ISLAMIC REPUBLIC OF PAKISTAN
WATER AND SANITATION AGENCY FAISALABAD (WASA-F)

ISLAMIC REPUBLIC OF PAKISTAN

THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

FINAL REPORT

VOLUME III SUPPORTING REPORT

FEBRUARY 2019

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NIHON SUIDO CONSULTANTS CO., LTD.
JAPAN TECHNO CO., LTD.
YOKOHAMA WATER CO., LTD.

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FINAL REPORT
ON
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE
MASTER PLAN OF FAISALABAD

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(In addition to the above reports, a Completion Report summarizing the results, outcomes, and recommendations obtained from the pilot activities of this Project will be prepared in May 2019 as a supplemental report.)

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(1) Location of Projects

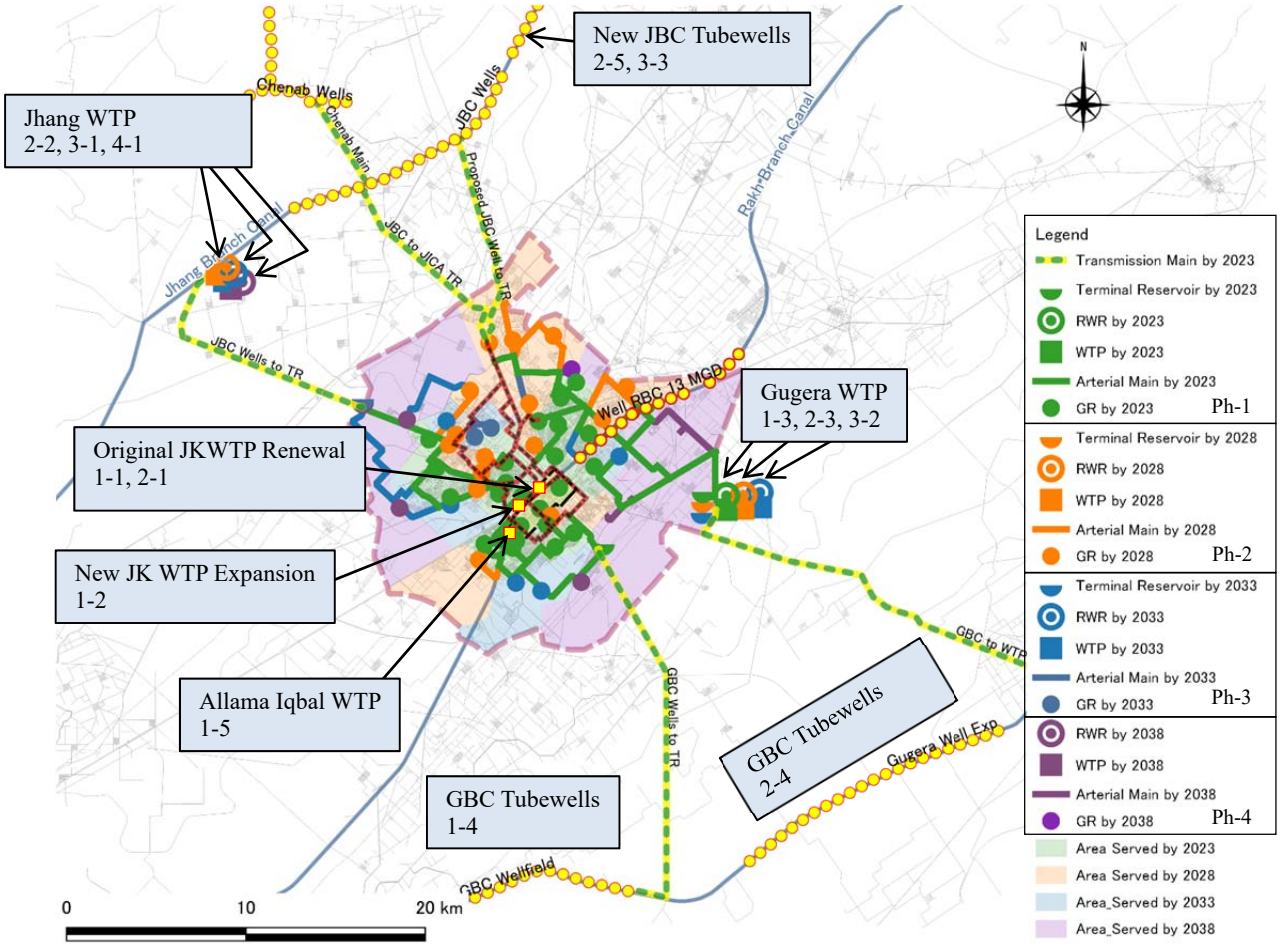
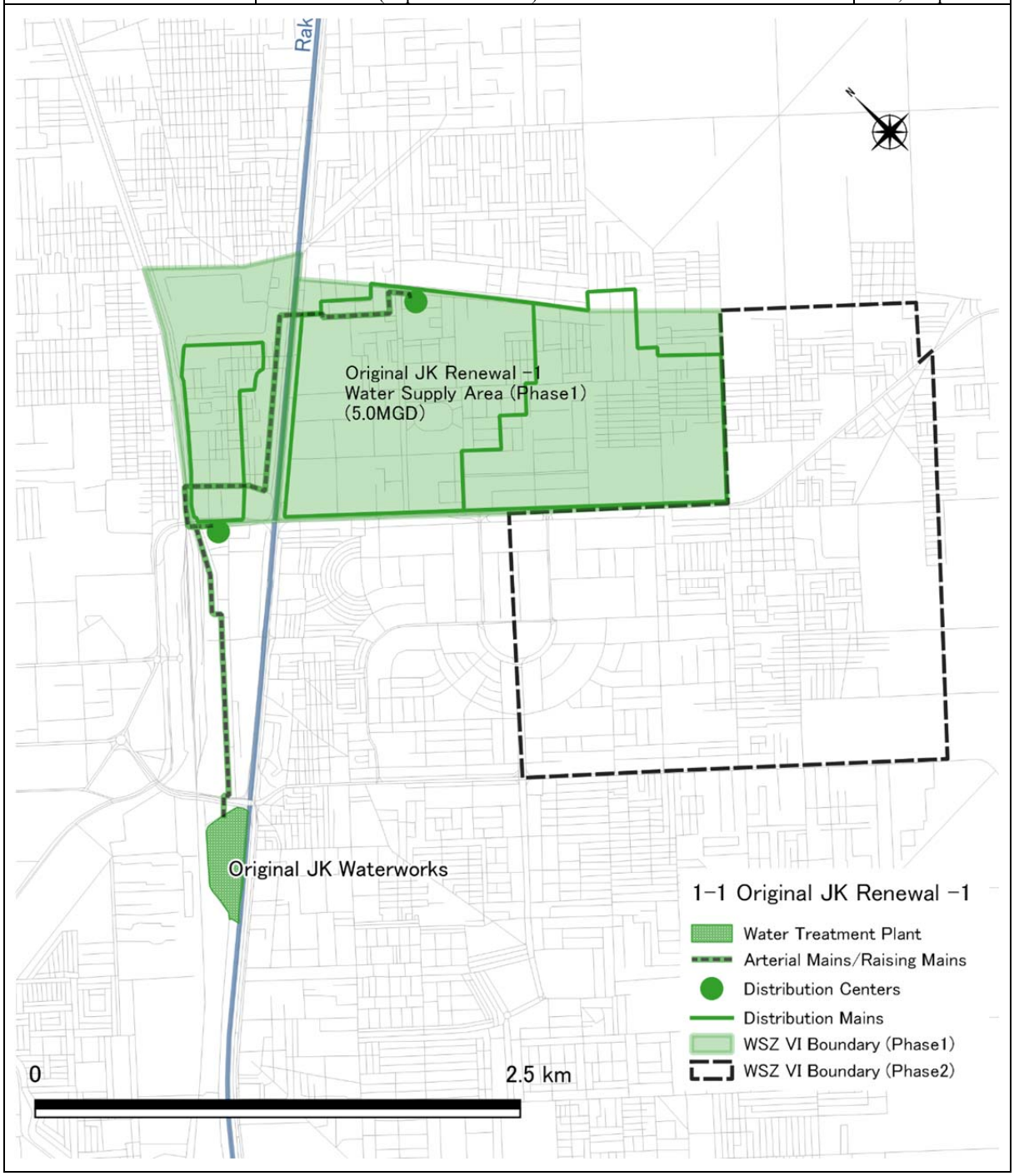


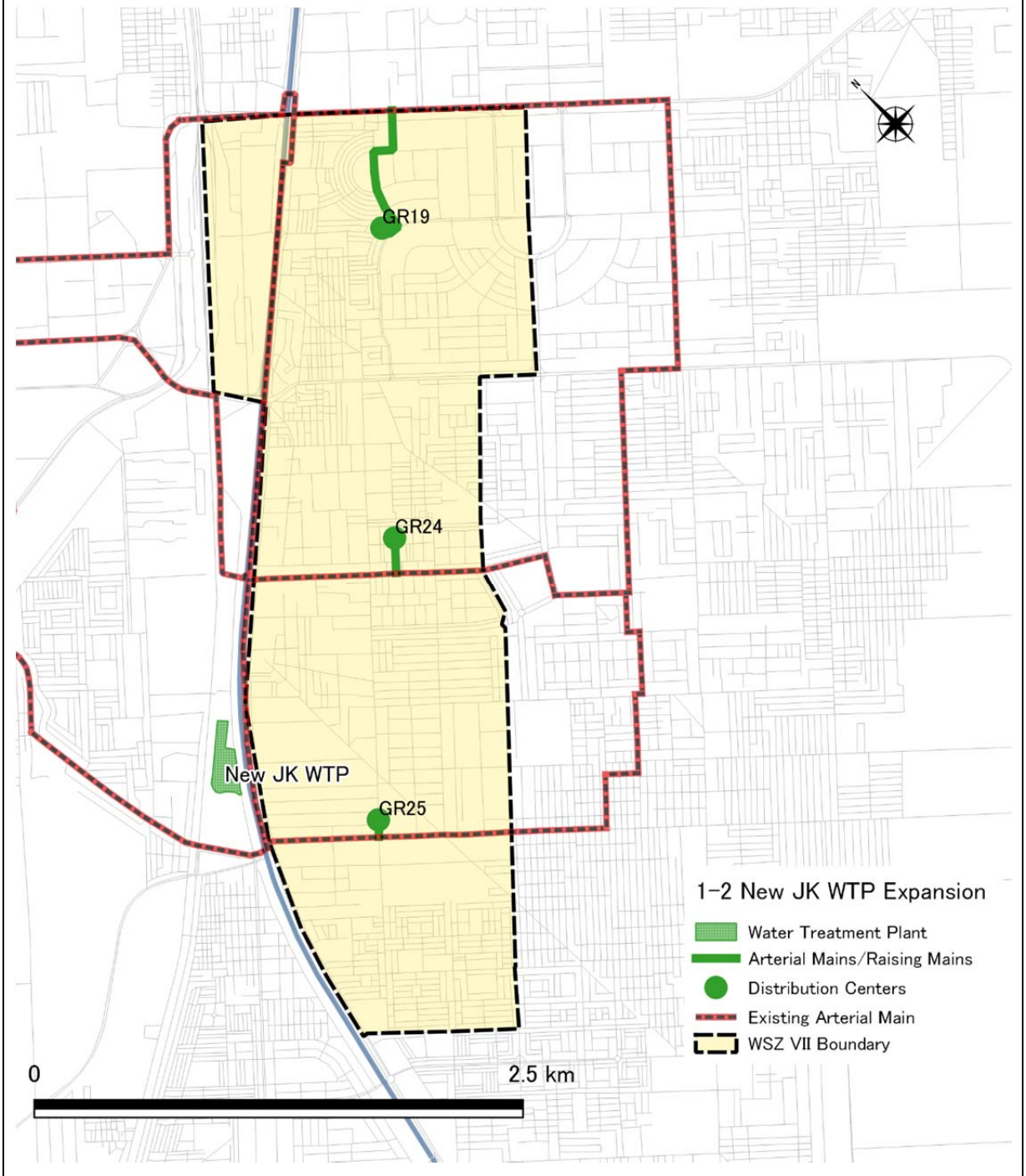
Figure: Locations of Projects

(2) Project Sheet

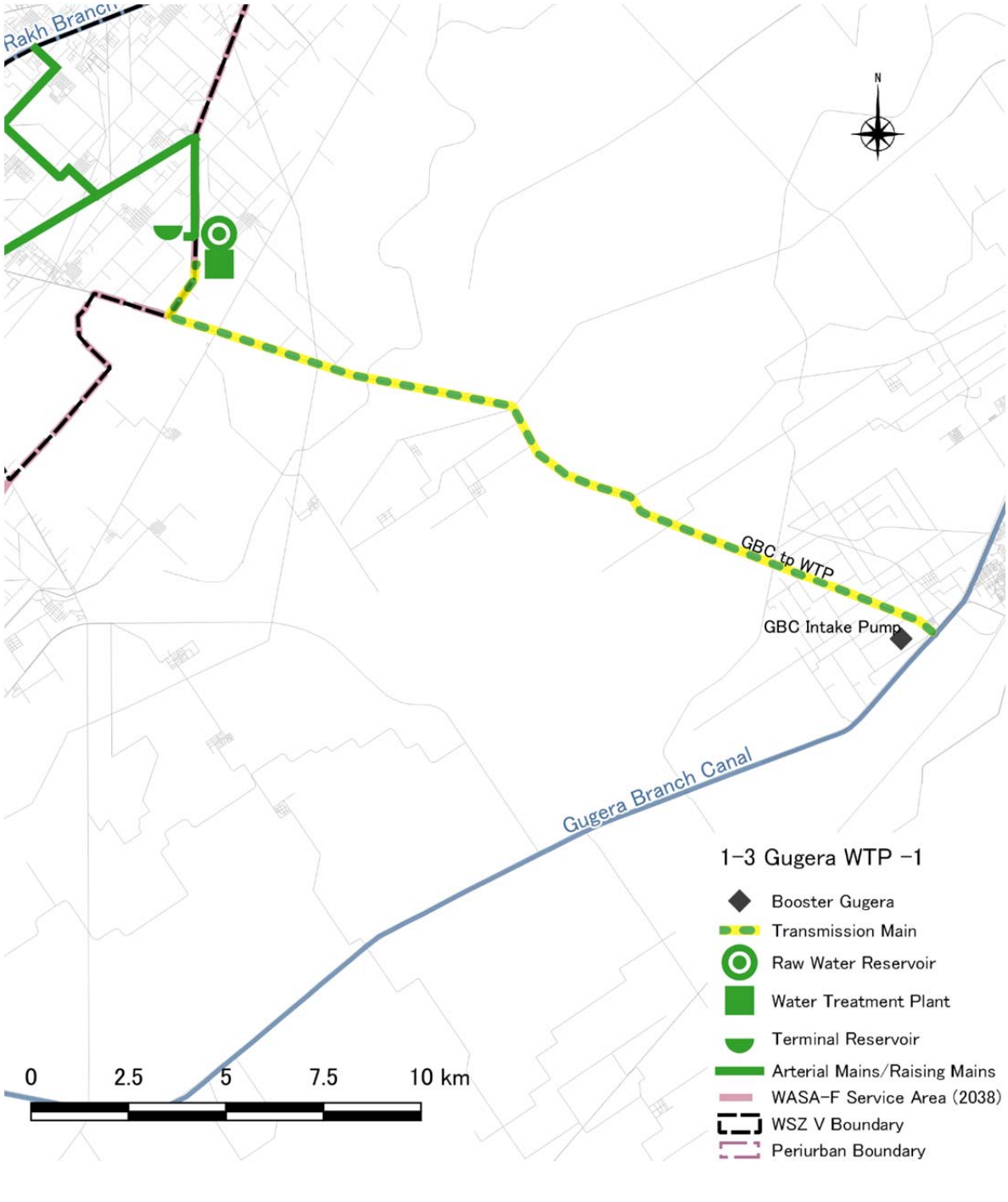
Project 1-1 Original JK WTP Renewal-1 and Water Distribution System		
■ WTP/Tubewells	Replacement of Slow sand filter to Rapid Sand Filter: 22,700 m^3 /day (5.0 MGD)	1,031 mil. PKR
■ Transmission	-	1,168 mil. PKR
■ Arterial Main	D400mm -D600mm: L=4.2 km	
■ Distribution Main	D300mm – D450: L=11.2 km	
■ TR	-	332 mil. PKR
■ DC	2 nos.	
■ Distribution Network	D75mm - D200mm: 53.5 km	174 mil. PKR
■ DMA meter	5 sets	
■ **Construction Cost**	**Total**	**2,705 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	71,200 persons



Project 1-2 New JK WTP Expansion and Water Distribution System			
■	WTP/Tubewells	New JK WTP /AFD Project: 22,700 m^3 /day (5.0 MGD)	961 mil.PKR
■	Transmission	-	1,111 mil. PKR
■	Arterial Main	D450mm -D500mm: L=1.0 km	
■	Distribution Main	D250mm -D500mm: L=16.4 km	
■	TR	-	311 mil. PKR
■	DC	3 nos.	
■	Distribution Network	D75mm -D200mm: L=53.5 km	163 mil. PKR
■	DMA meter	5 sets	
■	**Construction Cost**	**Total**	**2,546 mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	71,200 persons

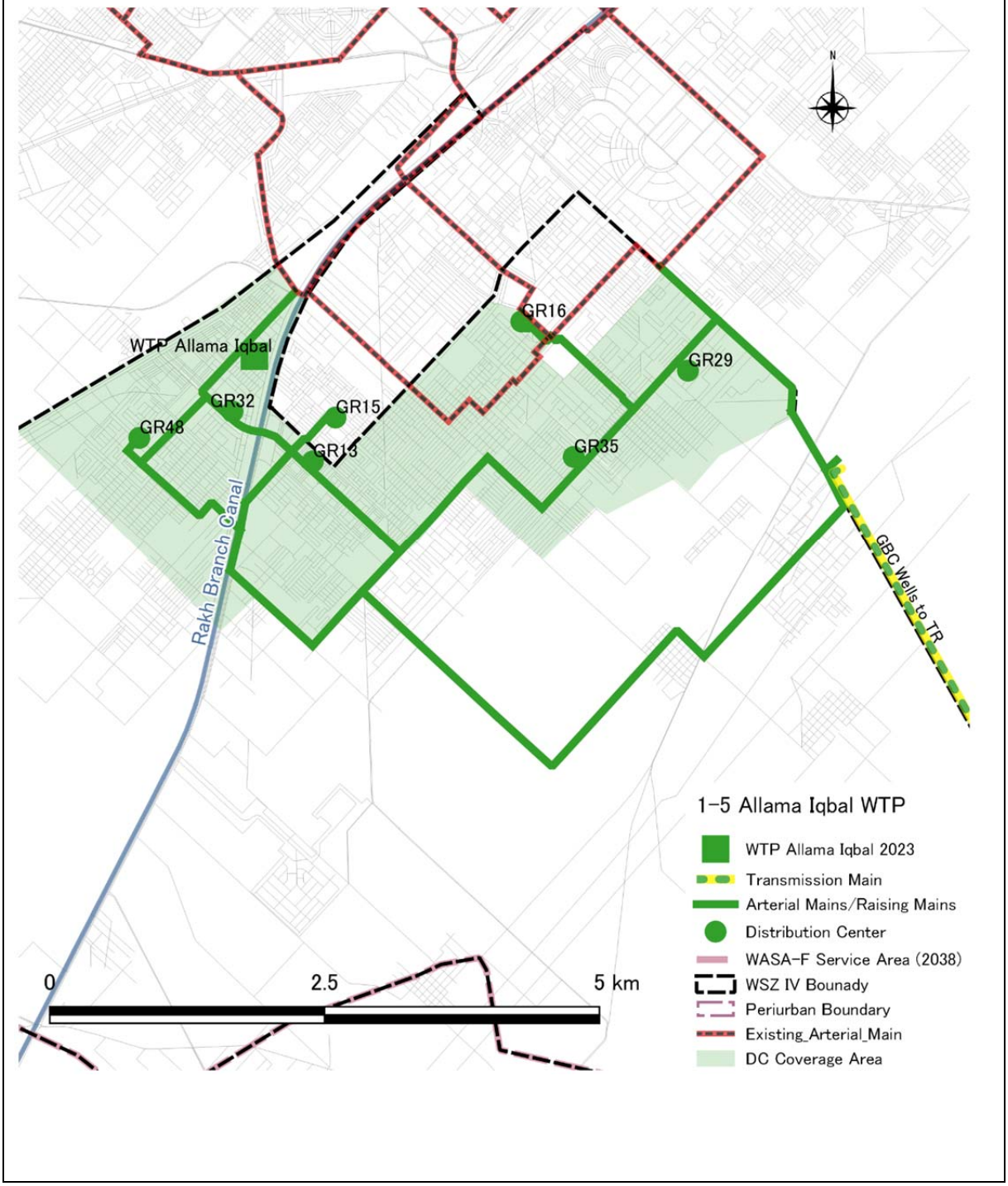


Project 1-3 Gugera WTP-1 and Water Distribution System			
■	WTP/Tubewells	Gugera WTP New construction: 113,700 m^3/day (25.0 MGD)	4,979 mil. PKR
■	Transmission	D1000mm – D1200mm: L=24.0 km	8,907 mil. PKR
■	Arterial Main	D600mm – D1000mm: L=20.8 km	
■	Distribution Main	D250mm – D500mm: L=82.0 km	
■	TR	1 no.	3,110 mil. PKR
■	DC	-	
■	Distribution Network	D75mm – D200mm: L=267.6 km	850 mil. PKR
■	DMA meter	27 sets	
■	**Construction Cost**	**Total**	**17,846 mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	356,700 persons

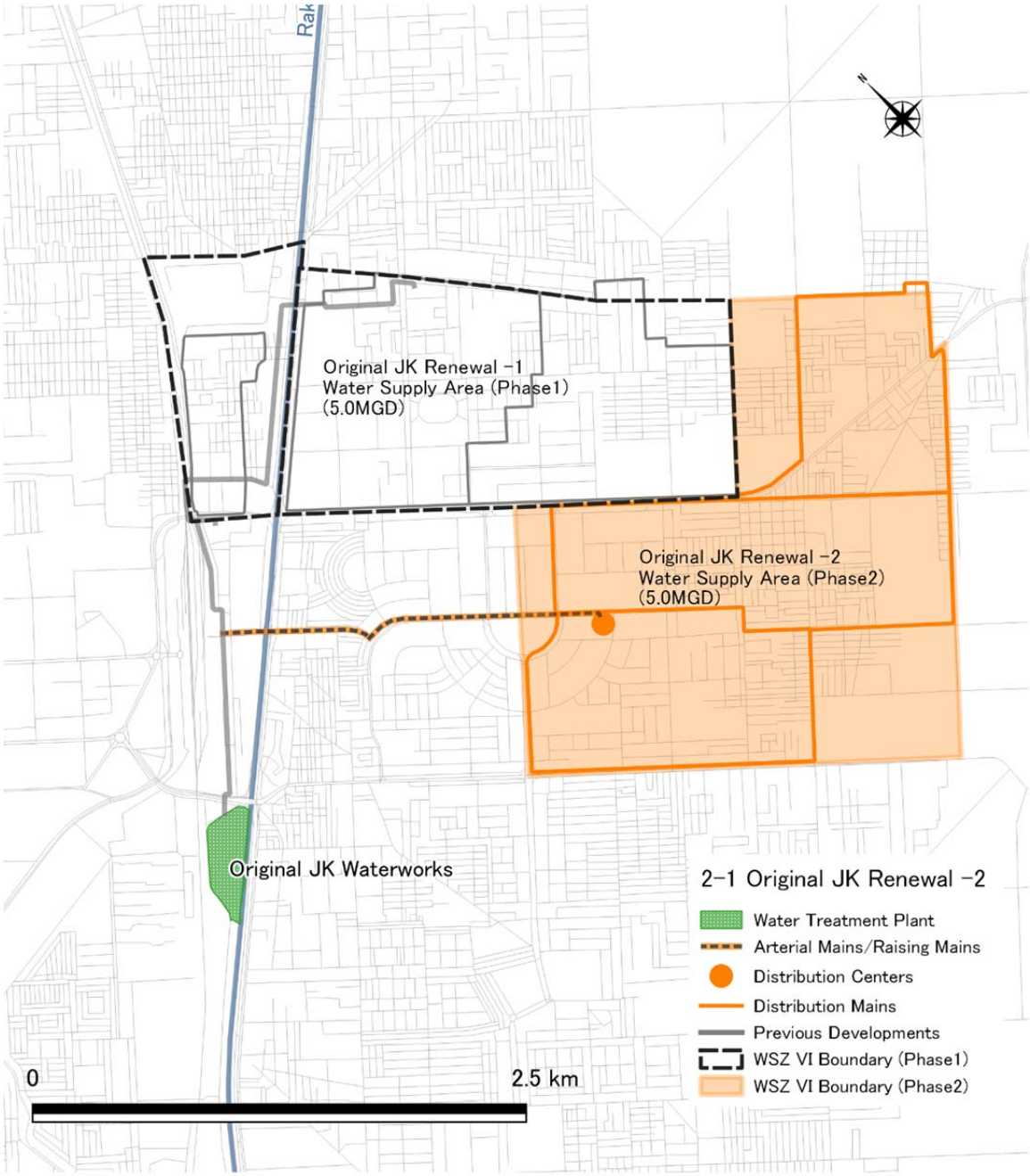


Project 1-4 GBC Tubewells-1 and Distribution System			
■	WTP/Tubewells	GBC New Tubewells: 22,700 m^3/day (5.0 MGD)	205 mil. PKR
■	Transmission	D800mm – D1000mm: L=30.0 km	3,804 mil. PKR
■	Arterial Main	D500mm – D1400mm: L=25.7 km	
■	Distribution Main	D250mm – D500mm: L=16.4 km	
■	TR	1 no.	472 mil. PKR
■	DC	7 nos.	
■	Distribution Network	D75mm – D200: L=53.5 km	174 mil. PKR
■	DMA meter	5 sets	
■	**Construction Cost**	**Total**	**4,655 mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	71,200 persons

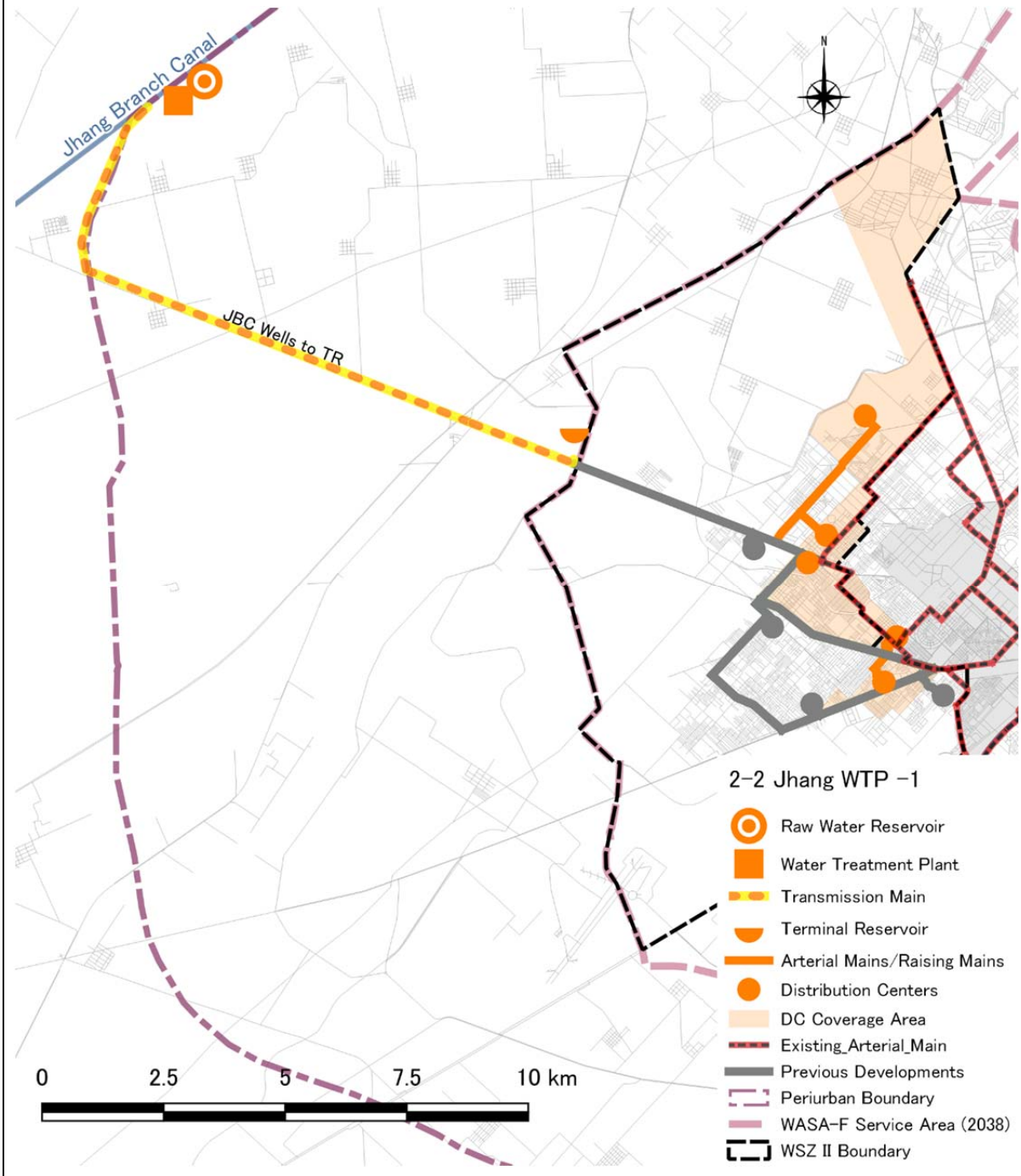
Project 1-5 Allama Iqbal WTP Water Distribution System			
■	WTP/Tubewells	Allama WTP New Construction: 6,800 m^3/day (1.5 MGD)	308mil. PKR
■	Transmission	-	351mil. PKR
■	Arterial Main	D500mm – D1400mm: L=3.4 km	
■	Distribution Main	D250mm – D500mm: L=4.9 km	
■	TR	-	111mil. PKR
■	DC	1 no.	
■	Distribution Network	D75mm – D200mm: L=16.1 km	51mil. PKR
■	DMA meter	2 sets	
■	**Construction Cost**	**Total**	**821mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	21,300 persons



