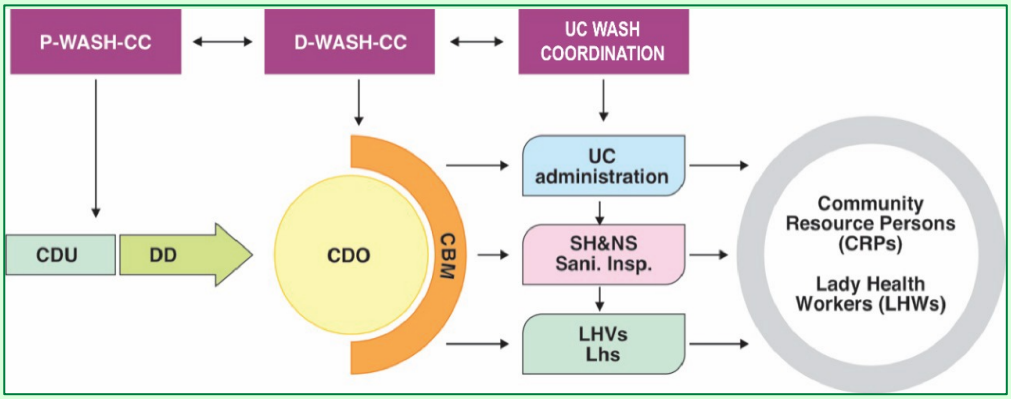




A Case Study of PATS Implementation in Punjab- Government of Punjab and UNICEF

The Pakistan Approach to Total Sanitation (PATS) in Punjab was initiated as a part of Rural Sanitation in Flood Affected Districts of Pakistan (RuSFAD) in response to the 2010 floods. Based on the learning, the PHED of the Government of Punjab and UNICEF took the initiative in 2011-2012 to integrate PATS within the existing systems and structures of public sector service delivery, initially in 40 villages and later on scaled up to 218 villages in Rahim Yar Khan and Bahawalpur. From 2015-16, PATS has been scaled up and is being implemented in all 36 districts of Punjab under the ADP of the Government of Punjab.

The Community Development Unit (CDU) of PHED leads on the social mobilisation, in collaboration with community groups, local government staff, schoolteachers and health workers. There is a dedicated Deputy Director for Community Development at the provincial level with overall supervision of community engagement initiatives. Each district has one Community Development Officer (CDO), supported by six Community-Based Mobilisers (CBM). Generally, a CBM manages more than five to ten union councils. The Union Council is the smallest administrative unit with 10 to 12 villages having a population of 12,000 to 25,000. It is not possible for a CBM to reach every village during a month. Thus, the project sought the engagement of Health, Education, and Local Government Departments. Below is the schematic description of the integration of PATS into existing systems and structures in the last eight years below:



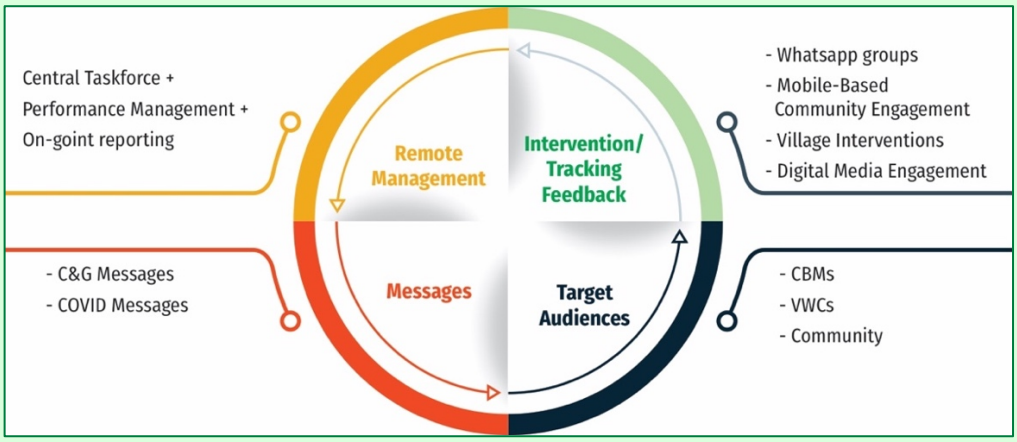
The LHWs serve as frontline health workers in the villages and are responsible for 100 to 125 families/households for preventive health care. Each LHW has to pay at least one visit to each household in her designated area on a monthly basis. For every 10-15 LHWs, there is a Lady Health Supervisor (LHS) stationed at the local health facilities for providing mentoring and to monitor the work of LHWs. Similarly, every UC in Punjab province has a dedicated Secretary/ Staff to lead the administration of the Local Government and other development initiatives. Furthermore, there are School Health & Nutrition Supervisors (SH&NS) who are responsible for school health and community screening of out-of-school children. In the first phase, the project deployed local volunteers as CRPs on nominal stipends. However, over time, the role of CRPs has been replaced by trained village WASH/ sanitation committees being formed in each targeted village. Each district has a dedicated District WASH Coordination Committee under the leadership of district administration, local elected representatives, other line departments, and local NGOs to steer WASH interventions, including rolling out PATS with

ODF certification. Similarly, the Provincial WASH steering committee provides overall leadership and strategic guidance to the stakeholders with periodic performance reviews.

The PATS has evolved over time to become a more sustainable and integrated initiative, aligning with the Punjab Growth Strategy 2018 and the Clean Green Punjab 2018, both of which emphasised behavioural change and institutional strengthening. On 5th March 2020, the Chief Minister of Punjab launched the PATS Plus programme, targeting over five million people and aiming to construct 195,000 latrines across 10 districts, with a particular focus on supporting the poorest communities. The project prioritised capacity-building by training Community-Based Mobilisers (CBMs) and establishing Village WASH Committees (VWCs) to promote behavioural change and eliminate open defecation. The training also introduced an android-based application for monitoring and reporting progress at the village level. The programme integrated Clean Green Pakistan principles to enhance community ownership and engagement.

In response to the COVID-19 pandemic, the PATS Plus programme was refined to incorporate a COVID-19-specific approach, termed PATS+C. This adapted strategy employed remote management techniques, including a central taskforce for performance monitoring, alongside mobile-based applications and digital media for community engagement. Social and behaviour change interventions were tailored to disseminate sanitation, hygiene, and COVID-19 messages through face-to-face interaction (with social distancing) and platforms like Facebook and WhatsApp. The programme equipped 60 CBMs, 10 Community Development Officers (CDOs), and 10 Monitoring and Coordinating Officers with Clean Green Punjab kits, motorbikes, masks, gloves, and sanitisers to strengthen frontline efforts. Village branding activities further raised awareness about sanitation and hygiene. Over six months, the campaign reached over 13 million people, demonstrating its effectiveness in promoting public health during challenging times

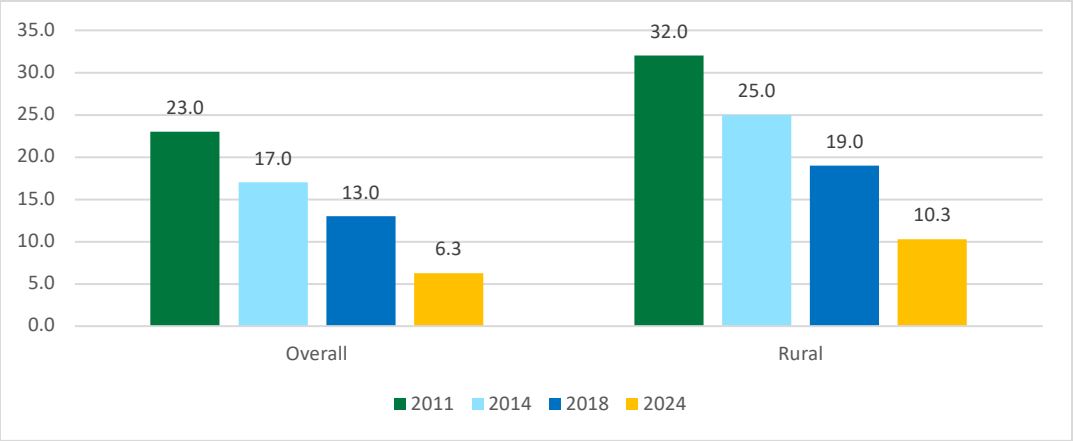
Below is the schematic diagram of the PATS+C approach.



Impact of PATS

In 2011, at the time when PATS was being piloted and scaled up in the province, around 23 percentage population of Punjab used to practice open defecation. This was significantly high in rural areas with a ratio of 32 percent. In other words, one out of every four persons in

Punjab and nearly 1/3rd of the rural population was engaged in open defecation. Since the launch of PATS, these numbers have reduced significantly from 23 percent population in 2011 to 13 percent population in 2018 and now 6.3 percent in 2024 in overall Punjab; while in rural areas, it has reduced from 32 percent of population in 2011 to 19 percent in 2018, and 10.3 percent in 2024, as shown in below figures.

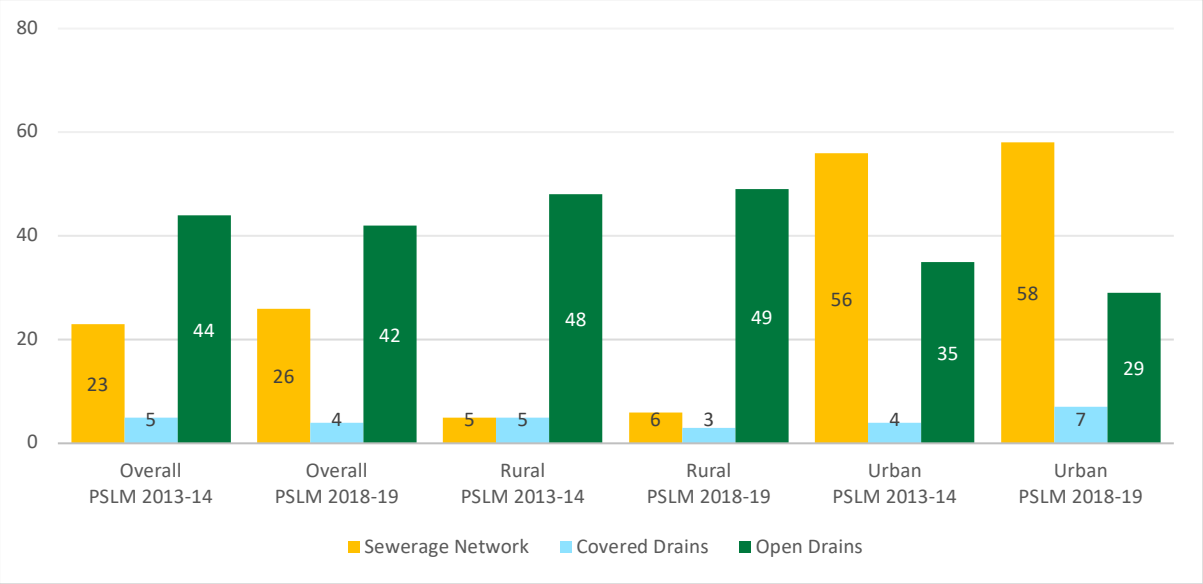


Based on the Population Census 2023 data for Punjab, an analysis indicated that open defecation reduced from 21.6 million in 2011 to 14.3 million in 2018, and now 8.04 million in 2024. This included population growth rate of 2.13 percentage in Punjab. On the contrary, the ratio of population with improved sanitation has increased from 68.6 million in 2011 to 88.1 million in 2018, and now 111.47 million in 2024 showing an achievement of an additional 42.87 million population with improved sanitation. In simple words, around 3.29 million people were added to have improved sanitation annually in last 13 years counting in the population growth rate.

SEWERAGE/ DRAINAGE NETWORK

As per MICS 2024, nearly 30 percent of households of the province are connected with sewer systems. 2/3rd of households of urban areas i.e., 64.5 percent are connected with sewers compared to only 5.9 percent in rural areas. Similarly, the CGPI dataset of 29 cities in 2022 indicates that 68 percent of households in these cities are connected with sewerage network. Whereas the cities of Bahawalpur and Mianwali have the highest sewerage network coverage at 85 percent each, followed by Sahiwal at 79 percent. However, information about drainage network is not available in MICS 2024. Comparing the Pakistan Social and Living Standard Measurement Survey (PSLM) datasets from 2013-14 to 2018-19 revealed that the province's overall sewerage and drainage system coverage remained consistent at 72 percent. However, the sewerage network's share of the overall sanitation system has increased from 23 percent in 2014 to 26 percent in 2019. On the other hand, coverage of covered drains has decreased from five percent in 2014 to four percent in 2019. Similarly, the proportion of open drains has decreased from 44 percent to 42 percent. For urban areas in Punjab, a similar trend of increased sewerage network coverage and decreased open drains is evident. However, the percentage of open drains has increased slightly in rural areas.

Figure 39: Coverage of Sewerage/ Drainage Network in Punjab-PSLM 2014 Vs PSLM 2019



According to the most recent data available from the Clean Green Punjab Campaign (CGPC) March 2022, an average of 97 percent of sewerage disposal stations are operational in 138 Municipal Committees/ Corporations. However, the electricity costs associated with disposal/pumping stations place a significant strain on the government's budget due to insufficient revenue generated by WASH services. This could be a potential factor in the failure of the sewerage system.

Recent initiatives by the Government of Punjab's Cities Programme in 16 small cities and the Punjab Intermediate Cities Improvement and Investment Programme (PICIIP) in two intermediate cities, respectively, with support from the World Bank and ADB, place equal emphasis on sanitation network development/extension and rehabilitation. According to PICIIP's 2019-20 annual reports, the project planned to replace 41 kilometres of sewer pipes (Sahiwal-11, Sialkot-30) and install 18 sewage pumping stations (Sahiwal-10, Sialkot-8), as well as provide wastewater management equipment. Additionally, approximately 15 sewerage infrastructure replacement projects have been reflected in ADPs since 2016. Likewise, the LG&CD recently approved the Punjab Municipal Services Programme, which includes the rehabilitation of defunct schemes as one of the key components.

Citywide Inclusive Sanitation (CWIS)[17]

The Citywide Inclusive Sanitation (CWIS) is a progressive urban sanitation approach aimed at providing safe, equitable, and sustainable sanitation services for all city residents, including vulnerable and marginalised populations. Unlike traditional infrastructure-based models that rely solely on centralised sewer systems, CWIS adopts a more diverse and integrated approach. It considers the entire sanitation service chain—from containment to treatment and safe disposal or resource recovery—ensuring inclusive access regardless of socioeconomic status or location.

[17] World Bank. (2019). Citywide Inclusive Sanitation: Achieving the Urban Sanitation SDGs through a Systems Approach. Water and Sanitation for the Urban Poor (WSUP). (2021). Citywide Inclusive Sanitation Framework for Implementation. WHO & UNICEF. (2020). Sanitation Safety Planning: Manual for Safe Use and Disposal of Wastewater and Excreta.

At its core, CWIS is guided by several principles. It prioritises inclusivity, ensuring sanitation services reach all residents, including those in informal settlements. Equity is a key focus, striving to make services affordable and accessible, particularly for underserved communities. CWIS promotes sustainability, employing environmentally sound practices to manage wastewater and faecal sludge effectively. The approach is service-oriented, shifting attention from infrastructure to reliable and accessible service delivery. It underscores collaboration, encouraging active participation of governments, service providers, and communities in planning and operations. Furthermore, adaptability is vital, enabling the use of context-specific solutions such as sewer networks, septic tanks, and faecal sludge management systems.

The implementation framework of CWIS involves clear and well-defined institutional arrangements, assigning roles to local governments, utilities, private sector players, and community organisations. Coordination mechanisms are essential, integrating efforts across water, sanitation, and urban planning sectors, while capacity building ensures that officials, service providers, and communities are well-equipped to implement CWIS.

Inclusive policies and regulations form the backbone of the approach, enforcing health and environmental standards and establishing monitoring frameworks to ensure effective service delivery and system performance. Financing mechanisms blend public, private, and donor funding, with targeted subsidies for low-income households and performance-based contracts to incentivise private sector involvement. Infrastructure and service delivery are diversified, incorporating a range of technologies including sewer networks, decentralised treatment plants, and on-site sanitation systems. These are complemented by integrated faecal sludge management (FSM) to ensure safe handling, treatment, and disposal in areas without sewer coverage. M&E processes are data-driven, using indicators to track service coverage, equity, and environmental impact, and leveraging insights for continuous improvement.

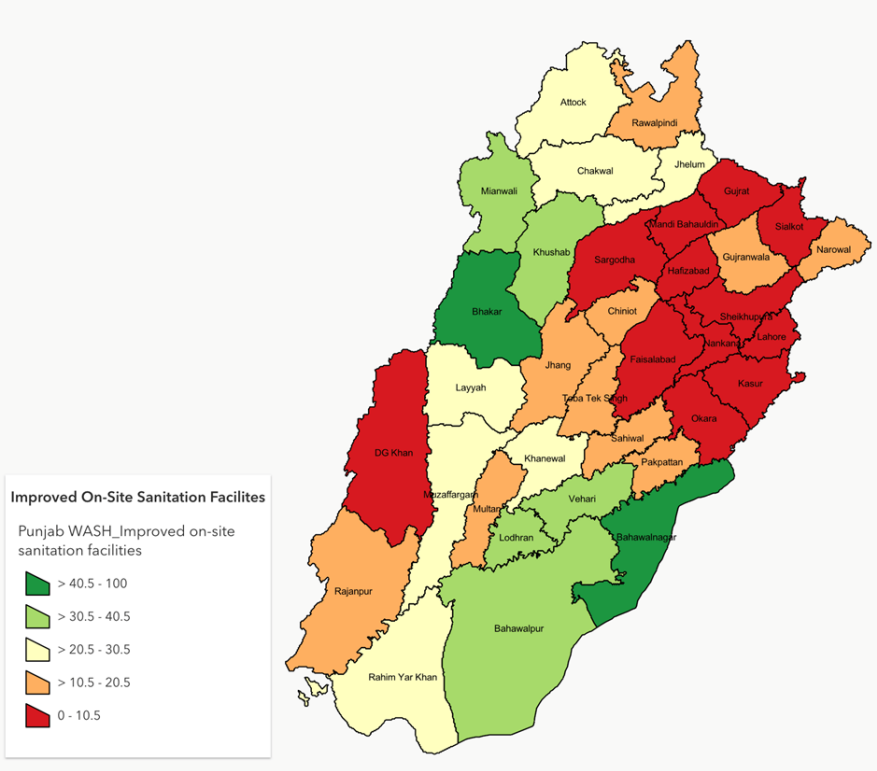
Community engagement and social inclusion are central to CWIS, involving local communities—particularly women and marginalised groups—in planning and decision-making. Behaviour changes campaigns and participatory approaches foster ownership and encourage sustained sanitation practices. Several tools support CWIS implementation. Sanitation Safety Planning (SSP) helps identify and mitigate health risks along the sanitation service chain. Faecal Sludge Management (FSM) focuses on the safe handling of waste from on-site systems, while performance-based contracts ensure service providers are rewarded for delivery outcomes rather than infrastructure installation.

Given the context of Punjab, where only 30 percent of the household latrines are connected with sewers, and this is significantly low in peri-urban and rural areas. Similarly, there is lack of any clear faecal sludge management policy and strategy, it is pertinent to roll out CWIS in the province to strengthen local service delivery with improved enabling environment and inclusivity of all segments of the society.

WASTEWATER MANAGEMENT

Following the launch of the SDGs in 2016, wastewater management became a primary focus of the WASH sector. SDG 6.2 requires the safe disposal of excreta in situ or transported and treated off-site. SDG 6.3.1 asks for safe treatment of domestic and industrial wastewater flow. On-site disposal of excreta was inquired first time in Punjab MICS 2017-18. The comparison between MICS 2017-18 and MICS 2023-24 reveals significant progress in the safe emptying and in-situ disposal of excreta from on-site sanitation facilities in Punjab. In 2017-18, only 40.7 percent of households reported safe on-site disposal, with rural areas showing higher coverage (50.5 percent) compared to urban areas (23.4 percent). By 2024, overall safe disposal practices had improved to 75.8 percent. Rural areas continue to lead, with 77.4 percent of households practicing safe disposal in 2024, up from 50.5 percent in 2018. Urban areas also experienced a significant increase, rising from 23.4 percent in 2018 to 70.0 percent in 2024.

Figure 40: District Wise On-Site Safe Disposal of Excreta in Punjab-MICS 2024



A comparison of safe emptying and in-situ disposal of excreta across Punjab districts highlight significant improvements between MICS 2018 and MICS 2023-24. In 2018, over a third of Punjab's districts had less than 40 percent coverage for safe on-site disposal of human excreta, and two-thirds reported 50 percent or lower coverage. By 2024, this scenario improved markedly, with 28 out of 36 districts (approximately 78 percent) now achieving more than 70 percent coverage.

The northern districts continue to perform better, consistent with earlier trends in basic sanitation. Lodhran, Attock, and Rahim Yar Khan districts lead with over 90 percent safe disposal rates. Conversely, Lahore, Faisalabad, and Sheikhupura districts have the lowest rates, with Lahore district with the lowest rate of 39.1 percent.

The Government of Punjab implemented a Southern Punjab Basic Urban Services Project from 2005-2012 with the support of the ADB. The project included the construction of sewerage wastewater treatment plants at selected places in 21 towns of Sothern Punjab. The project developed more than 80 sewerage and wastewater treatment plants. The wastewater treatment capacity of 570,000 cubic meter per day was added by the project. However, many of these plants became inactive and no data was generated. There is a need for carrying out an independent assessment of these plants while identifying the barriers and what additional support would be required to keep them functional.

Although specific data on off-site wastewater treatment is not readily available. However, the Punjab government has made significant efforts in the last five years to install and rehabilitate wastewater treatment plants in various urban areas throughout the province. Since 2016, ADPs have reflected 20 wastewater treatment plant schemes in the cities of Faisalabad, Jhelum, Rahim Yar Khan, Lahore, Multan, Rawalpindi, Gujranwala and Sahiwal. Additionally, ADPs reflect the elimination of ponds from major villages in Punjab in order to improve sanitation and eradication of vector-borne diseases through bioremediation (Phase II) and, wastewater treatment through the construction of decentralised wastewater treatment systems in Punjab.

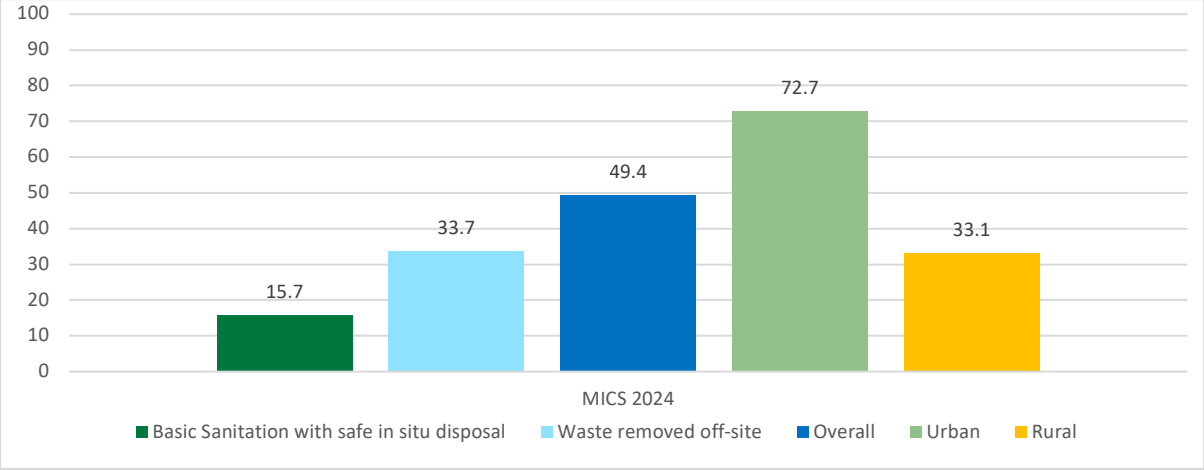
The Environment Protection Department (EPD) Punjab has a mandate for enforcing National Environmental Quality Standards (NEQS), which include standards for municipal and industrial effluents. EPD currently operates laboratories in Lahore, Faisalabad, Gujranwala, Sialkot, Rawalpindi, Sheikhupura, and Rahim Yar Khan. These laboratories are developed to accommodate the environmental monitoring and testing needs of the aforementioned and adjacent districts, including wastewater and surface water monitoring. These laboratories, however, are relatively less effective at monitoring and enforcing NEQS for municipal and industrial effluents. To bridge this gap, the EPD has been receiving capacity building support from the World Bank's Jobs & Competitiveness (J&C) programme for the enforcement of NEQs in Punjab since 2016. The Government of Punjab has recently initiated three projects of Combined Effluent Treatment Plants (CETPs) at Weaving City Industrial Estate Faisalabad, Sundar Industrial Estate Lahore, and Quaid-e-Azam Industrial Estate Lahore through PPP.

SAFELY MANAGED SANITATION

The SDGs define Safely Managed Sanitation services as: a population that uses an improved sanitation facility that is not shared with other households and where excreta are safely disposed of in situ or transported and treated off-site. According to MICS 2018 data, 32.9 percent of households in Punjab had safely managed sanitation, with 20.2 percent residing in urban areas and 40.2 percent in rural areas. The figure below depicts the overall ladder of Safely Managed Sanitation Services in Punjab.

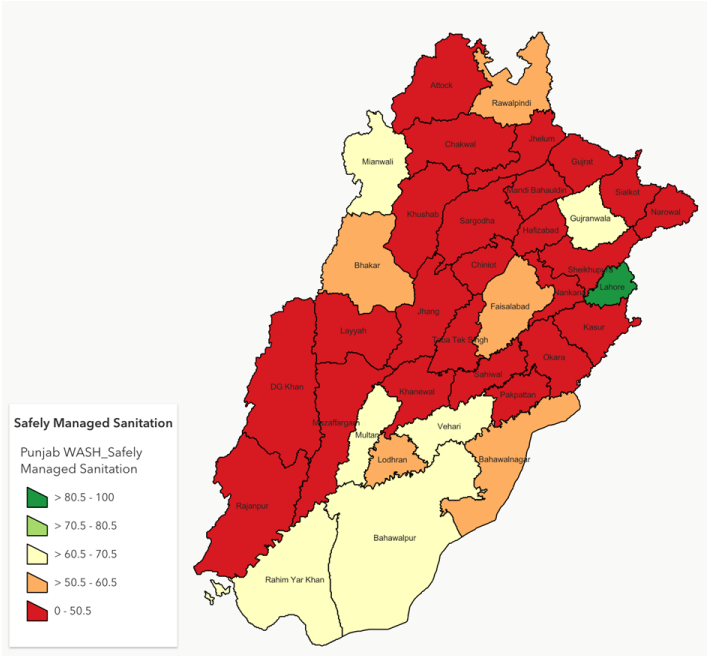
Overall, 49.4 percent of the population has access to safely managed sanitation, with 15.7 percent relying on improved on-site sanitation where waste is safely disposed of in situ and 33.7 percent utilising off-site removal. Urban areas show significantly higher coverage, with 72.7 percent of the population having access to safely managed sanitation. This includes 67.5 percent relying on off-site waste removal, while only 5.1 percent use safely managed on-site sanitation. In rural areas safely managed sanitation is at 33.1 percent. Reliance on on-site sanitation is higher at 23.0 percent, while off-site removal is at 10.1 percent.

Figure 41: Safely Managed Sanitation Services-MICS 2023-24



The district-level analysis of safely managed sanitation in Punjab highlights significant disparities. Lahore district stands out with the highest coverage at 90.7 percent, followed by Gujranwala district at 66.2 percent. Gujrat (12.9 percent), and Mandi Bahauddin (15.3 percent) districts exhibit the lowest safely managed sanitation coverage. The analysis shows that 23 out of 36 districts have less than 50 percent coverage of safely managed sanitation.

Figure 42: Safely Managed Sanitation Services at District Level-MICS 2024



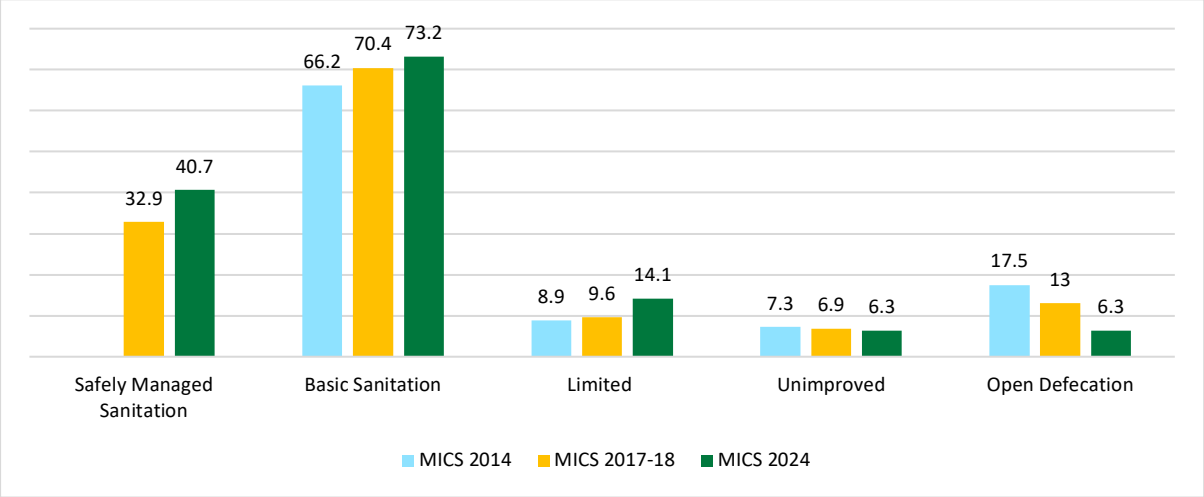
SANITATION LADDER

Sanitation services in Punjab have shown significant improvements, reflecting positive trends in access to and management of sanitation facilities, over the years. The proportion of households with safely managed sanitation has increased substantially, rising from 32.9 percent in MICS 2017-18 to 49.4 percent in 2024[18]. Similarly, access to basic sanitation has also improved, increasing from 66.2 percent in 2014 to 73.2 percent in 2024. Notably, open defecation has seen a steady decline, dropping from 17.5 percent in 2014 to 13 percent in 2017-18, and further down to just 6.3 percent in 2024.

[18] Punjab MICS 2014 did not include safe disposal of excreta, thus, coverage of safely managed sanitation services for 2014 is not available

The overall progress in sanitation services reflects ongoing efforts to improve public health, reduce environmental contamination, and achieve SDGs related to sanitation. However, continuous investment and policy focus are necessary to further bridge gaps and ensure equitable access to sanitation across all communities.

Figure 43: Sanitation Ladder in Punjab – MICS 2014, 2017-18 & 2024



SOLID WASTE MANAGEMENT

The Draft Solid Waste Management Guidelines (SWMG) 2005 of Pakistan Environment Protection Authority and the Operations & Maintenance (O&M) Manual 2023 covering energy management and operation and maintenance in 16 selected municipal committees' services infrastructure asset project provide a comprehensive regulatory and operational framework to improve waste collection, transportation, disposal, and environmental compliance across Pakistan. These documents align with key legislation, including the Pakistan Environmental Protection Act (1997), National Environmental Quality Standards (NEQS), provincial solid waste management laws, and municipal sanitation regulations. They establish a standardised, legally enforceable approach for municipalities, ensuring efficient service delivery, resource optimisation, and environmental protection.

From a policy and governance perspective, the SWMG outlines institutional responsibilities for local governments, municipal authorities, and waste management agencies, ensuring accountability in waste collection, treatment, and disposal. The framework promotes decentralised waste governance, empowering local governments and tehsil-level waste management committees while establishing provincial regulatory bodies to oversee compliance. Additionally, the guidelines propose legally binding standards for waste segregation, hazardous waste handling, landfill management, and recycling practices to minimise environmental impact.

A key aspect of the guidelines is the emphasis on financial sustainability, introducing cost-recovery models, user-fee structures, and revenue generation through recyclable waste processing. The SWMG also encourages public-private partnerships (PPPs) to mobilise investment in waste collection, processing, and disposal infrastructure. It promotes circular economy models, advocating for waste-to-energy projects, material recovery facilities, and composting initiatives to reduce reliance on landfill dumping.

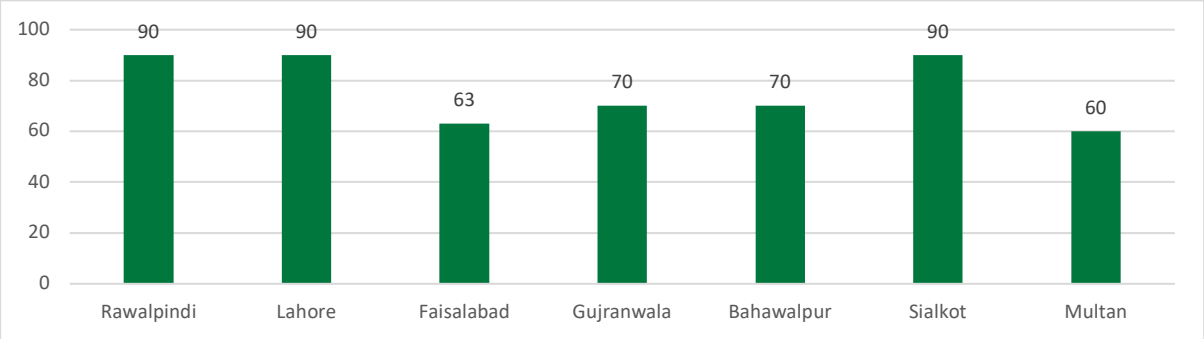
The Operations & Maintenance (O&M) Manual provides technical guidance for waste collection efficiency, equipment maintenance, workforce management, and monitoring systems. It introduces structured waste collection schedules, fleet optimisation strategies, and performance benchmarks for service providers. Additionally, the manual highlights the importance of worker safety protocols, operational training for municipal staff, and real-time tracking of waste management performance.

Both the SWMG and O&M Manual underscore the need for digital transformation in waste management, advocating for geographic information system (GIS)-based route planning, digital waste tracking, and automated monitoring systems. Furthermore, they stress the role of public awareness campaigns, behaviour change initiatives, and community-led waste management solutions to improve compliance with waste segregation and recycling programmes.

By integrating policy enforcement, operational efficiency, financial sustainability, and community engagement, the SWMG and O&M Manual provide a strategic roadmap for sustainable, climate-resilient waste management in Pakistan, ensuring improved environmental health, economic viability, and institutional capacity-building.

The establishment of waste management company in Lahore in 2010 and subsequent replication of the model in the province's major cities, including Faisalabad, Rawalpindi, Gujranwala, Multan, Sialkot, and Bahawalpur during 2013-14, significantly increased the efficiency of solid waste collection in Punjab's urban areas. According to information available by LG&CD and respective waste collection companies, the average waste collection efficiency in the respective cities is around 76 percent. The below figure illustrates the specific waste collection efficiency of each major city.

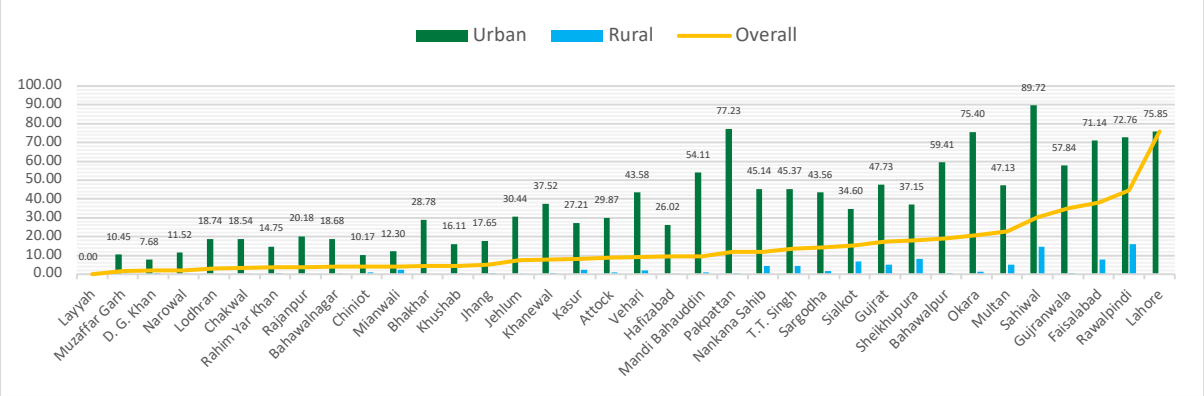
Figure 44: Solid Waste Collection Efficiency in Major Cities



According to PSLM 2019-20, only 23.65 percent household in Punjab have access to solid waste collection services that was reported as 26 percent in PSLM 2018-19. Furthermore, PSLM 2019-20 reports a coverage of 56.05 percent household for solid waste collection services in urban areas of Punjab that was reported by 60 percent in PSLM 2018-19 and estimated for 73 percent as per CGPI data. PSLM 2019-20 indicates the rural coverage of 2.74 percent for solid waste collection services whereas, the previous year's PSLM 2018-19 reported the rural areas coverage for solid waste collection as 5 percent.

At the district level, PSLM 2019-20 showed that district Layyah lacked solid waste collection services, while district Muzaffargarh had just 1.69 percent household coverage for solid waste collection, followed by district DG Khan at 1.85 percent and Narowal at 2.10 percent. According to the PSLM 2019-20, district Lahore has the highest coverage of solid waste collection at 75.85 percent households. Please refer to the figure below for district and area wise solid waste collection coverage reported by PSLM 2019-20.

Figure 45: District and Area Wise Solid Waste Collection in Punjab-PSLM 2019-20



According to CGPI data of June 2021, only 19 of the 29 cities have land fill sites for solid waste disposal. Additionally, the CGPI data shows that just ten cities in Punjab, out of a total of 29, have adopted at least one contemporary technique for solid waste management. Furthermore, the establishment of segregation, treatment and disposal plant/facility for solid waste management at Sahiwal city is frequently reported in ADPs. Additionally, the Government of Punjab has decided to revive the waste to energy project at Lakhodair in Lahore city through PPP that was halted in the previous few years due to some technical issues. Options of methane production from the closed dumping sites in Punjab are also under review by the Government of Punjab. The CGPC data of Punjab for March 2020 indicates that 189 MCs/TMAs in Punjab have 2,236 functional motorised machinery units for solid waste collection and average daily workload of each motorised machinery unit is 5.5 tons. 64 percentage MC/TMAs have five tons or below workload on available motorised machinery units.

THE SUTHRA PUNJAB PROGRAMME: TRANSFORMING WASTE MANAGEMENT ACROSS PUNJAB

The Suthra Punjab Programme, officially launched under the banner “Ab Gaon Chamkain Gay” (Now Villages Will Shine), by the Honourable Chief Minister of Punjab, is a comprehensive initiative aimed at revolutionising waste management and sanitation practices across the province, with a particular focus on rural areas. This ambitious programme underscores the importance of community engagement and the enhancement of local sanitation infrastructure to create a cleaner and healthier environment.

Initially introduced by the Interim Government of Punjab in September 2023 as “Ab Gaon Chamkain Gay,” the programme was implemented in 2,468 Union Councils (UCs). Each UC was allocated Rs 175,000 per month to hire necessary staff and local loaders to collect and dispose of solid waste at designated landfill sites. A monthly sanitation fee ranging from Rs 50 for households to Rs 2,000 for industrial units was collected to support these efforts. To monitor progress, a dedicated portal developed by the Punjab Information Technology Board was utilised. The programme emphasised participatory governance through the creation of management and village committees for planning, monitoring, and review.

Since the newly elected government assumed office in February 2024, under the leadership of the Honourable Chief Minister, significant reforms have been introduced to strengthen the Local Government and Community Development Department (LG&CDD). The department transitioned from solely managing water and sanitation projects to leading the identification, planning, and execution of such initiatives in both urban and rural areas. Additionally, the programme was scaled up from “Ab Gaon Chamkain Gay” to “Suthra Punjab”, integrating sustainable waste management models that involve the private sector and local communities in the provision of sanitary and solid waste management services.

Punjab generates approximately 57,500 tonnes of solid waste daily, with an average of 0.45 kg per capita per day. While 18,438 tonnes are collected by waste management companies, a significant gap persists, as nearly 39,062 tonnes per day remain unmanaged. To address this, the Standing Committee of the Cabinet on Finance and Development approved the Sustainable Waste Management Model in May 2024. Subsequently, all 229 local government bodies, as defined under the Local Government Act 2013, signed Services and Asset

Management Agreements (SAMA) with Waste Management Companies (WMCs). Under these agreements, waste management functions were transferred to WMCs, which extended their services from divisional headquarters to encompass all urban and rural areas across Punjab. In July 2024, WMCs were directed to notify approved service rates following approval from their respective Boards of Directors.

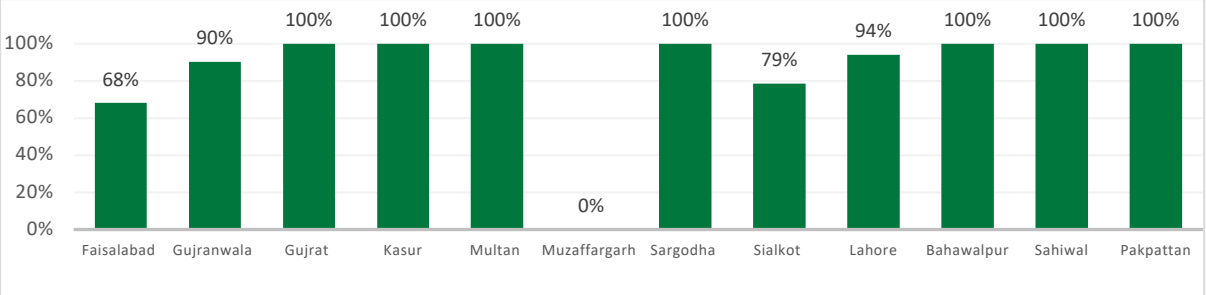
To ensure transparency and accountability, a dashboard for the Suthra Punjab Programme has been established, currently hosting pre-assessment data such as target households, expected fee collections, and expenditure forecasts. Key interventions being reported include manual sweeping, door-to-door waste collection, desilting of drains, clearance of stagnant sewerage water, cleanliness in markets and public spaces, installation and maintenance of manhole covers, repair of water filtration plants, and placement of waste containers. Additional efforts include the maintenance of streetlights, road signage, and footpaths, along with clearing open plots and improving sanitation at bus terminals.

However, the absence of comprehensive baseline data and performance benchmarks poses challenges to monitoring progress and evaluating programme effectiveness. There is a pressing need to develop performance indicators that cover critical aspects such as waste collection efficiency, recycling rates, community participation, environmental impact, and cost efficiency.

In a significant development, the Honourable Chief Minister officially launched a province-wide door-to-door waste collection campaign on 3rd December 2024, symbolising a new era of systematic waste management. The outsourcing of solid waste management services has already been completed in 103 tehsils, with ongoing efforts in 32 others, creating employment opportunities for over 100,000 individuals. This transformative programme reflects the Punjab government's commitment to cultivating a cleaner, healthier, and more sustainable environment through innovative and inclusive waste management practices.

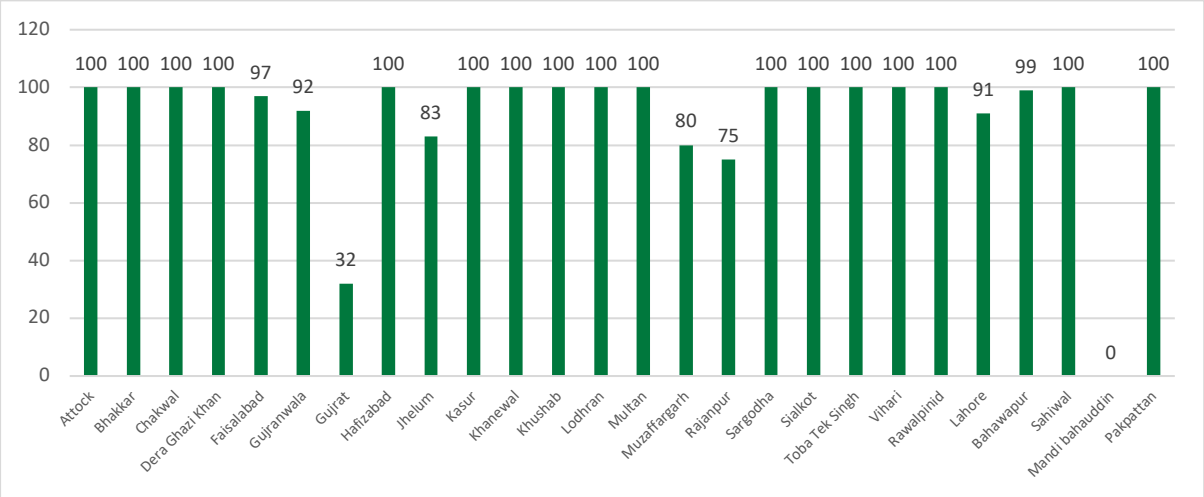
According to CGPI data, only 12 of the reporting cities have industrial units and generate waste. Among these cities with industrial units, industrial waste is collected and disposed of in 11 cities except Muzaffargarh city. In-terms of quantity, a total of 136,202 tons industrial waste is generated in Punjab on monthly bases, while 85 percent of this waste (115,942 tons) is collected and disposed. However, the information related to incineration of hazardous industrial waste is not available. The figure below illustrates the industrial waste collection efficiency of the reported 12 cities.

Figure 46: Industrial Waste Collection Efficiency in Major Cities of Punjab-CGPI Data



For hospital waste collection and disposal, 26 among the reported cities have shared the data in CGPI June 2021 reports. The data indicates that all of the cities have hospital waste collection and disposal arrangements except Mandi Bahauddin city. The CGPI data further indicates that 122,670 tons of hospital waste is generated per month in 26 cities of the Punjab whereas, 91 percent of this waste (112,179 tons) is collected and disposed. However, various sources have confirmed that a very limited number of hospitals in Punjab have functional incinerators for proper disposal of hazardous waste. On the other hand, the recently devised Punjab Health Sector Strategy 2019-2028 places significant focus on the compliance of Punjab Hospital Waste Management Rules 2014. The specific hospital waste collection/ disposal efficiency of each reported city is presented in below figure.

Figure 47: Hospital Waste Collection Efficiency in Punjab-CGPI Data



Developing Resilient Environments and Advancing Municipal Services (DREAMS)

The Developing Resilient Environments and Advancing Municipal Services (DREAMS) project, supported by the ADB, aims to enhance municipal services and environmental resilience in Punjab's urban centres. The project focuses on improving water supply, sanitation, and urban infrastructure to support sustainable urban development and uplift living standards. It targets seven cities across two phases, beginning with Sialkot and Sahiwal in Phase I, followed by Multan, Sargodha, Muzaffargarh, Rahim Yar Khan, Bahawalpur, and Rawalpindi in Phase II. Notable sub-projects include augmenting Rawalpindi's water supply through the Chahan Dam and establishing advanced solid waste management systems in Bahawalpur.

The implementation strategy prioritises land acquisition and resettlement planning (LARP), ensuring fair compensation and livelihood restoration for affected persons. Key infrastructure developments include constructing water treatment plants, pumping stations, and distribution networks, as well as engineered landfills for waste management. A three-tier grievance redress mechanism (GRM) offers accessible and gender-inclusive channels for addressing complaints. The project is executed by the LG&CD and implemented through dedicated city teams under the Project Coordination Unit (PCU). Regular consultations with affected communities and robust monitoring ensure compliance with ADB safeguards and foster stakeholder engagement. The project's expected benefits include improved access to clean water and sanitation, enhanced solid waste management, and better urban amenities, directly benefiting hundreds of thousands of residents. It promotes economic uplift through

job creation, skill development, and reduced losses associated with inadequate WASH services. By prioritising inclusivity and community engagement, the DREAMS project lays the groundwork for sustainable urban development and improved living standards across Punjab.

Punjab Rural Municipal Services Company (PRMSC): Transforming Rural WASH Services

Creation and Purpose: The PRMSC was established in 2021 under the PRSWSSP, approved by the Punjab Development Working Party. Its creation marked a significant step towards addressing rural Punjab's critical water and sanitation challenges. PRMSC was designed to ensure equitable and sustainable access to WASH (Water, Sanitation, and Hygiene) services while promoting public health and empowering local governance.

Scope and Reach: PRMSC operates in approximately 2,000 villages across Punjab, covering multiple districts and tehsils. These efforts focus on extending WASH services to underserved rural areas, directly impacting millions of lives. The company works closely with Tehsil and Village Councils, equipping them with the capacity to manage water and sanitation facilities effectively. This extensive outreach has positioned PRMSC as a cornerstone of rural WASH development in Punjab.

Key Roles and Responsibilities: PRMSC's responsibilities include implementing water and sanitation projects, conducting feasibility and design reviews, and establishing operation and maintenance frameworks to ensure infrastructure longevity. It also provides training to local governments and communities, manages contracts and procurements transparently, and uses GIS mapping to plan and monitor infrastructure development. These efforts ensure a comprehensive approach to improving rural WASH systems.

Key Successes: PRMSC has achieved significant milestones in transforming rural water and sanitation services. It has extended clean water access to villages, reducing reliance on unsafe water sources and lowering the prevalence of waterborne diseases. Comprehensive sanitation systems have been introduced, including solid waste management, which has improved hygiene and environmental sustainability. The company has conducted extensive public education campaigns, successfully promoting hygiene practices such as handwashing and proper waste disposal. Additionally, PRMSC is introducing innovative solutions to enhance sustainability and climate resilience like Anaerobic Baffle Reactor (ABR) for waste treatment. Capacity-building programmes have also strengthened the ability of local councils to manage WASH services effectively, ensuring long-term benefits.

Challenges: Despite these successes, PRMSC faces several challenges. Limited funding for maintaining infrastructure constrains its ability to sustain project outcomes. While the company shall be operating in 2,000 villages, many rural areas remain underserved, highlighting the need for expanded outreach. Deeply ingrained cultural practices pose challenges to achieving widespread behaviour change in hygiene practices. Furthermore, flood-prone and drought-affected regions require more robust and adaptive WASH infrastructure to cope with climate-related challenges.

Partnerships and Collaborations: PRMSC works in collaboration with key partners to maximise its impact. WaterAid, along with the Strengthening Participatory Organisation (SPO)

and M&C Saatchi World Services Pakistan, supports the implementation of PRSWSSP by enhancing WASH practices and community education. The World Bank provides financial and technical support, ensuring that international best practices guide PRMSC's initiatives. These partnerships enable PRMSC to leverage expertise, resources, and innovative strategies to achieve its objectives.

Conclusion: The PRMSC has emerged as a transformative entity in the rural WASH sector. Its work across 2,000 villages has improved access to clean water, sanitation, and hygiene, positively impacting health and quality of life in rural Punjab. While challenges remain, PRMSC's comprehensive approach, innovative solutions, and strong partnerships position it as a critical player in building sustainable and equitable WASH services for the future.

Strategic Actions for Safely Managed Sanitation

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Develop new programmatic approaches like City Wide Inclusive Sanitation (CWIS) for urban areas and community managed sanitation in rural areas with effective faecal sludge management	Conduct CWIS assessment in 20 percent cities of Punjab and, develop faecal sludge management guidelines and business model for these cities.	Scaling up CWIS in 30 percentage cities of Punjab 20 percent of villages have efficient faecal sludge management arrangements.
Strengthen partnerships with local governments and NGOs to accelerate latrine construction in underserved areas.	Integrate sanitation improvement into local development plans with dedicated funding allocations.	Institutionalise behaviour change programmes through community structures for sustained impact.
Rehabilitate and desilt 50 percent of existing sewerage networks in major cities such as Lahore, Faisalabad, and Multan.	Expand sewerage and drainage networks to secondary and tertiary cities with a target of 75 percentage coverage by 2030.	Establish a province-wide modern sewerage network with universal coverage, prioritising climate-resilient infrastructure.
Pilot cost-effective solutions for wastewater disposal and management in peri-urban areas.	Develop regional wastewater treatment facilities for smaller cities to promote off-site sanitation.	Fully integrate stormwater drainage systems into sewerage networks in flood-prone urban areas.
Train local government staff on maintenance and operational efficiency of sewerage and drainage systems.	Create a centralised monitoring system for sewerage performance with real-time data collection.	Introduce automation and IoT-enabled monitoring for sewerage and drainage operations across the province.
Conduct an audit of existing wastewater treatment plants to identify non-functional systems and prioritise rehabilitation.	Scale up the construction of decentralised wastewater treatment systems in small towns and peri-urban areas.	Ensure that 100 percent of wastewater is safely treated before discharge, achieving SDG 6.3 targets.
Promote low-cost bioremediation techniques for wastewater treatment in rural areas.	Establish Combined Effluent Treatment Plants (CETPs) in industrial clusters across the province.	Align wastewater treatment practices with international environmental standards and NDC commitments.
Expand ODF Punjab Programme to cover high OD districts and promote safe on-site sanitation practices.	Ensure that all on-site sanitation facilities meet safety standards as per ODF Punjab Program, with targeted interventions in underserved districts to eliminate	Achieve universal access to safely managed sanitation services, prioritising high-risk districts.

