



TA-8556 REG: Punjab Intermediate Cities Improvement Investment Project Phase II

Final Report

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Prepared by:



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REPORT

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List of Abbreviations

ADB	Asian Development Bank
AFD	French Development Agency
CDIA	Cities Development Initiative for Asia
CIU	City Implementation Unit
CSIRO	Commonwealth Scientific and Industrial Research Organization
DBO	Design Build and Operate
DFID	Department for International Development (United Kingdom)
EA	Executing Agency
EIA	Environmental Impact Assessment
FMA	Financial Management Assessment
FMAQ	Financial Management Assessment Questionnaire
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit (Germany)
GoPb	Government of Punjab
HH	Household
IFI	International Financing Institutions
KP	Khyber Pakhtunkhwa
LG	Local Government
LG&CD	Local Government & Community Development
MC	Municipal Committee or Municipal Corporation
MSW	Municipal Solid Waste
O&M	Operations & Maintenance
PFS	Pre-Feasibility Study
PHA	Pakistan Housing Authority
PHED	Public Health Engineering Department
PICIIP	Punjab Intermediate Cities Improvement Investment Program
PICIIP2	Punjab Intermediate Cities Improvement Investment Project 2
PKR	Pakistani Rupee
PLGA	Punjab Local Government Act
PMU	Program Management Unit
PPP	Public Private Partnership
SDGs	Sustainable Development Goals
SECO	State Secretariat for Economic Affairs (Switzerland)
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
WASA	Water and Sanitation Agency
WASH	Water, Sanitation and Hygiene
WMC	Waste Management Companies
WTP	Water Treatment Plant
WWF	World Wildlife Fund
WWTP	Wastewater Treatment Plant

1. Executive Summary

1. The PICIIP will address urban development challenges at intermediate city levels including integrated planning, improved urban infrastructure, responsive institutional frameworks for urban services and strengthened utility business processes. The PICIIP is carried out in two phases: the first phase of the PICIIP supports interventions in the cities of Sialkot and Sahiwal with a total investment of \$250 million, while the second phase (PICIIP2) will support interventions in the cities of Sargodha, Rahim Yar Khan, Bahawalpur and Muzaffargarh.
2. The main goal of this Report is to prepare pre-Feasibility Studies (PFS) for priority projects in the four cities. These priority projects were agreed with the cities through consultations facilitated by the PMU. This choice was made based on a 15-year Integrated Urban Resilient Infrastructure Investment Programs prepared by CDIA team in close collaboration with cities.
3. The four PICIIP2 cities present a clear lack of urban infrastructures and green areas which impacts health, environment and cities livability.
4. The PICIIP2 considers the improvement of urban systems (water supply, wastewater, drainage, solid waste, urban greening) with a view to improving city resilience's as a key output of the Project. In this respect, resilience improvements have been considered from the project kick-off and fully included in the project design.
5. Weak financial systems, a lack of adequate resources, ineffective transfer mechanisms coupled with high population growth have created pressures on the ability of intermediate cities in Punjab to respond to constituent needs. The most salient of these are presented thus:
 - ▶ A clear lack of forward economic or physical planning in each of the PICIIP2 cities: there are no documents for city planning (neither urban master plans, nor infrastructure plans nor sector plans).
 - ▶ At the city levels, technical, managerial and financial skills are quite limited.
 - ▶ Service organizations and institutions which are meant to be complementary often work with limited coordination.
 - ▶ No attention to the role of the poor and poorer households within city functions.
 - ▶ A lack of understanding on climate action and building resilient systems, responsive processes and accommodating infrastructure.
 - ▶ Limited city level opportunities to engage in creative service delivery mechanisms or cost recovery schemes.
6. To improve the situation in terms of infrastructure need as well as technical and financial management, key outputs of PICIIP2 will include:
 - ▶ Introduction of integrated, strategic urban planning and accompanying institutional management and delivery systems;
 - ▶ Improved urban-resilient infrastructure that supports consensus-based, negotiations-driven city visions and holistic and inclusive growth. This will include:
 - Improved access to water, wastewater collection and drainage management, solid waste management and safer contaminated disposal services for all city residents;
 - Reduced water and air borne disease;
 - Improvement and expansion of parks, and cityscape investments which instill a sense of urban pride.
 - ▶ Particular attention will be paid to include Katchi Abadis¹ in order to improve urban services and especially water supply and solid waste management in poorer areas.
 - ▶ A reorientation of agencies towards treating citizens as customers of essential urban services.

¹ Katchi Abadis are low income urban settlements, often unplanned and irregular in physical layout and service terms.

- ▶ Citizen engagement, participatory planning and budgeting processes at the local level;
- ▶ Strengthened business processes (including longer incubation periods, process optimization, operational efficiencies and cost effectiveness) of all urban utilities.

7. The PFS emphasis on water resources is a precursor to ensuring longer-term and sustainable water supplies in cities. Indeed, whilst there are five rivers that flow downstream from India's Punjab through to Pakistan's Punjab, water availability remains questionable and its quality is degrading.

8. The following table summarizes proposed infrastructures to be built as a priority and associated investment base costs.

City	Water Supply - Main components	Wastewater / Drainage - Main components	Solid Waste - Main components	Urban livability - Main Components	Soft components
Bahawalpur Total costs: 52 MUSD	Increase of production : + 17,500 m ³ /d (tubewells rehabilitation), Pilot DMA area	Construction of 1 new disposal station, rehabilitation of 4 km of network, rehabilitation of the East Wastewater Treatment Plant, provision of O&M equipment	New sanitary landfill with associated transfer station and collection equipment, closure of existing dumpsite	3.5 hectares of new parks and 11 kilometers of green belt	<i>For every city:</i> - Water supply Master Plan - Wastewater and drainage Master Plan - Urban Master Plan - Capacity building and training TOTAL COST (4 cities): 66 MUSD
	CAPEX 8 MUSD	CAPEX 16 MUSD	CAPEX 26 MUSD	CAPEX 1.7 MUSD	
Muzaffargarh Total costs: 55 MUSD	Pilot DMA area	Construction of 1 new disposal station and rehabilitation of 6 existing disposal stations, rehabilitation of 9.5 km of network, provision of O&M equipment	New sanitary landfill with associated transfer station and collection equipment, closure of existing dumpsite	3.3 ha of new parks and 16 km of green belt	
	CAPEX 3 MUSD	CAPEX 38 MUSD	CAPEX 12 MUSD	CAPEX 1.7 MUSD	
Rahim Yar Khan Total costs: 77 MUSD	Increase of production : 6,600 m ³ /d (tubewells rehabilitation) and +48,000 m ³ /d (new tubewells); new main pipeline: 18 km, improvement of distribution network of 224 km, Pilot DMA area	Construction of 2 new disposal station, rehabilitation of 1.6 km of network, provision of O&M equipment	New transfer station and collection equipment	1.5 ha of new parks and 12 km of green belt	
	CAPEX (base costs): 52 MUSD	CAPEX (base costs): 18 MUSD	CAPEX (base costs): 5 MUSD	CAPEX 1.7 MUSD	
Sargodha Total costs: 125 MUSD	Increase of production : 35,000 m ³ /d (Water Treatment Plant) and rehabilitation of tubewells + 15,600 m ³ /d; new main pipeline: km, improvement of distribution network of 310 km, Pilot DMA area	Construction of 2 new disposal station and rehabilitation of 6 disposal stations, construction of 8.5 km of new network, rehabilitation of 13.7 km of network, provision of O&M equipment	New sanitary landfill with associated transfer station and collection equipment, closure of existing dumpsite	22 ha of new parks and 11 km of green belt	
	CAPEX 60 MUSD	CAPEX 27 MUSD	CAPEX 33 MUSD	CAPEX 5 MUSD	

Total costs include physical and financial contingencies as well as engineering costs and taxes (from counterpart funding)

9. All inhabitants from the four cities (as a total 2.1 million inhabitants in 2018) will benefit from the project outputs. Indeed, while water supply and wastewater projects will focus on priority areas, solid waste and urban greening projects will fully cover every city. Institutional and capacity building components as well as improvement of urban planning will also benefit all residents.

10. Considering physical and financial contingencies as well as engineering costs, the entire investment for PICIIP Phase 2 is now estimated to be about \$ 532.7 million. The previous table mention only projects proposed to be built as priorities (phase 1). The proposed financing plan for the entire PICIIP 2 is in table below.

11. Priorities for phase 1 projects (projects mentioned in the previous table) have been agreed during final workshop to remain within a budget of \$ 375 million USD. This shall be confirmed with the SSTA team² and PMU.

Source	Tranche 1	Tranche 2	Amount (\$ million)	Share of Total (%)
Asian Development Bank	300.0	126.2	426.2	80%
Government of Punjab	75.0	31.5	106.5	20%
Total	375.0	157.7	532.7	100%

Source: Consultant's Estimate

12. To ensure the longevity and technical as well as financial sustainability of investments, responsive operation and maintenance (O&M) systems will be necessary. This requires a program of institutional strengthening and capacity development to coincide with (and in some cases, even precede) the PICIIP2 investments. An institutional and capacity development roadmap has been developed with short, medium- and long-term proposals.

13. The investments proposed should coincide with financial sustainability at the city level. In this respect, the Report presents a Financial Management Assessment (FMA) of the cities.

14. The four cities do not have sufficient revenues to ensure adequate O&M of existing and future infrastructure. In this respect, cities should either look for national or provincial financial sources to ensure proper O&M or raise urban services tariffs. With regard to tariffs, a tariff roadmap has been developed in the City Reports to propose a way forward for them to ensure sustainable asset management. Demonstrable (written official) commitments from cities shall be obtained before moving forward with these next steps.

15. At this stage, preliminary screening of environmental and social impacts has been prepared. Limited environmental impact is expected. Projects with potential social impacts were not retained as priority and proposed projects have a limited impact.

16. The PICIIP2 investments will be implemented through the following mechanisms:

- ▶ A Program Steering Committee (PSC) notified by GoPb order to oversee and monitor the implementation of the program under the Planning & Development Department;
- ▶ LGCD Department and Program Management Unit (PMU);
- ▶ MC and City Implementation Unit (CIUs)

17. The LGCD Department of the GoPb is the PICIIP and PICIIP2 executing agency (EA). The MCs in Sargodha, Bahawalpur, Muzaffargarh, and Rahim Yar Khan are the implementing

² SSTA Team : Scall Scale Technical Assistance Team mobilized by ADB in March 2019 in order to conduct next project step and building upon CDIA work.

agencies. The LGCD Department will execute its functions through a provincial level Program Management Unit (PMU), whereas the city level City Implementation Units (CIU) will be established in each project city under respective MCs (or perhaps Tehsil Municipal Administrations (TMAs) in the future).