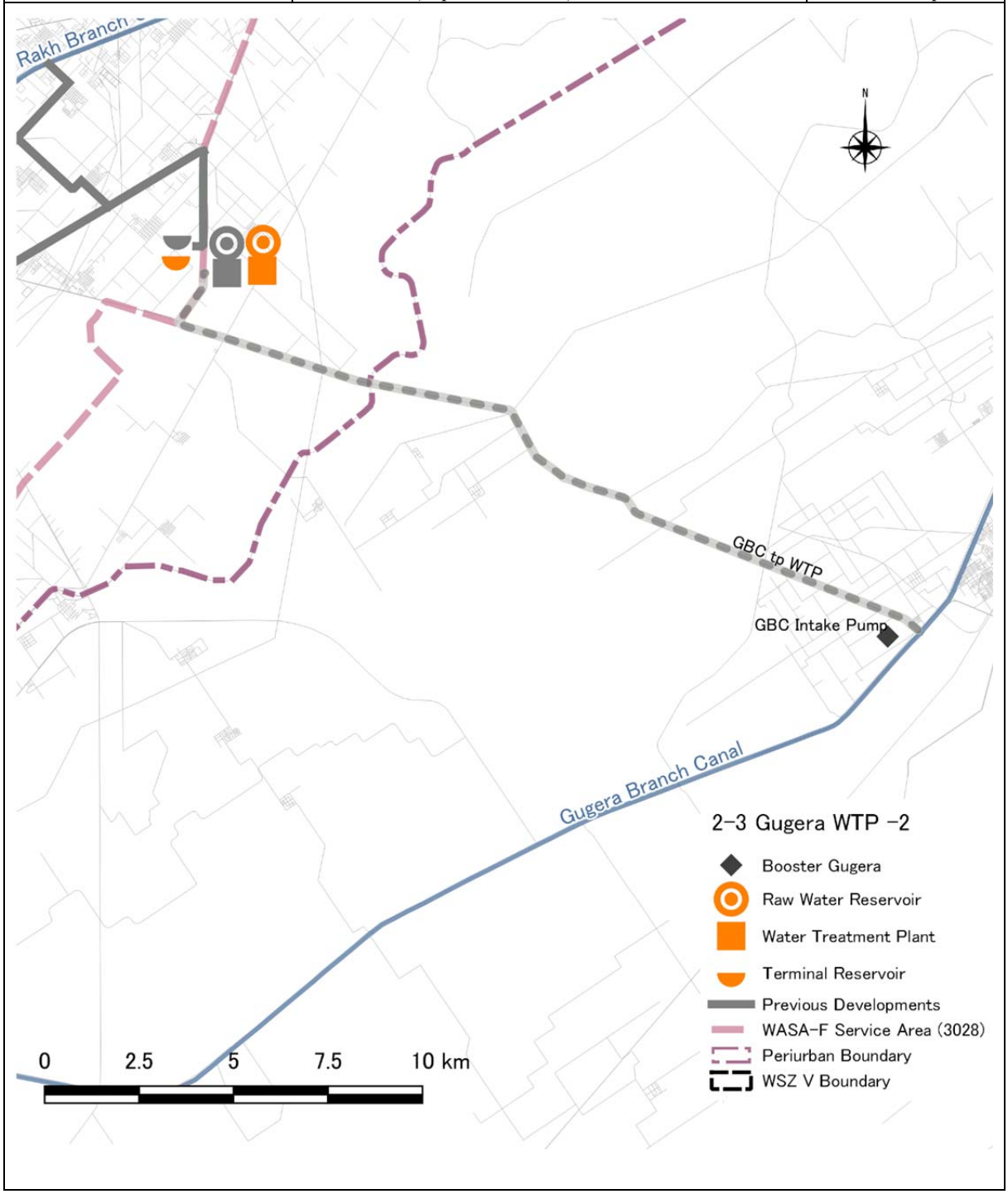
Project 2-1 Original JK WTP Renewal-2, Expansion and Distribution System			
■	WTP/Tubewells	Original JK WTP Expansion: 22,700 m^3/day (5.0 MGD)	1,139 mil. PKR
■	Transmission	-	607 mil. PKR
■	Arterial Main	D400mm – D450mm: L=2.0 km	
■	Distribution Main	D300mm – D500mm: L=8.7 km	
■	TR	-	122 mil. PKR
■	DC	1 no.	
■	Distribution Network	D75mm – D200: L=99.5 km	297 mil. PKR
■	DMA meter	6 sets	
■	**Construction Cost**	**Total**	**2,165 mil.PKR**
■	Effectiveness	Beneficiaries (Population Served)	56,400 persons



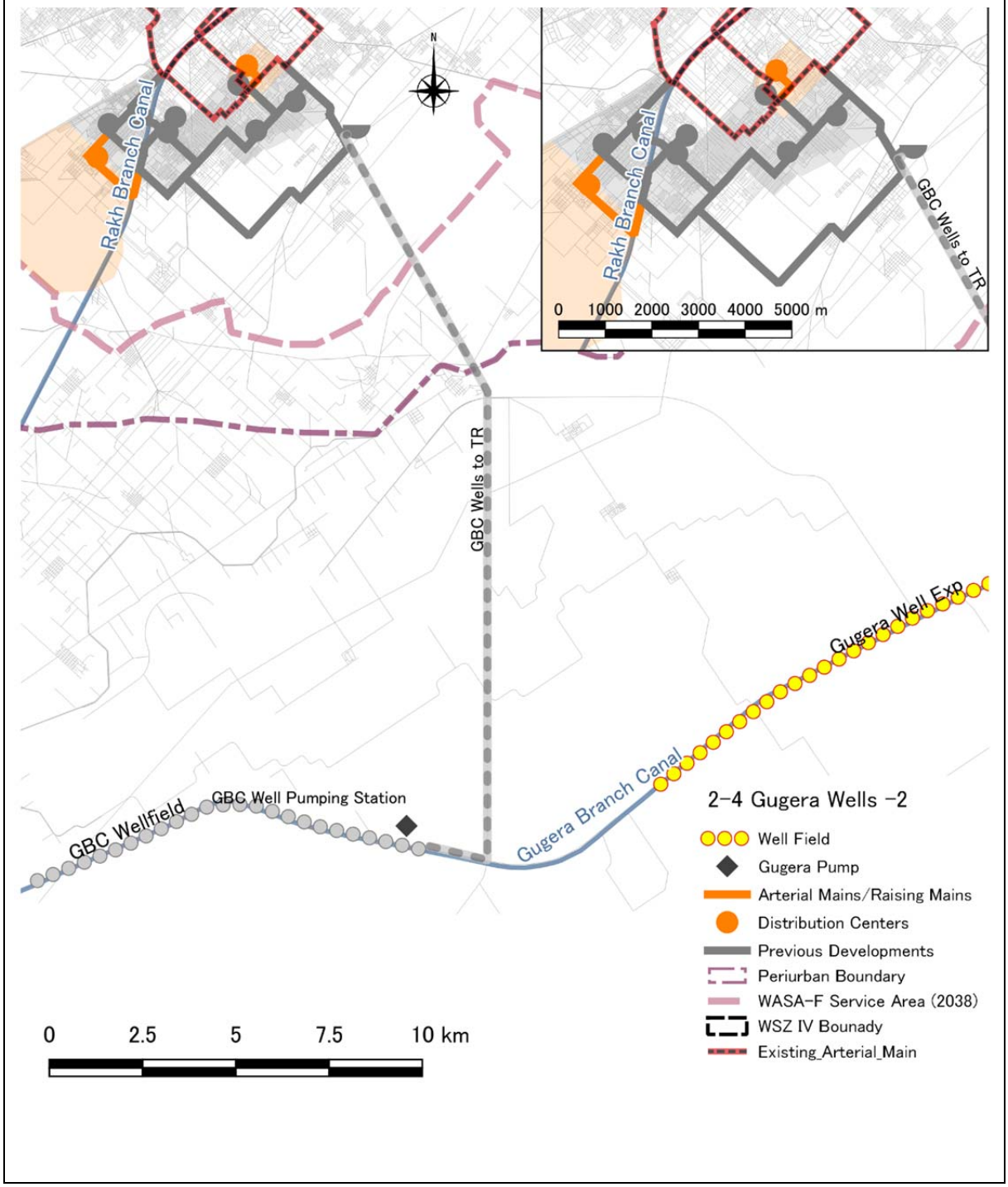
Project 2-2 Jhang WTP-1 and Water Distribution System			
■	WTP/Tubewells	Jhang WTP New Construction: 90,900 m^3/day (20.0 MGD)	4,642 mil. PKR
■	Transmission	D1200mm: L=12 km	4,505 mil. PKR
■	Arterial Main	D500mm – D800mm: L=5.9 km	
■	Distribution Main	D250mm – D500mm: L=83.2 km	
■	TR	-	1,466 mil. PKR
■	DC	5 nos.	
■	Distribution Network	D75mm – D200mm: L=398.2 km	1,227 mil. PKR
■	DMA meter	24 sets	
■	**Construction Cost**	**Total**	**11,840 mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	225,800 persons



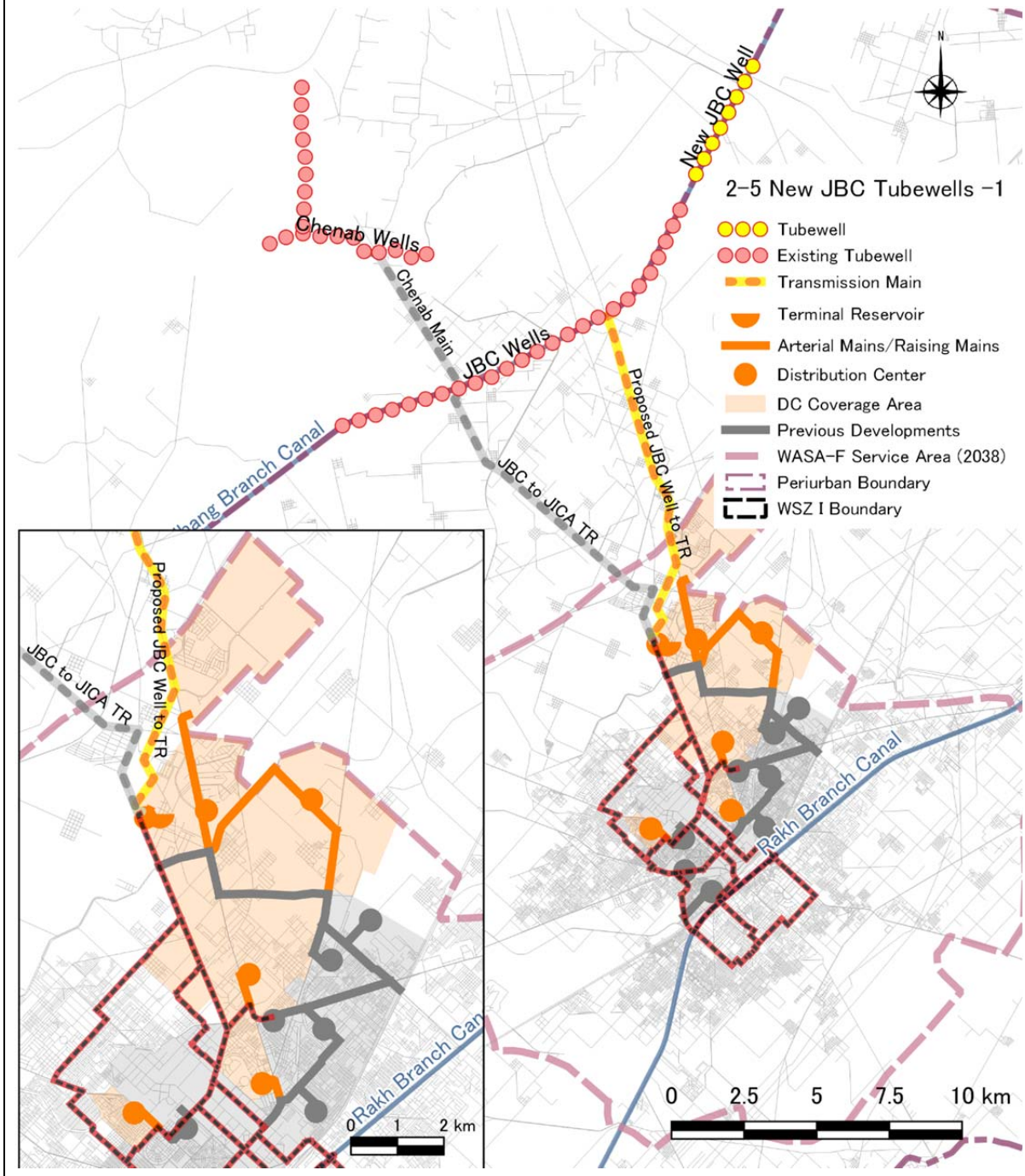
Project 2-3 Gugera WTP-2, Expansion and Distribution System		
■ WTP/Tubewells	Gugera WTP Extension: 113,700 m^3/day (25.0 MGD)	6,110 mil. PKR
■ Transmission	D1000mm – D1400mm: L=34.6 km	11,080 mil. PKR
■ Arterial Main	-	
■ Distribution Main	D250mm – D500mm: L=104.0 km	
■ TR	1 no.	2,577 mil. PKR
■ DC	1 no.	
■ Distribution Network	D75mm – D200mm: L=497.7 km	1,641 mil. PKR
■ DMA meter	30 sets	
■ **Construction Cost**	**Total**	21,408 mil. PKR
■ Effectiveness	Beneficiaries (Population Served)	282,400 persons



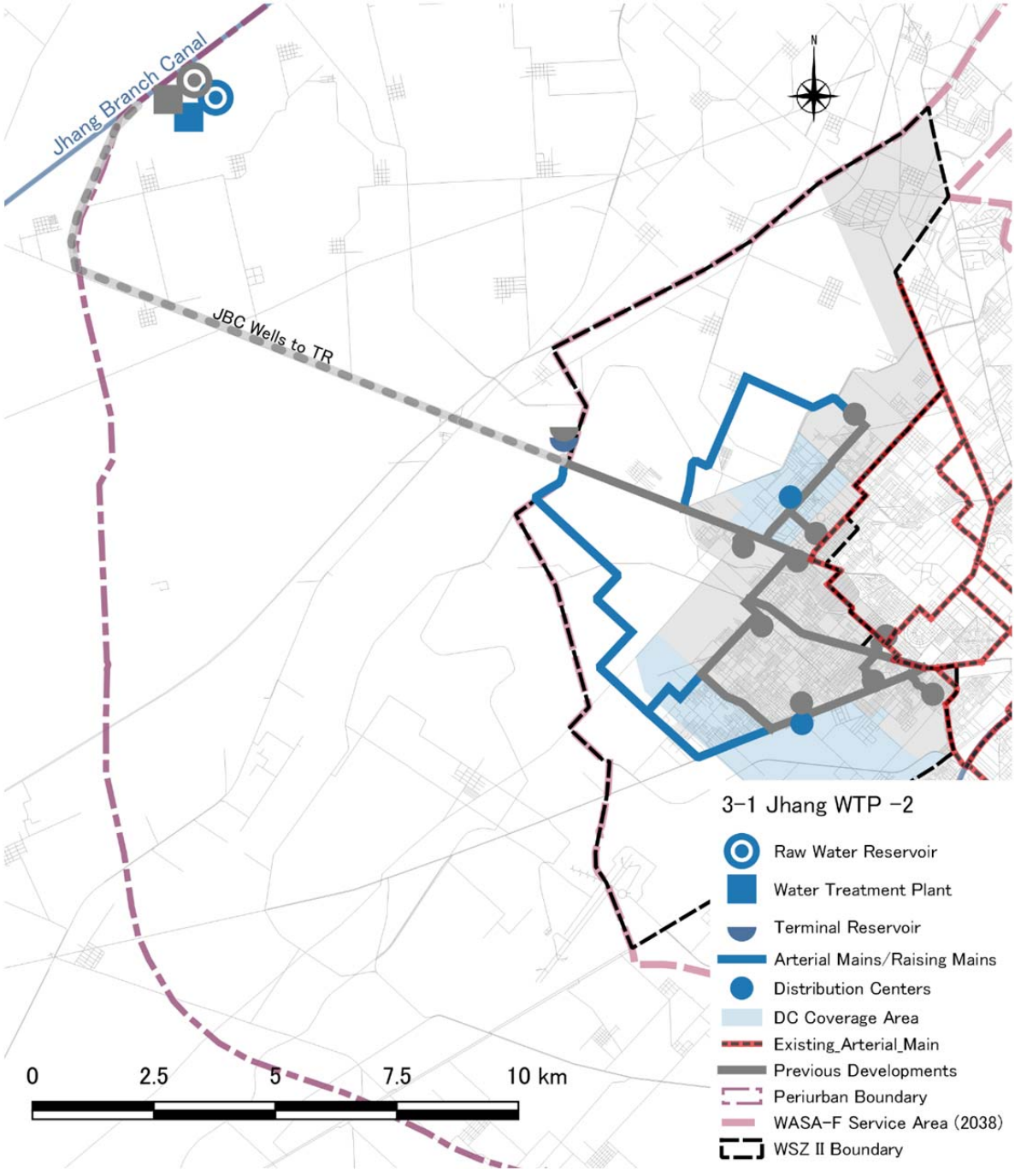
Project 2-4 GBC Tubewells-2 and Distribution System		
■ WTP/Tubewells	GBC Tubewells Expansion: 22,700 m^3/day (5.0 MGD)	239 mil. PKR
■ Transmission	-	637 mil. PKR
■ Arterial Main	D500mm – D600mm: L=4.4 km	
■ Distribution Main	D250mm – D500mm: L=20.8 km	
■ TR	-	129 mil. PKR
■ DC	2 nos.	
■ Distribution Network	D75mm – D200mm: L=99.5 km	328 mil. PKR
■ DMA meter	6 sets	
■ **Construction Cost**	**Total**	**1,333 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	56,400 persons



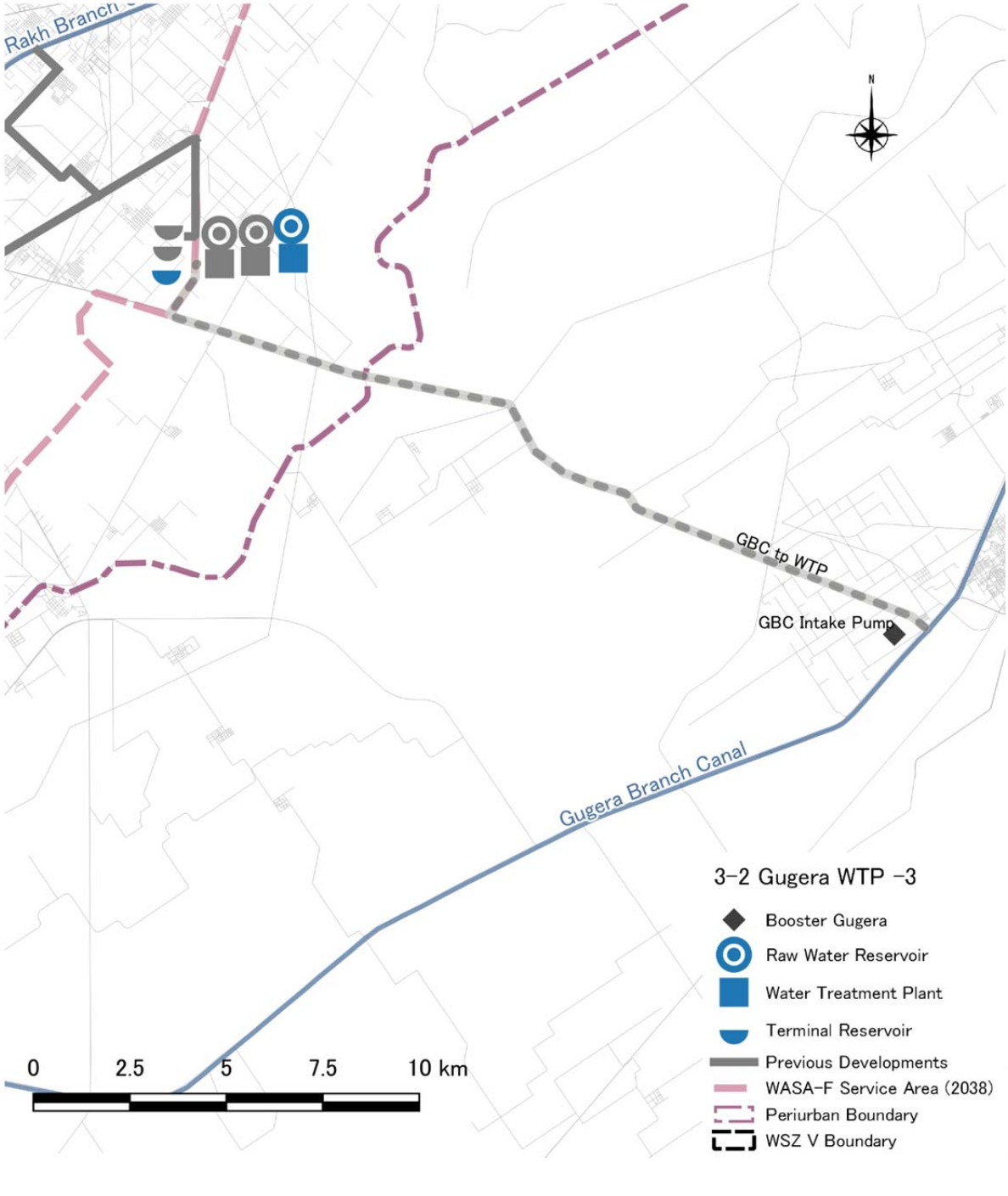
Project 2-5 New JBC Tubewells-1 and Distribution System		
■ WTP/Tubewells	JBC New Tubewells: 45,500 m^3/day (10.0 MGD)	477 mil. PKR
■ Transmission	D900mm: L=13.0 km	2,633 mil. PKR
■ Arterial Main	D500mm – D600mm: L=13.1 km	
■ Distribution Main	D250mm – D500mm: L=41.6 km	
■ TR	-	587 mil. PKR
■ DC	6 nos.	
■ Distribution Network	D75mm – D200mm: L=199.1 km	657 mil. PKR
■ DMA meter		
■ **Construction Cost**	**Total**	**4,354 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	113,000 persons



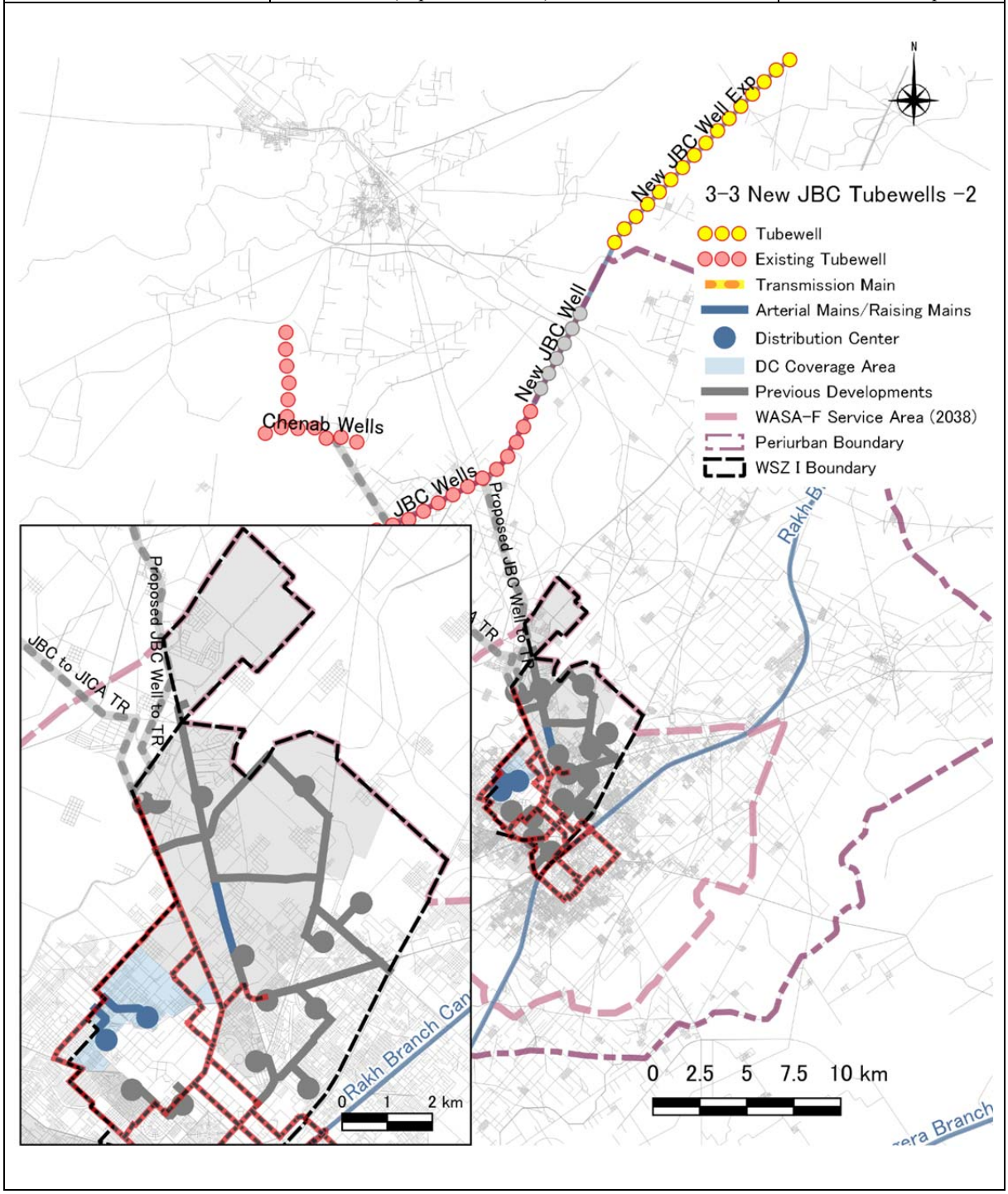
Project 3-1 Jhang WTP-2, Expansion and Distribution System			
■	WTP/Tubewells	Jhang WTP Extension: 90,900 m^3/day (20.0 MGD)	5,813 mil. PKR
■	Transmission	D1200mm: L=12.0 km	5,5563 mil. PKR
■	Arterial Main	D500mm – D1000mm: L=13.6 km	
■	Distribution Main	D250mm – D500mm: L=83.2 km	
■	TR	1 no.	2,157 mil. PKR
■	DC	2 nos.	
■	Distribution Network	D75mm – D200mm: L=422.5 km	1,634 mil. PKR
■	DMA meter	31 sets	
■	**Construction Cost**	**Total**	**15,160 mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	307,400 persons



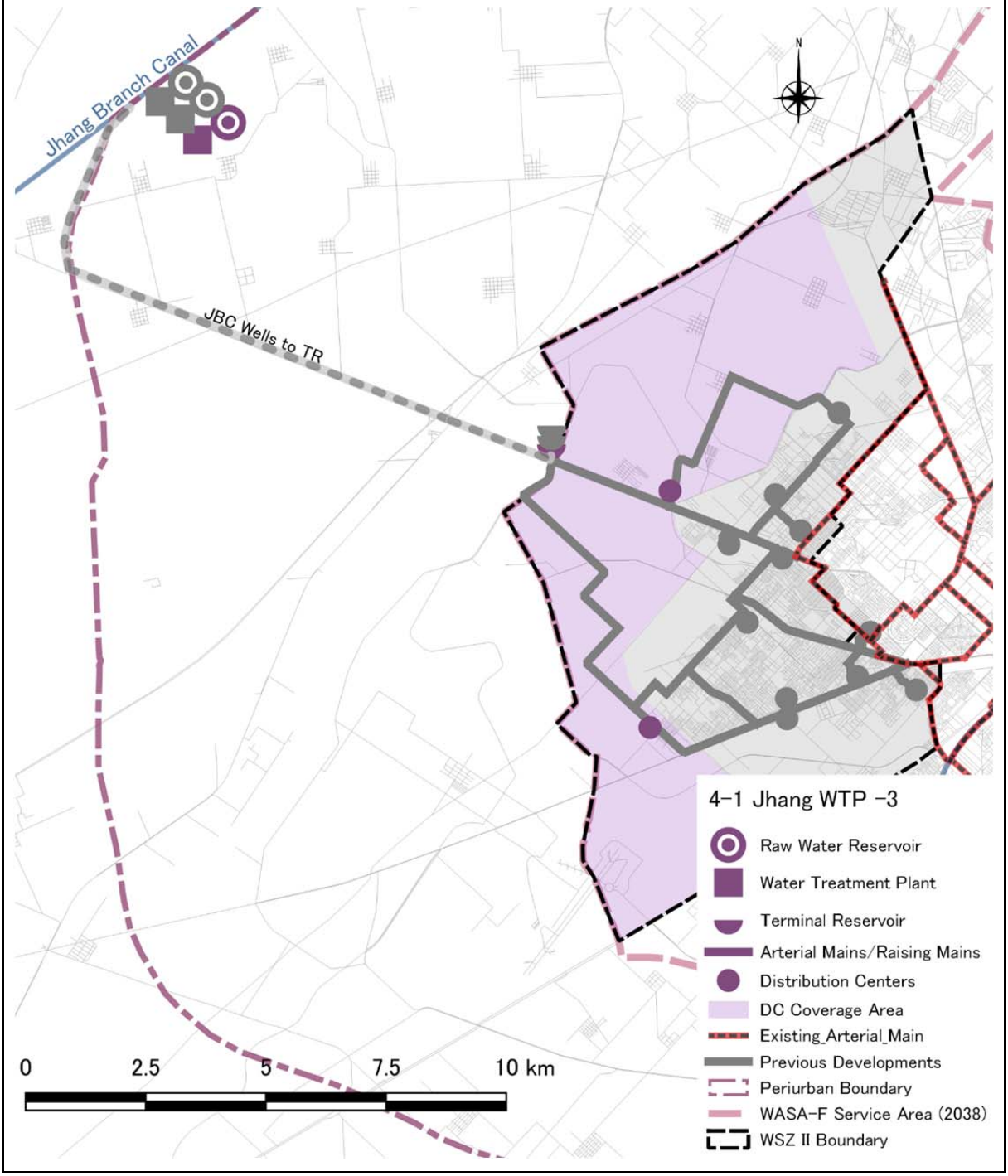
Project 3-2 Gugera WTP-3, Expansion and Distribution System			
■	WTP/Tubewells	Gugera WTP Extension: 113,700 m^3/day (25.0 MGD)	7,267 mil. PKR
■	Transmission	-	3,943 mil. PKR
■	Arterial Main	D500mm : L=0.1 km	
■	Distribution Main	D250mm – D500mm: L=104.0 km	
■	TR	-	454 mil. PKR
■	DC	-	
■	Distribution Network	D75mm – D200mm: L=528.1 km	2,038 mil. PKR
■	DMA meter	31 sets	
■	**Construction Cost**	**Total**	**13,702 mil. PKR**
■	Effectiveness	Beneficiaries (Population Served)	384,600 persons



Project 3-3 New JBC Tubewells-2 and Distribution System		
■ WTP/Tubewells	New JBC Tubewells Extension: 45,400 m^3/day (10.0 MGD)	559 mil. PKR
■ Transmission	-	1,579 mil. PKR
■ Arterial Main	D600mm : L=3.8 km	
■ Distribution Main	D250mm – D500mm: L=83.2 km	
■ TR	-	153 mil. PKR
■ DC	2 nos.	
■ Distribution Network	D75mm – D200mm: L=422.5 km	819 mil. PKR
■ DMA meter	16 sets	
■ **Construction Cost**	**Total**	**3,110 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	153,900 persons



Project 4-1 Jhang WTP-3, Expansion and Distribution System		
■ WTP/Tubewells	Jhang WTP Extension: 90,900 m^3/day (20.0 MGD)	6,956 mil. PKR
■ Transmission	-	3,374 mil .PKR
■ Arterial Main	D500mm : L=0.2 km	
■ Distribution Main	D250mm – D500mm: L=49.8 km	
■ TR	1 no.	2,479 mil. PKR
■ DC	2 nos.	
■ Distribution Network	D75mm – D200mm: L=512.5 km	2,288 mil. PKR
■ DMA meter	75 sets	
■ **Construction Cost**	**Total**	**15,09 7mil.PKR**
■ Effectiveness	Beneficiaries (Population Served)	750,600 persons