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
	open defecation and promote safe sanitation practices.	
Conduct district-level workshops to strengthen the capacity of local governments in managing sanitation services.	Develop regional sanitation strategies that align with provincial goals and international commitments.	Institutionalise provincial sanitation frameworks to ensure compliance with SDG and national policies.
Develop and implement a comprehensive strategy for solid waste management service in urban areas through PPPs.	Scaling up and enhanced f waste management services under PPPs in urban and rural areas	Achieve 100 percent outsourcing of solid waste management services and, explore addition of liquid waste management in pilot cities
Rehabilitate existing landfill sites and improve waste collection systems in low-performing cities like Muzaffargarh.	Establish waste segregation and recycling plants in major cities, aiming for 25 percentage recycling of municipal waste by 2030.	Achieve 75 percentage solid waste recycling efficiency across all major and secondary cities in Punjab.
Launch pilot projects for waste-to-energy initiatives in Lahore and Faisalabad	Expand waste-to-energy projects to other major cities, focusing on renewable energy generation from organic waste.	Integrate solid waste management with climate mitigation strategies, ensuring alignment with NDC and SDG goals.
Improve data collection mechanisms on industrial and hospital waste	Develop industrial waste treatment facilities to comply with environmental quality standards.	Achieve 100 percentage compliance with hazardous waste treatment regulations in all districts.

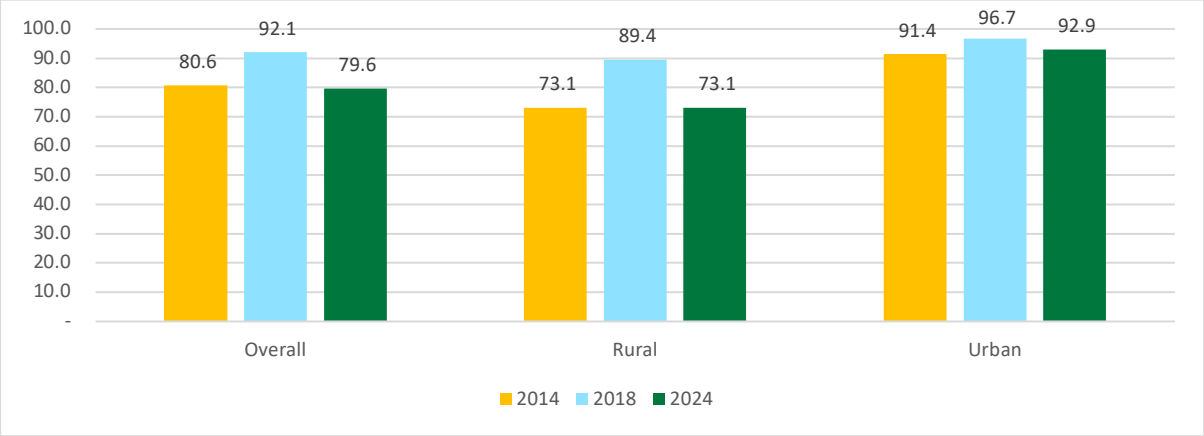
HEALTH AND HYGIENE

Hygiene, which plays a crucial role in maintaining public health, was notably absent from the targets and indicators of MDGs. However, its inclusion in SDG target 6.2 highlights a growing recognition of its importance, particularly its link to sanitation, with practices such as handwashing, food hygiene, and menstrual hygiene management (MHM) being essential for disease prevention and overall health and well-being of a population.

HANDWASHING FACILITIES

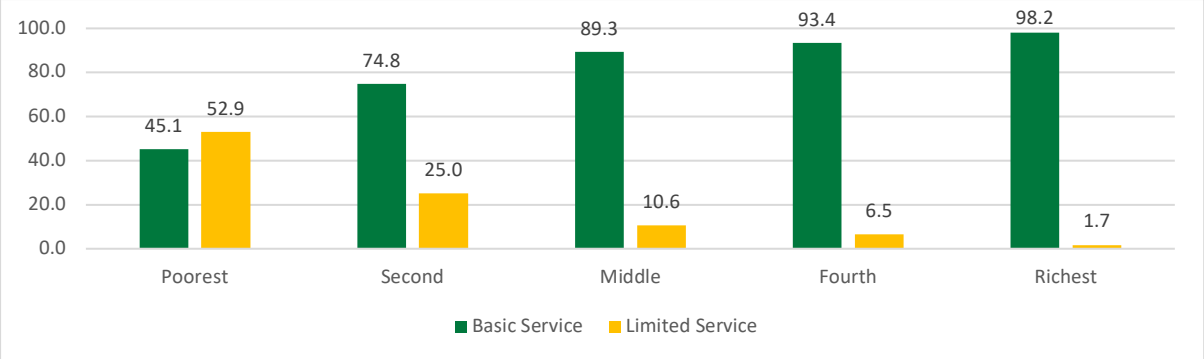
Punjab MICS data show an erratic trend in basic handwashing services[19], with coverage fluctuating from 80.6 percent in 2014 to 92.1 percent in 2018, before declining to 79.6 percent in 2024. Similarly, area-wise coverage of basic handwashing services in urban and rural areas has followed a comparable fluctuating pattern over the past decade.

Figure 48: Basic Handwashing Services (In Percentage) (Punjab MICS 2014, 2018, 2024)



Further analysis of Punjab MICS 2024 reveals clear wealth-based disparities in basic handwashing services. The first wealth quintile (poorest) has the lowest access to basic handwashing services with only 45.1 percent coverage, whereas the fifth quintile (richest) enjoys 98.2 percent coverage. In contrast, limited handwashing services[20] are highest among the poorest quintile at 52.9 percent, while the richest quintile has the lowest proportion of the population relying on limited handwashing services (only 1.7 percent).

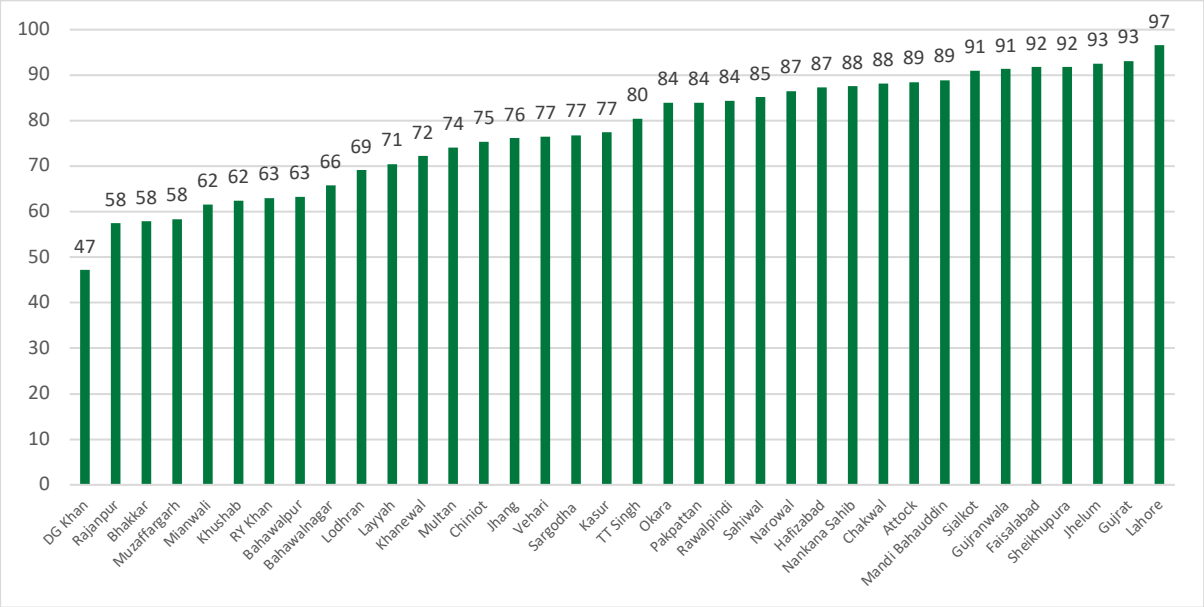
Figure 49: Basic and Limited Handwashing Services (In Percentage) Among Wealth Quintiles-Punjab MICS 2024



[19] Households with a handwashing facility with soap and water available on-premises meet the criteria for a basic handwashing service-Joint Monitoring Programme (WHO and UNICEF)
[20] Households that have a facility but lack water or soap will be classified as having a limited service Joint Monitoring Programme (WHO and UNICEF)

Among the districts of Punjab, Lahore has the highest coverage of basic handwashing services at 97 percent, followed by Gujrat and Jhelum, each at 93 percent. In contrast, Dera Ghazi Khan has the lowest coverage at 47 percent, followed by Rajanpur, Bhakkar, and Muzaffargarh, each with 53 percent coverage.

Figure 50: District Wise Coverage of Basic Handwashing Services (In Percentage) -Punjab MICS 2024



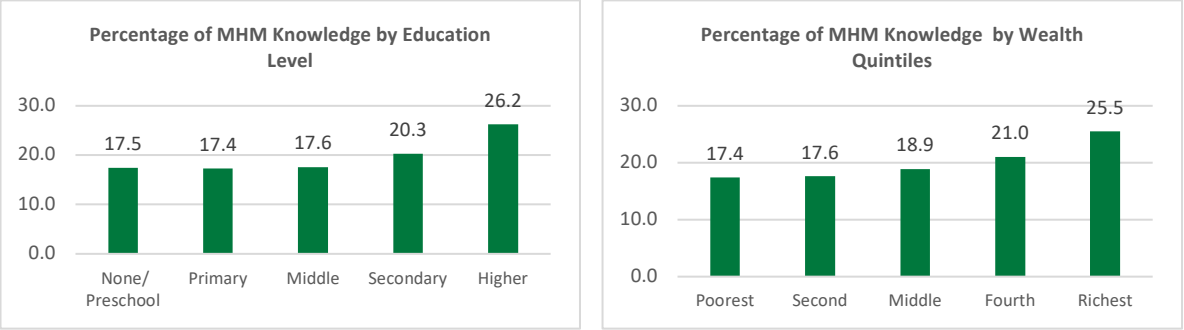
MENSTRUAL HYGIENE MANAGEMENT (MHM)

Ensuring that women and adolescent girls can manage their menstrual cycle safely, privately, and with dignity is essential for their health, psychological well-being, and freedom of movement. Provision of appropriate MHM facilities and lead to better WASH conditions and vice versa. It also aligns with various goals of SDGs such as SDG 3 and 6.

According to Punjab MICS 2024, only 20.3 percent of women aged 15 to 49 years had knowledge about menstruation before their first menstrual period. Notably, awareness is slightly higher among urban women at 21 percent, compared to 19.8 percent in rural areas. This alarmingly low percentage underscores the critical need for MHM awareness among adolescent girls at school level and empowering mothers at community level to educate their girls about menstruation, its health implications, and the potential risks of using unsafe materials.

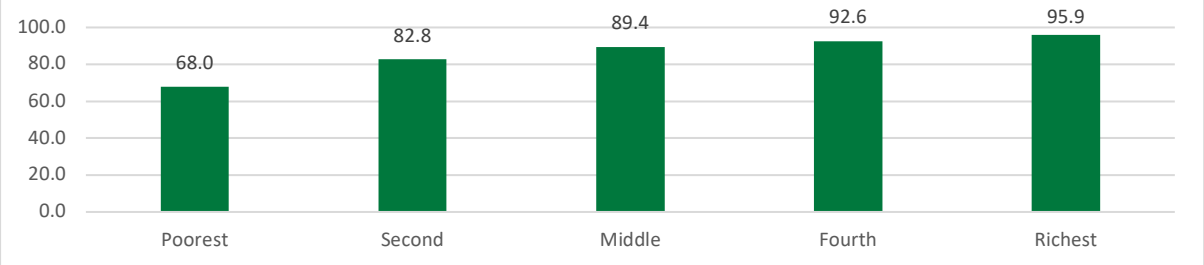
Further analysis of menstrual awareness before the first menstrual period reveals that a higher percentage of educated women had prior knowledge compared to those with no education or only primary-level education. Similarly, the lowest percentage of women with prior knowledge was observed in the poorest wealth quintile, while the highest percentage was recorded among women in the richest wealth quintile. This disparity also highlights the influence of education and economic status on menstrual health awareness.

Figure 51: Knowledge about Menstruation Before First Menstrual Period (Percentage of Women Aged 15-49 Years) -Punjab MICS 2024



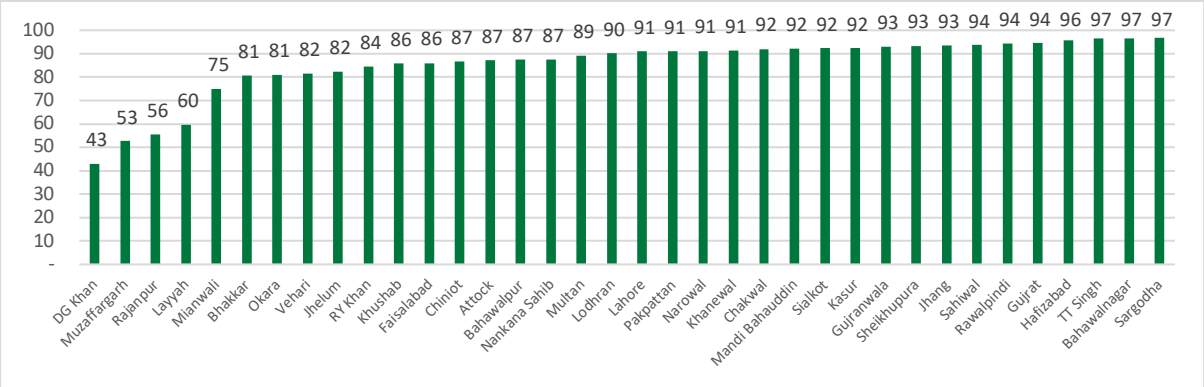
According to Punjab MICS 2024, overall 86.7 percent women aged 15-49 years have enough menstrual materials to change them as often as they wanted throughout their last menstruation. This percentage is higher in urban areas at 90.7 percent, compared to 83.6 percent in rural areas. However, a significant disparity exists across wealth quintiles—only 68 percent of women from the poorest quintile had adequate menstrual materials, compared to 95.9 percent of women in the richest quintile. This stark contrast highlights the need for introducing more economical options of menstrual hygiene products among economically disadvantaged women.

Figure 52: Quintile Based Percentage of Women (Aged 15-49 Years) with Enough ***menstrual materials to change*** *-Punjab MICS 2024*



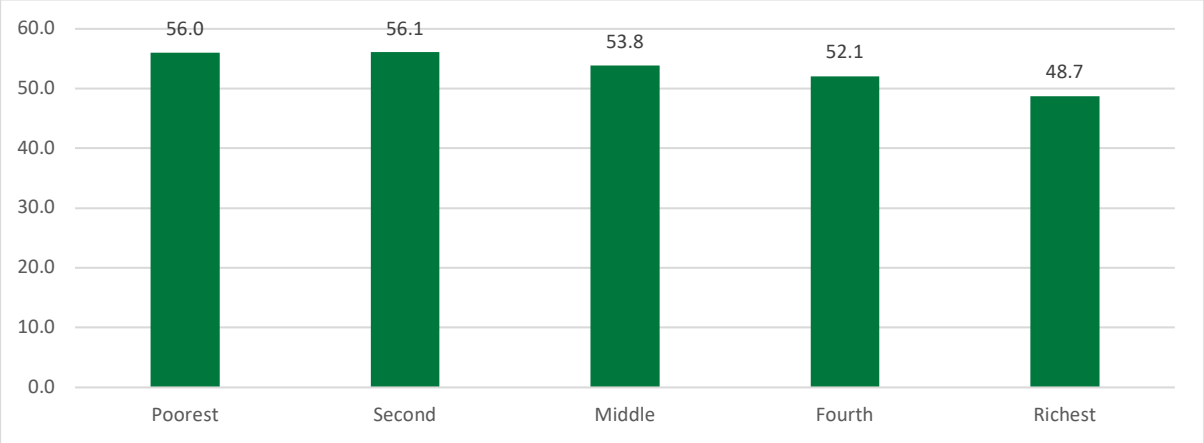
At the district level, Toba Tek Singh, Bahawalnagar, and Sargodha have the highest percentage of women with adequate menstrual materials, each at 97 percent. In contrast, Dera Ghazi Khan has the lowest percentage, with only 43 percent of women having sufficient materials to manage their menstruation. This regional disparity highlights the need of targeted interventions for MHM within the district of Punjab.

Figure 53: District Wise Percentage of Women (Aged 15-49 Years) with Enough ***menstrual materials to change*** *-Punjab MICS 2024*



Inadequate MHM often restricts menstruating women from participating in daily activities, including work, education, training, and social engagements. According to Punjab MICS 2024, 53.2 percent of women reported difficulties in participating in these activities during menstruation. The percentage of women reporting trouble in last menstrual period is slightly higher in rural areas at 53.9 percent, compared to 52.2 percent in urban areas. However, economic disparities are more pronounced for women who reported trouble in last menstrual period, with the highest percentage of women facing difficulties belonging to the first and second wealth quintiles, whereas the lowest percentage is observed among women in the fifth (richest) quintile.

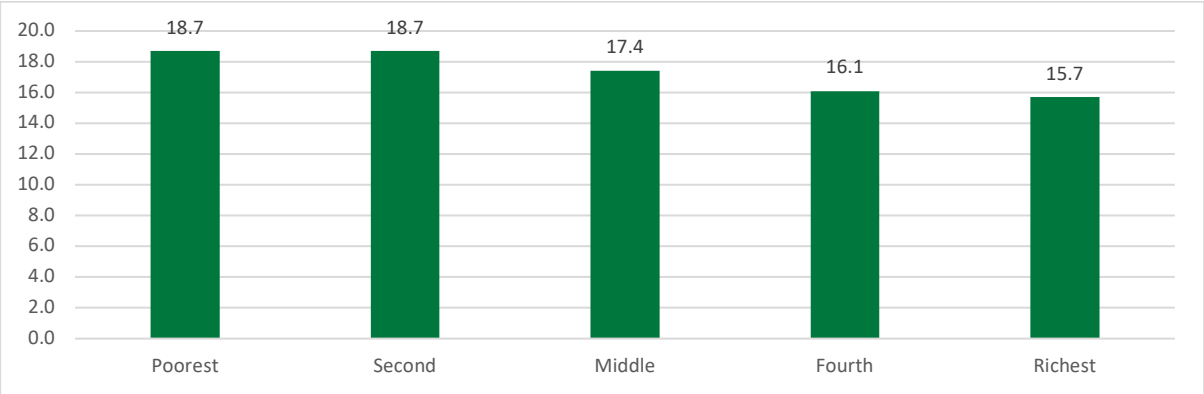
Figure 54: Quintile Based Percentage of Women Reported Trouble in Participating in Work, Education, Training or Social Activities due to Their Last Menstruation - Punjab MICS 2024



DIARRHOEA

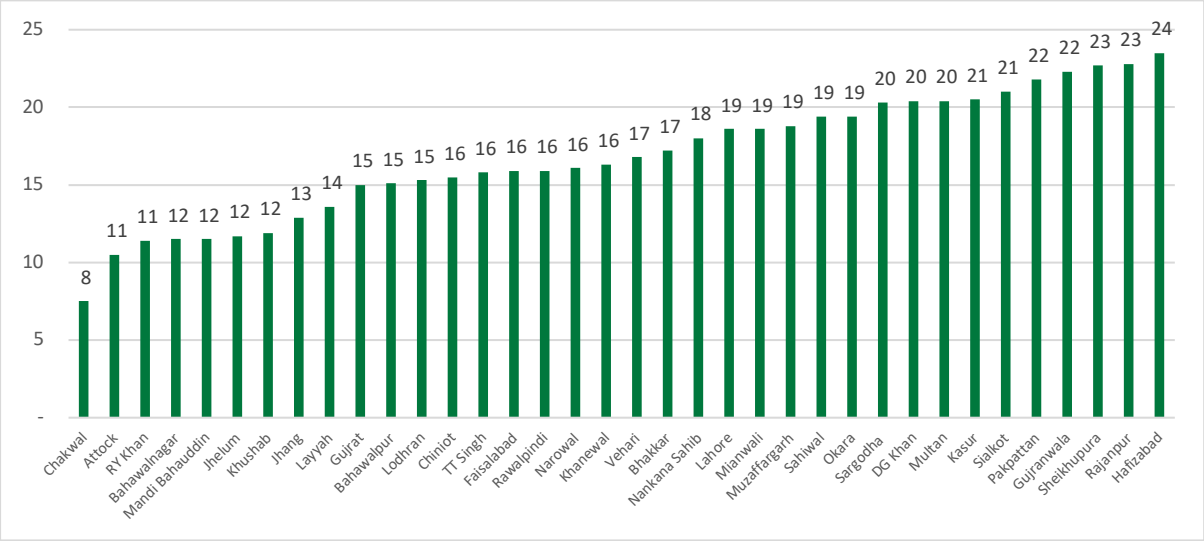
Punjab MICS 2024 reports a diarrhoea prevalence of 17.4 percent among children under five years. This prevalence is almost identical in urban and rural areas, at 17.5 percent and 17.4 percent, respectively. However, wealth-based disparities are significant, with a higher prevalence of 18.7 percent among children in the poorest quintile, compared to 15.7 percent in the richest quintile.

Figure 55: Quintile Based Percentage of Diarrhoea Prevalence Among Children Under Five Years - Punjab MICS 2024



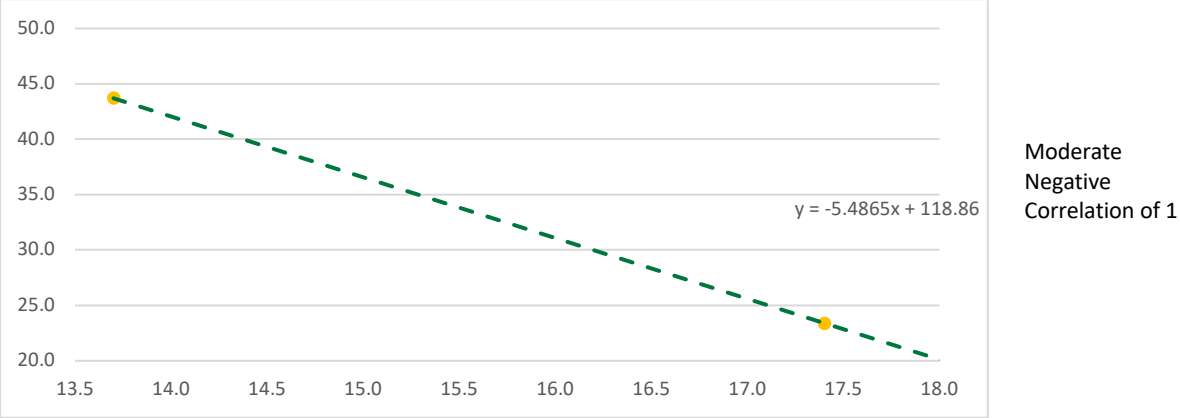
Within the districts of Punjab, the lowest prevalence of diarrhoea among children under five years was reported in Chakwal at 8 percent, followed by Attock and Rahim Yar Khan, each at 11 percent. In contrast, Hafizabad recorded the highest prevalence at 24 percent, followed by Rajanpur and Sheikhupura, each at 23 percent.

Figure 56: District Wise Percentage of Diarrhoea Prevalence Among Children Under Five Years - Punjab MICS 2024



The prevalence of diarrhoea among children under five years was previously reported at 13.7 percent in Punjab MICS 2018, which is 3.7 percent lower than the latest 17.4 percent reported in Punjab MICS 2024. Meanwhile, the coverage of safely managed drinking water services in Punjab has significantly declined from 43.7 percent to 23.4 percent over the same period. This time-based variation in both indicators—diarrhoea prevalence and access to safely managed drinking water—suggests a very high negative statistical correlation of -1, indicating a strong inverse relationship between these both indicators.

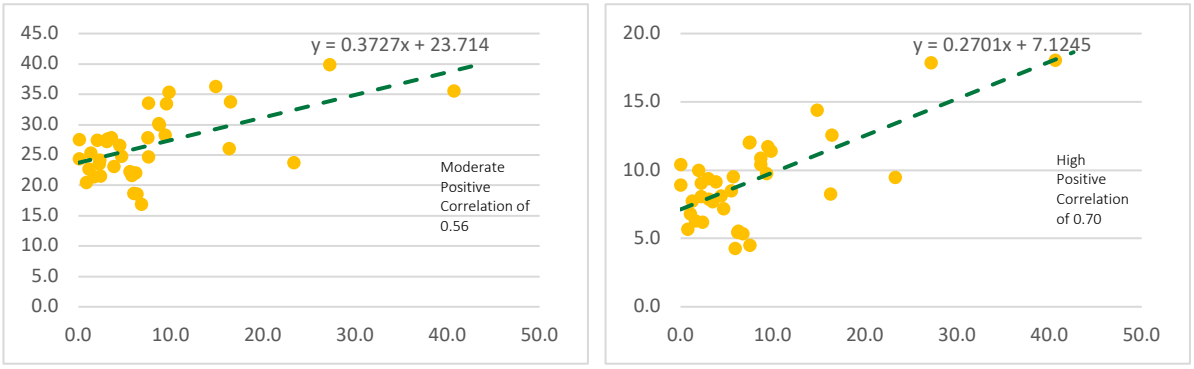
Figure 57: Time Based Statistical Corelation Between Prevalence of Diarrhoea and Safely Managed Drinking Water Services - Punjab MICS 2018 and 2024



THE IMPACT OF WASH ON CHILD STUNTING

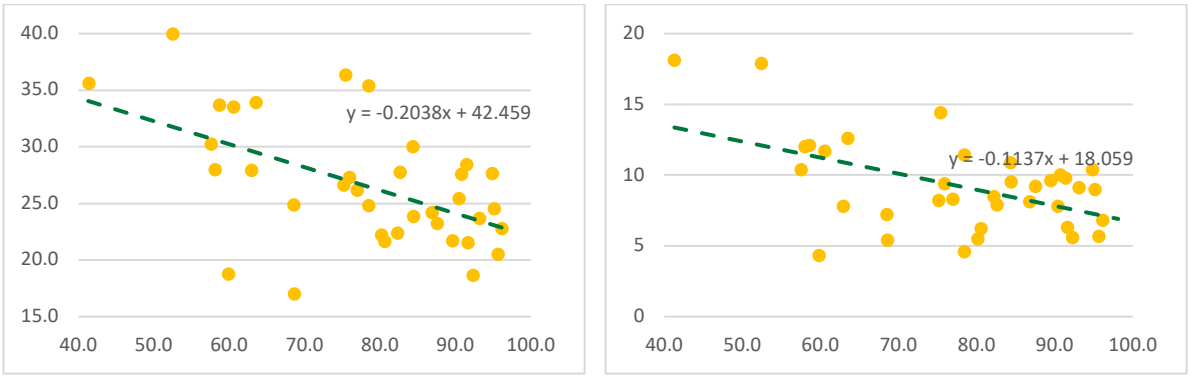
The district-wise data from Punjab MICS 2024 indicates a high positive statistical correlation of 0.7 between the prevalence of open defecation and severe stunting (-3SD) among children under five. In contrast, a moderate positive correlation of 0.56 is observed between the prevalence of open defecation and moderate stunting (-2SD). These findings suggest a strong link between inadequate sanitation and child undernutrition, reinforcing the importance of improving WASH conditions to reduce stunting.

Figure 58: District Wise Statistical Corelation Between Open Defecation and Child Stunting- Punjab MICS 2024



Furthermore, the district-wise data from Punjab MICS 2024 indicates a moderate negative correlation of -0.51 between basic handwashing services and the prevalence of severe stunting (-3SD) among children under five years. Similarly, a moderate negative correlation of -0.54 is observed between basic handwashing services and moderate stunting (-2SD). These correlations suggest that enhanced coverage and proper practice of handwashing can play a significant role in reducing child stunting, highlighting the link between hand hygiene and child nutrition outcomes.

Figure 59: District Wise Statistical Corelation Between Basic Handwashing and Child Stunting- Punjab MICS 2024



Impact of Water, Sanitation, and Hygiene (WASH) interventions on diarrhoeal infections among children in the tribal regions of Palghar: a quasi-experimental study[21]

A study conducted in six tribal villages of Palghar district assessed the effectiveness of a four-week WASH intervention on reducing diarrheal infections among children under five years old. The research also evaluated changes in knowledge, awareness, and practices (KAP) related to WASH among participating mothers. The primary aim was to determine whether targeted educational and practical measures could lead to significant health improvements in these communities.

The study employed a quasi-experimental design involving 180 households with mothers of children under five registered at local anganwadi centres. Baseline data on the incidence of diarrheal infections and KAP regarding WaSH were collected through structured interviews and health records. Following this, a comprehensive WaSH intervention was implemented, which included educational sessions on hygiene practices, demonstrations of proper

[21] Available at https://iwaponline.com/jwh/article/22/7/1125/102730/Impact-of-Water-Sanitation-and-Hygiene-WaSH

sanitation techniques, and the distribution of hygiene materials. After the four-week intervention, follow-up data were gathered to assess changes in health outcomes and KAP indicators.

The study indicates a significant reduction in reported diarrhoea cases among children in the intervention group, where the prevalence decreased from 31 percent to 24 percent. In contrast, the control group showed only a marginal change, with cases remaining nearly unchanged from 35 percent to 33 percent. Additionally, there was a significant improvement in the mothers' knowledge and practices related to WASH. These findings suggest that even short-term, targeted interventions can have a substantial impact on health outcomes in vulnerable populations. The study emphasises the importance of community-based educational programs and the provision of resources to promote sustainable hygiene practices.

Strategic Actions for Health and Hygiene

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Scale up awareness campaigns on handwashing and menstrual hygiene at community and school levels.	Introduce affordable, sustainable menstrual hygiene and handwashing products through PPPs.	Strengthen supply chain of subsidised menstrual hygiene and handwashing products to manage the demand among economically disadvantaged groups.
Increase targeted messaging for adolescent girls and mothers on menstrual health and safe practices.	Strengthen training programs for healthcare providers on MHM and diarrhoea prevention.	Institutionalise comprehensive WASH education in schools, making it part of the national curriculum.
Scale up community-led sanitation programs to reduce open defecation and associated stunting.	Achieve elimination of open defecation through sustained behavioural change programs.	Promote investment in climate-resilient WASH solutions, particularly for vulnerable districts.
Ensure immediate WASH interventions in districts with the highest diarrhoea and child stunting prevalence.	Integrate WASH improvements into broader child nutrition and public health strategies.	Monitor and evaluate long-term health impacts of improved WASH services on diarrhoea and stunting.

WASH IN HEALTH CARE FACILITIES

WASH in healthcare facilities (HCFs) is fundamental to public health, serving as critical components in Infection Prevention and Control (IPC), reducing Health Care Associated Infections (HAIs), and combating Antimicrobial Resistance (AMR), which, in turn, is vital to the safety of the patient and the healthcare staff. Insufficient environmental conditions and scarce availability of standard precaution items in a HCF increase the risks of infection through contaminated water, hands, food, medical equipment, and unsafe disposal of waste (Cronk & Bartram, 2018). There are numerous consequences of poor WASH services in HCFs. Infections associated with healthcare affect millions of patients each year where 15 percent of the patients from low-and middle-income countries develop one or more infections during their stay at hospitals. This burden of infection is higher in women who come to HCFs to deliver and in the new-born children. Sepsis and other severe infections are major killers estimated to cause 430,000 deaths annually (WHO, UNICEF, 2015). According to the Punjab District Health Information System (DHIS) report for FY 2023-24, Punjab hosts 4,168 HCFs, including 48 teaching hospitals, 34 District Headquarters (DHQs) hospitals, 139 Tehsil Headquarters (THQs) hospitals, 319 RHCs, 2,522 BHUs, 287 MCHCs, and 1,026 dispensaries. Primary and secondary HCFs fall under the jurisdiction of the Primary & Secondary Healthcare Department (P&SHD), while tertiary facilities are governed by the Specialised Health & Medical Education Department (SH&MED).

In 2021, the Ministry of National Health Services, Regulation & Coordination, with support from UNICEF, conducted "The Scoping Study to Establish a Baseline for Reporting to SDGs for WASH in Health Care Facilities in Pakistan." This study confirmed that water is readily available across HCFs in Punjab, with over 95 percent of these facilities using improved water sources. The type of water source varies based on groundwater quality and proximity to service line. In urban areas, municipal water supplies are generally used, while facilities near shallow groundwater rely on hand or motorised pumps. Only 21 percent of primary HCFs are connected to municipal water systems, with the majority relying on motorised pumps (66 percent) and a smaller percentage using hand pumps or dug wells (14 percent). In arrangement where HCFs rely on handpump or dug well, often limit access to running water for toilet flushing and hand hygiene, resulting in a need for pour-flush systems. Additionally, motorised pumps serve as the main water source for 48 percent of secondary and 52 percent of tertiary HCFs.

The study also evaluated water access at critical points within the HCFs, such as toilets and service areas. In Punjab, around 60 percent of primary HCFs have water available in toilets, but only 52 percent provide water in service areas. While 100 percent of secondary HCFs have sufficient water overall, only 80 percent have water available in toilets and just 60 percent offer water at hand hygiene stations. Tertiary facilities show the highest overall availability, with all surveyed facilities providing drinking water and 90 percent offering toilets with running water. However, water quality testing remains a relatively low priority across HCFs in Punjab; only 35 percent of primary, 58 percent of secondary, and 70 percent of tertiary facilities conduct regular testing.

Hand hygiene, critical for infection prevention, has gained increased importance amid COVID-19. Although all healthcare levels in Punjab have at least one hand hygiene station, functionality rates vary significantly: 60 percent functional hand hygiene stations at primary level, 97 percent at secondary level, and 100 percent at tertiary level. At care points, 90 percent of primary, 97 percent of secondary, and 90 percent of tertiary facilities have at least one functional hand hygiene facility. Most primary HCFs (94 percent) provide hand hygiene stations within five metres of toilets, as do nearly all secondary

(97 percent) and tertiary (90 percent) HCFs. Hygiene materials are available in most of HCFs—90 percent of primary, 97 percent of secondary, and 90 percent of tertiary HCFs. Hand hygiene promotion sessions, essential for behaviour change, occur monthly in 30 percent of primary HCFs, while secondary and tertiary levels conduct these more frequently.

Sanitation infrastructure varies by facility. Municipal sewer connections serve approximately 67 percent of facilities, though primary HCFs often use on-site septic tanks (54 percent) or pit with slab (18 percent) in areas with limited water. Secondary and tertiary facilities typically have more comprehensive setups, with tertiary facilities having a greater number of toilets, although functionality decreases as toilet counts increase. Restricted access due to locked toilets is a common issue across Punjab's HCFs. In primary HCFs, staff-only access dominates (92 percent), with limited toilets for women (63 percent) and individuals with disabilities (38 percent).

Solid waste management is generally structured, with 96 percent of primary and 100 percent of secondary and tertiary HCFs using color-coded bins for waste segregation. Waste bins are usually emptied daily in primary facilities, and as needed in secondary and tertiary levels. However, disposal practices for infectious waste vary, with primary facilities using pits or open burning, and secondary facilities relying on autoclaves, incinerators, or external services.

Effective environmental cleaning and infection prevention control (IPC) require adherence to cleaning protocols and proper training. While Punjab's HCFs follow these protocols—92 percent at primary, 97 percent at secondary, and 100 percent at tertiary levels—training remains insufficient. Disinfection of service areas is practiced in 100 percent of tertiary facilities and around 90 percent of primary and secondary facilities. Budgets for cleaning vary, with secondary and tertiary levels generally having sufficient funds, whereas primary HCFs often face budgetary shortfalls.

Notably, perhaps due to COVID-19 protocols, an unexpectedly high percentage of gynaecology staff in Punjab HCFs is wearing personal protective equipment (PPE): 93 percent in primary, 84 percent in secondary, and 100 percent in tertiary facilities. Ensuring safe gynaecological procedures, however, also relies heavily on effective instrument sterilisation. In Punjab, 50 percent of primary HCFs sterilise instruments by simple boiling, while smaller proportions use additional methods: 15 percent combine heating with chemicals, 25 percent use high-pressure steam, and 10 percent employ gas vapor sterilisation. Secondary facilities also use a mix of these techniques, with 30 percent using chemical solutions and 32 percent relying on simple boiling. Tertiary HCFs apply a similar variety, including high-pressure steam (40 percent), chemical boiling (30 percent), and simple boiling (30 percent).

Waste management practices for gynaecological procedures vary. At the primary level, color-coded waste bags are rarely used, while 61 percent of secondary and 50 percent of tertiary HCFs in Punjab use biohazard-specific yellow bags, with another 20 percent of tertiary facilities using black bags, and 30 percent using non-identified polyethylene bags. Labour and procedure rooms are routinely cleaned with water and antibacterial solutions in most HCFs: 92 percent of primary, 100 percent of secondary, and 80 percent of tertiary facilities in Punjab follow this practice, while the rest use aerosol-based cleaners.

For handling and disposing of human placenta, which, although not immediately hazardous, can quickly become septic, most HCFs practice temporary storage in coded bins, with 65 percent of primary and

secondary and, 70 percent of tertiary facilities using this method. Disposal practices commonly involve burial in lined or unlined pits, with 87 percent of primary, 84 percent of secondary, and 80 percent of tertiary, either on-site or via third-party arrangements. Only a small fraction incinerates placental waste (1 percent of primary, 16 percent of secondary, and 20 percent of tertiary HCFs).

Placenta disposal practices also vary by HCF level, often influenced by available space and the extent of outsourcing. An increasing trend towards external disposal is observed, with 47 percent of primary, 45 percent of secondary, and 60 percent of tertiary HCFs opting for external sites. However, adequate distance between water sources and disposal sites, ideally at least 10 metress, is frequently compromised due to space constraints. In Punjab, 56 percent of primary, 42 percent of secondary, and 30 percent of tertiary HCFs have placenta disposal sites within 10 metress of a water source. This issue warrants high-priority intervention, particularly in congested areas where relocation may be unfeasible. Instead, it is recommended to line placenta disposal pits with watertight materials, ensure water abstraction from deep aquifers, and conduct regular water quality checks.

Based on the National Scoping Study on WASH in HCFs, the Government of Punjab, along with the Primary and Secondary Healthcare Department and the Specialised Health & Medical Education Department, has developed the Punjab WASH in HCFs Strategy and Action Framework (2022-2030). This framework aims to advance SDGs 3.7, 3.8, 6.1, and 6.2. The strategy comprises three volumes, addressing key thematic areas, bottleneck analysis, a Bottleneck Removal Action Plan, costing, and an implementation and, monitoring & evaluation framework. Additionally, it introduces a Minimum WASH & IPC Package for HCFs and Training Manuals for HCF management and staff supervisors to support effective implementation of the strategy. The strategic guidelines for WASH in Health Care Facilities (HCFs) focus on four key thematic areas:

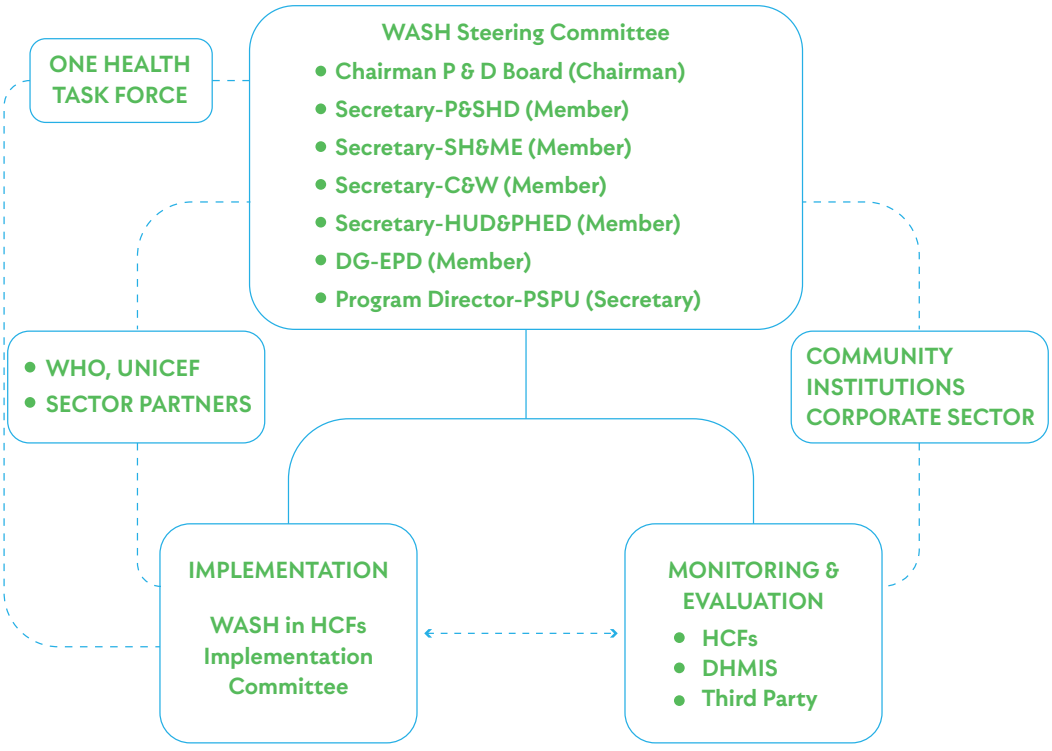
Figure 60: Conceptual Framework for WASH in HCF

Source: Punjab WASH in HCFs Strategy and Action Framework (2022-2030)

1. Infrastructure Development and Maintenance: Guidelines include provisions for clean water storage, water conservation, sanitation standards, hand hygiene, environmental hygiene, and solid waste management. This includes designated sanitation facilities for different users, onsite wastewater treatment, and compliance with environmental standards.
2. Health Workforce Development: Dedicated WASH supervisors and staff are essential for the operation and maintenance of WASH infrastructure. Training programmes emphasise the importance of WASH in preventing infections, with supervisors responsible for worker safety and dignity.
3. Community Participation: Active community involvement in WASH efforts is promoted through Health Councils and District WASH Committees, with private sector contributions encouraged, especially from the beverage and bottled water industries.
4. Monitoring & Evaluation (M&E): Continuous M&E is integrated into the District Health MIS (DHMIS) with regular reporting. Third-party reviews after each phase ensure scalability, strategy refinement, and knowledge sharing.

The Punjab WASH in HCFs Strategy and Action Framework (2022-2030) outlines a collaborative, multi-agency approach for its implementation, involving government departments, UN agencies, sector partners, community institutions, and corporate organisations. The Strategy will draw on technical and financial support from these entities, aiming for sustainable WASH development in HCFs across Punjab.

Figure 61: Institutional Structure for the Implementation of Punjab WASH in HCFs Strategy



The core of this institutional structure is a high-powered, multi-departmental Steering Committee chaired by the Chairman of the P&D Board, comprising key government secretaries and the Director General of the EPD. This committee will direct the implementation of the Strategy and facilitate informed decision-making by overseeing the progress in WASH infrastructure quality and efficiency.

The Strategy is designed to function in close coordination with the One Health Task Force, a body established under the Punjab Health Sector Strategy (2019-2028) and chaired by the Punjab Health Minister. This Task Force will receive quarterly progress reports and provide guidance on critical implementation decisions.

UN agencies such as WHO and UNICEF, which will facilitate periodic reporting to the Joint Monitoring Programme (JMP) platform in line with SDGs 3.7, 3.8, 6.1, and 6.2. Additional support from sector partners, including WaterAid, Qatar Charity, and various INGOs, will enhance financial and technical resources and sponsor research to assess the impact of WASH interventions.

The Strategy seeks to transform communities from passive beneficiaries to active participants in improving WASH conditions in HCFs, following the Eight Practical Steps guidelines. Community organisations, such as Village Organisations (VOs) and Programme Support Organisations (PSOs), along with Community Development Officers (CDOs) and Community-Based Motivators (CBMs) under the HUD&PHED, will engage communities in WASH awareness and facility upkeep. Community members can act as advocates, voicing their needs for better WASH facilities.

The corporate sector, particularly through Corporate Social Responsibility (CSR) initiatives, is encouraged to invest in WASH infrastructure, particularly companies in water bottling and the beverage industry. With CSR units often empowered to contribute actively to social initiatives, these organisations are poised to support WASH improvements financially.

For the implementation of WASH infrastructure, the Strategy assigns the responsibility directly to the HCFs, working through the PHED. The Steering Committee will form an Implementation Committee, reporting directly to the Steering Committee to monitor the progress of WASH infrastructure investments. This Committee will assist HCFs in securing funding approvals through the District Health Officers and PHED. Additionally, the Committee may oversee construction, engaging engineering consulting organisations when necessary to ensure quality and timely completion.

The Punjab WASH in HCFs Strategy has outlined a total investment of Rs. 21.13 billion for the Action Plan period from 2022 to 2030. This expenditure includes Rs. 9.04 billion allocated for WASH infrastructure development and improvement, with an additional Rs. 12.09 billion designated for non-development costs. The annual average development expenditure is estimated at Rs. 1.3 billion, while the non-development expenses, which cover repairs, maintenance, supplies, staff expansion, and capacity building, are projected at Rs. 1.51 billion per year.

Table 8: Summary of Costs for Punjab WASH in HCFs Strategy 2022-30 (in Rs. Million)

Sr.	Description	Total Cost	Sources of Funds				
			Punjab ADPs (Health Sector)		*Health Sector Non-Development Budgets*		*Multilateral & Bilateral Funding Organisations*
			Total	*percentage*	*Total*	*percentage*	
1	WASH Infrastructure Development	9,043	9,043	100	0	0	To be discussed separately with each funding organisation and agreed on the type and size of Financial/ Technical Assistance
2	Additional WASH Staff Salaries/ Benefits	7,379	0	0	7,379	100	
3	Supplies and Consumables	2,687	0	0	2,687	100	
4	Minor WASH Infrastructure Repairs	921	0	0	921	100	
5	Capacity Building	1,102	0	0	1,102	100	
Total Investment Programme		21,131	9,043	42.8	12,088	57.2	

Strategic Actions for WASH in Health Care Facilities (HCFs)

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct a rapid assessment of WASH infrastructure in all HCFs to identify critical gaps.	Rehabilitate and upgrade existing WASH infrastructure in 50 percent of HCFs, prioritising underserved districts.	Achieve universal compliance with national and international WASH standards across all HCFs.
Ensure functional hand hygiene stations and water access in all critical service areas of primary and secondary HCFs.	Expand wastewater management systems to secondary and tertiary facilities with decentralised treatment solutions.	Implement climate-resilient infrastructure for WASH services in all HCFs, capable of withstanding extreme weather events.
Pilot the WASH FIT tool in few districts of Punjab. Review and customise it to meet the province's specific needs. Additionally, strengthen the capacities of health staff and other related service providers to effectively implement the tool.	Expand the implementation of the WASH FIT tool across all districts of Punjab, ensuring that each district adapts the tool to its unique local needs and conditions.	Conduct periodic reviews and continuous monitoring of the WASH FIT tool to assess its effectiveness and relevance over time.
Procure basic WASH supplies and consumables for all primary and secondary HCFs.	Install modern water quality monitoring systems across 70 percent of HCFs for regular testing and compliance.	Institutionalise regular WASH audits to ensure quality and safety in all HCFs.
Train 50 percent of WASH supervisors and facility staff on hygiene promotion and infection prevention and control (IPC).	Introduce specialised training modules for healthcare staff, focusing on antimicrobial resistance (AMR) prevention.	Establish a permanent cadre of WASH professionals within the healthcare workforce.
Strengthen capacity building efforts for local health committees and district WASH coordinators.	Develop a provincial training institute for WASH in HCFs, offering advanced certification programmes.	Align training programmes with international best practices and integrate WASH education into medical and nursing curricula.
Conduct quarterly hand hygiene promotion sessions in 50 percent of primary HCFs.	Institutionalise monthly hygiene promotion activities in all secondary and tertiary facilities.	Achieve sustained behavioural change through community-level engagement and awareness campaigns on WASH in healthcare.

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Establish community-based health councils to oversee WASH service delivery in 30 percent of HCFs.	Strengthen collaboration with private sector partners for co-financing WASH infrastructure development.	Achieve active community engagement in WASH governance through district-level health councils.
Launch awareness campaigns on the importance of WASH in HCFs, targeting underserved communities.	Scale up PPPs to cover at least 50 percent of HCFs for enhanced WASH service provision.	Institutionalise community-driven WASH monitoring systems integrated with district health management information systems (DHMIS).
Mobilise corporate social responsibility (CSR) funding to support WASH improvements in select pilot districts.	Encourage long-term CSR commitments to fund WASH infrastructure in under-resourced facilities.	Ensure sustainable financing for WASH in HCFs through community and private sector contributions.
Establish a baseline for WASH in HCFs through the District Health Management Information System (DHMIS).	Develop a digital monitoring platform for real-time tracking of WASH indicators in 70 percent of HCFs.	Fully integrate M&E frameworks into provincial health strategies, with automated reporting for WASH progress.
Conduct third-party reviews for key pilot projects to ensure transparency and scalability.	Roll out district-level WASH scorecards to evaluate the performance of HCFs in meeting WASH standards.	Align M&E systems with national and global SDG reporting requirements for WASH in HCFs.
Develop standardised M&E guidelines for facility-level reporting and data collection.	Ensure independent evaluations of WASH in HCFs every five years to guide policy adjustments.	Use M&E data to drive evidence-based policy changes and resource allocations in healthcare.

WASH IN SCHOOLS

Water, Sanitation, and Hygiene promotion in Schools (WinS) is a crucial aspect of child-friendly school initiatives designed to provide safe, healthy, and comfortable water, sanitation, and hygiene (WASH) facilities. Access to drinking water and sanitation is essential for community health and hygiene, and this importance is even greater when it comes to the needs of children in schools.

The School Education Department of Punjab administers a total of 48,473 schools, which include 22,935 schools for boys and 25,538 schools for girls. The overall student enrolment stands at 11,968,153, consisting of 5,888,420 boys and 6,079,733 girls. The department employs 333,039 teachers, with 145,807 male teachers and 187,232 female teachers. The level wise schools include 12 Masjid Maktab (MM) schools, 32,344 primary schools, 7,226 middle schools, 8,077 high schools, and 814 higher secondary schools.[22] The district-wise breakdown of Government schools in Punjab reveals a total of 48,473 schools, of which 42,823 are located in rural areas and 5,650 in urban areas. The districts with the highest number of schools are Rahim Yar Khan (2,775), Bahawalnagar (2,132), and Sargodha (1,922). Conversely, the districts with the fewest schools are Chiniot (698), Hafizabad (734), and Pakpattan (858). According to the annual census data 2023-24, a majority of schools have access to drinking water (99.5 percent) and functional toilets (99.6 percent).[23]

According to the Punjab Private Education Provider Registration and Information System, there are a total of 106,172 registered private educational institutes in the province as of November 2024, with an enrolment of 12,368,647 students—slightly exceeding the enrolment figures of Government schools.[24] Despite this significant presence, data on WASH facilities in private schools is limited. However, the ASER 2023 provides some insights, indicating that 93 percent of private schools have useable toilets, and 83 percent schools with clean drinking water. Given the extensive outreach of private schools in Punjab, there is a pressing need to develop and implement a comprehensive monitoring mechanism that includes WASH indicators.

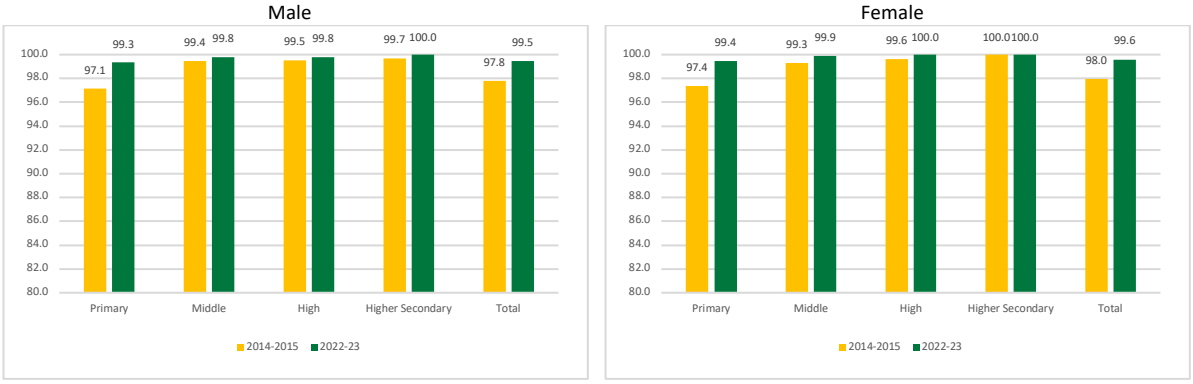
Trend of Access to Drinking Water in Schools for Last 10 Years

The comparison of Pakistan Education Statistics (PES) 2014-15 data with the 2022-23 data indicates that the drinking water availability in Government schools which was 97.9 percent of schools (97.8 percent boys' schools and 98.0 percent girls' schools) in 2014-15 has increased to 99.5 percent of schools (99.5 percent of boys' schools and 99.6 percent of girls' schools) in 2022-23. At primary level, the access to drinking water has reached to 99.4 percent in 2022-23 from 97.2 percent in 2014-15. For middle schools, the availability of drinking water has improved slightly from 99.4 percent to 99.8 percent, while high schools saw an increase from 99.5 percent to 99.8 percent. At the higher secondary level, drinking water availability reached 100 percent in 2022-23.

These achievements demonstrate Punjab's commitment to ensuring basic WASH facilities in schools for both genders and at all educational levels. However, while access to drinking water has been successfully ensured, the focus must now shift to ensuring the safety and quality of the water provided. Currently, no systematic mechanism exists for monitoring water quality in school.