18. The CDIA team has identified some of the preliminary risks which could adversely affect the deliverability of the PFS. The following are worthy of mention:

- ▶ Political and/or institutional changes which could challenge decisions made and/or delay project implementation;
- ▶ If the proposed institutional and capacity development as well as financial recommendations are not applied, investments are unlikely to be adequately managed, operated or maintained. This could lead to equipment failures and asset depletion, resulting in the present scenario of non-performing systems;
- ▶ For projects requiring a substantial allocation of land (in particular, sanitary landfills or treatment plants), each of the cities have confirmed that they have publicly-owned sites presently available. The PICIIP PMU will need to take immediate steps to verify and confirm this and to reserve these lands for the proposed PICIIP2 investments. Lessons learnt from the activities in PICIIP1 necessitate immediate action by the GoPb on this matter as any change in sites or exchange of their ownership may compromise the feasibility of investments.

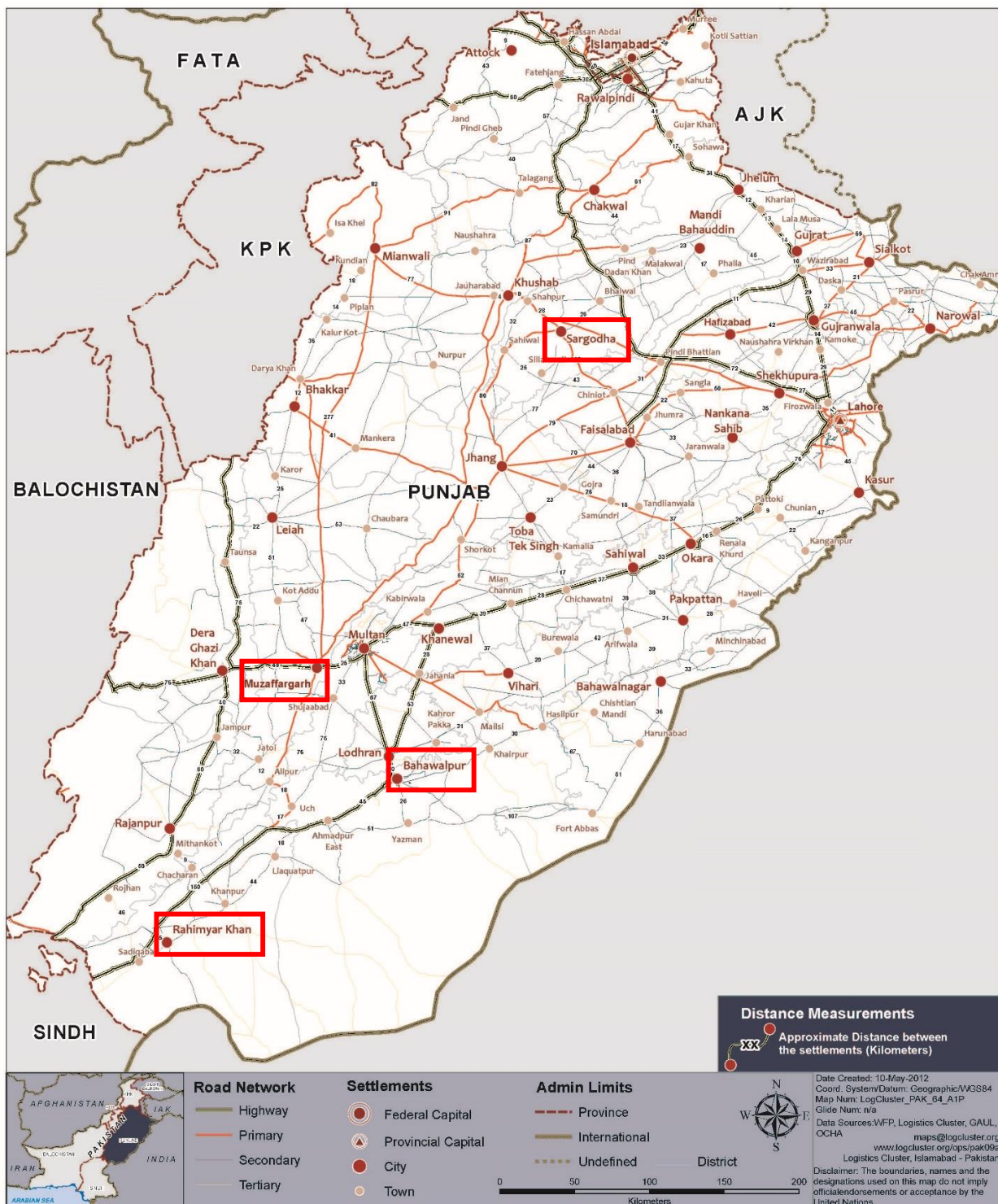
19. To mitigate some of the known risks, the following measures are proposed:

- ▶ The full involvement of project stakeholders in the decision making to avoid changes in decisions made/delays in implementation;
- ▶ An institutional strengthening and capacity development roadmap is to be implemented in order to limit associated risks;
- ▶ Written confirmation from cities to confirm land availability has been provided by the cities – however, this still needs to be followed up to ensure no issue in subsequent stages.

20. In parallel with CDIA team PFS finalization, ADB mobilized a SSTA team to prepare project next steps. The objective will be to move on with ADB project preparation activities. SSTA Team is then in charge of preparing projects documents as per ADB requirements.

2. Context Map

Figure 1: Location of project cities



3. Final Report

3.1. Introduction

1. The Asian Development Bank's (ADB's) Punjab Intermediate Cities Improvement Investment Program (PICIIP) will improve the quality of life of residents living in intermediate cities of Punjab. The PICIIP2 PFS outlining the necessary investments in support of inclusive and resilient growth for intermediate cities in Punjab is financed by the Cities Development Initiative for Asia (CDIA)³.
2. The PICIIP will address urban development challenges at intermediate city levels including integrated planning, improved urban infrastructure, responsive institutional frameworks for urban services and strengthened utility business processes. The PICIIP is carried out in two phases: the first phase of the PICIIP supports interventions in the cities of Sialkot and Sahiwal with a total investment of \$250 million, while the Second phase will support interventions in the cities of Sargodha, Rahim Yar Khan, Bahawalpur and Muzaffargarh.
3. The PICIIP is supported by the government of Punjab (GoPb) through the Local Government and Community Development (LGCD) Department. A Program Management Unit (PMU) within the LGCD provides counterpart and logistical support to the CDIA team undertaking the PFS. The PMU is the prime contact between the cities and the CDIA team for daily project management and coordination. They oversee PICIIP2 preparation and PICIIP implementation.
4. In December 2016 three cities (namely Bahawalpur, Rahim Yar Khan and Sargodha) requested CDIA support to PFS level for improved sewerage/drainage, water supply and solid waste management. Urban green space has also been included as it is considered vital to improving city livability, a key feature of CDIA work. In December 2017, the city of Muzaffargarh was added to the PICIIP2 portfolio as it also expressed needs similar to the initial three cities. This was duly approved subsequently by CDIA. The Joint Venture of SCE and NDC was then retained as the Consultant to implement the PFS for the PICIIP2 project.
5. The second phase of PICIIP (hereinafter referred to as PICIIP2), is expected to involve a further \$300 million of ADB financing and \$75 million of counterpart funding by the Government of Punjab (GoPb).⁴ The first tranche would then be limited to the available ADB ceiling of \$300 million (or \$200 million, if lowered) and the second tranche would carry the additional investments up to the level proposed by the cities. It is possible that the second tranche will attract investments from a marketplace of other financiers or even from the ADB, should they decide to increase their original lending ceiling.
6. The four PICIIP2 cities face a considerable lack of provision of basic urban services necessary to foster economic growth and human development. As such, their current urban services and resilience needs as determined by the CDIA team exceeds the originally anticipated ceiling of \$300 million.

³ The CDIA is a donor-funded organization supported by the Asian Development Bank; the European Commission; Federal Ministry of Finance – Austria; Department for International Development (DFID) - United Kingdom, State Secretary for Economic Affairs (SECO) – Switzerland; The Rockefeller Foundation; Swedish Regional Development Cooperation; United States Agency for International Development (USAID). The CDIA is implemented by the ADB and the French Development Agency (AFD).

⁴ The ADB financing amount may actually be limited to only \$200 million, but this remains to be confirmed. As the investment appetite for the cities presented in this Report far exceeds the initial available ADB commitment of \$300 million, the investments are proposed to be broken down into two funding tranches.

7. This Final Main Report (the Report) presents the penultimate analysis of the existing situation in each city and proposes feasible and resilient options for improving essential urban infrastructure, and the systems that support them. The Report is meant to be read in conjunction with previously issued reports and for purposes of brevity, information previously submitted may not always be repeated here. The Report considers options for ensuring that systems and investments render each of the cities able to withstand (known as well as unpredictable) institutional, economic, environmental and social shocks and stresses in the future. Water supply, sewerage, drainage and solid waste collection necessitate improvement in a planned, integrated and sustainable manner if they are to render the cities more inclusive, their populations more productive and their ways of life more resilient. Land use and financial planning as well as improved environmental management are integral to the success of the investments. Adaptation to climatic variability and the development of resilient systems and approaches are essential to ensure the benefits of infrastructure investments can provide economic, social and environmental benefits over their life-span. The main goal of this Report is to finalize the options for the Integrated Urban Resilient Infrastructure Investment Program for each of the PICIIP2 cities.

8. In preparation of this Report, the CDIA team engaged in extensive consultations at the provincial, district and city levels. Consultations were both formal and informal. Formal (PMU to city) consultations were facilitated by the PMU. Since the PMU is a unit of the LGCD, most of the formal consultations were with the Tehsils or the Municipal Corporations, the administrations of each of the cities. There were limited civil society actors officially invited to participate in the needs assessments, investment prioritization or resilience building processes or consultations. Informally however, team members have worked alongside key stakeholders from all sectors. This has allowed the team to consider the contexts, understood the problems and consensually identify opportunities for improving the situation in the four cities. Despite the interactions with various stakeholders and field presence, data and information has been limited and of poor (and often unreliable) quality. During the whole project implementation, the CDIA team kept close discussions with the cities and updates in recommendations were done as per discussion held at interim and final workshops. As a consequence, there is confidence that the Report adequately and comprehensively identifies specific investment opportunities to render each of the cities more inclusive, resilient and competitive.

3.2. Rationale: Sector Performance, Problems & Opportunities

3.2.1. Performance Indicators and Analysis

3.2.1.1. National level

9. Pakistan is one of South Asia's most urbanized countries⁵ with a population estimated to be more than 200 million⁶. Urban infrastructure in most cities is aging, and as a result, basic needs are not fulfilled. For example, only 40.7 percent of the urban population has access to safely managed drinking water⁷ and only 58 percent of the total population using improved forms of sanitation facilities⁸. Infrastructure has not expanded at the pace necessary to provide basic services or stimulate economic growth and create jobs. Housing and livability challenges,

⁵ With an estimated 40 percent of its population living in cities.