2. SEWERAGE AND DRAINAGE MASTER PLAN

(1) Location of Projects

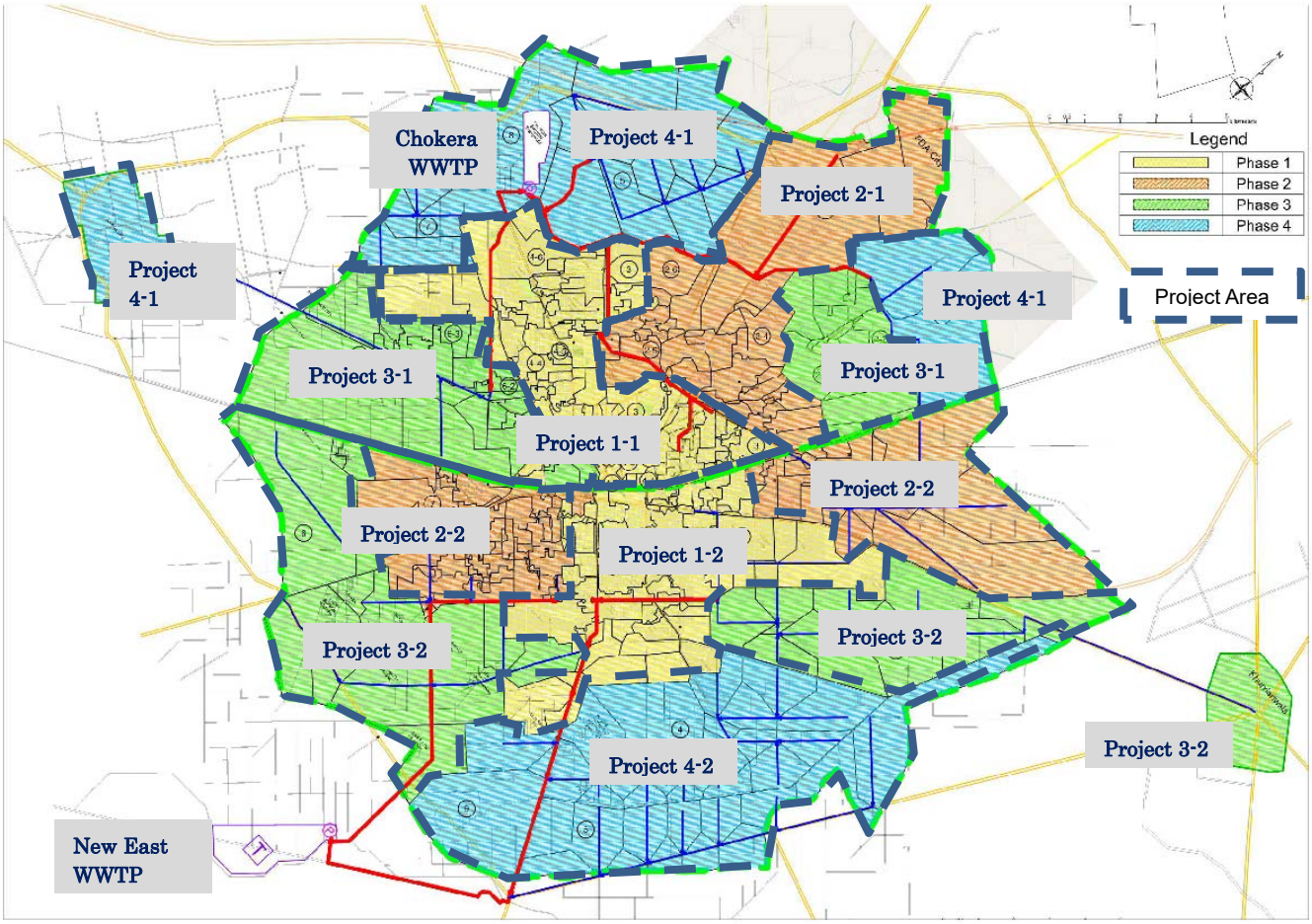
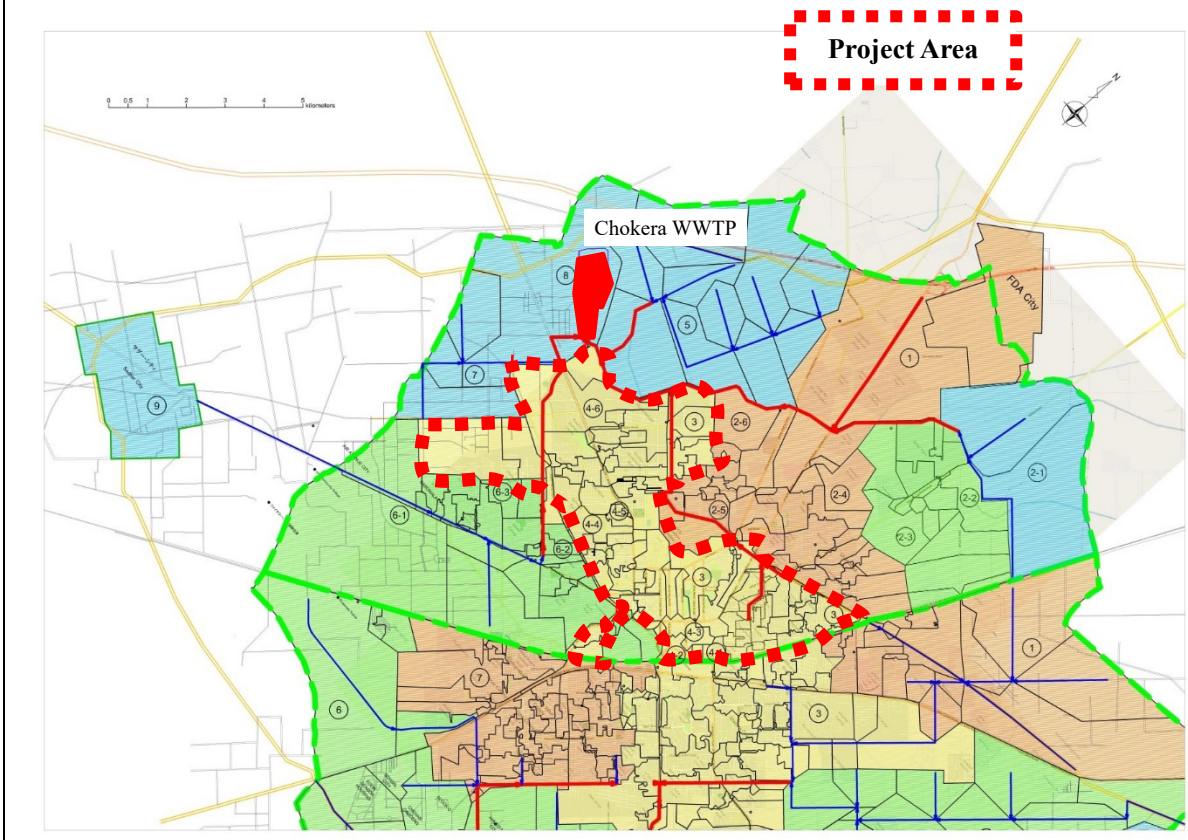


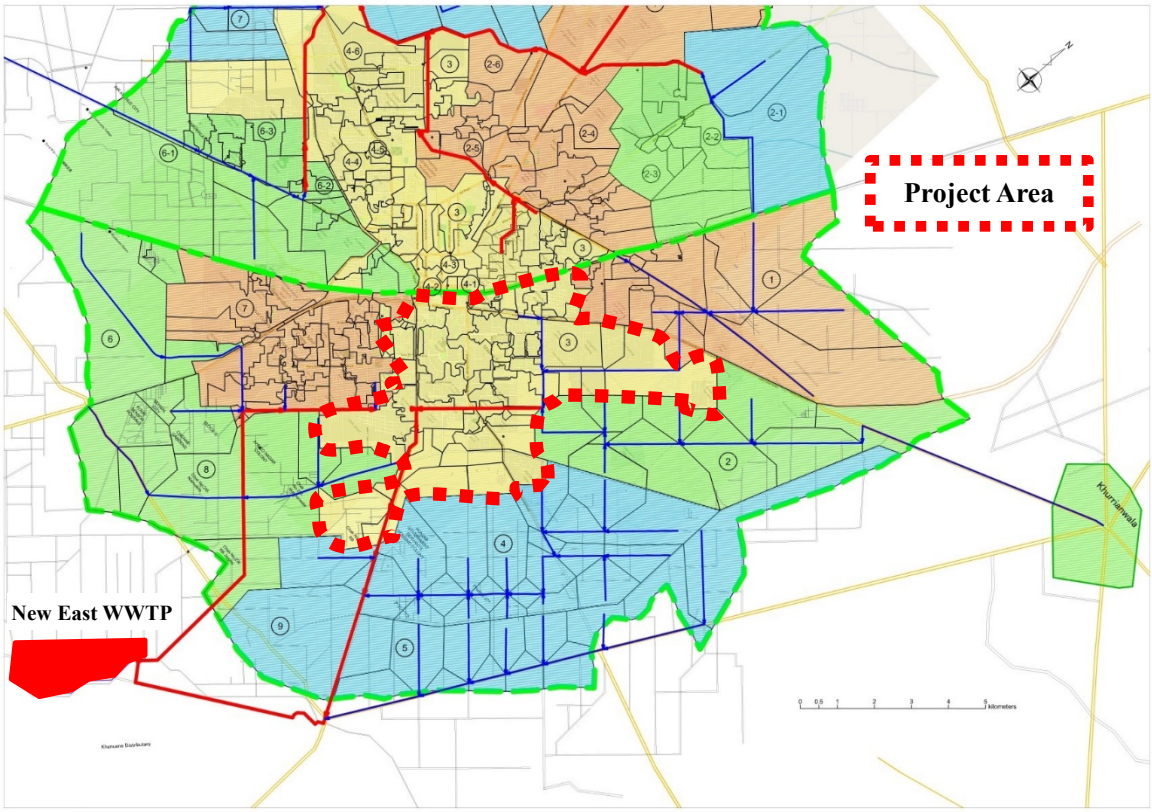
Figure: Locations of Projects

(2) Project Sheet

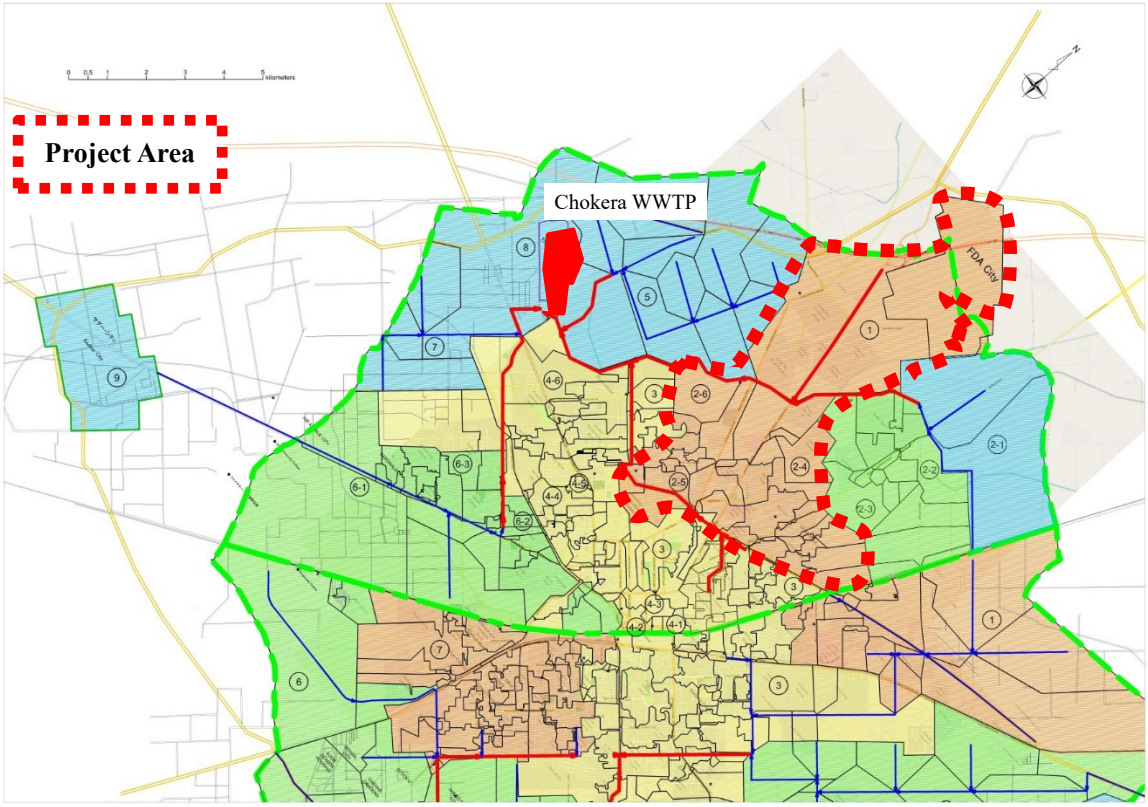
Project 1-1 West Sewerage District Facilities		
■ Sewer Replacement	D750mm – D1,650mm: L=11.4 km	1,701 mil. PKR
■ Interceptor	D450mm – D2,700mm: L=11.6 km	7,160 mil. PKR
■ Trunk Sewer	-	
■ Main Sewer	-	
■ Branch Sewer	D225mm: L=391.9 km	8,440 mil. PKR
■ Lifting Pump Station	5 nos.	3,752 mil. PKR
■ Influent Pump Station	Pumps for Chokera WWTP (Structural Works with 1/2 Capacity Pumps)	
■ WWTP (*Treatment method is an assumption)	Chokera WWTP ▪ 216,900 m^3/day ▪ UASB reactor, 1 Unit ▪ Facultative pond, 3 Units ▪ Sludge drying bed, 1 Unit	5,400 mil. PKR
■ Treated wastewater pump and transmission facilities	-	-
■ **Construction Cost**	**Total**	**26,543 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	719,700 persons



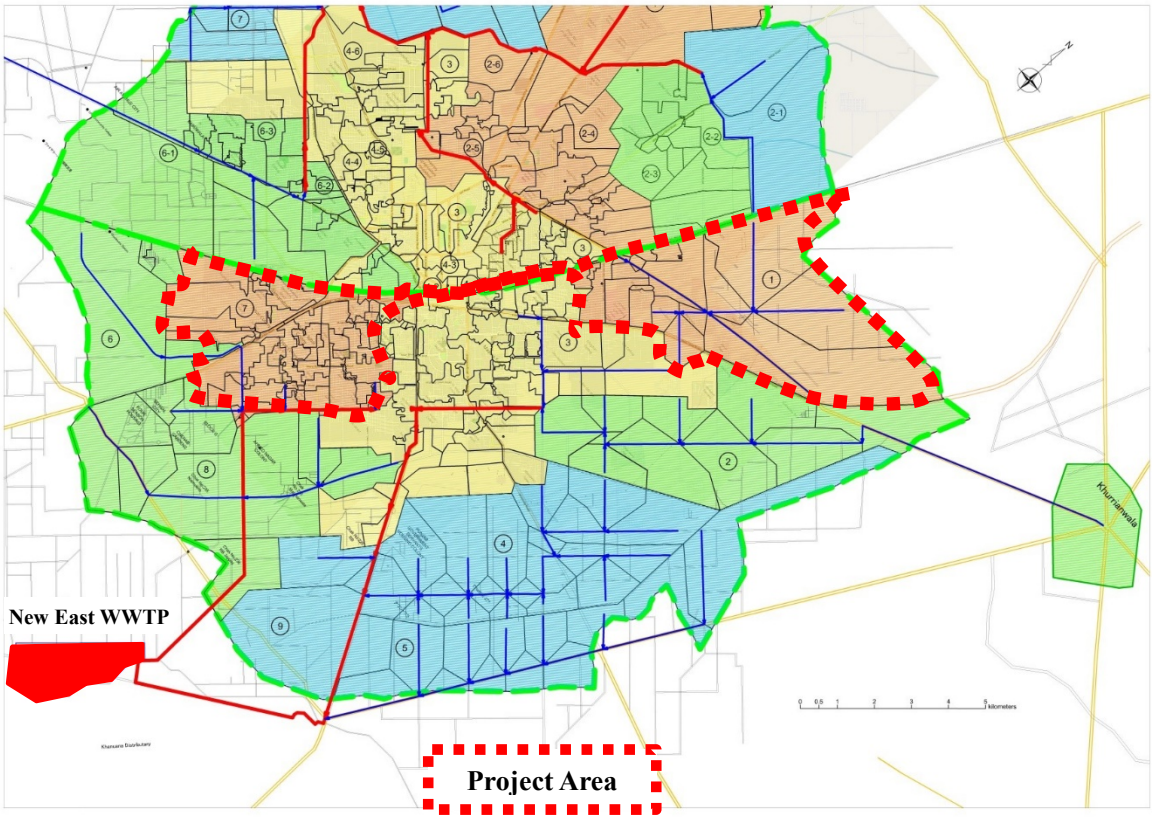
Project 1-2 East Sewerage District Facilities		
■ Sewer Replacement	D900mm – D1,350mm: L=4.1 km	110 mil. PKR
■ Interceptor	D2250mm: L=4.3 km	22,304 mil. PKR
■ Trunk Sewer	D1950mm – D2700mm: L=18.9 km	
■ Main Sewer	D300mm – D750mm: L=2.1 km	
■ Branch Sewer	D225mm: L=533 km	12,051 mil. PKR
■ Lifting Pump Station	2 nos.	3,387 mil. PKR
■ Influent Pump Station	Pumps for New East WWTP (Structural Works with 1/2 Capacity Pumps)	
■ WWTP (*Treatment method is an assumption)	New East WWTP	3,931 mil. PKR
	▪ 217,000 m^3/day	
	▪ Anaerobic Pond	
	▪ Faculative Pond	
	▪ Sludge drying bed	
■ Treated wastewater pump and transmission facilities	-	-
■ **Construction Cost**	**Total**	**41,783 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	616,200 persons



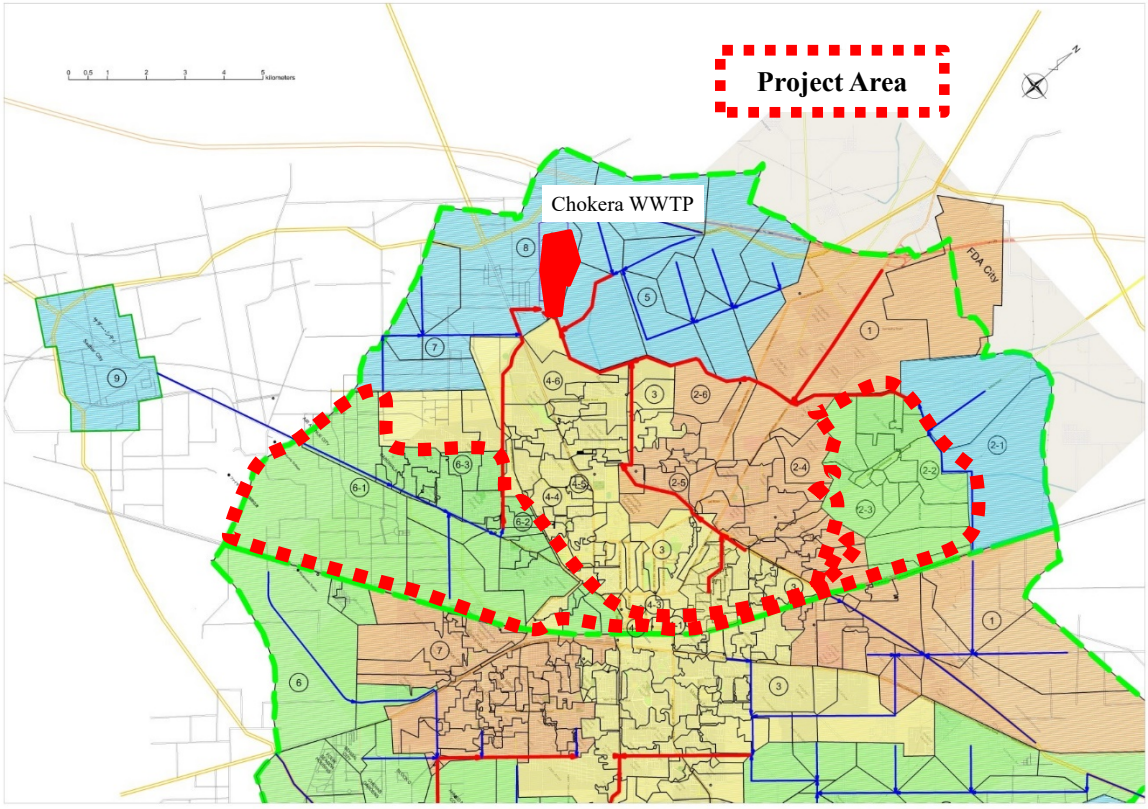
Project 2-1 West Sewerage District Facilities		
■ Sewer Replacement	-	-
■ Interceptor	D2250mm – D2400mm: L=4.7 km	5,092 mil. PKR
■ Trunk Sewer	D1500mm: 4.1 km	
■ Main Sewer	-	
■ Branch Sewer	D225: L=472.2 km	10,677 mil. PKR
■ Lifting Pump Station	1 no.	1,064 mil. PKR
■ Influent Pump Station	Pumps for Chokera WWTP (1/2 Capacity Pumps)	
■ WWTP (*Treatment method is an assumption)	Chokera WWTP	5,400 mil. PKR
	▪ 216,900 m^3/day	
	▪ UASB reactor, 1 Unit	
	▪ Faculatie Pond, 3 Units	
	▪ Sludge darying bed, 1 Unit	
■ Treated wastewater pump and transmission facilities	-	-
■ **Construction Cost**	**Total**	22,233 mil. PKR
■ Effectiveness	Beneficiaries (Population Served)	432,000 persons



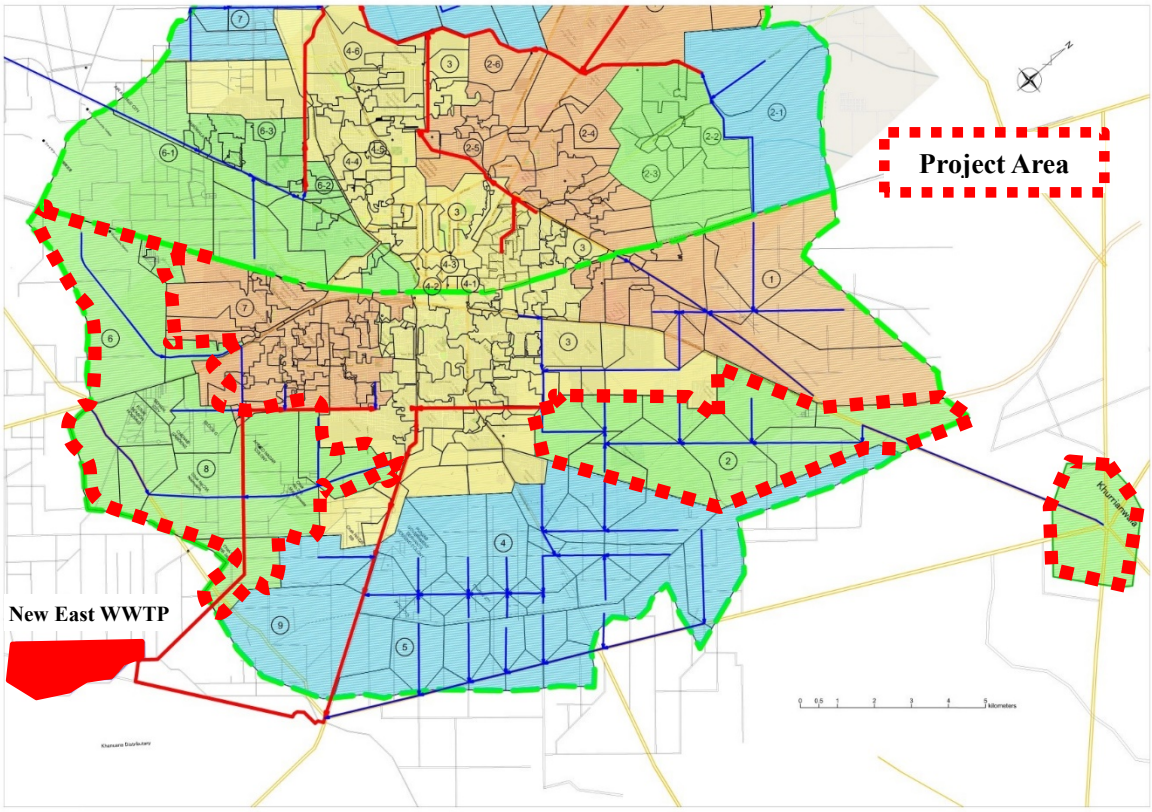
Project 2-2 East Sewerage District Facilities		
■ Sewer Replacement	D900mm – D1050mm: L=0.7 km	748 mil. PKR
■ Interceptor	D1350mm – D1650mm: L=3.6 km	15,514 mil. PKR
■ Trunk Sewer	D1050mm – D2250mm: L=14.4 km	
■ Main Sewer	D600mm – D1350mm: L=12.3 km	
■ Branch Sewer	D225mm: L=526 km	11,903 mil. PKR
■ Lifting Pump Station	1 no.	917 mil. PKR
■ Influent Pump Station	Pumps for New East WWTP (1/2 Capacity Pumps)	
■ WWTP (*Treatment method is an assumption)	New East WWTP	3,931 mil. PKR
	▪ 217,000 m^3/day	
	▪ Anaerobic Pond, 2 Units Parallel	
	▪ Faculative Pond, 3 Units	
■ Treated wastewater pump and transmission facilities	-	-
■ **Construction Cost**	**Total**	**33,013 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	654,000 persons



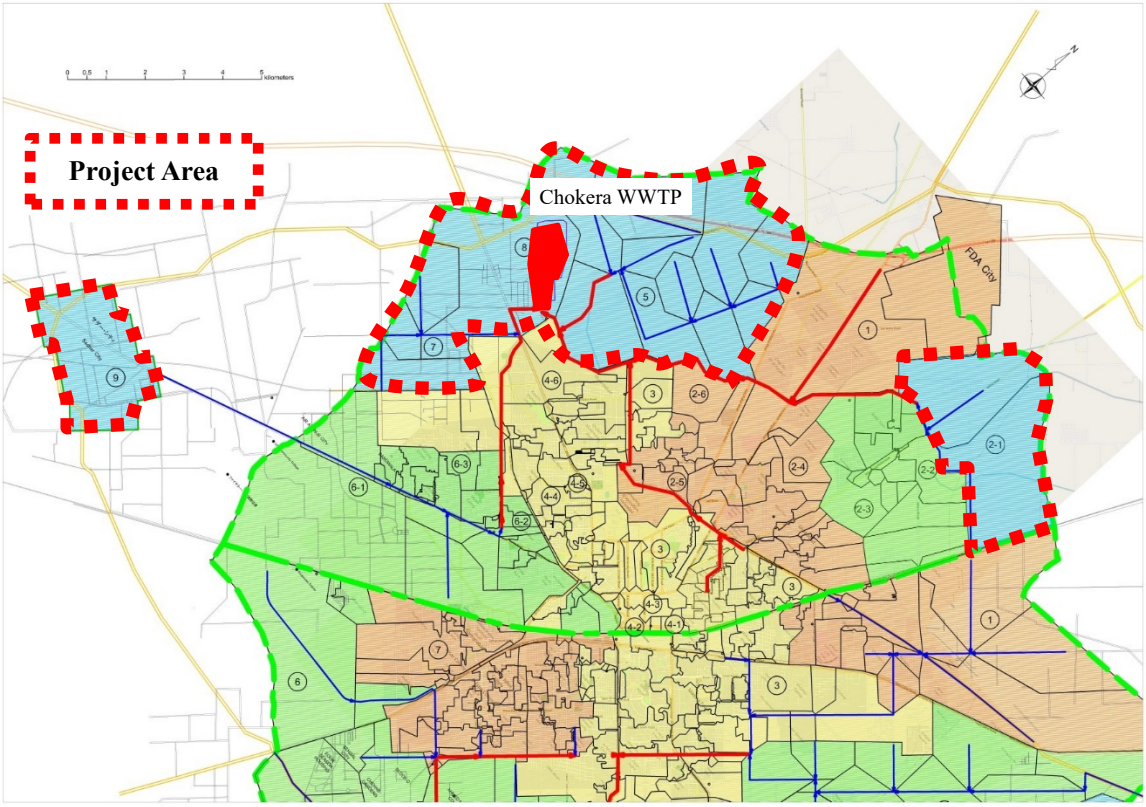
Project 3-1 West Sewerage District Facilities		
■ Sewer Replacement	-	523 mil. PKR
■ Interceptor	D1050mm – D1950mm: L=10.1 km	8,622 mil. PKR
■ Trunk Sewer	D1050mm – D1500mm: 3.3 km	
■ Main Sewer	D525mm: 2.2 km	
■ Branch Sewer	D225mm: L=480.0 km	10,854 mil. PKR
■ Lifting Pump Station	-	-
■ Influent Pump Statuion	-	-
■ WWTP	-	-
■ Treated wastewater pump and transmission facilities	Pumps (1/2 Capacity) Force Main D1500mm: L=14.6km Surge Tank 1 unit	10,091 mil. PKR
■ **Construction Cost**	**Total**	**30,090 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	485,100 persons



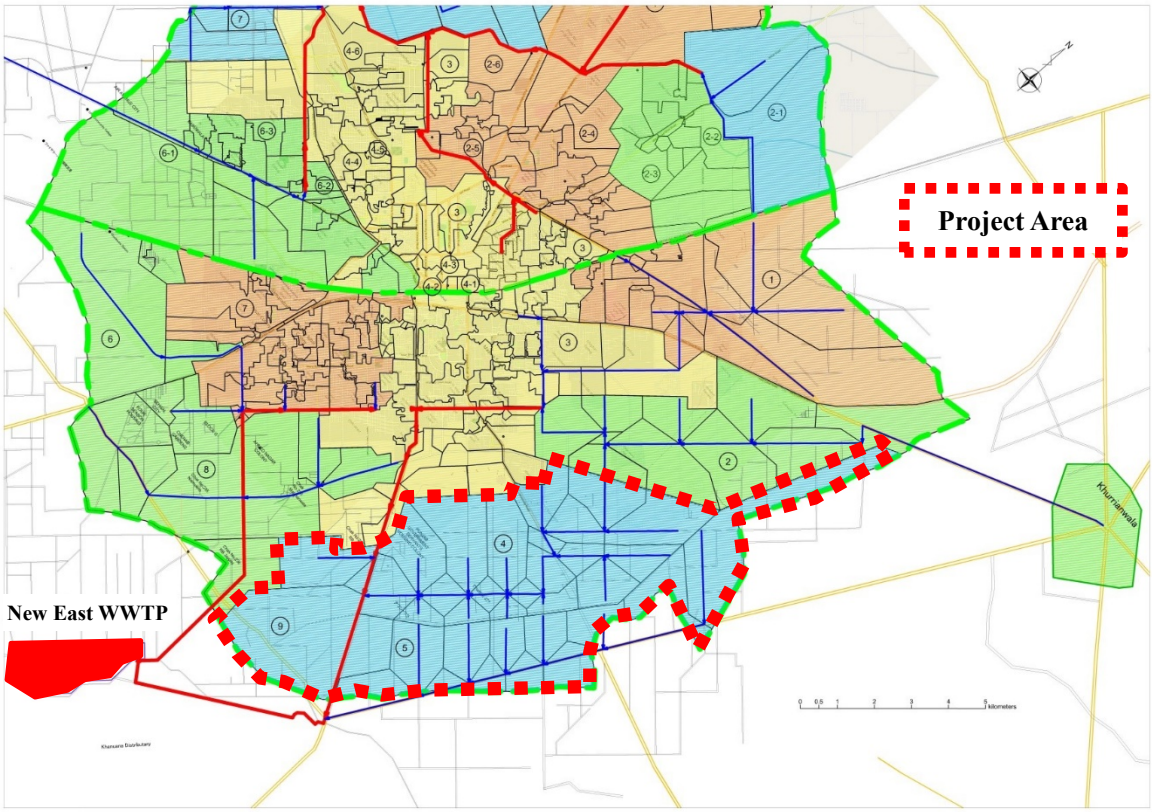
Project 3-2 East Sewerage District Facilities		
■ Sewer Replacement	-	-
■ Interceptor	-	5,557 mil. PKR
■ Trunk Sewer	D600mm – D1500mm: L=14.5 km	
■ Main Sewer	D350mm – D1050mm: L=24.6 km	
■ Branch Sewer	D225mm: L=633.5 km	14,324 mil. PKR
■ Lifting Pump Station	-	-
■ Influent Pump Statuion	-	
■ WWTP	-	-
■ Treated wastewater pump and transmission facilities	Pumps (1/2 Capacity) Force Main D1500mm: L=12.3km Surge Tank 1 unit	8,904 mil. PKR
■ **Construction Cost**	計	28,785 mil. PKR
■ Effectiveness	Beneficiaries (Population Served)	299,300 persons



Project 4-1 West Sewerage District Facilities		
■ Sewer Replacement	-	-
■ Interceptor	-	6,132 mil. PKR
■ Trunk Sewer	D1050mm – D1200mm: 8.7 km	
■ Main Sewer	D300mm – D1050mm: 29.8 km	
■ Branch Sewer	D225: L=737.5 km	16,675 mil. PKR
■ Lifting Pump Station	-	-
■ Influent Pump Statuion	-	-
■ WWTP	-	-
■ Treated wastewater pump and transmission facilities	Pumps (1/2 Capacity) Force Main D1500mm: L=14.6km Surge Tank 1 Unit	8,272 mil. PKR
■ **Construction Cost**	**Total**	**31,079 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	464,300 persons



Project 4-2 East Sewerage District Facilities		
■ Sewer Replacement	-	-
■ Interceptor	-	15,564 mil. PKR
■ Trunk Sewer	D900mm – D1500mm: L=11.2 km	
■ Main Sewer	D225mm – D1050mm: L=32.9 km	
■ Branch Sewer	D225mm: L=696.4 km	15,746 mil. PKR
■ Lifting Pump Station	-	-
■ Influent Pump Statuion	-	
■ WWTP	-	-
■ Treated wastewater pump and transmission facilities	Pumps (1/2 Capacity) Force Main D1500mm: L=12.3km Surge Tank 1 Unit	7,085 mil. PKR
■ **Construction Cost**	**Total**	**34,395 mil. PKR**
■ Effectiveness	Beneficiaries (Population Served)	475,200 persons



APPENDIX FOR CHAPTER A1 INTRODUCTION

AA1.1 Minutes for the Project

RECORD OF DISCUSSIONS

ON

THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

IN

THE ISLAMIC REPUBLIC OF PAKISTAN

AGREED UPON BETWEEN

FAISALABAD WATER AND SANITATION AGENCY

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Lahore, 3 March, 2016

Mr. Yasuhiro Tojo
Chief Representative
JICA Pakistan Office

Mr. Syed Zahid Aziz
Managing Director
Water and Sanitation Agency
Faisalabad Development Authority

Mr. Yawar Hussain
Director General
Faisalabad Development Authority

Mr. Asim Iqbal
Secretary
Housing, Urban Development & Public Health Engineering Department,
Government of Punjab

Mr. Iftikhar Ali Sahoo
Secretary
Planning & Development Department
Government of Punjab

Mr. Syed Mujtaba Hussain
Joint Secretary(ADB/Japan)
Economic Affairs Division
Islamic Republic of Pakistan

Based on the minutes of meetings on the Detailed Planning Survey on the Project for Updation of Water Supply Sewerage and Drainage Master Plan of Faisalabad City (hereinafter referred to as "the Project") signed on 18 November, 2015 among Water and Sanitation Agency, Faisalabad Development Authority (hereinafter referred to as "WASA Faisalabad"), other authorities concerned of the Islamic Republic of Pakistan and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with WASA Faisalabad and relevant organizations to develop a detailed plan of the Project.