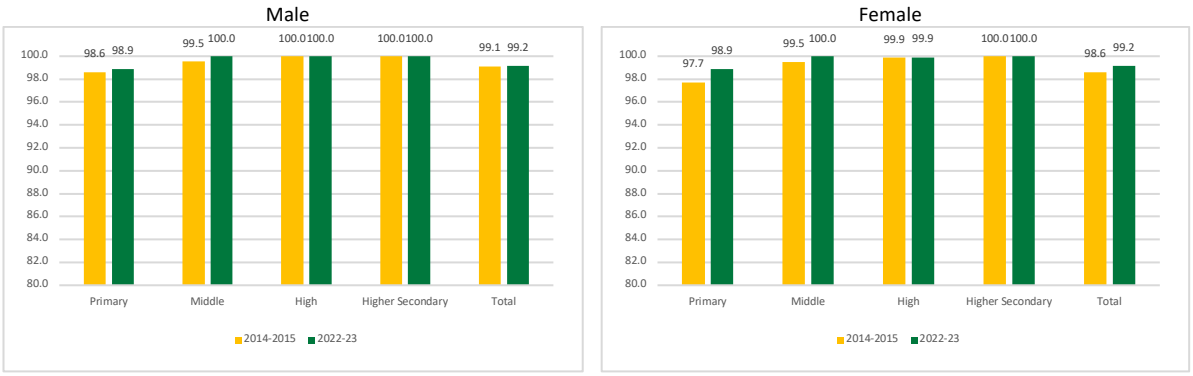
[22] Annual School Census, 2023-24, School Education Department, Punjab
[23] Annual School Census, 2023-24, School Education Department, Punjab
[24] Accessed on 19 November 2024, https://pepris.punjab.gov.pk/

Figure 62: Gender wise availability of drinking water in overall schools of Punjab- (PES 2014-15 & 2022-23)



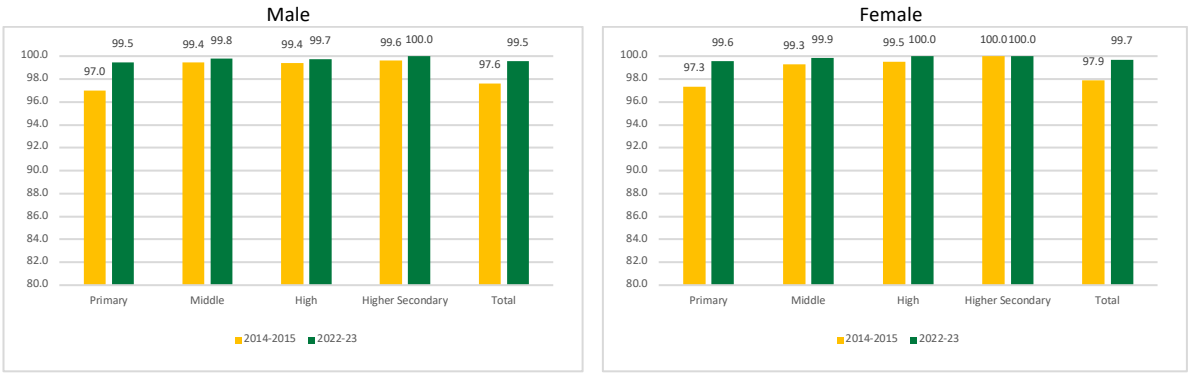
In terms of drinking water availability in urban schools of Punjab, the data indicates that nearly all schools provide drinking water facilities for both male and female students. The PES data from 2014-15 shows that almost all schools at the middle, high, and higher secondary levels have access to drinking water which is still consistent in PES 2022-23. However, approximately 2 percent of primary schools for girls lack drinking water facilities in 2014-15 which is now reduced to around one percent in the PES 2022-23 data.

Figure 63: Gender wise availability of drinking water in urban schools of Punjab- (PES 2014-15 & 2022-23)



In rural areas of Punjab, the availability of drinking water facilities in Government schools has shown remarkable improvement. According to the Pakistan Education Statistics (PES) 2023 data, access to drinking water in rural schools has nearly reached 100 percent, a significant increase from 97 percent in 2015. Both boys' and girls' schools now report over 99 percent access to drinking water facilities.

Figure 64: Gender wise availability of drinking water in rural schools of Punjab- (PES 2014-15 & 2022-23)



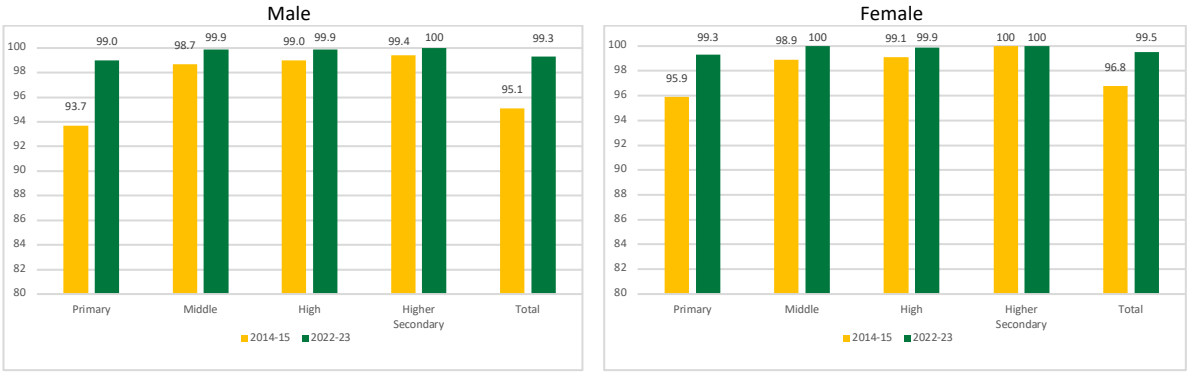
According to the school monthly monitoring data for May 2024[25], more than 97 percent of schools across districts in Punjab have access to drinking water facilities, with the exception of Okara and Lodhran. (For a detailed breakdown of district-level WASH facilities, please see Annexure).

In contrast to the progress reported by official monitoring systems, the ASER data from 2014 to 2023 indicates a decline in drinking water availability at rural primary schools. Drinking water availability in rural Government primary school dropped from 87.6 percent in 2014 to 85.0 percent in 2023. Similarly, private rural schools showed a more pronounced decline, with availability falling from 95.9 percent in 2014 to 83.0 percent in 2023. This discrepancy between ASER data and the school education department data underscores a significant gap in reporting and highlights the need for a unified, reliable monitoring framework, particularly for WASH indicators.

Trend of Access to Toilet in Schools for Last 10 Years

The PES data for 2014-15 indicated that overall 96.0 percent of Government schools (95.1 percent boys' schools and 96.8 percent girls' schools) in Punjab had toilet facilities, which increased to 99.4 percent (99.3 percent boys' schools and 99.5 percent girls' schools) by 2022-23. At the primary level, the data indicates an improvement in toilet availability from 94.8 percent in 2014-15 to 99.2 percent in 2023-24. Similarly, middle schools had an increase in toilet availability from 98.8 percent to 99.9 percent. For high schools, the availability was reported at 99.9 percent in 2022-23, while higher secondary schools achieved full availability at 100.0 percent in the same year.[26]

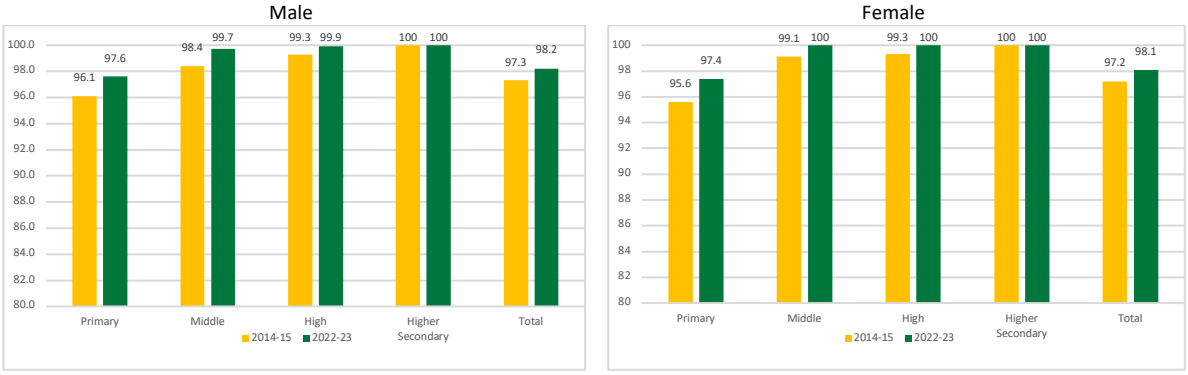
Figure 65: Gender wise availability of toilet in the overall schools of Punjab- (PES 2014-15 & 2022-23)



In urban areas, the access to toilet facility at Government schools has increased from 97.3 percent boys' schools to 98.2 percent by 2022-23. A similar trend has observed in girls' schools, where toilet availability rose from 97.2 percent in 2014-15 to 98.1 percent in 2022-23, reflecting a positive incremental change.

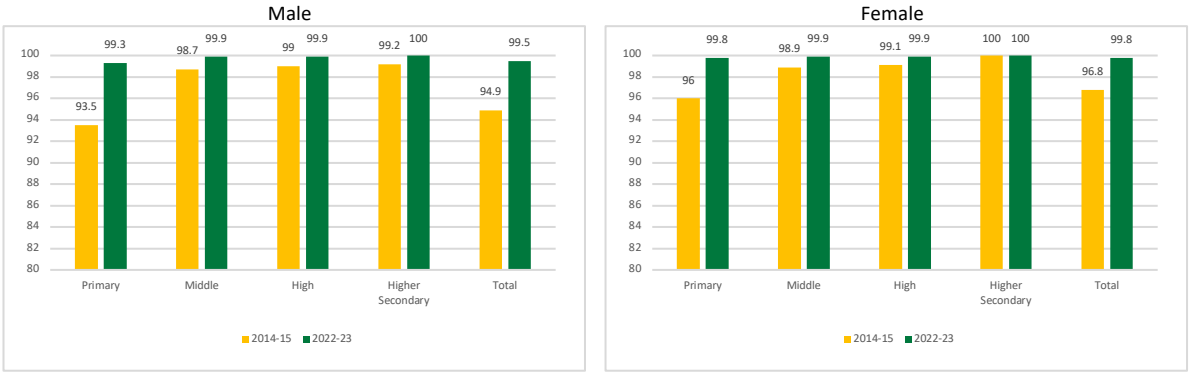
[25] https://open.punjab.gov.pk/schools/home/districts_performance
[26] Pakistan Education Statistics Reports, Pakistan Institute of Education (PIE)

Figure 66: Gender wise availability of latrine in the urban schools of Punjab- PES (2014-15 & 2022-23)



In rural areas of Punjab, the PES data indicates a similar improvement in the availability of toilets in government schools. For boys' government schools, toilet availability increased from 94.9 percent in 2014-15 to 99.5 percent in 2022-23. Similarly, girls' schools had an increase from 96.8 percent to 99.8 percent during the same period.

Figure 67: Gender wise availability of latrine in the rural schools of Punjab- PES (2014-15 & 2022-23)



According to the school monthly monitoring data for May 2024, the sufficiency of toilets in schools varies significantly across districts in Punjab. Only 19 districts have sufficient toilets in more than 90 percent of schools. For the sufficient toilets availability at schools, district Chakwal reports the highest percentage of schools (96.0 percent), whereas, district Lahore has least percentage of schools (79.3 percent) with sufficient toilet. (For a detailed breakdown of district-level WASH facilities, please see Annexure).

The ASER data from 2014 to 2023 reveals a stagnant percent of toilet availability in government primary schools, remaining around 92 percent over the years. Meanwhile, private primary schools showed slight improvement, with toilet availability increasing from 91.8 percent in 2014 to 93 percent in 2023.

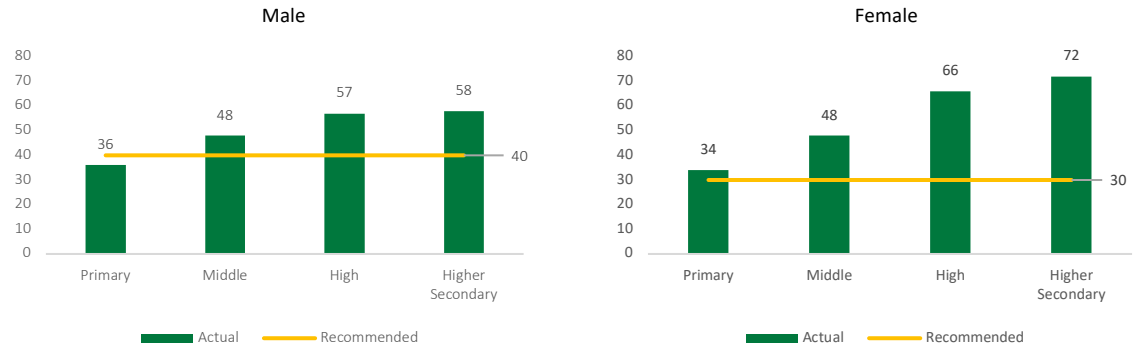
Furthermore, Inadequate sanitation facilities significantly impact girls' education and well-being in Pakistan, particularly during menstruation. The lack of proper sanitation infrastructure in schools and communities leads to increased absenteeism among girls, as they may feel uncomfortable or unsafe attending school during their menstrual periods. This situation is exacerbated by cultural taboos and a lack of open discussion about menstruation, resulting in insufficient knowledge and preparedness among girls. The absence of adequate sanitation facilities in schools poses a significant barrier to girls' education in Pakistan. Without proper latrines and hygiene facilities, girls are more likely to miss school during menstruation, leading to decreased attendance and, consequently, lower academic

performance. A study highlighted by Malala Fund emphasises that the lack of proper sanitation facilities at schools is a serious hurdle for girls on their path to getting an education (Amna Quddus, 2022). MHM remains a critical issue in Pakistan. As per MICS 2024, 53.2 percent of the women have trouble participating in work, education/training or social activities due to their last menstruation. A significant number of girls lack access to basic menstrual hygiene products and facilities, both at home and in schools. According to UNICEF, 44 percent of girls do not have access to basic menstrual hygiene facilities at home, their workplace, or school (Malik, et al., 2023).

Student Toilet Ratio (SToR)

While government schools in Punjab have made significant progress in ensuring toilet availability, the Student Toilet Ratio (SToR) remains alarmingly high, especially in girls' schools, exceeding the recommended ratio of 30:1. According to the ASC 2023-24, the SToR for girls' primary schools is 34:1, rising to 48:1 in middle schools, 66:1 in high schools, and 72:1 in higher secondary schools. Similarly, boys' middle, high, and higher secondary schools exceed the recommended ratio of 40:1. These figures highlight the urgent need for additional toilets in schools, particularly in secondary and higher secondary levels, to ensure gender-sensitive infrastructure and better hygiene standards for students. (For a district level SToR, please see Annexure).

Figure 68: Student Toilet Ratio in Government Schools-Annual School Census 2023-24



School Hygiene

Although limited data is available on school hygiene, the School Monitoring Programme of the Schools Education Department collects observations on overall school cleanliness, including toilet cleaning, drinking water points, and solid waste management. According to the school monthly monitoring data for May 2024, the highest levels of school hygiene were observed in Rajanpur (93.8 percent) and D.G. Khan (90.9 percent), indicating commendable cleanliness practices in these districts. Conversely, the districts with the lowest levels of hygiene were Bhakkar (67.1 percent), Gujrat (67.0 percent), Chiniot (67.9 percent), and Khushab (69.7 percent). These figures highlight the need for targeted interventions in low-performing districts to ensure consistent hygiene standards across all schools.

WASH in Schools Strategy

In 2016, the School Education Department of Government of Punjab identified the need for a specific WinS strategy in collaboration with UNICEF. The development of the WinS strategy went through participatory consultation with Sector Partners and other stakeholders.

Through the WASH Sector Development Plan 2014-24, the Government aims to cascade the promotion of WASH through the Directorate of Staff Development, District Training, and Support Centres, and Cluster Training and Support Centres. The Punjab's WinS Strategy not only guides the stakeholders for strategic interventions but coupled with Strategy Rollout Action Plan, provides WinS Standards and training modules for key stakeholders.

Strategy and Implementation

- UNICEF supported the government of Punjab in developing a WinS strategy, guided by the UNICEF Three Star Approach. This strategy provides stakeholders with a framework for strategic interventions but also outlines the Strategy Rollout Action Plan, WinS Standards, and training modules. It encompasses four major programme components: 1) Minimum Hygiene Package, 2) Training Package for Stakeholders, 3) Minimum Hardware Package, and 4) M&E Framework and Action Plan.[27]
- The Minimum Hygiene package included training for School Health and Nutrition Supervisors, Head Teachers, School Teachers, School Councils, and Lady Health Workers (LHWs) in hygiene promotion, leading to the establishment and operation of school WASH clubs. These clubs consist of three subgroups: Little Doctors, who manage the physical hygiene of students; School WASH Ambassadors, who disseminate WASH messages in schools and communities; and School WASH Engineers, who oversee the maintenance and cleanliness of facilities.
- The Education Sector Reforms Programme of the Government of Punjab has made notable improvements in WASH facilities within schools by investing in the construction and provision of essential amenities. However, there is still considerable room for enhancement in terms of access and quality, particularly concerning gender considerations, physical accessibility, and the willingness to utilise these facilities[28].
- On January 30, 2018, the Punjab School Education Department issued a notification titled "Implementation of Punjab WinS Strategy, Standards and Action Plan." This directive instructed all Chief Executive Officers (CEOs) at the district level to establish WASH clubs in schools and ensure the availability of soap for students to wash their hands at critical times. Additionally, the notification made head teachers responsible for any failure to implement its directives.
- In November 2018, the WinS strategy was aligned with the Clean & Green Pakistan Movement, leading the Minister for the School Education Department of the Government of Punjab to launch the Clean & Green School Programme in Jhang district. This initiative was subsequently incorporated into the Government of Punjab's "New Deal" document and expanded to all 36 districts of Punjab.
- On January 4, 2019, the Programme Monitoring and Implementation Unit (PMIU) of the Punjab Education Department revised its monitoring indicators through a notification. The new set of districts ranking indicators consists of 14 criteria, three of which are derived from the WinS framework: the sufficiency of toilets, availability of drinking water, and hygiene standards in schools. In another notification issued in January 2019, the PMIU updated the hygiene indicator to include the availability of soap. Additionally, on April 9, 2019, the PMIU incorporated a new set of indicators related to the existence and functionality of WASH clubs into its schools' monitoring application.

[27] School Education Department; Clean green and wash Pakistan(https://schools.punjab.gov.pk/cleanpakistan)
[28] UNICEF; Case Study: Improving WASH in School in Punjab – Pakistan (https://knowledge.unicef.org/resource/case-study-improving-wash-school-punjab-pakistan)\

- 440 teachers from the districts of Faisalabad, DG Khan, Rahim Yar Khan, Rajanpur, and Bahawalpur received training on WinS from the Literacy and Non-Formal Basic Education Department of the Government of Punjab.

Impact of Water, Sanitation, and Hygiene (WASH) Interventions on Absenteeism and Teacher-Pupil Contact Time: A Quasi-Experimental Study[29]

A study conducted in Zambia assessed the effectiveness of a WASH in Schools intervention on reducing pupil and teacher absenteeism while improving teacher-pupil contact time. The research also evaluated seasonal variations in absenteeism and the influence of WASH on enrolment and dropout rates. The primary aim was to determine whether targeted school-based WASH interventions could lead to significant educational improvements.

The study employed a quasi-experimental design involving 124 schools (64 intervention and 64 control schools) across two provinces in Zambia. Baseline data on absenteeism rates, teacher presence, and school enrolment were collected through structured observations and administrative records. Following this, a comprehensive WASH intervention was implemented, which included the provision of safe drinking water, improved sanitation facilities, hygiene education programs, and handwashing stations. Throughout the school year, follow-up data were gathered to assess changes in absenteeism, contact time, and enrolment trends.

The study indicates a significant reduction in absenteeism among both pupils and teachers in the intervention group. Pupil absenteeism rates in control schools were up to five times higher than in intervention schools, with the most notable improvements observed in the second and third school terms. Teacher absenteeism also declined, particularly in later school terms. Additionally, there was a marked increase in teacher-pupil contact time, reinforcing the educational benefits of WASH programs. These findings suggest that even school-based WASH interventions can significantly improve attendance and engagement, fostering better learning environments. The study emphasises the importance of integrating WASH programs into school policies to promote long-term educational and health benefits for students and educators alike.

Strategic Actions for Enhancing WASH in Schools in Punjab

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Identify and map schools lacking safe drinking water facilities, especially in rural areas, and initiate emergency water provision programmes.	Develop and implement a comprehensive water quality monitoring and treatment system for all schools, including private institutions, ensuring regular testing for contaminants like E. coli, arsenic, and nitrates.	Maintain sustainable access to clean drinking water in all schools through advanced technologies like real-time digital monitoring systems integrated with school databases, ensuring timely maintenance and addressing contamination issues proactively.
Ensure functional hand hygiene stations and water access in all critical service areas of primary and secondary HCFs.	Collaborate with local governments and private sector partners to provide water	Achieve universal coverage of safe drinking water through diversified water supply systems, including rainwater harvesting and solar-

[29] Available at https://www.washplus.org/sites/default/files/SPLASH%20Outcome%20Study%20Final%20508.pdf

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
	filtration systems in at least 60 percent of underserved schools.	powered water treatment units, to ensure climate resilience and reliability in supply.
Construct additional toilets in schools to meet Student Toilet Ratio (SToR) standards, with a focus on girls' secondary schools and higher secondary schools where the current ratios exceed acceptable norms (e.g., 34:1 for girls' primary schools).	Standardise toilet sufficiency across all schools through provincial-level infrastructure investments, incorporating climate-resilient designs such as elevated structures in flood-prone areas and durable, weather-resistant materials. Establish maintenance protocols to ensure functionality, cleanliness, and accessibility for all students, including those with disabilities, while integrating water-efficient technologies to address climate-induced challenges.	Achieve equitable access to gender-sensitive sanitation facilities in all schools by ensuring compliance with WASH standards, with regular audits and corrective actions as part of institutionalised processes.
Ensure that newly constructed toilets meet gender-specific and disability-inclusive design standards, including adequate handwashing stations.	Introduce automated reporting systems for toilet functionality to track performance and schedule timely repairs, ensuring at least 90 percent functional toilets in all schools.	Integrate toilet maintenance and improvement into the annual education sector planning and budgeting process, ensuring sustainable financing and operational efficiency.
Train school staff, teachers, and WASH club members on maintaining hygiene standards, focusing on districts with low hygiene levels like Bhakkar, Gujrat, and Chiniot.	Establish a centralised digital monitoring system to track hygiene indicators, including availability of soap, toilet cleaning schedules, and solid waste management in all schools, with district-level accountability mechanisms.	Achieve universal adherence to hygiene standards across all schools through automated monitoring systems and community-based oversight mechanisms, ensuring sustainability and consistent compliance with hygiene protocols.
Promote hygiene practices through school WASH clubs and community engagement activities, including handwashing campaigns and health awareness days.	Expand hygiene promotion activities to include regular health screenings, linking hygiene practices with student health outcomes, and ensuring that all schools meet provincial hygiene benchmarks. Pilot cost-effective handwashing stations (e.g., tippy taps) in rural schools.	Introduce advanced hygiene practices, such as automated soap dispensers and touch-free facilities in urban schools and provide rural schools with cost-effective and sustainable hygiene solutions that align with international best practices. Institutionalise hygiene education in the school curriculum, focusing on climate resilience and sustainability.
Introduce MHM facilities in at least 50 percent of girls' schools, including the provision of sanitary products, disposal mechanisms, and private changing spaces.	Scale up MHM programs to all girls' and co-educational schools, ensuring comprehensive MHM education in curriculums and regular availability of menstrual products and disposal solutions, supported by health workers and NGOs.	Institutionalise gender-sensitive WASH practices across the education sector by embedding them in the national curriculum, teacher training programmes, and school health policies, ensuring sustainability and wide-scale impact.

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct teacher training on climate resilient and gender-sensitive hygiene practices, including MHM education, and raise awareness among students and parents about the importance of these facilities.	Develop partnerships with private sector organisations and NGOs to provide low-cost menstrual products and to pilot innovative disposal technologies in underserved areas.	Ensure gender-sensitive WASH compliance through robust monitoring systems and targeted investments in infrastructure, with annual progress reporting and corrective action plans.
Mobilise School Management Committees (SMCs) to prioritise WASH goals in school development plans and allocate budgets for maintaining water, sanitation, and hygiene facilities.	Pilot SMC-led maintenance models in selected districts to develop scalable best practices for WASH governance, with a focus on engaging parents, local leaders, and community organisations in oversight and funding efforts.	Institutionalise community engagement in WASH governance across all schools, with SMCs actively monitoring and maintaining WASH facilities, supported by provincial and district-level oversight mechanisms and annual reporting frameworks.
Organise WASH awareness campaigns to educate community and parents to highlight the importance of safe water, sanitation, and hygiene for children's health and education, fostering ownership and accountability among stakeholders.	Expand partnerships with local governments, NGOs, and corporate CSR programmes to co-fund WASH infrastructure improvements in low-performing districts, ensuring sustainable community involvement and support for long-term success.	Build a province-wide community engagement framework for WASH in schools, aligned with provincial education and health strategies, ensuring consistent resource mobilisation and implementation of best practices learned from pilot projects.

GENDER INCLUSIVITY IN WASH

Marginalised communities, whether women and girls, people living with disabilities, older people or those from different cultures and religions often face difficulties while accessing WASH facilities. Limitations to WASH access can also be attitudinal and institutional (Byatnal, 2020). Barriers to accessing WASH are wide-ranging and variable. For example, an inaccessible path to a toilet could mean a person with a disability is unable to reach it, or shared toilets without latches or doors could put women at heightened risk of sexual assault. Other barriers may include physical inaccessibility of WASH facilities or the path towards them, infrastructure limitations, risk of violence or stigma, and unavailability of support and lack of involvement in policy and practice (Mactaggart, et al., 2021), (Byatnal, 2020). When using public, community or institutional toilets, which are often sex-segregated, transgender people face not only exclusion but also verbal harassment and physical abuse (Nath, Hueso, & VR, 2018). Caregivers have also reported challenges in coping with the hygiene and menstruation of their adolescent girls with disabilities in humanitarian contexts, including limited privacy and the subsequent concerns for their well-being and dignity, especially during disasters and emergency situations. Children with disabilities are less likely to benefit from WASH in Schools programmes. Additionally, inaccessible WASH facilities in schools create additional barriers for children with disabilities to attend school (UNICEF). Sanitation is a gender issue, women and girls face a number of hidden difficulties in accessing sanitation in Pakistan (Cooper, 2018). The data availability regarding the barriers faced by transgender and persons with disability for accessing WASH services is extremely limited in Pakistan. The current water and sanitation policies of the country do not cater inclusive interventions regarding WASH.

As per MICS 2024, water collection is primarily the responsibility of men with 61.5 percent men collecting water as compared to 38.5 percent women. 19.3 percent children till the age of 19 (3.1 percent female and 16.2 percent male) are involved in water collection which causes them to miss or drop out of school and be vulnerable to attack as they walk long distances.
Furthermore, although poor access to appropriate WASH services is not the root cause of violence, it can increase individuals' vulnerability to violence[30]. In Pakistan, the WASH sector has yet to adequately address the issue of gender-based violence (GBV) related to access to water and sanitation in both development and humanitarian settings. Several factors contribute to this gap. A significant challenge is the lack of valid and reliable documentation that captures the experiences of girls, boys, women, and men who face violence while accessing WASH facilities. Existing data is often fragmented, making it difficult to grasp the scale and nature of the issue. Furthermore, cultural sensitivity and societal stigma surrounding GBV, defecation, and menstruation hinder open discussions and the collection of accurate data. These topics remain taboo in many communities, which perpetuates secrecy and prevents victims from speaking out about their experiences.
Bottom of Form

The lack of focus of engineered solutions in WASH has limited the attention to gender. Bridging the gap between the practical gender needs with strategic gender interests is an essential aspect of achieving gender equality in the WASH sector (MacArthur, Carrard, & Willetts, 2020). Regardless of the barriers, the exclusion stands in the way of progress toward achieving SDG 6 — access to water and sanitation for all — as well as impacting a person's dignity, well-being, and access to opportunities. Reaching

[30] WaterAid; Violence gender and WASH toolkit (https://washmatters.wateraid.org/publications/violence-gender-and-wash-toolkit)

everyone with decent toilets means reaching everyone, whatever their age, gender or specific needs (Byatnal, 2020). Recognising the access to water and sanitation as a human right, the global SDGs have made it a priority to ensure everyone has access to adequate and equitable WASH by 2030. The SDGs specify that the communities who are hardest to reach must be reached first (Nath, Hueso, & VR, 2018). Provision of safe, inclusive and accessible WASH ensures everybody benefits from improved health outcomes, enhances the protection of people with disability, reduces the workload of families in caregiving tasks, and reduces the rate of acquiring and spreading of disease (UNICEF).

Strategic Actions for Enhancing Gender Inclusivity in WASH

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct research on gender-based violence (GBV) and other forms of discrimination in accessing WASH facilities, particularly among vulnerable groups.	Develop and implement a social behaviour change communication (SBCC) campaign promoting inclusive WASH services for women, transgender individuals, and persons with disabilities, informed by key research findings.	Institutionalise gender-inclusive WASH practices by establishing a dedicated unit to oversee policy implementation.
Strengthen community-led WASH committees with diverse representation from women, persons with disabilities, transgender and other vulnerable groups, to support planning, monitoring, and feedback mechanisms.	Integrate gender-disaggregated data into the provincial WASH dashboard to identify and address access barriers, particularly for persons with disabilities.	Develop and implement targeted programmes to support marginalised groups and vulnerable communities in accessing inclusive WASH services.
Upgrade existing WASH facilities with basic accessibility features, such as ramps, handrails, latches, and proper lighting.	Install accessible WASH facilities in schools and public spaces, ensuring privacy for women, girls, and children with disabilities.	Promote climate-resilient, gender-inclusive WASH infrastructure across all public and institutional facilities to ensure long-term sustainability.
Develop comprehensive gender analysis guidelines for the WASH sector, ensuring their integration into planning, implementation, and monitoring frameworks.	Conduct periodic reviews of the guidelines' implementation to assess the effectiveness of gender inclusion in the WASH sector and update them to address any bottlenecks identified during the review.	Institutionalise gender inclusion within WASH policies and practices, drawing on lessons learned from the implementation and review of gender-inclusive guidelines

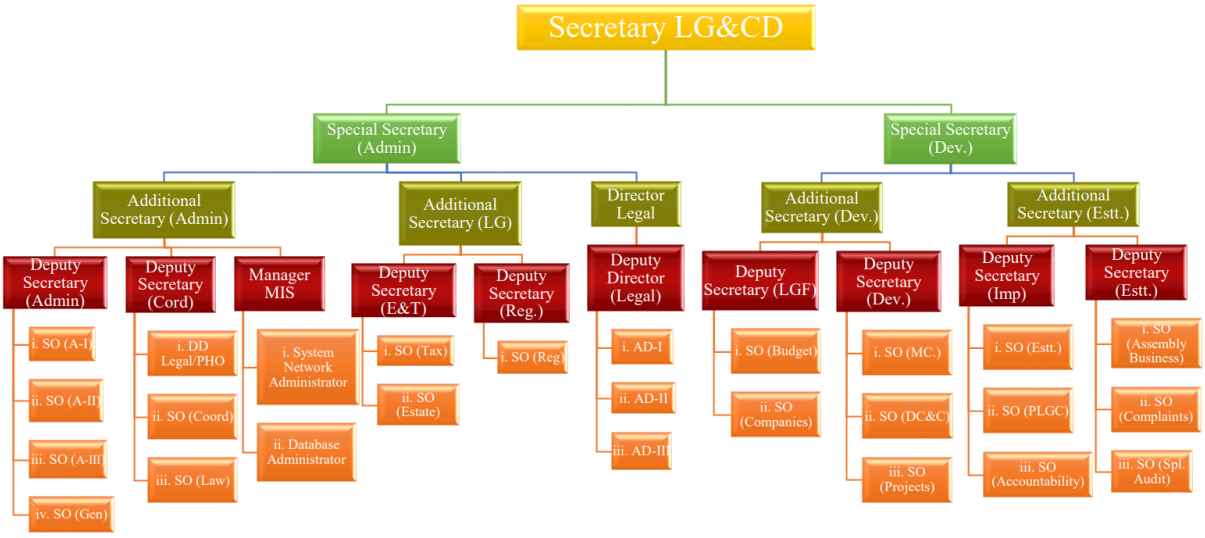
SECTOR CAPACITY

WASH sector in Punjab is mainly served by two public departments i.e. LG&CD and HUD&PHED, along with their attached departments and affiliated companies. Whereas, Punjab Environment Protection and Climate Change Department has a role of monitoring and surveillance of WASH services in accordance with the Punjab Environment Quality Standards. This chapter on sector capacity will therefore review the functioning, human resources, and capacity enhancement initiatives within these key departments and their associated bodies.

LOCAL GOVERNMENT & COMMUNITY DEVELOPMENT DEPARTMENT

The LG&CD implements the Punjab Local Government Act (PLGA) 2022[31]. Additionally, the LG&CD has a supervisory role to ensure that local governments operate within the provincial framework and comply with both federal and provincial laws. The LG&CD comprises two attached departments: The Directorate General of Local Government and Community Development, and the Provincial Local Government Commission. Furthermore, the Punjab Local Government Board operates as an autonomous body affiliated with the LG&CD. The department also oversees several attached companies, including the PMFDC, Solid Waste Management Companies, PRMSC and Cattle Market Management Companies. Two authorities namely The Walled City of Lahore Authority and Punjab Shehr-e-Khamoshan Authority are also attached to the LG&CD department.

Figure 69: Organogram of LG&CD



Source: LG&CD website: https://lgcd.punjab.gov.pk/organogram

As per the LG&CD budget for FY 2023-24, there are currently a total of 330 employees working in both the provincial and South Punjab secretariats (282 at provincial secretariat and 48 at South Punjab secretariat). Among these, 137 are gazetted officers in BPS-16 and above whereas, 185 staff are in BPS-15 or lower. Additionally, the department has employed eight experts on the Management Pay Scale (MPS), specialising in areas such as solid waste management, stock market analysis, corporate governance, municipal finance, and research.

[31] LGCDD; Overview (https://lgcd.punjab.gov.pk/overview)

During the last decade, the LG&CD has implemented several initiatives through PPP model or donor driven initiatives aimed at enhancing the department's capacity in service delivery. Some of these initiatives are outlined below:

The LG&CD has established nine Solid Waste Management Companies in the divisional headquarters of Punjab, namely Dera Ghazi Khan, Faisalabad, Gujranwala, Gujrat, Lahore, Sialkot, Rawalpindi, Multan, and Bahawalpur. Over time, these companies have improved waste collection efficiency by implementing waste collection facilities, mechanical sweeping, mechanical washing, and manual sweeping. Building on the success of this model, the scope of these waste collection companies is now being expanded across the entire province through Services and Assets Management Agreements (SAAMAs) with respective local governments, as per the Meeting Minutes of the Standing Committee of Cabinet on Finance and Development dated May 21, 2024.

The PMDFC, established in 1998, is a corporate body working to improve municipal services across Punjab. PMDFC functions as the technical arm of the LG&RD, governed by a General Body and Board of Directors with representatives from key government sectors. PMDFC's motto, "Help Build Healthy Cities," reflects its commitment to enhancing urban infrastructure, capacity building, and sustainable municipal services. Since, its inception the key completed projects of PMDFC are as in below.

1. Implementation of Punjab Municipal Services Improvement Project (PMSIP) 105 (all non-city district TMAs in Punjab)
2. Facilitation of occupational safety and health education for the frontline staff & sanitary workers of the MCs (Muridke & Gojra) as a part of COVID-19 response
3. Revitalisation of wastewater pond at District Sheikhupura and Rajanpur.
4. Municipal Assets Management through development of 190 base maps along with a Web Application
5. Elimination of Ponds, Phase I and II
6. Establishing Dengue Monitoring Cell
7. Installation of 307 water filtration plants under Clean Drinking Water for All
8. Renovation of Local Government Lala Musa Academy
9. Establishing Local Government Dashboard

Under the auspices of LG&CD, PMDFC has launched another major initiative in 2018, the Punjab Cities Programme (PCP), funded by the World Bank. This project is being implemented across 16 partner Municipal Committees (MCs): Okara, Jaranwala, Gojra, Jhang, Kamalia, Muridke, Hafizabad, Kamoki, Daska, Wazirabad, Jhelum, Vehari, Burewala, Khanewal, Bahawalnagar, and Kot Addu. The PCP focuses on key services such as water supply, sewerage, storm drainage, solid waste management, wastewater treatment plants, roads, parks, and street lighting in these MCs. The total project cost is USD 236 million, with USD 200 million funded by the World Bank and USD 36 million by the Government of Punjab. Of the World Bank's financing, USD 180 million is allocated for infrastructure development, while USD 20 million is designated for institutional strengthening of the selected MCs. By the end of FY 2022-23, a total of USD 156.32 million had been released, based on the achievement of Disbursement Linked Results by the respective MCs.[32]

[32] PMDFC Annual Report 2022-23 available at https://pmdfc.punjab.gov.pk/system/files/Annual percentage20Report_PMDFC_2022-23.pdf

The Government of Punjab has been implementing the five-year Punjab Intermediate Cities Improvement Investment Programme (PICIIP) with financial support from the ADB, amounting to USD 250 million, including a USD 200 million ADB loan and USD 50 million from the Government of Punjab. Initiated in 2018, the project aims to enhance living standards, health, and economic development in Sahiwal and Sialkot, aligned with the Punjab Growth Strategy 2018[33]. Its primary areas of focus include water supply and sanitation improvements, urban space enhancements, and institutional support for local governments. After successful Phase I implementation in Sahiwal and Sialkot, Phase II has expanded the programme to Multan, Sargodha, Muzaffargarh, Rahimyar Khan, Bahawalpur, Rawalpindi, and Faisalabad. Lahore and Lala Musa have also been added to strengthen the Local Government Academy in Lala Musa and establish a proposed Local Government Academy in Lahore as a Centre of Excellence. The second phase, called the Developing Resilient Environments and Advancing Municipal Services (DREAMS) project, prioritises transport, urban planning, and WASH (Water, Sanitation, and Hygiene) investments. DREAM-I has launched in Rawalpindi and Bahawalpur, focusing on a climate-resilient water supply system and integrated solid waste management, respectively. DREAM-II will add integrated sewerage systems to Bahawalpur, Rahim Yar Khan, Muzaffargarh, and Dera Ghazi Khan, along with a water supply system and wastewater treatment for Sargodha. DREAM-III will introduce wastewater treatment plants in Multan and Faisalabad.

The Local Government and Community Development Department (LG&CD), with financial support from the World Bank, is implementing the PRSWSSP across 2,000 villages in 16 districts, including Khushab, Mianwali, Sargodha, Chakwal, Bhakkar, Pakpattan, Chiniot, Jhang, Rajanpur, Rahim Yar Khan, Dera Ghazi Khan, Lodhran, Bahawalpur, Muzaffargarh, Bahawalnagar, and Multan, from 2021 to 2028. The PRMSC provides project management support under LG&CD's guidance. PRSWSSP comprises four main components: Water Supply and Sanitation Infrastructure Development ($467.1 million), Behaviour Change and Capacity Development ($15.4 million), Service Delivery Improvement ($50 million), and Project Management and Monitoring ($14.4 million).[34] The project aims to deliver integrated benefits by providing safe drinking water, improving health, education, poverty reduction, gender development, environmental improvement, and human resource development. Water supply features include skimming wells, disinfection, treatment facilities, comprehensive piping networks, overhead reservoirs, and metered connections for efficient distribution. Sanitation infrastructure incorporates a resilient piping network, septic tanks, anaerobic baffled reactors, bio-trickling filters, and sludge drying beds for effective wastewater management and environmental health. Additionally, the project includes solid waste management initiatives with village-level composting arrangements and solid waste collection points, fostering cleaner and more sustainable communities.[35]

The PLGA, Lala Musa serves as the training wing of the LG&CD. Since its establishment in 1953, PLGA has conducted over 5,300 training courses, building the capacity of more than 133,000 local government officials and elected representatives on the following listed topics[36];

- Post Induction Training Courses for Officials of LG&CDD Punjab (BS-14 to BS-19)
- Mandatory Promotion Training Courses for Officials of LG&CDD Punjab (BS-01 to BS-19)

[33] Punjab Intermediate Cities Improvement Programme Annual Report 2023 available at: https://piciip.gop.pk/images/downloads/Consolidated percentage20Annual percentage20Progress percentage20Report percentage20(APR) percentage202023.pdf
[34] Punjab Rural Sustainable Water Supply and Sanitation Project (https://lgcd.punjab.gov.pk/punjab-rural-sustainable-water-supply-and-sanitation-project)
[35] Punjab Rural Sustainable Water Supply & Sanitation Project - PRSWSSP | On-Going Project (https://prmsc.punjab.gov.pk/ongoing_projects)
[36] https://plga.punjab.gov.pk/system/files/Draft percentage20PLGA percentage20Brochure_0.pdf

- Special Training Courses for Officials of LG&CD Department Punjab, LG&RD Department Azad Jammu & Kashmir, Govt. of Gilgit Baltistan & Capital Development Authority Islamabad
- Special Training Courses for Officials of NGOs, Donors and Private Sector Organisations
- Refresher Training Courses for Officials of LG&CDD
- Awareness Raising Seminars & Workshops for Stakeholders
- Exposure Visits to Students of Universities and Officials of other Departments and Development Agencies

Despite having a broad training scope, PLGA rarely organises specialised WASH-related technical training except any ad-hoc or need-based courses for selected cities and districts. PLGA has also supported the capacity building of cities administrations in all 36 districts' headquarters on the Clean Green Pakistan Programme during 2019 to 2021. Recently, a state-of-the-art campus of the Punjab Local Government Academy was established in Johar Town, Lahore, under the Punjab Intermediate Cities Improvement Investment Programme (PICIIP), at a total cost of PKR 137 million.

Additionally, some other recent WASH-related initiatives by the LG&CD Department are as follow:

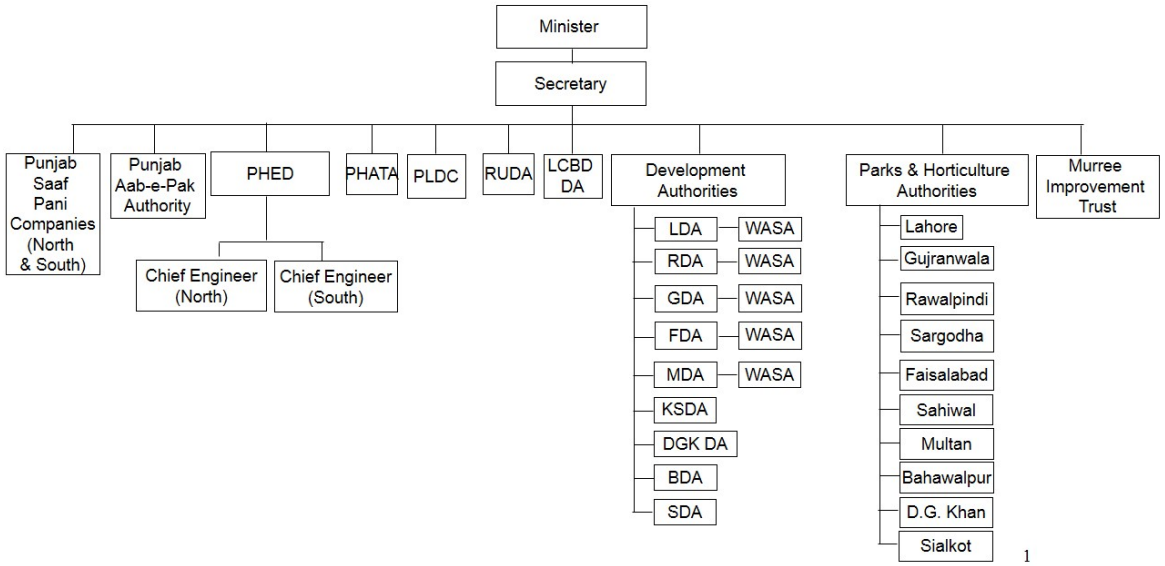
1. IT-Based Monitoring System: Aims to digitise LG&CD Department processes with a PKR 371.193 million budget, enhancing governance through a centralised dashboard for sanitation, HR, e-billing, and complaint management.
2. Master Land Use Plans for Tehsil: Develops sustainable land use plans to regulate urban growth, improve infrastructure, and enhance the quality of life across Punjab's cities.
3. Volunteers of Local Government (VLG): Mobilises youth volunteers to support local governance through community service activities, focusing on cleanliness, greenery, and cultural events to foster vibrant and well-maintained communities.

HOUSING, URBAN DEVELOPMENT AND PUBLIC HEALTH ENGINEERING DEPARTMENT (HUD&PHED)

The Housing, Urban Development & Public Health Engineering Department (HUD & PHED) of Punjab, has mandate to enhance urban infrastructure and public health services across the province through its various functional organs. It oversees numerous Development Authorities, including those in Lahore, Rawalpindi, Gujranwala, Faisalabad, Multan, Bahawalpur, Sargodha, Dera Ghazi Khan, and Koh-e-Suleman, ensuring planned urban growth and infrastructure development. Additionally, specialised authorities like the Punjab Central Business District Authority and Ravi Urban Development Authority contribute to advanced urban development initiatives. Punjab Housing and Town Planning Agency (PHATA), focusing on revitalising the housing sector, particularly for low-income and shelter-less populations, to provide affordable housing solutions. Through the Public Health Engineering wing, the department ensures access to safe drinking water and sanitation, especially in areas affected by brackish or contaminated water, to uplift public health standards.

In addition, HUD & PHED manages parks and green spaces through Parks & Horticulture Authorities, enhancing environmental quality and community well-being. WASAs play a vital role in providing efficient water supply and wastewater management in urban areas, supporting hygiene and environmental sustainability. Punjab Saaf Pani Authority is also working in support of HUD&PHED for safe drinking water supply in selected rural areas of Punjab.

Figure 70: Organogram of HUD & PHED



Source: https://hudphed.punjab.gov.pk/organogram

The HUD&PHED is headed by the Secretary. Whereas PHED wing of the department is further divided into Chief Engineer (North) and Chief Engineer (South).[37] As per the budget for FY 2023-24, the PHED employs a total of 6,814 staff members. This includes 1,738 personnel at the Chief Engineer North office, 1,747 at the Chief Engineer South office, 383 at Superintendent Engineers offices, and 2,946 at Executive Engineers offices. Of the total workforce, 664 are officers in BPS-16 and above, while 6,150 employees are in BPS-15 and below.

HUD&PHED with the support of UNICEF, developed the WASH Capacity Needs Assessment and Human Resource Development Plan and Strategic Roadmap in 2016 as one of the required actions of the WASH sector plan. The roadmap is a crucial step regarding capacity building of the WASH sector as it was designed to act as a catalyst for achieving the strategic objectives of the targets enunciated in Punjab WASH Sector Plan 2014-24. Besides devising the Human Resource Development plan, the Government of Punjab has also conducted two separate studies for the rationalisation of technical staff and structural reform at PHED and WASA in 2018. Both studies recommended the need for a new Water Act for harmonisation and rationalisation of staff especially around social mobilisation and effective monitoring and reporting. The recommendations of these studies are linked with the operationalisation of the Water Act 2019.

WASA is a governmental organisation responsible for the planning, design, development, maintenance, repair, and operation of water supply, sewerage, and drainage systems. It also oversees the collection of aquifer water charges. A key aspect of WASA's mandate is to provide a safe, reliable, and efficient water supply that meets the needs of both government and public sectors. In Punjab, five WASAs operate within the province: WASA Lahore, WASA Rawalpindi, WASA Faisalabad, WASA Multan, and WASA Gujranwala. According to the WASAs Key performance Indicators for the period from 01.07.2023 to 30.06.2024, the staffing of water supply and sewerage and drainage of WASAs is as follow:

[37] https://hudphed.punjab.gov.pk/overview

Table 9: WASA staffing of Water Supply and Sewerage & Drainage

Staffing on Water Supply	Lahore WASA	Faisalabad WASA	Gujranwala WASA	Multan WASA	Rawalpindi WASA
Regular and Contract Staff on Water Supply	2588	428	155	193	761
Work Charged Staff on Water Supply	800	30	88	22	280
Total Staff on Water Supply	3388	458	243	215	1041
Staffing on Sewerage & Drainage					
Regular and Contract Staff on Sewerage & Drainage	2109	491	454	712	103
Work Charged Staff on Sewerage & Drainage	1009	254	80	178	57
Total Staff on Sewerage & Drainage	3118	745	534	890	160

Source: Key Performance Indicators, WASA, 2024

1. L-WASA was established in 1976 by the LDA with the mission of planning, designing, developing, and maintaining an efficient water supply, sewerage, and drainage system for Lahore. At the helm of WASA is the Managing Director, supported by 03 Deputy Managing Directors: one for Finance, Administration, and Revenue; another for Operations and Maintenance; and the third for Engineering and 21 Directors.[38]
2. F-WASA was established on April 23, 1978, under the Development of Cities Act, 1976, to provide essential services related to water supply, sewerage, and drainage. Currently, WASA Faisalabad serves an area of 225 square kilometres, which includes 113 urban union councils across four towns, with a total of 260,000 registered consumers. It is estimated that WASA provides sewerage services to approximately 72 percent of the city and water services to about 60 percent.[39] WASA Faisalabad comprises eleven directorates that oversee the various functions of the agency. These directorates include Planning and Design, Construction, Water Resources, Revenue and Recovery, Administration, Operations and Maintenance, Finance, and Drainage and Wastewater Management. To effectively carry out its diverse responsibilities, approximately 2,200 personnel are employed across these eleven directorates.
3. G-WASA (Gujranwala WASA) was established in 1997 to assume primary responsibility for the planning, design, and construction of new water supply, sewerage, and drainage facilities, as well as the rehabilitation and enhancement of existing systems. It is also tasked with the operation and maintenance of the entire infrastructure in Gujranwala City. Currently, WASA Gujranwala provides water and sewerage services to 73 urban union councils covering an area of 93 square kilometres. The water supply system has a coverage rate of 37 percent, while the sewerage and drainage system cover 70 percent.[40] WASA Gujranwala is structured with a team that includes Director General, one Managing Director, two Directors, two Deputy Directors, one Junior Research Officer, nine Assistant Directors, and eight Sub Engineers.
4. M-WASA (Multan WASA) was established in 1992. It is a dedicated authority to providing water supply and sewerage services to the residents of Multan. Currently, WASA serves approximately 60 percent of the population by producing and supplying at least 31.5 million gallons of drinking water daily. Additionally, residents independently produce around 12 million gallons of water per day. Consequently, WASA is responsible for collecting, lifting, and disposing of 43.5 million

[38] https://lda.gop.pk/website/page.php?p=TmpVeA==
[39] https://wasafaisalabad.gop.pk/Home/WASAProfile
[40] https://www.wasag.org.pk/content/wasag/about

gallons of sewage daily through its sewer network and disposal stations. This volume peaks during the summer months at 48 million gallons per day and drops to a minimum of 39 million gallons per day in winter.[41]

5. R-WASA (Rawalpindi WASA) was established in 1998 as a result of the devolution plan under the Local Government Ordinance 2001. WASA operates under a hierarchical structure to ensure efficient management and service delivery. At the helm is the Managing Director, supported by Deputy Managing Directors for Operations, Engineering, and Finance & Administration. The agency is divided into seven departments: Operations & Maintenance, Engineering, Finance, Administration, Customer Services, Planning & Development, and Human Resource. These departments are further subdivided into six sub-departments, including Water Distribution, Sewerage, Water Treatment, Laboratory, Billing, and Revenue Collection. Key officials include the Managing Director, Chief Engineer, Director Finance, Director Administration, and Director Operations, who oversee the agency's operations and strategic direction.[42]

The Punjab Saaf Pani Authority, reconstituted under the Punjab Saaf Pani Authority Act 2024 following the repeal of the Punjab Aab-e-Pak Authority Act 2019, is responsible for provide safe drinking water across Punjab in collaboration with local governments and other relevant entities. Its primary mission is to ensure access to clean drinking water for approximately 70 million people residing in rural, semi-urban, and peri-urban areas across 36 districts of the province. According to the FY 2023-24 budget, the Punjab Saaf Pani Authority employs a total workforce of 115, including 85 officers in BPS-16 and above or special scales, and 30 employees in BPS-15 and below. Since its establishment in 2019, the Punjab Saaf Pani Authority has installed a total of 1,713 water filtration plants across Punjab, including 714 funded through its own resources and 999 implemented with support from other organisations.

Table 10: Division Wise Installed Water Filtration Plants by Punjab Saaf Pani Authority

Sr.	Division	Saaf Pani Authority	Others	Total
1	Multan	81	14	95
2	Lahore	200	160	360
3	Rawalpindi	89	45	134
4	Sargodha	4	55	59
5	Faisalabad	119	282	401
6	Gujranwala	8	139	147
7	D.G KHAN	168	168	336
8	Bahawalpur	9	107	116
9	Sahiwal	36	29	65
Subtotal		714	999	1713

Source: Saaf Pani Authority Website available at https://saafpani.com.pk

The Al-Jazari Water and Sanitation Academy (AJWA) was established by the Government of Punjab, under the strategic initiative "Capacity Building of WASAs in Punjab province", with the Japanese International Cooperation Agency (JICA) in Lahore during 2016-17. The Urban Unit of P&D Board provides necessary technical and management support to the Academy in designing and implementing the courses. The Academy implemented the first phase of "Improving the Capacity of WASAs in Punjab

[41] Available at; https://multan.punjab.gov.pk/Intro_wasa
[42] WASA Rawalpindi (https://wasarwp.gop.pk/)

Province" in 2016-2018. The project laid emphasis on conducting the training needs assessment and design different strategic courses as in below table.