⁶ As per 2017 census data, exact population was 207 million in 2017

⁷ 2015 data from ADB basic 2018 statistics report

⁸ 2015 data from WHO (World Health Organization)

including lack of water supply and sanitation, poor solid waste management facilities, and increased traffic congestion and poor air quality, are key concerns, particularly for the urban poor.

10. National estimates show that Pakistan will achieve a 4.8 percent Gross Domestic Product (GDP) growth rate in 2019 while the 2018 growth rate was 5.8 percent⁹. This is expected to worsen as the government has agreed to the IMF's condition of deregulating control of the Pakistani Rupee¹⁰, which could see inflation rise to its highest levels in over a decade.

11. The ADB reports that in 2013, 30 percent of the population lived in poverty and that 79 of 1,000 babies die before they reach five years old. The concept of improved water supply and enhanced waste management are understood by the majority of educated urban inhabitants, but not sufficiently valued (at least in economic terms) to encourage payment for improved services. The United Nations International Children's Education Fund (UNICEF) has reported that 87 percent of water sources in the country are unsafe for drinking.

3.2.1.2. Provincial level

12. With 110 million inhabitants¹¹, Punjab is by far the most populated province in Pakistan. About 36 percent of the population lives in urban areas, which is slightly less than the national average. Infrastructure at the provincial level resembles that throughout the rest of Pakistan, most notably¹²:

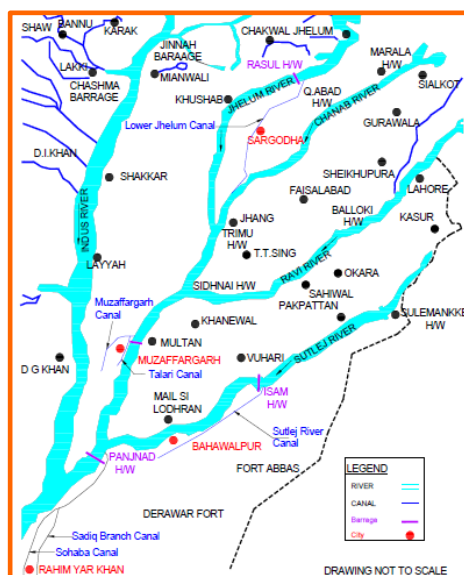
- ▶ 94.4 percent of the population uses improved drinking water sources (improved drinking water sources include piped water, public taps or standpipes, boreholes or tubewells, protected dug wells, protected springs and rainwater collection);
- ▶ 2.1 percent use treated water;
- ▶ 75.1 percent use improved sanitation;
- ▶ 9.05 percent of the annual development budget is dedicated to water and sanitation (while 14.28 percent is dedicated to roads, for example).

13. Punjab has five rivers (four of which are tributaries of the most significant, the Indus) which are extensively used, especially for irrigation (see **figure 2**). All of the PICIIP2 cities are included in the irrigated area of Punjab. Consequently, several canals are located close to PICIIP2 cities¹³.

14. All five of the rivers flow from India. Water management is regulated by the Indus Water Treaty (signed in 1960). According to this agreement, control over the water flowing in three eastern rivers (the Beas, the Ravi and the Sutlej) was given to India, while control over the water flowing in three western rivers (the Indus, the Chenab and the Jhelum) was given to Pakistan.

15. Despite the extensive diversion of water for irrigation, water availability is not fully understood. Some rivers (such as the Sutlej) are facing droughts during the dry season. Furthermore, most of the cities in Punjab (including Lahore) rely on groundwater to respond to citizen needs.

Figure 2: Indus River watershed and irrigation canals in PICIIP2 area (source: CDIA Consultant)



⁹ ADB estimates

¹⁰ The Pakistani Rupee has depreciated by nearly 33 percent against the U.S. Dollar since December, 2017. The increased commodity prices, particularly on imported goods and inputs has adversely impacted all sectors, and particularly the poor.

¹¹ As per 2017 census data

¹² From Multiple Indicator Cluster Survey (MICS), Punjab, 2014 & Bureau of Statistics Punjab in Figures 2018

¹³ The illustration in Figure 2 only shows canals close to PICIIP2 cities.

Groundwater is also being used for irrigation purposes. This causes quality and supply issues¹⁴. In this respect, water supply for the PICIIP2 and other cities in Punjab should be managed based on the entire watershed, and its ability to respond to the demand for water over time. A Water Resources and Infrastructure Master Plan is recommended to be prepared in future studies of the PICIIP2 to ensure proper water allocation amongst users as well as investment consistency. While several studies have been done on the ability of the Indus River to serve the needs of Punjab, no forward planning document has been identified so far. The Indus River System Model (IRSM) prepared by Commonwealth Scientific and Industrial Research Organization (CSIRO) would be a good starting point to prepare such a master plan.

3.2.1.3. City level

16. Table 1 summarizes the main population characteristics for each of the PICIIP2 cities. A more in-depth description of the services for each city is also presented below.

Table 1: Population evolution in PICIIP2 cities

City	Population 2018	Punjab city rank	Density (inh / km2)	Population Growth Rate	Population projection				
					2019	2023	2028	2033	2038
Bahawalpur	787,550	6th	8,575	3.34%	802,792	866,766	953,950	1,049,904	1,155,509
Muzaffargarh	215,530	24th	13,320	2.83%	219,702	237,210	261,070	287,329	316,231
Rahim Yar Khan	433,631	10th	10,723	3.14%	442,023	477,248	525,253	578,086	636,233
Sargodha	672,633	7th	13,684	1.94%	685,650	740,290	814,752	896,705	986,900

17. City growth rates are presented as varying from between nearly 2 percent (for Sargodha) to over 3 percent (for Bahawalpur). Extrapolating these on a linear basis, PICIIP2 is expected to impact at least 2.3 million inhabitants by 2023.

3.2.2. Analysis of key problems

3.2.2.1. General Considerations

18. Although budgets are seen as the key constraint for each of the four PICIIP2 cities, extra financial resources alone will unlikely resolve all of the urban problems previously noted, nor build the levels of resilience necessary to cope with and respond to future challenges. Institutional strengthening; instilling a service-orientated culture; a deeper appreciation for environmental issues; social equity between women and men; and a cross government commitment and action to respond to the needs of the poor and marginalized are also all necessary to ensure PICIIP2 cities are socially resilient and culturally inclusive. Historical challenges preventing robust and inclusive growth in the cities include, but are not limited to, the following:

- ▶ **Lack of planning documentation:** There are few documents or plans for each of the cities. This includes urban master plans mainly and some sector plans (such as in Bahawalpur). Where such documentation exists, these are often outdated or not applied.
- ▶ **Lack of technical skills and an inability to implement responsive programs:** Within cities, technical skills (in infrastructure and physical planning, management and financial oversight) are in short supply, with some individuals often covering multiple responsibilities.
- ▶ **No attention to the role of the poor and poorer households within city functions:** The needs of the poor are typically institutionally bypassed in many cities in Punjab. This has been observed in various circumstances (by, for example expanding water services to affluent areas while poorer areas (Katchi Abadis) suffering from dilapidated infrastructure in more urgent need of repair and improvement receive no reciprocal attention). As a consequence, poorest areas benefit less from public services.

¹⁴ as mentioned in Indus River System Model (IRSM) – a planning tool to explore water management options in Pakistan - CSIRO – August 2018 and in Development of Integrated River Basin Management (IRBM) for Indus Basin – WWF – 2012)

- ▶ **A lack of understanding on climate action and building resilient systems, responsive processes and accommodating infrastructure:** None of the cities have an institutional awareness of how climate will impact them in the coming decades. Disproportionately, federal as well as provincial governments have put the bulk of the onus of implementing climate actions such as the Punjab Disaster Risk Management Plan (2008) and the Punjab Disaster Risk Management Plan (2014) on cities, with little or no financial or technical or other resources to do so.
- ▶ **Weak participatory governance:** There is limited community and business involvement in municipal processes, and these are often *ad hoc* or opaque and clandestine.
- ▶ **Lack of coordination amongst agencies:** As previously noted, various agencies are responsible for the planning, delivery and maintenance of essential urban services. Few, if any of these have coordination mechanisms to allow one to understand what the other is doing (or will do). While the Public Health and Engineering Department (PHED) oversees the design and construction of water and sanitation infrastructure programs, it is the cities and the WASAs that are in charge of their operation. Transfer of completed works are often a challenge, as there is a reluctance on the part of cities to inherit assets while they were not involved in the design and would not have sufficient resources (financial and technical) for operation.
- ▶ **Inadequate tariff schemes, limited tax issuance and collection systems:** Historically, there has been an unwillingness to accept that urban services be managed as both economic as well as social commodities. Tariff structures rarely cover the true costs of bulk service delivery, let alone pay for overheads such as staff, forward planning, maintenance and repair. There is little political willingness to charge economic tariffs or even increase rates on a marginal or progressive basis. As a result, services continue to remain poor and degenerate over time. Flat tariff schemes favor those who aren't disincentivized or impacted on the basis of use. Poor services have resulted in an unwillingness to pay and self-reliance on owner operated infrastructure. With few people willing to pay their fees for poor services, city agencies are not so keen to issue further fees for expanded services.

19. As a result, urban services are not provided efficiently and are not managed to respond to shocks and stresses. Infrastructure continues to be depleted, and municipal talent are continuously looking for other rent seeking opportunities either within city administrations or through migrating to the private sector to supplement their low salaries. Significant and meaningful reforms within municipalities, coupled with behavior changes within their departments as well as consumers, are required concurrent to the range of technical improvements in engineering infrastructure.

20. All PICIIP2 cities lack the financial and technical capacities to ensure proper asset management. Poor institutional governance and inadequate service-oriented planning and decision-making further hamper the proper management of urban services in the cities.

3.2.2.2. Infrastructure conditions in the cities

21. It is obvious that water supply is a major issue in each of the cities. Production capacities are inadequate to cover city needs in the immediate, medium and longer terms. Furthermore, the majority of water infrastructure equipment and related assets are defunct, outdated or inoperable (there are examples of unused infrastructure have been abandoned by the cities because systems are loss-making as they are and assuming expanded loss-making infrastructure would only result in further deficits). A history of neglect coupled with a lack of attention to maintenance and insufficient budgets have resulted in nearly obsolete or inoperable systems in all the cities. Tariffs are in place in every city, but these are not sufficient to cover even the most basic of costs

related to water services. None of the cities have tariff structures based on actual consumption, and so there are no disincentives for excessive consumption or wasted use.