Both parties agreed the details of the Project and the main points discussed as described in the Appendix 1 and the Appendix 2 respectively.

Both parties also agreed that WASA Faisalabad, the counterpart to JICA, will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of the Islamic Republic of Pakistan (hereinafter referred to as "Pakistan").

The Project will be implemented within the framework of the Agreement on Technical Cooperation signed on 30 April, 2005 (hereinafter referred to as "the Agreement") and the Note Verbales exchanged on April 20, 2015 between the Government of Japan (hereinafter referred to as "GOJ") and the Government of Pakistan (hereinafter referred to as "GOP").

Appendix 1: Project Description
Appendix 2: Minutes of Meetings on the Project for Updation of Water Supply Sewerage and Drainage Mater Plan of Faisalabad City

Appendix 1

PROJECT DESCRIPTION

I. BACKGROUND

In the "Punjab Drinking Water Policy" approved in 2011, the Government of Punjab Province (hereinafter referred to as "GOPb") set development vision as "provision of safe drinking water of an adequate quantitiy at an affordable cost through equitable, efficient and sustainable services to all citizens by 2020" in the province by strengthening the capacity of Water and Sanitation Agencies (WASAs) in urban area as high priority, as well as sustainable access to improved sanitation for all by 2025 described in "National Sanitation Policy" set in 2006. GOJ expressed that assistance for water supply and sanitation especially in urban area would be prioritized in the "Country Assistance Policy for the Islamic Republic of Pakistan (April 2012)".

WASA Faisalabad had formulated its first development master plan (M/P) in cooperation with the Asian Development Bank (ADB) in 1976, and revised it in 1993 under the assistance of the World Bank (WB). However, only the part of investment plan had been implemented because of shortage of the budget and lack of groundwater resources. As the target year of existing M/P was set in 2018, WASA Faisalabad would not have the integrated M/P after 2018.

Faisalabad, the third largest city of Pakistan, has a population of 3.1 million (2013) and average population growth rate is approximately 3.2% (1990-2013). 98% of water source depends on groundwater recharged from irrigation canals and rivers, and pumped up by mainly tube wells around Chenab River and Jhang Branch canal.

Although WASA Faisalabad had been tackling the water resources development under the assistance from foreign development partners including JICA, the amount of existing water sources remain 60% of the estimated demand in 2017. Regardless of this situation, further water resources development have not been remarkably progressed as there are strong concerns for additional development of groundwater while surface water development requires the coordination for the water right.

With regard to sewerage and drainage, presently, a wastewater treatment plant operates in the western area of Faisalabad. Its capacity is very limited. Most of wastewater generated in Faisalabad is directly discharged to the rivers through drains without any treatment. In addition, there are some areas prone to inundation.

In terms of financial aspect, the billing system is not based on the consumption volume but the dimensions of lands which customers have, thus there is no incentive of efficient water use. In addition, low tariff collection ratio and high Non-Revenue Water (NRW) ratio estimated as 33% made WASA Faisalabad difficult to cover the cost for operation and maintenance. WASA Faisalabad is regularly in serious financial deficit even after receiving subsidy from the Government of Punjab Province.

As described, while the rapid population growth made water demand increase, WASA Faisalabad is facing the range of difficulties such as deteriorated infrastructures, insufficient operation and maintenance capacity due to the lack of trained staff, shortage of operation cost due to the low revenue resulting in a serious imbalance between supply and demand of water.

Under these circumstances, to formulate M/P for appropriate service by WASA Faisalabad, GOP submitted the official request for the Technical Cooperation for Development Planning on the Project to GOJ.

II. OUTLINE OF THE PROJECT

1. Title of the Project

Though the requested title of the Project was "The Project for Updation of Water Supply Sewerage and Drainage Master Plan of Faisalabad City", the both sides decided to change it to "The Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad" to reflect the goal and activities of the Project.

2. Expected Goals which will be attained after implementing the Proposed Plan

(1) The Master Plan to be formulated in the Project (hereinafter referred to as "the M/P") is authorized as an official development plan of WASA Faisalabad.
(2) Necessary activities are continuously implemented based on the M/P.

3. Outputs

(1) To develop the integrated M/P for water supply, sewerage and drainage in Faisalabad
(2) To enhance the institutional capacity for implementation of the M/P

4. Activities

Basic Study

(1) Review of the Faisalabad Environmental Infrastructure M/P in 1993
(2) Collection and analysis of data and information
  - Urban development and land use plan
  - Natural and socio-economic conditions
  - Current situations of water resources and water supply facilities
  - Groundwater potential (including the possibility of deep fresh groundwater)
  - Current situations of sewerage and drainage facilities (including reassessment of pumping needs to avoid multiple pumping, and analysis of ponding areas)
  - Law and regulation, policy, and organization related to water, sewerage and drainage
  - Organization, operation, and financial management of WASA Faisalabad
(3) Water quality survey (water sources, raw and treated wastewater, industrial wastewater)
(4) Public awareness survey (socio-economic survey)
(5) Identification of issues on water supply, sewerage and drainage

Formulation of M/P

A. Water Supply

(1) Setting of planning strategy and goal of water supply plan
(2) Delineation of water supply service area
(3) Planning basis (population, per capita water consumption, non-domestic water supply volume, etc.)
(4) Water demand projection
(5) Water sources development plan
(6) Water supply pipeline plan (raw water transmission, treated water transmission, distribution network)
(7) Distribution water storage and pumping plan
(8) Water treatment plant (WTP) plan
(9) Phased implementation plan
(10) Project cost estimation
(11) Economic and financial evaluation
(12) Strategic environmental assessment
(13) Project evaluation
(14) Recommendation of priority project
(15) Preliminary design for the priority project

B. Sewerage and Drainage

(1) Setting of planning strategy and goal of sewerage and drainage plan (including integration of pumping systems, separation of wastewater and storm water, and storage of storm water)
(2) Delineation of sewerage and drainage planning area
(3) Planning basis (population, per capita wastewater generation, design influent and effluent quality, etc.)
(4) Trunk sewer plan and preliminary design
(5) Wastewater treatment plant (WWTP) plan and preliminary design
(6) Drainage plan and preliminary design
(7) Phased implementation plan
(8) Project cost estimation
(9) Economic and financial evaluation
(10) Strategic environmental assessment
(11) Project evaluation
(12) Recommendation of priority project

C. Institution and Finance

(1) Organization and management improvement plan
(2) Finance plan

Pilot Activity for Water Supply

(1) Planning of pilot activity
(2) Selection of a pilot activity area
(3) Hydraulic isolation of the pilot activity area
(4) Improvement of distribution
(5) Promotion activity for water meter installation
(6) Leakage detection and repair work
(7) Legalization of illegal connections
(8) Improvement of bill collection
(9) Training of meter readers
(10) Evaluation and recommendations

5. Input

(1) Input by JICA

(a) Dispatch of Mission

i) Water Supply and Sewerage M/P

1) Team leader / Water supply planner
2) Water supply pipeline planner
3) Water treatment plant planner
4) Hydraulic analysis specialist
5) Hydrogeologist
6) Sewerage and drainage planner
7) Sewer and drain planner
8) Wastewater treatment plant planner
9) Mechanical and electrical facility planner
10) Cost estimator / construction planner
11) Organization / management / institution specialist
12) Billing collection and customer relations specialist
13) Economic and financial specialist
14) Environment and social consideration specialist
15) GIS database specialist
16) Any other Specialists as required

ii) Pilot Activity

1) Water supply operation and management
2) NRW reduction specialist
3) Leakage detection and repair specialist
4) Social mobilization specialist
5) Any other Specialists as required

Input other than indicated above will be determined through mutual consultations between JICA and WASA Faisalabad during the implementation of the Project, as necessary.

(b)Machinery and Equipment

JICA will provide the machinery and equipment necessary to implement the Project.

(c)Training

Approximately eight (8) persons directly related to the Project directly nominated by WASA Faisalabad and JICA will be trained in Japan and other country.

(2) Input by WASA Faisalabad

WASA Faisalabad will take necessary measures to provide at its own expense:

(a) Services of WASA Faisalabad's counterpart personnel and administrative personnel as referred to in II-6;
(b) Suitable office space with necessary equipment;
(c) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the equipment provided by JICA;
(d) Information as well as support in obtaining medical service;

(e) Credentials or identification cards;
(f) Available data (including maps and photographs) and information related to the Project;
(g) Running expenses necessary for the implementation of the Project;
(h) Expenses necessary for transportation within Pakistan of the equipment referred to in II-5 (1) as well as for the installation, operation and maintenance thereof; and
(i) Necessary facilities to members of the JICA missions for the remittance as well as utilization of the funds introduced into Pakistan from Japan in connection with the implementation of the Project

6. Implementation Structure

The project organization chart is given in the Annex I. The roles and assignments of relevant organizations are as follows:

(1) WASA Faisalabad

(a) Project Director

Managing Director will be responsible for overall administration and implementation of the Project.

(b) Project Manager

Director (Water Resources / Coordination) will be responsible for the day-to-day implementation of the Project.

(2) Project Implementation Unit (PIU)

WASA Faisalabad will create a Project Implementation Unit (PIU) that will implement day-to-day Project activities. During the Project, the members of PIU will undergo On-The-Job-Training from JICA Mission.

(3) JICA Mission

The JICA mission will give necessary technical guidance, advice and recommendations to WASA Faisalabad on any matters pertaining to the implementation of the Project.

(4) Joint Coordinating Committee

Joint Coordinating Committee (hereinafter referred to as "JCC") will be established in order to review overall progress of the Project, and discuss necessary measures to support the implementation of the M/P as the Government of Punjab Province (hereinafter referred to as "GOPb"). JCC will be held whenever deems it necessary. A list of proposed members of JCC is shown in the Annex II.

(5) Technical Committee

Technical Committee (hereinafter referred to as "TC") will be organized to confirm the progress of formulation of the M/P, discuss the technical matters, and facilitate inter-organizational coordination. TC will be held at least twice a year. A list of proposed members of TC is shown in the Annex II.

7. Project Site(s) and Beneficiaries

The project site is the boundary area of Faisalabad Peri-Urban Structure Plan. Beneficiaries are people living in the area. The Map of the area is shown in Annex III.

8. Duration
The duration of the Project would be thirty six (36) months from the date when the JICA Mission member(s) arrives. The Project will be carried out in accordance with the tentative schedule shown in the Annex IV. The schedule is tentative and subject to change when both parties agree upon any necessity that will arise during the course of the Project.

9. Reports
JICA will prepare and submit the following reports to WASA Faisalabad in English.
(1) Twenty (20) copies of Inception Report at the commencement of the first work period in Pakistan
(2) Twenty (20) copies of Progress Report at the end of Basic Survey
(3) Twenty (20) copies of Interim Report which contains outline of the M/P
(4) Twenty (20) copies of Progress Report for Pilot Activity for approximately every 6 months after the commencement of Pilot Activity
(5) Forty (40) copies of Draft Final Report at the end of formulation of the M/P
(6) Forty (40) copies of compilation of planning criteria which includes planning basis such as a)population, per capita water consumption, non-domestic water supply volume, for water supply, b)population, per capita wastewater generation, design influent and effluent quality, for sewerage and c)rainfall intensity and run-off coefficient for drainage
(7) Forty (40) copies of Final Report within one (1) month after the receipt of the comments on the Draft Final Report
(8) Forty (40) copies of Completion Report for Pilot Activity at the time of completion of the Project

10. Environmental and Social Considerations
WASA Faisalabad will abide by 'JICA Guidelines for Environmental and Social Considerations (April,2010)' in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project.

11. Management of Safety for Construction Works
For construction works which will be carried out in the Project, WASA Faisalabad and JICA will assure the management of safety in accordance with the "Safety Plan" and "Method Statements of Safety"submitted by contractors based on the Guidance for the Management of Safety for Construction Works in Japanese ODA Projects.

III. UNDERTAKINGS OF WASA FAISALABAD AND GOP

1.WASA Faisalabad and GOP will take necessary measures to:
(1) ensure that the technologies and knowledge acquired by the Pakistan nationals as a result of Japanese technical cooperation contributes to the economic and social development of Pakistan, and that the knowledge and experience acquired by the personnel of Pakistan from technical training as well as the equipment provided by JICA will be utilized effectively in the implementation of the Project; and

(2) grant privileges, exemptions and benefits to members of the JICA missions referred to in II-5 above and their families, which are no less favorable than those granted to members of the missions and their families of third countries

or international organizations performing similar missions in Pakistan.

Other privileges, exemptions and benefits will be provided in accordance with the Agreement on Technical Cooperation signed on April 30th, 2005 between GOJ and GOP.

IV. MONITORING AND EVALUATION

JICA will conduct the following evaluations and surveys to verify how the proposed plan is utilized and draw lessons. WASA Faisalabad is required to provide necessary support for them.

1. Ex-post evaluation three (3) years after the project completion, in principle
2. Follow-up surveys on necessity basis

V. PROMOTION OF PUBLIC SUPPORT

For the purpose of promoting support for the Project, WASA Faisalabad will take appropriate measures to make the Project widely known to the people of Pakistan.

VI. MISCONDUCT

If JICA receives information related to suspected corrupt or fraudulent practices in the implementation of the Project, WASA Faisalabad and relevant organizations will provide JICA with such information as JICA may reasonably request, including information related to any concerned official of the government and/or public organizations of the Pakistan.

WASA Faisalabad and relevant organizations will not, unfairly or unfavorably treat the person and/or company which provided the information related to suspected corrupt or fraudulent practices in the implementation of the Project.

VII. MUTUAL CONSULTATION

JICA and WASA Faisalabad will consult each other whenever any major issues arise in the course of Project implementation.

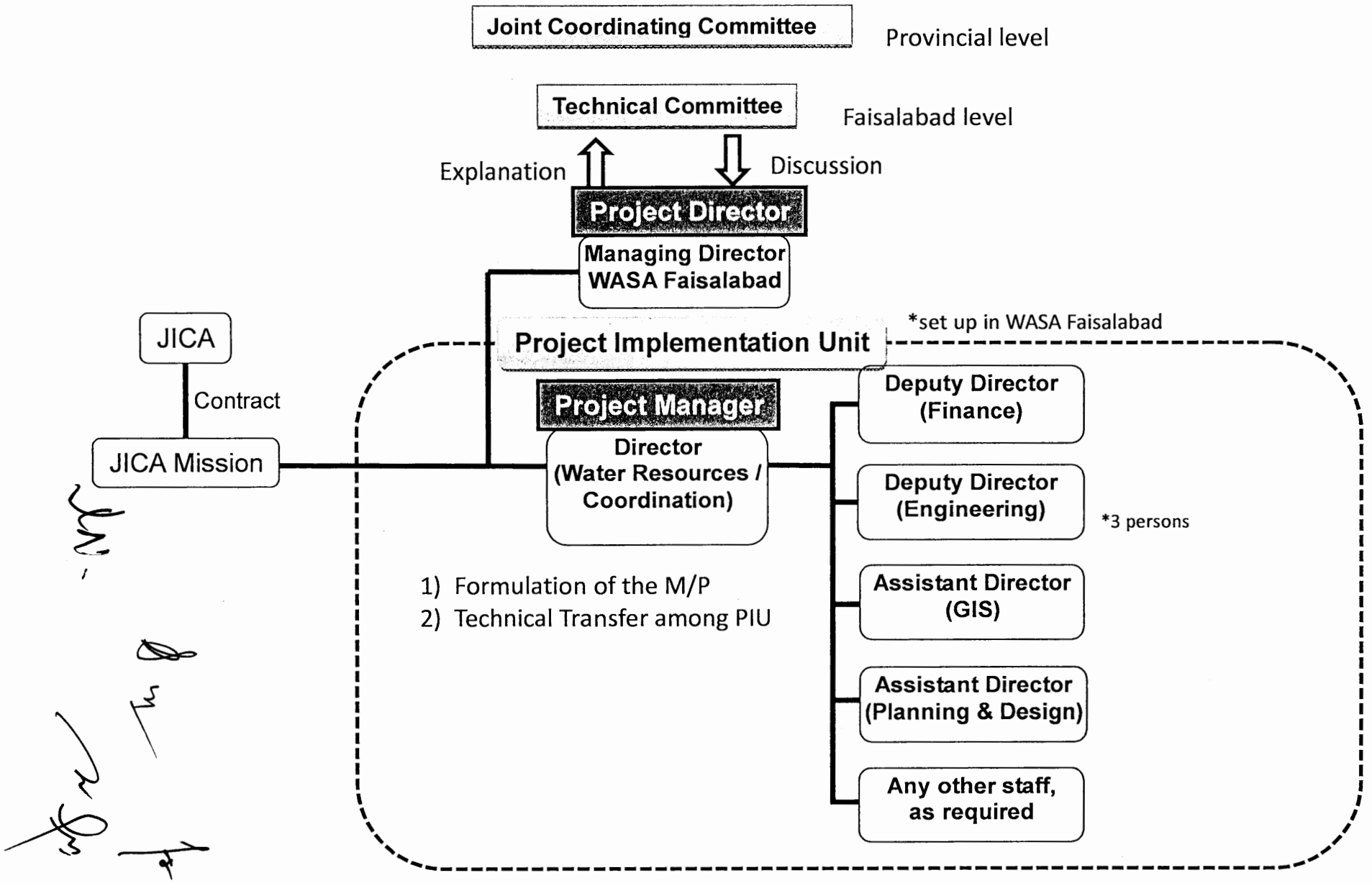
VIII. AMENDMENTS

The record of discussions may be amended by the minutes of meetings between JICA and WASA Faisalabad. The minutes of meetings will be signed by authorized persons of each side who may be different from the signers of the record of discussions.

(End)

Annex I	Project Organization Chart
Annex II	List of Proposed Members of Joint Coordinating Committee/Technical Committee
Annex III	Map of the target area
Annex IV	Tentative Schedule
Annex V	Terms of Reference for Environmental and Social Considerations

Annex I Project Organization Chart



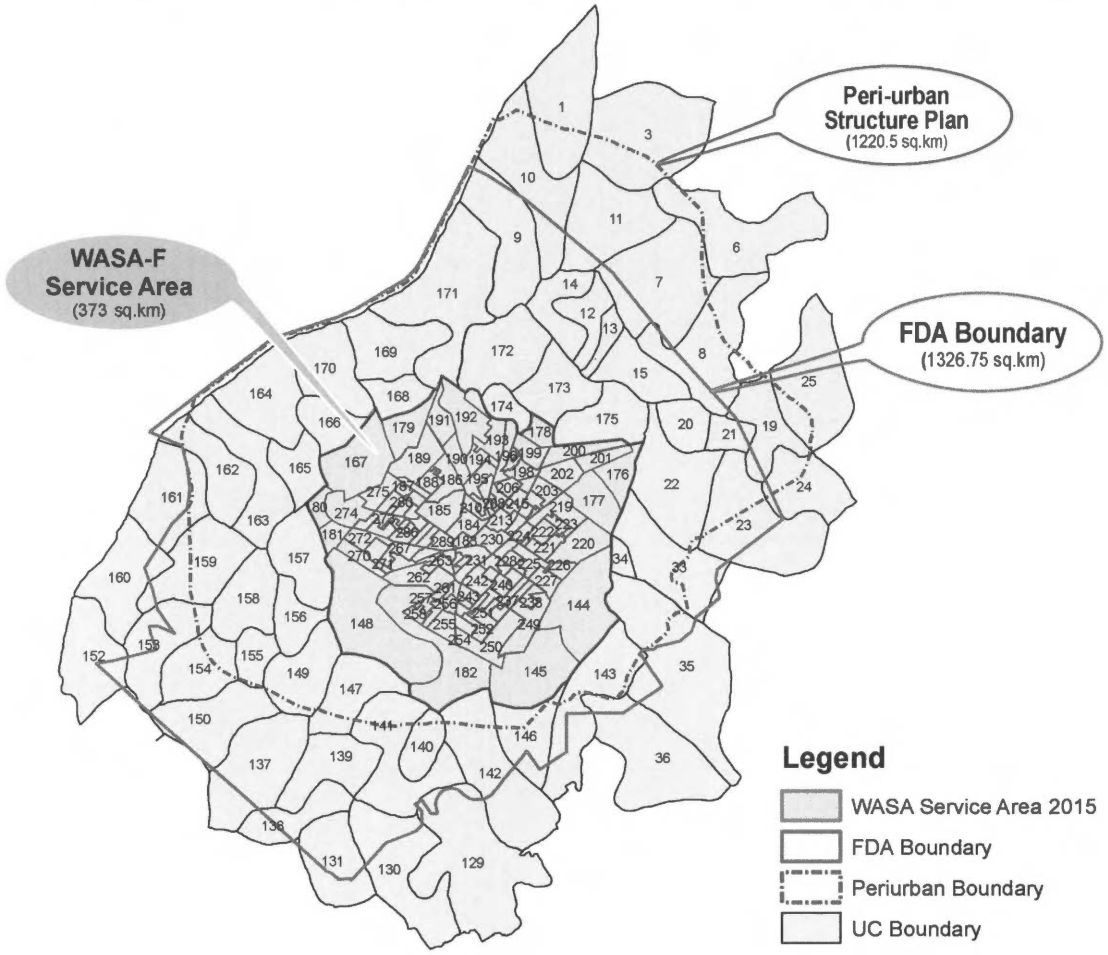
Annex II List of Proposed Members of Joint Coordinating committee/ Technical Committee

Structure	Function	Member
Joint Coordinating Committee	A Joint Coordinating committee (hereinafter referred to as "JCC") will be organized at the provincial level to review overall progress of the Project, and discuss necessary measures to support the implementation of the M/P as GOPb. JCC will meet whenever the necessity arises (at least at the submission of inception report and draft final report) in order to fulfill the following functions: 1) To review the progress of the Project; 2) To exchange opinions on major issues that may arise during the implementation of the Project; 3) To coordinate related organizations at the provincial level; 4) To discuss any other issue(s) pertinent to the smooth implementation of the Project.	1) Chairperson: Secretary of Planning and Development of GOPb (P&D) 2) Members of the Pakistan Side: a. Secretary Finance of GOPb b. Secretary Irrigation of GOPb c. Secretary, Housing Urban Development and Public Health Engineering of GOPb (HUD/PHED) d. Secretary of Environmental Protection Department e. Mayor of Municipal Corporation, Faisalabad f. District Coordination Officer (DCO), Faisalabad g. Director General, Faisalabad Development Authority (FDA) h. Managing Director, WASA Faisalabad i. CEO, Urban Sector Planning and Management Services Unit Pvt. Ltd (UU) j. Any other official concerned, to be co-opted by GOPb, if necessary 3) Members of the Japanese Side: a. Representative of JICA Pakistan Office b. Members of the JICA Missions c. Any other official concerned, to be co-opted by JICA, if necessary
Technical Committee	The Technical Committee (hereinafter referred to as "TC") will be organized to confirm the progress of formulation of the M/P, discuss the technical matters, and facilitate inter-organizational coordination. TC will be held at least twice a year.	1) Chairperson: Managing Director, WASA Faisalabad 2) Members of the Pakistan Side: a. Senior Chief (Urban Development), P&D b. Representative of HUD&PHED c. Representative of Mayor, Municipal Corporation, Faisalabad d. Representative of DCO (District Coordination Officer), Faisalabad e. Representative of Irrigation Department f. Representative of UU g. Representative of Faisalabad Waste Management Company h. Representative of Environmental Protection Agency i. Any other official concerned, to be co-opted by WASA Faisalabad, if necessary 3) Members of the Japanese Side: a. Representative of JICA Pakistan Office b. Members of the JICA Missions c. Any other official concerned, to be co-opted by JICA, if necessary

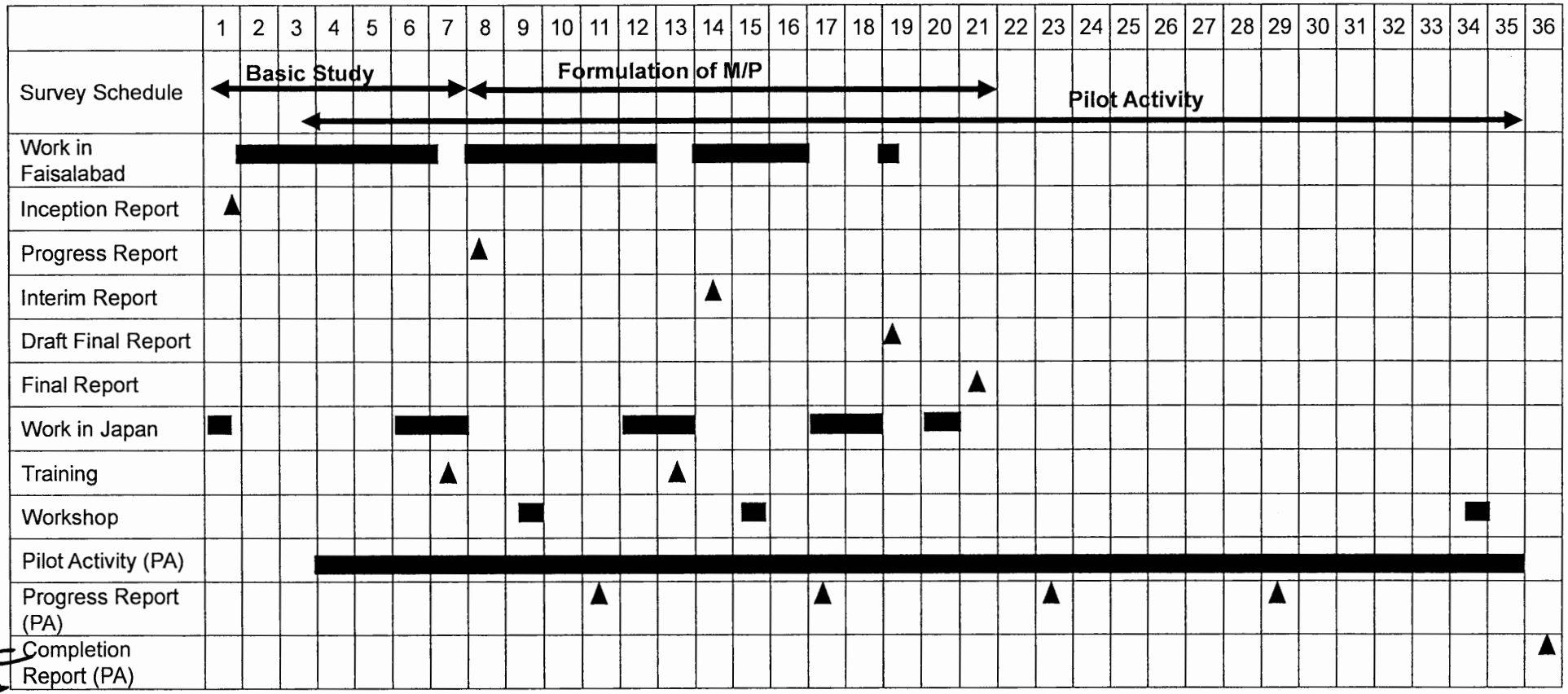
Annex III The Map of the target area

*The target area is "Peri-urban Structure plan" described as line with red dot. ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

Map Showing WASA Service Area and Peri-urban Structure Plan Boundary



Annex IV Tentative Schedule



Annex V Terms of Reference for Environmental and Social Considerations

The Project should include Terms of Reference (TOR) for Environmental and Social Considerations in line with the JICA Guidelines as follows:

(1) Review of existing development plans, development projects, studies, and public and private investments;
(2) Analysis to identify constraints to development, factors of promoting development;
(3) Analysis of alternatives for achieving the goals of the Project;
(4) Consideration of contents of developed policy and plans;
(5) Scoping (clarify extremely important items on environmental and social impacts and its evaluation methods at the time of decision making of the M/P;
(6) Confirmation of existing environmental and social conditions of the proposed project area in the M/P as a base line data (land use, natural environment, culture and lifestyle of indigenous people and their communities, local economy and socio-cultural environment and others);
(7) Confirm legal framework and institution of Pakistan on environmental and social considerations, and examine the experiences of SEA study in Pakistan; a) Laws, regulations and standards related to environmental and social considerations (environmental impact assessment, resettlement, public participation, information disclosure and others);
(8) SEA Study reports conducted in Pakistan, development projects, and other relevant information:
(9) Gaps between the "JICA Guidelines for Environmental and Social Considerations (April 2010)" and legal framework of Pakistan on environmental and social considerations;
(10) Outlines of relative agencies and institutions responsible for the implementation of the projects;
(11) Prediction of likely impacts of proposed projects in the M/P;
(12) Assessment of likely impacts of the projects above 11) and comparative analysis of alternatives of proposed projects, including "without project" option;
(13) Examination of the mitigation measures (to be avoided, minimized and compensated);
(14) Examination of the monitoring methods (monitoring items, frequencies and methods); and
(15) Support to hold stakeholder meetings.