Table 11: Key Modules of Al-Jazari Water and Sanitation Academy

Course	Module
O&M of Tube Well and Pump Facility	O&M of Water Distribution System
Leakage Detection	1. Basic Knowledge of Leakage Prevention Work 2. Leakage detection and repair at the site (OJT) 3. Installation and operation of the equipment at the site (OJT)
O&M of Sewer and Storm Water Drainage	1. Safety control and measure for sewerage and drainage 2. Operation and maintenance of sewerage system 3. Operation and maintenance of drainage system
O&M of Electrical and Mechanical Equipment's	1. Centrifugal Pumps, Induction Motors and Valves 2. Electrical Panels and instrumentation Equipment's 3. Generators 4. Chlorination and Filtration System 5. Heavy Machines 6. Supervisory Control and Data Acquisition (SCADA) 7. Water Metre Maintenance and Repair
Assets Management	1. Introduction to Assets Management 2. Creating & Updating Asset Database in Assets MIS 3. Assets Database Analysis 4. Assets Replacement Plan 5. Assets Condition Survey & Analysis 6. Use of GIS application in Assets Management
Business Planning	1. Business Plan & Operation of WASAs 2. Strategies for Water and Sanitation service delivery improvement 3. Human Capital Development 4. Financial Management System 5. Implementation of Business Plan

Source: PHED website: https://hudphed.punjab.gov.pk/ajwa

On the successful completion of Phase 1 of "The Project for Improving the Capacity of WASAs in Punjab Province" (July 2015 - July 2018), the Government of Pakistan initiated Phase 2 of the project to enhance water supply and sewerage services by resolving operational, maintenance, and financial issues in WASAs through stronger collaboration between WASA and AJWA. Phase 2 focuses on improving the quality of training by involving WASA staff as guest lecturers and conducting training-of-trainers (ToT) programmes. It also aims to establish in-house training systems within each WASA to ensure the dissemination of practical skills to field staff. Furthermore, it seeks to create a sustainable training system that supports the continuous professional development of staff across five WASAs (Lahore, Faisalabad, Multan, Rawalpindi, and Gujranwala).

During the project phase from 2018 to 2023, significant progress was made. Thirty-six participants from WASAs underwent international training in Japan on operations and maintenance (O&M) in the water

and sewerage sector through three separate batches. Additionally, 162 WASA staff received professional training, while 548 technical staff members benefited from in-house training programmes.[43]

Table 12: List of In-House Trainings Conducted Under the Project for Improving the Capacity of WASAs in Punjab

No	Training module	Date	No. of participants
O&M of Sewerage and Drainage			
1	CleaningofSewerageandDrainagePipelines: Cleaning	01-02 Jun 2022	22
		13-14 Jun 2022	34
		25 Nov 2022	13
		18 Feb 2023	6
		27 Mar 2023	18
2	Cleaning of Sewerage and Drainage Pipelines: Crown failure	24 Feb 2023	7
		23 Dec 2023	24
3	Flow Measurement of Open Channels	27-28 Jun 2022	24
		18 Nov 2022	11
4	Wastewater Treatment Technologies	4 Jul 2022	17
		16 Nov 2022	10
		17 May 2023	10
O&M of Mechanical & Electrical Equipment			
5	Selection of Suitable Pump	2 Jul 2022	18
		27 Apr 2023	13
		5 Aug 2023	15
6	Designing of Star-Delta Control Panel	12 Nov 2022	16
7	Slip Ring Motors and starters	1 Nov 2023	11
8	PracticalTrainingonEnergyAuditandPump Efficiency	19 Dec 2022	11
		8 Aug 2023	15
9	Energy Audit	8 Mar 2023	15
10	Tube wells performance monitoring and rehabilitation	4 Dec 2023	31
11	Relationship of Head, Motor capacity, and Delivery size with Pump flow	28 Dec 2023	12
Leakage Control, Plumbing and Pipe Replacement Plan			
12	Plumbing (Distribution Pipe), Jointing / Welding and Pressure Test	26-27 Jul 2022	20
		7 Mar 2023	14
13	Proper Handling of Leakages from Valves & Connections	29 Oct 2022	10
		10 Jan 2023	8
		11 Jan 2023	6
		7 Mar 2023	14
14	Water meters selection and installation	6 Aug 2022	10
15	Pressure Testing of Water Distribution Model	13 Jul 2023	15
16	Working of a water supply network (water Supply Model)	3 Oct 2023	13
17	Leakage Control, Plumbing and Pipe Replacement Plan	11-12 Jan 2023	9
18	Construction Management for Pipe Installation	14 Jul 2023	13
19		24-26 Jan 2023	55

[43] Project Completion Report- The Project for Improving the Capacity of WASAs in Punjab Province Phase 2 available at https://openjicareport.jica.go.jp/pdf/12349114_01.pdf

	Utilisation of mWATER app and Web Portal for field data collection	23 Oct 2023	8
Total			548

Source: Project Completion Report- The Project for Improving the Capacity of WASAs in Punjab Province Phase 2

ENVIRONMENT PROTECTION AND CLIMATE CHANGE DEPARTMENT

The Environment Protection and Climate Change Department (EPCCD), established in December 1996, addresses environmental challenges in Punjab, with the Punjab EPA operating as its key attached agency under the Environment Protection Act 1997. Over the years, the department has expanded its scope and initiatives significantly, particularly through the Punjab Green Development Programme (PGDP), launched in collaboration with the World Bank in response to worsening smog conditions in the province.

The Punjab Green Development Programme (PGDP) is a World Bank-funded initiative valued at $273 million, with the World Bank contributing $200 million and the Government of Punjab providing $73 million. The primary objectives of the PGDP are to strengthen environmental governance and promote green investments. The implementing agencies for this programme include the Environment Department, Industries Department, Energy Department, Transport Department, Finance Department, and P&D Department.[44] Initially the programme was scheduled for five years from 2018 to 2023, the programme was extended to 2025 due to delays caused by COVID-19. To support PGDP, three additional agencies were established under EPCCD: the Environmental Monitoring Centre, Environmental Policy Centre, and Environmental Technology Centre. Key initiatives under the programme include:

- Installation of 30 air quality-monitoring stations and 15 water quality-monitoring stations at natural water bodies, monitoring multiple environmental parameters.
- Development of critical environmental policies, such as the Punjab Smog Policy (2017), Punjab Clean Air Policy (2023), and Punjab Plastic Management Strategy, alongside regulations on single-use plastics, environmental information, and citizen engagement.
- Construction of a certified green building in Lahore, which will house all attached departments.
- Establishment of the Punjab Environmental and Climate Change Endowment Fund with a $50 million seed capital for piloting new technologies, research, and environmental projects.
- Provision of green loans to over 595 micro-enterprises and 85 SMEs through the Industries Department, promoting resource-efficient and cleaner production technologies.
- Support for solarisation of 30 District Headquarters Hospitals (DHQs) and planning for solarising WASA filtration plants.
- Construction of a combined effluent treatment plant in Kasur with JICA's support and assistance for tannery zone relocation in Sialkot.

EPCCD has also introduced structural reforms to decentralise its operations, establishing divisional directorates and environmental complexes to address complaints and regulate environmental issues locally, expediting resolution processes. Additional efforts include the publication of two diagnostic reports on Punjab's environment (2022 and 2023), the preparation of a pilot project on low-cost wastewater treatment technologies in rural areas, and the establishment of the Punjab Environmental Reference Laboratory, an ISO-certified facility to monitor water and air quality.

[44] https://www.pgdp.pk/

URBAN UNIT

The Urban Unit, established in 2005 under the Planning and Development Department of Punjab, has emerged as a transformative force in urban P&D. Transitioning into an independent government-owned company in 2012, the Unit has become a vital entity in addressing Punjab's urban challenges. It focuses on sustainable urban solutions, fostering economic growth through industrialisation, agglomeration, and the development of an integrated "system of cities." Leveraging advanced GIS-based analytics, the Urban Unit provides technical expertise and policy guidance in urban planning, transport, solid waste management, water and sanitation, municipal finance, and capacity building. Its multidisciplinary approach ensures data-driven solutions that align with the province's evolving urban landscape.

The Urban Unit has played a pivotal role in addressing Punjab's WASH challenges. Recently, it extended technical support to five major WASAs to enhance their capacity and operational efficiency. Under the World Bank-funded Punjab Cities Governance Improvement Project (PCGIP), the Unit developed comprehensive water supply and sanitation plans for 29 cities, including Multan, Faisalabad, and Rawalpindi. These plans aimed to expand service coverage, reduce non-revenue water, improve wastewater management, and address drainage challenges. In addition to infrastructure planning, the Urban Unit has crafted crucial policy frameworks for the WASH sector, including the Punjab Spatial Strategy 2047, which integrates water and sanitation initiatives into the province's broader urban development goals. The strategy highlights equitable access to water, sustainable service delivery, and climate resilience. Moreover, the Unit has contributed to the formulation of key regulatory documents, such as the Punjab Water Act and the WASH Master Plan, creating a foundation for effective water governance in Punjab.

In the field of solid waste management (SWM), the Urban Unit has introduced innovative and sustainable solutions to address the growing challenges of waste disposal and management. By applying GIS-based analytics, it has developed integrated SWM systems that focus on waste reduction, segregation, recycling, and safe disposal. The Unit's interventions include policy development, standardising SWM practices for municipalities, and providing operational guidelines to local governments.

To ensure efficient waste management, the Urban Unit has prioritised capacity building, equipping municipal staff and community stakeholders with the knowledge and skills needed to implement sustainable practices. It has also supported the establishment of modern waste disposal sites and recycling facilities to minimise landfill dependency. By fostering PPPs the Unit has enhanced the efficiency of SWM services, enabling municipalities to collaborate with private sector entities for better service delivery. Additionally, the Urban Unit has conducted feasibility studies and master planning for SWM projects in major urban centres. These initiatives identify gaps in existing systems and propose actionable solutions for waste collection, transportation, and disposal, contributing to environmental sustainability and public health.

The Urban Unit's contributions to water, sanitation, and solid waste management have significantly improved service delivery across Punjab. Its data-driven approach ensures that urban policies and plans are tailored to the unique needs of each city, fostering a sustainable and resilient urban environment. By strengthening institutional capacities, the Unit has empowered local governments to effectively manage their urban services, benefiting millions of residents. Looking ahead, the Urban Unit is

committed to scaling up its efforts by integrating smart technologies, such as real-time monitoring systems and Internet of Things (IoT) devices, into urban infrastructure management. Through fostering innovation, empowering local governments, and driving sustainable practices, the Urban Unit continues to shape Punjab's urban future, setting a benchmark for urban development in Pakistan and beyond.

Strategic Actions for Sector Capacity

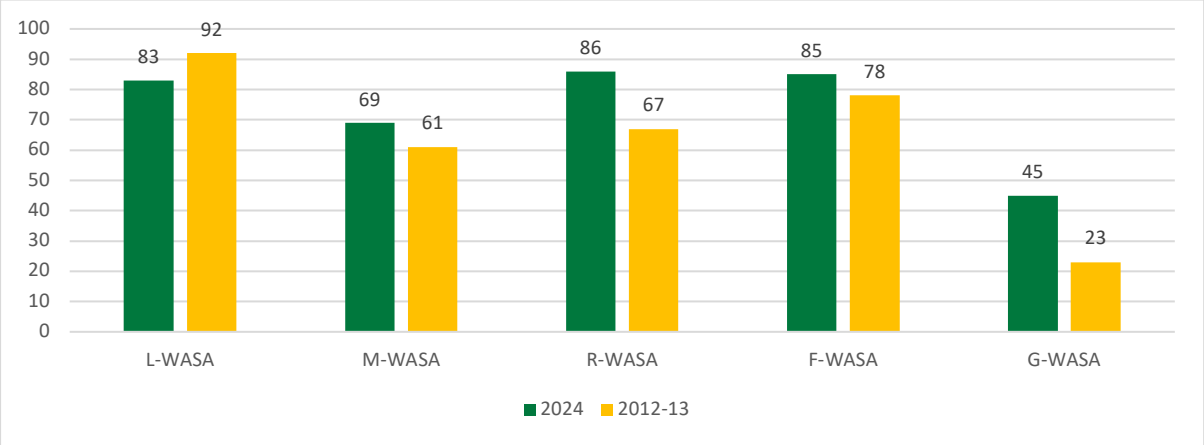
Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct a gap analysis of current training programmes in Local Government Academies and AJWA to identify WASH-related capacity gaps.	Develop and integrate comprehensive WASH-specific courses into the curriculum of Local Government Academies and AJWA.	Transform existing academies into centres of excellence for WASH, offering internationally accredited programmes.
Train field and managerial staff through tailored WASH-specific training modules developed in collaboration with Urban Unit.	Expand practical training programmes, including on-the-job sessions for field staff in all WASAs and MCs.	Institutionalise continuous professional development and certifications for all staff in WASH entities.
Rationalises staffing across PHED, WASAs, and LG&CD departments through needs-based assessments.	Implement performance-based appraisals and digitise HR management for WASH entities.	Fully integrate advanced HR systems with predictive analytics to optimise workforce management and planning.
Launch short-term, intensive courses for staff in technical roles, including GIS, SCADA, and modern sanitation techniques.	Develop a structured training programme for advanced technologies and innovations in WASH systems, leveraging partnerships with AJWA.	Offer international exposure and certification opportunities for technical and managerial staff.
Digitise monitoring systems and introduce centralised dashboards for real-time tracking of WASH service delivery.	Strengthen data-driven decision-making tools, such as predictive models for operational challenges.	Fully integrate AI-based tools for predictive maintenance and smart service delivery optimisation.
Conduct workshops and leadership training for mid- to senior-level officers to improve strategic decision-making.	Introduce mentoring programmes pairing senior leaders with junior professionals for skills transfer and leadership development.	Establish executive leadership academies or programmes for top-tier management in the WASH sector.
Design and launch training programmes for women professionals to encourage participation in WASH services, focusing on community roles.	Develop gender-inclusive policies and ensure equal opportunities in training and recruitment across all WASH-related entities.	Achieve gender parity in all WASH organisations and implement gender-sensitive monitoring frameworks.

SECTOR EFFICIENCY

MAJOR CITIES OF PUNJAB

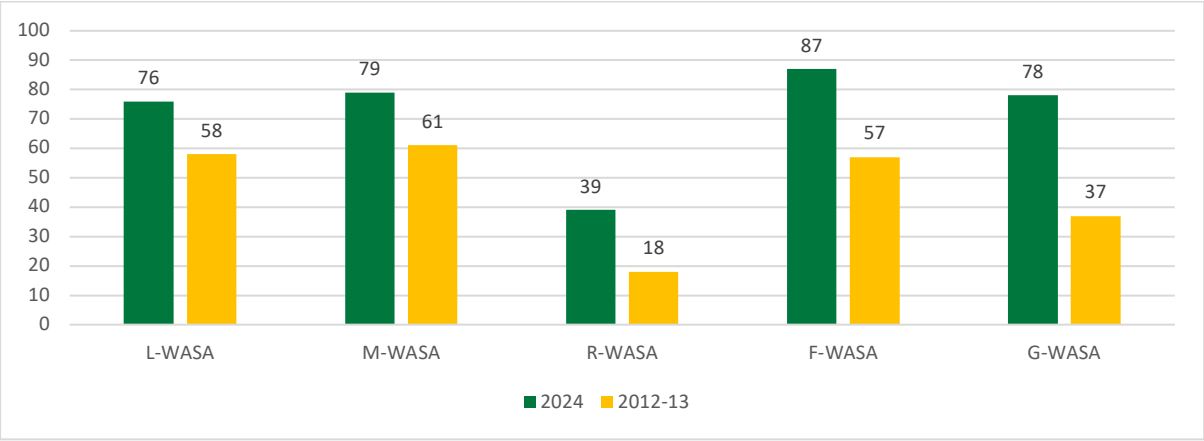
To review the progress of WASH sector efficiency in the major five cities of Punjab, a comparative analysis of WASA performance against key performance indicators (KPIs) from 2012/13 to 2024 was conducted. It was identified that all urban utilities, except WASA Lahore, have improved their water supply coverage for the target population. The most significant increase was achieved by WASA Gujranwala, which expanded its water supply coverage from 23 percent in 2012/13 to 45 percent in 2024. Following closely, WASA Rawalpindi made substantial progress, increasing its coverage from 67 percent in 2012/13 to 86 percent in 2024.

Figure 71: Water Supply Services Coverage in Major Cities of Punjab



For sewerage services, all urban utilities have expanded their coverage over the past decade. The most significant improvement was made by WASA Gujranwala, which increased its coverage from 37 percent in 2012/13 to 78 percent in 2024. WASA Faisalabad followed, with an increase from 57 percent in 2012/13 to 87 percent in 2024.

Figure 72: Sewerage Services Coverage in Major Cities of Punjab



In terms of efficient water resource use, none of the urban utilities have made substantial improvements over the last decade. Groundwater extraction remains the primary source of water

production across all utilities, with only a small proportion of surface water utilised by WASA Rawalpindi and WASA Faisalabad.

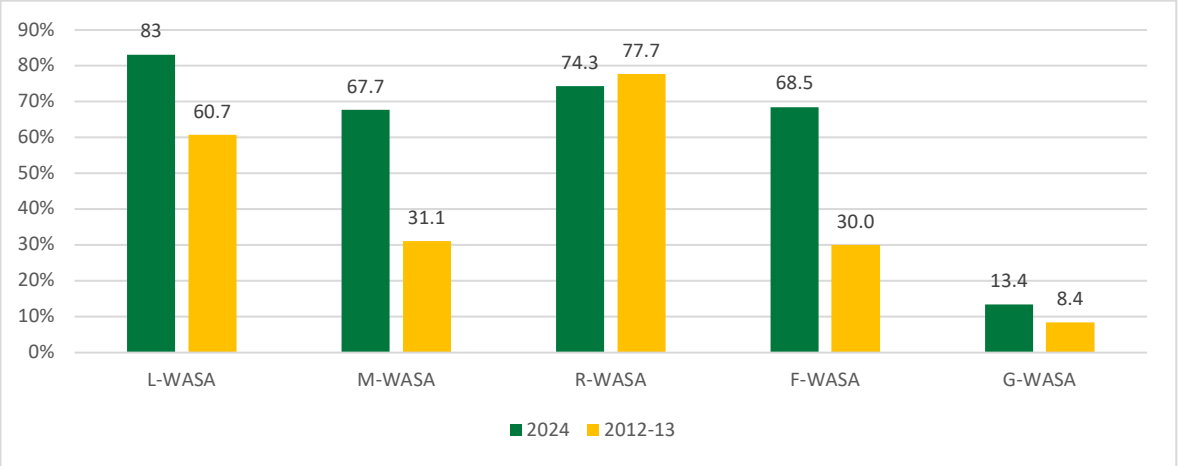
The staffing ratio per 1,000 water connections has increased at WASA Rawalpindi and WASA Lahore, while it has decreased at WASA Gujranwala, WASA Multan, and WASA Faisalabad over the past decade. For sewerage connections, the staffing ratio per 1,000 connections has risen at WASA Lahore and WASA Multan but has decreased across the remaining WASAs.

The percentage of metered water connections across Punjab remains very limited, with metering only implemented in the major cities of Lahore and Faisalabad. In Lahore, the proportion of metered connections has decreased, suggesting that no new metered connections have been added since 2012/13. In Faisalabad, metered connections are just 0.1 percent of total water connections.

Chemically unfit water samples are reported only by WASA Lahore, at a rate of 0.3 percent, while all other WASAs report no cases of chemical contamination. However, a comparison of 2024 data with 2012/13 data reveals a mixed trend in biologically unfit water samples: rates have decreased for WASA Lahore, WASA Gujranwala, and WASA Rawalpindi, yet have increased for WASA Multan and WASA Faisalabad. This comparison highlights diverse progress in water quality control efforts across urban utilities.

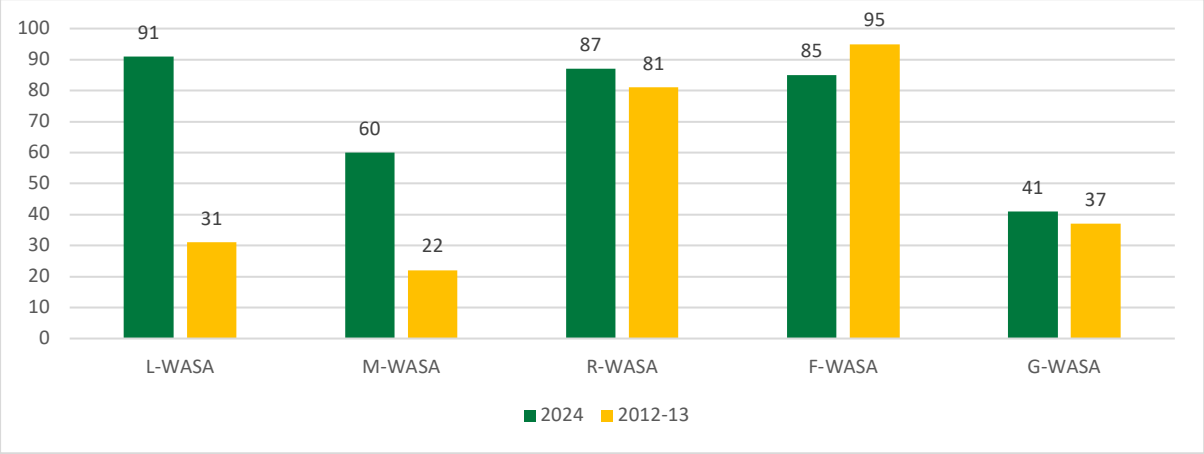
Apart from WASA Rawalpindi, all WASAs have improved their physical bill collection efficiency, measured by the percentage of total bills paid against total bills generated. The most notable increase was achieved by WASA Faisalabad, where collection efficiency rose from 30 percent in 2012/13 to 68.5 percent in 2024. WASA Lahore also showed significant improvement, with efficiency increasing from 60.7 percent in 2012/13 to 83 percent in 2024.

Figure 73: Physical Bill Collection Efficiency of WASA



Financial bill collection efficiency, measured by the total amount received as a percentage of the total amount billed, has improved for all WASAs except WASA Faisalabad over the past decade. The most significant improvements have been observed for WASA Lahore and WASA Multan.

Figure 74: Financial Bill Collection Efficiency of WASA



The working ratio, defined as the proportion of operating expenditures to total operating revenues, has improved for WASA Lahore, WASA Multan, and WASA Rawalpindi, where expenditures have now been balanced with revenues. Previously, these utilities faced expenditures that were two to four times higher than their revenues. In contrast, the working ratio has worsened for WASA Faisalabad and WASA Gujranwala, reaching 1.73 and 5.53, respectively.

It is pertinent to note that the above working ratio of WASAs is calculated based on total operating revenues of urban utilities which also include the subsidies by the provincial government. Further analysis reveals that during the FY 2023-24, the Government of Punjab has provided a sum of Rs. 11.72 billion to five WASAs to meeting the operating expenses of Rs. 36.93 billion operating expenditures, which indicate that the operating revenues of the WASAs through own source revenue (OSR) accounted for only about two-thirds of their total operating revenues. When examining the working ratio based solely on OSR, it becomes evident that none of the WASAs in Punjab are financially self-sufficient to meet their operating expenses without provincial government subsidies. Furthermore, only WASA Lahore and WASA Faisalabad are currently conducting external financial audits.

The energy crisis in the country over the past decade, coupled with rising electricity costs, has prompted a shift toward solar and other alternative energy sources for water supply and sewerage installations. Currently, 31.8 percent of installations at WASA Faisalabad and 19.8 percent at WASA Gujranwala operate on alternative energy sources. Notably, 15.1 percent of WASA Gujranwala's installations rely specifically on solar energy. In contrast, the use of solar and alternative energy sources at other WASAs remains minimal, covering less than one percent of their installations.

Revenue Augmentation through Improve Water Supply Services: A Case Study of SMART-WASA team of Faisalabad Pakistan[45]

Despite Faisalabad WASA (F-WASA) having the infrastructure to supply approximately 500,000 m3 of water per day, due to the high operation costs of transmission and distribution pumping, only half of that amount was actually supplied. Additionally, F-WASA has a flat rate system where tariffs are based on the sizes of customers' properties and not the amounts of water they use. Therefore, increasing the water supply to customers might not increase F-

[45] Available at: https://iwaponline.com/washdev/article/11/6/1097/83807/Revenue-augmentation-through-improved-water-supply

WASA's revenue. To search for a solution to these drawbacks, Government of Punjab, with support from the Japan International Cooperation Agency (JICA), formulated a long-term master plan from July 2016 to June 2019 for the development of water supply, sewerage, and drainage, together with improving the management of F-WASA. Under the plan, a pilot activity in two separate areas of Faisalabad was conducted with the aim of providing better water supply services through the establishment of a hydraulically separated distribution system that has its own ground storage tank (GST), overhead reservoir (OHR) and isolated distribution network, to increase water pressures. The results showed that the durations of water supply increased from 3.5 to 12 hours and from 6 to 18 hours per day in the pilot areas. The water pressure in each pilot area increased from 2 to 10 m and from 3 to 18 m, respectively. Wastewater contamination was also eliminated after increasing the water pressure. Customers were informed of these achievements through workshops, flyers, and banners on streets, which encouraged them to shift from a flat rate system to a metering system. Consequently, the total billed amounts for two pilot areas in March 2019 increased by 65.0 percent and 97.0 percent, compared with those from November 2016. The bill collection ratios also increased from 48.2 percent to 56.9 percent and from 48.1 percent to 60.6 percent respectively during pilot activities. The pilot activity affirmed that urban residences would be willing to pay more for better services. Improving services of water supply utilities through the formation of a water distribution area with an increase in water pressure is recommended as an effective method for revenue augmentation.

District Metered Approach - learnings from Dhaka WASA[46]

Dhaka, capital of Bangladesh, with a population of more than 21 million people, and 36,941 residents per square kilometre, is the fourth-most densely populated city in the world. Around 80 percent Dhaka's Water Supply and Sewerage Authority (DWASA) water supply relies on groundwater sources. DWASA's distribution network was divided into 10 zones which were difficult to manage, as individual or collective entity, by virtue of varied geographical sizes and population density. DWASA adopted a sectioned approach by splitting the large citywide distribution network into isolated, pressurised clusters, known as District Metered Areas (DMAs).

A DMA is a hydraulically isolated and completely metered section of the complete water network. If any particular network cluster faces a problem in water supply, that cluster can be isolated to solve the issue without affecting the water supply in other clusters. This also makes it simpler to monitor the amount of water supplied and consumed, and to detect any leakages or illegal connections within the network (water loss) more effectively. In addition, this enables DWASA's field staff to conduct maintenance activities without interrupting (shutting down) the water supply of the whole network especially when city is being shifted towards surface water supply. It is pertinent to mention that DMAs are tools rather than a complete solution to all distribution problems, they require efficient management and careful maintenance in order to remain effective.

[46] Available at: https://wopbangladesh.com/introducing-model-district-metered-areas-dmas-to-improve-operational-excellence-a-case-study-from-dhaka-wasa/

Key limitations of DMA in Dhaka include: i) Extreme constructions and high population density in Dhaka made it very difficult to construct standardised DMA sizes with “natural” boundaries, ii) Integration of informal /illegal settlements that generally resort to illegal connections causing damage to water supply infrastructure and resulting in non-revenue water, and iii) Required new ways of working to remain vigilant for O&M and optimum utilisation of water infrastructure along with ensuring strategic assets management.

Table 13: WASAs Progress Review against Key Performance Indicators

Sr.#	Description	L-WASA Current Status 30.06.2024	L-WASA (Q4 2013) data)	M-WASA Current Status 30.06.2024	M-WASA (Q2 2012 data)	R-WASA Current Status 30.06.2024	R WASA (Q3 2012 data)	F-WASA Current Status 30.06.2024	F-WASA (Q4 2012 data)	G-WASA Current Status 30.06.2024	G-WASA (Q3 2013 data)
1	**WATER SUPPLY AND SEWERAGE SERVICES**										
1.1	Water Supply Coverage (percentage of Population living in Designated Area)	82.5	91.6	69.0	61.0	85.5	67.0	84.9	77.9	44.5	23.1
1.2	Sewerage Coverage (percentage of Population living in Designated Area)	76.0	58.2	79.0	61.0	38.5	18.2	87.1	57.4	77.5	37.0
1.3	Share of Surface Water Supplied (in MGDs)	0	N/A	0	N/A	29	N/A	6	N/A	0	N/A
1.4	Share of Groundwater Supplied (in MGDs)	345	N/A	41	N/A	35	N/A	49	N/A	29	N/A
1.5	Supply Hours of Water Supply Services (in Hours)	Summer 14: Winter 8	14	06	04	2 to 4	08	6 to 8	7.5	9 to 11	12
2	**STAFFING AND QUALITY OF SERVICES**										
2.1	WS Staff/'000 Water connections	4.4	1.9	1.0	4.2	13.5	8.5	4.2	9.3	3.5	8.7
2.2	Sewerage Staff/'000 Sewerage connections	4.1	2.7	4.3	4.0	2.1	4.5	2.3	5.6	2.4	3.5
2.3	Percentage of Functional Water Meters out of Total Water Connections	1.0	4.0	Nil	0.0	0.0	0.0	0.1	0.0	Nil	0.0
2.4	Complaints About W&WW Services percentage of total connections (during last month)	1.1	0.3	0.4	2.1	0.7	2.2	0.3	1.3	1.0	0.8
2.5	Water Samples Chemically found Unfit percentage of total samples	0.3	0.0	0.0	0.0	0.0	0.0	0.0	10.1	0.0	0.0
2.6	Water Samples Biologically found Unfit percentage of total samples	13.0	19.7	3.3	0.0	3.0	12.8	4.8	1.5	3.7	10.8
3	**FINANCIAL PERFORMANCE**										
3.1	Billing Efficiency (percentage of bills	100.0	47.2	100.0	14.9	98.0	3.6	97.1	19.0	96.9	7.3

	delivered out of total connections)										
3.2	Collection Efficiency (Physical) percentage of payees out of total connections	83.0	60.7	67.7	31.1	74.3	77.7	68.5	30.0	13.4	8.4
3.3	Collection Efficiency (Financial) percentage of Amount Received out of Total Amount Billed	91.0	31.1	60.2	22.4	86.8	80.5	85.0	95.3	41.1	23.7
3.4	Working Ratio for Total Operating Revenues (Operating Expenditures/ Operating Revenues)	0.99	1.09	0.99	2.32	1.01	4.17	1.73	0.99	5.53	1.34
3.5	Working Ratio for Own Source Revenue[47] (Operating Expenditures/ Own Source Revenue)	1.51	N/A	2.35	N/A	1.51	N/A	1.13	N/A	5.53	N/A
3.6	Any 3rd Party Validation conducted in the Current Financial Year	Yes, By RASG (CA firm) in progress		No		No		Yes: Muhammad Ashraf, Individual Consultant (July 2023)		No	
4	**ALTERNATE ENERGY SOURCES**										
4.1	percentage of WASA Installations having Alternative Energy Arrangements	0.3	N/A	0.0	N/A	0.3	N/A	31.8	N/A	19.8	N/A
4.3	percentage of WASA Installations having Solar arrangements	0.3	N/A	0.0	N/A	0.2	N/A	1.5	N/A	15.1	N/A

Source: HUD&PHED data for 2024 and Last Sector Development Plan for 2012/13 data

[47] Operating Revenues excluding the Subsidies by Provincial Government

INTERMEDIATE AND SMALL CITIES OF PUNJAB

The review of WASH sector efficiency in small and intermediate cities, based on the latest data from the Regional Development Master Plans developed by Punjab's Urban Unit, covering 22 cities across the province. The analysis revealed particularly low water supply service coverage in cities of Southern Punjab, with Lodhran at only 5 percent coverage and Jhang at 10 percent. Additionally, in Muzaffargarh, Rajanpur, and Layyah, significant portions of the water supply network remain dormant due to various reasons. Cities like Sialkot and Chiniot also reported less than 50 percent water supply coverage within their jurisdictions. The functionality of installed water supply schemes is notably low in Rajanpur, where none of the six installed schemes are operational. This is followed by Muzaffargarh, with only 4 percent of schemes functional, and Bhakkar with 22 percent functional schemes. Furthermore, only 9 out of the 22 cities reviewed have a functionality rate of 90 percent or higher for their water supply schemes. In terms of meeting water demand for populations connected to the water supply network, only the city of Toba Tek Singh is adequately supplying water, even exceeding the required demand. Of the remaining 21 cities, 14 are supplying less than 50 percent of their water demand.

Table 14: Water Supply Services in Small and Intermediate Cities of Punjab

Selected Cities	Percent of area Covered for water supply	Total Water Supply Schemes	Functional Water Supply Schemes	Percent of Functional Water Supply Schemes	Water Demand in MGD	Water Supplied in MGD	Water Supply as a percentage of water demand
Chiniot	30	3	3	100	10.0	2.0	20
Toba Tek Singh	80	25	23	92	4.4	6.0	136
Jhang	10	3	2	67	21.0	0.8	4
Gujrat	75	65	60	92	39.1	19.3	49
Hafizabad	N/A	19	11	58	25.9	4.2	16
Mandi Bahauddin	100	6	5	83	14.1	10.5	74
Narowal	N/A	15	15	100	9.9	2.9	29
Sahiwal	80	56	35	63	25.3	16.9	67
Okara	60	24	11	46	14.6	1.9	13
Pakpattan	90	29	27	93	12.3	5.4	44
Sargodha	80	53	31	58	26.0	4.4	17
Khushab	70	28	8	29	6.4	0.9	13
Mianwali	80	11	10	91	9.3	1.6	18
Bhakkar	70	9	2	22	6.2	0.2	4
Sialkot	37	113	103	91	42.1	38.8	92
Khanewal	50	10	10	100	14.0	4.3	31
Lodhran	5	3	3	100	0.5	0.4	80
Vehari	60	23	8	35	7.5	0.2	2
DG Khan	80	34	27	79	15.0	7.3	49
Muzaffargarh	70 (but scheme is dormant for around 10 years)	25	1	4	8.4	6.8	81
Rajanpur	20 (but non-functional)	6	0	0	6.0	0.0	0
Layyah	30 (but majority not working, except 80 domestic and 2 commercial connections)	7	3	43	7.0	0.3	4

The regional development plans reveal minimal sewerage coverage in Khushab, where only 10 percent of the designated area is served. Apart from Toba Tek Singh, none of the selected cities achieve full (100 percent) sewerage network coverage. Additionally, only Mianwali and Sahiwal among the 22 cities have wastewater treatment plants. The plant in Mianwali, however, is non-functional, while the plant in Sahiwal is under construction as part of the Punjab Intermediate Cities Improvement Investment Programme (PICIIP). Consequently, these 22 cities collectively discharge approximately 503 million gallons per day (MGD) of untreated wastewater into natural water bodies.

Table 15: Sanitation Services in Small and Intermediate Cities of Punjab

Sr.	Selected Cities	Sewerage Coverage (in percent)	Total Sewage Flow (in MGD)	Wastewater treatment plant
1	Chiniot	60	25.0	No
2	Toba Tek Singh	100	7.4	No
3	Jhang	90	36.5	No
4	Gujrat	60	52.6	No
5	Hafizabad	61	12.5	No
6	Mandi Bahauddin	56	24.6	No
7	Narowal	N/A	12.5	No
8	Sahiwal	85	33.6	Under Construction
9	Okara	85	23.0	No
10	Pakpattan	90	22.0	No
11	Sargodha	70	59.4	No
12	Khushab	10	11.7	No
13	Mianwali	70	11.3	Non-Functional
14	Bhakkar	70	10.8	No
15	Sialkot	N/A	52.7	No
16	Khanewal	60	22.0	No
17	Lodhran	80	10.1	No
18	Vehari	70	12.3	No
19	DG Khan	70	29.9	No
20	Muzaffargarh	60	13.0	No
21	Rajanpur	50	9.4	No
22	Layyah	60	11.0	No

RURAL AREAS OF PUNJAB

The department data of HUD&PHED indicate that only 50 percent of the 5,302 rural water supply schemes in Punjab are currently functional. The smallest percentage of functional rural water supply schemes is in district Bhakkar with 8 percent schemes followed by Gujranwala at 20 percent and Jhang at 29 percent. Furthermore, apart from Toba Tek Singh, no district in Punjab has at least 90 percent of its rural water supply schemes in working condition. The majority of functional rural water supply schemes in Punjab, accounting for 90 percent, are managed by CBOs, with an additional 7 percent overseen by the respective Union Council (UC) administrations.

Table 16: Status of Rural Water Supply Schemes in Punjab

Sr.	District	Total Water Supply Schemes	Functional Water Supply Schemes	Percentage of Functional Water Supply Schemes	Management of Functional WSS			
					CBO	UCs	MCs	Other
1	Attock	237	151	64	151	0	0	0
2	Bahawalnagar	565	484	86	479	0	4	1
3	Bahawalpur	194	131	68	130	0	1	0
4	Bhakkar	12	1	8	0	0	1	0
5	Chakwal	307	127	41	126	0	1	0
6	Chiniot	8	4	50	2	0	0	2
7	DG Khan	392	247	63	194	53	0	0
8	Faisalabad	255	120	47	120	0	0	0
9	Gujranwala	35	7	20	5	1	1	0
10	Gujrat	193	107	55	106	0	1	0
11	Hafizabad	10	3	30	1	0	2	0
12	Jhang	24	7	29	6	1	0	0
13	Jhelum	175	85	49	66	0	0	19
14	Kasur	192	85	44	85	0	0	0
15	Khanewal	49	30	61	30	0	0	0
16	Khushab	162	122	75	122	0	0	0
17	Lahore	66	21	32	15	0	6	0
18	Layyah	12	5	42	4	1	0	0
19	Lodhran	159	122	77	122	0	0	0
20	M.B. Din	36	15	42	15	0	0	0
21	Mianwali	213	180	85	90	90	0	0
22	Multan	80	59	74	58	0	1	0
23	Muzaffargarh	24	9	38	6	3	0	0
24	Nankana Sahab	36	15	42	9	6	0	0
25	Narowal	77	25	32	25	0	0	0
26	Okara	143	62	43	60	0	2	0
27	Pakpattan	67	51	76	49	0	2	0
28	R.Y Khan	240	153	64	148	1	1	3
29	Rajanpur	73	36	49	14	22	0	0
30	Rawalpindi	442	282	64	243	0	7	32
31	Sahiwal	62	27	44	27	0	0	0
32	Sargodha	152	62	41	59	3	0	0
33	Sheikhupura	35	19	54	19	0	0	0
34	Sialkot	136	71	52	56	1	14	0
35	T.T Sing	293	280	96	280	0	0	0
36	Vehari	146	84	58	84	0	0	0
Total		5302	2654	50	2376	182	40	56

According to the regional development plans, only 24 percent of water filtration plants in Gujrat are functional, followed by Narowal at 27 percent and Rajanpur at 30 percent. Moreover, only 4 out of 18 districts—Faisalabad, Toba Tek Singh, Khanewal, and Layyah—have all their filtration plants operational. To address the challenges of limited-service coverage and significant infrastructure dysfunction in rural areas, the Government of Punjab, with financial support from the World Bank, is

implementing the PRSWSSP. This project aims to improve water supply and sanitation services in 2,000 villages across 16 districts, including Khushab, Mianwali, Sargodha, Chakwal, Bhakkar, Pakpattan, Chiniot, Jhang, Rajanpur, Rahim Yar Khan, DG Khan, Lodhran, Bahawalpur, Muzaffargarh, Bahawalnagar, and Multan.

Table 17: Functional Water Filtration Plants in Rural Areas of Selected Districts

Sr.	Districts	Total PHED/ MC Filtration plants	Functional PHED/MC Filtration plants	Percentage of Functional Filtration Plants
1	Faisalabad	54	54	100
2	Jhang	15	14	93
3	Toba Tek Singh	18	18	100
4	Chiniot	7	4	57
5	Narowal	272	73	27
6	Gujranwala	12	4	33
7	Sialkot	25	12	48
8	Gujrat	58	14	24
9	Mandi Bahuddin	18	6	33
10	Sahiwal	156	98	63
11	Okara	10	7	70
12	Pakpattan	35	17	49
13	Multan	96	65	68
14	Khanewal	50	50	100
15	Lodhran	37	31	84
16	Vehari	76	45	59
17	Rajanpur	46	14	30
18	Layyah	12	12	100

Strategic Actions for Sector Efficiency

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Conduct needs assessment for underserved areas and identify priority expansion zones in urban areas	Expand water and sewerage networks in priority areas	Achieve full water and sewerage coverage in all major urban centres and ensure efficient network maintenance
Implement water quality monitoring standards and strengthen groundwater management policies	Increase surface water utilisation	Shift to a 50/50 balance of groundwater and surface water usage across all WASAs
Develop OSR improvement plans	Implement metreing for all new connections	Implement capacity-building programmes for CBOs managing water schemes for water metering
Conduct annual external financial audits of WASA	Achieve WASA financial self-sufficiency by reducing dependency on provincial subsidies to 20 percent of total expenditures	Achieve WASA financial self-sufficiency without provincial subsidies
Complete under-construction treatment plants and assess current non-functional plants for rehabilitation	Develop at least two wastewater treatment plants in major cities and one in each of intermediate cities	Achieve 100 percentage wastewater treatment capacity across all urban areas.

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Identify alternate water sources for meeting demand supply gaps	Upgrade infrastructure to meet 70 percent of the water demand in cities	Ensure water supply meets 100 percent demand across all cities in Punjab
Install solar power on a pilot basis for critical installations. Introduce hybrid solar systems where feasible	Scale up solar installations in all major and intermediate cities	Achieve 50 percentage of energy needs from alternative sources in major and intermediate cities
Conduct district-level assessments to identify reasons for filtration plants and water supply schemes failures	Introduce digitalised management systems for CBOs and UCs to monitor scheme performance e.g., SCADA	Achieve 90 percentage functionality rate for all rural water supply schemes and filtration plants

SECTOR FINANCING

WASH sector financing in Punjab remains a significant challenge, particularly to achieve the ambitious targets set under the Punjab WASH Sector Plan 2025-35. The financial landscape requires increased public and private sector involvement to bridge the funding gaps. This chapter examines the current financial landscape, challenges, and the strategic direction for improving sector financing at both provincial and district levels.

WASH FINANCIAL PORTFOLIO FOR THE LAST TEN YEARS

Since 2014, annual allocations to the WASH sector have reached nearly three times, rising from Rs. 27 billion in FY 2014-15 to Rs. 90 billion in FY 2023-24. Similarly, WASH expenditures have increased fourfold over the last decade, from Rs. 22 billion in FY 2014-15 to Rs. 87 billion in FY 2023-24. However, this increase has not followed a steady upward trajectory but instead displayed erratic patterns, with notable declines in allocations during FY 2018-19 and FY 2019-20, followed by another dip in FY 2022-23. Additionally, FY 2018-19 recorded the lowest budget utilisation at just 53 percent.

Further analysis reveals that much of the budgetary increases have been concentrated in the current budget. Allocations under the current budget rose from Rs. 7 billion in FY 2014-15 to Rs. 39 billion in FY 2023-24—five times higher than the base year. Similarly, expenditures in the current budget increased from Rs. 5 billion to Rs. 39 billion, a sevenfold rise. In contrast, development budget allocations grew from Rs. 20 billion in FY 2014-15 to Rs. 51 billion in FY 2023-24, while expenditures increased from Rs. 17 billion to Rs. 48 billion, both reflecting a threefold increase. These trends indicates that the increase in WASH investments is primarily driven by inflation and reinvestment in existing infrastructure, rather than efforts to expand services to underserved areas.

Table 18: Punjab WASH Sector Budget Allocations and Expenditures for Last 10 Years

Fiscal Years	Allocation (in Rs. Billion)			Expenditures (in Rs. Billion)			Budget Utilisation Rate (in percent)
	Current	Development	Total	Current	Development	Total	
2014-15	7	20	27	5	17	22	81
2015-16	12	24	36	12	27	39	108
2016-17	10	56	65	6	33	39	60
2017-18	6	65	70	6	46	52	74
2018-19	7	23	30	7	9	16	53
2019-20	10	30	40	10	18	28	70
2020-21	25	37	61	25	27	52	85
2021-22	30	75	105	30	69	99	94
2022-23	34	40	74	34	60	94	127
2023-24	39	51	90	39	48	87	97
Total	180	421	600	175	352	527	88

Source: WASH Budget Expenditure Review Reports

A closer examination of current budget expenditures reveals that a significant portion is allocated to the five major urban utilities, i.e., WASAs in Punjab. For instance, in FY 2023-24, the five WASAs accounted for Rs. 35 billion out of the total Rs. 39 billion in provincial WASH current expenditures. This shows that the bulk of operational support for the maintenance of WASH infrastructure is concentrated in these urban areas, leaving very little or no financial support for operational costs in the rest of the province. In rural areas, the responsibility for operating and maintaining WASH schemes is often

delegated to the local community, highlighting a clear disparity in financial allocations between urban and rural areas. This unequal distribution not only increases the financial burden on rural communities but also reflects a gap in ensuring equitable access to WASH services and infrastructure maintenance across the province.

Table 19: Operating Expenditures of Urban Utilities for FY 2023-24

Sr.	Urban Utilities	Operating Expenditures for FY 2023-24 (in Rs. billion)
1	WASA Multan	4.04
2	WASA Gujranwala	2.71
3	WASA Faisalabad	4.07
4	WASA Rawalpindi	2.61
5	WASA Lahore	21.73
Total Operating Expenditures		35.17

Source: WASA Annual KPIs Report 2023-24

DISTRICT-LEVEL DISPARITIES IN WASH INVESTMENT

While looking into development budget distribution within the districts, a clear disparity emerges in cumulative per capita allocations over the past decade (FY 2014-15 to FY 2023-24). District Muzaffargarh received the lowest per capita WASH development budget, with only Rs. 1,051 allocated and Rs. 785 spent per capita over the last ten years. In stark contrast, District Mianwali received a per capita allocation of Rs. 6,340, with Rs. 5,970 spent. Additionally, District Faisalabad demonstrated the lowest utilisation trend, with Rs. 6,740 allocated per capita but only Rs. 2,860 spent. This uneven distribution highlights significant inequalities in WASH development investments across districts.

Table 20: WASH Development Budget Per Capita Allocations and Expenditures for Last 10 Years

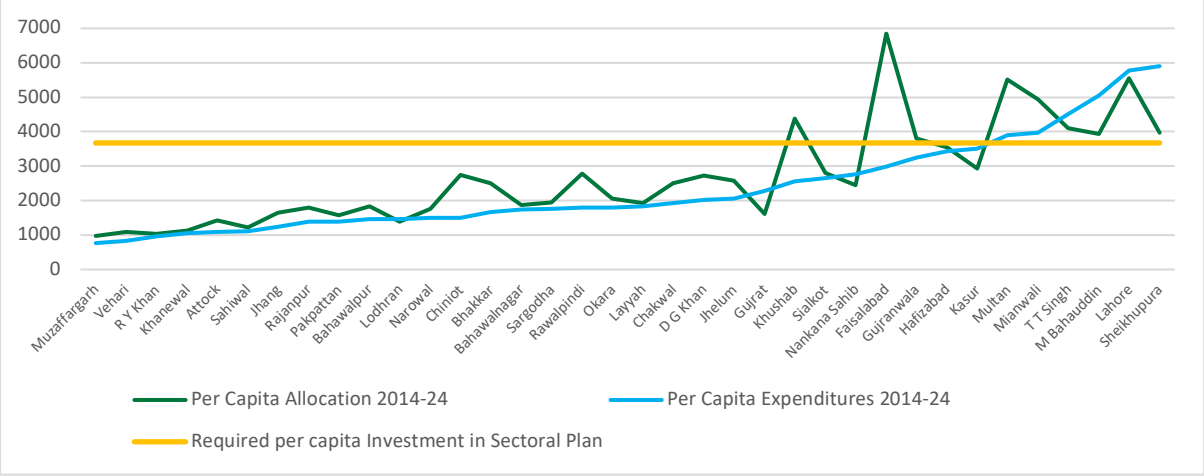
Sr.	District	Total Development Allocation 2014-24 (in Rs. Million)	Total Development Expenditures 2014-24 (in Rs. Million)	Per Capita Allocation 2014-24 (in Rs.)	Per Capita Expenditures 2014-24 (in Rs.)
1	Attock	3,288	2,638	1,515	1,216
2	Bahawalnagar	8,432	7,283	2,375	2,051
3	Bahawalpur	9,357	7,865	2,184	1,836
4	Bhakkar	5,611	4,091	2,866	2,090
5	Chakwal	4,848	4,301	2,794	2,479
6	Chiniot	4,375	3,182	2,799	2,036
7	D G Khan	9,539	6,649	2,811	1,959
8	Faisalabad	61,173	25,956	6,740	2,860
9	Gujranwala	22,154	18,528	3,717	3,109
10	Gujrat	6,031	7,742	1,873	2,405
11	Hafizabad	5,015	4,821	3,799	3,652
12	Jhang	5,051	3,898	1,648	1,272
13	Jhelum	4,015	3,437	2,905	2,486
14	Kasur	14,371	15,339	3,519	3,756
15	Khanewal	4,465	4,026	1,327	1,197
16	Khushab	6,923	5,446	4,612	3,628
17	Lahore	71,995	70,414	5,536	5,415
18	Layyah	4,477	3,916	2,129	1,863
19	Lodhran	3,245	2,989	1,683	1,550

Sr.	District	Total Development Allocation 2014-24 (in Rs. Million)	Total Development Expenditures 2014-24 (in Rs. Million)	Per Capita Allocation 2014-24 (in Rs.)	Per Capita Expenditures 2014-24 (in Rs.)
20	M Bahauddin	9,164	10,548	5,009	5,766
21	Mianwali	11,400	10,736	6,340	5,970
22	Multan	28,986	21,240	5,405	3,961
23	Muzaffargarh	5,271	3,939	1,051	785
24	Nankana Sahib	4,420	4,838	2,704	2,959
25	Narowal	3,601	3,441	1,846	1,764
26	Okara	7,005	6,137	1,993	1,746
27	Pakpattan	3,998	3,621	1,872	1,695
28	R Y Khan	7,172	6,234	1,289	1,120
29	Rajanpur	4,488	3,511	1,885	1,475
30	Rawalpindi	19,959	13,024	3,262	2,129
31	Sahiwal	3,406	3,001	1,182	1,041
32	Sargodha	8,963	8,069	2,068	1,862
33	Sheikhupura	19,640	23,808	4,850	5,879
34	Sialkot	13,911	12,811	3,092	2,847
35	T T Singh	11,167	11,931	4,424	4,727
36	Vehari	3,779	2,861	1,102	834
Total		**420,695**	**352,272**	**3,295**	**2,759**

WASH INVESTMENT TARGETS VS. ACTUAL

The Punjab WASH Sector Development Plan 2014-24 proposed a total investment of Rs. 584.217 billion to achieve 100 percent coverage of piped water and underground sewerage infrastructure. However, over the past ten years, public WASH development investment has only reached Rs. 352 billion, falling significantly short of the financial target. Analysing this investment need with the current population of 127.69 million (Census 2023) suggests a per capita investment requirement of Rs. 4,575. While analysis district level per capita investment reveals that except Toba Tek Singh, Lahore, Mandi Bahauddin, Sheikhupura and Mianwali, none of the district in Punjab had received the required per capita investment to achieve the service targets of last WASH Sector Plan 2014-24.

Figure 75: Per Capita WASH Investment Need (as per Last Sector Plan 2014-24 and Actual Spending at District Level



Further analysis of WASH development reveals a substantial contribution from donor-funded projects, particularly over the past three years. For FY 2023-24 donor funded projects account for 42 percent of total WASH development expenditures in province. The major donor funded projects in Punjab includes Punjab Rural Water Supply & Sanitation Project, Punjab Cities Programme and Punjab Intermediate Improvement Investment programme along with donor foreign funded development schemes with urban utilities i.e. WASA Lahore, WASA Faisalabad and WASA Multan. However, to maximise the impact and sustainability of these contributions, a comprehensive WASH investment strategy is needed to strategically guide and optimise donor financing in the sector.

Table 21: WASH Sector Investment (Expenditures) and Donor Funded Contribution for the Last Three Years

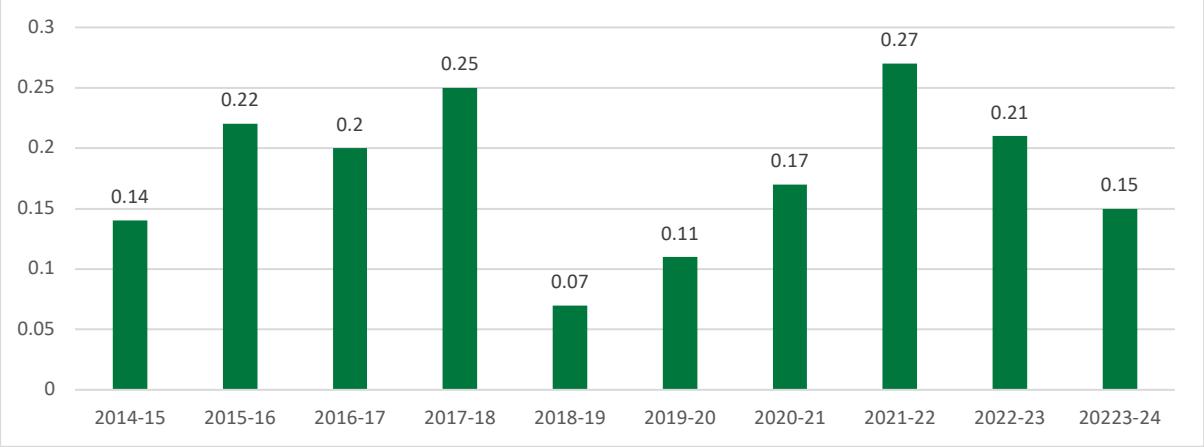
	FY 2021-22	FY 2022-23	FY 2023-24
Total Development Portfolio	69,094	59,501	47,619
Donor Funded Projects	13,556	12,040	20,154
Percentage of Donor Funded Projects out to Total Development Portfolio	20	20	42

Source: EAD Reports and WASH Expenditure Reports

WASH SHARE IN PROVINCIAL GDP

The comparison of estimated provincial GDP[48] for the last ten years and WASH sector expenditures, it has revealed that the total investment for WASH in the province remained less than 0.3 percent of the GDP for the last ten years. This allocation is strikingly low, especially given the estimated economic cost of inadequate water and sanitation services at around 3.94 percentage of the national GDP. (World Bank Group, 2012). This economic impact underscores a vast disparity, suggesting that poor WASH services contribute to a much higher financial loss than what is being invested to improve them.