► Water Supply

Table 2: Water Supply situation in the 4 cities¹⁵

City	Population - 2018	Number of customers (HH)	% of water demand addressed	Quality of water resource	Water fees	Condition of infrastructures / O&M capacities
Bahawalpur	787,550	5,500	12%	Brackish groundwater with Arsenic contamination, not adapted for human consumption Few information on surface water Rubber inflatable dam project in Bahawalpur considered by the city but not yet confirmed	Flat monthly fees - depending on user Basic fee: 100 PKR / month	Very poor (50 tubewells not operated, poor network)
Muzaffargarh	215,530	N/A	1%	No piped water supplied Ground water seems adapted for human consumption along canals No information on surface water	Flat monthly fees - depending on user Basic fee: 125 PKR / month	24 installed and not operational tube wells due as they were not transferred from PHED to the city (capacity / financial issues)
Rahim Yar Khan	433,631	9,157	26%	Ground water seems adapted for human consumption along canals No information on surface water	Flat monthly fees - depending on user Basic fee: 300 PKR / month	Relatively new infrastructures installed - operated
Sargodha	672,633	8,406	17%	Brackish groundwater not adapted for human consumption Surface water quality to be confirmed	Flat monthly fees - depending on user Basic fee: 1,500 PKR / month 24 hours connection provided for commercial and administration units in exchange of higher prices	Poor (13 tubewells not operated, poor network)

22. Each of the cities uses groundwater as their predominant water source. The sustainability and quality of this has not been adequately studied in the past. Sargodha and Bahawalpur both face issues with water supply quality as well as quantity.

► Wastewater / drainage

Table 3: Wastewater and drainage situation in the 4 cities¹⁶

City	Population - 2018	% of sewerage coverage	Assets	% of treated wastewater	Wastewater fees	Condition of infrastructures / O&M capacities
Bahawalpur	787,550	70%	- 300 km of network (combined) - 14 disposal stations (combined) - 2 WWTP	0%	No fee	- Combined sewerage and drainage network - Network in average to poor condition - 2 disposal stations not operated, the others in poor condition - WWTP not operated, one is not finished and the other one is not properly operated
Muzaffargarh	215,530	30%	- 25.4 km of network (combined) - 7 disposal stations (combined) - 1 WWTP under construction	0%	No fee	- Combined sewerage and drainage network - Network in poor condition - Disposal stations in average to poor condition - WWTP not yet in service
Rahim Yar Khan	433,631	90%	- 378 km of network (combined) - 18 disposal stations (combined) - 2 WWTP	> 75%	Connection fees (500 PKR/ HH) but no monthly fees	- Combined sewerage and drainage network - Network in good condition - Disposal stations in average to good condition - WWTP in good condition - O&M of the whole system is a problem due to lack of finance and capacities
Sargodha	672,633	80%	- 187 km of network (combined) - 12 disposal stations (combined) - No WWTP	0%	Flat monthly fees - depending on user Basic fee: 300 PKR / month	- Combined sewerage and drainage network - At least 50% of the the network in poor condition - Disposal stations are in average to poor condition

23. Each of the cities contains some form of sewerage and drainage system which is typically combined. However, the condition of most of these assets are poor. Drainage has not been reported to be a significant problem for any of the cities, except for seasonal flooding in Sargodha

¹⁵ Operational issues are noted in the institutional part of this Report to retain a focus on technical and financial issues here.

¹⁶ Operational issues are noted in the institutional part of this Report to retain a focus on technical and financial issues here.

due to blocked drains. The low levels of rainwater means that most cities (other than Sargodha) are not significantly impacted by floods. Flood risks in Muzaffargarh are mainly associated to seasonal river flooding. Improved maintenance is likely to resolve most of the flooding issues.

► Solid waste

Table 4: Solid Waste situation in the 4 cities¹⁷

City	Population - 2018	% of solid waste collected	Landfill / dump site	Available equipment	Solid Waste fees	Comments
Bahawalpur	787,550	> 90%	Dump site with monitoring of trucks	Adapted	No fee	Solid waste is pretty well managed in Bahawalpur. However, the city would need a sanitary landfill and better financial revenues to ensure sustainability.
Muzaffargarh	215,530	38%	Dump sites scattered in and around the city	Limited and outdated	No fee	Solid waste management is limited as collection rate is low and disposal is done in various dump site making it hazardous.
Rahim Yar Khan	433,631	78%	Dump site in a residential area	Limited and outdated	No fee	Solid waste management is limited. Even if the collection rate is average, the dump site is not appropriate.
Sargodha	672,633	75%	Dump site out of the city	Relatively limited with some old equipments	No fee	Solid waste management is limited. Even if the collection rate is average, the dump site is not appropriate.

24. Solid waste management is relatively poor in all four cities, the most notable exception being Bahawalpur, which has a reasonably functional collection system servicing most (but not all) of the city. There are no city-wide collection services in any of the cities. Aside from staff, the equipment available in cities is incapable of responding to the needs of the entire city. Even in Bahawalpur, disposal sites are merely dump sites, plagued by inadequate management, lack of liners and few practices to protect the environment, regulate pickers or ensure disease and insects and rodents are controlled. Some of these dump sites are even located in populated areas, causing serious health hazards.

► City Livability and green areas

25. City livability remains a main issue in Punjab. The cities have been developed with a lack of integrated planning. As a consequence, the 4 project cities suffer from a lack of open space and parks. The following figures provide a measure of how inadequate green spaces are in each city:

- Bahawalpur: 0.6 m² of green area / park per inhabitant,
- Muzaffargarh: 1.2 m² of green area / park per inhabitant,
- Rahim Yar Khan: 0.7 m² of green area / park per inhabitant,
- Sargodha: 0.9 m² of green area / park per inhabitant.

26. As a comparison, in developed countries, the ratio can vary from 10m² to 120m² per person. Singapore for example has 66 m² of green space per inhabitant and the World Health Organization (WHO) recommends at least 9 m² per inhabitant. By these standards, the city with the greenest space per inhabitant, Muzaffargarh, still needs to increase its parklands by over 8 times to even be within the WHO recommendations, and by over 50 times to match Singapore.

27. This situation is also the consequence of unplanned city development. Indeed, specific areas for parks and green places have never been planned or developed as such.

¹⁷ Operational issues are noted in the institutional part of this Report to retain a focus on technical and financial issues here.

3.2.3. Development Opportunities

28. The PICIIP2 provides an opportunity to develop realistic and achievable improvements to urban infrastructure services in each of the four intermediate cities noted. The main objectives shall be to (i) improve institutional and financial management to ensure better use of existing and future assets, (ii) make full use of existing assets by rehabilitating non-functional ones, (iii) improve the water supply and reduce the existing gap between demand and supplied water, (iv) improve wastewater management by fixing existing issues, (v) proposing an integrated and suitable solid waste management scheme to reduce associated hazards, (vi) increase the greening in each city to improve city livability. All of the proposals will also contribute to improving urban resilience, and the ability of cities to respond to future shocks and stresses. This is fully in line with Punjab and Pakistani government objectives, especially the following objectives mentioned in the *Punjab Growth Strategy 2018: “Enabling Cities to be Engines of Growth”* and *“Preventive Health: Building a healthier Punjab”*. This is also aligned with ADB strategy in Pakistan as “Water and other urban infrastructure and services” is a key component of ADB Country Operations Business Plan for the period 2019 – 2021.

29. While urban transportation is not part of the Consultant scope of work, this issue was frequently raised by the cities as one of their main need. In this respect, such components may be considered for the next project phases in order to propose an integrated approach to municipal services delivery.

3.3. The Proposed Project

3.3.1. Impacts and Outcomes

30. The main outcome will be to ensure that urban population of Bahawalpur, Muzaffargarh, Rahim Yar Khan and Sargodha benefit from improved urban services and of a greener city. This includes following improvements by 2025: (i) access to improved drinking water services increase by 20%; (ii) access to improved solid waste management services increase by 90%; (iii) access to improved wastewater services increase by 10% and (iv) urban green spaces increased by 10%.

3.3.2. Outputs

31. The main outputs of PICIIP2 will be improved infrastructure (water supply, sanitation, solid waste) and its management (by capacity building and institutional strengthening actions) in the four cities. During the interim phase, consultations were conducted with each city in order to define the phasing of projects (5/10/15 years). A list of priority projects was defined and agreed with cities at the interim workshop. Based on this, the PFS were prepared. After the final workshop, some last changes were done to fully take into account cities point of view. A total of \$532.7 million is required for the priority investments in the four cities. All of these are high priority and deemed essential. However, considering the ADB commitment of \$300 million coupled with a GoPb co-commitment of \$75 million, a phasing of these investments is proposed. The Final Report details specific investments for each city evaluated to PFS level for their technical and financial viability, impact on urban resilience, and acceptance and ability to respond to the needs of key stakeholders, particularly the poor.

32. Preliminary cost estimates have been prepared for the investments. Due to the unknowns, the estimates are highly variable, with margins of error ranging as high as 25 percent. Furthermore, proposed costs do not include (i) land acquisition, (ii) constraints due to soil or geotechnical conditions (such as contamination or the necessity for stronger foundations) and

topography. On the top of estimated costs, it is suggested a further 10 percent be added for additional engineering design inputs and project supervision costs during project implementation.

3.3.3. Special Features

3.3.3.1. Innovative approach implemented during the PFS

33. A core focus of the PFS is to ensure that all sub-projects are implemented to increase cities resilience. In this respect, urban resilience concept was introduced to all cities and was a key element in the decision making. This concept was new for all cities and related discussions allowed cities officers to have a better understanding of related issues.

34. Mapping of existing assets and future areas. In order to prepare Urban Resilient 15 years Infrastructure Investment Plan, it was required to get a full picture of existing assets and of cities mapping. As none of the city had a proper map for (i) their utilities, (ii) social conditions and particularly of poorest areas and (iii) available land, several sites visited and meetings were conducted with cities officers in order to prepare some maps that can then be used for programming and prioritize actions. This was done using GPS and existing drawings / sites visits.

3.3.3.2. Proposed Innovation for Project Implementation

35. Urban Resilience will continue to be a core issue in the next project steps. In this respect, all designs in the PFS were done to maximize urban resilience and better inform subsequent and more detailed designs. One core component required to improve urban resilience will be to ensure that the capacity building and institutional strengthening roadmap is properly implemented.

36. It is also recommended to implement a Water Resources Master Plan in order to ensure an adequate water use in Punjab. Indeed, while Punjab as sufficient water available, existing use does not allow proper allocation to all inhabitants.

37. It is proposed, for each city, to implement a DMA pilot area with metering in each city. This will allow cities to start having better knowledge of their network and to estimate NRW in some areas. This is a first step for the cities toward a full smart management of the network.

38. For some assets which require further technical capacities (such as Water Treatment Plants), it is strongly recommended to implement a DBO type of contract with at least 5 years of operation included. Considering existing lack of stakeholder consultation during the design phase and of proper O&M, DBO would be a good option. This would put the responsibility of the operation under a private company while giving the opportunity to the city to put penalties if contractual obligations are not fulfilled.