(16) Support to hold information disclosure.

(17) Scoping for the selected prioritized project (including the development of possible alternative analysis, the clarification of important items on environmental and social impacts and its evaluation methods)

MINUTES OF MEETINGS
ON
THE DETAILED PLANNING SURVEY
ON
THE PROJECT FOR UPDATION OF WATER SUPPLY SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD CITY IN THE ISLAMIC REPUBLIC OF PAKISTAN

In response to the official request submitted by the Government of the Islamic Republic of Pakistan (hereinafter referred to as "GOP") for "The Project for Updation of Water Supply Sewerage and Drainage Master Plan of Faisalabad City" (hereinafter referred to as "the Project"), the Government of Japan entrusted the preparation of the Project to the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency implementing the Japanese Government's technical cooperation.

Accordingly, JICA dispatched the Detailed Planning Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Shigeyuki Matsumoto, Senior Advisor, JICA, and held a series of discussions with Water and Sanitation Agency, Faisalabad Development Authority (hereinafter referred to as "WASA Faisalabad") and other authorities concerned of the Islamic Republic of Pakistan to develop a detailed plan of the Project.

In the course of discussions and field surveys, JICA and the Pakistani authorities concerned (hereinafter referred to as "both sides") confirmed the main items described in the attached sheets.

Lahore, 18 November, 2015

Mr. Shigeyuki Matsumoto
Leader
Detailed Planning Survey Team
JICA

Mr. Syed Zahid Aziz
Managing Director
Water and Sanitation Agency
Faisalabad Development Authority

Mr. Yawar Hussain
Director General
Faisalabad Development Authority

Mr. Asim Iqbal
Secretary
Housing, Urban Development & Public Health Engineering Department,
Government of Punjab

Secretary
Planning & Development Department
Government of Punjab

Mr. Muhammad Tahir
Deputy Secretary (Japan)
Economic Affairs Division
Government of Pakistan

ATTACHMENT

1. Draft of Record of Discussions

As a result of the discussions, both sides agreed on the contents of the draft of Record of Discussions (R/D) shown in Appendix. After discussion and approval of the JICA Headquarters, the commencement of the Project will be determined by signing of R/D.

The Team explained that the attached R/D is draft and is subject to change in authorization process by the competent authorities of both sides.

2. Title of the Project

Both sides confirmed that the name of the Project would be changed to "The Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad" subject to the approval of the both governments.

3. Implementing agency

Both sides agreed that WASA Faisalabad would be the implementing agency of the Project.

4. Target area

Both sides confirmed that the target area of the M/P would be the same as Peri-Urban Structure Plan boundary area, as this is regarded as the current basis of the urban development in Faisalabad.

5. Target year

Both sides confirmed that the M/P would be 20 years development plan. As the M/P will be developed from 2016 to 2018 through the technical cooperation from JICA, the M/P covers the period from 2018 to 2038.

6. Relationship between the M/P and other development plans.

Both sides confirmed the Master Plan to be formulated in the Project (hereinafter referred to as "the M/P") would include the priority area stipulated in the Peri-Urban Structure Plan which had been formulated by the Government of Punjab Province (hereinafter referred to as "GOPb").

Both sides also confirmed that, as the Project would be implemented in the same time of the discussion for setting up national targets and indicators for Sustainable Development Goals (SDGs), WASA Faisalabad should share necessary information such as the trend of above discussion, influence to the development plan of Faisalabad, etc. Both sides also confirmed that to implement the actions based on the recommendations in the M/P could contribute to achieve the goals and targets of SDGs.

7. Policy for the implementation of the M/P

WASA Faisalabad understood that the survey for the M/P would be conducted jointly by the Pakistani counterparts (hereinafter referred to as "C/P") and the JICA Mission. Therefore, involvement of C/P is essentially important. WASA Faisalabad assured that it would authorize the M/P as own official development plan and implement the necessary actions with own initiative as the responsibility to implement the priority projects and actions to be recommended in the M/P lies with WASA Faisalabad.

Based on the above, both sides confirmed that Managing Director of WASA Faisalabad would initiate the necessary coordination among GOPb for actions according to the M/P.

WASA Faisalabad also explained that the M/P would be officially authorized through the approval of the Governing Body of Faisalabad Development Authority (FDA).

WASA Faisalabad stated that expected financial sources to implement the M/P would be donor financing (JICA, the World Bank, ADB, etc.), PPP and ADP (Annual Development Programme). In addition, its own budget could be increased by improving bill collection efficiency, raising tariff for industrial and commercial customers, shifting to the volumetric tariff system, legalizing illegal connections, requesting the increase of subsidy and receipt of the property tax share, increasing the number of connections, and reducing operation cost. The team explained that financial feasibility would be further considered through the Project.

8. Purpose of the M/P

The purpose of the M/P is to formulate the integrated development plan for water supply, sewerage and drainage in service area of WASA Faisalabad and to clarify the feasible recommendations based on the verification.

To enable the sustainable service to people in Faisalabad City by WASA Faisalabad, both sides confirmed that to create the virtuous cycle between the improvement of service level and the increase in revenue is essentially important.

9. Scope of the Project

Based on the purpose of the M/P, both sides confirmed the scope of the Project would include the analysis of the present situation and capacity assessment, recommendations for improvement of institutional management which would be carried out by WASA Faisalabad, future investment plan including selection of priority projects for water supply, sewerage and drainage.

With regard to the selection of the priority projects, the M/P would cover the information necessary to prepare project proposals to be submitted to GOP or any other investors.

Both sides agreed that the M/P would include the preliminary design of the facilities, cost estimation and implementation plan.

10. Output of preliminary design

A: for water supply

Both sides confirmed the output of preliminary design for water supply would be concept drawings such as general layout of WTP with dimensions, pump arrangement at pumping station, plan of trunk main routes, typical drawing for pipeline section views and pipe bridge (if any), layout and section for OHR(s) and ground reservoir(s), of the facilities selected as priority project(s).

B: for sewerage and drainage

Both sides confirmed the output of preliminary design for sewerage and drainage facilities to be proposed in the M/P would be:

1) General plan and profile of trunk sewers,
2) General plan and section of main drains,
3) General layout plan, schematic hydraulic profile of wastewater and sludge treatment facilities,
4) Capacity calculations for determining the size of trunk sewers and main drains,
5) Capacity calculations for determining the dimensions of treatment facilities, and
6) Capacity calculations for determining the capacity and number of pumps required

11. Water resources development

WASA Faisalabad explained that its basic policy for water resources development was shift from groundwater to surface water by future development of Gogera branch (GB) canal, Jhang Branch (JB) canal, and Rakh branch (RB) canal, while the existing groundwater sources needed to be carefully operated in order not to deplete the groundwater potential and negatively affect the surrounding groundwater use. Future development of groundwater will be supplementary.

The Team stated that it would be necessary to consider the aspects of integrated urban water management, such as demand-side management, water saving, and wastewater reuse. However, especially the financial and technical feasibility should be carefully considered.

12. Groundwater survey

Both sides confirmed that situation of groundwater along the branch canals would be analyzed in order to prevent overexploitation and to identify the potential for further development.

In addition, WASA Faisalabad requested to investigate arsenic contamination of its well fields by a reliable method, as arsenic is detected in wells. The Team agreed to it.

WASA Faisalabad requested to reconsider the groundwater potential at Aminpur which the existing M/P had specified as the candidate development area. The Team pointed out that the groundwater table in the area was already lowered around 6 to 7 m due to the influence by the pumping at nearby Chenab well fields, and agreed to review the existing studies and plans related to groundwater development in the Project.

13. Canal closure

Both sides confirmed that the canal closure is annually conducted from 27 December to 13 January (18 days) for JB canal and from 13 to 30 January (18 days) for RB canal and GB canal. The canal closure is also conducted at the time of flood and other emergencies.

WASA Faisalabad stated that storage of water at treatment plant and management of water such as rationing and drawing water from other sources are measures to deal with canal closure period. The Team took note of it. Further measures would be considered through the Project.

14. Planning for drainage

Both sides confirmed that the return-period of the rainfall is determined as the design criteria in the M/P in order to avoid excessive investment. The existing ponding areas will be considered as priority areas to be addressed.

15. Industrial wastewater

WASA Faisalabad stated that pretreatment of industrial wastewater before discharging to sewer and drainage is the responsibility of polluters. Regulation of industrial wastewater discharge is the mandate of Environmental Protection Agency of GOPb (EPA). It is necessary for WASA Faisalabad to consider appropriate measures against industrial wastewater discharge, such as monitoring, regulations, guidance to factories, and enforcement of regulations, in cooperation with EPA. Both sides agreed to prepare the recommendations based on the water quality and quantity analysis of industrial wastewater in the M/P, and confirmed that WASA Faisalabad and EPA fully cooperate and coordinate to grasp the present situation of industrial wastewater.

WASA Faisalabad assured that it would coordinate with All Pakistan Textile Processing Mills Association (APTPMA) and Faisalabad Chamber of Commerce and Industries (FCCI) to obtain cooperation from the private sector. Ex-chairmen of both organizations above are members of the Governing Body of FDA.

16. Pilot activity

To verify whether a part of envisioned recommendations are feasible, both sides agreed to conduct the pilot activity through the Project, whose results would be summed up as the Action Plan and attached to the M/P. Although the detailed contents of the pilot activity would be mutually determined after the commencement of the Project, both sides exchanged the opinions that the pilot activity would aim at smooth transition to the volumetric tariff system, improvement of the willingness to pay, and reduction of Non-Revenue Water.

Both sides identified the candidate areas described below, considering the feasibility of hydraulic isolation of the area, manageable number of connections, and the possibility of 24-hour water supply. The pilot area will be decided during the Project.

Name of Place	Number of Connections	Water Source	Remarks
Madina town	about 3,000	Terminal Reservoir /Groundwater along RB canal (Expected)	middle income area, the ground reservoir is under construction for operation of overhead reservoir (OHR)
Sarfraz colony	about 1,000	Terminal Reservoir /Ground and surface water along RB canal (Expected)	middle income area, OHR and ground reservoir are already functional
Sitara Sapna	about 200	Terminal Reservoir	high income area

17. Implementation structure

Both sides confirmed to establish following implementation structure as described in the draft R/D to ensure smooth execution of the Project. Planning and Development (P&D) (at provincial government level) and WASA Faisalabad (at Faisalabad City level) will take necessary procedural action to set up the structure.

WASA Faisalabad and GOPb explained that assignment of enough personnel for Joint Coordinating Committee (JCC) and Technical Committee (TC) during the Project would be secured.

WASA Faisalabad assured that it would also secure the necessary personnel for Project Implementation Unit (PIU) before commencement of the Project.

Structure	Function	Member
Joint Coordinating Committee	A Joint Coordinating Committee (hereinafter referred to as "JCC") will be organized at the provincial level to review overall progress of the Project, and discuss necessary measures to support the implementation of the M/P as GOPb. JCC will meet whenever the necessity arises (at least at the submission of inception report and draft final report) in order to fulfill the following functions: 1) To review the progress of the Project; 2) To exchange opinions on major issues that may arise during the implementation of the Project; 3) To coordinate related organizations at the provincial level; 4) To discuss any other issue(s) pertinent to the smooth implementation of the Project.	1) Chairperson: Secretary of Planning and Development of GOPb (P&D) 2) Members of the Pakistan Side: a. Secretary Finance of GOPb b. Secretary Irrigation of GOPb c. Secretary, Housing Urban Development and Public Health Engineering of GOPb (HUD/PHED) d. Secretary of Environmental Protection Department e. Mayor of Municipal Corporation, Faisalabad f. District Coordination Officer (DCO), Faisalabad g. Director General, Faisalabad Development Authority (FDA) h. Managing Director, WASA Faisalabad i. CEO, Urban Sector Planning and Management Services Unit Pvt. Ltd (UU) j. Any other official concerned, to be co-opted by GOPb, if necessary 3) Members of the Japanese Side: a. Chief Representative of JICA Pakistan Office b. Members of the JICA Missions c. Any other official concerned, to be co-opted by JICA, if necessary
Technical Committee	The Technical Committee (hereinafter referred to as "TC") will be organized to confirm the progress of formulation of the M/P, discuss the technical matters, and facilitate inter-organizational coordination. TC will be held at least twice a year.	1) Chairperson: Managing Director, WASA Faisalabad 2) Members of the Pakistan Side: a. Senior Chief (Urban Development), P&D b. Representative of HUD&PHED c. Representative of Mayor, Municipal Corporation, Faisalabad d. Representative of DCO (District Coordination Officer), Faisalabad e. Representative of Irrigation Department f. Representative of UU g. Representative of Faisalabad Waste Management Company

Structure	Function	Member
Technical Committee (Continued)		h. Representative of Environmental Protection Agency i. Any other official concerned, to be co-opted by WASA Faisalabad, if necessary 3) Members of the Japanese Side: a. Representative of JICA Pakistan Office b. Members of the JICA Missions c. Any other official concerned, to be co-opted by JICA, if necessary
Project Implementation Unit (PIU)	Project Implementation Unit (PIU) is a counterpart team to deal with day-to-day project activities. PIU is set up in WASA Faisalabad.	1) Focal person in charge of PIU: Director (Water Resources / Coordination), WASA Faisalabad 1) Members (Counterparts): a. Deputy Director (Finance) b. Deputy Director (Engineering) *3 persons c. Assistant Director (GIS) d. Assistant Director (Planning & Design) e. Any other staff, as required
Project Director	Project Director will be responsible for overall administration and implementation of the Project.	Managing Director, WASA Faisalabad
Project Manager	Project Manager will be responsible for the day-to-day implementation of the Project.	Director (Water Resources / Coordination), WASA Faisalabad

18. Notification of the assignment of members of JCC and TC

Both sides confirmed that P&D would issue the official notification with regard to the assignment of members of JCC and WASA Faisalabad would issue the official notification for TC after signing of R/D and before commencement of the Project.

19. Provision of equipment

Both sides confirmed that JICA would procure the equipment necessary to implement the Project. Equipment for the pilot activity will be determined after deciding its detailed contents. WASA Faisalabad assured that they would prepare and install necessary flow meters, valves, bulk meters, chambers and customer meters.

20. Dissemination workshops

Both sides agreed that WASA Faisalabad would organize workshops to disseminate and share activities and results of the Project, and to promote full organizational ownership.

21. Training

The Team stated that JICA would provide training in Japan and/or a third country for personnel directly related to the Project who would be directly nominated by WASA Faisalabad and JICA.

22. Undertakings by WASA Faisalabad

WASA Faisalabad agreed on the undertakings, as attached in Appendix of the draft of R/D.

The Team emphasized and WASA Faisalabad assured to provide followings with enough budgets:

(1) Assignment of counterpart personnel before commencement of the Project.
(2) Allowance and transportation fees for the Pakistan counterpart personnel.
(3) Office space and necessary office facilities for JICA Mission including supply of electricity, internet access, air conditioners, etc. in the WASA Faisalabad headquarters before the arrival of JICA Mission.
(4) Provision of necessary information and inter-organizational coordination for the smooth implementation of the Project
(5) Providing rooms and spaces necessary for installation and storage of the equipment procured in the Project.
(6) Operational expenses for customs clearance, storage and domestic transportation for the equipment provided by the Japanese side should be borne by WASA Faisalabad, if necessity arises.
(7) Salaries, travel cost and daily allowances for SC members and TC members to attend committee meetings should be borne by each organization which committee members belong to.
(8) Necessary input for the Pilot Activity.
(9) Submission of the M/P to the Governing Body of FDA for approval

23. TOR of environmental and social considerations

The Project should include Terms of Reference (TOR) for Environmental and Social Considerations in line with the JICA Guidelines as follows:

(1) Review of existing development plans, development projects, studies, and public and private investments;
(2) Analysis to identify constraints to development, factors of promoting development;

(3) Analysis of alternatives for achieving the goals of the Project;
(4) Consideration of contents of developed policy and plans;
(5) Scoping (clarify extremely important items on environmental and social impacts and its evaluation methods at the time of decision making of the M/P;
(6) Confirmation of existing environmental and social conditions of the proposed project area in the M/P as a base line data (land use, natural environment, culture and lifestyle of indigenous people and their communities, local economy and socio-cultural environment and others);
(7) Confirm legal framework and institution of Pakistan on environmental and social considerations, and examine the experiences of SEA study in Pakistan; a) Laws, regulations and standards related to environmental and social considerations (environmental impact assessment, resettlement, public participation, information disclosure and others);
(8) SEA Study reports conducted in Pakistan, development projects, and other relevant information:
(9) Gaps between the "JICA Guidelines for Environmental and Social Considerations (April 2010)" and legal framework of Pakistan on environmental and social considerations;
(10) Outlines of relative agencies and institutions responsible for the implementation of the projects;
(11) Prediction of likely impacts of proposed projects in the M/P;
(12) Assessment of likely impacts of the projects above 11) and comparative analysis of alternatives of proposed projects, including "without project" option;
(13) Examination of the mitigation measures (to be avoided, minimized and compensated);
(14) Examination of the monitoring methods (monitoring items, frequencies and methods); and
(15) Support to hold stakeholder meetings.
(16) Support to hold information disclosure.
(17) Scoping for the selected prioritized project (including the development of possible alternative analysis, the clarification of important items on environmental and social impacts and its evaluation methods)

(End)

Appendix: Draft Record of Discussion (R/D)

MINUTES OF MEETING
ON
INCEPTION REPORT
FOR
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

The Japan International Cooperation Agency (hereinafter referred to as "JICA") through its Pakistan Office and the authorities concerned of the Government of Punjab Province (hereinafter referred to as "GOPb") exchanged the Record of Discussions (hereinafter referred to as the "R/D") and the Minutes of the Meetings (hereinafter referred to as the "M/M") on Japanese Technical Cooperation for the Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad (hereinafter referred to as "the Project") on 3rd March 2016 and 18th November, 2015 respectively. Based on the R/D and M/M, JICA established a consultant team for the Project (hereinafter referred to as the "JICA Mission"), and dispatched to Faisalabad and commenced the Project from the middle of July 2016. At the time of commencement, a meeting to discuss the contents of the Inception Report of the Project was held on 19th and 20th July, 2016, between JICA Mission and Water and Sanitation Agency, Faisalabad (hereinafter referred to as the "WASA-F").

After discussions, the Inception Report (Draft) was accepted in principle. The main points discussed during the meeting are as Attached Document.

Faisalabad on July 21st, 2016

Mr. Takashi Hoshino
Team Leader
JICA Mission Team
Nihon Suido Consultants Co., Ltd

Mr. Syed Zahid Aziz
Project Director of the Project
Managing Director
Water and Sanitation Agency, Faisalabad

Witnessed by:

Mr. Shigeyuki Matsumoto
Leader
Inception Report Mission
Japan International Cooperation Agency

The Attached Document

Main points are as follows.

1. Necessary input for the Pilot Activity

WASA-F explained that there are no overlaps of candidate pilot areas with other NRW reduction projects, and GOPb allocated budgets necessary for the costs required in the pilot activity. Both sides confirmed that WASA-F would prepare and install necessary equipment such as flow meters, bulk meters, chambers and customer meters for DMA preparation by the end of June 2017.

2. Tax exemption for survey equipment

Both sides confirmed that taxes for the equipment procured for the Project will be exempt, and WASA-F will take necessary actions including support for the custom clearance and other fiscal levies, according to the R/D.

3. Targets of the Project

Both sides shared consensus that, for the future expansion of WASA-F service area, the improvement of service level in the current WASA-F service area is essential. The M/P will be prepared based on this consensus.

4. Joint Coordinating Committee (JCC) and Technical Committee (TC)

JICA Mission confirmed that Joint Coordinating Committee (hereinafter referred to as "JCC") and Technical Committee (hereinafter referred to as "TC") have been formulated. TC Meeting was held on July 20th, 2016 at WASA-F. Both sides agreed the schedule below:

- Collecting comments from TC on Inception Report (draft) until July 27th, 2016.
- Finalizing of the Inception Report by the middle of August, 2016.
- Opening JCC Meeting by the end of August, 2016 for the explanation of the Inception Report.

5. Project Implementation Unit (PIU) and Task Team of Counterparts (C/Ps)

The members of Project Implementation Unit (hereinafter referred to as "PIU") were selected from WASA-F as follows.

Chairman		
1)	Mr. Muhammad Hafeez	Director (Technical)
Senior Member		
2)	Mr. Jabbar Anwar	Director (Technical)
Member		
3)	Mr. Roohan Javed	Deputy Director (Technical)
4)	Mr. Muhammad Rafi	Deputy Director (Technical)
5)	Mr. Abdul Rouf Butt	Deputy Director (Finance)
6)	Mr. Gul Hafeez Khokhar	Senior Institutional Development Specialist, Urban Unit
7)	Mr. Kamran Raza	Deputy Director (Technical)
8)	Mr. Ghulam Shabbir	Deputy Director (Technical)

9)	Mr. Tasawar Hussain	GIS Analyst
10)	Mr. Saqib Raza	Deputy Director (Technical)
11)	Mr. Muhammad Farhan Akram	Deputy Director (Technical)
12)	Mr. Furqan Haider	Assistant Director (Technical)

Also, task teams of C/Ps will be set up in PIU for each M/P formulation and pilot activities.

6. Approval of M/P

WASA-F shall submit the Final Report of the M/P prepared to the Governing Body of Faisalabad Development Authority (FDA). The M/P in the Project shall be an official development plan of WASA-F.

WATER AND SANITATION AGENCY FAISALABAD

OFFICE OF DIRECTOR (WATER RESOURCES) FAISALABAD

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No. 368 /WASA/2016
DATED 26 / 7 /2016

MINUTES OF IST MEETING OF THE TECHNICAL COMMITTEE

FOR THE PROJECT

WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

First meeting of technical committee for the project "WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD" was held in Committee Room of WASA Faisalabad on 20th July, 2016 under the chairmanship of Managing Director WASA Faisalabad. Following attended the meeting:-

JICA

1.	Mr. Shigeyuki Matsumoto	Mission Leader JICA, HQ
2.	Mr. Satoshi Hamano	JICA Pakistan
3.	Mr. Abrar Khan	JICA Pakistan
4.	Mr. Takashi Hoshino	JICA Mission
5.	Mr. Harutoshi Uchida	JICA Mission
6.	Mr. KajiNakashi	JICA Mission Coordinator
7.	Mr. Mitsuo Kitagawa	JICA Mission
8.	Mr. Yarai Sato	JICA Mission

PAKISTAN

1.	Mr. Syed Zahid Aziz	Managing Director WASA, Faisalabad
2.	Mr. Muhammad Hafeez	Director (W.R) WASA, Chairman PIU
3.	Mr. Jabbar Anwar	Director (I&C) WASA, Senior Member PIU
4	Ch. Muhammad Asghar	S.E LCC Circle Irrigation, Faisalabad.
5	Mr.Yaqoob Khan	Director Development, Commissioner Office, Faisalabad.
6.	Muhammad DawoodMakki	(Operation Manager) FWMC, FSD.
7.	Mr. Zia Mustafa	Water Specialist Urban Unit Lahore
8.	Mr. Mubashar Ahmad Cheema	Water Specialist Urban Unit Lahore
9.	Mr. Shoukat Hayat	District Officer EPA, Faisalabad.
10.	Mr. ZafarHussain	XEN Irrigation Faisalabad.
11.	Mr. Saeed Ahmad	DDO (P), DCO Office, Faisalabad.
12.	Mr. GhulamShabbir	Deputy Director (Technical)PIU WASA
13.	Mr. FarhanAkram	Deputy Director (Technical)PIU WASA
14.	Mr. SaqiqRaza	Deputy Director (Technical)PIU WASA
15.	Mr. Kamran Raza	Deputy Director (Technical)PIU WASA
16.	Mr. TasawarHussain	Assistant Director GIS WASA, Faisalabad.

The meeting started with introduction of the participants. Managing Director WASA, briefed the meeting about Master Plan Project and purpose of constitution of Technical Committee.

Mr. Shigeyuki Matsumoto mission leader of JICA team briefed the meeting about the Inception Report prepared by JICA for the Master Planningof WASA, Faisalabad. Mr. Takashi Hoshino (water expert) and Mr.Harutoshi Uchida(sewerage expert) of JICA gave presentation on the main points of Inception Report covering all important aspects of Master Planning and invited questions from the participants. Mr. Zia Mustafa of Urban unit raised the point about importance of consumer water meters. The Managing Director WASA and JICA Teamleader informed about pilot area selected in WASA Faisalabad where 100% metering is planned in this Master Plan Project and this successful experience would be replicated in other areas also.
The representatives of urban unit showed satisfactionon on the main points included in the Inception Report.
Mr.Dawood Makki, Manager Operations, Faisalabad Waste Management Company admired the presentation being very informative. He was of the opinion that this was a step taken in the right direction.
Mr.Yaqoob Khan, Director Development, Commissioner office Faisalabad Division, praised MD WASA for his leadership and JICA for their continuous support to the residents of Faisalabad.

It was decided by the meeting to invite comments of the participants on Inception Report upto 27th July,2016. WASA requested that nonsubmission of comments by any participant may be considered as approval from his Department.

Managing Director, Faisalabad WASA gave concluding remarks and thanked to all participants for their attendance of TC meeting.

The participants thanked the chair for inviting them in such a good and informative meeting and promised to forward comments, if any, by 27th of July,2016.

MUHAMMAD HAFEEZ
CHAIRMAN PIU
DIRECTOR (WATERRESOURCES)
WASA, FAISALABAD

C.C to:-

1. Mr. Shigeyuki Matsumoto JICA HQ
2. Mr. Satoshi Hamano JICA Islamabad Pakistan
3. Mr. Takashi Hoshino JICA Mission
4. Mr. Harutoshi Uchida JICA Mission
5. Deputy Managing Director (Engg) WASA, Faisalabad.
6. Senior Chief (UD)P&DD Punjab
7. Ch. Muhammad Asghar S.E LCC Circle Irrigation Department, Faisalabad
8. MrYaqoob Khan, Director Development, Commissioner office Faisalabad
9. Mr. Shoukat Hayat District Officer EPA, Faisalabad.
10. Mr. Dawood Makki, Manager Operations, Faisalabad Waste Management Company
11. Mr. Mubashar Ahmad Cheema Water Specialist AlJazari Academy Urban Unit Lahore
12. Deputy Secretary (UD) HUD & PHE Department
13. Mr. Saeed Ahmad DDO (P), DCO Office, Faisalabad
14. SO to Managing Director WASA, Faisalabad.
15. PIU WASA, Faisalabad.

MINUTES OF MEETING
OF
THE JOINT COORDINATION COMMITTEE
ON
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

In response to the official request submitted by the WASA, Faisalabad of the Islamic Republic of Pakistan to the P&D Department Punjab for the first Joint Coordination Committee meeting for the Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad, the meeting was held on 22nd August 2016 in Committee Room No.1 of P&D Department, Government of Punjab at 9:30 AM under the Chairmanship of member (SI) Punjab P&D Board to review the progress and to discuss Inception Report.

JICA Pakistan, JICA Mission and Participants from Pakistan confirmed the minutes described in the attached sheets.

Mr. Takashi Hoshino,
JICA Mission (Team Leader)

Mr. Aslam Javed,
Senior Chief (UD)
P&D Department,
Govt. of Punjab

Mr.Syed Zahid Aziz,
Managing Director
WASA,Faisalabad

THE ATTACHED DOCUMENTS

1. Participants of the JCC meeting:

1	Mr. Malik Mukhtar Ahmed	Member SI, P&D Department (in chair)
2	Mr. Aslam Javaid	Senior Chief UD, P&D Department
3	Mr. Syed Zahid Aziz	Managing Director WASA-FDA
4	Mr. Muazam Jameel	Dy. Secretary HUD &PHE
5	Mr. Muhammad Hafeez	Chairman PIU, WASA-FDA
6	Mr. Muhammad Kashif Iqbal	Asst. Chief (ECA-1), P&D
7	Mr. Mustafa Moazam	District Officer (SP), Faisalabad
8	Mr. Sarfraz Ahmed	Planning Officer, P&D
9	Mr. Osama Bin Mallik	Consultant Specialized Health Care
10	Mr. Satoshi Hamano	Rep JICA Pakistan Office
11	Mr. Abrar Khan	Programme Officer JICA Pakistan Office
12	Mr. Takashi Hoshino	JICA Mission (Team Leader)
13	Mr. Harntoshi Uchida	JICA Mission
14	Mr. Makoto Suga	JICA Mission
15	Mr. Kaoru Suzuki	JICA Mission
16	Mr. Hiroshige Takano	JICA Mission
17	Mr. Sultan Azam	JICA Mission
18	Mr. Shuja Haider	JICA Mission

2. **Role of JCC** The Chairman PIU WASA apprised of the participants of previous master plan conducted in 1993 as well as current study, started on 19th July 2016, with the help of JICA technical assistance. The project implementation unit (PIU) has been formed at WASA level and Technical Committee (TC) at Faisalabad level for better coordination with all stake holders and joint coordination committee (JCC) has been formed at Provincial level as per mutual agreement and minutes of meeting signed on 18th November, 2015 between JICA, Punjab Government and Government of Pakistan. The role of JCC is to review the overall progress of project and to support the implementation of master plan.

3. **Summary of Project**. The JICA mission team leader gave a presentation to explain the Project of "water supply, sewerage and drainage master plan for Faisalabad" which included the project background, study area, project scope, project schedule, implementation structure and outcome of the project. The concept of engineering aspects, institutional aspects and pilot activity of water supply were also described by the JICA Mission team leader.

The Senior Chief (UD) commented to incorporate the current discussion of Punjab Government for institutional improvement of the WASA's in to the master plan. Against the comment from Senior Chief (UD), representative of JICA Pakistan replied that the Master Plan should incorporate the discussion of WASA reform in P&D and JICA mission, who includes some experts from water utilities of Japan, is ready to input the discussion on WASA reform based on Japanese experiences.

The Chair commented that the project outcome should be determined in terms of increase in revenue and decrease in O&M costs including energy cost. The JICA mission explained that the goal of profit earning organization can be achieved by improving the service quality first.
The improved services will gain customer satisfaction and willingness to pay, which will eventually increase the revenue. This concept is already incorporated in institutional aspects as virtuous cycle.
The chair commented to incorporate the latest energy efficient technology for electromechanical equipment in the master plan. The JICA mission informed that energy efficiency of existing machinery would also be analyzed in the master plan.
The Deputy Secretary HUD & PHED asked for close coordination with the other stakeholders of the Faisalabad as FDA is also going to start master planning for their area of jurisdiction and close coordination will be beneficial for both. The water supply, sewerage & drainage are not in the scope of FDA master plan however resources shall be optimized with the coordination. The chair asked HUD & PHE department to ensure the resource optimization.

4. Inception Report

The JICA mission presented the inception report for the master plan project and asked the participants for comments. The Managing Director WASA told that the Technical Committee (TC) already approved the Inception Report where opinions of all the local stakeholders were taken into consideration. On the proposal by DS (UD) HUD&PHED, the participants of JCC agreed to approve the inception report based on TCC recommendation.

WATER & SANITATION AGENCY

OFFICE OF THE PROJECT IMPLEMENTATION UNIT
Water Supply, Sewerage And Drainage Master Plan Of Faisalabad

No. / /2017
Dated: /05/2017

Minutes of Technical Committee (TC) meeting-002

The 2nd meeting of Technical Committee was held under the chairmanship of Vice Chairman WASA, FDA at 11:30 hrs on 27th April 2017 in the committee room, WASA main office, Faisalabad. The following attended the meeting.