Figure 76: Provincial WASH Expenditures as percentage of Provincial GDP

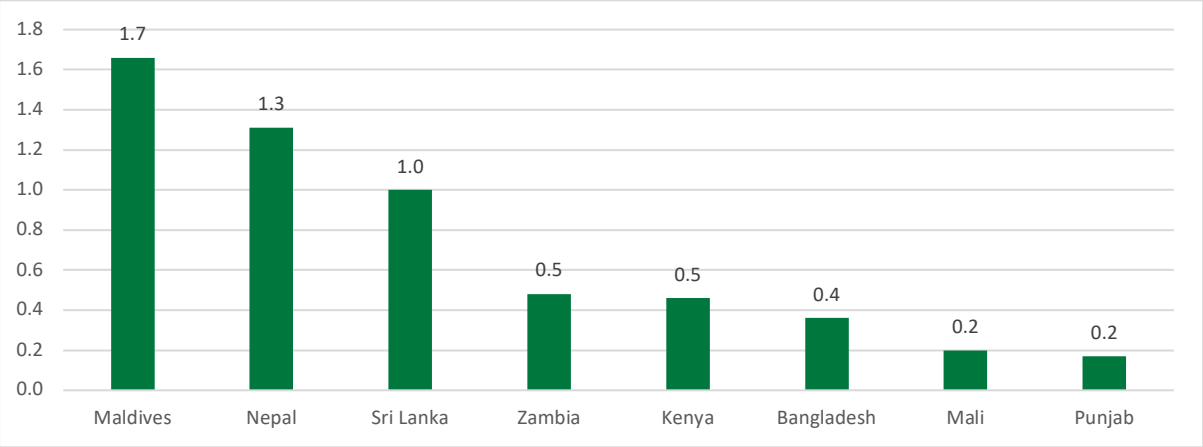


Comparing Punjab's WASH expenditure for FY 2020-2021 with that of other developing countries, based on the latest 2021 data from the GLAAS portal [49] reveals a notable shortfall. Punjab invested the least percentage of its GDP to WASH, lagging even behind several African countries, including Mali, Kenya, and Zambia. Whereas, South Asia, countries such as Maldives, Sri Lanka, and Nepal allocated over 1 percentage of their GDP to WASH. This contrast highlights a critical area for policy reflection, as

[48] 54 percent as per Punjab Growth Strategy 2023
[49] WHO-GLAAS data portal https://glaas.who.int/glaas/data

higher WASH investments are correlated with improved public health, economic stability, and resilience against water-related crises.

Figure 77: WASH GDP Share in Developing Countries Versus Punjab for 2021



Economic loss

As per a study conducted by Lahore University of Management Sciences in collaboration with WaterAid Pakistan in 2023, the economic burden of inadequate WASH services on households in Punjab amounted to Rs. 67.62 billion in July 2018 to June 2019, escalating to Rs. 121.83 billion by April 2022 to March 2023. Of this Rs. 121.83 billion, 48.5 percent represents direct healthcare expenses, while 51.5 percent accounts for productivity losses due to missed work, school, or caregiving responsibilities. Malaria imposes the highest financial burden, contributing nearly 45.3 percent of the cost, followed by typhoid at 35.9 percent and diarrhoea at 18.7 percent. The aggregate cost of malaria, diarrhoea, and typhoid to households in Punjab is Rs. 5,553 per household.

The study further estimates that households in Pakistan face an annual economic cost of PKR 145.7 billion (based on HIES 2018-19) due to time lost accessing open defecation (OD) sites and Rs. 69 billion to access shared toilets. Extrapolating the HEIS 2018-19 open defecation and shared toilets data with the Census 2023 population data reveals the share of Punjab as Rs. 82.5 billion for opportunity cost of open defecation and Rs. 39 billion for the toilets sharing.

Table 22: Estimated WASH Economic Loss in Punjab

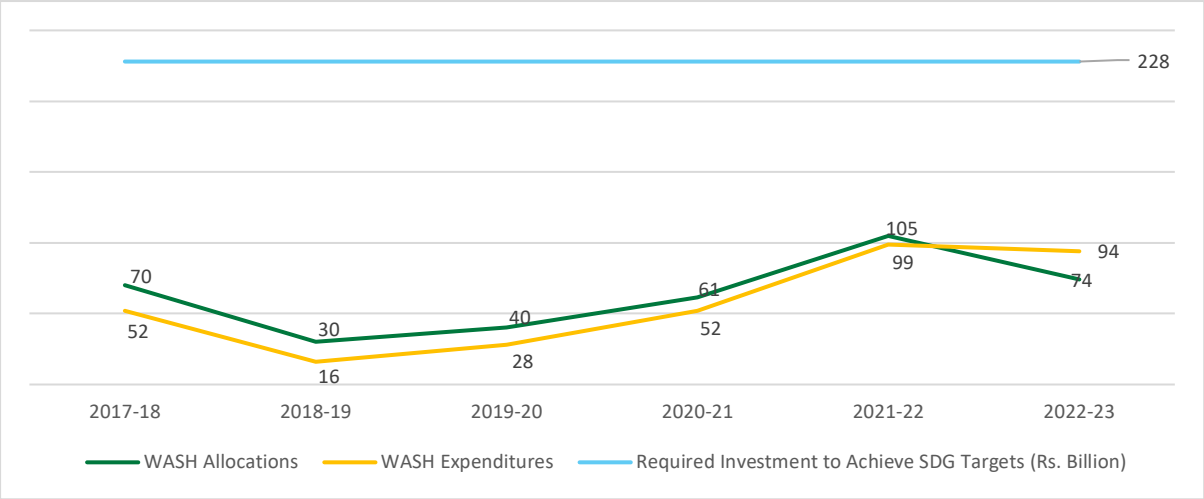
Sr.	WASH Economic Loss	Rs. in billion
1.1	Direct Cost of Illness	59.06
1.2	Indirect Cost of Illness	62.77
1	Total Cost of Illness	121.83
2	Opportunity Cost for Open Defecation	82.45
3	Opportunity Cost for Toilet Sharing	39.05
Total Economic Cost		365.16

SDG COSTING

The Punjab WASH Sector Plan (2014-2024), developed before the launch of the SDGs, primarily focused on universal coverage of piped water supply and sewerage systems for sanitation. However, it fell short of addressing SDG indicators 6.1 and 6.2, which emphasise "safely managed" drinking water and sanitation services. Safely managed drinking water is defined as, "the use of an improved drinking water source that is located on-premises, available when needed, and free from microbial and priority chemical contamination. Whereas safely managed sanitation is defined as an improved private sanitation facility (not shared with other households) where faecal wastes are safely disposed on site or transported and treated off-site; plus, a hand washing facility with soap and water.[50]

During the WASH JSR 2017, by using SDG costing tool developed by World Bank and UNICEF, the total financial investment to achieve 100 percent safely managed drinking water and 95 percent safely managed sanitation services in the province by 2030 were estimated Rs. 2,970 billion with annual allocation of Rs. 228.46 billion. However, none of the subsequent years, even witnessed half of this required allocation.

Figure 78: WASH Investment Targets (2017) for SDGs vs. Actual



The revised WASH investment requirements are available in the WASH Investment chapter of this document, aligned with SDG targets and existing resource availability.

Strategic Actions for Sector Financing

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Allocate at least 1 percent of Punjab's GDP to WASH services to address immediate infrastructure needs and operational deficits.	Ensure a consistent 10 percent annual increase in the provincial WASH development budget to maintain momentum toward SDG targets.	Secure full funding for universal WASH coverage by 2034, integrating it into the provincial economic development plan.
Conduct a comprehensive review of current expenditures to reallocate funds more effectively to underserved rural areas.	Develop a multi-year financing framework aligned with the Punjab WASH Sector Plan (2025-35).	Institutionalise sustainable WASH funding through dedicated budget lines and increased fiscal decentralisation.
Identify and prioritise the 10 lowest-performing districts, such	Implement a district equity-based funding model to ensure balanced	Achieve equitable WASH service coverage across all districts by

[50] https://washdata.org/monitoring/drinking-water

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
as Muzaffargarh and Rajanpur, for accelerated investment programmes.	resource allocation, focusing on rural and remote areas.	2034 through continuous monitoring and resource adjustment.
Allocate emergency funds for critical WASH infrastructure rehabilitation in flood-prone and drought-affected areas.	Expand targeted development initiatives for districts with the highest disparities in per capita investment.	Institutionalise equity-based WASH investment as part of the provincial development strategy.
Introduce financial incentives, such as tax breaks and subsidies, to encourage private sector investment in WASH projects.	Expand PPP models for water supply, sanitation, and solid waste management in urban areas.	Ensure private sector partnerships account for at least 30 percent of municipal WASH services in major cities by 2034.
Develop a WASH investment strategy to attract private sector and donor financing, focusing on innovative financing mechanisms.	Pilot private sector-led operations in urban WASH systems, leveraging private expertise in service delivery efficiency.	Institutionalise PPP frameworks as standard practice for urban WASH infrastructure and service management.
Mobilise donor funding to cover immediate gaps in underfunded districts and critical infrastructure projects.	Align donor-funded projects with provincial WASH goals to maximise impact and sustainability.	Institutionalise donor partnerships as part of Punjab's WASH financing strategy to ensure consistent support
Introduce a Climate Resilience Fund to address the impacts of climate change on WASH infrastructure and services.	Secure international climate adaptation funds to finance large-scale resilient WASH infrastructure projects.	Achieve full integration of climate resilience into all WASH investments, ensuring sustainability against extreme weather events.

MONITORING AND EVALUATION (M&E)

WASH AND INEQUITIES

Different studies conducted at the global and regional levels indicated that inequalities in access to improved water and sanitation existed between the rich and poor households both in the urban and rural areas and wealthier household better access to water and sanitation in both rural and urban areas. The Punjab Economic Research Institute (PERI) of P&D Board of Government of Punjab conducted a study titled "Inequalities in Access to Safe Drinking Water and Improved Sanitation based upon Household Socio-economic Factors within Districts of Punjab" in 2020. The analysis of inequality comprised of dissimilarity index, coverage rate and human opportunity index along with determining the contribution of each selected variable in the inequality in access to safe drinking water/improved sanitation. Dissimilarity index measures the inequality in access rates to safe drinking water/ improved sanitation for households defined by the selected variables (Household wealth status, education level of household head, household media exposure, place of residence and number of household members). Coverage rate measures the prevalence of a basic service i.e., access to safe drinking water/improved sanitation in current case. Human Opportunity Index (HOI) measures the average availability of basic services, discounted by how inequitably these services are distributed among the household population. This is done by measuring the coverage rate of a particular service (water and sanitation in this case) and then adjusting it according to how equitably the available services are distributed among groups. The dataset of Multiple-Indicator Cluster Survey (MICS), 2018 has been used for analysis.

Drinking Water

- **Dissimilarity Index:** The highest inequality in access to drinking water is observed in Bahawalnagar district followed by Faisalabad. The lowest inequality in access to safe drinking water has been found in Narowal followed by Bhakkar.
- **Coverage Rate:** The Narowal district has the highest coverage rate, followed by Gujrat, Sahiwal, the lowest coverage rate is in Bahawalnagar followed by Lodhran and Rawalpindi.
- **Human Opportunity Index (HOI):** The highest percentage of opportunities is in Narowal district followed by Gujrat and Bahawalpur. The lowest percentage of opportunities is in Bahawalnagar followed by Lodhran and Rawalpindi.

Improved Sanitation

- **Dissimilarity Index:** The highest inequality is observed in Chiniot district, followed by Rajanpur and D.G Khan. The lowest inequality is observed in Gujranwala, followed by Lahore and Sheikhupura.
- **Coverage Rate:** Gujranwala has the highest coverage rate, followed by Lahore, the Rajanpur district has the lowest coverage rate followed by Chiniot.
- **Human Opportunity Index (HOI):** the highest percentage of opportunities availability is in Gujranwala district followed by Lahore and Sheikhupura. The
- The lowest percentage of opportunities is in Rajanpur followed by Chiniot and DG Khan

Table 23: Ranking of Districts for DI, Coverage and HOI- Drinking Water

Ranking	Dissimilarity Index	Coverage Rate	Human Opportunity Index
1	Bahawalnagar	Narowal	Narowal
2	Faisalabad	Gujrat	Gujrat
3	TT Singh	Sahiwal	Bahawalpur
4	Pakpattan	Chiniot	Sahiwal
5	Nankana Sahib	Jhelum	Chiniot
6	Chakwal	Hafizabad	Hafizabad
7	Mandi Bahauddin	Khanewal	Jhelum
8	Lodhran	Vehari	Khanewal
9	Rajanpur	Attock	Attock
10	DG Khan	Bahawalpur	Bhakkar
11	Lahore	Sialkot	Sialkot
12	Okara	Mianwali	Vehari
13	Khushab	Kasur	Mianwali
14	Jhang	Bhakkar	Kasur
15	Multan	Nankana Sahib	RY Khan
16	Jhelum	Sheikhupura	Sheikhupura
17	Layyah	Layyah	Muzaffargarh
18	Gujranwala	Okara	Layyah
19	Rawalpindi	DG Khan	Okara
20	Vehari	Muzaffargarh	DG Khan
21	Mianwali	RY Khan	Nankana Sahib
22	Sheikhupura	Jhang	Jhang
23	Sahiwal	Sargodha	Gujranwala
24	Sargodha	Gujranwala	Sargodha
25	Kasur	Multan	Multan
26	Sialkot	Rajanpur	Rajanpur
27	Khanewal	Chakwal	Mandi Bahauddin
28	Muzaffargarh	Mandi Bahauddin	Chakwal
29	Chiniot	Faisalabad	Faisalabad
30	Bahawalpur	TT Singh	TT Singh
31	Hafizabad	Pakpattan	Lahore
32	RY Khan	Lahore	Pakpattan
33	Gujrat	Khushab	Khushab
34	Attock	Rawalpindi	Rawalpindi
35	Bhakkar	Lodhran	Lodhran
36	Narowal	Bahawalnagar	Bahawalnagar

Table 24: Contributing Factors of Inequities - Access to Drinking Water

Districts	Household Wealth status	Family Size	Education Level of Household Head	Urban-Rural	Household Media exposure
Bahawalpur	56	2.35	8.12	12.08	21.45
Bahawalnagar	38.9	11.82	13.82	7.46	27.91
RY Khan	12.4	32.32	1.38	40.66	13.15
DG Khan	25.4	22.36	14.87	8.77	28.55
Layyah	28.3	3.68	18.55	27.05	22.35

Districts	Household Wealth status	Family Size	Education Level of Household Head	Urban-Rural	Household Media exposure
Muzaffargarh	34.6	23.84	5.96	33.87	1.68
Rajanpur	8.81	4.65	39.81	42.73	4
Faisalabad	65.2	1.96	11.92	8.8	12.02
Chiniot	8.44	25.45	55.51	2.6	7.99
Jhang	39.7	1.01	45.03	9.58	4.66
TT Singh	17.4	14.89	56.36	3.03	8.31
Gujranwala	51.7	18.08	21.17	5.5	3.23
Gujrat	31.7	12.58	29.71	11.02	14.98
Hafizabad	35.7	41.49	3.98	11.25	7.1
Mandi Bahauddin	12.3	3.51	22.77	34.85	26.48
Narowal	52.0	57.46	15.03	31.06	1.3
Sialkot	6.22	47.79	22.83	20.15	3.01
Lahore	2.81	65.54			
Kasur	21.9	26.11	12.48	8.37	31.06
Nankana Sahib	23.7	21.82	19.41	16.52	18.51
Sheikhupura	18.8	7.23	21.87	7.31	44.7
Multan	2.83	2.9	1.25	82.54	10.47
Khanewal	18.7	3.744	15.05	55.25	7.24
Lodhran	46.8	23.19	3.99	16.05	9.88
Vehari	9.31	1.63	59.24	2.04	27.78
Rawalpindi	12.2	4.39	30.24	44.4	8.76
Attock	39.3	1.95	9.21	48.16	1.33
Chakwal	73.2	3.12	2.91	16.04	4.65
Jhelum	49	15.08	17.33	11.89	6.69
Sahiwal	41.8	13.6	14.49	20.35	9.72
Okara	14.5	4.14	27.6	47.76	5.94
Pakpattan	43.9	26.84	4.52	6.49	18.2
Sargodha	10.4	3	14.53	24.52	47.53
Bhakkar	16.2	25.19	10.11	12.17	36.27
Khushab	3.05	60.46	28.71	2.2	5.57
Mianwali	21.5	34.12	1.61	23.15	19.57

Table 25: Ranking of Districts for DI, Coverage and HOI- Improved Sanitation

Ranking	Dissimilarity Index	Coverage Rate	Human Opportunity Index
1	Chiniot	Gujranwala	Gujranwala
2	Rajanpur	Lahore	Lahore
3	DG Khan	Sheikhupura	Sheikhupura
4	Multan	Gujrat	Gujrat
5	Khushab	Rawalpindi	Rawalpindi
6	Jhang	Jhelum	Jhelum
7	Lodhran	Narowal	Narowal
8	Pakpattan	TT Singh	TT Singh
9	Bahawalnagar	Attock	Chakwal
10	Muzaffargarh	Chakwal	Attock
11	Bahawalpur	Faisalabad	Mianwali

Ranking	Dissimilarity Index	Coverage Rate	Human Opportunity Index
12	Bhakkar	Hafizabad	Faisalabad
13	Okara	Mianwali	Nankana Sahib
14	Vehari	Sialkot	Hafizabad
15	Khanewal	Nankana Sahib	Layyah
16	Mandi Bahauddin	Sargodha	Sargodha
17	RY Khan	Layyah	Sialkot
18	Sialkot	Mandi Bahauddin	Sahiwal
19	Hafizabad	Sahiwal	Mandi Bahauddin
20	Sahiwal	RY Khan	Kasur
21	Kasur	Kasur	RY Khan
22	Sargodha	Bhakkar	Bhakkar
23	Faisalabad	Vehari	Okara
24	Nankana Sahib	Okara	Vehari
25	Layyah	Bahawalpur	Khanewal
26	TT Singh	Bahawalnagar	Bahawalnagar
27	Attock	Khanewal	Bahawalpur
28	Mianwali	Pakpattan	Pakpattan
29	Chakwal	Jhang	Muzaffargarh
30	Narowal	Khushab	Jhang
31	Jhelum	Muzaffargarh	Lodhran
32	Rawalpindi	Lodhran	Khushab
33	Gujrat	Multan	Multan
34	Sheikhupura	DG Khan	DG Khan
35	Lahore	Chiniot	Chiniot
36	Gujranwala	Rajanpur	Rajanpur

Table 26: Contributing Factors of Inequities- Access to Improved Sanitation

Districts	Social Norm	Household Wealth status	Family Size	Education Level of Household Head	Urban-Rural	Gender of Household Head	Household Media Exposure
Bahawalpur	41.35	26.79	0.6242	9.71	12.2	0.4499	8.87
Bahawalnagar	41	31.82	1.74	9.02	5.98	0.3524	10.8
RY Khan	27.53	32.79	0.1343	13.81	10.79	0.2844	14.66
DG Khan	32.38	34.13	1.32	8.73	11.51	0.4696	11.45
Layyah	29.45	40.16	3.35	8.44	6.39	2.2	10
Muzaffargarh	28.71	40.1	2.29	14.84	2.47	0.3606	11.22
Rajanpur	29.35	30.58	1.94	13.68	9.5	0.8841	14.059
Faisalabad	45.31	23.49	1.48	9.96	13.38	0.1937	6.19
Chiniot	33.3	31.64	1.63	8.56	11.42	0.2594	13.18
Jhang	22.7	39.65	1.109	13.01	8.29	1.36	13.86
TT Singh	29.17	41.05	1.1	12.72	5.51	0.71	10.58
Gujranwala	24.54	44.51	6.23	7.84	7.18	3.65	6.05
Gujrat	21.34	46.53	2.78	14.3	6.64	2.85	5.54
Hafizabad	24.59	42.85	3.73	10.15	9	0.61	9.06
Mandi Bahauddin	23.07	49.45	0.38	13.49	6.32	0.38	6.9
Narowal	19.06	58.32	5.57	7.61	3.66	0.4	5.38

Districts	Social Norm	Household Wealth status	Family Size	Education Level of Household Head	Urban-Rural	Gender of Household Head	Household Media Exposure
Sialkot	75.61	9.8	3.64	0.84	7.65	2.29	0.15
Lahore	49.34	30.96	0.88	11.88		0.03	6.91
Kasur	58.06	16.51	1.43	9.6	8.58	1.09	4.73
Nankana Sahib	30.92	35.1	6.79	15.27	1.8	0.52	9.6
Sheikhupura	22.72	37.94	1.41	17.02	12.6	0.2	8.04
Multan	43.87	23.08	1.21	8.39	18.88	0.16	4.41
Khanewal	34.31	30.64	2.8	12.81	3.78	1.39	14.26
Lodhran	36.98	32.46	1.49	13.59	5.63	1.05	8.8
Vehari	44.95	28.96	1.04	7.3	6.14	0.2	11.41
Rawalpindi	25.35	41.59	0.13	8.41	14.39	0.98	9.14
Attock	27.85	44.29	4.77	8.29	5.28	0.26	9.24
Chakwal	24.09	40.86	2.2	14.53	4.85	1.53	11.93
Jhelum	20.93	51.22	1.87	6.01	9.12	2.05	8.8
Sahiwal	32.45	34.39	0.34	14.55	9.27	0.51	8.49
Okara	29.8	35.85	1.74	8.97	11.56	0.39	11.69
Pakpattan	34.3	33.09	1.57	9.79	7.74	1.06	12.43
Sargodha	29.73	40.71	0.52	9.01	9.78	1.23	9.02
Bhakkar	32.05	39.44	2.82	7.79	5.4	0.34	12.16
Khushab	25.47	36.42	2.79	12.26	9.76	0.14	13.15
Mianwali	37.55	36.92	1.2	11.13	2.87	0.15	10.18

The analysis of contributing factors for water and sanitation varied in each district. However social norm emerged as a key factor in southern districts of Punjab along with household wealth status for sanitation. For water, household wealth status and education level are key contributing factors. This shows the need of developing a comprehensive social behavioural change communication strategy that underpins climate resilient WASH and universal access to WASH. The recommendations for long term actions to reduce impacts of climate change on WASH are:

1. Recognise and address the complex interrelations between climate change risks and their subsequent impacts, instead of relying on risk analysis of individual hazards, for a systematic analysis of complex threats.
2. Build robust human, technical, and financial multisectoral coordination mechanisms to address climate change impacts on regional WASH and ensure adequate financing mechanisms to speed up investment in water management.
3. Ensure equitable access, availability, and quality to water and sanitation in all socioeconomic settings to improve risk management.
4. Develop and implement effective early warning systems as a part of disaster response plans at community, district, and provincial levels, with surveillance systems for WASH-related climate-sensitive diseases.
5. Ensure resilience of water and sanitation infrastructure as a major climate adaptation measure and explore sanitation technologies which offer alternatives to water-borne sanitation.
6. Build operational capacity of WASH sector to avoid additional burden of climate change threats and to ensure long-term resilience. Capacity building efforts need to focus both on

strengthening the systems and structures for governance, as well as the capacity for planning based on adaptive management and IWRM principles.

7. Develop and implement an effective social behavioural change communication strategy with a focus on addressing inequities and climate resilient WASH services.
8. Establish integrated monitoring systems that include indicators for measuring the impact of WASH and nutrition interventions, such as reductions in stunting rates and diarrhoea prevalence. This approach will help evaluate the effectiveness of WASH services in improving public health outcomes and mitigating the adverse effects of climate change on food security and nutrition.

THEORETICAL PROJECT CYCLE

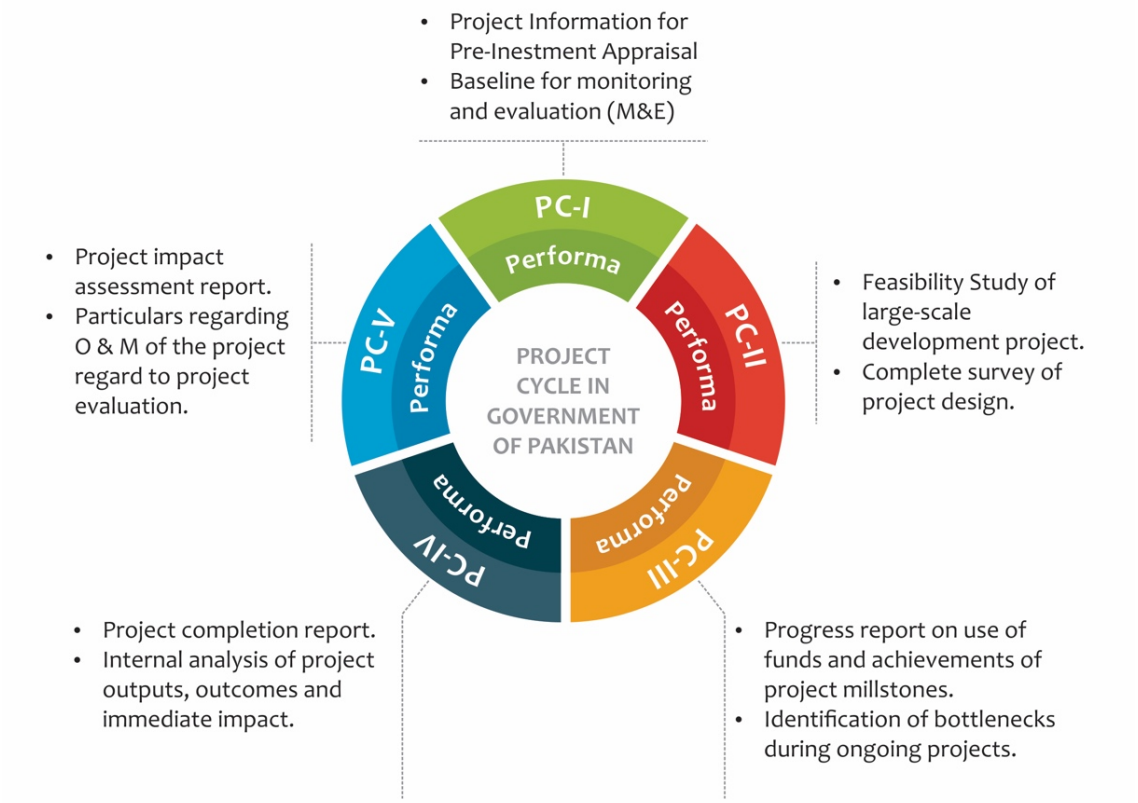
The Government of Punjab employs a structured project cycle for its schemes and initiatives, intended to ensure systematic planning, implementation, and evaluation of the projects. This cycle is defined by a series of Project Cycle (PC) documents, each representing a specific stage in the project lifecycle. While the framework is robust in theory, its practical application often reveals gaps, particularly for small and medium-sized projects.

The project cycle begins with PC-I, which serves as the project proposal. It is a critical step where the feasibility and alignment of the project with government priorities and development goals are assessed. Once approved, the project moves to the PC-II stage, which involves a detailed feasibility study. This step ensures that the different aspects of the project are thoroughly examined. PC-II provides the foundation for informed decision-making and minimises risks associated with project implementation.

During the implementation phase, the PC-III document is used to track progress via the Project Implementation Progress Report. This report monitors the execution of project activities against planned timelines, budgets, and deliverables. PC-III serves as an essential tool for identifying challenges during implementation and enables course correction to ensure the project stays on track.

Upon completion of the project, PC-IV is prepared as the project completion report. This document summarises the achievements of the project, evaluates its adherence to the planned scope, and identifies any deviations or shortcomings. It also provides an opportunity to document lessons learned, which can inform the planning and execution of future projects.

Figure 79: Project Cycle of Public Sector in Pakistan



The final stage of the project cycle, PC-V, is the project evaluation report. This document evaluates the long-term impacts, sustainability, and effectiveness of the project in achieving its objectives. It involves a comprehensive analysis of project outcomes, resource utilisation, and overall efficiency. However, PC-V is rarely developed for small and medium-sized projects due to resource constraints, limited capacity, or a perception that these projects do not warrant such detailed evaluation. Consequently, the PC-V process is often confined to mega-projects, where the scale and investment justify a more thorough evaluation.

The limited application of PC-V for smaller projects creates gaps in assessing their effectiveness and sustainability. This lack of evaluation prevents the government from systematically learning from these projects, identifying recurring issues, or improving the design of future interventions. To strengthen the project cycle, there is a need to Institutionalise the development of PC-V for all projects, regardless of size. Simplified evaluation processes could be introduced for smaller projects to make this feasible without imposing excessive administrative burdens. By fully operationalising the theoretical project cycle, the government can enhance accountability, ensure efficient use of resources, and maximise the impact of its development initiatives.

COORDINATED FRAMEWORK FOR WASH PLANNING AND MONITORING IN PUNJAB

Punjab's WASH sector operates under a structured framework involving key provincial agencies like the P&D Board, Finance Department, HUD & PHED, WASAs, and LG&CDD This framework is informed by national and provincial surveys, including MICS and PSLM, which provide critical data on water, sanitation, and hygiene indicators. The P&D Department uses this data to prioritise annual plans,

focusing on infrastructure development, service improvements, and rehabilitation in underserved areas. The Finance Department ensures resource allocation through the Annual Development Plan (ADP), targeting projects aligned with sustainable development and climate resilience goals. Monitoring is conducted through regular inspections, progress reports, and site visits, while surveys track outcomes like access to safe water and sanitation, ensuring alignment with SDG 6. This coordinated approach enhances planning, resource distribution, and accountability in Punjab's WASH initiatives.

Infrastructure Development and Monitoring Mechanisms

Infrastructure development under WASH initiatives often lacks robust O&M mechanisms. A significant portion of schemes have become non-functional due to the absence of monitoring systems that track infrastructure performance over time. The Punjab Green Development Programme has introduced real-time water quality monitoring stations to address this gap, aiming to provide live updates and enhance public accountability. Additionally, efforts such as the digitisation of WATSAN infrastructure mapping in 200 cities, with progress in 30 cities to date, are steps toward creating a comprehensive database for monitoring and planning purposes.

Financial Allocation and Resource Management

Financial monitoring within the WASH sector is constrained by disparities in resource allocation across districts. Over the past decade, there has been no systematic analysis of financial equity in resource distribution, creating inefficiencies in addressing local needs. Municipal Committees and Corporations face severe resource shortages, further limiting their capacity to monitor and manage WASH services effectively. M&E mechanisms must incorporate tools to track financial flows and ensure that resources are allocated based on evidence and community needs.

Institutional Coordination and Policy Implementation

The fragmented roles of multiple entities, including WASAs, Local Government, and the Aab-e-Pak Authority, hinder effective M&E in the WASH sector. Overlapping mandates create jurisdictional conflicts, making it challenging to coordinate monitoring efforts. The PWRC has been operational for five years, but the Punjab Water Services Regulatory Authority remains inactive due to operational and political challenges. Furthermore, there is no unified baseline data to inform monitoring frameworks.

Community Engagement and Social Assessments

Social and environmental assessments, critical for effective M&E, are often overlooked in the design and implementation of WASH schemes. Community engagement during the identification and assessment of needs is limited, reducing ownership and sustainability of interventions. Past successful approaches, such as requiring community contributions and ensuring ongoing support post-implementation, are no longer consistently applied. This limits the effectiveness of current WASH projects and their ability to meet community needs.

Key Performance Indicators (KPIs)

Monitoring progress against KPIs has been initiated for some entities, such as WASAs, with updates expected by soon. These KPIs include water treatment coverage, infrastructure performance, and service delivery standards. However, a lack of standardised KPIs across the sector limits the ability to evaluate the overall performance of WASH services. Data from real-time monitoring systems and periodic surveys needs to be integrated to provide a comprehensive assessment of progress and identify areas for improvement.

DATA SOURCES FOR WASH-RELATED INDICATORS

Accurate and reliable data resources are essential for informed decision-making in the WASH sector, as they provide a clear understanding of the current state of water, sanitation, and hygiene services. Comprehensive data allows policymakers and stakeholders to identify gaps, allocate resources effectively, and monitor progress toward national and global targets such as the SDGs. It enables evidence-based planning by highlighting disparities in access, assessing the quality of services, and evaluating the impact of interventions. Furthermore, accurate data supports accountability and transparency by ensuring that decisions are guided by verifiable information, ultimately leading to more equitable and sustainable WASH solutions. Without robust data systems, the sector risks inefficient investments and failure to address the needs of vulnerable populations.

Table 27: Data Sources for WASH-Related Indicators

Survey/ Report & Publishing Agency	Relevant Indicators
Global GLAAS (Global Analysis and Assessment of Sanitation and Drinking-Water WHO and UN-Water) Every 2-3 years Latest Published: 2022 GLAAS 2024/2025 data collection cycle is underway.	Provides an overview of the global status of WASH systems, focusing on progress towards SDG 6. In the context of Pakistan, covers: - WASH Policies and Governance: - Financing and Investment Gaps: - Institutional Coordination: - Access and Equity: - Human Resources and Capacity: - Climate Resilience and Health Impacts. This report uses data submitted by countries, so information on Pakistan would be based on government or third-party submissions relevant to the GLAAS survey. It provides insights into Pakistan's progress and ongoing challenges, which can serve as valuable context for understanding and improving the country's WASH sector within the framework of SDG 6.
Global JMP (Joint Monitoring Programme) WHO and UNICEF Annual updates, biennial reports	JMP plays a central role as the custodian of global data on WASH across various settings, including households, schools, and HCFs. JMP's estimates are derived from comprehensive data gathered by national authorities, ensuring that these insights are rooted in localised, context-specific information. Moreover, JMP actively produces a wide array of publications and reports tailored to the WASH landscape in individual countries. These documents provide critical insights into current conditions and highlight areas needing improvement. Through these efforts, JMP not only monitors but also encourages ongoing improvements in WASH services, offering data-driven recommendations and advocating for policies that address the unique needs of all population segments, thereby advancing global goals for sustainable, safe, and inclusive WASH access.
Global SACOSAN Report (South Asian onference on Sanitation) SACOSAN Secretariat (SAARC) Every 2-3 years Latest: 2018	Used as a platform for monitoring and promoting progress in sanitation and hygiene across South Asian countries, including Pakistan. While SACOSAN itself is a conference and not a regular data collection or survey mechanism, it serves a monitoring function by: - Setting Regional Goals - Reviewing Progress - Publishing Outcome Reports - Encouraging Accountability

Survey/ Report & Publishing Agency	Relevant Indicators
National PDHS (Pakistan Demographic and Health Survey) Pakistan Bureau of Statistics (PBS), Ministry of National Health Services, Regulation, and Coordination, with support from USAID, UNFPA, and UNICEF Every 5 years Latest Published: 2017-18	Includes significant data on WASH indicators in Punjab. Specifically, it covers the following aspects: - Access to Drinking Water: - Sanitation Facilities: - Handwashing Practices: - Child Health and Waterborne Diseases: Regional Comparisons:
National PSLM (Pakistan Social and Living Standards Measurement) Pakistan Bureau of Statistics (PBS) Alternate Years at Provincial and District Level Latest Published:2019-20	PSLM survey offers a comprehensive view of Punjab's WASH landscape, covering drinking water sources, sanitation facilities, hygiene practices, and waste management. - Sources of Drinking Water - Access to Safe Drinking Water - Distance to Water Sources - Service providers for water - Sanitation Facilities - Open Defecation - Type of sanitation and drainage systems - Hygiene Practices - Waste Management:
National NNS Ministry of National Health Services, Regulation, and Coordination, with support from UNICEF and other partners Every Five Years (both national and district level) Latest Published: 2018	Provides a comprehensive view of the WASH situation, focusing on water quality, sanitation access, and hygiene practices. - Drinking Water Quality - Access to Improved Drinking Water - Sanitation Facilities - Open Defecation - Safe Disposal of Child Faeces - Handwashing Practices
National Climate Risk Assessment for WASH Sector in Pakistan Ministry of Climate Change (and Environmental Coordination), UNICEF First Report Latest Published: 2021	Covers the following WASH aspects in the context of Punjab: - Risk of Waterborne Diseases: - Water Access and Quality: - Sanitation and Hygiene Practices: - Environmental and Climatic Impact: - Vulnerable Populations: - Infrastructure and Service Gaps: - Recommendations for Improvement: *The assessment is primarily an analytical and evaluative document. It does not involve primary data collection but rather uses existing data and assessments from various sources to analyse WASH risks and challenges. It synthesises information from previous studies, reports, and data sources to provide an overview of WASH conditions and risks.*
National Scoping Study to Establish a Baseline for Reporting to SDGs for WASH in HCFs	Evaluation of WASH services in HCFs across Pakistan, including those in Punjab. Key aspects covered in the report are: - Water Supply - Sanitation

Survey/ Report & Publishing Agency	Relevant Indicators
Ministry of National Health Services, Regulation and Coordination, UNICEF First Report Latest Published: 2021	- Hand Hygiene Facilities - Waste Management - Infrastructure Assessment: Infection Prevention and Control (IPC)
National Population Census Pakistan Bureau of Statistics (PBS) Irregular Timeline Latest Published: 2023	7th Population and Housing Census provides detailed data on household facilities, including: - The sources of drinking water - Types of toilet and washroom facilities available to households
National/ Provincial PCRWR Reports PCRWR, Ministry of Science and Technology Regular Reports Latest Published: 2023-24 (annual report)	The report highlights several key initiatives and activities related to Punjab, such as water quality testing and monitoring in major cities to identify contamination hotspots and improve drinking water safety. It also covers pilot projects for rainwater harvesting in urban and peri-urban areas, focusing on installing systems in schools and public buildings. Additionally, it discusses groundwater studies in canal command areas, mapping recharge zones, and assessing extraction patterns to ensure sustainable water resource management. Additionally, PCRWR issues numerous reports on water management, water quality across Punjab.
National/ Provincial JSR UNICEF, Ministry of Climate Change and Environmental Coordination and Provincial Government Departments Irregular Timeline Latest: 2021	The JSR utilised WASH-Bottleneck Analysis Tool (WASH-BAT) to access the current situation of WASH and services in Punjab: WASH Facilities Sector Financing and Budget Analysis Institutional Roles, Policies, and Governance Capacity Development Monitoring and Evaluation Alignment with SDGs Recommendations
National and Provincial ASER (Annual Status of Education Report) Idara-e-Taleem-o-Aagahi (ITA) Annually Latest Published: 2023	The national report discusses WASH facilities in schools across regions, including Punjab. It covers the availability of functional sanitation facilities, access to usable drinking water, and the presence of handwashing stations with running water. The report examines these aspects in both government and private primary schools, highlighting differences in WASH infrastructure and noting the gaps in essential facilities, especially in government schools. The provincial publications cover WASH in the context of school infrastructure. They highlight the availability of functional sanitation facilities, access to clean drinking water, and handwashing facilities in schools across in Punjab, noting areas with deficits and areas where infrastructure exists but may be limited in accessibility or functionality.
Provincial Annual School Census Programme Monitoring and Implementation Unit, School Education Department Annual Updates Latest Published: 2023-24	The Census provides detailed information on WASH facilities in schools across Punjab, broken down by district, gender, and educational level. Specifically, it covers: - Schools with Drinking Water Access: - Schools with Toilet Facilities: - Handwashing Facilities: - Sanitation and Hygiene in ECCE: - Student-to-Toilet Ratio: - Gender-Sensitive Sanitation:

Survey/ Report & Publishing Agency	Relevant Indicators
Provincial MICS UNICEF in collaboration with provincial governments Irregular Timeline Latest Published: 2017-18 The data for MICS 2024 has been collected and is currently being analysed.	This comprehensive data provides insights into the availability, quality, and safety of WASH services in Punjab, informing targeted interventions to improve health outcomes and access to essential services. Use of Improved and Unimproved Water Sources Use of Basic and Limited Drinking Water Services Person Collecting Water Time Spent Collecting Water Availability of Sufficient Drinking Water When Needed Quality of Source Drinking Water Quality of Household Drinking Water Safely Managed Drinking Water Services Household Water Treatment Handwashing Facility with Soap and Water on Premises Use of Improved and Unimproved Sanitation Facilities: Use of Basic and Limited Sanitation Services Emptying and Removal of Excreta from On-Site Sanitation Facilities Management of Excreta from Household Sanitation Facilities Disposal of Child's Faeces Drinking Water, Sanitation, and Handwashing Ladders MHM Exclusion from Activities During Menstruation
Provincial District Health Information System (DHIS) Directorate General of Health Services Regular Online Updates	DHIS is a facility-based routine health information system used for data collection, analysis, and feedback across HCFs. Functional in all districts of Punjab since 2009, it supports performance monitoring, evidence-based decision-making, and policy implementation at district and provincial levels. DHIS provides essential indicators for planning and monitoring disease patterns, preventive services, and resource management. Feedback reports analyse key performance indicators, helping district managers and facility in-charges identify problems, plan and implement solutions, and evaluate outcomes. It also tracks diseases like diarrhoea and cholera, highlighting links to WASH services.

Joint Sector Review of Punjab – District level Case Study

The Joint Sector Review (JSR) process is a periodic and inclusive mechanism that brings together government entities, development partners, and civil society organisations to comprehensively assess the performance of a specific sector. Within the Water, Sanitation, and Hygiene (WASH) sector, JSR serves as a critical tool for identifying challenges, aligning policies, and fostering collaboration to improve service delivery and sustainability. By consolidating evidence from data, literature reviews, and stakeholder consultations, JSRs aim to strengthen sector governance, resource allocation, and operational effectiveness.

In Pakistan, the Ministry of Climate Change (MoCC), supported by partners like UNICEF, introduced the JSR process in 2016. This included integrating the WASH Bottleneck Analysis Tool (WASH-BAT), which facilitates a systematic assessment of sectoral gaps and their underlying causes. The methodology identifies five key building blocks for review: sector policy and strategy, institutional arrangements, financing, monitoring and evaluation, and capacity development. The initial round of provincial JSRs conducted in 2017-18 informed key decisions

across provinces, such as influencing Balochistan's public sector budget prioritises, feeding into Punjab's Economic Growth Strategy, revising KP's WASH Sector Master Plan, and shaping Sindh's SDG Strategy and WASH Sector Development Plan.

Building on these successes, the first district-level WASH JSR was conducted in Jhang, Punjab, offering an opportunity to localise the assessment process and address grassroots challenges. The JSR in Jhang focused on evaluating the accessibility, quality, and sustainability of WASH services while identifying systemic issues. The process involved stakeholder consultations, reviews of existing literature and frameworks, and bottleneck analysis workshops, which allowed local authorities and partners to collaboratively identify gaps and actionable solutions.

Findings from Jhang highlighted significant disparities in access to safe drinking water and sanitation services, particularly in rural and economically disadvantaged areas. For instance, 31 percent of households lacked any form of sanitation, and open defecation was prevalent among the poorest communities. Access to clean drinking water also showed disparities, with rural areas more dependent on groundwater sources that are often prone to contamination. Institutional challenges such as overlapping roles among departments, weak coordination mechanisms, and limited community involvement during the planning stages were identified as critical barriers to effective WASH service delivery. Additionally, financial constraints, including inadequate budget allocations and insufficient resources for awareness campaigns, further hindered progress.

The JSR process in Jhang proposed several recommendations to address these challenges. These included the development of a district-level WASH plan through stakeholder consultations, enhanced capacity-building initiatives for service providers, and the introduction of more effective coordination mechanisms among local government departments. Community engagement was identified as a key priority, with a need to involve local populations from the planning stages of WASH interventions to ensure ownership and sustainability. The review also emphasised the importance of mobilising resources, both through improved public sector financing and partnerships with private entities, to expand access to safe water and sanitation facilities.

Beyond the immediate findings, the Jhang WASH JSR serves as a valuable model for decentralised assessments, demonstrating how localised reviews can generate actionable insights tailored to specific needs. It provides a framework for scaling up interventions across other districts in Pakistan, offering a roadmap for improving WASH services at both provincial and national levels. As the country continues to align its efforts with global commitments such as the SDGs the role of district-level JSRs will be instrumental in bridging policy gaps, enhancing accountability, and ensuring equitable access to WASH services for all.

PERFORMANCE MANAGEMENT FRAMEWORK FOR WATER AND SANITATION SERVICES IN PUNJAB

Indicator	Definition	Means of Verification	Frequency of Collection
Outcome Level Indicators	**Objective:** Ensure availability and sustainable management of water and sanitation for all in both rural and urban areas.		
Reduction in waterborne diseases	Percentage reduction in diseases caused by contaminated water	Health department reports, Surveys	Annually
Open defecation rate	Percentage reduction in the practice of open defecation	Household surveys, Community reports	Annually
Water service reliability	Percentage of time water supply services are available	Service logs, Household surveys	Quarterly
Reduction in urban flooding (Urban)	Frequency and severity of urban flooding events caused by poor sanitation and drainage	Flood reports, Community feedback	Annually
Output Level Indicators	**Objective:** Improve the efficiency and effectiveness of water and sanitation services in both rural and urban areas.		
Water supply coverage	Percentage of households with access to a reliable water supply	Service coverage maps, Records	Quarterly
Functionality of water systems	Percentage of water systems functioning properly	Maintenance logs, Inspection reports	Quarterly
Availability of sanitation facilities	Percentage of public places with adequate sanitation facilities	Sanitation inspection reports	Quarterly
Quality of drinking water	Percentage of water samples meeting national water quality standards	Water quality test reports	Monthly
School water and sanitation facilities	Percentage of schools with functional water and sanitation facilities	School inspection reports	Quarterly
Availability of handwashing facilities	Percentage of households and public places with handwashing facilities	Household surveys, Inspection reports	Quarterly
Number of community water filtration points	Number of operational community water filtration points	Inspection reports, Community reports	Quarterly
Sanitation facility maintenance	Percentage of sanitation facilities that are regularly maintained	Maintenance logs, Inspection reports	Quarterly
Wastewater treatment coverage	Percentage of households connected to wastewater treatment systems	Service records, Inspection reports	Biannually

Indicator	Definition	Means of Verification	Frequency of Collection
Urban drainage system functionality (Urban)	Percentage of urban drainage systems functioning properly	Inspection reports, Maintenance logs	Quarterly
Process Level Indicators	**Objective:** Ensure effective processes and operations for water and sanitation services in both rural and urban areas.		
Community engagement activities	Number of community meetings and awareness programme conducted	Event reports, Attendance records	Quarterly
Staff training and capacity building	Number of training sessions conducted, and staff trained	Training attendance sheets, Certificates	Quarterly
Timeliness of repair and maintenance	Average time taken to repair and maintain water and sanitation facilities	Maintenance logs, Customer reports	Monthly
Cleanliness of water storage tanks	Percentage of water storage tanks cleaned and maintained	Inspection reports, Maintenance logs	Quarterly
Compliance with safety standards	Number of incidents related to non-compliance with safety standards	Incident reports, Safety audits	Monthly
Proper disposal of sanitation waste	Percentage of sanitation waste disposed of in an environmentally safe manner	Sanitation waste disposal records	Monthly
Water quality testing frequency	Number of water quality tests conducted per quarter	Water quality test reports	Quarterly
Hygiene promotion activities	Number of hygiene promotion activities conducted	Event reports, Attendance records	Quarterly
Local water committees	Number of operational local water committees	Committee reports, Meeting minutes	Quarterly
Budget allocation for water and sanitation	Percentage of local budget allocated to water and sanitation services	Financial reports, Budget documents	Annually
Customer satisfaction	Percentage of users satisfied with water and sanitation services	Customer surveys, Feedback forms	Biannually
Monitoring and reporting accuracy	Accuracy and completeness of monitoring and reporting data	Audit reports, Data quality assessments	Quarterly
Public toilet availability (Urban)	Number of public toilets available per capita in urban areas	Inspection reports, Community surveys	Quarterly
Response to water leakages	Average response time to repair reported water leakages	Service logs, Customer reports	Monthly

Strategic Action for Monitoring and Evaluation

Short Term (1-3 Years)	Medium Term (4-6 Years)	Long Term (7-10 Years)
Develop and implement standardised KPIs for monitoring WASH progress across all districts.	Scale up real-time digital monitoring systems, including water quality sensors and infrastructure tracking tools.	Institutionalise a comprehensive M&E framework with routine third-party audits to enhance accountability.
Train local government staff and WASA personnel on improved M&E tools and digital reporting.	Establish a WASH Index and develop a district-level planning tool based on data.	Integrate WASH indicators into district and provincial decision-making processes.
Develop a real-time integrated WASH dashboard at the provincial level utilising the existing datasets MICS, PSLM, and other WASH-related datasets.	Use predictive analytics to identify high-risk areas for WASH-related interventions and optimise resource allocation.	Ensure interoperability of the WASH dashboard with other provincial and national governance platforms for cross-sectoral planning and policy formulation.
Digitalise complaint registration and redressal systems for improved service response.	Develop a mobile application for citizen engagement and WASH service feedback.	Promote community-led monitoring and accountability mechanisms.

PUNJAB WASH INVESTMENT NEED 2025-35

INVESTMENT-OPTION 1

To achieve 100 percent coverage of safely managed drinking water services and safely managed sanitation services, Punjab province would require an estimated investment of Rs. 8,831.59 billion over the period of next ten years (FY 2025-26 to FY 2034-35). This investment not only includes the development costs for WASH schemes but also accounts for operation and maintenance (O&M) expenses, as well as community mobilisation and monitoring efforts to ensure the sustainability of WASH infrastructure. Additionally, Rs. 15.06 billion would be required to create a better enabling environment for the effective and efficient implementation of WASH services under the WASH system reform plan. Therefore, the total WASH investment need for Balochistan amounts to Rs. 8,846.64 billion for the next ten years, covering both direct and indirect costs.

Table 28: WASH Investment needs – Option 1 (In Rs. millions)

Theme	Short Term	Medium Term	Long Term	Total
	2025-2028	2028-2031	2031-2035	
In-Direct Cost	**Short term**	**Medium Term**	**Long Term**	**Total**
Strategic Actions for Climate Resilient WASH	393	750	60	1,203
Strategic Actions for Enhancing Legislation and Policy Implementation in WASH Services	134	22	17	173
Strategic Actions for Institutional Arrangements	32	60	127	219
Strategic Actions for Water Resources	2,020	105	10	2,135
Strategic Actions for Access to Safely Managed Water	20	370	10	400
Strategic Actions for Safely Managed Sanitation	3,722	15	3,611	7,347
Strategic actions for health and hygiene	108	41	113	262
Strategic Actions for WASH in Health Care Facilities (HCFs)	320	135	178	633
Strategic Actions for Enhancing WASH in Schools	457	380	20	857
Strategic Actions for Enhancing Gender Inclusivity in WASH	36	18	5	59
Strategic Actions for Sector Capacity	52	470	1,015	1,537
Strategic Actions for Sector Efficiency	61	10	36	107
Strategic Actions for Sector Financing	110	5	0	115
Strategic Actions for Monitoring& Evaluation	29	0	0	29
Total Indirect Cost	7,477	2,381	5,196	15,055
Direct Cost				
Direct costs Water Supply	1,246,225	1,246,225	1,661,633	4,154,083
Direct costs Sanitation	941,813	941,813	1,255,751	3,139,376
10% Water Supply and Sanitation O&M Cost	218,804	218,804	291,738	729,346
WASH in Schools	1,028	1,028	1,371	3,427
WASH in HCF	745	745	994	2,484
Social Mobilisation and Capacity Building Cost	240,861	240,861	321,149	802,872

Theme	Short Term	Medium Term	Long Term	Total
	2025-2028	2028-2031	2031-2035	
Total Direct Cost	2,649,476	2,649,476	3,532,635	8,831,588
Total Direct and Indirect costs	2,656,954	2,651,857	3,537,831	8,846,643

INVESTMENT-OPTION 2

For the option 1, Punjab province requires a total investment of Rs 8,846.64 billion (an annual average of Rs 884.66 billion over the next ten years) to achieve universal safely managed drinking water and sanitation services coverage. However, the available resource envelope with the provincial government remains highly constrained, as reflected in the recent budget allocation trend for WASH, which has remained around Rs 100 billion annually over the last three fiscal years (2021-22 to 2023-24).

Assuming that effective advocacy efforts lead to a maximum possible WASH budget allocation of Rs 150 billion for 2025-26, followed by a 15 percent annual increase over the next decade, the total cumulative investment in the WASH sector would amount to approximately Rs 3 trillion. Despite this projected increase, there would still be a funding gap around Rs 6 trillion to meet the full investment requirement for the option 1 of the investment for universal safely managed WASH services.