3.3.4. Urban Resilient 15-year Infrastructure Investment Programs

39. All projects included within the Urban Resilient 15-year Infrastructure Investment Programs will bring considerable benefits and improvement to urban resilience. The main benefits being:

- ▶ Master planning: to ensure investment consistency and anticipate future stresses and shocks due to (i) climate change as well as other environmental factors, (ii) population increases and demographic changes (iii) macroeconomic changes and regional variability and specializations.
- ▶ Infrastructure projects:
 - Water supply – this was identified as a key issue in every city as supplied water volume is far below the demand:
 - Production: for all cities, use of surface water is recommended as the quality is likely to be better and the availability can be ensured through concerted water resources

- management while ground water resources are not guaranteed in the medium and long terms due to quality and availability issues.
- Distribution: Improvements in storage and distribution are proposed to be retained as priorities in every city. This will reduce water shortages for the vast majority of the population and improve daily life and reduce health risks, especially for poor inhabitants, by improving service to low income/high priority areas.
 - Solid waste – this is also identified as a key priority for every city as solid waste management is not undertaken systematically:
 - Collection: in every city, collection shall be improved, especially by providing better equipment and skills. This will contribute to reduce city stresses and waste related hazards, thereby improving livability.
 - Disposal and treatment: for every city there is an urgent need for a sanitary landfill, as solid waste is currently disposed of in dumpsites proliferated by waste scavengers, further increasing the risk from transmission of diseases and epidemics. Most of this activity occurs at serious risk to the scavengers themselves as well as to the public at large.
 - Wastewater – this is identified as a lower priority, hence most of the retained projects focus on specific wastewater issues to be resolved in the short term. These projects will bring immediate benefits to inhabitants living in areas where sewerage is not channeled properly, causing stagnant pooling, resulting in environmental and health stresses.
 - Green parks/filtration systems/tree plantations/city livability: in all cities, green areas and parks are very limited. Hence inhabitants cannot escape from heavily built up, congested or high-traffic areas. Development of new green spaces and the planting of particulate filtering tree species will significantly contribute to reducing pollution and associated health impacts while improving city livability.

40. Conceptual design of proposed infrastructures also considered potential climate changes impacts and consequences to reduce vulnerability.

41. The full 15-year Urban Resilient Infrastructure Investment Programs for each city are presented in the core appendix, while the main findings are presented here. The appendix also details the rationale for the prioritization.

3.3.5. Pre-Feasibility Studies (PFS)

42. Based on the 15-year Urban Resilient Infrastructure Investment Programs, conceptual designs have been developed for priority projects (to be implemented within the first 5 years) for each city. The following tables present the main technical characteristics of the proposed projects. Following preparation of the PFS, the total costs (including financial contingencies, taxes, inflation) amount to \$532.7 million (base cost, including physical contingencies and engineering, amounting to \$385 million). Projects mentioned as priorities in next tables are estimated to cost a total of \$385 million, including financial contingencies. This would then be in line with ADB financing target of \$300 million, supported by \$75 million from GoPb. The PFS conducted by the CDIA team includes the initial financial and economic analyses considering all projects studied up to pre-FS level as all of them are considered essentials. All benefits derived by the cities including urban resilience benefits have been detailed in the core appendices. The full conceptual design is presented in the city reports.

3.3.5.1. Bahawalpur

43. The following projects were selected by Bahawalpur as essential to its priorities.

Table 5: List of projects studied up to PFS level – City of Bahawalpur

Component	Sub-Components		Main characteristics	Land requirements	Cost (million USD)	CAPEX* (million USD)	OPEX** (million USD/year)	Proposed as priority
Water Resources / Supply	Studies		Water Supply Master Plan, including hydrological analysis, digital mapping	No need	2.5	3.25	0	YES
	Transmission / storage	Construction of storage tanks to ensure 25% of short term water storage - to match increased supply	7,000 m3 of overhead reservoirs 13,000 m3 of underground reservoirs	1 ha	4.9	6.4	0.15	
		Improvement of transmission mains	construction of 25.4 km mains	No need	10.7	13.91	0.15	
	Distribution	Short Term - 500 km of network to improve coverage of existing population (about 30% more)	Phase 1 (by 2023): 100 km, priority areas: Arshad town, Ouaide Azan, Kot Nora, Civil hospital, Sadiq Colony, Bhatta Jat n°1 to n°3	No need	9.1	11.8	0.2	
	Rehabilitation of existing infrastructure	Medium - long term - 1,140 km of network	Rehabilitation of 37 to 50 tube wells built in 2009 (equipment mainly)	No need	2.5	3.25	0.24	YES
Improvement of measurement equipment and asset management / billing	Improvement of water supply production	Equipment of 2,000 HH with water meters Equipment of commercial consumers (hotels, industries) with meters Definition and installation of a DMA for 2,000 HH	Not needed - under public land	2	2.6	0	YES	
Wastewater	Studies		Wastewater and Drainage Master Plan, including modelling and topography surveys	Not relevant	1.5	1.95	0	YES
	Collection and transfer	1 new Disposal Station	At hospital road	0.5 ha needed	3.21	4.173	0.1	YES
		Wastewater collection / Transfer	Main trunk sewer from Kohnou hotel to Lalbag disposal station: 1.5 km Civic hospital, Jangi Wala Road - 2.5 km	No need	4.71	6.123	0.05	YES
		East WWTP	Rehabilitation of East WWTP	Yes	0.7	0.91	0.1	YES
Equipment		3 Combi trucks high pressure water/vacuum suction tank; 2 tractors front loader; 5 Diesel power generators (transportable); Safety Equipment workers	No need	0.5	0.65	0.075	YES	
Solid Waste	Sanitary landfill (including equipment's)	1st Phase - Short and medium Term need	All including	No need	6.97	9.061	0.2	YES
	Transfer point	1st Phase - Short and medium Term need	Civil works and weighbridge	To be identified	0.4	0.52	0	YES
	Collection and Transport Equipment	For narrow lane in city center	Waste containers, tractors, mini dumpers, refuse collection vehicles	Yes	5.22	6.786	0.3	YES
	Closure of existing dump sites and rehabilitation of old dump sites	Medium term improvement	Reshaping of waste body and installation of surface sealing system.	No need	3.32	4.316	0.08	YES
Urban Planning and Green areas	Improvement of city urban planning		Urban Master Plan	No need	1.5	1.95	0	YES
	Improvement of green areas		New parks and green areas, including natural filtration planting	To be checked	1	1.3	0.02	YES
Soft Components	Institutional strengthening and capacity building		Training, Improve building and plumbing regulations	No need	2	2.6	0	YES
	Improvement of operation arrangement for water supply, sanitation and solid waste		Establish WSS, improve HR management, subcontracting of some activities,....	No need	2	2.6	0	YES
	Improvement of financial management		Set up tariffs, strengthen financial management procedures,....	No need	0.6	0.78	0	YES
	Improve climate change planning and management		Master planning considering climate change and resilience issues	No need	0.4	0.52	0	YES
GRAND TOTAL (MUSD) - INFRASTRUCTURE						71.8		39.7
GRAND TOTAL (MUSD) - SOFT COMPONENTS						13.7		13.7

*Including physical contingencies (20%) and engineering costs (10%)

** OPEX estimated for 2025 / start of services

44. The main components of the Bahawalpur project will consist of (i) increase water supply production (+17,500 m³/day with tubewells rehabilitation); (ii) wastewater collection, transfer and management improved through construction of a new disposal station and rehabilitation of sewer network as well as WWTP; (iii) better solid waste collection and management with a sanitary landfill for the whole city; (iv) improved city livability including new parks and green spaces and (v) institutional strengthening.

45. The **total cost for projects budgeted for the Bahawalpur PFS is \$85.5 million**, including 10 percent for further engineering studies and 20 percent for contingencies. The amount related to master planning and soft components is \$13.65 million (including urban master planning, water supply and drainage / wastewater master planning and soft components).

46. Costs for proposed priority projects is of 39.7 MUSD (without financial contingencies and taxes).

3.3.5.2. Muzaffargarh

48. The following projects were selected by Muzaffargarh as essential to its priorities.

Table 6: List of projects studied up to PFS level – City of Muzaffargarh

Component	Sub-Components		Main characteristics	Land requirements	Cost (million USD)	CAPEX* (million USD)	OPEX** (million USD/year)	Proposed as priority
Water Resources / Supply	Studies		Water Supply Master Plan, including hydrological analysis, digital mapping	Not relevant	2.5	3.25	0	YES
	Production	Increase of Water Supply - short term	To cope with short term demand - 12 tube wells of 2,450 m ³ /d each, to serve new areas	Low (can be available)	1.13	1.469	0.1	
	Transmission / storage	Construction of storage tanks to ensure 100% of short term water storage (to cope with tubewells)	6,000 m ³ of overhead reservoirs 12,000 m ³ of underground reservoirs	1 ha	4.4	5.72	0.1	
		Expansion of water transmission mains	12.8 km of main transmission pipes	No need	10.7	13.91	0.1	
	Distribution	Short Term - 150 km of network to cover existing population	Phase 1 (by 2023): 75 km - especially 2 zones and old city center	No need	3	3.9	0.05	
	Improvement of measurement equipment and asset management / billing	Implementation of Pilot Area for DMA and household metering	Equipment of 2,000 HH with water meters Equipment of commercial consumers (hotels, industries) with meters Definition and installation of a DMA for 2,000 HH	Not needed - under public land	2	2.6	0	YES
Wastewater	Studies		Wastewater and Drainage Master Plan, including modelling and topography surveys - Flood Risk Study	Not relevant	1.5	1.95	0.00	YES
	Collection and transfer	Northern area	8.4 km of collection network 1 disposal station	Land identified and available	8	10.4	0.05	YES
		Western Area	Sewer system and pumping station in Tibba Karimabad, a low income area	Land identified and available	3.5	4.55	0.05	YES
		Southern area	6.7 km of collection network 1 pumping station	Land identified and available	7	9.1	-	YES
		Girls College Road disposal stat	New Disposal Station at Girls College Road	Existing one	1.44	1.872	0.04	YES
	Equipment		Sewer cleaning equipments - O&M equipments	No need	0.25	0.325	-	YES
	Rehabilitation of existing infrastructure		Replacement of sewer lines in non working condition - 9.5 km Rehabilitation of 6 disposal stations (including deplacement of 2 DS: Hayat Nagar and Rawal-e-Wala)	No need	4.52	5.876	0.04	YES
Solid Waste	Collection and Transport Equipment	1st Phase - Short and medium Term need	Waste containers, tractors, mini dumpers, refuse collection vehicles	No need	1.39	1.81	0.06	YES
	Transfer point	For narrow lane in city center	Civil works and weighbridge	To be identified	0.4	0.52	0	YES
	Sanitary landfill (including equipment)	1st Phase - Short Term need	All including	Identified	3	3.9	0.11	YES
	Closure of existing dump sites and rehabilitation of old dump sites		Reshaping of waste body and installation of surface sealing system.	No need	2.04	2.652	0.04	YES
Urban Planning and Green areas	Improvement of city urban planning		Urban Master Plan	No need	1.5	1.95	0	YES
	Improvement of green areas		New parks and green areas, including natural filtration planting	To be checked	1	1.3	0.02	YES
Soft Components	Institutional strengthening and capacity building		Training, Improve building and plumbing regulations	No need	1.5	1.95	0	YES
	Improvement of operation arrangement for water supply, sanitation and solid waste		Establish WSS, improve HR management, subcontracting of some activities....	No need	1.5	1.95	0	YES
	Improvement of financial management		Set up tariffs, strengthen financial management procedures....	No need	0.4	0.52	0	YES
	Improve climate change planning and management		Master planning considering climate change and resilience issues	No need	0.3	0.39	0	YES
GRAND TOTAL (MUSD) - INFRASTRUCTURE						76.4		42.3
GRAND TOTAL (MUSD) - SOFT COMPONENTS						12.0		12.0