1	Mr. Irfan Manan	Vice Chairman WASA, FDA (in chair)
2	Mr. Muhammad Hafeez	Project Manager PIU, WASA-FDA
3	Mr. Waseem Ahmed	Deputy Managing Direct Services, WASA-FDA
4	Mr. Ghulam Murtaza	Superintending Engineer LCC (W), Irrigation
5	Mr. Shaukat Hayyat	DO Environment, Faisalabad
6	Miss. Sahreen Altaf	Asst. Chief, P&D Lahore
7	Mr. Khalid Javed	Municipal Officer Infrastructure, MC Fsd
8	Mr. Kamran Attique	Executive Engineer PHED
9	Mr. Zain Mustafa	Water supply specialist, UU Lahore
10	Mr. Adnan Nisar	Direct P&D, WASA-FDA
11	Mr. Shoaib Rasheed	Director R&R, WASA-FDA
12	Mr. Farhan Akram	Dy. Director WD, WASA-FDA
13	Mr. Kamran Raza	Dy. Director WR, WASA-FDA
14	Mr. Farhan Ali	Dy. Director IT, WASA-FDA
15	Mr.Abdul Rauf	Dy. Director Revenue, WASA-FDA
16	Mr. Tasawar Hussain	Asst. Director GIS, WASA-FDA
17	Mr. Omura YOSHIKI	Rep JICA HQ Japan Office
18	Mr. Koji NAKASAIMA	Rep JICA HQ Japan Office
19	Mr. Abrar Khan	Rep JICA Pakistan Office
12	Mr. Takashi HOSHINO	JICA Mission (Team Leader)
13	Mr. Harutoshi UCHIDA	JICA Mission Team
14	Mr. Takao OZAKI	JICA Mission Team
15	Mr. Kaoru SUZUKI	JICA Mission Team
16	Mr. Itsuro MATSUBARA	JICA Mission Team
17	Mr. Tetsuya MURAKAMI	JICA Mission Team
18	Mr. Yudai TADAKI	JICA Mission Team
19	Mr. Pervaiz Iqbal	JICA Mission Team
20	Mr. Sultan Azam	JICA Mission Team
21	Mr. Shujja Haider	JICA Mission Team

The chair welcomed and paid his gratitude to the participants from other Govt Departments. The chair also paid his regards to the people of Japan for continuous support by JICA.

1. Review of Inception Report

The Team Leader JICA Mission Team explained that.

The previous Master Plan for water & sewerage in Faisalabad was prepared in 1976 which was updated in 1993 for 25years.

This study started in July 2016 with technical assistance from JICA. The study area is same as Peri-Urban Structure Plan 2014. The project scope comprises formulation of water Supply, Sewerage & Drainage Master Plan and enhancement of institutional capacity of WASA along with pilot activity. The Master Plan is scheduled to be completed in March 2018 whereas pilot activities will be carried out in 3 selected areas up to March 2019.

The implementation structure for the project includes Joint Coordination Committee headed by Secretary P&D Punjab and Technical Committee headed by MD WASA, FDA. The project will be implemented by Project Implementation Unit which will be supported technically by JICA Project Team.

The outcome of the project includes:

- Strategic water supply, sewerage & drainage improvement plans up to 2038.
- Institutional & Engineering based improvement plans,
- Improvement of services & billing collection through Pilot Activities and Creation of attractive projects for donors.

The JMT and PIU are now focused to formulate practical Master Plan and put the same into practice. So, this plan must be authorized by the Governing body FDA. The Team Leader requested TC member for useful and beneficial advice.

2. Progress of Master Plan

The Team Leader explained that the purpose of the meeting is to have consensus between JMT & TC member on current status and issues. The major findings and issues observed by JMT are as under:

Common Issues:

The laws, regulation and policies for Water Supply & sanitation are present but these are enforced. The regulators must be empowered. The current WASA collection ratio is low. Also, an average household of 12 Marla consumes Rs1500/month in terms of electric pumping of ground water (private well) whereas WASA tariff is only Rs 332/month which means this reveals potential to pay subject to improvement in services and customer satisfaction. Currently WASA depends on subsidy by the Provincial Government for development budget. WASA services collection covers only 43% of its non-development expenditures.

Water Supply:

1. Faisalabad city consist of 2.8 million urban populations and currently it is estimated that 70% of WASA service

area of 251 km² is obtaining water with the total demand of 650,000 m³/day and NRW 33%.

2. The main water resources are exhausting and not being utilized fully due to higher energy costs. WASA needs to improve the efficiencies of facilities with up gradation such as replacement of pumps at Chenab Booster Pumping Station & Terminal Reservoir which is taken up by JICA assistance.
3. The water distribution facilities indicate that the storage capacities (both ground & overhead) are not sufficient. The network also consists of aged AC pipes which needs to be replaced systematically.
4. WASA is mainly relying on ground water .On the other hand, surface water from canals is also limited and the irrigation authorities do not allow more than already committed water from irrigation canals. The other option is river water. The future demand is estimated to be 1,200,000 m³/day and two scenarios are under consideration by JICA Mission Team. For scenario 1, canal water will be taken as source . For scenario 2, Chenab river water will be taken as source.

Sewerage & Drainage:

The on-site sanitation facilities for domestic wastewater are not managed properly due to no de-sledging. In urban areas waste water is conveyed to two irrigation drains which encounter multiple pumping. The sewer system shall consist of deep trunk sewers installed by latest micro-tunneling methods, collective large pumping stations and waste water treatment plants.

The existing treatment plant at Chokera is not fully utilized and needs be enhanced in capacity. Two more treatment plants on Eastern & Western side are being planned. The Project Manager added that the NEQS standard for waste water allows TDS < 3500 for inland water bodies as the treated water will be mixed with flowing water and will be diluted 10 times.

The high TDS in waste water is damaging the irrigation lands at downstream. TDS & toxicity introduced in effluent also damages WASA sewerage system. By restricting the groundwater use and promoting industrial waste water treatment within the industry, the TDS in waste-water can be managed within WHO standards.

The JMT observed that only 7 industries have facility for waste water treatment and all other effluent is discharged untreated..District Officer Environment reported that 163 industries are being shifted out of urban area and further shifting is expected in future Meanwhile WASA shall monitor the effluent quality from industry and information sharing will be alone..

The results of waste water flow rate and quality survey were presented to understand the BOD load from Faisalabad to Pharand & Maduana drains.

Inundation occurs at low lying areas. A map showing inundated areas is prepared based on information of WASA. JMT will study the storm water entrance structure into drains. The storm water is collected partially and conveyed to the sewerage system along with waste water.

The JICA Mission Team recommends developing secondary drainage system such as open drains & road gutters. The study for possibility of storm water usage for groundwater recharge at large facilities shall be carried out.

3. Customer Survey Report

The data for house condition, household income, Service level, customer feedback and suggestions for improvement is collected from 530 domestic and 100 non-domestic consumers. The key features / findings of the consumer survey are:

Domestic

- The average household is 6.83 persons.
- The expenditure on electricity & gas is more than 3000 PKR/month in 69% consumers
- 51% consumers don't know about the water supply timings in their area. 48% consumers reported the water supplied is less than 6 hrs.
- 71% consumers extract water from WASA lines by using pumps.
- More than 45% consumers are willing to pay up to 1500 PKR/month subject to quality services.
- More than 56% consumers experienced sewer pipeline overflowing due to poor drainage in their areas.

Industrial & Commercial

59% consumers are dependent on their own ground water pumps, 18% are using combined source from WASA & groundwater whereas only 8% are fully dependent on WASA water.

4. Pilot Activities

Three pilot areas are selected from Faisalabad city in which it is proposed that the billing collection rate and NRW rate should be improved, and ultimately, revenue situation of WASA-F will be improved. The collection ratio and NRW was 27.6% & 32.9% in FY-2014. For this purpose, three pilot areas having completely different consumer statistics are selected.

To achieve the said goals, water distribution by block system is proposed with sustainable and appropriate management system. The work flow is as under:

- Confirmation of continuous water source & storage capacities

- Preparation of GIS based consumer database & network mapping.
- Confirmation of volumetric flows and determination of leakages & NRW.
- Public awareness campaign to mobilize community for active participation and response.
- Implementation of improved water supply up to 18hrs/24hrs and monitoring the water demands.
- Increased HR input for revenue collection and better customer relationship.
- Introduction of consumer meter and conversion from flat tariff to appropriate metered tariff.
- Monitoring the actual consumptions and NRW.

WASA-F has established SMART-WASA cell to achieve the aforesaid targets.

In the closing remarks of the meeting the Vice Chairman WASA summarized that WASA-F is the first WASA in Punjab to revise its non-domestic tariff autonomously. He further added that consumer awareness campaign is desired so those 100% consumers agree to pay more for improved services which is currently 70% as reported by JMT.
The meeting ended with the vote of thanks from the participants.

MUHAMMAD HAFEEZ
CHAIRMAN PIU
DIRECTOR (WATER RESOURCES)
WASA, FAISALABAD

C.C to:

1. Mr. Satoshi Hamano JICA Islamabad Pakistan
2. Mr.Takashi Hoshino, JICA Mission Team Leader
3. Mr. Harutoshi Uchida JICA Mission
4. Deputy Managing Director (Engg) WASA ,Faisalabad
5. Senior Chief (UD), P&D Department, Government of Punjab, Lahore
6. Ch. Muhammad Asghar S.E LCC Circle Irrigation Department, Faisalabad
7. Mr. Shoukat Hayat District Officer EPA, Faisalabad
8. Mr. Dawood Makki, Manager Operations, Faisalabad Waste Management Company.
9. Mr. Mubashar Ahmad Cheema Water Specialist AlJazari Academy Urban Unit Lahore
10. Deputy Secretary (UD) HUD & PHE Department
11. Mr. Saeed Ahmad DDO (P), DCO Office Faisalabad
12. S.O. to Managing Director WASA, Faisalabad
13. PIU WASA, Faisalabad
14. Mr. Okomura JICA HQ

MUHAMMAD HAFEEZ
CHAIRMAN PIU
DIRECTOR (WATER RESOURCES)
WASA, FAISALABAD

WATER & SANITATION AGENCY

OFFICE OF THE PROJECT IMPLEMENTATION UNIT

Water Supply, Sewerage and Drainage Master Plan of Faisalabad

No.S-18 / /2017
Dated: 22/06/2017

MINUTES OF JOINT COORDINATION COMMITTEE (JCC) MEETING-002

The 2nd meeting of Joint Coordination Committee was held under the chairmanship of Member Social Infra Structure (SI) at 15:00 hrs on 28th April 2017 in the committee room-I, P&D Lahore. The following attended the meeting.

1	Mr. Mahmood Hassan	Member Social Infrastructure, P&D Punjab (in chair)
2	Mr. Muhammad Imran	Chief UD, P&D Punjab
3	Mr. Moazzam Jamil	Deputy Secretary UD, HUD & PHED
4	Mr. Zahid Aziz	Managing Director, WASA-F
5	Mr. Jabbar Anwar	M&E expert, HUD & PHED
6	Mr. Muhammad Hafeez	Project Manager PIU, WASA-F
7	Mr. Roohan Javed	Director I&C, WASA-F
8	Mr. Muhammad Azhar Iqbal	Deputy Director TT, Environment
9	Mr. Zia Mustafa	Water specialist, Urban Unit Punjab
10	Mr. Muhammad Kashif Iqbal	Assistant Chief ECA, P&D Punjab
11	Mr. Saeed Ahmed	Deputy Director Development, Faisalabad
12	Mr. Yosuhiro TOJO	Chief Representative, JICA Pakistan
13	Mr. Omura YOSHIKI	Senior Advisor, JICA HQ Japan
14	Mr. Koji NAKASAIMA	Rep JICA HQ Japan
15	Mr. Ken OKUMURA	Representative JICA Pakistan
16	Mr. Mahmood Jillani	Special Advisor, JICA Pakistan
17	Mr. Takashi HOSHINO	JICA Mission Team (Team Leader)
18	Mr. Harutoshi UCHIDA	JICA Mission Team
19	Mr. Yudai TADAKI	JICA Mission Team
20	Mr. Sultan Azam	JICA Mission Team
21	Mr. Shujja Haider	JICA Mission Team

The chair welcomed the participants JICA Mission Team. The JMT presented and distributed 10 copies of the progress report & pilot activity to the participants which were accepted with the discussion as below:-

1. Opening Remarks

The Managing Director explained the purpose and background of Master Planning in WASA Faisalabad. He informed that first master plan was prepared in 1976 which was updated in 1993 for the planning horizon of 25 years. Now with the technical assistance of JICA, the updating of master plan for next 25 years is started.

Moreover, pilot activity projects in three areas will be carried out.

2. Review of Inception Report

The Team Leader summarized that the fresh study for Master Planning of water, sewerage and drainage in Faisalabad started on 19th July 2016 with technical assistance of JICA. To formulate a practical master plan and put it into practice, the master plan to be

3. **Progress of Master Plan Project**

prepared shall be authorized by Governing Body of FDA.

The team leader JMT explained that the purpose of the meeting is to have consensus between JMT and JCC members on current status, issues and future strategies. The master planning progress is described as under regarding Water supply, Sewerage and Drainage.

General:

Currently WASA consumers are using both WASA piped water and ground water. The consumers are consuming more electricity for pumping of ground water resulting in high FESCO payments. The average cost of electricity for operation of ground water pumps is 1500 PKR/month and WASA tariff for typical 12 marla house is 332PKR/month. WASA water supply is therefore very cheap source as compared to other options, so the consumers have potential for paying more to WASA subject to improved service delivery. The same is reflected in JMT consumer survey report.

Financially WASA is depending on subsidy from Government of the Punjab. Chair inquired about the amount of subsidy from GOP. The Managing Director WASA informed that approximately PKR 262 million is provided to WASA annually as a subsidy since year 2011.

Water Supply:

The problem analysis for water supply was explained diagrammatically. It was apprised that domestic water supply system is facing issues of low pressure. For future strategies, JMT has proposed water distribution management using block system (isolated area) to provide sufficient & safe water at proper pressure using ground reservoirs and overhead reservoirs.

The existing groundwater source of Chenab well field is facing issue of drawdown. The surface water from canals has limitations of volume regarding agriculture use by Irrigation Department. The canal water is not available for 20-30 days during annual canal closure. The JMT is studying two scenarios for future water sources as under:

Scenario-I: New water sources from irrigation canal

Scenario-II: New water sources from irrigation canals as per irrigation department commitment & from Chenab River

According to the calculations by JMT, the additional water sources of 200 cusec or more will be required up to year 2038. The chair commented that like WASA, irrigation department is also part of GOP so the priority sector for canal water can be decided by GOP at later stages. However, the JMT shall take into account sustainable water sources and deterioration of existing water sources.

Sewerage & Drainage:

The problem analysis was explained by co-team leader JMT. The cause of low capacity and aging sewer pipes were analyzed.

JMT is also considering to use storm water as water source.

The Chair asked about viability of RO technology for drinking purpose. The co-team leader JMT told that this process is very costly and is not sustainable.

The chair asked to study the issues with water supply sources and their sustainability. The Chief Representative JICA Pakistan briefed that this study is already in their program

The meeting ended with the vote of thanks from the chair and participants

MUHAMMAD HAFEEZ
CHAIRMAN PIU
DIRECTOR (WATER RESOURCES)
WASA, FAISALABAD

C.C to

1. The Secretary HUD&PHE Department, Government of the Punjab, Lahore
2. The Secretary Finance Department, Government of the Punjab, Lahore
3. The Secretary Irrigation Department, Government of the Punjab, Lahore
4. The C.E.O. Urban Unit, Lahore
5. Senior Chief (UD), P&D Department, Government of Punjab, Lahore
6. The Director General, FDA, Faisalabad
7. The Director General, Environment Protection Agency, Punjab, Lahore
8. P.S. to Secretary (P&D) Department, Government of Punjab, Lahore
9. Assistant Chief (ECA-I), P&D Department, Government of Punjab, Lahore
10. P.S. to Member (SI), P&D Board, Government of Punjab, Lahore
11. P.S. to District Coordination Officer, Faisalabad
12. S.O. to Managing Director WASA, Faisalabad
13. Mr.Abrar Khan, JICA Pakistan Office
14. Mr.Takashi Hoshino, JICA Mission Team Leader

MUHAMMAD HAFEEZ
CHAIRMAN PIU
DIRECTOR (WATER RESOURCES)
WASA, FAISALABAD

WATER & SANITATION AGENCY

OFFICE OF THE PROJECT IMPLEMENTATION UNIT
Water supply, sewerage and drainage master plan of Faisalabad

No. 13A /2018
Dated: 05/01/2018

Minutes of 3rd Technical Committee on The Project for Water Supply, Sewerage and Drainage Masterplan of Faisalabad

The 3rd meeting of Technical Committee was held on 16th Nov 2017 in the committee room, WASA main office, Faisalabad under the chairmanship of MD WASA, Faisalabad.
The chair welcomed and paid his gratitude to the participants from other Govt Departments. The chair also paid his regards to the people of Japan for continuous support by JICA. The JMT presented and distributed ten copies of progress report and pilot activity report to the participants which is accepted and discussed as below:

No	Agenda	Discussion & Decision
1	Water supply Planning	The JICA Mission Team Leader explained water supply planning as under: The water supply services for consumer are available for 6-7 hrs/day. The ground water sources are depleting and weak management of distribution network causing poor customer satisfaction levels ultimately resulting in low tariff income. The water demand plan revealed that 1,252,000 m³/day will be required in 2038. The JMT deeply studied all options for securing water sources and concluded to use canals as major water source in their planning. The raw water requirement is below 5% of total canal flow and relatively cheaper than construction of a dam on Chenab River. For proper management of water distribution network, 7 zones with respect to water source shall be created. New water distribution zones with 56 new distribution centers comprising ground tank and overhead tank are planned. Each distribution center along with network is hydraulically isolated. The higher service levels will improve the tariff income and financial situation of WASA-F. The water supply plan shall be implemented in 4 phases with 5 years in each phase. The estimated construction cost is 101 billion PKR.
2	Sewerage Planning	The Deputy Team Leader JMT shared the results of pollution load analysis and water quality survey. The BOD load of Paharang and Maduana drain is currently 299 mg/l and 330 mg/l respectively. The study reveals that reduction in emission of industrial pollutions or Industrial wastewater treatment is necessary to restrain the pollution. Two new domestic wastewater treatment plants with capacity of 95MGD each with implementation of WASA & environmental regulations for industrial wastewater are planned. The treated water can be utilized for irrigation purposes. The planning basis of wastewater & stormwater conveyance system is outlined. The basic concept is to use deeper trunk sewers conveying sewage from various pumping station to treatment plants. Instead of using peak factors for flow calculations, the JMT proposed capacity

		allowance based on pipe diameters. The routes and levels of trunk sewers are under study. The technical and financial comparison for domestic wastewater treatment processes is carried out and the most suitable options are recommended however keeping in view the change in situation, WASA can adopt other options for implementation.
3	Financial & Business Planning	The JMT Finance team member presented the WASA-F financial analysis and forecast based on service level and customer categories data for last 7 years. Currently the operational cost does not meet the revenue generated from water supply consumers. Based on master plan area, the forecast population will be 3 times more resulting further increase in operational cost so, increase in tariff is inevitable to meet the expenses. Low recovery rate indicates accumulation of arrears which is a hidden treasure in future which have reached to 3.2 billion in 2017. The focus for financial improvement revolves around arrears recovery and increase in payee ratio. Recommendations for improved financial management and revenue were also proposed. The JMT team leader presented outline of business plan for the next 5 years to implement requirement of master plan and pilot project. The basic concept includes better service for customers and improvement in financial conditions. The relationship between master plan and new business plan for 5 years include • Water vision • 5 goals of water service improvement, Sewerage and drainage service improvement, financial stability, human resource development, customer relation. • Activities for how to implement the changes for the overall improvement Detail primary objectives for each goal were presented separately as in the end the overview of master plan top objectives were presented with the context of new business plan.

In the closing remarks of the meeting the Managing Director WASA praised all the stake holders for active participation in formulation of masterplan and anticipated valuable feedback and comments.
The meeting ended with the vote of thanks from the participants.

(Adnan Nisar Khan)
Manager PIU / Director P&D
Water & Sanitation Agency
Faisalabad.

CC:

- All participants of the meeting

MINUTES OF MEETING
OF
THE 3rd JOINT COORDINATION COMMITTEE ON
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

In response to the official request submitted by the WASA, Faisalabad of the Islamic Republic of Pakistan to the P&D Department Government of Punjab for the 3rd Joint Coordination committee meeting for the Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad, the meeting was held on 20th November 2017 at 03:00 PM in Committee Room No.1 of P&D Department Chairmanship of Secretary P&D Department to review the progress and to discuss inception Report submitted by JICA mission.

1.	**Status of the Project**	The JICA Mission Team leader Mr. Hoshino apprised the participants about the current status of the project is almost completed in terms of data collection and planning
2.	**Water Supply**	JMT proposed various phased projects along with cost estimations, covering the demand-supply gap of Water Resources in Faisalabad. JMT also compared two scenarios as sources for water intake in future which are canals and river Chenab respectively. Scenario I was selected for the study of this master plan since the scenario is more feasible and economical.
3.	**Sewerage & Drainage**	JMT Co-Team leader Dr. Uchida apprised the participants about the water quality projections at inlets and outlets of Faisalabad under three scenarios. The participants understood that pollution load of the industrial wastewater is much larger than that of the municipal wastewater load. Therefore adequate industrial wastewater treatment meeting the National Environmental Quality Standards (NEQS) was indispensable for the water quality improvement. He also proposed the sewerage planning bases and the facility plan, which are formulated aiming the treated wastewater to be used as irrigation water.

4.	**Financial & Accounting Analysis**	The last presentation was from Mr. Yasir, Finance Expert from JMT in which he appraised the pattern on which revenue, tariff and service delivery has increased during the last year in F-WASA. The Chair appreciated the efforts of present WASA management for uplifting revenue/recovery and asked to continue efforts to enhance it further to minimize revenue-expenditure gap for the sustainability of the Agency.
5.	**Interim Report**	JMT shared interim report for the project and asked for comments on it from the participants

In the closing remarks, the Chair asked about few queries to be addressed by WASA as follows.

i. To intimate and get response from Irrigation Department in writing about the interim report.

ii. Request Urban Unit to assess how much water has been saved by Urban settlement during last decade.

iii. To confirm the validity from Irrigation Department about the MoU signed between WASA & Irrigation Department for water rights 1953 for utilization of canal water of 10 cusecs at old Jhal water works.

iv. To look forward for WASA's reform and capacity building as well as facility development.

The meeting ended with a vote of thanks by the Chair.

Mr. Takashi Hoshino
Team Leader,
JICA Mission

Mr. Adnan Nisar Khan
Director (P&D)
WASA, Faisalabad

84/MD
29-01-2018

Mr. Faqir Muhammad Chaudhry
Managing Director,
WASA, Faisalabad

CC:
- All participants of the meeting

MINUTES OF THE 4th TECHNICAL COMMITTEE MEETING ON THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

The 4th Technical Committee Meeting was held on 17th Oct 2018 in the committee room, WASA main office, Faisalabad under the chairmanship of MD WASA, Faisalabad.

The chair welcomed and paid his gratitude to the participants from other Govt Departments. The chair also paid his regards to the continuous support by JICA. The chair briefly explained the participants about the history of WASA-F master planning and anticipated an active role of all service delivery departments in improving the life standard of the people after implementation of this Master Plan.

The JICA Mission Team shared the finding/results of Draft Final Report on masterplan as under:

1.	**Project Outline**	The Team Leader, JMT apprised the participants about the history, schedule and current status of the project. The Team Leader also explained about the planning basis, planning area, concept and goals of Master Plan.
2.	***Water Supply Masterplan***	The findings of JMT revealed that improvement of water supply in terms of quantity, pressure and quality is the main goal of water supply masterplan. To achieve the goals, securement and enhancement of multiple water sources is required. Keeping in view the current scenarios, the JMT proposed various water sources mainly from JBC, RBC and GBC irrigation canals. The distribution network shall be modified to hydraulically isolated areas served by distribution center. The distribution centers comprise storage facilities such as ground and overhead reservoirs. The phased implementation program with financial simulation was explained to the participants. The current water supply tariff of WASA-F is very low as

compared to the other countries so operation cost cannot be covered. Financial support in shape of subsidy till the improvement of services and rationalization of tariff is required for financial sustainability of public service provider organization.

3. *Sewerage & Drainage*

The Deputy Team Leader apprised the participants about sewerage and drainage Master Plan. The sewerage masterplan consists of various tertiary, main and trunk sewers for existing and expanded service area. The JMT also proposed intercepting sewers and diversion chambers for dry weather and storm flows. Keeping in view the water quality improvement in public water bodies the JMT proposed enforcement of regulations and treatment of wastewater by treatment plants. The sewerage plans along with its cost estimation and financial simulations to recover capital and operational expenditures by rationalization of tariff/enhancement of subsidy were also shared. The results of simulation revealed that sewerage tariff shall be higher than the water tariff.

4. *WASA's Reform Plans*

The Team leader JMT explained WASA's Reform Plans in order to implement the recommendation of Master Plan study. The proposed reforms included Operation & Management Reforms, Financial Reforms, Organizational Reforms and Human Resource Development. The JMT proposed to develop 5-year business plans with targets outputs and outcomes. Financial reform plan proposed change in includes accounting system with separation of water supply, sewerage and drainage accounts. Organizational reforms consist of formation of decision-making management at DMD level and separation of water and sewerage DMD. The human

resource development and management plans shall utilize SOP's and OJT's.

5. ***Draft Final Report*** — JMT submitted Draft Final Report for the Master Plan together with Progress Report #3 for pilot activity to WASA which will be conveyed to the stakeholders. The participants were requested to convey the comments and feedback till 20th Nov.

In the closing remarks, the Chair thanked all the participants. He also appreciated JICA HQ officials for their efforts on preparation of Master Plan study report.

Takshi HOSHINO
Team Leader
JICA Master Plan Team

Adnan Nisar Khan
Manager PIU/ Director (I&C)
WASA, Faisalabad

D/A
List of participants

CC:
All participants of the meeting

No. 275/D(13C)/WASA
Dated: 1-12-2018

4th Technical Committee meeting for The Project of Water Supply, Sewerage and Drainage Masterplan of Faisalabad.

List of Participants

Dated 17th Oct 2018 at 12:00 PM in WASA Faisalabad.

No	Name	Department	Designation
1	Faqir Muhammad Ch.	WASA-F	Managing Director
2	Waseem Ahmed	WASA-F	DMD Services
3	Jabbar Anwer Chaudhary	WASA-F	DMD Administration
4	Asghar Ali	FDA	Chief Engineer
5	Muhammad Javed	Osmani & Co Pvt Ltd.	Design Engineer
6	Mubushar Hussain	Osmani & Co Pvt Ltd.	GM Urban Planning
7	Asma Mohsin	FDA	Director Town Planning-I
8	Ghulam Murtaza	Punjab Irrigation Dept	Superintending Engineer (W)
9	Muhammad Saleem	Punjab Irrigation Dept	Superintending Engineer (E)
10	Moeen ud Din	Punjab Irrigation Dept	XEM Hafizabad
11	Muhammad Asad Khan	Municipal Corporation Fsd	MO Services
12	Roman Sahar	Municipal Corporation Fsd	Engineer
13	Huzaifa Jalil	FWMC	AD Landfill
14	Raheel Zafar	FDA	AD Town Planning
15	Dr. Ahmed Khan	Punjab Health Dept	Deputy District Officer
16	Mubasher Cheema	The Urban Unit	Technical specialist
17	Asif Niazi	PHATA Faisalabad	D.D.T.P.
18	Ijaz Ali	WASA-F	Director P&D
19	Shoaib Rasheed	WASA-F	Director Revenue
20	Adnan Nisar	WASA-F	Director I&C
21	Shahyar Hassan	WASA-F	DD Revenue
22	Samreen Ashraf	WASA-F	AD GIS
23	Farhat Abida	WASA-F	SRO
24	M. Farhan Akram	WASA-F	DD WDM
25	M. Farhan Ali	WASA-F	DD IT
26	Azher Aziz	WASA-F	PRO
27	Makoto IWASE	Global Environmental Department, JICA HQ	Director
28	Hironobu NAKAYAMA	Global Environmental Department, JICA HQ	Technical Advisor
29	Takashi HOSHINO	Nihon Suido Consultants (JMT)	Team Leader
30	Harutoshi UCHIDA	Nihon Suido Consultants (JMT)	Co-Team Leader
31	SAKAI Takeshi	Nihon Suido Consultants (JMT)	Team Member
32	Kazuho UJIIE	JICA-Pakistan	Representative
33	Sultan Azam	JICA Masterplan Team	Team Member (local)
34	Muhammad Abrar Khan	JICA- Paksiatan	In charge Water & Disaster Management
35	Shujja Haider	JMT	Project Coordinator

MINUTES OF MEETING
ON
DRAFT FINAL REPORT MISSION
FOR
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

The Japan International Cooperation Agency (hereinafter referred to as "JICA") through its Pakistan Office and the authorities concerned of the Government of Punjab Province (hereinafter referred to as "GOPb") exchanged the Record of Discussions (hereinafter referred to as the "R/D") and the Minutes of the Meetings (hereinafter referred to as the "M/M") on Japanese Technical Cooperation for the Project for Water Supply, Sewerage and Drainage Master Plan of Faisalabad (hereinafter referred to as "the Project") on 3rd March 2016 and 18th November, 2015 respectively. Based on the R/D and M/M, JICA has established and dispatched a consultant team for the Project (hereinafter referred to as the "JMT") to Faisalabad, and carried out the Project since the middle of July 2016.

At the end of the Master Plan (hereinafter referred to as the "M/P") preparation, JICA dispatch Draft Final Report Mission (hereinafter referred to as the "JICA DFR Mission") with JMT from 13th October to 20th October, 2018 to have a meeting with Water and Sanitation Agency, Faisalabad (hereinafter referred to as the "WASA-F") and other stakeholders. To explain and discuss the contents of the DFR, the Technical Committee meeting held on 17th October, 2018, and after discussions, the DFR was accepted by Pakistan side in principle.

WASA-F, JMT and JICA DFR mission had a series of separate meeting to discuss about regarding the contents of the DFR, and the main points discussed during the meeting are as Attached Document.

Faisalabad on 18th October, 2018

Mr. Takashi Hoshino
Team Leader
JICA Mission Team
Nihon Suido Consultants Co., Ltd

Mr. Adnan Nisar Khan
Project Director of the Project
Water and Sanitation Agency, Faisalabad

Witnessed by:

Mr. Makoto Iwase
Leader
Draft Final Report Mission
Japan International Cooperation Agency

18.10.2018

Mr. Faqir Muhammad Chaudhry
Managing Director
Water and Sanitation Agency, Faisalabad

The Attached Document

Main points are as follows.

1. Comments on the DFR

The JMT requested that the Pakistan side shall send comments on the DFR to the JMT on or before 20th November, 2018 if any, and the Pakistan side agreed on it. The JICA confirmed that, based on the comments, the JMT will finalize the report as the Final Report of the M/P, and JICA will submit the Final Report by the end of March, 2019 to WASA-F.

2. Approval of the M/P

Both sides confirmed that Faisalabad Development Authority (FDA) has right to approve the M/P as official development plan, the FDA Governing body will approve the FR and will finally be submitted to Secretary Housing and Urban Development Department (HUD) & Public Health Engineering Department (PHED) of the GOPb for endorsement. The JMT requested WASA-F to facilitate the endorsement procedure of the M/P in the GOPb, and WASA-F agreed on it.

3. Acquirement of Water Rights

The JMT proposed that the future water source should be shifted from ground water, which contains high TDS, to surface water (i.e. irrigation canals), which is relatively safe sources, in the M/P. In this point, the arrangements of the water allocation from irrigation canals (Jhang Branch Canal, Rakh Branch Canal, and Gugera Branch Canal) between WASA-F and Irrigation Department are necessary. The WASA-F confirmed that WASA-F and Irrigation Department continuously discuss this issue based on the M/P.