Thus, within the constraints of the current resource envelope, a more feasible approach is proposed as Option 2. This option sets a realistic target of achieving 34 percent coverage of safely managed drinking water and 50 percent coverage of safely managed sanitation services, while ensuring that the remaining 66 percent of the population is served with basic water services and 50 percent with basic sanitation services. The total investment required for Option 2 is estimated at Rs 3,018.45 billion, comprising Rs 3,003.39 billion in direct costs for WASH infrastructure and Rs 15.06 billion in indirect costs for strengthening the WASH enabling environment. This approach presents an achievable investment framework that aligns with provincial budgetary realities, making it a practical pathway for improving WASH services in Punjab.

Figure 80: Annual Investment Case – In Rs. Billion

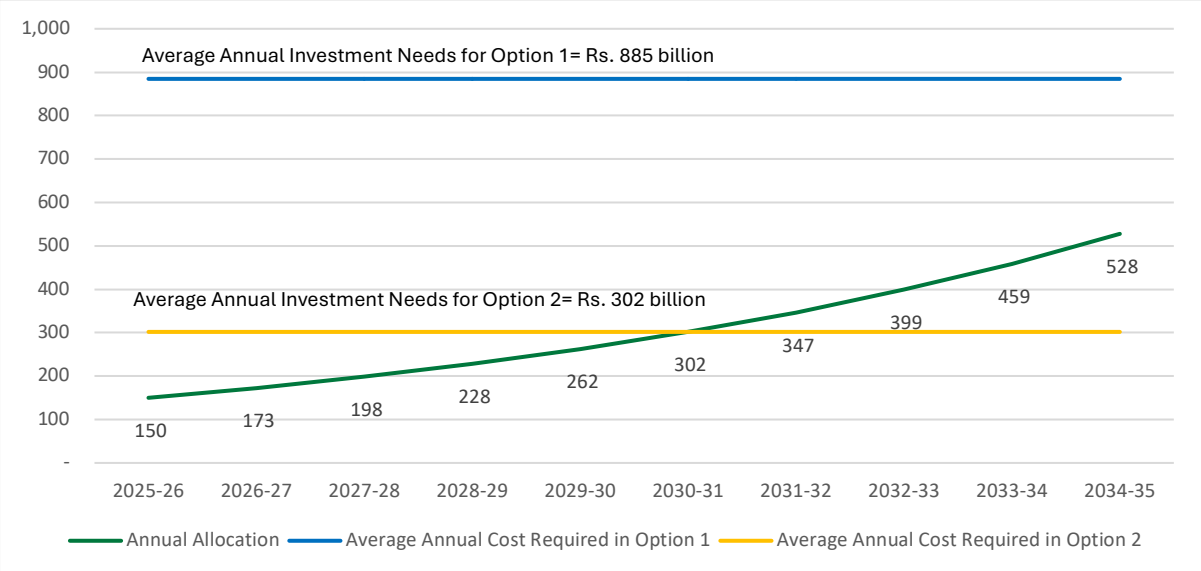


Figure 81: Cumulative Investment Case - In Rs. Billion

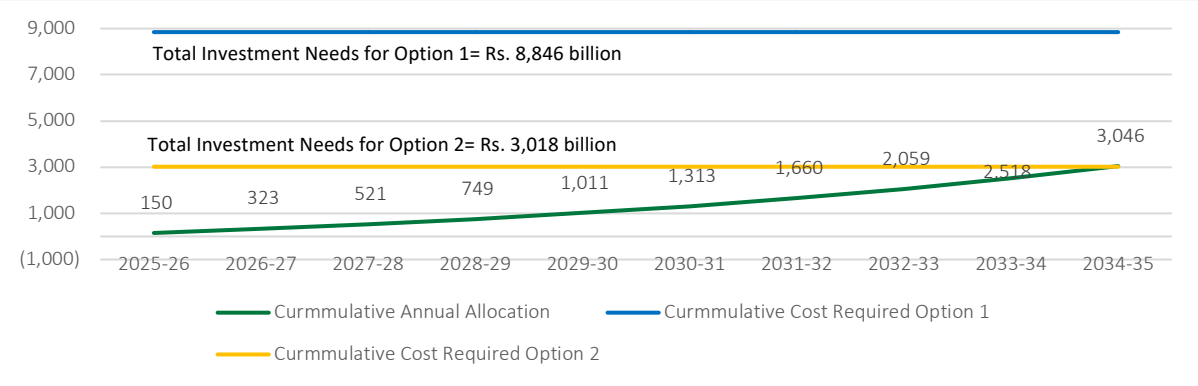


Table 29:WASH Investment needs – Option 2 (In Rs. millions)

Theme	Short Term	Medium Term	Long Term	Total
	2025-2028	2028-2031	2031-2035	
Strategic Actions for Climate Resilient WASH	393	750	60	1,203
Strategic Actions for Enhancing Legislation and Policy Implementation in WASH Services	134	22	17	173
Strategic Actions for Institutional Arrangements	32	60	127	219
Strategic Actions for Water Resources	2,020	105	10	2,135
Strategic Actions for Access to Safely Managed Water	20	370	10	400
Strategic Actions for Safely Managed Sanitation	3,722	15	3,611	7,347
Strategic actions for health and hygiene	108	41	113	262
Strategic Actions for WASH in Health Care Facilities (HCFs)	320	135	178	633
Strategic Actions for Enhancing WASH in Schools	457	380	20	857
Strategic Actions for Enhancing Gender Inclusivity in WASH	36	18	5	59
Strategic Actions for Sector Capacity	52	470	1,015	1,537
Strategic Actions for Sector Efficiency	61	10	36	107
Strategic Actions for Sector Financing	110	5	0	115
Strategic Actions for Monitoring& Evaluation	29	0	0	29
Total Indirect Cost	7,477	2,381	5,196	15,055
Direct Cost				
Direct costs Water Supply	318,234	318,234	424,312	1,060,780
Direct costs Sanitation	424,796	424,796	566,395	1,415,988
10% Water Supply and Sanitation O&M Cost	74,303	74,303	99,071	247,677
WASH in Schools	1,028	1,028	1,371	3,427
WASH in HCF	745	745	994	2,484
Social Mobilisation and Capacity Building Cost	81,911	81,911	109,214	273,036
Total Direct Cost	901,018	901,018	1,201,357	3,003,392
Total Direct and Indirect costs	908,495	903,399	1,206,553	3,018,446

Indirect Costs

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
A	**Strategic actions for Climate Resilient WASH**								
A1	***Short term actions***								
A1.1	Conduct an audit of WASH infrastructure to identify climate vulnerabilities, including sanitation systems.	1		10,000,000	10,000,000			10,000,000	Consultancy fee, assessment,
A1.2	Implement rainwater harvesting systems in public buildings such as schools, hospitals, and community toilets.	36	Schemes	2,000,000	72,000,000			72,000,000	construction cost
A1.3	Install water quality and wastewater monitoring stations to reduce contamination risks.	9	Station	10,000,000	90,000,000			90,000,000	Monitoring system/ station, consultancy fee
A1.4	Develop early warning systems for climate hazards like floods and heatwaves, and train communities in preparedness.	9	EWS	10,000,000	90,000,000		0	90,000,000	Development cost
A1.5	Launch public awareness campaigns on climate-resilient WASH practices, including safe water storage, sanitation, and hygiene.	3	Campaign	3,000,000	9,000,000			9,000,000	BCC, IEC material
A1.6	Train local government officials and CBOs in managing climate-resilient WASH and sanitation systems.	360	persons	20,000	7,200,000			7,200,000	Event cost, consultancy fee
A1.7	Strengthen disease surveillance systems for climate-sensitive illnesses such as cholera and dengue.	1	System	5,000,000	5,000,000			5,000,000	System strengthening at DoH
A1.8	Assess and document the potential for generating carbon credits through sustainable sanitation projects.	1	Assessment	5,000,000	5,000,000			5,000,000	Consultancy, workshop
A1.9	Mobilise climate financing through partnerships with multilateral agencies, focusing on eco-sanitation and waste-to-energy projects.	1		5,000,000	5,000,000			5,000,000	consultant engagement
A1.10	Provide financial incentives to rural households for adopting resilient sanitation solutions like elevated latrines, biogas toilets, and flood-proof septic systems.	1	incentive	100,000,000	100,000,000			100,000,000	incentive @ 10,000 per HH
	Subtotal of A1				**393,200,000**	**-**	**-**	**393,200,000**	
A2	***Medium term actions***								

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
A2.1	Retrofit WASH facilities, including sanitation systems, to improve flood resilience and stormwater drainage.	100	Facilities	1,000,000		100,000,000		100,000,000	Upgradation and rehabilitation
A2.2	Scale up solar and alternative energy solutions for WASH facilities, including sanitation systems.	1	province	-		-		-	Covered under direct cost
A2.3	Establish wastewater treatment plants in urban and intermediate cities to promote water recycling and sludge management.	5	City	100,000,000		500,000,000		500,000,000	construction cost
A2.4	Encourage industries to adopt treated wastewater reuse and co-finance industrial sanitation projects through regulatory incentives.	1	scheme	50,000,000		50,000,000		50,000,000	Cost sharing / co financing with industry/ private sector
A2.5	Construct small dams, community ponds, and eco-sanitation systems in drought-prone areas to ensure water availability and sanitation safety.	1	fund	-		-		-	Covered under direct cist
A2.6	Deploy eco-sanitation solutions in water bodies to prevent contamination during floods.	1	fund	-		-		-	Covered under direct cist
A2.7	Expand community-led WASH and eco-sanitation initiatives in high-risk areas to ensure local ownership and sustainability.	1	fund	-		-		-	covered under direct cost
A2.8	Launch pilot projects to implement carbon credit mechanisms for sanitation initiatives.	1	Pilot	100,000,000		100,000,000		100,000,000	implementation
A2.9	Establish a dedicated provincial Climate Resilient WASH Fund to support large-scale adaptation and mitigation projects, including sanitation.	1	Fund	-		-		-	Covered under direct cost
A2.10	Introduce sanitation programmes for peri-urban areas with climate-resilient designs, including systems for composting and reuse.	1	program	0		-		-	Covered under direct cost
	Subtotal of A2				**-**	**750,000,000**	**-**	**750,000,000**	
A3	***Long term actions***								
A3.1	Develop a province-wide IWRM framework, integrating sanitation for sustainable water management.	1	Framework	10,000,000			10,000,000	10,000,000	Consultancy fee, workshop

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
A3.2	Achieve a 50:50 balance between groundwater and surface water use, with resilient sanitation systems province-wide.	1		0			-	-	
A3.3	Ensure 100 percentage climate-resilient water supply and sanitation coverage by 2034.	1					-	-	Covered under direct cost
A3.4	Introduce smart water management systems, including digital monitoring, remote sensing, and carbon credit tracking for sanitation.	1	System	20,000,000			20,000,000	20,000,000	consultancy fee, , establishment , workshop
A3.5	Promote the use of constructed wetlands for natural wastewater treatment and carbon sequestration in urban and peri-urban areas.	1	project	-			-	-	Covered under direct cost
A3.6	Align all WASH infrastructure developments, including sanitation systems, with Pakistan's Nationally Determined Contributions (NDCs).	1	System/ policy	10,000,000			10,000,000	10,000,000	Consultancy fee, workshop
A3.7	Expand the use of alternative energy sources to meet 50 percentage of WASH and sanitation energy needs.	1		0			-	-	Covered under direct cost
A3.8	Integrate carbon credit trading for sanitation into provincial financing frameworks to attract international investments.	1	integration	10,000,000			10,000,000	10,000,000	Consultancy fee, meetings
A3.9	Strengthen legislative frameworks to support climate-adaptive WASH and sanitation policies in line with global agreements.	1	Framework	10000000			10,000,000	10,000,000	Consultancy fee, meetings
A3.10	Develop carbon-neutral WASH systems, integrating renewable energy and advanced waste management for sanitation sustainability.	1	system	0			-	-	Covered under A3.8
	Subtotal of A3				-	-	**60,000,000**	**60,000,000**	
	Total of A				**393,200,000**	**750,000,000**	**60,000,000**	**1,203,200,000**	
B	**Strategic actions for Enhancing Legislation and Policy Implementation in WASH Services**								
B1	***Short term actions***								
B1.1	Strengthen enforcement mechanisms by building the capacity of PWRA and local institutions.	1	Capacity	-	-			-	No cost required
B1.2	Revise the Punjab Water Act 2019 and Local Government Act 2022 to mandate climate-adaptive WASH infrastructure	1	Consultant	10,000,000	10,000,000			10,000,000	Consultancy fee, field work, meetings, workshop

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
B1.3	Pilot projects for retrofitting WASH infrastructure to withstand extreme weather events.	5	projects	20,000,000	100,000,000			100,000,000	
B1.4	Establish inter-departmental task forces to align efforts across WASH governance bodies.	1	Task force	0	-			-	No cost required
B1.5	Conduct training for municipal and council staff on water quality monitoring and compliance inspections.	720	staff	20,000	14,400,000			14,400,000	Event cost, consultancy
B1.6	Introduce tiered water pricing policy and services to encourage conservation and efficient water use.	1	Policy	10,000,000	10,000,000			10,000,000	Consultancy fee, meeting, workshop
	Subtotal of B1				**134,400,000**	-	-	**134,400,000**	
B2	***Medium term actions***								
B2.1	Expand climate-resilient sewerage and solid waste management infrastructure in urban and rural areas.	1	Fund	-	-	-	-	-	Covered under direct cost
B2.2	Roll out province-wide digital monitoring systems for tracking water quality, sanitation performance, and compliance.	1	Monitoring	-	-	-	-	-	No cost. , and A1.3
B2.3	Promote PPPs for financing and implementing sustainable WASH infrastructure projects.	1	Pilot	-	-	-	-	-	Covered under direct cost
B2.4	Provide advanced training on innovative technologies like constructed wetlands and aquifer storage recovery.	720	staff	30,000		21,600,000		21,600,000	Event cost, consultancy
B2.5	Scale up GIS-based mapping of WASH infrastructure for better planning and resource allocation.	1	province	-	-	-	-	-	No cost required
B2.6	Scale up water tiered pricing models and approaches across the province both in urban as well rural areas.	1	model	-	-	-	-	-	No cost required
	Subtotal of B2				-	**21,600,000**	-	**21,600,000**	
B3	***Long term actions***								
B3.1	Develop and operationalise a province-wide IWRM framework.	1	Consultant	-			-	-	Cost covered under A3.1
B3.2	Institutionalise climate-adaptive planning within all WASH-related laws, aligned with Pakistan's NDCs.	1		0			-	-	No cost required

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
B3.3	Establish a dedicated Climate Resilience Fund for WASH to support long-term adaptation and mitigation projects.	1		0			-	-	Covered under direct cost
B3.4	Engage international donors and private sector partners to co-finance large-scale climate-resilient projects.	1		0			-	-	No cost required
B3.5	Align WASH services with broader public health policies to address climate-sensitive diseases like cholera.	1	Policy	5,000,000			5,000,000	5,000,000	Consultancy fee,
B3.6	Launch targeted public awareness campaigns focusing on water conservation, hygiene practices, and wastewater risks.	4	Campaign	3000000			12,000,000	12,000,000	1 campaign per year
	Subtotal of B3				-	-	**17,000,000**	**17,000,000**	
	Total of B				**134,400,000**	**21,600,000**	**17,000,000**	**173,000,000**	
C	**Strategic actions for Institutional Arrangements**								
C1	***Short term actions***								
C1.1	Conduct a detailed institutional mapping to clarify roles and eliminate overlaps among stakeholders at all levels.	1	Mapping	10,000,000	10,000,000			10,000,000	Consultancy fee, meetings
C1.2	Train local government officials and staff in WASH governance, service delivery, and compliance with existing laws.	360	Staff	20,000	7,200,000			7,200,000	Event cost, consultancy fee
C1.3	Strengthen inter-departmental coordination through task forces focusing on water resource management and sanitation.	1		-	-			-	No cost required
C1.4	Launch public awareness campaigns to educate communities on the importance of WASH governance and their role in accountability.	1	Campaign	-	-			-	Cost covered under A1.5, B3.6
C1.5	Mobilise international donor support for short-term capacity building and emergency WASH interventions in high-risk areas.	1		-	-			-	No cost required
C1.6	Conduct workshops for elected local government representatives to promote understanding of their responsibilities in WASH governance.	10	Workshop	1,500,000	15,000,000			15,000,000	One workshop each in provincial capital and one each at divisional headquarter
	Subtotal of C1				**32,200,000**	-	-	**32,200,000**	
C2	***Medium term actions***								

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
C2.1	Develop an integrated provincial WASH governance framework to align responsibilities and mandates across institutions.	1	Framework	5,000,000		5,000,000		5,000,000	Consultancy fee
C2.2	Build capacity within district and municipal governments to plan and execute climate-resilient WASH projects.	1	Capacity building	-		-	-	-	Cost covered under A1.6, B2.4 and C1.2
C2.3	Expand partnerships with the private sector to promote public-private collaboration in WASH infrastructure development.	1	Partnership	0		-	-	-	No cost required
C2.4	Roll out provincial WASH digital monitoring systems to track project performance, resource utilisation, and compliance.	1		0		-	-	-	Cost covered under A1.3
C2.5	Pilot decentralised service delivery models to empower CBOs in managing local WASH initiatives.	1	Pilot project	50,000,000		50,000,000		50,000,000	Pilot in one district
C2.6	Design and implement financial models to ensure sustainable funding for municipal and district-level WASH services.	1	Financial model	5,000,000		5,000,000		5,000,000	Consultancy fee
	Subtotal of C2				-	**60,000,000**	-	**60,000,000**	
C3	***Long term actions***								
C3.1	Institutionalise a unified WASH regulatory framework with clear mandates for federal, provincial, and local levels.	1	Framework	0			0	-	Covered under A1.6
C3.2	Establish a fully operational and autonomous PWRA for robust WASH oversight.	1	Authority	100,000,000			100,000,000	100,000,000	Establishment cost,
C3.3	Create a centralised data repository for WASH planning and monitoring, integrating real-time digital tools.	1	Data repository system	10,000,000			10,000,000	10,000,000	Consultancy fee, establishment
C3.4	Implement long-term strategies for addressing WASH inequalities in marginalised and underserved communities.	1	Implement	0			0	-	Covered under direct cost
C3.5	Fully implement the Punjab Local Government Act 2022 to empower local councils for autonomous WASH governance.	1	Implement	0			0	-	Covered under direct cost
C3.6	Ensure integration of WASH strategies with Punjab's Climate Change Policy to achieve sustainable, adaptive outcomes.	1	Implement				0	-	No cost required
	Subtotal of C3				-	-	**110,000,000**	**110,000,000**	
	Total of C				**32,200,000**	**60,000,000**	**127,000,000**	**219,200,000**	

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
D	**Strategic actions for Water Resources**								
D1	***Short term actions***								
D1.1	Initiate rehabilitation of existing irrigation infrastructure to improve efficiency and reduce water wastage.	1	Infrastructure	1,000,000,000	1,000,000,000			1,000,000,000	Rehabilitation
D1.2	Promote modern irrigation techniques such as drip and sprinkler systems, particularly in water-scarce areas.	1	System	1,000,000,000	1,000,000,000			1,000,000,000	
D1.3	Establish and enforce regulations to control excessive groundwater extractions, prioritising high-risk districts.	1	Enforcement	-	-			-	No cost required
D1.4	Conduct groundwater mapping to identify critical depletion zones and create targeted management strategies.	1	Mapping	20,000,000	20,000,000			20,000,000	Consultancy, field work, meetings
D1.5	Introduce awareness programmes to educate communities on the importance of conserving and protecting groundwater resources.	1	awareness campaign	-	-	-	-	-	Cost covered under B3.6
D1.6	Promote rainwater harvesting systems in urban areas, schools, and public buildings, supported by financial incentives.	1	System	-	-	-	-	-	Covered under direct cost
D1.7	Incentivise adoption of water-efficient technologies, including water-saving appliances and low-flow plumbing systems.	1	Incentive	-	-	-	-	-	Covered under direct cost
	Subtotal of D1				**2,020,000,000**	**-**	**-**	**2,020,000,000**	
D2	***Medium term actions***								
D2.1	Implement IWRM practices across all districts to ensure equitable water allocation.	1	Implement	-		0	-	-	Covered under direct cost
D2.2	Establish provincial-level water usage planning and forecasting systems for sustainable management.	1	System	5,000,000		5,000,000		5,000,000	Consultancy
D2.3	Expand water quality monitoring systems, particularly in urban and industrial hubs, to prevent contamination.	1	Water quality monitoring	-		-		-	Covered under direct cost
D2.4	Scale up community – led water conservation initiatives in high risk climate zones, focusing on rural areas.	1	Incentive	100,000,000		100,000,000		100,000,000	Incentive for best user

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
D2.5	Establish treatment facilities for areas with high contamination levels of arsenic, fluoride, and nitrates.	1	treatment	-	-	-	-	-	Covered under direct cost
D2.6	Expand wastewater recycling projects across the province to reduce freshwater demand and promote reuse.	1	Project	-		0		-	Covered under direct cost
D2.7	Establish large-scale constructed wetlands for natural wastewater treatment and conservation in peri-urban areas.	1	waste water treatment	-		0		-	Covered under direct cost
	Subtotal of D2				-	**105,000,000**	**-**	**105,000,000**	
D3	***Long term terms***								
D3.1	Achieve a 30 percent reduction in groundwater extractions through enforcement of regulatory frameworks	1	Project	-			0	-	Covered under direct cost
D3.2	Implement basin-level water resource management plans incorporating stakeholder input to optimise water use.	1	Implement	-			-	-	Covered under direct cost
D3.3	Fully integrate groundwater recharge initiatives such as aquifer storage and recovery into provincial water management plans.	1	Plan	10,000,000			10,000,000	10,000,000	Consultancy, field work, workshop
D3.4	Institutionalise a centralised groundwater monitoring authority for data collection, policy enforcement, and resource allocation.	1	Authority	-			-	-	No cost required
D3.5	Ensure that all major urban centres have functional and sustainable groundwater management systems by 2034.	1	System	-			-	-	Covered under D3.4
D3.6	Ensure all WASH infrastructure is designed for climate resilience, capable of withstanding extreme weather events.	1	Infrastructure	-			-	-	Covered under direct cost
D3.7	Align all provincial water management strategies with national and international climate change commitments, including the NDCs.	1		-			0	-	No cost required
	Subtotal of D3				-	-	**10,000,000**	**10,000,000**	
	Total of D				**2,020,000,000**	**105,000,000**	**10,000,000**	**2,135,000,000**	
E	**Strategic actions for Access to Safely Managed Water**								
E1	***Short term actions***								

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
E1.1	Conduct an updated mapping of drinking water sources to identify areas with critical access gaps and contamination levels.	1	Mapping	20,000,000	20,000,000			20,000,000	Consultancy, field work, meetings
E1.2	Launch pilot projects for community-managed water supply schemes and water safety planning in underserved areas to promote ownership and sustainability.	1	Project	-	-			-	Covered under direct cost
E1.3	Scale up solar-powered water supply schemes in drought-prone regions to ensure sustainable and energy-efficient solutions.	1	Project	-	-			-	Covered under direct cost
E1.4	Conduct public awareness campaigns on the consequences of over-extractions and contamination of groundwater resources.	1	awareness campaign	-	-			-	Covered under A1.5 and b2.6
E1.5	Promote rainwater harvesting in urban areas through financial incentives and mandatory rainwater harvesting infrastructure in new constructions.	1	project	-	-			-	Covered under direct cost
E1.6	Set up mobile water quality testing units to provide immediate monitoring and testing capabilities in areas with high contamination risks.	1	Labs	-	-			-	Covered under direct cost
E1.7	Train local government officials and CBOs on water quality monitoring and early identification of contamination risks.	1	Training	-	-			-	Covered under A1.6, C1.2, B2.4
	Subtotal of E1				**20,000,000**	**-**	**-**	**20,000,000**	
E2	***Medium term actions***								
E2.1	Expand the piped water network in urban and rural areas, prioritising high-need districts, with a target to increase coverage by 20 percent.	1		-		-	-	-	Covered under direct cost
E2.2	Develop integrated water resource systems to ensure reliable water supply, including multi-source options such as groundwater, surface water, and rainwater.	1	System	0		-	-	-	Cost covered under A3.1
E2.3	Establish water filtration plants in all major urban centres and 30 percent of rural districts, prioritising areas with high contamination levels.	1		0		-	-	-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
E2.4	Develop a provincial groundwater monitoring system with real-time data on usage and quality to guide regulatory actions.	1	System	10,000,000		10,000,000		10,000,000	Consultancy fee, meeting, monitoring system
E2.5	Scale up wastewater recycling projects for non-potable uses in agriculture and industry, targeting a reduction in freshwater demand by 15 percentage.	1		0		-		-	Covered under direct cost
E2.6	Develop and enforce water quality improvement programmes, including filtration plants and awareness campaigns in contamination hotspots.	1		0		-	0	-	Covered under direct cost
E2.7	Introduce district-level water quality monitoring labs, covering both physical and chemical contaminants, with accessible reporting systems.	36	District	10000000		360,000,000		360,000,000	
	Subtotal of E2				-	**370,000,000**	-	**370,000,000**	
E3	***Long term actions***								
E3.1	Achieve universal access to improved drinking water sources across the province, focusing on safely managed water as per SDG 6 standards.	1		0			0	-	Covered under direct cost
E3.2	Implement district-wide infrastructure for multi-source water systems, ensuring redundancy and resilience in water supply against climate shocks.	1		0			0		Covered under direct cost
E3.3	Deploy advanced treatment technologies, such as reverse osmosis plants, in contamination-prone districts, ensuring water quality compliance.	1		0			0	-	Covered under direct cost
E3.4	Fully operationalise a centralised groundwater authority to oversee abstractions, recharge, and quality standards across all districts.	1	Authority	0			0	-	No cost required,
E3.5	Ensure that all WASH infrastructure is designed and retrofitted for climate resilience, including flood-proof and drought-resistant systems.	1					0		Covered under direct cost
E3.6	Ensure all urban and rural water supply schemes meet WHO and SDG standards for water quality, with regular audits to maintain compliance.	1					0		Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
E3.7	Establish an integrated province-wide water quality management system, using digital platforms to track contamination sources and mitigation efforts.	1	System	10000000			10000000	10,000,000	Consultancy, meetings, workshop
	Subtotal of E3				-	-	**10,000,000**	**10,000,000**	
	Total of E				**20,000,000**	**370,000,000**	**10,000,000**	**400,000,000**	
F	**Strategic actions for Safely Managed Sanitation**								
F1	***Short term actions***								
F1.1	Develop new programmatic approaches like City Wide Inclusive Sanitation (CWIS) for urban areas and community managed sanitation in rural areas with effective faecal sludge management	1	Program	-	-			-	Covered under direct cost
F1.2	Strengthen partnerships with local governments and NGOs to accelerate latrine construction in underserved areas.	1	Partnership	0	-			-	No cost required
F1.3	Rehabilitate and desilt 50 percent of existing sewerage networks in major cities such as Lahore, Faisalabad, and Multan.	1	Rehabilitation	0	-			-	Covered under direct cost
F1.4	Pilot cost-effective solutions for wastewater disposal and management in peri-urban areas.	1	solution	-	-			-	Covered under direct cost
F1.5	Train local government staff on maintenance and operational efficiency of sewerage and drainage systems.	360	Staff	10,000	3,600,000			3,600,000	One day training for staff
F1.6	Conduct an audit of existing wastewater treatment plants to identify non-functional systems and prioritise rehabilitation.	1	Audit	-	-			-	Cost covered under A1.1
F1.7	Promote low-cost bioremediation techniques for wastewater treatment in rural areas.	1	project	-	-			-	Covered under direct cost
F1.8	Expand ODF Punjab Programme to cover high OD districts and promote safe on-site sanitation practices.	1	program	-	-			-	Covered under direct cost
F1.9	Conduct district-level workshops to strengthen the capacity of local governments in managing sanitation services.	36	workshop	500,000	18,000,000			18,000,000	Event cost, consultancy
F1.10	Develop and implement a comprehensive solid waste management strategy in urban areas through PPP	36	district	100,000,000	3,600,000,000			3,600,000,000	cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
F1.11	Rehabilitate existing landfill sites and improve waste collection systems in low-performing cities like Muzaffargarh.	10	city	10,000,000	100,000,000			100,000,000	10 low performing city/ district
F1.12	Launch pilot projects for waste-to-energy initiatives in Lahore and Faisalabad	1	Project	-	-			-	Covered under direct cost
F1.13	Improve data collection mechanisms on industrial and hospital waste	1		0	-			-	No cost required
	Subtotal F1				**3,721,600,000**	-	-	**3,721,600,000**	
F2	***Medium term actions***								
F2.1	Conduct CWIS assessment in 20 percent cities of Punjab and Develop faecal sludge management guidelines and business model for these cities	20	percent	-		-		-	Covered under direct cost
F2.2	Integrate sanitation improvement into local development plans with dedicated funding allocations.	1	project	-		-		-	Covered under direct cost
F2.3	Expand sewerage and drainage networks to secondary and tertiary cities with a target of 75 percentage coverage by 2030.	1	project	-		-		-	Covered under direct cost
F2.4	Develop regional wastewater treatment facilities for smaller cities to promote off-site sanitation.	1	project	-		-		-	Covered under direct cost
F2.5	Create a centralised monitoring system for sewerage performance with real-time data collection.	1	system	10,000,000		10,000,000		10,000,000	Consultancy fee
F2.6	Scale up the construction of decentralised wastewater treatment systems in small towns and peri-urban areas.	1	System	-		-		-	Covered under direct cost
F2.7	Establish Combined Effluent Treatment Plants (CETPs) in industrial clusters across the province.	1	program	-		-		-	Covered under direct cost
F2.8	Ensure that all on-site sanitation facilities meet safety standards as per ODF Punjab Program, with targeted interventions in underserved districts to eliminate open defecation and promote safe sanitation practices.	1	program	-		-		-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
F2.9	Develop regional sanitation strategy that align with provincial goals and international commitment.	1	strategy	5,000,000		5,000,000		5,000,000	consultancy fee, meetings
F2.10	Scaling up and enhanced waste management services under PPPs in urban and rural areas	1	Services	-	-	-		-	Covered under direct cost
F2.11	Establish waste segregation and recycling plants in major cities, aiming for 25 percent recycling of municipal waste by 2030.	1	project	-	-	-		-	Covered under direct cost
F2.12	Expand waste-to-energy projects to other major cities, focusing on renewable energy generation from organic waste.	1	project	0		-		-	Covered under direct cost
F2.13	Develop industrial waste treatment facilities to comply with environmental quality standards.	1	facility	0		-	-	-	covered under direct cost
	Subtotal F2				**-**	**15,000,000**	**-**	**15,000,000**	
F3	***Long term actions***								
F3.1	Scaling up CWIS in 30 percent cities of Punjab, 20 percent of villages have efficient faecal sludge management arrangements.	30	percent	0			0	-	Covered under direct cost
F3.2	Institutionalise behaviour change programmes through community structures for sustained impact.	20	percent	0			0	-	Covered under direct cost
F3.3	Establish a province-wide modern sewerage network with universal coverage, prioritising climate-resilient infrastructure.	1	network	0			0	-	covered under cost
F3.4	Fully integrate stormwater drainage systems into sewerage networks in flood-prone urban areas.	1	system	0			0	-	covered under cost
F3.5	Introduce automation and IoT-enabled monitoring for sewerage and drainage operations across the province.	1	system	10,000,000			10,000,000	10,000,000	Consultancy fee, meeting
F3.6	Ensure that 100 percent of wastewater is safely treated before discharge, achieving SDG 6.3 targets.	1	treatment	-			-	-	covered under cost
F3.7	Align wastewater treatment practices with international environmental standards and NDC commitments.	1	standards	500,000			500,000	500,000	Consultancy fee, meeting
F3.8	Achieve universal access to safely managed sanitation services, prioritising high-risk districts.	1	Service	-			-	-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
F3.9	Institutionalise provincial sanitation frameworks to ensure compliance with SDG and national policies.	1	implement	-			-	-	covered under cost
F3.10	Achieve 100 percent outsourcing of solid waste management services and, explore addition of liquid waste management in pilot cities	1	outsource				-	-	Outsource
F3.11	Achieve 75 percentage solid waste recycling efficiency across all major and secondary cities in Punjab.	36	district	100,000,000			3,600,000,000	3,600,000,000	Recycling efficiency at each district
F3.12	Integrate solid waste management with climate mitigation strategies, ensuring alignment with NDC and SDG goals.	1	integrate	0			-	-	covered under cost
F3.13	Achieve 100 percent compliance with hazards waste treatment regulation in all districts	1	compliance	0			0	-	covered under cost
	Subtotal of F3				**-**	**-**	**3,610,500,000**	**3,610,500,000**	
	Total of F				**3,721,600,000**	**15,000,000**	**3,610,500,000**	**7,347,100,000**	
G	**Strategic actions for health and hygiene**								
G1	***Short term actions***		***sector capacity***						
G1.1	Scale up awareness campaigns on handwashing and menstrual hygiene at community and school levels.	36	District	1,000,000	36,000,000			36,000,000	1 million per district
G1.2	Increase targeted messaging for adolescent girls and mothers on menstrual health and safe practices.	36	District	0	-			-	Cost covered under G1.1
G1.3	Scale up community-led sanitation programs to reduce open defecation and associated stunting.	36	District	2,000,000	72,000,000			72,000,000	2 million per district for BCC campaign and messages on reduction of open defecation,
G1.4	Ensure immediate WASH interventions in districts with the highest diarrhoea and child stunting prevalence.	1	Implement	0	-			-	covered under cost
	Subtotal G1				**108,000,000**	**-**	**-**	**108,000,000**	
G2	***Medium term actions***								
G2.1	Introduce affordable, sustainable menstrual hygiene and handwashing products through PPPs.	36	District	1,000,000		36,000,000		36,000,000	1 million for each district

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
G2.2	Strengthen training programs for healthcare providers on MHM and diarrhoea prevention.	1080	Staff	5000		5,400,000		5,400,000	
G2.3	Achieve elimination of open defecation through sustained behavioural change programs.	1	BCC	0		-			covered under G1.3
G2.4	Integrate WASH improvements into broader child nutrition and public health strategies.	1	system	0		-		-	covered under direct cost
	Subtotal G2				**-**	**41,400,000**	**-**	**41,400,000**	
G3	***Long term actions***								
G3.1	Strengthen supply chain of subsidised menstrual hygiene and handwashing products to manage the demand among economically disadvantaged groups.	36	District	2,000,000			72,000,000	72,000,000	2 million for each district for supply chain
G3.2	Institutionalise comprehensive WASH education in schools, making it part of the national curriculum.	1	Curriculum	5,000,000			5,000,000	5,000,000	Consultancy cost
G3.3	Promote investment in climate-resilient WASH solutions, particularly for vulnerable districts.	1	Solution	0			-		covered under cost
G3.4	Monitor and evaluate long-term health impacts of improved WASH services on diarrhoea and stunting.	36	District	1,000,000			36,000,000	36,000,000	
	Subtotal G3				**-**	**-**	**113,000,000**	**113,000,000**	
	Total of G				**108,000,000**	**41,400,000**	**113,000,000**	**262,400,000**	
H	**Strategic actions for WASH in Health Care Facilities (HCFs)**								
H1	***Short Term actions***								
H1.1	Conduct a rapid assessment of WASH infrastructure in all HCFs to identify critical gaps.	36	district	1,000,000	36,000,000			36,000,000	Consultancy fee, assessment,
H1.2	Ensure functional hand hygiene stations and water access in all critical service areas of primary and secondary HCFs.	1	Schemes	-	-			-	Covered under direct cost
H1.3	Pilot the WASH FIT tool in few districts of Punjab. Review and customise it to meet the province's specific needs. Additionally, strengthen the capacities of health staff and other related service providers to effectively implement the tool.	10	District	10,000,000	100,000,000			100,000,000	Monitoring system/ station , consultancy fee

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
H1.4	Procure basic WASH supplies and consumables for all primary and secondary HCFs.	1	Consumable	-	-			-	Covered under direct cost
H1.5	Train 50 percent of WASH supervisors and facility staff on hygiene promotion and infection prevention and control (IPC).	2000	staff	10,000	20,000,000			20,000,000	Event cost, consultancy fee
H1.6	Strengthen capacity building efforts for local health committees and district WASH coordinators.	4168	Committee	10,000	41,680,000			41,680,000	Event cost, consultancy fee
H1.7	Conduct quarterly hand hygiene promotion sessions in 50 percent of primary HCFs.	1900	HCFs	4,000	7,600,000			7,600,000	1000 for one session
H1.8	Establish community-based health councils to oversee WASH service delivery in 30 percent of HCFs.	1250	health council		-			-	No cost required
H1.9	Launch awareness campaigns on the importance of WASH in HCFs, targeting underserved communities.	1	incentive	100,000,000	100,000,000			100,000,000	
H1.10	Mobilise corporate social responsibility (CSR) funding to support WASH improvements in select pilot districts.	1	CSR	0	0		0	-	No cost required
H1.11	Establish a baseline for WASH in HCFs through the District Health Management Information System (DHMIS).	1	Baseline	0	0				Cost covered under F1.1
H1.12	Conduct third-party reviews for key pilot projects to ensure transparency and scalability.	1	Review	10,000,000	10,000,000			10,000,000	Consultancy fee, review
H1.13	Develop standardised M&E guidelines for facility-level reporting and data collection.	1	Guideline	5,000,000	5,000,000			5,000,000	
	Subtotal of H1				**320,280,000**	**-**	**-**	**320,280,000**	
H2	***Medium Term actions***								
H2.1	Rehabilitate and upgrade existing WASH infrastructure in 50 percent of HCFs, prioritising underserved districts.	50	percent	-	-	-		-	Covered under direct cost
H2.2	Expand wastewater management systems to secondary and tertiary facilities with decentralised treatment solutions.	1	System	-	-	-		-	Covered under direct cost
H2.3	Expand the implementation of the WASH FIT tool across all districts of Punjab, ensuring that	1	Implementation	-	-	-		-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
	each district adapts the tool to its unique local needs and conditions.								
H2.4	Install modern water quality monitoring systems across 70 percent of HCFs for regular testing and compliance.	1	System	-	-	-		-	No cost required
H2.5	Introduce specialised training modules for healthcare staff, focusing on antimicrobial resistance (AMR) prevention.	1	Training module	5,000,000	-	5,000,000		5,000,000	Consultancy fee,
H2.6	Develop a provincial training institute for WASH in HCFs, offering advanced certification programmes.	1	Training institute	100,000,000	-	100,000,000		100,000,000	Establishment cost
H2.7	Institutionalise monthly hygiene promotion activities in all secondary and tertiary facilities.	1	Hygiene promotion	-	-	-		-	No cost required
H2.8	Strengthen collaboration with private sector partners for co-financing WASH infrastructure development.	1	Collaboration	-	-	-		-	No cost required
H2.9	Scale up PPPs to cover at least 50 percent of HCFs for enhanced WASH service provision.	1	WASH services	-	-	-		-	Covered under direct cost
H2.10	Encourage long-term CSR commitments to fund WASH infrastructure in under-resourced facilities.	1	Fund	0	-	-		-	Covered under direct cost
H2.11	Develop a digital monitoring platform for real-time tracking of WASH indicators in 70 percent of HCFs.	1	Monitoring	10,000,000	-	10,000,000		10,000,000	Consultancy, establishment
H2.12	Roll out district-level WASH scorecards to evaluate the performance of HCFs in meeting WASH standards.	1		0	-	-		-	Covered under direct cost
H2.13	Ensure independent evaluations of WASH in HCFs every five years to guide policy adjustments.	2	Evaluation	10,000,000	-	20,000,000		20,000,000	
	Subtotal of H2				-	**135,000,000**	**-**	**135,000,000**	
H3	***Long-Term actions***								
H3.1	Achieve universal compliance with national and international WASH standards across all HCFs.	1	compliance	-			-	-	Covered under direct cost
H3.2	Implement climate-resilient infrastructure for WASH services in all HCFs, capable of withstanding extreme weather events.	1	Infrastructure	0			-	-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
H3.3	Conduct periodic reviews and continuous monitoring of the WASH FIT tool to assess its effectiveness and relevance over time.	1	Monitoring	0			-	-	Covered under direct cost
H3.4	Institutionalise regular WASH audits to ensure quality and safety in all HCFs.	1	Institution	-			-	-	No cost required
H3.5	Establish a permanent cadre of WASH professionals within the healthcare workforce.	37	District	4,800,000			177,600,000	177,600,000	One staff per district @100000 x 4 years
H3.6	Align training programmes with international best practices and integrate WASH education into medical and nursing curricula.	1	Integration	-	-	-	-	-	No cost required
H3.7	Achieve sustained behavioural change through community-level engagement and awareness campaigns on WASH in healthcare.	1	campaign	0			-	-	Engage local health workers
H3.8	Achieve active community engagement in WASH governance through district-level health councils.	1	Community engagement	-			-	-	No cost required
H3.9	Institutionalise community-driven WASH monitoring systems integrated with district health management information systems (DHMIS).	1	monitoring	0			-	-	No cost required
H3.10	Ensure sustainable financing for WASH in HCFs through community and private sector contributions.	1	system	0			-	-	
H3.11	Fully integrate M&E frameworks into provincial health strategies, with automated reporting for WASH progress.	1	framework	0			-	-	No cost required
H3.12	Align M&E systems with national and global SDG reporting requirements for WASH in HCFs.	1		0			-	-	No cost required
H3.13	Use M&E data to drive evidence-based policy changes and resource allocations in healthcare.	1		0			-	-	
	Subtotal of H3				**-**	**-**	**177,600,000**	**177,600,000**	
	Total of H				**320,280,000**	**135,000,000**	**177,600,000**	**632,880,000**	
I	**Strategic actions for Enhancing WASH in Schools**								
I1	***Short term actions***								
I1.1	Identify and map schools lacking safe drinking water facilities, especially in rural areas, and	36	Mapping	10,000,000	360,000,000			360,000,000	Consultancy fee, field work,

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
	initiate emergency water provision programmes.								
I1.2	Construct additional toilets in schools to meet Student Toilet Ratio (SToR) standards, with a focus on girls' secondary schools and higher secondary schools where the current ratios exceed acceptable norms (e.g., 34:1 for girls' primary schools).	1	Projects	-	-			-	Covered under direct cost
I1.3	Ensure that newly constructed toilets meet gender-specific and disability-inclusive design standards, including adequate handwashing stations.	1		0	-			-	Covered under direct cost
I1.4	Train school staff, teachers, and WASH club members on maintaining hygiene standards, focusing on districts with low hygiene levels like Bhakkar, Gujrat, and Chiniot.	720	Staff	10,000	7,200,000			7,200,000	Event cost, consultancy
I1.5	Promote hygiene practices through school WASH clubs and community engagement activities, including handwashing campaigns and health awareness days.	36	District	1,000,000	36,000,000			36,000,000	1 million per district
I1.6	Introduce MHM facilities in at least 50 percent of girls' schools, including the provision of sanitary products, disposal mechanisms, and private changing spaces.	1	facility	-	-			-	Covered under direct cost
I1.7	Conduct teacher training on climate resilient and gender-sensitive hygiene practices, including MHM education, and raise awareness among students and parents about the importance of these facilities.			-	-			-	
I1.8	Mobilise School Management Committees (SMCs) to prioritise WASH goals in school development plans and allocate budgets for maintaining water, sanitation, and hygiene facilities.	1		-	-			-	Covered under direct cost
I1.9	Organise WASH awareness campaigns to educate community and parents to highlight the importance of safe water, sanitation, and hygiene for children's health and education, fostering ownership and accountability among stakeholders.	36	District	1,000,000	36,000,000			36,000,000	1 campaign per district @ 100,000
	Subtotal of I1				**439,200,000**	**-**	**-**	**439,200,000**	

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
I2	***Medium term action***								
I2.1	Develop and implement a comprehensive water quality monitoring and treatment system for all schools, including private institutions, ensuring regular testing for contaminants like E. coli, arsenic, and nitrates.	36	Water quality monitoring	10,000,000		360,000,000		360,000,000	
I2.2	Collaborate with local governments and private sector partners to provide water filtration systems in at least 60 percent of underserved schools.	1	system	-		-		-	Covered under direct cost
I2.3	Standardise toilet sufficiency across all schools through provincial-level infrastructure investments, incorporating climate-resilient designs such as elevated structures in flood-prone areas and durable, weather-resistant materials. Establish maintenance protocols to ensure functionality, cleanliness, and accessibility for all students, including those with disabilities, while integrating water-efficient technologies to address climate-induced challenges.	1		-		-		-	Covered under direct cost
I2.4	Introduce automated reporting systems for toilet functionality to track performance and schedule timely repairs, ensuring at least 90 percent functional toilets in all schools.	1	Reporting system	20,000,000		20,000,000		20,000,000	Establishment cost,
I2.5	Establish a centralised digital monitoring system to track hygiene indicators, including availability of soap, toilet cleaning schedules, and solid waste management in all schools, with district-level accountability mechanisms.	1	system	-		-		-	Cost covered under G2.4
I2.6	Expand hygiene promotion activities to include regular health screenings, linking hygiene practices with student health outcomes, and ensuring that all schools meet provincial hygiene benchmarks.	36	Hygiene promotion	-		-	-	-	No cost required
I2.7	Pilot cost-effective handwashing stations (e.g., tippy taps) in rural schools.	1	pilot	-		-		-	Covered under direct cost
I2.8	Scale up MHM programmes to all girls' and co-educational schools, ensuring comprehensive MHM education in curriculums and regular availability of menstrual products and disposal	1	program	-		-		-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
	solutions, supported by health workers and NGOs.								
I2.9	Develop partnerships with private sector organisations and NGOs to provide low-cost menstrual products and to pilot innovative disposal technologies in underserved areas.	1	partnership	-		-		-	No cost required
I2.10	Pilot SMC-led maintenance models in selected districts to develop scalable best practices for WASH governance, with a focus on engaging parents, local leaders, and community organisations in oversight and funding efforts.	1	model	-		-		-	Covered under direct cost
I2.11	Expand partnerships with local governments, NGOs, and corporate CSR programmes to co-fund WASH infrastructure improvements in low-performing districts, ensuring sustainable community involvement and support for long-term success.	1	partnership cost	-		-		-	Covered under direct cost
	Subtotal of I2				**-**	**380,000,000**	**-**	**380,000,000**	
I3	***Long term actions***								
I3.1	Maintain sustainable access to clean drinking water in all schools through advanced technologies like real-time digital monitoring systems integrated with school databases, ensuring timely maintenance and addressing contamination issues proactively.	1	Access	-			-	-	Covered under direct cost
I3.2	Achieve universal coverage of safe drinking water through diversified water supply systems, including rainwater harvesting and solar-powered water treatment units, to ensure climate resilience and reliability in supply.	1	Coverage	0			-	-	Covered under direct cost
I3.3	Achieve equitable access to gender-sensitive sanitation facilities in all schools by ensuring compliance with WASH standards, with regular audits and corrective actions as part of institutionalised processes.	1	Access	0			-	-	Covered under direct cost
I3.4	Integrate toilet maintenance and improvement into the annual education sector planning and budgeting process, ensuring sustainable financing and operational efficiency.	1	consultant	5000000			5,000,000	5,000,000	

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
I3.5	Achieve universal adherence to hygiene standards across all schools through automated monitoring systems and community-based oversight mechanisms, ensuring sustainability and consistent compliance with hygiene protocols.	1		-			-	-	No cost required
I3.6	Introduce advanced hygiene practices, such as automated soap dispensers and touch-free facilities in urban schools and provide rural schools with cost-effective and sustainable hygiene solutions that align with international best practices.	1		0			-	-	Covered under direct cost
13.7	Institutionalise hygiene education in the school curriculum, focusing on climate resilience and sustainability.						-	-	
I3.8	Institutionalise gender-sensitive WASH practices across the education sector by embedding them in the national curriculum, teacher training programmes, and school health policies, ensuring sustainability and wide-scale impact.	1		0			-	-	Cost covered under G3.7
I3.9	Ensure gender-sensitive WASH compliance through robust monitoring systems and targeted investments in infrastructure, with annual progress reporting and corrective actions plans.	1	Monitoring system	5,000,000			5,000,000	5,000,000	Consultancy for development of monitoring and reporting system
I3.10	Institutionalise community engagement in WASH governance across all schools, with SMCs actively monitoring and maintaining WASH facilities, supported by provincial and district-level oversight mechanisms and annual reporting frameworks.	1		0			-	-	No cost required
I3.11	Build a province-wide community engagement framework for WASH in schools, aligned with provincial education and health strategies, ensuring consistent resource mobilisation and implementation of best practices learned from pilot projects.	1	framework	5,000,000			5,000,000	5,000,000	Consultancy fee, meeting, field work
	Subtotal of I3				**-**	**-**	**15,000,000**	**15,000,000**	
	Total of I				**439,200,000**	**380,000,000**	**15,000,000**	**834,200,000**	
J	**Strategic Actions for Enhancing Gender Inclusivity in WASH**								

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
J1	***Short term actions***								
J1.1	Conduct research on gender-based violence (GBV) and other forms of discrimination in accessing WASH facilities, particularly among vulnerable groups.	1	Research	10,000,000	10,000,000			10,000,000	Consultancy cost, field work
J1.2	Strengthen community-led WASH committees with diverse representation from women, persons with disabilities, transgender and other vulnerable groups, to support planning, monitoring, and feedback mechanisms.	36	District	500,000	18,000,000			18,000,000	Training cost
J1.3	Upgrade existing WASH facilities with basic accessibility features, such as ramps, handrails, latches, and proper lighting.	36	District	-	-			-	Covered under direct cost
J1.4	Develop comprehensive gender analysis guidelines for the WASH sector, ensuring their integration into planning, implementation, and monitoring frameworks.	1	Guideline	-	-			-	Cost covered under J1.1
	Sub Total of J1				**28,000,000**	**-**	**-**	**28,000,000**	
J2	***Medium term action***								
J2.1	Develop and implement a social behaviour change communication (SBCC) campaign promoting inclusive WASH services for women, transgender individuals, and persons with disabilities, informed by key research findings.	36	District	500,000		18,000,000		18,000,000	No cost required
J2.2	Integrate gender-disaggregated data into the provincial WASH dashboard to identify and address access barriers, particularly for persons with disabilities.	1	Dashboard	5,000,000	5,000,000			5,000,000	Consultancy fee,
J2.3	Install accessible WASH facilities in schools and public spaces, ensuring privacy for women, girls, and children with disabilities.	1	WASH Facilities	-	-			-	Covered under direct cost
J2.4	Conduct periodic reviews of the guidelines' implementation to assess the effectiveness of gender inclusion in the WASH sector and update them to address any bottlenecks identified during the review.	3	review	1,000,000.0	3,000,000			3,000,000	Review cost
	Subtotal of J2				**8,000,000**	**18,000,000**	**-**	**26,000,000**	
J3	***Long term actions***								

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
J3.1	Institutionalise gender-inclusive WASH practices by establishing a dedicated unit to oversee policy implementation.	1	Institution	-			-	-	No cost
J3.2	Develop and implement targeted programmes to support marginalised groups and vulnerable communities in accessing inclusive WASH services.	1	Implement	-			-	-	Covered under direct cost
J3.3	Promote climate-resilient, gender-inclusive WASH infrastructure across all public and institutional facilities to ensure long-term sustainability.	1	Infrastructure	-			-	-	Covered under direct cost
J3.4	Institutionalise gender inclusion within WASH policies and practices, drawing on lessons learned from the implementation and review of gender-inclusive guidelines.	1	Institutionalize	5,000,000.0			5,000,000	5,000,000	Consultancy fee,
	Subtotal of J3				**-**	**-**	**5,000,000**	**5,000,000**	
	Grand Total of J				**36,000,000**	**18,000,000**	**5,000,000**	**59,000,000**	
K	**Strategic actions for Sector Capacity**								
K1	***Short term actions***								
K1.1	Conduct a gap analysis of current training programmes in Local Government Academies and AJWA to identify WASH-related capacity gaps.	1	consultant	5,000,000	5,000,000			5,000,000	Consultancy fee, meetings
K1.2	Train field and managerial staff through tailored WASH-specific training modules developed in collaboration with Urban Unit.	360	staff	20,000	7,200,000			7,200,000	Event cost, consultancy fee
K1.3	Rationalises staffing across PHED, WASAs, and LG&CD departments through needs-based assessments.	1	Assessment	5,000,000	5,000,000			5,000,000	Consultancy fee, need assessment
K1.4	Launch short-term, intensive courses for staff in technical roles, including GIS, SCADA, and modern sanitation techniques.	1	consultant	5,000,000	5,000,000			5,000,000	Consultancy fee,
K1.5	Digitise monitoring systems and introduce centralised dashboards for real-time tracking of WASH service delivery.	1	Dashboard	10,000,000	10,000,000			10,000,000	Consultancy fee, establishment of dashboard
K1.6	Conduct workshops and leadership training for mid- to senior-level officers to improve strategic decision-making.	10	Workshop	1,500,000	15,000,000			15,000,000	One workshop at provincial level and 9 at divisional headquarter level.