*Including physical contingencies (20%) and engineering costs (10%)

** OPEX estimated for 2025 / start of services

49. The main components of the Muzaffargarh project will consist in (i) water supply production increase (+29,400 m³/day with rehabilitation of tubewells); (ii) increase of wastewater collection and transfer coverage by serving 3 new areas and building a new disposal station; rehabilitation of existing assets will also be done; (iii) increases in solid waste collection and management with a sanitary landfill for the whole city; (iv) improved city livability with new parks and green spaces and (v) institutional strengthening.

50. The **total cost budgeted for the Muzaffargarh PFS is \$88.4 million**, including 10 percent for further engineering studies and 20 percent for contingencies. The amount related to master planning and soft components is \$12 million (including urban master planning, water supply and drainage / wastewater master planning and soft components).

51. Costs for priority projects is of 42.3 MUSD (without financial contingencies and taxes).

3.3.5.3. Rahim Yar Khan

52. The following projects were selected by Rahim Yar Khan as essential to its priorities.

Table 7: List of projects studied up to PFS level – City of Rahim Yar Khan

Component	Sub-Components	Main characteristics	Land requirements	Cost (million USD)	CAPEX* (million USD)	OPEX** (million USD/year)	Proposed as priority	
Water Resources / Supply	Studies	Water Supply Master Plan, including hydrological analysis, digital mapping, water quality tests	No need	2.5	3.3	0	YES	
	Production	Rehabilitation of existing tubewells	No need	0.82	1.1	0.05	YES	
		Construction of tube wells to cover the city average demand in short term	New tube wells only along those canals operating all year (providing groundwater resource is capable of accommodating) to double water production, size and optimum capacity of new wells proposed to be confirmed in pre-design studies - +48,000 m ³ /d	about 100 m ² for each	1.38	1.8	0.1	YES
	Transmission / storage	Construction of storage tanks to ensure short term water storage	12,500 m ³ of overhead reservoirs 22,500 m ³ of underground reservoirs	1.5 ha	8.5	11.1	0.2	
		Transmission mains	18.8 km of mains	No need	15.8	20.5	0.1	YES
	Distribution	Short Term - 300 km of network to cover existing population	New distribution system: 125 km	No need	5.8	7.5	0.1	YES
		Rehabilitation of existing system: 109km, including 4km of main along Bahadarpur road, from Unilever bridge to Rahim Yar Khan by pass road	Rehabilitation of existing system: 109km, including 4km of main along Bahadarpur road, from Unilever bridge to Rahim Yar Khan by pass road	No need	5.1	6.6	0.05	YES
Improvement of measurement equipment and asset management / billing	Implementation of Pilot Area for DMA and household metering	Equipment of 2,000 HH with water meters Equipment of commercial consumers (hotels, industries) with meters Definition and installation of a DMA for 2,000 HH	Not needed - under public land	2	2.6	-	YES	
Wastewater	Studies	Wastewater and Drainage Master Plan, including modelling and topography surveys	Not relevant	1.5	2.0	0	YES	
	Collection and transfer - new infrastructures	2 new disposal stations	Land available	7.99	10.4	0.42	YES	
	Rehabilitation sewer network	1. DS Javid Colony and Qadirabad 2. DS Batta colony, Essa colony, Tahir colony	No need	2.63	3.4	0.025	YES	
	Equipment & workshop	- Force Main pressure pipes at Habib Colony Replacement of old AC pipes (Asbestos Cement): 600m diam. 400mm (14") - Replacement of damaged sewer lines at Sadiq Branch Canal to DS Chak III east: 400m diam 1,000mm; replace sewers at the Abassiah Sports Complex	Transportable generators: 2; Safety equipment: 1 unit, ventilation equipment and sewer gas testing meters, portable dewatering unit, desludging equipment (excavator), high pressure vacuum trucks, construction of a maintenance building	No need (maintenance building to see)	0.37	0.5	0.075	YES
Solid Waste	Collection and Transport Equipment	1st Phase - Short and medium Term need	Waste containers, tractors, mini dumpers, refuse collection vehicles and a new workshop in the city yards to maintain and repair these vehicles and equipment	No need	2.32	3.0	0.2	YES
	Closure of existing dump sites and rehabilitation of old dump sites	Reshaping of waste body and installation of surface sealing system.	No need	0.92	1.2	0.03	YES	
Urban Planning and Green areas	Improvement of city urban planning	Urban Master Plan	No need	1.5	2.0	0	YES	
	Improvement of green areas	New parks and green areas, including natural filtration planting	To be checked	0.8	1.0	0.02	YES	
Soft Components	Institutional strengthening and capacity building	Training, Improve building and plumbing regulations	No need	1.5	2.0	0	YES	
	Improvement of operation arrangement for water supply, sanitation and solid waste	Establish WSS, improve HR management, subcontracting of some activities,...	No need	1.5	2.0	0	YES	
	Improvement of financial management	Set up tariffs, strengthen financial management procedures,...	No need	0.4	0.5	0	YES	
	Improve climate change planning and management	Master planning considering climate change and resilience issues	No need	0.3	0.4	0	YES	
GRAND TOTAL (MUSD) - INFRASTRUCTURE						70.8		59.7
GRAND TOTAL (MUSD) - SOFT COMPONENTS						12.0		12.0

*Including physical contingencies (20%) and engineering costs (10%)

** OPEX estimated for 2025 / start of services

53. The main components of the Rahim Yar Khan project will consist in (i) water supply production increase (+54,600 m³/day rehabilitation/construction of tubewells) and improvement of distribution with about 20km of transmission main and 125 km of distribution system, (ii) improved wastewater collection and transfer by building new disposal stations and rehabilitating existing assets; (iii) enhanced solid waste collection (no landfill site is proposed as land is unavailable); (iv) improved city livability with new parks and green spaces and (v) institutional strengthening.

54. The **total cost budgeted for the Rahim Yar Khan PFS investments is \$82.7 million**, including 10 percent for further engineering studies and 20 percent for contingencies. The amount related to master planning and soft components is \$12 million (including urban master planning, water supply and drainage / wastewater master planning and soft components).

55. Costs for proposed priority projects is of 59.7 MUSD (without financial contingencies and taxes).

3.3.5.4. Sargodha

56. The following projects were selected by Sargodha as essential to its priorities.

Table 8: List of projects studied up to PFS level – City of Sargodha

Component	Sub-Components		Main characteristics	Land requirements	Cost (million USD)	CAPEX* (million USD)	OPEX** (million USD/year)	Proposed as priority	
Water Resources / Supply	Studies		Water Supply Master Plan, including hydrological analysis, digital mapping	No need	2.5	3.25	0	YES	
	Production	Water Treatment Plant - short term	Rapid sand filter surface waster treatment plant - phase 1 / 35,000 m ³ /d	12 ha - existing main WTP is 12 ha	16.00	20.80	1.40	YES	
	Distribution	Short Term	Phase 1 (by 2023): 100 km	No need	9.3	12.1	0.2	YES	
			Phase 2 (by 2024): 150 km	No need				YES	
	Transmission / storage	Construction of storage tanks to ensure 45% of short term water storage (to cope with new WTP)		10,000 m ³ of overhead reservoirs 20,000 m ³ of underground reservoirs	1 ha	7.3	9.49	0.15	
		transmission mains		12.55 km of transmission mains	No need	7.9	10.27	0.05	
	Rehabilitation of existing infrastructure	Improvement of water supply production		Rehabilitation of 30 tube wells - +15,600 m ³ /d	No need	1.87	2.431	0.125	YES
		Improvement of distribution		Renewal of 160 km of water supply pipelines in poor condition	No need	5.9	7.67	0.1	YES
	Improvement of measurement equipment and asset management / billing		Implementation of Pilot Area for DMA and household metering	Equipment of 2,000 HH with water meters Equipment of commercial consumers (hotels, industries) with meters Definition and installation of a DMA for 2,000 HH	Not needed - under public land	2	2.6	0	YES
	Wastewater	Studies		Wastewater and Drainage Master Plan, including modelling and topography surveys	Not relevant	1.5	1.95	0	YES
Collection and transfer - new infrastructures		New sewer / drainage network	Zone IIA and IIB and zone III: new sewerage network and one disposal station: 8.5km - 1,500 HH connections	For pumping station - not identified yet	6.3	8.19	0.1	YES	
Rehabilitation of existing infrastructure		Rehabilitation of Block A- Disposal Station		1 pump and connections, and discharge pipes	No need	0.190	0.247	0.020	YES
		Rehabilitation of Block C- Disposal Station		2 pumps and connections, and discharge pipes	No need	0.260	0.338	0.035	YES
		Rehabilitation of Main Disposal station (receiving Block A and block C wastewater)		Incl. pumps and sewer connections, and discharge pipes	No need	0.500	0.650	0.200	YES
		Rehabilitation of Sillanwala - Disposal Station		Incl. 5 pumps and sewer connections, and discharge pipes	No need	0.500	0.650	0.200	YES
		Zone I-A		Repairs of Sewerage lines: 4.9km	No need	3.100	4.030	0.025	YES
		Zone I-B		Repairs of Sewerage lines: 2.9km	No need	1.430	1.859	0.015	YES
		Zone II		Repairs of Sewerage lines: 2.1km	No need	0.880	1.144	0.015	YES
		Zone III		Repairs of Sewerage lines: 3.8km	No need	2.140	2.782	0.020	YES
Fazal Town - Disposal Station		Replacement of 1 pump incl. piping	No need	0.210	0.273	0.020	YES		
Model Town - Disposal Station		Replacement of 1 pump incl. piping	No need	0.210	0.273	0.020	YES		
Solid Waste	Collection and Transport Equipment	1st Phase - Short and medium Term need	Waste containers, tractors, mini dumpers, refuse collection vehicles	No need	5.75	7.475	0.2	YES	
	Transfer point	For narrow lane in city center	Civil works and weighbridge	To be identified	0.4	0.52	0	YES	
	Sanitary landfill	1st Phase - Short Term need	All including	Identified and suitable	5.96	7.748	0.26	YES	
	Closure of existing dump sites and rehabilitation of old dump sites		Reshaping of waste body and installation of surface sealing system.	No need	7.05	9.165	0.15	YES	
Urban Planning and Green areas	Improvement of city urban planning		Urban Master Plan	No need	1.5	1.95	0	YES	
	Improvement of green areas		New parks and green areas, including natural filtration planting	To be checked	3.25	4.225	0.02	YES	
Soft Components	Institutional strengthening and capacity building		Training, Improve building and plumbing regulations	No need	2	2.6	0	YES	
	Improvement of operation arrangement for water supply, sanitation and solid waste		Establish WSS, improve HR management, subcontracting of some activities....	No need	2	2.6	0	YES	
	Improvement of financial management		Set up tariffs, strengthen financial management procedures....	No need	0.6	0.78	0	YES	
Improve climate change planning and management		Master planning considering climate change and resilience issues	No need	0.4	0.52	0	YES		
GRAND TOTAL (MUSD) - INFRASTRUCTURE						114.9		95.2	
GRAND TOTAL (MUSD) - SOFT COMPONENTS						13.7		13.7	