4. Implementation of Priority Project

WASA-F requested to JICA to implement a grant aid project in the Priority Project listed of the M/P. JICA informed that JICA planned to dispatch a preparatory survey team for Renewal of OLD JK WTP Phase1, one of the Priority Project, to Faisalabad on March, 2019. JICA also explained WASA-F about necessary documents and schedule, such as official request and PC-1 before September 2019 for implementing the project.

5. Coordination of Pilot Project

JMT pointed out that a World Bank project to be carried out for a NRW reduction contains a pilot area, Sitara Sapna City, selected in the Project. WASA-F explained that it is not sure when the World Bank project can start, so WASA-F requested JMT to continue the pilot activities in Sitara Sapna City. For securing sufficient water pressure in the Sitara Sapna City for implementing the pilot activities, JMT requested WASA-F to conduct some works, such as ground reservoir construction with pumping facilities, water meter installations, and DMA establishment until February, 2019 and to take over and continue the activities after the end of the Project on March, 2019. WASA-F agreed on it.

(End)

MINUTES OF MEETING
OF
THE JOINT COORDINATION COMMITTEE
ON
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

In response to the official request submitted by the WASA, Faisalabad of the Islamic Republic of Pakistan to the P&D Department Punjab for the fourth Joint Coordination Committee Meeting for the Project "Water Supply, Sewerage and Drainage Master Plan of Faisalabad", the meeting was held on 19th October 2018 in Committee Room of P&D Department, Government of Punjab at 10:00 AM under the Chairmanship of Secretary P&D Department to review the progress and to discuss Draft Final Report submitted by JICA Mission Team (JMT).

Managing Director, WASA Faisalabad briefed about the project and history of water supply, sewerage & drainage master plans developed for Faisalabad City. He stated that the Consultants have completed Master Plan study & submitted Draft Final Report for its review/discussion. The Final Report will be submitted in March 2019.

The following agenda points were discussed as below: -

1.	**Status of the Project**	Mr. Hoshino, Team Leader, JICA Mission apprised the participants about the current status of the project. The project on M/P formulation is now in completion stage and Draft Final Report is being submitted to the JCC participants for its review, so that the comments from the participants will be incorporated in Final Report.
2.	**Water Supply**	JMT proposed various phased projects along with cost estimation. Covering the demand-supply gap of Water Resources in Faisalabad. The Team Leader JMT described the future water supply projects and explained different simulations for implementation of Master Plan which includes improvement of service delivery, rationalization of tariff / enhancement of subsidy to enable WASA-F cover its operational expenditures and financial sustainability in long run.
3.	**Sewerage & Drainage**	Mr. Uchida, JMT Co-Team leader apprised the participants about wastewater and storm water solutions by the proposed sewerage and drainage plans. He also discussed about the water quality improvement in public water bodies by the sewerage and industrial sector interventions to satisfy the National Environment and Quality Standards. The sewerage plans along with its cost estimation and financial simulations to recover capital and operational

expenditures by rationalization of tariff / enhancement of subsidy, were also shared.

4.	**WASA's Reform Plans**	Mr. Hoshino, Team leader JMT explained WASA's Reform Plans in order to implement the recommendation of Master Plan study. The proposed reforms included Human Resource Development, Organizational, Financial and Operational & Management.
5.	**Draft Final Report**	JMT submitted Draft Final Report for the project and asked for comments on it from the participants.

In the closing remarks, the Chair thanked the JICA mission for their continuous support especially in Water & Sanitation sector in Faisalabad/Punjab. He also appreciated the efforts of JMT on preparation of Master Plan study report. He asked Managing Director WASA to arrange a meeting in Faisalabad with participation from Government and Private sectors and discuss with them the findings of Master Plan study for its smooth implementation. He committed that P&D/GoPb will extend full support in implementation of the updated water supply, sewerage & drainage Master Plan of Faisalabad City. He suggested that the reform plan proposed by JMT for WASA Faisalabad can be replicated in all five WASAs of Punjab for sustainability of water supply agencies. He proposed that JMT should also explore options for making WASA into a self-sustained business model entity.

The meeting ended with a vote of thanks by the Chair.

No. 225/D(ISC)/WASA
Dated: 25-10-2018

Takashi Hoshino
(Team Leader)
JICA Mission

Adnan Nisar Khan
Director (I&C)
WASA, Faisalabad

Yasir Mubeen
Chief (UD)
P&D Department
Govt. of the Punjab, Lahore

D/A
List of participants

CC:

- All participants of the meeting

4th Joint Coordination Committee meeting for The Project of Water Supply, Sewerage and Drainage Masterplan of Faisalabad.

List of Participants

Dated 19th Oct 2018 at 10:00 AM in DR-I P&D Lahore.

No	Name	Department	Designation
1	Iftikhar Sahoo (In Chair)	P&D Punjab	Secretary P&D
2	Yasir Mubeen	P&D Punjab	Chief UD
3	Faqir Muhammad Ch.	WASA-F	Managing Director
4	Adnan Nisar	WASA-F	Director I&C
5	Asghar ali	FDA	Chief Engineer
6	Jabbar Anwer	WASA-F	Deputy Managing Director F&I
7	Muhammad Saleem	Punjab Irrigation	Superintending Engineer LCC (East) Faisalabad
8	Abdul Gaffar Naveed	WASA-F	Deputy Director P&D
9	Mubasher Cheema	Urban Unit	Specialist
10	Mehar Ayub	FDA	Deputy Director Urban Development-I
11	Zeeshan Anwer	P&D Punjab	Assistant Chief UD
12	Makoto IWASE	Global Environmental Department, JICA HQ	Director
13	Hironobu NAKAYAMA	Global Environmental Department, JICA HQ	Technical Advisor
14	Takashi HOSHINO	Nihon Suido Consultants (JMT)	Team Leader
15	Harutoshi UCHIDA	Nihon Suido Consultants (JMT)	Co-Team Leader
16	SAKAI Takeshi	Nihon Suido Consultants (JMT)	Team Member
17	Sultan Azam	JICA Masterplan Team	Team Member (local)
18	Muhammad Abrar Khan	JICA- Paksiatan	In charge Water & Disaster Management
19	Kazuho UJIIE	JICA-Pakistan	Representative

MINUTES OF MEETING
FOR
COORDINATION MEETING WITH PUBLIC AND INDUSTRIAL REPRESENTATIVES
ON
THE PROJECT FOR WATER SUPPLY, SEWERAGE AND DRAINAGE MASTER PLAN OF FAISALABAD

In compliance to the instruction by Secretary P&D during 4th JCC meeting, a coordination meeting with public and industrial representatives was arranged under the Chairmanship of Commissioner Faisalabad on 26th Oct 2018 in the committee room of Commissioner Office to share concepts and ideas of Draft Final Report .

The Chair welcomed all the participants and the meeting proceeded as under:

1. **Water Supply Masterplan** — The JMT Team Leader shared the basic concept of water supply planning and proposed various phased projects along with cost estimation to achieve the targets of planning horizon 2038. He explained different financial simulations for implementation of Master Plan which includes temporarily enhancement of subsidy, improvement of service and rationalization of tariff to enable WASA-F cover its operational expenditures and financial sustainability in long run. The Chairman APTPMA asked about the industrial water demand consideration in the masterplan. WASA-F officials told that 30% of domestic water demand is considered in the planning area. The industrial zones are outside the planning area and the water demand for these zone shall be taken into account in the planning of respective Industrial zone. The President FCCI asked about availability/provision of water in irrigation canals for drinking purposes as the country is facing acute shortage of water. WASA-F told that in future, WASA-F will exchange treated wastewater as per NEQS against canal water with irrigation department. However, the simultaneous closure for all three canals i-e JBC, RBC & GBC must be negotiated with the concerned authorities in accordance with the storage facilities constructed/planned at water treatment plants.

2. **Pilot Activity & Priority Project** — The Team Leader explained the results and experience learnt from the pilot activities conducted in pilot area of Sarfraz colony. The same concept will be replicated for whole city in the Masterplan. JICA has showed interest for investment as grant-in-aid for one project termed as Priority Project of Masterplan. The plan consists of rehabilitation of Old Jhal WTP, construction of new Distribution Centers and laying of Transmission Main & Distribution Main pipes. The participants appreciated &

thanked for the efforts and support provided by JICA and People of Japan.

3. **Sewerage & Drainage** — Mr. Uchida, JMT Co-Team leader apprised the participants about wastewater and storm water solutions by the proposed sewerage and drainage plans. He also discussed about the water quality improvement in public water bodies by the sewerage and industrial sector interventions to satisfy the National Environment and Quality Standards. The Chairman APTPMA responded that most of the industrial units are scheduled to be shifted inside the industrial area in future. The sewerage plans along with its cost estimation and financial simulations to recover capital and operational expenditures by rationalization of tariff were also shared.

4. **Draft Final Report** — JMT submitted 5 copies of Draft Final Report to the participants for further comments and feedback.

In the closing remarks, the Chair thanked the JICA mission for their continuous support especially in Water & Sanitation sector in Faisalabad/Punjab.

The meeting ended with a vote of thanks by the Chair.

D/A
List of participants

Adnan Nisar Khan
Director (I&C)
WASA, Faisalabad

No. 228 **/D(I&C)/WASA** **Dated:** 29-10-2018

CC:

- The Chief UD, P&D Punjab.
- SO to MD WASA-Faisalabad.
- All participants of the meeting.

Coordination Committee meeting with Public & Industrial representatives on The Project of Water Supply, Sewerage and Drainage Masterplan of Faisalabad.

List of Participants

Dated 26th Oct 2018 at 11:00 AM in Committee Room, Commissioner Office, Faisalabad.

No	Name	Department	Designation
1	Mr. Asif Iqbal (In Chair)	---	Commissioner Faisalabad
2	Mr. Syed Ahmed Fawad	---	Deputy Commissioner Faisalabad
3	Mr. Shakeel Shahid	---	MPA PP-111
3	Mr. Dr. Asad Moazam	FDA	Chairman FDA
4	Mr. Aamir Aziz	FDA	Director General
5	Ms. Asma Mohsin	FDA	Director Town Planning-I
6	Mr. Rizwan Ashraf	APTPMA	Chairman
7	Mr. Syed Zian Alumdar	FCCI	President
8	Mr. Zubair Ansari	APTPMA	General Secretary
9	Mr. Mian Nabeel	---	Representative of MNA-108
10	Mr. Jabbar Anwer	WASA-F	Deputy Managing Director F&I
11	Mr. Adnan Nisar	WASA-F	Director I&C
12	Mr. Shoaib Rasheed	WASA-F	Director R&R
13	Mr. Abdul Gaffar	WASA-F	Deputy Direct P&D
14	Mr. Abdul Rauf	WASA-F	Deputy Director Fianance
15	Mr. Takashi HOSHINO	Nihon Suido Consultants (JMT)	Team Leader
16	Mr. Harutoshi UCHIDA	Nihon Suido Consultants (JMT)	Co-Team Leader
17	Mr. Sultan Azam	JICA Masterplan Team	Team Member (local)

APPENDIX FOR CHAPTER A2 DESCRIPTION OF THE STUDY AREA

AA2.1 Questionnaire for Customer Survey (Interview Survey)

Serial No.:

HOUSEHOLD

Date : ____/____, 2016, Time : ____:____PM / AM

A. Basic Information

1. Name of Surveyor _____/_____
2. Survey Area _____ 3. Address _____
   Parcel No_____
4. Name of Respondent _____

a. Male	b. Female

5. Respondent's status in the family

a. Head of household	b. Housewife	c. Retired Elderly
c. A child of the Head	d. Others (specify,)	

6. Respondent's age (years old)
7. Family Members (a. Total ___persons, b. Adult men __persons,
   c. Adult women ___persons, d. children (<13 years old) ___persons)
8. Total Earning Members _____
9. Type of Dwelling

a. Concrete(Pacca)	b. Bricks(Semi Pacca)	c. Tin-shed
c. Special material	d. Others (specify,)	

B. Water Supply

10. How do you obtain water for your daily household use? Check from items below (multiple answers allowed);

a. WASA	b. Electric Pump
c. Other material Pump	d. Other (specify_____)

11. How many days a week WASA water supplied to your house?

a. 7 days	b. 6 days	
c. 5 days	d. 4 days	e. No water available

12. How many hours WASA water supplied to your house?

a. less than 2 hours	b. less than 4 hours	
c. less than 6 hours	d. less than 12 hours	e. Up to 12 hours

13. Does your house have a water tank for WASA water or ground water ?

a. Yes for WASA water or Groundwater	b. No

If "Yes", check the storage tank type from the listed below (multiple answers allowed), it's capacity, and how many times the tank is filled fully per day ?

a. Under ground _____gallon,___times/day	b. Overhead _____gallons, __times/day
c. Other _____	c.

14. Do your use a pump for domestic?

a. Yes which from? _____	b. No

15. Do you drink WASA tap water?

a. Yes	b. No

If "Yes",

a. After Boiling	b. Without Boiling

16. How often do you observe contamination in WASA Tap water?

a. Rarely	b. Frequently	b. Never

17. How much does your family pay for household WASA water usage per month? (Rs. / month)

a. Up to Rs. 100	b. Up to Rs. 200	c. Up to Rs. 300
d. Up to Rs. 400	e. Up to Rs. 500	f. More than Rs. 500

18. If the service level of WASA Water becomes better in terms of volume, quality and pressure, how much are you willing to pay for the services per month? (Rs. / month)

a. Up to Rs. 200	b. Up to Rs. 300	
c. Up to Rs. 400	d. Up to Rs. 500	e. More than Rs. 500

19. **For New users:** If a WASA Water pipe comes near your house, do you want to use the WASA water supply?

a. Yes	b. No

20. **For New users:** How many hours a day do you want WASA water supply? (hours per day)

a. 6 hours	b. less than 12 hours
c. less than 18 hours	d. 24 hours

21. **For New users:** How much are you willing to pay for WASA Water supply with good quality per month? (Rs.)

a. Up to Rs. 100	b. Up to Rs. 200	c. Up to Rs. 300
d. Up to Rs. 400	e. Up to Rs. 500	f. More than Rs. 500

22. How do you obtain water for your household Drinking use? Check from items below (multiple answers allowed);

a. WASA	b. using own water filtration unit	e. WASA bottled water
d. Can unites	e. Private bottled water	f. Other (specify _____**)**

If answer without " a"

23. How much does your family pay for Drinking water usage per month? (Rs. / month)

a. Nothing	b. Up to Rs. 500	c. Up to Rs. 750
d. Up to Rs. 1000	e. Up to Rs. 1500	f. More than Rs. 1500

24. Do you want which water is the most safe for drinking?

a. WASA water	b. water treated by own water filtration unit	e. WASA bottled water
d. Private bottled water	e. Other (specify _____**)**	

25. Do you have any requests concerning the WASA water?

a. Yes	b. No

If "Yes", select the requests you have from the following items (multiple answers allowed)

a. More Quantity (volume)	b. More water pressure	c. Less smell of water
d. No turbidity / color	e. Longer supply hour	f. Tariff adjustment as per service
g. Less time to repair if leaked	h. Better attitude of staff	i. Other (specify_____)

C. Sewerage & Drainage

26. What kind of toilet do you use at your house ?

a. Flush Toilet	b. Pour Flush Toilet
c. Bucket Latrine	d. Others (specify _____)

27. Water kind of sanitation facilities do you use at your house ?

a. Sewer line ==> go to Q28.	b. Septic tank ===> go to Q30
c. Open drain ==> go to Q30	d. Others (specify _____)

28. Do you have experience of wastewater overflowing from sewer pipeline or rainwater flooding due to poor drainage facility?

a. Yes, _____ times per year (wastewater overflow from the sewer pipeline) _____ times per year and about ___ hours per event (rainwater flooding due to poor drainage facilities
b. No. then, Go to Q29

29. Do you think what is the main problems? Choose the reasons listed below, but two (2) maximum.

a. Poor capacity of sewers	b. Choking with sludge or solid wastes
c. No street gutters or drains	d. e. Other (_____)

30. Why you don't connect to sewer line?

a. No sewer line near the house	b. Too expensive to connect	c. I don't feel the necessity to connect
d. I don't want to spend money for it	e. Others (specify, _____)	f. No. reason

31. If you have to connect to sewer line, how much could you pay for the sewerage service charge to WASA (Rs/Month) ?

a. Up to Rs. 100	b. Up to Rs. 200	c. Up to Rs. 300
d. Up to Rs. 400	e. Up to Rs. 500	f. More than Rs. 500

D. Health Issue

32. Did your family member suffered from a water-born disease in last one year? If yes, chooses the disease from the listed below, but maximum two.

a. Malaria	b. General Diarrhea	c. Skin disease
d. Typhoid	e. Dysentery	f. Hepatitis
g. Others (specify _____ _____)		

33. How often is your family suffered from the water borne diseases in last one year?.

a. 1 to 2	b. 3 to 5	c. Up to 5

34. When you are sick suffering from water borne disease, how much you pay when you go to the doctor per visit? (Rs.)

a. Up to Rs. 100	b. Up to Rs. 250	c. Up to Rs. 400
d. Up to Rs. 500	e. Up to Rs. 1000	f. More than Rs. 1000

E. Sanitary Practice

35. Where do you dispose the garbage?

a. Designated place for its collection, then go to Q37	b. Street nearby house, then go to Q36
c. Drainage channels, drains, or sewers, then go to Q36	d. Paharan or Madhuana drains, then go to Q36

36. If you answer, b, c, and d, why you don't dispose to the designated place?

a. The disposal place is far away from home	b. Because everyone dispose
c. I don't think it is not good	d. Others (specify,)

37. Where do you go to toilets when you go outside?

a. Public Toilet	b. Restaurant / cafe
c. Canal or drain	d. Others (specify,)

F. Income

38. Average Monthly Income Level

a. Up to Rs. 5,000	b. Up to Rs. 10,000	c. Up to Rs. 20,000
d. Up to Rs. 50,000	e. Up to Rs. 100,000	f. More than Rs. 100,000

39. Average Monthly Expense Level

a. Up to Rs. 5,000	b. Up to Rs. 10,000	c. Up to Rs. 30,000
d. Up to Rs. 50,000	e. Up to Rs. 100,000	f. More than Rs. 100,000

40. Expenses for the following item per month (Should be a & b)

a. Electricity (less than 3000 Up to 3000 _____)	b. Gas (less than 1500 Uo to 1500 ._____)	c. Solid wastes collection (Rs._____)
d. Food (Rs._____)	f. Housing (Rs._____)	

G. Comments & Suggestions

_____

_____

_____

_____

Thank you very much for your cooperation!

Serial No.:

Questionnaire for Customer Survey (Interview Survey)
COMMERCIAL & INDUSTRIAL

Date : ____/____**, 2016, Time :** ____**:**____PM / AM

Name of Surveyor _____/_____

Survey Area_____(a. Existing water supply area, b. Non water supply area)

Company's Name; _____ **Address;** _____

A. Types of Company

1. **To ALL**: What kind of work is your company doing?

a. Restaurant	b. Textile factory	c. Manufacturing
d. Hotel	e. Retail Shop	f. Other (specify_____)

2. **To ALL**: What is the major work of your company? (Please specify _____)
3. **To ALL**: How many staff are there in your company? Total _____staff
4. **To ALL**: Is your company accompanied with house (using 1 tap for both business and house)? a. Yes / b. No
5. **To ALL**: If you use large amount of water for special purpose, please inform us. Special purpose _____

   If your company use large amount of water for special purpose, how much do you use for it? _____ m^3/month
6. **To Hotel**: How many rooms are there in your hotel? _____ Rooms
7. **To Restaurant**: How many tables and seats in your restaurant? _____Tables_____Seats

B. Water Supply Condition

8. **To ALL**: How do you obtain water for your daily business? Check from items below (multiple answers allowed);

a. WASA supply	b. Well	c. Water vendor
d. Bottle water	e. Other (specify_____)	

9. **To well users**: If you use well, what is the type of well?

a. Open well	b. Hand pump
c. Deep well with pump	d. Other (specify_____)

10. **To WASA users**: How much does your company pay for WASA supply? Do you think it is expensive?
    _____Rs. per month (check; a. Expensive / b. Normal / c. Cheap)
11. **To ALL**: How much does your company pay for other water than WASA supply per month?
    _____Rs. per month Pay to (who)_____
12. **To ALL**: Are there any private water vendors whom you can buy water? a. Yes / b. No
    If "Yes", how much is it if you buy water from private water vendor? _____ Rs. / 20 litters
13. **To ALL**: Do you buy any bottled water? a. Yes / b. No
    If "Yes", How many and how much does your family consume bottled water per day?
    _____Liter / per day Total_____Rs. / day
14. **To ALL**: Does your company have water tank? a. Yes / b. No
    If "Yes", check the type of the storage tank from items below (multiple answers allowed);

a. Underground tank	b. Tank on the ground
c. Tank on the roof	d. Other (specify_____)

    How much is the size of the tank? Capacity of the tank _____liters
15. **To ALL**: Does your company have pump for the storage tank? a. Yes / b. No
16. **To ALL**: For which purpose do you use each water? If used, write "1" in cells below.

Items	WASA supply	Well	Water vendor	Bottle water	Others ( )
Drinking					
Washing					
Toilet					
Gardening / car wash					
For business (specify_____)					

17. **To WASA users**: How many hours and days are the WASA supplied to your house for?
    _____hours a day, and _____days a week
18. **To WASA users**: Do you have any requests concerning the WASA? a. Yes / b. No
    If "Yes", select the requests you have from the following items (multiple answers allowed);

a. More quantity (volume)	b. More water pressure	c. Less smell of water

d. No turbidity / color	e. Longer supply hour	f. Lower tariff level
g. Less time to repair if leaked	h. Better attitude of staff	i. Other (specify_____)

19. **To WASA users**: If the service level of WASA supply becomes better in terms of volume, quality, supply hours, and pressure by management and facility improvements, how much are you willing to pay for the water supply service per month maximum? _____Rs. per month

20. **To non WASA users**: If a WASA supply pipe comes near your house, do you want to use the WASA supply? a. Yes / b. No
    If "Yes", how much are you willing to pay for WASA supply with good quality per month?
    _____Rs. every month.
    If "Yes", how much are you willing to pay to install connection to WASA supply with good quality?
    _____Rs. (Once at connection)

Thank you very much for your cooperation!

APPENDIX FOR CHAPTER A3 LAWS, REGULATIONS, AND POLICIES

AA3.1 Lists for List for Laws and Regulations

1. Laws and Regulations for Water Supply, Sewerage and Drainage in Punjab	
Laws and Regulations	**Contents**
Punjab Municipal Water Act (Draft) 2014	This Act was formed to recognize, regulate and manage present and future municipal water in the Punjab. Currently this draft act has not yet come into force.
Sewerage and Drainage Regulation Faisalabad Regulations, 2015	This Regulation provides the necessary rules related to sewerage and drainage between the Agency and the users.
2. Laws and Regulations for Groundwater	
Laws and Regulations	**Contents**
Canal and Drainage Act	This Act was issued in 1873 and amended in 2006 and 2016. This is the legislation governing water providing the legal framework for water management in the agricultural sector.
Punjab Development of Cities Act, 1976	This law gives the Development Authority of each city strong right regarding the use of groundwater resources.
Punjab Private Housing Schemes and Land Subdivision Rules 2010	In the case of planning to install tube wells, it is supposed to inform the details such as quantity, capacity, design, drilling record and installation machinery, etc.
3. Laws and Regulations for Surface Water	
Laws and Regulations	**Contents**
The Canal and Drainage Act, 1873	This act regulates public water use of rivers, streams flowing in natural channels, lakes, etc.
The Indus Water Treaty, 1960	This treaty regulates for management of rivers flowing through Pakistan and India stipulated between the Government of Pakistan and the Government of India.
The Water Accord, 1991	Apportionment of the waters of the Indus river system, which was agreed between the provinces of Pakistan, is mentioned. Concrete figures of distributional water are described for each province.
The Punjab Irrigation and Drainage Authority Act, 1997	This act is expedient to establish the Punjab Irrigation and Drainage Authority to implement the strategy of the Government of Punjab for streamlining the Irrigation and Drainage System, and provides decentralization of a centrally-controlled irrigation system (Provincial Irrigation Department) into a three tier public private partnership based management system.

4. Laws and Regulations for Environmental and Social Considerations		
Category	**Title**	**Contents**
Environmental Protection (Federal)	Pakistan Environmental Protection Ordinance, 1983	This Ordinance is the first ordinance that specializes in environmental protection in Pakistan.
	National Conservation strategy, 1992	This Strategy is a fundamental policy document for environmental problems in Pakistan
	Pakistan Environmental Protection Act (PEPA), 1997	This Act is a comprehensive environmental protection law in place of the Pakistan Environment Protection Ordinance 1983, and a framework for implementing the national environmental conservation strategy, 1992.
	National Environmental Quality Standards (NEQUS), 2000	These Standards are standards established to control environmental pollution and have been enacted standards for domestic wastewater, factory wastewater, factory exhaust gas, emissions of automobile exhaust gas and noise, and drinking water.

Environmental Protection (Punjab)	Punjab Environmental Protection (Amendment) Act, 2012	This Act is a comprehensive legislation and provides the legislative framework for protection, conservation, rehabilitation and improvement of the environment.
	Punjab Environmental Quality Standards (PEQS), 2016	The PEQS, 2016 specify the following standards:
		▪ Maximum allowable concentration of pollutants in municipal and liquid industrial effluents discharged into inland waters, sewage treatment facilities, and the sea.
		▪ Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources.
		▪ Maximum allowable concentration of pollutants (two parameters) in gaseous emissions from vehicle exhaust and noise emission from vehicles.
IEE/EIA	Pakistan Environmental Assessment Procedure, 1997	The Federal Environmental Protection Agency published the guidelines on the implementation of environmental assessment and environmental management of different development projects.
	Guidelines for Preparation and Review of Environmental Reports, Government of Pakistan, 1997	The guidelines on the preparation and review of environmental reports specify the following for project proponents.
		▪ The nature of the information to be included in environmental reports
		▪ The minimum qualifications of the EIA conductors appointed
		▪ The need to incorporate suitable mitigation measures at every stage of project implementation
		▪ The need to specify monitoring procedures
	Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations, 2000	These Regulations were developed by the Pak-EPA to provide the necessary details on preparation, submission and review of the IEE and the EIA.
Land Acquisition and Resettlement	Land Acquisition Act (LAA), 1894	This Act was promulgated to govern acquisition of private land for public purposes.
	Punjab Land Acquisition Rules, 1983	In addition to LAA, the 1983 Rules were published in the Gazette of the Punjab Extraordinary, setting out the procedure for land acquisition in accordance with the provincial specific conditions.
	Project Implementation and Resettlement of Affected Persons Ordinance, 2001	This ordinance was developed as a supplementary document to the LAA as well as other laws of Pakistan, and wherever applicable under the resettlement policy.

5. Water Quality Standards in Pakistan

Standard	Contents
Drinking Water Quality Standards	In 2008, the Ministry of Environment published National Standards for Drinking Water Quality (NSDWQ) in collaboration with Ministry of Health, World Health Organization (WHO) and UNICEF. The standard includes 23 parameters and there is no significant difference between Pakistan and WHO in standard values for each parameter except arsenic (As). The guideline value of WHO for arsenic is 0.01 mg/L, while in Pakistan the value is 0.05 mg/L similar to most other Asian developing countries.
Environmental Quality Standards for Surface Water	Currently, in Pakistan there are no environmental quality standards for surface water. Existing National Environmental Quality Standards (NEQS) are only in place to regulate drinking water and municipal and liquid industrial effluents.
Effluent Quality Standards	In 1993, the Ministry of Environment published National Environmental Quality Standards (NEQS) for Municipal and Liquid Industrial Effluents and then the standard was revised in 2000. There are 32 parameters to regulate domestic and industrial wastewater before discharging into inland water, sewerage system and sea.

6. Policies for Water Supply, Sewerage and Drainage Sectors	
Policies	**Contents**
National Drinking Water Policy, 2009	Ministry of Environment formulated National Drinking Water Policy in 2009 to provide adequate quantity of safe drinking water to the entire population at an affordable cost in an equitable, efficient and sustainable manner.
Punjab Urban Water Supply and Sanitation Policy, 2007	The Punjab Urban Water Supply and Sanitation Policy was established by the Government of Punjab in 2007 intending to guide and support provincial organizations which are related to water supply and sanitation. This Policy is consistent with National Sanitation Policy 2006 and National Environment Policy 2005.
Punjab Drinking Water Policy, 2011	Punjab Drinking Water Policy was established in 2011 by the Government of Punjab to provide guiding principles under which the efforts of provincial and local authorities shall be planned and coordinated.
National Sanitation Policy, 2006	Ministry of Environment established the National Sanitation Policy in 2006, which provides a broad of the framework and policy guidelines to the Federal, Provincial and Local Governments to enhance and support sanitation coverage in the country through formulation of their sanitation strategies, plans and programs for improving the quality of life of the people of Pakistan and the physical environment necessary healthy life.

7. Policies for Environmental and Social Considerations		
Category	**Title**	**Contents**
Environmental Protection (Federal)	National Environmental Policy, 2005	This Policy has formulated a long-term framework for solving these problems that Pakistan is facing, such as pollution of land water and seawater, air pollution, inadequate waste management, deforestation, loss of biodiversity, the progress of desertification, the problem of natural disasters and climate change.
Environmental Protection (Punjab)	Punjab Environmental Policy, 2015 (Draft)	The policy provides guidelines to Provincial and Local Government in Punjab for addressing the environmental concerns related to them and ensuring effective management, restoration, enhancement of environmental resources and ensuring their sustainable use.
Land Acquisition and Resettlement	National Resettlement Policy (NRP), 2002	This resettlement policy has been drafted by Ministry of Environment, Local Government and Rural Development with technical assistance from ADB, and not yet approved. The policy will apply to all development projects involving adverse social impacts, including land acquisition, loss of income, loss of business etc.

APPENDIX FOR CHAPTER A6 CURRENT WASA-F OPERATION AND MANAGEMENT

AA6.1 Household Income in Faisalabad

According to the Household Integrated Economic Survey (HIES) conducted by Pakistan Bureau of Statistics, the average household income in Punjab Urban (urban areas in Punjab province) was 46,616 PKR/month (or approximately 47,000 PKR/month) in 2015-2016, as shown in **Table AA6.1.1**.

Table AA6.1.1 Distribution of Monthly Household Income by Quintile, 2015-2016

	Average	1st	2nd	3rd	4th	5th
Pakistan	35,662	19,742	23,826	28,020	33,668	60,451
Pakistan Urban	45,283	20,441	25,292	28,940	34,407	65,950
Pakistan Rural	30,110	19,625	23,392	27,613	33,170	52,008
Punjab	36,230	19,885	23,174	27,528	33,546	61,853
Punjab Urban	**46,616**	**19,366**	**24,315**	**28,224**	**34,588**	**68,975**
Punjab Rural	30,973	19,964	22,862	27,258	32,954	53,330
Sindh	33,948	18,199	23,104	26,765	31,405	57,875
Sindh Urban	42,846	20,957	24,816	27,959	32,230	60,997
Sindh Rural	23,825	17,625	22,310	25,681	29,902	37,744
Khyber Pakhtunkhwa (KP)	38,349	22,805	27,084	32,220	37,725	59,946
KP Urban	49,910	23,206	30,210	35,808	41,946	71,850
KP Rural	35,691	22,760	26,639	31,580	36,739	54,802
Balochistan	30,041	22,136	25,730	28,575	34,014	54,053
Balochistan Urban	41,991	24,610	31,554	37,075	42,192	61,353
Balochistan Rural	25,569	21,687	24,335	25,895	29,321	40,799

Source: HIES 2015-16

Comparing with the other cities in Punjab, the average household income in Faisalabad is lower than that of the Punjab Urban area on average. According to the results of a survey conducted by UU, "Poverty & Social Impact Analysis in Urban Punjab (PSIAUP) 2010," the average household income of Faisalabad is equivalent to approx.75% of that of the Punjab Urban area (18,312PKR / 23,853PKR = 77.6%).