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
K1.7	Design and launch training programmes for women professionals to encourage participation in WASH services, focusing on community roles.	1	Program	5,000,000	5,000,000			5,000,000	Consultancy fee
	Subtotal of K1				**52,200,000**	**-**	**-**	**52,200,000**	
K2	***Medium term actions***								
K2.1	Develop and integrate comprehensive WASH-specific courses into the curriculum of Local Government Academies and AJWA.	1	Course	5,000,000		5,000,000		5,000,000	Consultancy fee
K2.2	Expand practical training programmes, including on-the-job sessions for field staff in all WASAs and MCs.	36	District	10,000,000		360,000,000		360,000,000	10 million per district
K2.3	Implement performance-based appraisals and digitise HR management for WASH entities.	1	Implement	0		-		-	No cost required
K2.4	Develop a structured training programme for advanced technologies and innovations in WASH systems, leveraging partnerships with AJWA.	1	program	0		-		-	Covered under H2.3
K2.5	Strengthen data-driven decision-making tools, such as predictive models for operational challenges.	1		-		-		-	No cost required
K2.6	Introduce mentoring programmes pairing senior leaders with junior professionals for skills transfer and leadership development.	1	Program	100,000,000		100,000,000		100,000,000	
K2.7	Develop gender-inclusive policies and ensure equal opportunities in training and recruitment across all WASH-related entities.	1	Policy	5,000,000		5,000,000		5,000,000	Consultancy fee
	Subtotal of K2				**-**	**470,000,000**	**-**	**470,000,000**	
K3	***Long term actions***								
K3.1	Transform existing academies into centres of excellence for WASH, offering internationally accredited programmes.	1		0			0	-	Covered under H2
K3.2	Institutionalise continuous professional development and certifications for all staff in WASH entities.	1		-			-	-	No cost required
K3.3	Fully integrate advanced HR systems with predictive analytics to optimise workforce management and planning.	1	System	5,000,000			5,000,000	5,000,000	Consultancy fee,

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
K3.4	Offer international exposure and certification opportunities for technical and managerial staff.	1		1,000,000,000			1000000000	1,000,000,000	
K3.5	Fully integrate AI-based tools for predictive maintenance and smart service delivery optimisation.	1	System	10,000,000			10000000	10,000,000	Consultancy
K3.6	Establish executive leadership academies or programmes for top-tier management in the WASH sector.	1		0			0	-	Covered under H2
K3.7	Achieve gender parity in all WASH organisations and implement gender-sensitive monitoring frameworks.								
	Subtotal of K3				**-**	**-**	**1,015,000,000**	**1,015,000,000**	
	Total of K				**52,200,000**	**470,000,000**	**1,015,000,000**	**1,537,200,000**	
L	**Strategic actions for Sector Efficiency**								
L1	***Short term actions***								
L1.1	Conduct needs assessment for underserved areas and identify priority expansion zones in urban areas	1	Assessment	10,000,000	10,000,000			10,000,000	Consultancy fee, meetings
L1.2	Implement water quality monitoring standards and strengthen groundwater management policies	1	Implement	-	-		-	-	Covered under direct cost
L1.3	Develop OSR improvement plans	1	Plan	5,000,000	5,000,000			5,000,000	Consultancy fee, meetings
L1.4	Conduct annual external financial audits of WASA	1	Audit	10,000,000	10,000,000			10,000,000	Consultancy,
L1.5	Complete under-construction treatment plants and assess current non-functional plants for rehabilitation	1	Rehabilitation	-	-			-	Covered under direct cost
L1.6	Identify alternate water sources for meeting demand supply gaps	1		-	-			-	Covered under direct cost
L1.7	Install solar power on a pilot basis for critical installations. Introduce hybrid solar systems where feasible	1	Project	-	-			-	Covered under direct cost
L1.8	Conduct district-level assessments to identify reasons for filtration plants and water supply schemes failures	36	District	1,000,000	36,000,000			36,000,000	Assessment
	Subtotal of L1				**61,000,000**	**-**	**-**	**61,000,000**	

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
L2	***Medium term actions***								
L2.1	Expand water and sewerage networks in priority areas	1	Network	-		-		-	Covered under direct cost
L2.2	Increase surface water utilisation	1		-		-		-	Covered under direct cost
L2.3	Implement metering for all new connections	1	Implement	-		-		-	Covered under direct cost
L2.4	Achieve WASA financial self-sufficiency by reducing dependency on provincial subsidies to 20 percent of total expenditures	1	implement	-		-		-	Covered under direct cost
L2.5	Develop at least two wastewater treatment plants in major cities and one in each of intermediate cities	1	Project	-		-		-	Covered under direct cost
L2.6	Upgrade infrastructure to meet 70 percent of the water demand in cities	1	Project	-		-		-	Covered under direct cost
L2.7	Scale up solar installations in all major and intermediate cities	1	Project	-		-		-	Covered under direct cost
L2.8	Introduce digitalised management systems for CBOs and UCs to monitor scheme performance e.g. SCADA	1	System	10,000,000		10,000,000		10,000,000	Consultancy fee, digitalization
	Subtotal of L2				**-**	**10,000,000**	**-**	**10,000,000**	
L3	***Long term actions***								
L3.1	Achieve full water and sewerage coverage in all major urban centres and ensure efficient network maintenance	1	Coverage	-			-	-	Covered under direct cost
L3.2	Shift to a 50/50 balance of groundwater and surface water usage across all WASAs	1	Usage	-			-	-	Covered under direct cost
L3.3	Implement capacity-building programmes for CBOs managing water schemes for water metering	36	District	1,000,000			36,000,000	36,000,000	1 million per district
L3.4	Achieve WASA financial self-sufficiency without provincial subsidies	1		-		-	-	-	Covered under direct cost
L3.5	Achieve 100 percent wastewater treatment capacity across all urban areas.	100	percent	-			-	-	Covered under direct cost
L3.6	Ensure water supply meets 100 percent demand across all cities in Punjab	100	percent	-			-	-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
L3.7	Achieve 50 percent of energy needs from alternative sources in major and intermediate cities	50	percent				-	-	Covered under direct cost
L3.8	Achieve 90 percent functionality rate for all rural water supply schemes and filtration plants	90	percent						Covered under direct cost
	Subtotal of L3				**-**	**-**	**36,000,000**	**36,000,000**	
	Total of L				**61,000,000**	**10,000,000**	**36,000,000**	**107,000,000**	
M	**Strategic actions for Sector Financing**								
M1	***Short term actions***								
M1.1	Allocate at least 10 percent of Punjab's Budget to WASH services to address immediate infrastructure needs and operational deficits.	1	Budget	-	-			-	Covered under direct cost
M1.2	Conduct a comprehensive review of current expenditures to reallocate funds more effectively to underserved rural areas.	1	Review	5,000,000	5,000,000			5,000,000	Consultancy fee,
M1.3	Identify and prioritise the 10 lowest-performing districts, such as Muzaffargarh and Rajanpur, for accelerated investment programmes.	1	investment	-	-			-	Covered under direct cost
M1.4	Allocate emergency funds for critical WASH infrastructure rehabilitation in flood-prone and drought-affected areas.	1	Fund	-	-			-	Covered under direct cost
M1.5	Introduce financial incentives, such as tax breaks and subsidies, to encourage private sector investment in WASH projects.	1	incentive	100,000,000	100,000,000			100,000,000	
M1.6	Develop a WASH investment strategy to attract private sector and donor financing, focusing on innovative financing mechanisms.	1	Strategy	5,000,000	5,000,000			5,000,000	Consultancy,
M1.7	Mobilise donor funding to cover immediate gaps in underfunded districts and critical infrastructure projects.	1		-	-			-	No cost required
M1.8	Introduce a Climate Resilience Fund to address the impacts of climate change on WASH infrastructure and services.	1		-	-			-	Covered under direct cost
	Subtotal of M1				**110,000,000**	**-**	**-**	**110,000,000**	
M2	***Medium term actions***								
M2.1	Ensure a consistent 10 percent annual increase in the provincial WASH development	1	Budget	-		-		-	Covered under direct cost

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
	budget to maintain momentum toward SDG targets.								
M2.2	Develop a multi-year financing framework aligned with the Punjab WASH Sector Plan (2025-35).	1	Framework	5,000,000		5,000,000		5,000,000	Consultancy cost
M2.3	Implement a district equity-based funding model to ensure balanced resource allocation, focusing on rural and remote areas.	1	Model	-		-		-	Covered under direct cost
M2.4	Expand targeted development initiatives for districts with the highest disparities in per capita investment.	1		-		-		-	Covered under direct cost
M2.5	Expand PPP models for water supply, sanitation, and solid waste management in urban areas.	1	PPP Model	-		-		-	Covered under direct cost
M2.6	Pilot private sector-led operations in urban WASH systems, leveraging private expertise in service delivery efficiency.	1	Pilot			-		-	Covered under direct cost
M2.7	Align donor-funded projects with provincial WASH goals to maximise impact and sustainability.	1	alignment	-		-		-	Covered under I2.2
M2.8	Secure international climate adaptation funds to finance large-scale resilient WASH infrastructure projects.	1	Framework	-		-		-	Covered under I2.2
	Sub total of M2				**-**	**5,000,000**	**-**	**5,000,000**	
M3	***Long term actions***								
M3.1	Secure full funding for universal WASH coverage by 2034, integrating it into the provincial economic development plan.	1	Funding	-			-	-	No cost required
M3.2	Institutionalise sustainable WASH funding through dedicated budget lines and increased fiscal decentralisation.	1		-			-	-	Covered under direct cost
M3.3	Achieve equitable WASH service coverage across all districts by 2034 through continuous monitoring and resource adjustment.	1	WASH services	-		-	-	-	Covered under direct cost
M3.4	Institutionalise equity-based WASH investment as part of the provincial development strategy.	1		-		-	-	-	No cost required

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
M3.5	Ensure private sector partnerships account for at least 30 percent of municipal WASH services in major cities by 2034.	1	Services	-			-	-	Covered under direct cost
M3.6	Institutionalise PPP frameworks as standard practice for urban WASH infrastructure and service management.	1		-			-	-	No cost required
M3.7	Institutionalise donor partnerships as part of Punjab's WASH financing strategy to ensure consistent support.	1	Integration				-	-	No cost required
M3.8	Achieve full integration of climate resilience into all WASH investments, ensuring sustainability against extreme weather events.	1	0	-			-	-	Consultancy, meetings, workshop
	Subtotal of M3				-	-	-	-	
	Total of M				**110,000,000**	**5,000,000**	**-**	**115,000,000**	
N	**Strategic actions for Monitoring& Evaluation**								
N1	***Short term actions***								
N1.1	Develop and implement standardised KPIs for monitoring WASH progress across all districts.	1	KPI	5,000,000.0	5,000,000			5,000,000	Consultancy cost,
N1.2	Train local government staff and WASA personnel on improved M&E tools and digital reporting.	720	Staff	20,000.0	14,400,000			14,400,000	Event cost, consultancy, 20 staff per district
N1.3	Develop a real-time integrated WASH dashboard at the provincial level utilising the existing datasets MICS, PSLM, and other WASH-related datasets.	1	Dashboard	-	-			-	Cost covered under I1.5
N1.4	Digitalise complaint registration and redressal systems for improved service response.	1	System	5,000,000.0	5,000,000			5,000,000	Consultancy fee, meetings
	Subtotal of N1				**24,400,000**	**-**	**-**	**24,400,000**	
N2	***Medium term actions***								
N2.1	Scale up real-time digital monitoring systems, including water quality sensors and infrastructure tracking tools.	1	Monitoring	-		-		-	No cost required
N2.2	Establish a WASH Index and develop a district-level planning tool based on data.	1	Index	5,000,000.0	5,000,000			5,000,000	Consultancy fee,
N2.3	Use predictive analytics to identify high-risk areas for WASH-related interventions and optimise resource allocation.	1		-	-			-	Cost covered under L2.3

Sr. #	Strategic actions	Unit	Unit type	Units cost	Short Term (2025-28)	Medium Term (2029-31)	Long Term (2032-35)	Total	Remarks
N2.4	Develop a mobile application for citizen engagement and WASH service feedback.	1	Application	-	-			-	Cost covered under L1.4
	Subtotal of N2				**5,000,000**	**-**	**-**	**5,000,000**	
N3	***Long term actions***								
N3.1	Institutionalise a comprehensive M&E framework with routine third-party audits to enhance accountability.	1	Institution	-			-	-	No cost
N3.2	Integrate WASH indicators into district and provincial decision-making processes.	1	integrate	-			-	-	No cost required
N3.3	Ensure interoperability of the WASH dashboard with other provincial and national governance platforms for cross-sectoral planning and policy formulation.	1		-			-	-	No cost required
N3.4	Promote community-led monitoring and accountability mechanisms.	1					-	-	No cost required
	Subtotal of N3				-	-	-	-	
	Total of N				**29,400,000**	**-**	**-**	**29,400,000**	
	Total Cost (A + B + C + D + E + F + G + H + I+J+K+L+M+N)				**7,477,480,000**	**2,381,000,000**	**5,196,100,000**	**15,054,580,000**	

Summary of Direct Costs for Districts- Option 1

District	Safely Managed Water	Safely Managed Sanitation	O&M Costs Water and Sanitation	WASH in Schools	WASH in HCF	Social Mobilisation and Capacity Building Cost	Total Notional Costs for District	Estimated Short Term Costs	Estimated Medium Term Costs	Estimated Long Term Costs
			O&M 10%	*Cost of Missing WASH Facilities in Primary, Middle and High Schools*	*Cost of Missing WASH Facilities in BHUs/ Civil Dispensaries*	*5% capacity building + 5% social mobilisation*	*Total notional costs for district*	*Estimated Short Term Costs*	*Estimated Medium Term Costs*	*Estimated Long Term Costs*
Attock	72,627,136,782	59,534,522,155	13,216,165,894	52,964,475	85,493,430	14,551,628,274	160,067,911,010	48,020,373,303	48,020,373,303	64,027,164,404
Bahawalnagar	132,267,974,371	86,811,434,637	21,907,940,901	222,776,880	122,411,047	24,133,253,784	265,465,791,619	79,639,737,486	79,639,737,486	106,186,316,648
Bahawalpur	128,647,491,539	86,251,622,776	21,489,911,432	91,966,751	58,290,975	23,653,928,347	260,193,211,819	78,057,963,546	78,057,963,546	104,077,284,728
Bhakkar	73,632,928,753	49,613,990,305	12,324,691,906	98,998,801	42,099,037	13,571,270,880	149,283,979,682	44,785,193,905	44,785,193,905	59,713,591,873
Chakwal	70,106,600,660	54,382,991,942	12,448,959,260	29,964,799	62,177,040	13,703,069,370	150,733,763,072	45,220,128,922	45,220,128,922	60,293,505,229
Chiniot	52,212,490,780	53,022,271,453	10,523,476,223	31,042,751	38,212,972	11,582,749,418	127,410,243,597	38,223,073,079	38,223,073,079	50,964,097,439
DG Khan	94,887,652,731	91,616,077,685	18,650,373,042	175,003,972	66,063,105	20,539,517,053	225,934,687,587	67,780,406,276	67,780,406,276	90,373,875,035
Faisalabad	338,791,805,638	189,166,559,084	52,795,836,472	127,626,362	156,737,955	58,103,856,551	639,142,422,063	191,742,726,619	191,742,726,619	255,656,968,825
Gujranwala	174,616,547,705	114,496,271,075	28,911,281,878	134,213,512	69,949,170	31,822,826,334	350,051,089,675	105,015,326,902	105,015,326,902	140,020,435,870
Gujrat	105,328,838,553	113,932,741,167	21,926,157,972	70,298,322	87,436,462	24,134,547,248	265,480,019,724	79,644,005,917	79,644,005,917	106,192,007,890
Hafizabad	40,166,667,344	39,189,430,970	7,935,609,831	49,916,505	58,290,975	8,739,991,563	96,139,907,188	28,841,972,156	28,841,972,156	38,455,962,875
Jhang	84,389,072,877	84,155,154,258	16,854,422,714	147,948,323	49,871,167	18,559,646,934	204,156,116,274	61,246,834,882	61,246,834,882	81,662,446,509
Jhelum	34,489,495,420	29,807,845,374	6,429,734,079	35,405,237	39,508,327	7,080,198,844	77,882,187,281	23,364,656,184	23,364,656,184	31,152,874,912
Kasur	131,191,407,173	143,047,304,524	27,423,871,170	48,961,396	63,472,395	30,177,501,666	331,952,518,324	99,585,755,497	99,585,755,497	132,781,007,330
Khanewal	96,197,134,243	92,623,087,887	18,882,022,213	108,246,340	76,425,945	20,788,691,663	228,675,608,291	68,602,682,487	68,602,682,487	91,470,243,316
Khushab	53,755,199,312	45,509,014,779	9,926,421,409	54,555,279	49,223,490	10,929,441,427	120,223,855,696	36,067,156,709	36,067,156,709	48,089,542,279
Lahore	465,923,175,901	157,250,954,487	62,317,413,039	131,962,132	107,514,465	68,573,102,002	754,304,122,026	226,291,236,608	226,291,236,608	301,721,648,810
Layyah	55,208,175,574	52,132,398,113	10,734,057,369	82,477,951	34,974,585	11,819,208,359	130,011,291,952	39,003,387,586	39,003,387,586	52,004,516,781
Lodhran	63,015,759,732	42,087,052,931	10,510,281,266	71,333,041	54,404,910	11,573,883,188	127,312,715,069	38,193,814,521	38,193,814,521	50,925,086,027
Mandi Bahauddin	61,092,683,459	62,911,000,084	12,400,368,354	30,940,310	40,803,682	13,647,579,589	150,123,375,479	45,037,012,644	45,037,012,644	60,049,350,191
Mianwali	63,784,860,351	38,626,024,149	10,241,088,450	150,267,333	51,166,522	11,285,340,681	124,138,747,486	37,241,624,246	37,241,624,246	49,655,498,994
Multan	180,321,282,148	108,969,462,880	28,929,074,503	157,163,641	81,607,365	31,845,859,054	350,304,449,590	105,091,334,877	105,091,334,877	140,121,779,836
Muzaffargarh	151,011,436,277	139,011,125,307	29,002,256,158	110,128,923	72,539,880	31,920,748,655	351,128,235,200	105,338,470,560	105,338,470,560	140,451,294,080
Nankana Sahib	64,553,145,252	53,449,602,574	11,800,274,783	38,337,327	66,710,782	12,990,807,072	142,898,877,790	42,869,663,337	42,869,663,337	57,159,551,116
Narowal	49,583,011,298	55,324,827,863	10,490,783,916	59,149,310	63,472,395	11,552,124,478	127,073,369,260	38,122,010,778	38,122,010,778	50,829,347,704
Okara	106,385,368,215	100,869,981,872	20,725,535,009	97,396,447	84,198,075	22,816,247,962	250,978,727,579	75,293,618,274	75,293,618,274	100,391,491,032

District	Safely Managed Water	Safely Managed Sanitation	O&M Costs Water and Sanitation	WASH in Schools	WASH in HCF	Social Mobilisation and Capacity Building Cost	Total Notional Costs for District	Estimated Short Term Costs	Estimated Medium Term Costs	Estimated Long Term Costs
			O&M 10%	*Cost of Missing WASH Facilities in Primary, Middle and High Schools*	*Cost of Missing WASH Facilities in BHUs/ Civil Dispensaries*	*5% capacity building + 5% social mobilisation*	*Total notional costs for district*	*Estimated Short Term Costs*	*Estimated Medium Term Costs*	*Estimated Long Term Costs*
Pakpattan	73,411,085,638	62,117,885,362	13,552,897,100	29,822,958	46,632,780	14,915,832,384	164,074,156,222	49,222,246,867	49,222,246,867	65,629,662,489
Rajanpur	78,707,905,398	74,554,323,791	15,326,222,919	88,748,009	29,145,487	16,870,634,561	185,576,980,166	55,673,094,050	55,673,094,050	74,230,792,066
Rawalpindi	176,663,594,407	146,291,332,192	32,295,492,660	97,485,826	85,493,430	35,543,339,852	390,976,738,367	117,293,021,510	117,293,021,510	156,390,695,347
RY Khan	168,130,758,567	108,167,383,296	27,629,814,186	265,701,598	78,368,977	30,427,202,662	334,699,229,287	100,409,768,786	100,409,768,786	133,879,691,715
Sahiwal	87,306,946,541	73,687,772,130	16,099,471,867	72,938,525	68,653,815	17,723,578,288	194,959,361,167	58,487,808,350	58,487,808,350	77,983,744,467
Sargodha	131,748,220,785	142,056,988,506	27,380,520,929	130,189,114	123,058,725	30,143,897,806	331,582,875,866	99,474,862,760	99,474,862,760	132,633,150,346
Sheikhupura	128,936,655,168	99,133,635,101	22,807,029,027	104,082,908	69,301,492	25,105,070,370	276,155,774,065	82,846,732,220	82,846,732,220	110,462,309,626
Sialkot	141,547,089,420	145,344,452,086	28,689,154,151	68,342,768	83,550,397	31,573,258,882	347,305,847,704	104,191,754,311	104,191,754,311	138,922,339,082
TT Singh	91,358,063,705	69,606,674,797	16,096,473,850	78,821,542	61,529,362	17,720,156,326	194,921,719,583	58,476,515,875	58,476,515,875	77,968,687,833
Vehari	132,085,772,499	74,623,261,184	20,670,903,368	81,719,197	55,052,587	22,751,670,884	250,268,379,720	75,080,513,916	75,080,513,916	100,107,351,888
Punjab	4,154,083,434,221	3,139,376,458,777	729,345,989,300	3,426,898,566	2,483,843,209	802,871,662,407	8,831,588,286,480	2,649,476,485,944	2,649,476,485,944	3,532,635,314,592

Summary of Direct Costs for Districts- Option 2

District	34% Safely Managed Water and Remaining 66% Basic Water	50% Safely Managed Sanitation and Remaining 50% Basic Sanitation	O&M Costs Water and Sanitation	WASH in Schools	WASH in HCF	Social Mobilisation and Capacity Building Cost	Total Notional Costs for District	Estimated Short Term Costs	Estimated Medium Term Costs	Estimated Long Term Costs
			O&M 10%	*Cost of Missing WASH Facilities in Primary, Middle and High Schools*	*Cost of Missing WASH Facilities in BHUs/ Civil Dispensaries*	*5% capacity building + 5% social mobilization*	*Total notional costs for district*	*Estimated Short Term Costs*	*Estimated Medium Term Costs*	*Estimated Long Term Costs*
Attock	17,125,701,997	27,636,319,738	4,476,202,174	52,964,475	85,493,430	4,937,668,181	54,314,349,995	16,294,304,999	16,294,304,999	21,725,739,998
Bahawalnagar	34,216,530,179	43,956,336,990	7,817,286,717	222,776,880	122,411,047	8,633,534,181	94,968,875,994	28,490,662,798	28,490,662,798	37,987,550,397
Bahawalpur	35,386,648,913	49,449,643,571	8,483,629,248	91,966,751	58,290,975	9,347,017,946	102,817,197,403	30,845,159,221	30,845,159,221	41,126,878,961
Bhakkar	17,925,571,670	24,653,581,960	4,257,915,363	98,998,801	42,099,037	4,697,816,683	51,675,983,515	15,502,795,055	15,502,795,055	20,670,393,406
Chakwal	15,606,527,672	22,264,178,599	3,787,070,627	29,964,799	62,177,040	4,174,991,874	45,924,910,611	13,777,473,183	13,777,473,183	18,369,964,245
Chiniot	12,084,597,719	20,818,283,771	3,290,288,149	31,042,751	38,212,972	3,626,242,536	39,888,667,898	11,966,600,369	11,966,600,369	15,955,467,159
DG Khan	29,598,385,306	54,111,443,508	8,370,982,881	175,003,972	66,063,105	9,232,187,877	101,554,066,649	30,466,219,995	30,466,219,995	40,621,626,659
Faisalabad	72,861,946,586	76,814,110,457	14,967,605,704	127,626,362	156,737,955	16,492,802,706	181,420,829,771	54,426,248,931	54,426,248,931	72,568,331,909
Gujranwala	46,684,376,834	54,407,395,460	10,109,177,229	134,213,512	69,949,170	11,140,511,221	122,545,623,427	36,763,687,028	36,763,687,028	49,018,249,371
Gujrat	25,319,071,202	32,286,981,442	5,760,605,264	70,298,322	87,436,462	6,352,439,269	69,876,831,962	20,963,049,588	20,963,049,588	27,950,732,785
Hafizabad	8,965,892,761	14,164,171,971	2,313,006,473	49,916,505	58,290,975	2,555,127,868	28,106,406,553	8,431,921,966	8,431,921,966	11,242,562,621
Jhang	19,834,738,927	35,265,501,028	5,510,023,996	147,948,323	49,871,167	6,080,808,344	66,888,891,786	20,066,667,536	20,066,667,536	26,755,556,714
Jhelum	9,338,752,347	10,493,721,251	1,983,247,360	35,405,237	39,508,327	2,189,063,452	24,079,697,974	7,223,909,392	7,223,909,392	9,631,879,190
Kasur	44,224,819,323	64,492,478,384	10,871,729,771	48,961,396	63,472,395	11,970,146,127	131,671,607,396	39,501,482,219	39,501,482,219	52,668,642,958
Khanewal	24,324,201,303	38,210,504,494	6,253,470,580	108,246,340	76,425,945	6,897,284,866	75,870,133,528	22,761,040,059	22,761,040,059	30,348,053,411
Khushab	15,130,255,961	21,824,821,181	3,695,507,714	54,555,279	49,223,490	4,075,436,363	44,829,799,988	13,448,939,996	13,448,939,996	17,931,919,995
Lahore	130,116,448,424	97,437,378,888	22,755,382,731	131,962,132	107,514,465	25,054,868,664	275,603,555,303	82,681,066,591	82,681,066,591	110,241,422,121
Layyah	15,331,719,142	27,356,648,634	4,268,836,778	82,477,951	34,974,585	4,707,465,709	51,782,122,799	15,534,636,840	15,534,636,840	20,712,849,120
Lodhran	14,782,574,094	23,624,046,257	3,840,662,035	71,333,041	54,404,910	4,237,302,034	46,610,322,371	13,983,096,711	13,983,096,711	18,644,128,948
Mandi Bahauddin	14,538,870,006	20,459,355,279	3,499,822,529	30,940,310	40,803,682	3,856,979,181	42,426,770,987	12,728,031,296	12,728,031,296	16,970,708,395
Mianwali	16,065,548,646	21,003,713,050	3,706,926,170	150,267,333	51,166,522	4,097,762,172	45,075,383,892	13,522,615,168	13,522,615,168	18,030,153,557
Multan	38,933,598,770	58,389,357,442	9,732,295,621	157,163,641	81,607,365	10,729,402,284	118,023,425,122	35,407,027,537	35,407,027,537	47,209,370,049
Muzaffargarh	38,879,775,269	76,037,349,841	11,491,712,511	110,128,923	72,539,880	12,659,150,642	139,250,657,066	41,775,197,120	41,775,197,120	55,700,262,827
Nankana Sahib	17,698,262,692	22,693,079,825	4,039,134,252	38,337,327	66,710,782	4,453,552,488	48,989,077,365	14,696,723,210	14,696,723,210	19,595,630,946
Narowal	12,080,061,248	17,533,225,749	2,961,328,700	59,149,310	63,472,395	3,269,723,740	35,966,961,142	10,790,088,343	10,790,088,343	14,386,784,457
Okara	26,948,481,785	32,871,013,071	5,981,949,486	97,396,447	84,198,075	6,598,303,886	72,581,342,750	21,774,402,825	21,774,402,825	29,032,537,100

District	34% Safely Managed Water and Remaining 66% Basic Water	50% Safely Managed Sanitation and Remaining 50% Basic Sanitation	O&M Costs Water and Sanitation	WASH in Schools	WASH in HCF	Social Mobilisation and Capacity Building Cost	Total Notional Costs for District	Estimated Short Term Costs	Estimated Medium Term Costs	Estimated Long Term Costs
			O&M 10%	*Cost of Missing WASH Facilities in Primary, Middle and High Schools*	*Cost of Missing WASH Facilities in BHUs/ Civil Dispensaries*	*5% capacity building + 5% social mobilization*	*Total notional costs for district*	*Estimated Short Term Costs*	*Estimated Medium Term Costs*	*Estimated Long Term Costs*
Pakpattan	18,959,170,834	20,362,023,531	3,932,119,437	29,822,958	46,632,780	4,332,976,954	47,662,746,494	14,298,823,948	14,298,823,948	19,065,098,598
Rajanpur	24,991,333,812	42,035,655,967	6,702,698,978	88,748,009	29,145,487	7,384,758,225	81,232,340,478	24,369,702,143	24,369,702,143	32,492,936,191
Rawalpindi	42,455,478,827	74,858,713,199	11,731,419,203	97,485,826	85,493,430	12,922,859,048	142,151,449,533	42,645,434,860	42,645,434,860	56,860,579,813
RY Khan	47,913,085,431	65,272,408,115	11,318,549,355	265,701,598	78,368,977	12,484,811,348	137,332,924,825	41,199,877,447	41,199,877,447	54,933,169,930
Sahiwal	21,254,431,700	24,118,764,526	4,537,319,623	72,938,525	68,653,815	5,005,210,819	55,057,319,008	16,517,195,702	16,517,195,702	22,022,927,603
Sargodha	34,634,923,005	54,670,038,470	8,930,496,147	130,189,114	123,058,725	9,848,870,546	108,337,576,008	32,501,272,802	32,501,272,802	43,335,030,403
Sheikhupura	31,718,610,268	43,214,252,623	7,493,286,289	104,082,908	69,301,492	8,259,953,358	90,859,486,938	27,257,846,081	27,257,846,081	36,343,794,775
Sialkot	32,546,496,503	42,674,737,360	7,522,123,386	68,342,768	83,550,397	8,289,525,041	91,184,775,455	27,355,432,637	27,355,432,637	36,473,910,182
TT Singh	20,607,972,619	21,767,231,346	4,237,520,396	78,821,542	61,529,362	4,675,307,527	51,428,382,792	15,428,514,838	15,428,514,838	20,571,353,117
Vehari	31,695,496,609	38,759,779,022	7,045,527,563	81,719,197	55,052,587	7,763,757,498	85,401,332,476	25,620,399,743	25,620,399,743	34,160,532,990
Punjab	1,060,780,358,382	1,415,988,246,002	247,676,860,438	3,426,898,566	2,483,843,209	273,035,620,660	3,003,391,827,257	901,017,548,177	901,017,548,177	1,201,356,730,903

Safely Managed Water – Option 1

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline		Estimated HOUSEHOLDs 2035	Pop gap to meet access by 2035
				Percentage	Household Served		
Attock	353,973	2.4%	362,362	23.2%	84,222	458,005	373,782
Bahawalnagar	557,616	3.0%	574,344	15.9%	91,141	771,871	680,730
Bahawalpur	673,437	2.6%	691,148	33.8%	233,917	896,014	662,096
Bhakkar	313,311	2.9%	322,460	15.8%	51,046	430,005	378,959
Chakwal	288,838	2.5%	296,088	6.3%	18,577	379,387	360,810
Chiniot	256,438	2.2%	262,182	22.3%	58,482	327,199	268,717
DG Khan	454,464	2.8%	467,325	27.7%	129,409	617,757	488,348
Faisalabad	1,382,773	2.4%	1,415,683	3.4%	47,465	1,791,089	1,743,624
Gujranwala	849,177	2.9%	874,143	30.8%	269,269	1,167,949	898,681
Gujrat	489,337	2.6%	502,207	21.7%	108,982	651,067	542,085
Hafizabad	197,206	2.2%	201,604	22.1%	44,630	251,352	206,722
Jhang	491,999	1.9%	501,199	33.7%	168,901	603,217	434,316
Jhelum	229,064	2.1%	233,829	46.9%	109,776	287,279	177,503
Kasur	645,308	2.8%	663,635	30.6%	202,923	878,112	675,189
Khanewal	526,196	2.4%	538,772	34.7%	187,220	682,308	495,088
Khushab	248,304	2.7%	254,983	21.9%	55,845	332,501	276,656
Lahore	2,010,225	2.7%	2,063,496	13.7%	282,443	2,680,360	2,397,918
Layyah	341,131	2.4%	349,318	45.4%	158,679	442,813	284,134
Lodhran	323,866	2.1%	330,764	25.4%	84,052	408,368	324,317
Mandi Bahauddin	285,989	2.3%	292,653	18.5%	54,034	368,453	314,419
Mianwali	296,339	2.6%	304,044	21.3%	64,741	393,016	328,275
Multan	886,392	2.1%	904,652	20.0%	181,229	1,109,269	928,040
Muzaffargarh	804,438	2.5%	824,469	33.6%	277,166	1,054,360	777,195
Nankana Sahib	246,956	3.2%	254,834	6.5%	16,617	348,846	332,229
Narowal	281,536	2.3%	287,871	36.3%	104,425	359,609	255,184
Okara	549,724	2.5%	563,192	30.2%	169,902	717,425	547,522
Pakpattan	344,546	2.7%	353,745	23.3%	82,573	460,391	377,817
Rajanpur	354,016	3.0%	364,601	23.2%	84,440	489,518	405,078
Rawalpindi	998,000	2.1%	1,018,958	33.9%	345,120	1,254,335	909,216
RY Khan	826,942	2.5%	847,367	25.5%	216,231	1,081,531	865,301
Sahiwal	446,606	2.3%	456,923	27.3%	124,814	574,148	449,333
Sargodha	684,321	2.7%	702,798	34.0%	239,295	917,349	678,055
Sheikhupura	593,260	2.7%	609,041	21.1%	128,295	791,879	663,585

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline		Estimated HOUSEHOLDs 2035	Pop gap to meet access by 2035
				Percentage	Household Served		
Sialkot	671,320	2.4%	687,700	21.3%	146,689	875,175	728,485
TT Singh	393,896	2.4%	403,350	10.2%	41,123	511,306	470,183
Vehari	543,036	2.8%	558,404	10.5%	58,362	738,154	679,792
Punjab	19,839,980	2.6%	20,340,142	23.4%	4,722,035	26,101,417	21,379,382

(Cont'd) Safely Managed Water – Option 1

DISTRICT	Mean cost per HH at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Attock	90,000	33,640,416,816	3,364,041,682	72,627,136,782	7,262,713,678
Bahawalnagar	90,000	61,265,664,411	6,126,566,441	132,267,974,371	13,226,797,437
Bahawalpur	90,000	59,588,680,339	5,958,868,034	128,647,491,539	12,864,749,154
Bhakkar	90,000	34,106,293,107	3,410,629,311	73,632,928,753	7,363,292,875
Chakwal	90,000	32,472,920,898	3,247,292,090	70,106,600,660	7,010,660,066
Chiniot	90,000	24,184,485,726	2,418,448,573	52,212,490,780	5,221,249,078
DG Khan	90,000	43,951,342,845	4,395,134,284	94,887,652,731	9,488,765,273
Faisalabad	90,000	156,926,158,188	15,692,615,819	338,791,805,638	33,879,180,564
Gujranwala	90,000	80,881,247,809	8,088,124,781	174,616,547,705	17,461,654,771
Gujrat	90,000	48,787,632,125	4,878,763,213	105,328,838,553	10,532,883,855
Hafizabad	90,000	18,604,938,752	1,860,493,875	40,166,667,344	4,016,666,734
Jhang	90,000	39,088,469,022	3,908,846,902	84,389,072,877	8,438,907,288
Jhelum	90,000	15,975,309,686	1,597,530,969	34,489,495,420	3,448,949,542
Kasur	90,000	60,767,005,495	6,076,700,550	131,191,407,173	13,119,140,717
Khanewal	90,000	44,557,886,154	4,455,788,615	96,197,134,243	9,619,713,424
Khushab	90,000	24,899,058,272	2,489,905,827	53,755,199,312	5,375,519,931
Lahore	90,000	215,812,581,025	21,581,258,103	465,923,175,901	46,592,317,590
Layyah	90,000	25,572,067,415	2,557,206,742	55,208,175,574	5,520,817,557
Lodhran	90,000	29,188,489,555	2,918,848,955	63,015,759,732	6,301,575,973
Mandi Bahauddin	90,000	28,297,733,148	2,829,773,315	61,092,683,459	6,109,268,346
Mianwali	90,000	29,544,731,953	2,954,473,195	63,784,860,351	6,378,486,035
Multan	90,000	83,523,643,654	8,352,364,365	180,321,282,148	18,032,128,215

DISTRICT	Mean cost per HH at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Muzaffargarh	90,000	69,947,513,910	6,994,751,391	151,011,436,277	15,101,143,628
Nankana Sahib	90,000	29,900,596,516	2,990,059,652	64,553,145,252	6,455,314,525
Narowal	90,000	22,966,527,953	2,296,652,795	49,583,011,298	4,958,301,130
Okara	90,000	49,277,009,785	4,927,700,978	106,385,368,215	10,638,536,821
Pakpattan	90,000	34,003,536,821	3,400,353,682	73,411,085,638	7,341,108,564
Rajanpur	90,000	36,456,989,241	3,645,698,924	78,707,905,398	7,870,790,540
Rawalpindi	90,000	81,829,426,511	8,182,942,651	176,663,594,407	17,666,359,441
RY Khan	90,000	77,877,072,515	7,787,707,252	168,130,758,567	16,813,075,857
Sahiwal	90,000	40,440,009,102	4,044,000,910	87,306,946,541	8,730,694,654
Sargodha	90,000	61,024,917,934	6,102,491,793	131,748,220,785	13,174,822,079
Sheikhupura	90,000	59,722,619,049	5,972,261,905	128,936,655,168	12,893,665,517
Sialkot	90,000	65,563,690,077	6,556,369,008	141,547,089,420	14,154,708,942
TT Singh	90,000	42,316,460,192	4,231,646,019	91,358,063,705	9,135,806,371
Vehari	90,000	61,181,269,690	6,118,126,969	132,085,772,499	13,208,577,250
Punjab	90,000	1,924,144,395,691	192,414,439,569	4,154,083,434,221	415,408,343,422

Drinking Water- Option 2

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline Percentage for Safely Managed Water	Baseline Percentage for Basic Water	Current Household Served for Safely Managed Water	Current Household Served for Basic Water (After Deducting Households Served with Safely Managed Water)	Estimated HOUSEHOLDs 2035	Pop gap to meet 34% Safely Managed Water Services by 2035	Pop gap to meet 66% Basic Water Services by 2035
Attock	353,973	2.4%	362,362	23.2%	98.4%	84,222	272,261	458,005	74,756	26,765
Bahawalnagar	557,616	3.0%	574,344	15.9%	96.8%	91,141	464,678	771,871	136,146	79,905
Bahawalpur	673,437	2.6%	691,148	33.8%	96.1%	233,917	430,274	896,014	132,419	99,403
Bhakkar	313,311	2.9%	322,460	15.8%	99.6%	51,046	270,239	430,005	75,792	32,928
Chakwal	288,838	2.5%	296,088	6.3%	98.3%	18,577	272,331	379,387	72,162	16,317
Chiniot	256,438	2.2%	262,182	22.3%	97.9%	58,482	198,071	327,199	53,743	16,902
DG Khan	454,464	2.8%	467,325	27.7%	87.9%	129,409	281,356	617,757	97,670	109,322
Faisalabad	1,382,773	2.4%	1,415,683	3.4%	98.2%	47,465	1,342,367	1,791,089	348,725	52,532
Gujranwala	849,177	2.9%	874,143	30.8%	99.2%	269,269	597,886	1,167,949	179,736	121,059
Gujrat	489,337	2.6%	502,207	21.7%	99.3%	108,982	389,888	651,067	108,417	43,780
Hafizabad	197,206	2.2%	201,604	22.1%	99.4%	44,630	155,778	251,352	41,344	9,599
Jhang	491,999	1.9%	501,199	33.7%	97.0%	168,901	317,017	603,217	86,863	30,436
Jhelum	229,064	2.1%	233,829	46.9%	96.9%	109,776	116,879	287,279	35,501	25,124
Kasur	645,308	2.8%	663,635	30.6%	84.1%	202,923	355,012	878,112	135,038	185,139
Khanewal	526,196	2.4%	538,772	34.7%	98.5%	187,220	343,732	682,308	99,018	52,339
Khushab	248,304	2.7%	254,983	21.9%	91.0%	55,845	176,249	332,501	55,331	45,076
Lahore	2,010,225	2.7%	2,063,496	13.7%	88.2%	282,443	1,538,188	2,680,360	479,584	380,146
Layyah	341,131	2.4%	349,318	45.4%	97.9%	158,679	183,149	442,813	56,827	44,159
Lodhran	323,866	2.1%	330,764	25.4%	97.1%	84,052	237,020	408,368	64,863	22,433
Mandi Bahauddin	285,989	2.3%	292,653	18.5%	96.3%	54,034	227,652	368,453	62,884	23,884
Mianwali	296,339	2.6%	304,044	21.3%	96.5%	64,741	228,564	393,016	65,655	34,056
Multan	886,392	2.1%	904,652	20.0%	98.8%	181,229	712,898	1,109,269	185,608	29,535
Muzaffargarh	804,438	2.5%	824,469	33.6%	98.2%	277,166	532,437	1,054,360	155,439	89,319
Nankana Sahib	246,956	3.2%	254,834	6.5%	91.5%	16,617	216,503	348,846	66,446	49,280
Narowal	281,536	2.3%	287,871	36.3%	99.5%	104,425	181,878	359,609	51,037	22,269
Okara	549,724	2.5%	563,192	30.2%	97.6%	169,902	379,641	717,425	109,504	58,377
Pakpattan	344,546	2.7%	353,745	23.3%	96.3%	82,573	258,230	460,391	75,563	44,023
Rajanpur	354,016	3.0%	364,601	23.2%	85.9%	84,440	228,853	489,518	81,016	95,209
Rawalpindi	998,000	2.1%	1,018,958	33.9%	98.1%	345,120	654,057	1,254,335	181,843	73,316
RY Khan	826,942	2.5%	847,367	25.5%	89.9%	216,231	545,183	1,081,531	173,060	147,058

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline Percentage for Safely Managed Water	Baseline Percentage for Basic Water	Current Household Served for Safely Managed Water	Current Household Served for Basic Water (After Deducting Households Served with Safely Managed Water)	Estimated HOUSEHOLDs 2035	Pop gap to meet 34% Safely Managed Water Services by 2035	Pop gap to meet 66% Basic Water Services by 2035
Sahiwal	446,606	2.3%	456,923	27.3%	97.4%	124,814	320,424	574,148	89,867	39,043
Sargodha	684,321	2.7%	702,798	34.0%	99.1%	239,295	457,162	917,349	135,611	85,282
Sheikhupura	593,260	2.7%	609,041	21.1%	98.2%	128,295	469,816	791,879	132,717	61,052
Sialkot	671,320	2.4%	687,700	21.3%	99.7%	146,689	539,175	875,175	145,697	43,613
TT Singh	393,896	2.4%	403,350	10.2%	97.5%	41,123	352,098	511,306	94,037	24,049
Vehari	543,036	2.8%	558,404	10.5%	98.1%	58,362	489,503	738,154	135,958	54,331
Punjab	19,839,980	2.6%	20,340,142	23.4%	95.6%	4,722,035	14,736,446	26,101,417	4,275,876	2,367,059

(Cont'd) Drinking Water Option-2

DISTRICT	Mean cost per HH for Safely Managed Water at current rates	Mean cost per HH for Basic Water at current rates	Cost to meet gap for Safely Managed Water at current rates (2025-35)	Cost to meet gap for Basic Water at current rates (2025-35)	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Attock	90,000	45,000	6,728,083,363	1,204,430,281	7,932,513,644	793,251,364	17,125,701,997	1,712,570,200
Bahawalnagar	90,000	45,000	12,253,132,882	3,595,741,081	15,848,873,964	1,584,887,396	34,216,530,179	3,421,653,018
Bahawalpur	90,000	45,000	11,917,736,068	4,473,129,274	16,390,865,342	1,639,086,534	35,386,648,913	3,538,664,891
Bhakkar	90,000	45,000	6,821,258,621	1,481,749,446	8,303,008,068	830,300,807	17,925,571,670	1,792,557,167
Chakwal	90,000	45,000	6,494,584,180	734,257,810	7,228,841,989	722,884,199	15,606,527,672	1,560,652,767
Chiniot	90,000	45,000	4,836,897,145	760,609,824	5,597,506,969	559,750,697	12,084,597,719	1,208,459,772
DG Khan	90,000	45,000	8,790,268,569	4,919,510,762	13,709,779,331	1,370,977,933	29,598,385,306	2,959,838,531
Faisalabad	90,000	45,000	31,385,231,638	2,363,947,550	33,749,179,188	3,374,917,919	72,861,946,586	7,286,194,659
Gujranwala	90,000	45,000	16,176,249,562	5,447,649,783	21,623,899,345	2,162,389,934	46,684,376,834	4,668,437,683
Gujrat	90,000	45,000	9,757,526,425	1,970,102,480	11,727,628,905	1,172,762,890	25,319,071,202	2,531,907,120
Hafizabad	90,000	45,000	3,720,987,750	431,955,391	4,152,943,142	415,294,314	8,965,892,761	896,589,276
Jhang	90,000	45,000	7,817,693,804	1,369,628,104	9,187,321,909	918,732,191	19,834,738,927	1,983,473,893
Jhelum	90,000	45,000	3,195,061,937	1,130,587,337	4,325,649,274	432,564,927	9,338,752,347	933,875,235
Kasur	90,000	45,000	12,153,401,099	8,331,247,223	20,484,648,322	2,048,464,832	44,224,819,323	4,422,481,932
Khanewal	90,000	45,000	8,911,577,231	2,355,234,416	11,266,811,647	1,126,681,165	24,324,201,303	2,432,420,130
Khushab	90,000	45,000	4,979,811,654	2,028,424,380	7,008,236,034	700,823,603	15,130,255,961	1,513,025,596
Lahore	90,000	45,000	43,162,516,205	17,106,575,398	60,269,091,603	6,026,909,160	130,116,448,424	13,011,644,842

DISTRICT	Mean cost per HH for Safely Managed Water at current rates	Mean cost per HH for Basic Water at current rates	Cost to meet gap for Safely Managed Water at current rates (2025-35)	Cost to meet gap for Basic Water at current rates (2025-35)	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Layyah	90,000	45,000	5,114,413,483	1,987,138,985	7,101,552,468	710,155,247	15,331,719,142	1,533,171,914
Lodhran	90,000	45,000	5,837,697,911	1,009,494,147	6,847,192,058	684,719,206	14,782,574,094	1,478,257,409
Mandi Bahauddin	90,000	45,000	5,659,546,630	1,074,763,281	6,734,309,911	673,430,991	14,538,870,006	1,453,887,001
Mianwali	90,000	45,000	5,908,946,391	1,532,511,125	7,441,457,515	744,145,752	16,065,548,646	1,606,554,865
Multan	90,000	45,000	16,704,728,731	1,329,060,687	18,033,789,418	1,803,378,942	38,933,598,770	3,893,359,877
Muzaffargarh	90,000	45,000	13,989,502,782	4,019,355,941	18,008,858,723	1,800,885,872	38,879,775,269	3,887,977,527
Nankana Sahib	90,000	45,000	5,980,119,303	2,217,600,726	8,197,720,029	819,772,003	17,698,262,692	1,769,826,269
Narowal	90,000	45,000	4,593,305,591	1,002,100,115	5,595,405,706	559,540,571	12,080,061,248	1,208,006,125
Okara	90,000	45,000	9,855,401,957	2,626,959,320	12,482,361,277	1,248,236,128	26,948,481,785	2,694,848,178
Pakpattan	90,000	45,000	6,800,707,364	1,981,057,106	8,781,764,470	878,176,447	18,959,170,834	1,895,917,083
Rajanpur	90,000	45,000	7,291,397,848	4,284,425,232	11,575,823,080	1,157,582,308	24,991,333,812	2,499,133,381
Rawalpindi	90,000	45,000	16,365,885,302	3,299,216,024	19,665,101,326	1,966,510,133	42,455,478,827	4,245,547,883
RY Khan	90,000	45,000	15,575,414,503	6,617,614,663	22,193,029,166	2,219,302,917	47,913,085,431	4,791,308,543
Sahiwal	90,000	45,000	8,088,001,820	1,756,912,536	9,844,914,356	984,491,436	21,254,431,700	2,125,443,170
Sargodha	90,000	45,000	12,204,983,587	3,837,687,209	16,042,670,796	1,604,267,080	34,634,923,005	3,463,492,301
Sheikhupura	90,000	45,000	11,944,523,810	2,747,329,917	14,691,853,727	1,469,185,373	31,718,610,268	3,171,861,027
Sialkot	90,000	45,000	13,112,738,015	1,962,587,225	15,075,325,240	1,507,532,524	32,546,496,503	3,254,649,650
TT Singh	90,000	45,000	8,463,292,038	1,082,186,681	9,545,478,720	954,547,872	20,607,972,619	2,060,797,262
Vehari	90,000	45,000	12,236,253,938	2,444,893,693	14,681,147,631	1,468,114,763	31,695,496,609	3,169,549,661
Punjab	90,000	45,000	384,828,879,138	106,517,675,152	491,346,554,291	49,134,655,429	1,060,780,358,382	106,078,035,838

Safely Manged Sanitation – Option 1

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline		Estimated HOUSEHOLDs 2035	Pop gap to meet access by 2035
				Percentage	Household Served		
Attock	353,973	2.4%	362,362	41.8%	151,605	458,005	306,400
Bahawalnagar	557,616	3.0%	574,344	56.6%	325,088	771,871	446,783
Bahawalpur	673,437	2.6%	691,148	65.4%	452,111	896,014	443,902

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline		Estimated HOUSEHOLDs 2035	Pop gap to meet access by 2035
				Percentage	Household Served		
Bhakkar	313,311	2.9%	322,460	54.2%	174,662	430,005	255,343
Chakwal	288,838	2.5%	296,088	33.6%	99,500	379,387	279,887
Chiniot	256,438	2.2%	262,182	20.7%	54,315	327,199	272,884
DG Khan	454,464	2.8%	467,325	31.3%	146,246	617,757	471,511
Faisalabad	1,382,773	2.4%	1,415,683	57.7%	817,526	1,791,089	973,564
Gujranwala	849,177	2.9%	874,143	66.2%	578,684	1,167,949	589,266
Gujrat	489,337	2.6%	502,207	12.9%	64,701	651,067	586,366
Hafizabad	197,206	2.2%	201,604	24.6%	49,660	251,352	201,692
Jhang	491,999	1.9%	501,199	33.9%	170,105	603,217	433,112
Jhelum	229,064	2.1%	233,829	57.3%	133,870	287,279	153,409
Kasur	645,308	2.8%	663,635	21.4%	141,905	878,112	736,206
Khanewal	526,196	2.4%	538,772	38.2%	205,615	682,308	476,693
Khushab	248,304	2.7%	254,983	38.5%	98,285	332,501	234,216
Lahore	2,010,225	2.7%	2,063,496	90.7%	1,871,053	2,680,360	809,307
Layyah	341,131	2.4%	349,318	50.0%	174,509	442,813	268,304
Lodhran	323,866	2.1%	330,764	58.0%	191,763	408,368	216,605
Mandi Bahauddin	285,989	2.3%	292,653	15.3%	44,676	368,453	323,777
Mianwali	296,339	2.6%	304,044	63.9%	194,223	393,016	198,792
Multan	886,392	2.1%	904,652	60.6%	548,448	1,109,269	560,822
Muzaffargarh	804,438	2.5%	824,469	41.1%	338,926	1,054,360	715,434
Nankana Sahib	246,956	3.2%	254,834	28.9%	73,762	348,846	275,083
Narowal	281,536	2.3%	287,871	26.0%	74,874	359,609	284,734
Okara	549,724	2.5%	563,192	35.2%	198,288	717,425	519,137
Pakpattan	344,546	2.7%	353,745	39.8%	140,695	460,391	319,696
Rajanpur	354,016	3.0%	364,601	29.0%	105,817	489,518	383,701
Rawalpindi	998,000	2.1%	1,018,958	49.2%	501,433	1,254,335	752,902
RY Khan	826,942	2.5%	847,367	61.9%	524,838	1,081,531	556,694
Sahiwal	446,606	2.3%	456,923	42.7%	194,906	574,148	379,241
Sargodha	684,321	2.7%	702,798	26.5%	186,240	917,349	731,110
Sheikhupura	593,260	2.7%	609,041	46.2%	281,679	791,879	510,201
Sialkot	671,320	2.4%	687,700	18.5%	127,146	875,175	748,029
TT Singh	393,896	2.4%	403,350	37.9%	153,069	511,306	358,237
Vehari	543,036	2.8%	558,404	63.4%	354,098	738,154	384,056
Punjab	19,839,980	2.6%	20,340,142	49.4%	9,944,320	26,101,417	16,157,097