*Including physical contingencies (20%) and engineering costs (10%)

** OPEX estimated for 2025 / start of services

57. The main components of the Sargodha project will consist in (i) water supply production increase (+50,600 m³/day with rehabilitation of tubewells and construction of a WTP) and extension of distribution system to serve new areas; (ii) wastewater collection and transfer improvement, especially through rehabilitation of existing network and by serving one new area; (iii) enhancements in solid waste collection and management with a sanitary landfill for the whole city; (iv) improved city livability with new parks and green spaces and (v) institutional strengthening.

58. The **total cost budgeted for the Sargodha PFS investments is \$128.6 million**, including 10 percent for further engineering studies and 20 percent for contingencies. The amount related to master planning and soft components is \$13.6 million (including urban master planning, water supply and drainage / wastewater master planning and soft components).

59. Costs for proposed priority projects is of 95.2 MUSD (without financial contingencies and taxes).

3.3.5.5. Consideration of climate change impact and urban resilience

60. During the PFS preparation, specific consideration has been given to ensure that climate change impacts and adaptation measures are fully considered into the conceptual design of assets, thereby ensuring that investments are adaptive and flexible in their design to respond to changing circumstances, most of which cannot be predicted. Further to the climate impacts, other potential shocks and stresses have been considered and proposed design as well as capacity building components include such updates.

3.3.6. Institutional strengthening and capacity development

61. Institutional strengthening and capacity development underpin all the PICIIP Phase 2 priority investments. Such assistance is necessary to ensure investments in infrastructure are well managed and functionally supported by individuals and systems to perform as designed over their life-cycle.

62. An institutional capacity analysis was carried out in all four PICIIP2 cities to identify the gaps, challenges and needs in the existing implementation framework, and to come up with suitable options for strengthening and supporting the systems meant to facilitate the investment objectives.

63. The following developments are ongoing with regard to institutional set up in Punjab:

- ▶ A new **Punjab Water Policy 2018** is being drafted by the Irrigation Department. The stated objective of the draft policy is to “provide clear policy directions to the Government of Punjab on the sustainable management and development of water from all sources of water for all sub-sectors of water use and for all regions at the basin level”.
- ▶ A **draft Punjab Aab-e-Pak Authority Act 2018** prepared by the incumbent government proposes establishing a clean drinking water authority to conceive, plan, execute and manage projects that provide for affordable supply of clean drinking water in Punjab and the sustainable and efficient management of water resources and installed infrastructure.

64. This new policy should not directly affect PICIIP2 project. Indeed, this may require further coordination with new stakeholders and new staffs to take over some positions but the overall set up and responsibilities should remain similar. The main risk being that new stakeholders / staffs could question previous decisions made and project scope and / or delay project implementation.

65. In this section, the main features of the institutional strengthening strategies proposed for each city have been summarized.

66. Main Institutional Gaps and Challenges in Municipal Administration: Assessment of municipal authorities and governance structures in the cities has revealed that local administrative arrangements and capacities are by and large inadequate in meeting the demands of providing and maintaining essential urban services, including the provision of water supply and sanitation services. Municipal administrations are caught in a cycle of weak revenue generation, insufficient funding for the development and maintenance of systems, poor services delivery, and consequently low willingness to pay by consumers; these issues are perpetuated by local government’s lack of autonomy in key areas like tariffs and staffing. Moreover, city governments and development authorities are not equipped with the appropriate skills and resources to undertake urban planning, let alone carry out the more complex tasks of climate-proofing growth and assets, and strategizing for urban resilience.

67. Drawing on the findings of a detailed assessment of the Municipal Corporations/Councils (MCs), the main issues and challenges in local institutional capacity that are relevant to the PICIIP2 investment objectives and plans are summarized as below:

- ▶ Critically, the workforce is insufficient in knowledge, motivation and skills at the MC level to properly plan, operate and maintain municipal water supply, sewerage and drainage

systems; existing staff are overstretched and unable to take on added responsibility for handling new water supply and sanitation facilities;

- ▶ There is a perpetual shortage of financial resources for the operation and maintenance of systems and assets. MCs have weak capacities to generate own-source revenues, partly due to lack of autonomy in financial planning and tariffs setting. MCs and local utility agencies (WASAs and Waste Management Companies (WMCs)) are unable to rationalize tariff structures for the water supply and sanitation services they provide due to limitations imposed by government; this is a main impediment to improving cost recovery and sustainability of local services and assets;
- ▶ Human and financial resources are not ring-fenced for specific purposes and are frequently diverted to other needs within the municipal administrations;
- ▶ There is a system-wide lack of advanced and efficient financial management skills and systems within local government to support existing let alone new services. Outdated methods of invoicing, revenue collection, accounting and information management are used in the MCs, preventing proper planning and monitoring of finances;
- ▶ There is a general lack of incentive and drive in local government to improve municipal governance and services. Business planning and goal setting are not practiced in local government, and there is little institutional incentive to plan and deliver beyond the annual development budget in the absence of effective performance management mechanisms;
- ▶ There is no formal training support or guidance available to municipal staff: operational staff often work in unsafe and poor environments due to lack of safety measures;
- ▶ There are continual changes to the local governance framework and urban management structures in Punjab. This makes it challenging to develop stable and accountable municipal institutions.

68. Institutional and Capacity Development Recommendations: The following interventions are proposed in view of the institutional issues discussed above. The proposed strategies build on the existing ventures funded by the government in Punjab to improve urban services and management systems, and promote collaboration with leading public sector programs and expert agencies to deliver assistance to the intended beneficiaries. This includes collaboration with the Punjab Municipal Development Fund Company (PMDFC), a key technical support agency under the LGCD that is extending assistance to municipalities in implementing upgraded financial and performance management systems.

Table 9: Summary of the Activities of the Institutional and Capacity Development Program and Road Map

MAIN PURPOSE	INTERVENTION	ACTIVITIES (over next 6 months)	ACTIVITIES (over next 2 years)	ACTIVITIES (beyond 2 years)
Institutional reform for improving municipal water supply & sanitation (WSS) services management 7.2 MUSD	Organize dedicated WSS Department in the MCs of Muzaffargarh and Rahim Yar Khan	Planning and confirmation with MMC and RMC; Organizational design and planning; Negotiations with the LG&CD Dept.	Operationalize WSS Dept. at the RMC & MMC; prepare business plan and private sector participation strategy; WSS Dept. staff training in administrative functions, information management & communication	Continued implementation of WSS Dept. management, operation and business plans with updates and improvements as needed; Support to water sector policy development and enforcement
	Establish WASA Sargodha and WASA Bahawalpur	Agreement with respective DAs and MCs; Planning and negotiations with the HUD&PHE Department and the LG&CD Department for WASA authorization; Organizational design, budget and implementation planning	WASA business strategy and financial planning; HR planning and institutional capacity development strategy; Delivery of WASA operationalization plan and negotiations with government as needed; Staff recruitment and transfer of assets and resources from SMC & BMC	Continued implementation of WASA operationalization and management plans, with updates and improvements as needed; Support to water sector policy development and enforcement

Capacity development of municipal WSS services staff for improving O&M <i>5.1 MUSD</i>	Training program in WSS O&M for the WSS staff of all four MCs	Partnership with the Al-Jazari Academy and/or the WASA Training Centre, Lahore; Training Needs Assessment of MCs WSS section	Al-Jazari Academy to develop training courses and content for WSS staff; preparation of O&M manuals and guidelines as supplementary material to trainings	Implementation of Training Program for municipal WSS staff by the Al-Jazari Academy and/or WASA Training Centre, Lahore; Monitoring, evaluation and updating of training courses and plans
Institutional strengthening and capacity development for municipal Solid Waste Management (SWM) operations <i>4.1 MUSD</i>	Revise organizational structure and HR plan for SWM services in the MCs of Sargodha, Muzaffargarh	Partnership with the BWMC, MWMC, and LWMC; Training Needs Assessment of MCs SWM staff; Assessment of the MCs HR schedule for municipal SWM operations & services	Revise and update the HR schedule and management plan for the MCs SWM section; Multi-year business planning and tariff system design for municipal waste management services; Public sensitization campaign; SWM training program development and delivery; Preparation of O&M manuals; Landfill design and development contracting	Implementation of the revised HR plan and management strategy for municipal SWM section; delivery of SWM services business plan and tariff system with updates and revisions as needed; SWM training program implementation; Management of landfill site development and operations contracts
	Multi-year business plan & tariff system design for SWM			
	Training program in SWM operations			
	Outsource SWM			
	Training and Technical support to the BWMC in Landfill Development & Operation + Institutional Training Program	Partnership with the LWMC for technical assistance and training support; Identification and recruitment of international experts for training and technical support to the BWMC; Training Needs Assessment of BWMC	Development of training courses and plans; Implementation of training and technical assistance program with the BWMC	Continued implementation of programs and plans; Monitoring and evaluation; Updating of capacity development strategies and plans
Improve municipal financial management <i>2.5 MUSD</i>	Institutionalize the PMDFC led Computerized Financial Management System (CFMS) in all four MCs	Collaboration with the PMDFC for implementing the CFMS in the MCs; Rapid analysis of MCs readiness for CFMS	Establish CFMS Monitoring Cell at the LG&CD Dept.; CFMS implementation plan preparation and delivery; Awareness raising sessions with MCs' staff	Continued implementation and upgrading of the CFMS in the MCs; monitoring and evaluation
Introduce performance management mechanisms in municipal management <i>1.8 MUSD</i>	Institutionalize the PMDFC led Performance Management System (PFS) in all four MCs	Collaboration with the PMDFC; Rapid situation analysis in MCs	Develop PMS indicators, values, and formats for MCs; PMS implementation plan preparation & delivery; Orientation and awareness raising sessions with MCs' staff; Data collection and entry	Continued implementation and upgrading of the PMS in the MCs; Monitoring and evaluation
Local government's capacity development for resilient urban planning <i>1.8 MUSD</i>	Trainings to local government and stakeholders in Resilient & Green Urban Planning	Consultative planning with respective MCs and DAs; Select suitable training partner for designing and delivering the training program	Training program development & delivery; Integration within Punjab Local Government Academy's curricula	Training program delivery, evaluation, and institutionalization

3.3.7. Project Investment Plan

69. The proposed financing plan for the entire PICIIP 2 is presented below. Further detail on each city investment plan and expenditures are provided in cities reports.