(Cont'd) Safely Managed Sanitation Option 1

DISTRICT	Mean cost per HH at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Attock	90,000	27,576,002,979	2,757,600,298	59,534,522,155	5,953,452,216
Bahawalnagar	90,000	40,210,491,215	4,021,049,122	86,811,434,637	8,681,143,464
Bahawalpur	90,000	39,951,190,007	3,995,119,001	86,251,622,776	8,625,162,278
Bhakkar	90,000	22,980,877,227	2,298,087,723	49,613,990,305	4,961,399,030
Chakwal	90,000	25,189,847,730	2,518,984,773	54,382,991,942	5,438,299,194
Chiniot	90,000	24,559,570,860	2,455,957,086	53,022,271,453	5,302,227,145
DG Khan	90,000	42,435,970,587	4,243,597,059	91,616,077,685	9,161,607,768
Faisalabad	90,000	87,620,718,331	8,762,071,833	189,166,559,084	18,916,655,908
Gujranwala	90,000	53,033,927,172	5,303,392,717	114,496,271,075	11,449,627,108
Gujrat	90,000	52,772,903,788	5,277,290,379	113,932,741,167	11,393,274,117
Hafizabad	90,000	18,152,289,227	1,815,228,923	39,189,430,970	3,918,943,097
Jhang	90,000	38,980,119,441	3,898,011,944	84,155,154,258	8,415,515,426
Jhelum	90,000	13,806,799,871	1,380,679,987	29,807,845,374	2,980,784,537
Kasur	90,000	66,258,579,943	6,625,857,994	143,047,304,524	14,304,730,452
Khanewal	90,000	42,902,411,156	4,290,241,116	92,623,087,887	9,262,308,789
Khushab	90,000	21,079,479,295	2,107,947,929	45,509,014,779	4,550,901,478
Lahore	90,000	72,837,618,114	7,283,761,811	157,250,954,487	15,725,095,449
Layyah	90,000	24,147,387,324	2,414,738,732	52,132,398,113	5,213,239,811
Lodhran	90,000	19,494,448,850	1,949,444,885	42,087,052,931	4,208,705,293
Mandi Bahauddin	90,000	29,139,965,568	2,913,996,557	62,911,000,084	6,291,100,008
Mianwali	90,000	17,891,322,856	1,789,132,286	38,626,024,149	3,862,602,415
Multan	90,000	50,473,945,606	5,047,394,561	108,969,462,880	10,896,946,288
Muzaffargarh	90,000	64,389,048,014	6,438,904,801	139,011,125,307	13,901,112,531
Nankana Sahib	90,000	24,757,507,853	2,475,750,785	53,449,602,574	5,344,960,257
Narowal	90,000	25,626,099,995	2,562,610,000	55,324,827,863	5,532,482,786
Okara	90,000	46,722,318,746	4,672,231,875	100,869,981,872	10,086,998,187
Pakpattan	90,000	28,772,599,993	2,877,259,999	62,117,885,362	6,211,788,536
Rajanpur	90,000	34,533,077,289	3,453,307,729	74,554,323,791	7,455,432,379
Rawalpindi	90,000	67,761,192,435	6,776,119,243	146,291,332,192	14,629,133,219
RY Khan	90,000	50,102,427,566	5,010,242,757	108,167,383,296	10,816,738,330
Sahiwal	90,000	34,131,696,202	3,413,169,620	73,687,772,130	7,368,777,213
Sargodha	90,000	65,799,872,013	6,579,987,201	142,056,988,506	14,205,698,851
Sheikhupura	90,000	45,918,054,229	4,591,805,423	99,133,635,101	9,913,363,510

DISTRICT	Mean cost per HH at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Sialkot	90,000	67,322,603,735	6,732,260,374	145,344,452,086	14,534,445,209
TT Singh	90,000	32,241,358,493	3,224,135,849	69,606,674,797	6,960,667,480
Vehari	90,000	34,565,008,640	3,456,500,864	74,623,261,184	7,462,326,118
Punjab	90,000	1,454,138,732,352	145,413,873,235	3,139,376,458,777	313,937,645,878

Sanitation Option -2

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline Percentage for Safely Managed Sanitation	Baseline Percentage for Basic Sanitation	Current Household Served for Safely Managed Sanitation	Current Household Served for Basic Sanitation (After Deducting Households Served with Safely Managed Sanitation)	Estimated HOUSEHOLDs 2035	Pop gap to meet 50% Safely Managed Water Services by 2035	Pop gap to meet 50% Basic Water Services by 2035
Attock	353,973	2.4%	362,362	41.8%	64.8%	151,605	83,214	458,005	61,280	161,906
Bahawalnagar	557,616	3.0%	574,344	56.6%	71.2%	325,088	83,689	771,871	89,357	273,738
Bahawalpur	673,437	2.6%	691,148	65.4%	68.8%	452,111	23,688	896,014	88,780	331,434
Bhakkar	313,311	2.9%	322,460	54.2%	70.5%	174,662	52,648	430,005	51,069	151,627
Chakwal	288,838	2.5%	296,088	33.6%	69.6%	99,500	106,695	379,387	55,977	117,215
Chiniot	256,438	2.2%	262,182	20.7%	63.9%	54,315	113,174	327,199	54,577	105,133
DG Khan	454,464	2.8%	467,325	31.3%	33.2%	146,246	8,834	617,757	94,302	368,375
Faisalabad	1,382,773	2.4%	1,415,683	57.7%	84.4%	817,526	377,614	1,791,089	194,713	401,237
Gujranwala	849,177	2.9%	874,143	66.2%	83.0%	578,684	147,093	1,167,949	117,853	324,319
Gujrat	489,337	2.6%	502,207	12.9%	86.8%	64,701	371,303	651,067	117,273	97,790
Hafizabad	197,206	2.2%	201,604	24.6%	72.4%	49,660	96,236	251,352	40,338	65,118
Jhang	491,999	1.9%	501,199	33.9%	65.2%	170,105	156,740	603,217	86,622	189,749
Jhelum	229,064	2.1%	233,829	57.3%	89.8%	133,870	76,077	287,279	30,682	46,650
Kasur	645,308	2.8%	663,635	21.4%	54.5%	141,905	219,614	878,112	147,241	369,351
Khanewal	526,196	2.4%	538,772	38.2%	71.3%	205,615	178,724	682,308	95,339	202,631
Khushab	248,304	2.7%	254,983	38.5%	60.7%	98,285	56,413	332,501	46,843	130,960
Lahore	2,010,225	2.7%	2,063,496	90.7%	89.1%	1,871,053	(31,773)	2,680,360	161,861	679,219
Layyah	341,131	2.4%	349,318	50.0%	61.5%	174,509	40,378	442,813	53,661	174,265
Lodhran	323,866	2.1%	330,764	58.0%	63.0%	191,763	16,759	408,368	43,321	156,525
Mandi Bahauddin	285,989	2.3%	292,653	15.3%	76.1%	44,676	177,941	368,453	64,755	81,081
Mianwali	296,339	2.6%	304,044	63.9%	71.2%	194,223	22,356	393,016	39,758	136,678
Multan	886,392	2.1%	904,652	60.6%	68.6%	548,448	71,973	1,109,269	112,164	376,684
Muzaffargarh	804,438	2.5%	824,469	41.1%	50.3%	338,926	75,854	1,054,360	143,087	496,493
Nankana Sahib	246,956	3.2%	254,834	28.9%	66.8%	73,762	96,516	348,846	55,017	123,551
Narowal	281,536	2.3%	287,871	26.0%	82.0%	74,874	161,209	359,609	56,947	66,579
Okara	549,724	2.5%	563,192	35.2%	85.7%	198,288	284,617	717,425	103,827	130,693
Pakpattan	344,546	2.7%	353,745	39.8%	89.0%	140,695	174,045	460,391	63,939	81,712
Rajanpur	354,016	3.0%	364,601	29.0%	36.6%	105,817	27,760	489,518	76,740	279,201
Rawalpindi	998,000	2.1%	1,018,958	49.2%	62.3%	501,433	132,948	1,254,335	150,580	469,374
RY Khan	826,942	2.5%	847,367	61.9%	61.5%	524,838	(3,829)	1,081,531	111,339	449,184

DISTRICT	HOUSEHOLDS (as per Census 2023)	Average Population Growth 2023	Estimated HOUSEHOLDS 2025	Baseline Percentage for Safely Managed Sanitation	Baseline Percentage for Basic Sanitation	Current Household Served for Safely Managed Sanitation	Current Household Served for Basic Sanitation (After Deducting Households Served with Safely Managed Sanitation)	Estimated HOUSEHOLDs 2035	Pop gap to meet 50% Safely Managed Water Services by 2035	Pop gap to meet 50% Basic Water Services by 2035
Sahiwal	446,606	2.3%	456,923	42.7%	87.9%	194,906	206,830	574,148	75,848	96,563
Sargodha	684,321	2.7%	702,798	26.5%	71.3%	186,240	314,603	917,349	146,222	270,285
Sheikhupura	593,260	2.7%	609,041	46.2%	73.7%	281,679	167,428	791,879	102,040	240,732
Sialkot	671,320	2.4%	687,700	18.5%	85.1%	127,146	458,376	875,175	149,606	140,048
TT Singh	393,896	2.4%	403,350	37.9%	89.0%	153,069	205,831	511,306	71,647	80,759
Vehari	543,036	2.8%	558,404	63.4%	74.5%	354,098	61,905	738,154	76,811	245,339
Punjab	19,839,980	2.6%	20,340,142	49.4%	73.2%	9,944,320	4,813,482	26,101,417	3,231,419	8,112,195

(Cont'd) Sanitation Option 2

DISTRICT	Mean cost per HH for Safely Managed Sanitation at current rates	Mean cost per HH for Basic Sanitation at current rates	Cost to meet gap for Safely Managed Sanitation at current rates (2025-35)	Cost to meet gap for Basic Sanitation at current rates (2025-35)	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Attock	90,000	45,000	5,515,200,596	7,285,762,742	12,800,963,337	1,280,096,334	27,636,319,738	2,763,631,974
Bahawalnagar	90,000	45,000	8,042,098,243	12,318,190,811	20,360,289,054	2,036,028,905	43,956,336,990	4,395,633,699
Bahawalpur	90,000	45,000	7,990,238,001	14,914,514,889	22,904,752,890	2,290,475,289	49,449,643,571	4,944,964,357
Bhakkar	90,000	45,000	4,596,175,445	6,823,203,177	11,419,378,622	1,141,937,862	24,653,581,960	2,465,358,196
Chakwal	90,000	45,000	5,037,969,546	5,274,652,999	10,312,622,545	1,031,262,254	22,264,178,599	2,226,417,860
Chiniot	90,000	45,000	4,911,914,172	4,730,979,304	9,642,893,476	964,289,348	20,818,283,771	2,081,828,377
DG Khan	90,000	45,000	8,487,194,117	16,576,874,146	25,064,068,264	2,506,406,826	54,111,443,508	5,411,144,351
Faisalabad	90,000	45,000	17,524,143,666	18,055,652,090	35,579,795,757	3,557,979,576	76,814,110,457	7,681,411,046
Gujranwala	90,000	45,000	10,606,785,434	14,594,365,846	25,201,151,281	2,520,115,128	54,407,395,460	5,440,739,546
Gujrat	90,000	45,000	10,554,580,758	4,400,538,796	14,955,119,554	1,495,511,955	32,286,981,442	3,228,698,144
Hafizabad	90,000	45,000	3,630,457,845	2,930,294,376	6,560,752,221	656,075,222	14,164,171,971	1,416,417,197
Jhang	90,000	45,000	7,796,023,888	8,538,726,542	16,334,750,430	1,633,475,043	35,265,501,028	3,526,550,103
Jhelum	90,000	45,000	2,761,359,974	2,099,263,375	4,860,623,349	486,062,335	10,493,721,251	1,049,372,125
Kasur	90,000	45,000	13,251,715,989	16,620,780,029	29,872,496,018	2,987,249,602	64,492,478,384	6,449,247,838
Khanewal	90,000	45,000	8,580,482,231	9,118,374,627	17,698,856,858	1,769,885,686	38,210,504,494	3,821,050,449

DISTRICT	Mean cost per HH for Safely Managed Sanitation at current rates	Mean cost per HH for Basic Sanitation at current rates	Cost to meet gap for Safely Managed Sanitation at current rates (2025-35)	Cost to meet gap for Basic Sanitation at current rates (2025-35)	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
Khushab	90,000	45,000	4,215,895,859	5,893,219,191	10,109,115,050	1,010,911,505	21,824,821,181	2,182,482,118
Lahore	90,000	45,000	14,567,523,623	30,564,835,774	45,132,359,397	4,513,235,940	97,437,378,888	9,743,737,889
Layyah	90,000	45,000	4,829,477,465	7,841,944,038	12,671,421,503	1,267,142,150	27,356,648,634	2,735,664,863
Lodhran	90,000	45,000	3,898,889,770	7,043,614,618	10,942,504,388	1,094,250,439	23,624,046,257	2,362,404,626
Mandi Bahauddin	90,000	45,000	5,827,993,114	3,648,647,022	9,476,640,136	947,664,014	20,459,355,279	2,045,935,528
Mianwali	90,000	45,000	3,578,264,571	6,150,518,539	9,728,783,110	972,878,311	21,003,713,050	2,100,371,305
Multan	90,000	45,000	10,094,789,121	16,950,781,019	27,045,570,141	2,704,557,014	58,389,357,442	5,838,935,744
Muzaffargarh	90,000	45,000	12,877,809,603	22,342,195,695	35,220,005,297	3,522,000,530	76,037,349,841	7,603,734,984
Nankana Sahib	90,000	45,000	4,951,501,571	5,559,785,229	10,511,286,799	1,051,128,680	22,693,079,825	2,269,307,982
Narowal	90,000	45,000	5,125,219,999	2,996,055,993	8,121,275,992	812,127,599	17,533,225,749	1,753,322,575
Okara	90,000	45,000	9,344,463,749	5,881,175,452	15,225,639,201	1,522,563,920	32,871,013,071	3,287,101,307
Pakpattan	90,000	45,000	5,754,519,999	3,677,036,705	9,431,556,704	943,155,670	20,362,023,531	2,036,202,353
Rajanpur	90,000	45,000	6,906,615,458	12,564,026,653	19,470,642,111	1,947,064,211	42,035,655,967	4,203,565,597
Rawalpindi	90,000	45,000	13,552,238,487	21,121,829,993	34,674,068,480	3,467,406,848	74,858,713,199	7,485,871,320
RY Khan	90,000	45,000	10,020,485,513	20,213,268,877	30,233,754,391	3,023,375,439	65,272,408,115	6,527,240,812
Sahiwal	90,000	45,000	6,826,339,240	4,345,315,429	11,171,654,669	1,117,165,467	24,118,764,526	2,411,876,453
Sargodha	90,000	45,000	13,159,974,403	12,162,831,410	25,322,805,813	2,532,280,581	54,670,038,470	5,467,003,847
Sheikhupura	90,000	45,000	9,183,610,846	10,832,949,562	20,016,560,408	2,001,656,041	43,214,252,623	4,321,425,262
Sialkot	90,000	45,000	13,464,520,747	6,302,139,704	19,766,660,451	1,976,666,045	42,674,737,360	4,267,473,736
TT Singh	90,000	45,000	6,448,271,699	3,634,168,114	10,082,439,813	1,008,243,981	21,767,231,346	2,176,723,135
Vehari	90,000	45,000	6,913,001,728	11,040,275,514	17,953,277,242	1,795,327,724	38,759,779,022	3,875,977,902
Punjab	90,000	45,000	290,827,746,470	365,048,788,282	655,876,534,752	65,587,653,475	1,415,988,246,002	141,598,824,600

WASH in Schools

DISTRICT	Total Schools- School Census 2023-24	Baseline DW (EMIS May 24)		Gap to meet for DW by 2035	Baseline Toilets (EMIS May 24)		Gap to meet for Toilet by 2035	Total Gap to meet for WinS by 2035	Mean cost per School at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
		Percentage	School Served		Percentage	School Served							
Attock	1216	100.0%	1216	-	91.9%	1118	98	98	250,000	24,532,800	2,453,280	52,964,475	5,296,448
Bahawalnagar	2132	99.9%	2129	3	80.8%	1722	410	413	250,000	103,188,800	10,318,880	222,776,880	22,277,688
Bahawalpur	1664	98.7%	1642	22	91.1%	1516	148	170	250,000	42,598,400	4,259,840	91,966,751	9,196,675
Bhakkar	1272	99.6%	1267	5	86.0%	1094	178	183	250,000	45,855,600	4,585,560	98,998,801	9,899,880
Chakwal	1140	99.1%	1130	10	96.0%	1095	45	56	250,000	13,879,500	1,387,950	29,964,799	2,996,480
Chiniot	698	99.2%	693	5	92.5%	646	52	58	250,000	14,378,800	1,437,880	31,042,751	3,104,275
DG Khan	1631	99.5%	1623	8	80.6%	1315	316	324	250,000	81,060,700	8,106,070	175,003,972	17,500,397
Faisalabad	2212	97.7%	2160	52	91.7%	2028	184	236	250,000	59,115,700	5,911,570	127,626,362	12,762,636
Gujranwala	1561	98.4%	1536	25	85.6%	1337	224	249	250,000	62,166,825	6,216,683	134,213,512	13,421,351
Gujrat	1399	97.5%	1364	35	93.2%	1303	96	130	250,000	32,561,725	3,256,173	70,298,322	7,029,832
Hafizabad	734	100.0%	734	-	87.4%	642	92	92	250,000	23,121,000	2,312,100	49,916,505	4,991,650
Jhang	1493	99.6%	1488	5	82.0%	1224	269	274	250,000	68,528,700	6,852,870	147,948,323	14,794,832
Jhelum	799	99.5%	795	4	92.3%	738	61	66	250,000	16,399,475	1,639,948	35,405,237	3,540,524
Kasur	1358	99.6%	1353	5	93.7%	1272	86	91	250,000	22,678,600	2,267,860	48,961,396	4,896,140
Khanewal	1238	99.6%	1233	5	84.2%	1043	195	201	250,000	50,139,000	5,013,900	108,246,340	10,824,634
Khushab	959	99.4%	953	6	90.1%	864	95	101	250,000	25,269,650	2,526,965	54,555,279	5,455,528
Lahore	1120	98.8%	1107	13	79.3%	889	231	244	250,000	61,124,000	6,112,400	131,962,132	13,196,213
Layyah	1513	99.7%	1508	5	90.2%	1365	148	153	250,000	38,203,250	3,820,325	82,477,951	8,247,795
Lodhran	760	93.9%	714	46	88.7%	674	86	132	250,000	33,041,000	3,304,100	71,333,041	7,133,304
Mandi Bahauddin	781	99.7%	779	2	92.9%	726	55	57	250,000	14,331,350	1,433,135	30,940,310	3,094,031
Mianwali	1233	96.8%	1194	39	80.6%	994	239	278	250,000	69,602,850	6,960,285	150,267,333	15,026,733
Multan	1317	97.6%	1285	32	80.3%	1057	260	291	250,000	72,797,175	7,279,718	157,163,641	15,716,364
Muzaffargarh	1759	98.9%	1739	20	89.5%	1575	184	204	250,000	51,011,000	5,101,100	110,128,923	11,012,892
Nankana Sahib	784	99.8%	783	1	91.1%	714	70	71	250,000	17,757,600	1,775,760	38,337,327	3,833,733
Narowal	1097	97.6%	1071	26	92.4%	1013	84	110	250,000	27,397,575	2,739,758	59,149,310	5,914,931
Okara	1412	93.0%	1314	98	94.2%	1330	82	180	250,000	45,113,400	4,511,340	97,396,447	9,739,645
Pakpattan	858	99.3%	852	6	94.3%	809	49	55	250,000	13,813,800	1,381,380	29,822,958	2,982,296

DISTRICT	Total Schools- School Census 2023-24	Baseline DW (EMIS May 24)		Gap to meet for DW by 2035	Baseline Toilets (EMIS May 24)		Gap to meet for Toilet by 2035	Total Gap to meet for WinS by 2035	Mean cost per School at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
		Percentage	School Served		Percentage	School Served							
Rajanpur	1050	100.0%	1050	-	84.3%	886	164	164	250,000	41,107,500	4,110,750	88,748,009	8,874,801
Rawalpindi	1808	99.7%	1803	5	90.3%	1632	176	181	250,000	45,154,800	4,515,480	97,485,826	9,748,583
RY Khan	2775	98.2%	2726	49	84.0%	2332	443	492	250,000	123,071,250	12,307,125	265,701,598	26,570,160
Sahiwal	1158	99.7%	1155	3	88.6%	1026	132	135	250,000	33,784,650	3,378,465	72,938,525	7,293,853
Sargodha	1922	99.7%	1916	6	87.8%	1687	235	241	250,000	60,302,750	6,030,275	130,189,114	13,018,911
Sheikhupura	1161	99.7%	1157	4	83.7%	972	189	193	250,000	48,210,525	4,821,053	104,082,908	10,408,291
Sialkot	1791	99.5%	1781	10	93.5%	1674	117	127	250,000	31,655,925	3,165,593	68,342,768	6,834,277
TT Singh	1245	97.4%	1213	32	90.9%	1131	114	146	250,000	36,509,625	3,650,963	78,821,542	7,882,154
Vehari	1423	96.9%	1379	44	92.4%	1315	108	151	250,000	37,851,800	3,785,180	81,719,197	8,171,920
Punjab	48,473	98.7%	47,840	633	88.6%	42,757	5,716	6,349	250,000	1,587,317,100	158,731,710	3,426,898,566	342,689,857

WASH in HCF

DISTRICT	Total HCF-DHIS Repot FY 23-24			Total HCF to Implement WASH-FIT	Mean cost per HCF at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
	BHUs	MCH Centre	Civil Dispensaries						
Attock	62	5	65	132	300,000	39,600,000	3,960,000	85,493,430	8,549,343
Bahawalnagar	103	7	79	189	300,000	56,700,000	5,670,000	122,411,047	12,241,105
Bahawalpur	75	10	5	90	300,000	27,000,000	2,700,000	58,290,975	5,829,097
Bhakkar	40	2	23	65	300,000	19,500,000	1,950,000	42,099,037	4,209,904
Chakwal	64	6	26	96	300,000	28,800,000	2,880,000	62,177,040	6,217,704
Chiniot	36	2	21	59	300,000	17,700,000	1,770,000	38,212,972	3,821,297
DG Khan	53	5	44	102	300,000	30,600,000	3,060,000	66,063,105	6,606,310
Faisalabad	167	6	69	242	300,000	72,600,000	7,260,000	156,737,955	15,673,795
Gujranwala	94	10	4	108	300,000	32,400,000	3,240,000	69,949,170	6,994,917
Gujrat	87	9	39	135	300,000	40,500,000	4,050,000	87,436,462	8,743,646
Hafizabad	32	5	53	90	300,000	27,000,000	2,700,000	58,290,975	5,829,097
Jhang	59	4	14	77	300,000	23,100,000	2,310,000	49,871,167	4,987,117
Jhelum	48	5	8	61	300,000	18,300,000	1,830,000	39,508,327	3,950,833
Kasur	81	7	10	98	300,000	29,400,000	2,940,000	63,472,395	6,347,239
Khanewal	88	4	26	118	300,000	35,400,000	3,540,000	76,425,945	7,642,594
Khushab	44	6	26	76	300,000	22,800,000	2,280,000	49,223,490	4,922,349
Lahore	39	50	77	166	300,000	49,800,000	4,980,000	107,514,465	10,751,446
Layyah	36	2	16	54	300,000	16,200,000	1,620,000	34,974,585	3,497,458
Lodhran	48	1	35	84	300,000	25,200,000	2,520,000	54,404,910	5,440,491
Mandi Bahauddin	47	3	13	63	300,000	18,900,000	1,890,000	40,803,682	4,080,368
Mianwali	42	8	29	79	300,000	23,700,000	2,370,000	51,166,522	5,116,652
Multan	93	29	4	126	300,000	37,800,000	3,780,000	81,607,365	8,160,736
Muzaffargarh	72	4	36	112	300,000	33,600,000	3,360,000	72,539,880	7,253,988
Nankana Sahib	47	4	52	103	300,000	30,900,000	3,090,000	66,710,782	6,671,078
Narowal	57	4	37	98	300,000	29,400,000	2,940,000	63,472,395	6,347,239
Okara	96	11	23	130	300,000	39,000,000	3,900,000	84,198,075	8,419,807
Pakpattan	55	2	15	72	300,000	21,600,000	2,160,000	46,632,780	4,663,278
Rajanpur	32	1	12	45	300,000	13,500,000	1,350,000	29,145,487	2,914,549
Rawalpindi	100	19	13	132	300,000	39,600,000	3,960,000	85,493,430	8,549,343
RY Khan	103	7	11	121	300,000	36,300,000	3,630,000	78,368,977	7,836,898
Sahiwal	76	6	24	106	300,000	31,800,000	3,180,000	68,653,815	6,865,381
Sargodha	132	16	42	190	300,000	57,000,000	5,700,000	123,058,725	12,305,872

DISTRICT	Total HCF-DHIS Repot FY 23-24			Total HCF to Implement WASH-FIT	Mean cost per HCF at current rates	Total Cost to meet gap at current rates (2025-35)	Mean Annual Cost to meet gap at current rates (2025-35)	Total Cost to meet gap with 8% inflation (2025-35)	Mean Annual Cost to meet gap at 8% inflation (2025-35)
	BHUs	MCH Centre	Civil Dispensaries						
Sheikhupura	81	4	22	107	300,000	32,100,000	3,210,000	69,301,492	6,930,149
Sialkot	89	13	27	129	300,000	38,700,000	3,870,000	83,550,397	8,355,040
TT Singh	70	2	23	95	300,000	28,500,000	2,850,000	61,529,362	6,152,936
Vehari	74	8	3	85	300,000	25,500,000	2,550,000	55,052,587	5,505,259
Punjab	2522	287	1026	3,835	300,000	1,150,500,000	115,050,000	2,483,843,209	248,384,321

Annexures

Annexure I: Tehsil Wise Water Allocations

Sr.	District	Tehsil	Area (km2)	Total Population	Total Water Demand (mgd)	Percentage Share of GW	Share of Ground Water	Balance Share from Surface Water
1	Attock	Attock	1,089	434,705	14.280	25	3.570	10.710
2		Fateh Jhang	1,308	325,970	11.329	25	2.832	8.496
3		Hassan Abdaal	380	216,566	11.230	25	2.808	8.423
4		Hazro	386	339,238	13.699	25	3.425	10.274
5		Jand	2,120	295,483	6.081	25	1.520	4.561
6		Pindi Gheb	1,543	271,594	5.162	25	1.290	3.871
7	Rawalpindi	Rawalpindi	1,616	3,258,547	138.060	25	34.515	103.545
8		Murree	384	233,471	6.706	0	0.000	6.706
9		Taxila	279	677,951	27.604	25	6.901	20.703
10		Gujjar Khan	1,476	678,503	10.425	10	1.043	9.383
11		Kahuta	613	220,576	4.319	25	1.080	3.240
12		Kallar Sayyadan	470	217,273	4.091	25	1.023	3.068
13		Kotli Sattian	368	119,312	1.998	25	0.500	1.499
14	Chakwal	Chakwal	2,193	656,978	13.789	15 percentage	2.068	11.720
15		Choa Saidan Shah	500	141,844	2.233	25	0.558	1.674
16		Kellar Kahar	830	169,660	3.180	25	0.795	2.385
17		Lawa	978	125,893	2.788	25	0.697	2.091
18		Talla Gang	2,179	401,607	9.395	25	2.349	7.046
19	Jhelum	Jhelum	604	445,190	13.038	25	3.259	9.778
20		Dina	722	238,660	4.444	25	1.111	3.333
21		Pind Dadan Khan	1,344	336,852	6.304	10	0.630	5.674
22		Sohawa	909	201,948	2.837	25	0.709	2.127
23	Gujrat	Gujrat	1,431	1,497,865	30.978	100	30.978	0.000
24		Kharain	1,262	1,010,912	18.139	100	18.139	0.000
25		Sarai Alamgir	484	247,333	4.507	85	3.831	0.676
26	Gujranwala	Gujranwala City	79	259,556	9.839	100	9.839	0.000
27		Gujranwala Saddar	783	2,807,054	121.805	100	121.805	0.000
28		Wazirabad	1,206	830,396	20.119	100	20.119	0.000
29		Kamoke	678	581,444	17.064	100	17.064	0.000
30		Nosheran Wirkan	878	535,746	9.632	100	9.632	0.000
31	Sialkot	Sialkot	967	1,794,658	51.568	100	51.568	0.000
32		Pasrur	1,016	840,881	18.607	100	18.607	0.000
33		Daska	750	846,933	19.617	100	19.617	0.000
34		Sambrial	360	411,200	9.830	100	9.830	0.000
35	Narowal	Narowal	728	596,565	11.282	100	11.282	0.000
36		Shakargarh	958	674,223	9.431	100	9.431	0.000
37		Zafarwal	637	438,969	6.151	100	6.151	0.000
38	Hafizabad	Hafizabad	1,098	663,735	18.406	100	18.406	0.000
39		Pindi Bhattian	1,176	493,222	10.441	100	10.441	0.000
40	Mandi Baha.	Mandi Bahauddin	876	668,007	18.990	100	18.990	0.000
41		Malakwal	747	371,869	7.492	100	7.492	0.000
42		Phalia	1,137	553,416	8.585	100	8.585	0.000
43	Lahore	Lahore City	502	3,655,774	219.346	0	0.000	219.346
44		Lahore Cantt	102	1,636,342	98.181	100	98.181	0.000
45		Model Town	337	2,698,235	160.308	50	80.154	80.154
46		Shalimar	298	2,280,308	136.819	100	136.819	0.000
47		Raiwind	446	855,626	49.762	100	49.762	0.000

Sr.	District	Tehsil	Area (km2)	Total Population	Total Water Demand (mgd)	Percentage Share of GW	Share of Ground Water	Balance Share from Surface Water
48	Kasur	Kasur	1,450	1,334,653	38.980	100	38.980	0.000
49		Chunnian	1,176	825,684	18.549	100	18.549	0.000
50		Pattoki	841	934,329	23.185	0	0.000	23.185
51		Kot Radha Kishan	428	360,330	8.007	40	3.203	4.804
52	Sheikhupura	Sheikhupura	1,254	1,555,424	52.868	100	52.868	0.000
53		Muridke	944	639,784	16.200	100	16.200	0.000
54		Ferozewala	457	795,498	28.774	100	28.774	0.000
55		Safdarabad	602	272,500	5.969	100	5.969	0.000
56		Sharakpur	374	197,220	3.642	100	3.642	0.000
57	Nankana Sahib	Nankana Sahib	1,627	883,876	16.278	50	8.139	8.139
58		Shahkot	244	244,868	5.397	0	0.000	5.397
59		Sangla Hill	302	227,630	4.807	0	0.000	4.807
60	Sargodha	Sargodha	1,455	1,537,866	47.360	0	0.000	47.360
61		Sahiwal	759	341,247	6.247	60	3.748	2.499
62		Bhera	722	315,148	5.894	100	5.894	0.000
63		Bhalwal	557	357,331	9.711	0	0.000	9.711
64		Kot Momin	891	453,562	9.592	40	3.837	5.755
65		Shahpur	787	353,969	7.244	50	3.622	3.622
66		Sillanwali	610	344,465	5.187	0	0.000	5.187
67	Mianwali	Mianwali	2,950	767,130	23.591	40	9.436	14.155
68		Issakhel	1,882	375,026	9.098	0	0.000	9.098
69		Piplan	1,197	403,938	10.469	100	10.469	0.000
70	Khushab	Khushab	2,077	689,742	22.022	0	0.000	22.022
71		Nowshera	136	117,942	1.880	50	0.940	0.940
72		Noorpur Thal	2,399	243,295	2.515	40	1.006	1.509
73		Quaidabad	1,280	230,320	6.186	0	0.000	6.186
74	Bhakkar	Bhakkar	1,830	685,059	19.145	100	19.145	0.000
75		Darya Khan	1,384	360,807	6.653	100	6.653	0.000
76		Mankera	3,558	257,100	3.919	100	3.919	0.000
77		Kalurkot	1,749	347,552	7.053	100	7.053	0.000
78	Faisalabad	Faisalabad City	200	3,238,841	161.391	0	0.000	161.391
79		Faisalabad Saddar	1,292	1,465,411	35.245	10	3.525	31.721
80		Ckak Jhumra	523	332,461	6.172	10	0.617	5.555
81		Jaranwala	1,727	1,492,276	32.064	0	0.000	32.064
82		Sammundri	867	643,068	13.849	0	0.000	13.849
83		Tandliawala	1,351	702,733	11.646	15	1.747	9.899
84	Toba Tek Singh	Toba Tek Singh	1,132	739,826	12.115	0	0.000	12.115
85		Kamalia	628	371,851	9.577	100	9.577	0.000
86		Pir Mahal	622	422,331	6.849	60	4.109	2.740
87		Gojra	690	656,007	18.431	0	0.000	18.431
88	Chiniot	Chaniot	698	556,147	17.490	100	17.490	0.000
89		Bawana	931	374,270	6.090	100	6.090	0.000
90		Lallian	981	439,323	9.385	100	9.385	0.000
91	Jhang	Jhang	2,611	1,466,141	37.105	100	37.105	0.000
92		Ahmadpur Sial	862	433,517	8.908	100	8.908	0.000
93		18 Hazari	1,654	295,801	6.217	60	3.730	2.487
94		Shorkot	1,226	548,626	11.157	60	6.694	4.463
95	Sahiwal	Sahiwal	1,640	1,491,553	36.606	50	18.303	18.303
96		Chichawatni	1,584	1,026,007	16.216	50	8.108	8.108
97	Okara	Okara	1,244	1,205,655	31.717	60	19.030	12.687
98		Renala Khurd	622	458,572	7.350	30	2.205	5.145
99		Depalpur	2,549	1,374,912	27.909	100	27.909	0.000
100	Pakpattan	Pakpattan	1,531	969,225	20.369	100	20.369	0.000

Sr.	District	Tehsil	Area (km2)	Total Population	Total Water Demand (mgd)	Percentage Share of GW	Share of Ground Water	Balance Share from Surface Water
101		Arifwala	1,155	854,462	15.183	100	15.183	0.000
102	Multan	Multan City	286	2,258,570	104.136	100	104.136	0.000
103		Multan Saddar	1,651	1,322,756	27.587	100	27.587	0.000
104		Shujaabad	838	609,631	14.885	100	14.885	0.000
105		Jalalpur Pirwala	871	554,152	11.560	100	11.560	0.000
106	Khanewal	Khanewal	1,191	856,793	20.582	100	20.582	0.000
107		Kabirwala	1,648	959,861	16.212	100	16.212	0.000
108		Jehanian	499	343,365	5.576	100	5.576	0.000
109		Mian Channu	1,024	761,971	14.394	100	14.394	0.000
110	Lodhran	Lodhran	1,142	704,668	17.155	60	10.293	6.862
111		Karor Pacca	714	500,939	7.350	100	7.350	0.000
112		Dunyapur	806	495,013	7.004	70	4.903	2.101
113	Vehari	Vehari	1,389	928,166	18.416	100	18.416	0.000
114		Burewala	1,498	1,015,385	22.020	100	22.020	0.000
115		Mailsi	1,598	953,895	15.989	100	15.989	0.000
116	Bahawalpur	Bahawalpur	246	681,696	34.085	100	34.085	0.000
117		Ahmadpur East	1,479	1,078,683	23.055	100	23.055	0.000
118		Bahawalpur Saddar	1,180	574,950	11.387	100	11.387	0.000
119		Khairpur Tamewali	724	262,628	8.340	100	8.340	0.000
120		Hasilpur	1,122	456,006	11.439	0	0.000	11.439
121		Yazman	19,160	614,143	8.554	0	0.000	8.554
122	Bahawalnagar	Bahawalnagar	2,001	815,143	17.497	0	0.000	17.497
123		Chishtian	1,819	691,221	15.233	0	0.000	15.233
124		Fort Abbas	2,396	426,529	6.626	0	0.000	6.626
125		Haroonabad	1,127	525,598	10.827	0	0.000	10.827
126		Minchinabad	1,412	526,428	8.089	0	0.000	8.089
127	Rahim Yar Khan	Rahim Yar Khan	2,628	1,530,330	38.503	50	19.252	19.252
128		Liaqatpur	4,644	1,035,509	17.508	50	8.754	8.754
129		Sadiqabad	2,548	1,264,752	27.814	50	13.907	13.907
130		Khanpur	3,065	983,414	21.957	60	13.174	8.783
131	Dera Ghazi Khan	Dera Ghazi Khan	1,918	1,226,612	38.758	15	5.814	32.944
132		D-Excluded Area	5,403	212,430	2.150	50	1.075	1.075
133		Taunsa	2,665	675,756	15.684	50	7.842	7.842
134		Kot Chutta	1,704	757,403	20.719	50	10.360	10.360
135	Rajanpur	Rajanpur	2,719	706,868	16.684	50	8.342	8.342
136		Rojhan	2,800	405,774	8.777	20	1.755	7.022
137		D-Excluded Area	4,797	34,230	0.342	50	0.171	0.171
138		Jampur	2,213	849,086	19.731	20	3.946	15.785
139	Muzaffargarh	Muzaffargarh	2,232	1,624,472	36.934	100	36.934	0.000
140		Kot Addu	3,165	1,346,687	31.281	100	31.281	0.000
141		Jatoi	1,033	714,576	20.191	100	20.191	0.000
142		Alipur	1,238	639,748	15.554	100	15.554	0.000
143	Layyah	Layyah	2,022	977,391	21.384	100	21.384	0.000
144		Choubara	2,939	252,200	5.592	0	0.000	5.592
145		Karor Lal Essan	1,418	594,639	10.237	100	10.237	0.000
	Total		204,441	110,020,468	3,213	60	1,932	1,281

Annexure II: Monthly School Monitoring Data of May 2024 for Schools[51]

Sr.	District	Availability of Drinking Water (in Percentage)	Sufficiency of Toilets (in Percentage)	School Hygiene (in Percentage)
1	Attock	100	91.93	82.25
2	Bahawalnagar	99.87	80.77	72.77
3	Bahawalpur	98.67	91.09	76.44
4	Bhakkar	99.59	85.99	67.07
5	Chakwal	99.09	96.04	76.98
6	Chiniot	99.23	92.53	67.91
7	D.G. Khan	99.52	80.60	90.89
8	Faisalabad	97.65	91.66	75.78
9	Gujranwala	98.43	85.64	71.89
10	Gujrat	97.53	93.16	66.96
11	Hafizabad	100	87.40	82.12
12	Jhang	99.64	82	72.96
13	Jhelum	99.48	92.31	81.28
14	Kasur	99.62	93.70	76.07
15	Khanewal	99.59	84.21	81.06
16	Khushab	99.35	90.11	69.72
17	Lahore	98.83	79.34	77.19
18	Layyah	99.70	90.20	86.54
19	Lodhran	93.91	88.70	73.13
20	Mandi Bahaud Din	99.72	92.94	79.52
21	Mianwali	96.81	80.61	72.88
22	Multan	97.60	80.29	86.54
23	Muzaffargarh	98.87	89.53	84.44
24	Nankana Sahib	99.82	91.12	84.35
25	Narowal	97.64	92.37	77.34
26	Okara	93.03	94.19	82.66
27	Pakpattan	99.28	94.28	75.51
28	Rahimyar Khan	98.23	84.03	75.63
29	Rajanpur	100	84.34	93.79
30	Rawalpindi	99.72	90.29	84.35
31	Sahiwal	99.70	88.63	82.25
32	Sargodha	99.70	87.75	74.98
33	Sheikhupura	99.65	83.74	76.50
34	Sialkot	99.45	93.48	77.23
35	T.T. Singh	97.40	90.87	71.62
36	Vehari	96.92	92.44	81.01

[51]https://open.punjab.gov.pk/schools/home/districts_performance

Annexure III: District, Level & Gender wise Student-Toilet Ratio (SToR)- Annual School Census, 2023-24

Sr.	District	Primary			Middle			High			H.Sec.		
		F	M	T	F	M	T	F	M	T	F	M	T
1	Attock	31	31	31	49	41	46	57	44	50	71	47	58
2	Bahawalnagar	35	35	35	46	43	44	60	48	53	58	47	53
3	Bahawalpur	30	33	32	36	41	38	57	57	57	68	58	63
4	Bhakkar	31	35	33	45	49	46	59	59	59	44	66	55
5	Chakwal	22	22	22	32	27	30	45	37	41	57	33	43
6	Chiniot	35	38	36	52	51	52	80	72	75	89	74	82
7	D.G. Khan	39	41	40	53	54	53	70	65	67	104	96	100
8	Faisalabad	40	39	39	55	53	54	71	66	68	73	70	72
9	Gujranwala	36	43	39	55	50	53	72	56	64	77	42	56
10	Gujrat	31	32	31	40	39	40	64	47	56	69	39	56
11	Hafizabad	36	38	37	52	43	48	68	61	64	85	61	74
12	Jhang	35	38	36	50	57	54	57	59	58	75	54	65
13	Jhelum	27	25	26	41	37	40	56	47	51	65	56	62
14	Kasur	34	37	36	55	55	55	61	56	59	59	48	53
15	Khanewal	38	36	37	50	50	50	68	68	68	97	71	85
16	Khushab	28	30	29	40	37	38	51	44	47	66	41	52
17	Lahore	48	52	50	66	79	71	88	65	77	69	55	64
18	Layyah	30	34	32	46	43	44	67	64	66	93	74	80
19	Lodhran	27	30	28	37	39	38	49	45	47	65	45	56
20	Mandi Bahaud Din	34	33	34	42	43	42	62	52	57	66	57	63
21	Mianwali	31	31	31	40	41	40	63	55	58	74	48	59
22	Multan	41	41	41	55	52	54	86	62	72	89	64	75
23	Muzaffargarh	33	39	36	46	49	48	62	61	62	92	66	73
24	Nankana Sahib	32	35	34	49	41	45	56	55	56	64	49	58
25	Narowal	31	31	31	42	41	42	59	45	52	56	48	52
26	Okara	31	32	31	46	48	47	72	62	67	82	51	66
27	Pakpattan	30	34	32	46	50	47	70	59	63	73	64	68
28	Rahim Yar Khan	36	37	36	50	52	51	67	61	63	75	62	69
29	Rajanpur	36	39	38	48	61	55	73	62	66	80	100	93
30	Rawalpindi	27	34	30	40	39	40	67	51	59	69	45	57
31	Sahiwal	37	37	37	55	55	55	69	69	69	72	67	70
32	Sargodha	33	32	33	51	48	49	72	57	64	70	58	65
33	Sheikhupura	38	40	39	57	52	55	71	64	68	88	55	75
34	Sialkot	28	29	28	41	39	40	59	51	55	63	53	60
35	T.T.Singh	39	35	37	52	46	50	56	53	54	56	62	58
36	Vehari	31	31	31	45	43	45	56	52	54	68	69	68

Annexure IV: Functional Health Care Facilities in Punjab- DHIS Report 2023-24

District	THOS	DHQ	THQ's	RHC	BHUS	MCH	Dispensaries	Total
Attock	-	1	5	6	62	5	65	79
Bahawalnagar	-	1	4	10	103	7	79	145
Bahawalpur	3	1	4	12	75	10	5	158
Bhakkar	-	1	3	5	40	2	23	90
Chakwal	-	1	4	12	64	6	26	87
Chiniot	-	1	2	3	36	2	21	48
D.G Khan	1	-	3	9	53	5	44	96
Faisalabad	5	2	5	17	167	6	69	314
Gujranwala	3	-	3	12	94	10	4	174
Gujrat	1	-	11	9	87	9	39	119
Hafizabad	-	1	1	7	32	5	53	64
Jhang	-	1	4	10	59	4	14	86
Jhelum	-	1	2	6	48	5	8	87
Kasur	-	1	4	11	81	7	10	132
Khanewal	-	1	3	9	88	4	26	106
Khushab	-	1	3	5	44	6	26	90
Lahore	18	2	14	5	39	50	77	240
Layyah	-	1	6	6	36	2	16	76
Lodhran	-	1	3	4	48	1	35	70
MB Din	-	1	2	10	47	3	13	72
Mianwali	-	2	3	10	42	8	29	77
Multan	5	2	2	8	93	29	4	164
Muzaffargarh	-	1	4	13	72	4	36	115
NankanaSahib	-	1	2	7	47	4	52	81
Narowal	1	-	2	6	57	4	37	83
Okara	-	2	3	10	96	11	23	138
Pakpattan	-	1	1	5	55	2	15	74
Rahimyar Khan	1	-	4	19	103	7	11	137
Rajanpur	-	1	2	7	32	1	12	57
Rawalpindi	5	1	6	8	100	19	13	151
Sahiwal	2	1	1	11	76	6	24	118
Sargodha	1	-	10	12	132	16	42	171
Sheikhupura	-	1	4	7	81	4	22	102
Sialkot	2	-	4	6	89	13	27	118
Toba Tek Singh	-	1	3	8	70	2	23	114
Vehari	-	1	2	14	74	8	3	135
Total	48	34	139	319	2,522	287	1,026	4,168

Progress Updates on Key WASH Indicators

Result / Outcome Statements	Performance Indicators	Targets for 2018	Progress (for 2024)
Access to improved water sources and sanitation	Proportion of Population with Access to Improved Water Sources (percentage)	93 percent Rural 100 percent Urban	99.2 percent Rural 99.7 percent Urban MICS 2024 (unreleased data)
	Proportion of Population with Access to Improved Sanitation (percentage)	90 percent Rural 100 percent Urban	81.6 percentage Rural 95.5 percentage Urban MICS 2024 (unreleased data)
Reduced Child Mortality	Proportion of Children Under 5 Who Suffered from Diarrhoea in the Last 30 Days (percentage)	<10 percentage	13.7 percentage in last two weeks - MICS 2017-18 6 percentage in last two weeks - PSLM 2018-19
Outputs			
1. Village water ponds causing contamination eliminated	Number of villages where ponds are eliminated	500	211 Source: https://lgcd.punjab.gov.pk/elimination_of_sewage_ponds)
2. Solid waste management in villages	Number of villages with solid waste management system	6	5 percentage Rural Area Coverage - PSLM 2018-19
3. Implementation of sanitation schemes	Number of sanitation schemes implemented	95 42 Rural 53 Urban	During 2015-20: 1,612 sanitation schemes are completed For 2020-2021 827 (urban 146, and rural 681) on-going 02 New Rural Schemes 752 sewerage (48 are dysfunctional) schemes are implemented by PHED – 5 are ongoing
4. Implementation of water supply schemes	Number of water supply schemes implemented	78 37 Rural 41 Urban	During 2015-20: 838 water supply schemes are completed For 2020-2021 183 (urban 44, and rural 139) on-going 01 New Rural Schemes There are 3280 Rural Water Supply schemes implemented by PHED (1925 of these are dysfunctional) – 66 schemes are ongoing.
	Rehabilitation of Dysfunctional schemes	172	Since 2016, around 126 water supply schemes rehabilitation/repair has been reflected in ADPs.
5. Implementation of ODF in villages	Number of villages ODF certified	3360	7,805 villages are certified while 2,161 are in process of certification by 2018. Beside this 15,950 were planned for interventions between 2018-21.
6. Water filtration Plants established	Number of filtration plants installed and operational	1479	As of May 27, 2024, at least 5,027 filtration plants have been installed across the province under the supervision of the various departments, out of which 2,960 are operational, while 2,067 are out of order due to machinery breakdown, failure to change filters, lack of regular water sampling checks, improper maintenance and monitoring. (Source: https://tribune.com.pk/story/2468433/water-filtration-service-to-be-centralised?utm_source=chatgpt.com) According to data available from Local Government and Community Development Department estimates, there are 1,307 filtrations plants in Punjab but an estimated 2,053 more are needed. (Source: https://www.cpdi-pakistan.org/wp-content/uploads/2023/01/State-of-Solid-Waste-Management-in-Punjab-min.pdf?utm_source=)

Result / Outcome Statements	Performance Indicators	Targets for 2018	Progress (for 2024)
	Number of beneficiaries getting clean drinking water		23.4 percentage HH in Punjab are using Safely Managed Drinking Water (24.5 percentage Rural and 27.1 percentage Urban) – MICS 2024 (unreleased data)
7. District Water quality testing labs	Number of water quality testing laboratories in operation	36	There are 35 Soil and Water Quality Testing Labs across Punjab, established by the Agriculture Department. (Source: https://agripunjab.gov.pk/labs?utm_) PCRWR has 10 water quality testing labs across Punjab. EPA as 8 laboratories across Punjab. One of their functions is monitoring of drinking water, surface water and subsoil water quality (Source: https://epd.punjab.gov.pk/epa_labs)
	Number of water samples examined		Numerous studies collect varying number of samples for water quality testing. The 2021 Drinking Water Quality in Pakistan report collected 165 samples from 11 cities in Punjab for testing. Similarly, 119 samples were collected from source and consumers end for the report Comparative Assessment of Change Pani and Traditional Water Supply Schemes. Similarly, PCRWR conducts numerous studies, collecting a significant number of water quality samples across Punjab to assess and monitor water safety and address challenges in water management.
8. Water resources effectively managed	Number of cities with schemes for rainwater harvesting initiated	19	Rainwater harvesting project started in urban areas of Lahore, Rawalpindi and Murree. 16 cities were being covered under ABAD.
9. Environment friendly disposal of sewage water	Number of pilot decentralised sewage water treatment system constructed	1 big city, one small and one intermediate	Since 2016, 20 schemes of wastewater treatment plant in cities of Faisalabad, Jhelum, Rahim Yar Khan, Lahore, Multan, Rawalpindi, Gujranwala and Sahiwal have been designed and being implemented in phases.
10. Improved sectoral governance	Number of cities with Master Plans for sanitation, water supply and drainage up to 2035	4 big cities 4 intermediate cities	The revisions of master plans of five development authorities of Lahore, Rawalpindi, Faisalabad, Gujranwala and Multan are under discussion. In addition, the allocations were made for five intermediate cities (DG Khan, Sheikhupura, Kasur, Nankana Sahib, and Bahawalnagar) in Annual Development Plan 2020-21. Master plan of Sialkot and Sahiwal are also developed through PICIIP project. Project for the feasibility study and design of sewerage and storm water drainage facilities in 50 cities of Punjab has been approved (2024). (Source: https://www.thenews.com.pk/print/1250795-feasibility-of-drainage-plans-in-50-cities-approved?utm_source=)
	Consumer water meters installed for accurate billing for small and medium cities (water supplies) and big cities (through service connection fee/ government support)	10 small and intermediate cities 5 big cities	Consumer and bulk-level water meter installation has initiated in Johar town of Lahore city. The Government of Punjab is also planning to extend “water metering” to all WASAs in Punjab. According to Punjab PPP Authority Newsletter 2022, 711,265 water meters (93 percentage domestic and 7 percentage commercial) will be installed in Lahore and consumers will be charged as per their actual usage of water. Additionally, procurement, installation and O&M of water meter in 4 cities, Rawalpindi, Faisalabad, Multan and Gujranwala, will be done. (https://p4a.punjab.gov.pk/system/files/PPPPA-Newsletter percentage20Jul-Dec_2022.pdf?utm_source=)
	Number of cities where bulk meters installed at major	30 small and intermediate cities 5 big cities	PICIIP includes rehabilitation of 114 existing Tube Wells, 16 Over Head Reservoirs, 45 pumping stations and 45 filtration plants in the Sahiwal and Sialkot cities.

<table>
<tr><th>Result / Outcome Statements</th><th>Performance Indicators</th><th>Targets for 2018</th><th>Progress (for 2024)</th></tr>
<tr><td></td><td>distribution system, tubewells, distribution stations and overhead reservoirs to measure quantity pumped of water</td><td></td><td>(Source: https://piciip.gop.pk/rehabilitation-of-ohrs-and-tube-wells.html?utm_source=)</td></tr>
<tr><td></td><td>Number of cities with Master plans for solid waste management</td><td>20 cities</td><td>7 cities (Lahore, Faisalabad, Gujranwala, Sialkot, Rawalpindi, Multan and Bahawalpur) where waste management companies exist
In addition, the allocations were made for five intermediate cities (DG Khan, Sheikhupura, Kasur, Nankana Sahib, and Bahawalnagar) in Annual Development Plan 2020-21.
Master plan of Sialkot and Sahiwal are also developed through PICIIP project.</td></tr>
<tr><td>11. Enhanced solid waste collection</td><td>percentage of garbage/waste collected against the estimated amount of garbage produced</td><td>70 percentage
20 cities</td><td>As per CGPI Report June 2021
29 reported cities in Punjab collect and dispose 86 percentage of solid waste generated at household level<table><tr><th>Typology</th><th>Waste Generated (kg per capita)</th><th>Waste Generated (MT per year)</th><th>Collection (% of generated)</th><th>Disposal (% of collected)</th></tr><tr><td>Large Cities</td><td>0.55</td><td>9.44</td><td>80</td><td>0</td></tr><tr><td>Mid and small sized cities</td><td>0.42</td><td>4.44</td><td>50-70</td><td>0</td></tr><tr><td>Rural communities</td><td>0.33</td><td>13.72</td><td><20</td><td>0</td></tr></table>(Source (2022): https://www.cpdi-pakistan.org/wp-content/uploads/2023/01/State-of-Solid-Waste-Management-in-Punjab-min.pdf?utm_source=)</td></tr>
<tr><td></td><td>Number of cities where secondary collection points established for small and medium cities</td><td>20 cities</td><td>As per CGPC Report March 2020
154 out of 189 MCs (Small and Medium cities) have dumping sites</td></tr>
<tr><td>12. Improved waste disposal system</td><td>percentage of waste finally disposed</td><td>70 percentage
20 cities</td><td>As per CGPI Report June 2021
29 reported cities in Punjab collect and dispose 86 percentage of solid waste generated at household level<table><tr><th>Typology</th><th>Waste Generated (kg per capita)</th><th>Waste Generated (MT per year)</th><th>Collection (% of generated)</th><th>Disposal (% of collected)</th></tr><tr><td>Large Cities</td><td>0.55</td><td>9.44</td><td>80</td><td>0</td></tr><tr><td>Mid and small sized cities</td><td>0.42</td><td>4.44</td><td>50-70</td><td>0</td></tr><tr><td>Rural communities</td><td>0.33</td><td>13.72</td><td><20</td><td>0</td></tr></table>(Source (2022): https://www.cpdi-pakistan.org/wp-content/uploads/2023/01/State-of-Solid-Waste-Management-in-Punjab-min.pdf?utm_source=)</td></tr>
<tr><td></td><td>Number of cities where hospital hazardous waste shall be managed and disposed of</td><td>40</td><td>As per CGPI Report June 2021
26 out of 29 cities have started hospital waste collection</td></tr>
<tr><td></td><td>percentage of waste disposed at land fill sites against the total waste collected for cities</td><td>75 percentage
20 cities</td><td>As per CGPI Report June 2021
19 out of 29 reported cities have Land fill sites while 18 of these cities utilise the land fill sites.
69.6 percentage of generated waste in 29 cities is being disposed off at land fill sites.</td></tr>
</table>

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