Table 10: PICIIP Phase 2 Financing Plan (source: CDIA Consultant)

Source	Tranche 1	Tranche 2	Amount (\$ million)	Share of Total (%)
Asian Development Bank	300.0	127.5	427.5	80%
Government of Punjab	75.0	30.2	105.2	20%
Total	375.0	157.7	532.7	100%

70. The following table provides a detail per city of the proposed investment. Costs of capacity development and institutional strengthening is included in the cost of soft components.

Table 11: PICIIP 2 cost detail per city

City	BAHAWALPUR		MUZAFFARGARH		RAHIM YAR KHAN		SARGODHA	
	Total	Proposed as priority	Total	Proposed as priority	Total	Proposed as priority	Total	Proposed as priority
Infrastructure costs (MUSD)	71.8	41.6	76.4	42.3	70.8	59.7	114.9	74.4
Soft components costs (MUSD)	13.7	13.7	12.0	12.0	12.0	12.0	13.7	13.7
TOTAL (MUSD)	85.5	55.3	88.4	54.3	82.7	71.7	128.6	88.0

3.3.8. Implementation Arrangements

71. The PMU was established in October 2017 to oversee the implementation of PICIIP and is expected to also oversee the implementation of PICIIP2 when donors such as the ADB approve loans on the basis of this PFS. ADB role during implementation will mainly be to review and approve reports, disbursements and to follow project implementation. The key role of the PMU will be to support LG&CD, the Executing Agency (EA), in the implementation of the institutional support components of follow on loan projects leading to the procurement of civil works and consulting services contracts. The EA however has not yet established any City Implementation Units (CIUs) to manage and oversee the delivery of investments at the city level.

3.3.9. Environmental and Social safeguards

72. Households surveys have been conducted (1,310 surveys over the 4 cities, resulting in a 95% statistical accuracy) in order to get a better understanding of conditions and needs.

73. A preliminary environmental screening of projects was done and highlighted that no major impact is expected. In this respect, the PICIIP2 is likely to be categorized as class B. This will have to be confirmed depending on actual final projects retained and on a more detailed analysis.

74. Similarly, resettlement / social screening was conducted for main sites (especially landfills). No major issue as been identified so far. However, some attention shall be paid on Sargodha site as some complaints from nearby residents may appear.

3.4. Project Benefits, Impacts, Assumptions and Risks

3.4.1. Major Benefits and Impacts

75. PICIIP2 is expected to offer the following benefits: (i) improved urban resilience by improving city planning, services delivery, improved organization/motivation/capacities of institutions, (ii) improved capacities and institutional and managerial rigor at district and city levels, (iii) better urban services management with upgraded assets and population coverage, (iv) a specific focus on improving essential municipal services to the poor and in poorer areas, (v) improvement of environmental conditions, public health and city livability, (vi) improvement of financial management and tariff reforms as a means for partial cost recovery.

76. Considering that improved water supply and solid waste projects will the needs of the entire city, up to 2.3 million people will benefit from improvements proposed by PICIIP2. When preparing the PFS, the team prioritized service delivery to low income areas in each city.

3.4.2. Financial and Economic Analysis

77. Financial Management Assessment (FMA) has been conducted for each city. All the subprojects in all the cities were classified as non-revenue generating thus, only a sustainability analysis was conducted. The financial sustainability analysis evaluates the capacity of the project owners to provide funds to maintain the new facilities to be constructed

under the project to ensure that the full project benefits will accrue to the economy in general and the residents in particular.

78. The FMAs for the four PICIIP2 cities were prepared in accordance with the ADB's Technical Guidance Note for Financial Management. The FMA also considered the capacity of the LGCD as the Executing Agency (EA).

79. A minimum of three years financial statements was requested from each MC to analyze their historical performance. However, only two years statements were actually provided for the analysis. This is because of the shift from a TMA to an MC structure in 2016. In general, the results of the assessments reveal the following:

- ▶ The MCs are heavily dependent on financial subsidies from the GoPb. Annual subsidies range from 34 percent in year 2016/17 for Bahawalpur to 94 for Muzaffargarh in 2016/17.
- ▶ Amongst the three infrastructure services examined for this Project, only water supply has tariffs. The tariffs however are still considered low and do not allow to cover for O&M costs.
- ▶ Solid waste is considered a part of the municipal services offering and therefore no direct fees are charged for garbage collection and/or disposal.

Table 12: Ratio for Revenues and Expenditures in the 4 cities

Particulars	Bahawalpur		Sargodha		Muzaffargarh		Rahim Yar Khan	
	2011/18	2016/17	2011/18	2016/17	2011/18	2016/17	2011/18	2016/17
Revenues								
Own source	57%	66%	39%	49%	10%	6%	39%	51%
Subsidies	43%	34%	61%	51%	90%	94%	61%	49%
Total Revenue	100%	100%	100%	100%	100%	100%	100%	100%
Expenditures								
Current Expenditures								
Establishment	49%	49%	69%	81%	58%	54%	38%	83%
Repairs	32%	42%	22%	13%	20%	36%	61%	22%
Development Expenditures	19%	9%	9%	6%	22%	19%	1%	1%
Total Exp.	100%	100%	100%	100%	100%	100%	100%	100%

80. It has been noticed that significant increases in own source revenues from year to year were due to the collection of delinquent accounts from previous years. Increases in expenditures was due to the payment by the city of arrears that could not be paid in previous years due to a lack of funds. Furthermore, the timing of revenue collections is also a factor in the expenditures. If revenues are received in the last quarter of the fiscal year, it is likely that most of the funds will be disbursed in the following year. However, since only two years of financial statements were provided, it cannot be ascertained whether or not this is the case.

81. In order to evaluate the financial capacity of each MC to undertake the operation and maintenance activities of the new project assets, the 2-year historical financial income and expenditure accounts provided by each MC were projected up to fiscal year 2039/40. The annual operating and maintenance cost estimated for each subproject in 2019 were projected to increase annually at the rate of inflation assumed at 7%. The results show that the 4 cities will not have sufficient financial capacity to operate and maintain properly the new infrastructures starting from the time that they become operational in 2025. The MC's will have increasing budgetary deficits throughout the 15-year evaluation period. The continuous budgetary shortfall means that the Punjab provincial government will have to provide substantial grants and subsidies annually to the 4 cities in order to ensure that the new assets will be sustainable. For fiscal year 2025/26, the total estimated subsidies to the MC's is about \$ 6.21 million increasing to about \$ 13.1 million in fiscal year 2039/40.

82. A financial analysis is presented in the core appendices and cities report. As a conclusion, if the situation remains as it is, the cities will not be able to pay for O&M of the new assets. In this respect and considering that resources for O&M are not provided by the provincial government, tariff increase shall be implemented to ensure sufficient money for sustainable O&M. Most of the inhabitants are ready to pay if the service is actually improved.

83. An affordability analysis was undertaken to assess whether the recommended future tariffs for water, sewerage and solid waste are affordable to residents (low income and average incomes). Minimum household income was assumed at the prevailing rate of PKR 550 per day and assumed to increase by about 7% every other year. The results of the affordability analysis show that the calculated future tariffs to recover the cost of operations and maintenance and depreciation in 2025 when the facilities become operational will be affordable for poor residents (earning minimum wage or less) of Bahawalpur but will not be affordable to poor residents in Muzaffargarh, Rahim Yar Khan and Sargodha. Based on social surveys implemented, these tariffs will be affordable for average income households in the four cities. Some specific measures for low income households should then be considered if tariff increase is retained.

84. An economic analysis is presented in the core appendices and cities report. As a conclusion, and considering base costs, all projects are economically viable. In all cities (and especially in Muzaffargarh) the sensitivity analysis shows that such viability can be impacted and questioned in case of combined issues encountered during project implementation.

3.4.3. Major Risks and Mitigation Measures

85. The following risks have been identified and are presented together with potential mitigation measures.

Table 13: Risk Matrix

Risk	Description	Proposed mitigation
Political risk Moderate	i) Local government (LG) elections may take place in 2019-2020, depending on finalization of the anticipated reforms to the Punjab local government system. This may impact the decisions made by city leaders regarding PICIIP2 investments and/or affect its implementation schedule; (ii) The Pakistani government has announced plans to restructure the LG system in Punjab with a Tehsil Administration set-up. This restructuring may also impact implementation.	Strong coordination and collaboration between national, provincial and municipal stakeholders shall be held to ensure approval of each decision to reduce risk of future change.
Capacity / Institutional risk High	To ensure full and sustainable operation of future assets, institutional and organizational changes are absolutely required to be implemented prior to assets construction.	Institutional strengthening and capacity building roadmap has been proposed to limit such risk For new investments, such as Water Treatment Plants (WTP), Design-Build-Operate (DBO) conditions of contract will allow more direct accountability for the delivery of specific services.
Climate change risk Moderate	Climate change is expected to increase the occurrence of natural disasters in the region, including flooding, heat-waves and droughts. The increased frequency and intensity of extreme weather events has implications for human and ecological health, agricultural productivity, resource consumption, and the security of critical infrastructure and assets. Higher temperatures, population increases and extended dry periods are expected to increase the demand for water resources	Developing adaptation options and implementation of already agreed strategies and policies over the longer term will be critical to the success of cities in Punjab. This approach should also include cultural/behavioral changes.
Land ownership and social issues Moderate	For projects requiring large tracts of land (especially landfills) every city has confirmed that they have adequate sites available under public ownership. Any change in sites considered at this stage may jeopardize the planning and design of the component. The SWM component is most at risk, as the land requirements for such investments are significant.	The team obtained a written approval from the cities on land ownership.