Table AA6.1.2 Mean Distribution of Monthly Household Income by Wealth Quintile in 2008

Quintile	**Faisalabad**	Gujranwala	Lahore	Multan	Rawalpindi	**Total**
Lowest	**5,799**	5,671	6,349	6,204	5,693	5,996
Second	**10,289**	10,321	10,426	10,226	10,448	10,367
Third	**14,705**	14,860	14,817	14,890	14,825	14,811
Fourth	**22,079**	22,320	21,643	21,338	21,864	21,879
Highest	**57,670**	63,328	76,132	62,075	49,300	66,986
Total (Average)	**18,312**	**17,237**	**28,532**	**20,067**	**23,247**	**23,583**

Source: Poverty & Social Impact Analysis in Punjab Urban, Urban Unit (2010)

The monthly household income in Faisalabad in 2015-2016 was estimated based on **Table AA6.1.3**.

Table AA6.1.3 Estimated Monthly Household Income in Faisalabad by Quintile in 2015-2016

Quintile	Income in Punjab Urban	Approximate income in Punjab Urban (a)	Estimated income in Faisalabad (a)×75%
Lowest	19,366	19,000	14,000
Second	24,315	24,000	18,000
Third	28,224	28,000	21,000
Fourth	34,588	35,000	26,000
Highest	68,975	69,000	52,000
Total (Average)	**46,616**	**47,000**	**35,000**

AA6.2 Comparisons for Water Tariff Level and Income Level in Principal Cities in the World

Country	City	Water Tariff Level	Income Level
Thai	Bangkok	0.26～0.45 USD/m^3	Legal minimum wage 262 USD/month*, Engineer 699 USD/month, Middle manager 1,538 USD/month
Cambodia	Phnom Penh	0.10～0.32 USD/m^3	Legal minimum wage 128 USD/month*, Engineer 351 USD/month, Middle manager 829 USD/month
Vietnam	Hanoi	0.28～0.75 USD/m^3	Legal minimum wage 141 USD/month*, Engineer 420 USD/month, Middle manager 927 USD/month
Japan	Tokyo	1.20～3.58 USD/m^3	Legal minimum wage 1,500 USD/month*, Engineer 3,395 USD/month, Middle manager 4,470 USD/month
Pakistan	Faisalabad	0.08 USD/m^3 (or 2.3 PKR/mon./HH in Intermediate size)	Lowest Quintile: 134 USD/month Average Quintile: 334 USD/month Highest Quintile: 496 USD/month

Note: *Legal minimum wages are as of year 2015.

Source: Reports from Bank of Tokyo Mitsubishi UFJ and JETRO

APPENDIX FOR CHAPTER A7 ANALYSIS OF WASA-F FINANCIAL PERFORMANCE

AA7.1 Accounting Analysis of WASA-F Financial Statement

Water And Sanitation Agency (FDA), Faisalabad
Statement Showing The Opreating Income & Expenditure
For The Year Ended 2012-13

Note that the split of water supply and sewerage incomes have come in place since 2012

Actual Income and Expenses (2000-16) **(Rs. In Million)**

Sr.No.	Particulars	2012	2013	2014	2015	2016
A	Opening Balance	(75.459)	(138.809)	0.000	2.000	(6.351)
B	Income from Water Supply & Sewerage					
1	Water Supply Charges	168.24	191.52	217.372	175.917	
2	Sewer Charges	203.960	287.28	287.903	279.263	
3	Recovery of Water Supply & Sewerage Arrears from Defaulters	183.000	205.2	60.240	160.898	
4	Infrastructure Charges	44.350	19.68	55.000	57.591	
5	Recovery Through out Sourcing of Illegal Connections	5.000	0			
6	Recovery Through out Sourcing from Chronic Defaulters	4.000	0			
7	Urban Immovable Property (UIP) Tax Shares	223.976	197.231	284.555	407.371	
8	Grant from Government of Punjab	325.435	261.975	261.996	222.7	
	Monsoon Grant				59.95	
9	Grant from District Government Faisalabad	0.000				
10	Annual Income from Leasing of Land & Auction of Waste Water	4.495	4.508	4.855	2.776	
11	Income from Leasing out Roofs of OHRs	12.184	6.364	6.978	12.968	
12	Income from letting out of Crane & Fork Lifters	0.210	0.25		0.09	
13	Income from Profits on Deposits	1.100	1.38	2.000	2.169	
14	Departmental/Contingency Charges from Development Schemes	42.500	14.409		25.886	
15	Tender/ Enlishment / Renewal Fee	4.500	7.359	7.900	2.36	
16	Miscellaneous Income	4.885	7.9	7.990	4.662	
	Income from WB			331.442	484.562	
	TOTAL	**1227.835**	**1205.06**	**1528.231**	**1899.16**	
C	**TOTAL (A+B)**	**1152.376**	**1066.25**	**1528.23**	**1901.16**	
D	**Expenditure**					
1	Pay & Allowances	429.812	453.938	442.921	523.5	
2	Other Benefits for employees	130.324	165.213	191.327	238.769	
3	Electrcity for Water Supply & Sewerage	457.060	362.627	442.342	517.87	
4	D&M Water Directorate 1/	3.345	1.019	5.908	2.939	
5	Total Water Resources Directorate	19.097	12.683	13.434	9.42	
6	Repair & Maintenance of Wellfield Area Along Jhang Canal Branch	1.200				
7	Waste Water Management Directorate (WWM)	51.457	46.753	30.913	17.99	
8	O&M East Sewer System Directorate	21.220	20.248	19.939	14.553	
9	O&M West Sewer System Directorate	32.595	24.927	22.033	11.243	
10	Drainage System Directorate	10.655	10.008	9.779	7.517	
11	POL Expenses of Vehicle	14.000	12.165	11.383	19.81	
12	Expenses of R&R Directorate	14.620	10.242	6.371	8.269	
13	Repair of Vehicles & Travelling Expenses	4.320	2.243	3.614	5.05	
14	Expenses on Office Provisions	8.485	9.458	10.674	15.262	
15	Electrcity & Gas for Offices	2.490	2.65	3.452	3.481	
16	Legal & Audit Fee	1.435	1.49	0.620	0.163	
17	Procurement & Stores	5.370	5.981	5.242	8.882	
18	Miscellaneous Expenses	6.700	2.606	10.972	18.234	
19	Depriciation of Replacement Cost	77.000				
20	World Bank			338.140	484.562	
	Total Expenditures	**1291.185**	**1144.251**	**1569.064**	**1907.514**	**0.000**
	Surplus / Deficit (C-D)	**(138.809)**	**(78.004)**	**(40.833)**	**(6.351)**	**0.000**

WASA-F Financial Statements and Ratio Analysis (2010-2014)

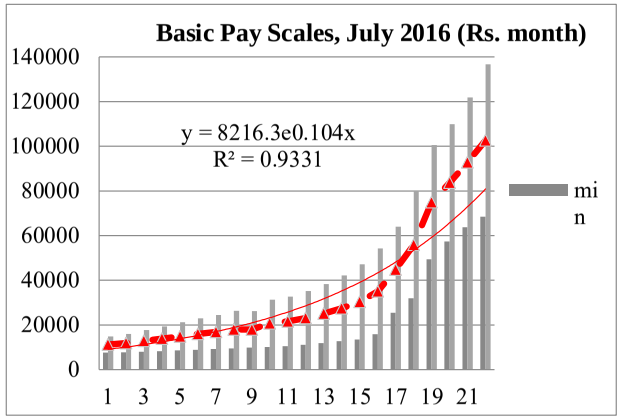
Based on Auditors Report

(Rs.)

Sr	Items	2010	2010-11	2011-12	2012-13	2013-14
		Million	Million	Million	Million	Million
1	**Opening Balance**	718.70	754.41	800.84	474.84	546.95
2	**Operating Revenue**					
	Water Supply	286.10	179.83	183.81	217.47	464.58
	Sewerage	172.33	214.29	227.76	293.31	383.59
	Share in Property Tax(UIP)	144.10	243.55	140.23	551.32	197.04
	Supplementary Grant of DCO Faisalabad	-	-	-	-	261.98
	Fee and Other Revenue	54.00	70.86	49.06	71.60	65.49
3	**Total Operating Revenue**	**656.53**	**708.53**	**600.86**	**1,133.70**	**1,372.68**
4	**Operating expenses**					
	Repair and Maintenance	36.34	53.02	18.28	53.97	22.86
	Power and Electricity	280.87	318.64	333.27	490.25	578.13
	Employees' Pay bills and fringe benefits / Salary wages	323.25	304.43	475.71	641.01	739.68
	Depreciation	32.54	31.22	29.56	28.55	27.57
	Others	-50.25	-22.94	-99.19	-136.92	-144.22
	Total Operating Expenses	**622.76**	**684.37**	**757.62**	**1,076.85**	**1,224.02**
5	**Operating Profit/ Loss**	**33.77**	**24.16**	**-156.76**	**56.85**	**148.66**
6	**Non-operational Revenue (Other income)**	**19.65**	**25.89**	**33.52**	**18.87**	**30.49**
7	**Non-Operating Cost/ Financial Expenses**					
	Bank Charges	14.68	0.06	0.83	0.09	0.04
	Others	3.03	3.57	3.55	3.52	4.38
	Total Non Operating Cost/ Financial Expenses	**17.71**	**3.63**	**4.38**	**3.61**	**4.42**
8	**Non Operating Profit/ Loss**	**1.94**	**22.26**	**29.14**	**15.27**	**26.07**
9	**Earning Before Financial Charges**	50.40	46.48	-126.79	72.20	174.77
10	**Total Revenue**	676.18	734.43	634.38	1,152.57	1,403.16
11	**Total Exp**	640.47	688.00	762.00	1,080.46	1,228.44
12	**Net Profit/ Loss**	**35.71**	**46.43**	**-127.62**	**72.12**	**174.72**
13	**Ratio Analysis (2010-2014) Bsed on Audit Anylasis**					
a	**Operating Profit Margin**	4.99%	3.29%	-55.98%	4.93%	10.59%
b	**Non Operational Profit Margin Ratio**	0.29%	3.03%	4.59%	1.32%	1.86%
c	**Net Profit/ Loss Margin Ratio**	5.28%	6.32%	-51.39%	6.26%	12.45%

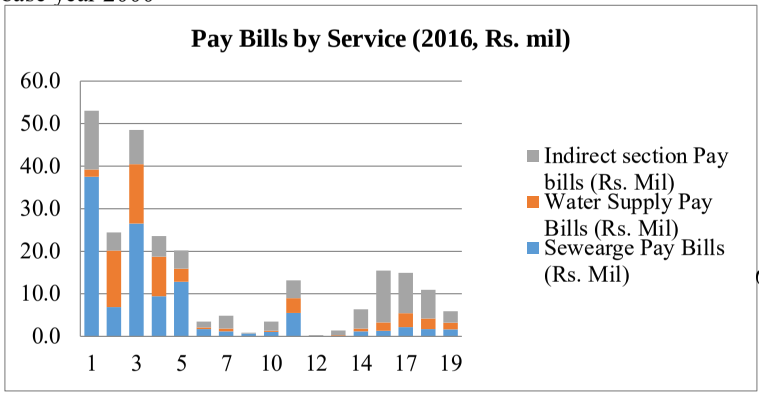
Basic Pay Scales, July 2016 (Rs. month) Ali, 13 May)

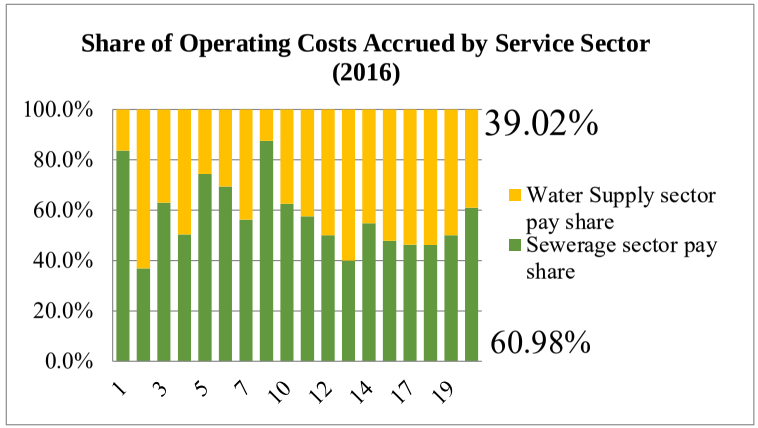
	min	max	average
1	7,640	14,840	11,240
2	7,790	16,040	11,915
3	8,040	17,790	12,915
4	8,280	19,380	13,830
5	8,590	21,190	14,890
6	8,900	23,000	15,950
7	9,220	24,520	16,870
8	9,540	26,340	17,940
9	9,860	26,160	18,010
10	10,180	31,280	20,730
11	10,510	32,710	21,610
12	11,140	35,140	23,140
13	11,930	38,330	25,130
14	12,720	42,120	27,420
15	13,510	47,110	30,310
16	15,880	54,280	35,080
17	25,440	64,040	44,740
18	31,890	79,890	55,890
19	49,370	100,570	74,970
20	57,410	109,910	83,660
21	63,780	121,880	92,830
22	68,540	136,720	102,630



Inflation base year 2000

2000	3.6
2001	4.4
2002	3.5
2003	3.1
2004	4.6
2005	9.3
2006	7.9
2007	7.8
2008	12.0
2009	19.6
2010	10.1
2011	13.7
2012	11.0
2013	7.4
2014	8.6
2015	4.5
2016	2.9





	Sewerage				Water Supply						Indirect Sections									
	O & M (EAST)	O & M (WEST)	Waste Water Management	Drainage	Water Resources	Changa Pani - PMU	Construction - I	Construction - II	French-PMU	JICA - PMU	Admin	Deputy Manager's Office ENGG	Deputy Manager's Office F&R	Deputy Manager's Office services	Finance	Industry & Commercial	Managing Director's Office	Planning and Development & Procurement	Revenue	Total
1	124	112	37	5	12					1	27	2	1	1	3	5	7	7	49	393
2	17	14	15	2	92		1				11	1			2			2	14	171
3	69	58	41	3	87		2		1		13	3	2		4	2		5	23	313
4	13	7	37		52	1	1	1	1		5			1	4	3	1	3	12	142
5	27	30	13	2	17						4	4		1				4	11	113
6	3	2	2	2	2						3	1			1				2	18
7		3	3		3						4							1	10	24
9	2	1									1									4
10	2	2	1		1						1					1		3	5	16
11	9	6	5	2	4		3	6	1		7				1	2	2	2	3	53

12																		1		1
13								1								1			3	5
14	2		1	1				2			3				4			2	6	21
16	1	3			3	1	1	1			12	1	1	1	7	4	1	6	4	47
17	2	2	1	1	3	1	2	1	2		5				7	7		4	3	41
18			3	1	2		1	2	1		4	1				4		4	3	26
19		1	1	1	1		1		1		1	1			1	1	1			11
Total	271	241	160	20	279	3	12	14	7	1	101	14	4	4	34	30	12	44	148	1399

Sew	692	0.49464
WS	316	0.22588
Indirect secions	391	0.27949
Total	1399	1

	Sewerage (employees)	Sewearge Pay Bills (Rs. Mil)	Water Supply (employees)	Water Supply Pay Bills (Rs.)	Indirect (employees)	Indirect section Pay bills (Rs.)	Total Pay bills by Section (Rs.)
1	278.0	37.5	13.0	1.8	102.0	13.8	53.0
2	48.0	6.9	93.0	13.3	30.0	4.3	24.4
3	171.0	26.5	90.0	13.9	52.0	8.1	48.5
4	57.0	9.5	56.0	9.3	29.0	4.8	23.6
5	72.0	12.9	17.0	3.0	24.0	4.3	20.2
6	9.0	1.7	2.0	0.4	7.0	1.3	3.4
7	6.0	1.2	3.0	0.6	15.0	3.0	4.9
9	3.0	0.6	0.0	0.0	1.0	0.2	0.9
10	5.0	1.1	1.0	0.2	10.0	2.2	3.5
11	22.0	5.5	14.0	3.5	17.0	4.2	13.2
12	0.0	0.0	0.0	0.0	1.0	0.3	0.3
13	0.0	0.0	1.0	0.3	4.0	1.1	1.4
14	4.0	1.2	2.0	0.6	15.0	4.5	6.3
16	4.0	1.3	6.0	2.0	37.0	12.2	15.5
17	6.0	2.2	9.0	3.3	26.0	9.5	14.9
18	4.0	1.7	6.0	2.5	16.0	6.7	10.9
19	3.0	1.6	3.0	1.6	5.0	2.7	5.9
Total	692.0	111.3	316.0	56.3	391.0	83.1	250.7

	Sewearge Pay Bills (Rs. Mil)	Water Supply Pay Bills (Rs.	Sewerage sector pay share	Water Supply sector pay share	Total
1	44.4	8.6	83.7%	16.3%	53.0
2	9.0	15.4	36.8%	63.2%	24.4
3	30.5	18.0	62.9%	37.1%	48.5
4	11.9	11.7	50.4%	49.6%	23.6
5	15.0	5.2	74.3%	25.7%	20.2
6	2.4	1.1	69.4%	30.6%	3.4
7	2.7	2.1	56.3%	43.8%	4.9
9	0.8	0.1	87.5%	12.5%	0.9
10	2.2	1.3	62.5%	37.5%	3.5
11	7.6	5.6	57.5%	42.5%	13.2
12	0.1	0.1	50.0%	50.0%	0.3
13	0.6	0.8	40.0%	60.0%	1.4
14	3.5	2.9	54.8%	45.2%	6.3
16	7.4	8.1	47.9%	52.1%	15.5
17	6.9	8.0	46.3%	53.7%	14.9
18	5.1	5.9	46.2%	53.8%	10.9
19	3.0	3.0	50.0%	50.0%	5.9
Total	152.9	97.9	60.98%	39.02%	250.7

Sew	692	49.5%
WS	316	22.6%
Indirect secions	391	27.9%
Total	1399	1

Regular	Contract	Total	Operating	income pc	
887.5	93.94	981.44	505.8	0.5154	0.610
511.5	60.06	571.56	334.2	0.5847	0.390
1399	154				

	Sew	WS	total
Labor	465.0	297.3	762.3
Elec	258.74	262.66	521.4
OM	36.45	36.45	72.9
Total	760.2	596.4	1356.6
income	**376**	**240**	
net	-384.4	-356.1	
profit loss r	0.50565	0.59709	

Source: IT section data Source #1

	Treat	cost	
Sewe	**332**	**760**	2.2887
WS	93	596	6.4088

	Work force (Regular +Contra t)	Operating income (Rs. mil, 2015)	Operating Income per head (Rs. mil)
Sewerage/ Drainage	887+94 = 981	375.8	**0.38**
Water Supply	512*64 = 576	240.3	**0.42**

Demand and Collection 2010-2017 WASA-F (Rs.)

2010-11	Category	Connections	Payee	Billed amount	Received Amount (with Arrear)
Domestic	Water	107578	37912	172,664,104	86,323,095
	Sewer	200670	57513	214,729,808	129,484,643
Commercial	Water	1997	852	20,723,291	15,355,115
	Sewer	14403	6236	91,973,714	85,483,854
Industry	Water	81	73	24,285,071	24,348,371
	Sewer	325	256	50,871,382	45,351,997
	Aquifer	300	237	25,854,438	21,701,767
Total	**Average**	**46,479**	**14,726**	**85,871,687**	**58,292,692**
	Aggregate	**325,354**	**103,079**	**601,101,808**	**408,048,842**
2011-12					
Domestic	Water	109137	37052	174,692,402	90,592,513
	Sewer	209358	57848	224,240,852	135,888,770
Commercial	Water	2060	804	20,684,242	14,120,894
	Sewer	15956	6333	101,588,914	89,098,147
Industry	Water	89	81	24,999,750	24,076,078
	Sewer	609	414	54,843,845	52,038,625
	Aquifer	284	231	25,787,175	22,072,904
Total	**Average**	**48,213**	**14,680**	**89,548,169**	**61,126,847**
	Aggregate	**337,493**	**102,763**	**626,837,180**	**427,887,931**
2012-13					
Domestic	Water	108277	37578	173,269,460	114,158,568
	Sewer	221785	61751	238,435,513	171,237,853
Commercial	Water	2053	861	20,444,802	15,722,019
	Sewer	17065	6991	113,034,402	118,461,661
Industry	Water	89	77	26,774,357	25,925,188
	Sewer	792	552	57,982,738	65,888,505
	Aquifer	339	264	26,393,504	24,407,790
Total	**Average**	**50,057**	**15,439**	**93,762,111**	**76,543,083**
	Aggregate	**350,400**	**108,074**	**656,334,776**	**535,801,584**
2013-14					
Domestic	Water	108920	39812	174,006,078	124,485,685
	Sewer	227492	70222	244,402,164	186,728,528
Commercial	Water	1989	833	20,351,772	16,120,868
	Sewer	17805	7032	123,614,002	129,023,432
Industry	Water	92	78	24,759,982	23,097,598
	Sewer	859	571	60,323,841	69,701,246
	Aquifer	387	305	29,417,966	26,834,746
Total	**Average**	**51,078**	**16,979**	**96,696,544**	**82,284,586**
	Aggregate	**357,544**	**118,853**	**676,875,805**	**575,992,103**
2014-15					
Domestic	Water	109802	32362	175,189,166	103,412,672
	Sewer	236098	60497	253,585,524	155,123,508
Commercial	Water	1975	911	20,488,170	15,880,019
	Sewer	18369	8036	131,433,199	124,011,328
Industry	Water	97	79	26,644,330	25,912,868
	Sewer	846	607	60,878,049	58,839,607
	Aquifer	440	351	36,612,047	33,573,883
Total	**Average**	**52,518**	**14,692**	**100,690,069**	**73,821,984**
	Aggregate	**367,627**	**102,843**	**704,830,485**	**516,753,885**

2015-16					
Domestic	Water	110497	32008	176,216,991	129,201,091
	Sewer	243873	59307	261,737,752	193,801,637
Commercial	Water	1965	862	20,273,592	16,857,293
	Sewer	19184	7702	139,581,971	135,352,217
Industry	Water	95	78	24,915,357	23,765,094
	Sewer	873	581	62,021,293	62,542,137
	Aquifer	451	365	39,449,412	36,788,555
Total	**Average**	**53,848**	**14,415**	**103,456,624**	**85,472,575**
	Aggregate	**376,938**	**100,903**	**724,196,368**	**598,308,024**

Demad And Collection list Category Wise FY July 16-June 17

2016-17	Catogary	Connections	Payee	Billed amount	Received Amount
Domestic	Water	111242	35797.917	177,641,012	133,523,913
	Sewer	238338	68417.417	265,091,403	200,285,870
Commercial	Water	1962	894	26,238,474	20,410,040
	Sewer	20485	8149	207,719,009	180,038,296
Industry	Water	94	77	26,983,770	24,067,987
	Sewer	875	562	76,561,255	73,048,674
	Aquifer	494	331	47,936,783	43,325,145
Total	**Average**	**53,356**	**16,318**	**118,310,244**	**96,385,704**
	Aggregate	**373,490**	**114,228**	**828,171,706**	**674,699,925**

Demad And Collection list Category Wise FY July 16-June 17 (Annual)

FY 2010-17	Catogary	Connections (Rs.)	Payee (Rs.)	Billed amount (Rs.)	Received Amount (Rs.)	%Rec	%Payee
Domestic	Water	109,350	36,075	1,223,679,213	781,697,537	63.88	32.99
	Sewer	225,373	62,222	1,702,223,016	1,172,550,809	68.88	27.61
Commercial	Water	2,000	860	149,204,343	114,466,248	76.72	42.98
	Sewer	17,610	7,211	908,945,211	861,468,935	94.78	40.95
Industry	Water	91	78	179,362,617	171,193,184	95.45	85.24
	Sewer	740	506	423,482,403	427,410,791	100.93	68.41
	Aquifer	385	298	231,451,325	208,704,790	90.17	77.33
Total	**Average**	**50,793**	**15,321**	**688,335,447**	**533,927,471**	**-**	**-**
	Aggregate	**355,549**	**107,249**	**4,818,348,128**	**3,737,492,294**	**77.57**	**30.16**

Connection-wise Tariff Demand and Receipts by Consumer 2016

Domestic JULY- 2016			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
110,447	**33,763Rs.**	**14,669,815Rs.**	**10,736,180Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
247,178	**62,915Rs.**	**22,087,699Rs.**	**16,104,270Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,413	**873Rs.**	**1,634,998Rs.**	**1,217,482Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,198	**7,632Rs.**	**12,110,832Rs.**	**10,901,090Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
94	**357Rs.**	**1,803,207Rs.**	**1,608,117Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
927	**561Rs.**	**5,267,775Rs.**	**4,862,357Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
492	**81Rs.**	**3,332,111Rs.**	**3,038,778Rs.**

Domestic AUG- 2016			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
110,439	**35,517Rs.**	**14,667,437Rs.**	**11,363,124Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
247,484	**66,718Rs.**	**22,117,701Rs.**	**17,044,686Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,423	**883Rs.**	**1,638,379Rs.**	**1,284,342Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,246	**7,734Rs.**	**12,158,429Rs.**	**11,987,195Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
94	**81Rs.**	**1,715,910Rs.**	**1,619,905Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
927	**561Rs.**	**5,278,723Rs.**	**5,544,230Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
493	**357Rs.**	**3,336,145Rs.**	**3,136,321Rs.**

Domestic SEP- 2016			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
110,631	**33,872Rs.**	**14,686,860Rs.**	**10,522,415Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
245,222	**64,051Rs.**	**21,929,620Rs.**	**15,783,622Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,423	**873Rs.**	**1,637,413Rs.**	**1,226,222Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,279	**7,501Rs.**	**12,255,262Rs.**	**11,158,610Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
94	**78Rs.**	**1,780,232Rs.**	**1,577,517Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
930	**583Rs.**	**5,290,082Rs.**	**5,133,137Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
494	**359Rs.**	**3,337,562Rs.**	**3,055,230Rs.**

Domestic OCT- 2016			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
110,805	**35,576Rs.**	**14,703,907Rs.**	**11,204,876Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
246,250	**67,809Rs.**	**22,014,558Rs.**	**16,807,314Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,431	**929Rs.**	**1,634,274Rs.**	**1,279,946Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,349	**8,042Rs.**	**12,329,205Rs.**	**11,485,508Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
94	**78Rs.**	**1,755,762Rs.**	**1,575,144Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
930	**543Rs.**	**5,290,082Rs.**	**4,625,415Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
495	**350Rs.**	**3,340,042Rs.**	**3,004,717Rs.**

Domestic NOV- 2016			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
112,772	**36,475Rs.**	**14,927,361Rs.**	**11,484,333Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
249,219	**68,946Rs.**	**22,231,201Rs.**	**17,226,499Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,431	**912Rs.**	**2,466,862Rs.**	**1,949,104Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,406	**8,182Rs.**	**19,746,986Rs.**	**15,674,304Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
94	**79Rs.**	**2,726,334Rs.**	**2,381,672Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
930	**569Rs.**	**7,007,647Rs.**	**6,780,875Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
493	**351Rs.**	**4,349,875Rs.**	**3,894,279Rs.**

Domestic DEC- 2016			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
110,973	**35,009Rs.**	**14,726,363Rs.**	**10,807,233Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
246,545	**66,268Rs.**	**22,053,613Rs.**	**16,210,849Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,433	**931Rs.**	**2,468,103Rs.**	**1,968,493Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,405	**8,187Rs.**	**19,737,034Rs.**	**15,836,418Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
93	**73Rs.**	**2,331,043Rs.**	**1,885,669Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
927	**558Rs.**	**6,962,826Rs.**	**6,545,162Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
491	**354Rs.**	**4,327,335Rs.**	**3,783,255Rs.**

Domestic JAN- 2017			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
111,047	**36,473Rs.**	**14,740,719Rs.**	**11,432,759Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
246,982	**69,268Rs.**	**22,100,367Rs.**	**17,149,139Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,433	**940Rs.**	**2,472,610Rs.**	**1,912,997Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,444	**8,631Rs.**	**19,729,611Rs.**	**16,999,646Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
93	**77Rs.**	**2,228,358Rs.**	**2,021,374Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
926	**577Rs.**	**7,016,691Rs.**	**6,735,227Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
490	**353Rs.**	**4,351,347Rs.**	**3,845,526Rs.**

Domestic FEB- 2017			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
111,230	**35,449Rs.**	**14,733,432Rs.**	**11,789,721Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
247,059	**74,111Rs.**	**21,898,081Rs.**	**17,684,581Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,439	**955Rs.**	**2,482,030Rs.**	**1,502,518Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,566	**8,577Rs.**	**19,902,572Rs.**	**12,113,353Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
93	**79Rs.**	**2,568,119Rs.**	**2,262,467Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
928	**582Rs.**	**7,030,334Rs.**	**5,956,074Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
494	**346Rs.**	**4,334,636Rs.**	**3,514,379Rs.**

Domestic MARCH- 2017			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
111,307	**37,874Rs.**	**14,771,174Rs.**	**11,633,131Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
245,034	**72,509Rs.**	**21,937,960Rs.**	**17,449,696Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,439	**940Rs.**	**2,480,097Rs.**	**1,912,365Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,624	**8,719Rs.**	**19,907,233Rs.**	**16,906,523Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
93	**79Rs.**	**2,548,209Rs.**	**2,247,543Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
928	**570Rs.**	**6,866,554Rs.**	**6,225,159Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
496	**357Rs.**	**4,314,125Rs.**	**3,792,197Rs.**

Domestic APRIL- 2017			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
111,542	**36,403Rs.**	**14,799,286Rs.**	**10,884,391Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
245,707	**69,385Rs.**	**21,996,801Rs.**	**16,326,586Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,440	**892Rs.**	**2,452,669Rs.**	**1,704,065Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,736	**8,025Rs.**	**19,940,380Rs.**	**15,706,381Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
93	**77Rs.**	**2,389,493Rs.**	**2,125,460Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
928	**568Rs.**	**6,828,710Rs.**	**6,958,949Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
496	**355Rs.**	**4,318,740Rs.**	**4,053,604Rs.**

Domestic MAY- 2017			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
111,825	**37,726Rs.**	**14,837,259Rs.**	**11,047,933Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
146,490	**71,624Rs.**	**22,064,947Rs.**	**16,571,901Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,434	**924Rs.**	**2,437,694Rs.**	**1,806,689Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,773	**8,352Rs.**	**19,911,041Rs.**	**17,138,991Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
92	**77Rs.**	**2,442,200Rs.**	**2,302,431Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
928	**561Rs.**	**6,878,581Rs.**	**6,508,561Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
494	**352Rs.**	**4,294,270Rs.**	**4,060,783Rs.**

Domestic JUNE- 2017			
Water Conn	Payee	Billed amount	Received Amount (with Arrear)
111,887	**35,438Rs.**	**14,842,822Rs.**	**10,597,057Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount (with Arrear)
246,896	**67,405Rs.**	**22,108,725Rs.**	**15,895,585Rs.**
Commercial			
Water Conn	Payee	Billed amount	Received Amount
2,429	**896Rs.**	**2,429,723Rs.**	**2,206,996Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
20,805	**8,210Rs.**	**19,941,342Rs.**	**18,521,503Rs.**
Industry			
Water Conn	Payee	Billed amount	Received Amount
92	**77Rs.**	**2,448,343Rs.**	**2,306,194Rs.**
Sewer Conn	Payee	Billed Amount	Received Amount
928	**561Rs.**	**6,843,250Rs.**	**6,661,789Rs.**
Aquifer Conn	Payee	Billed Amount	Received Amount
494	**352Rs.**	**4,294,270Rs.**	

Water Supply Tariff Collection by Consumer 2016

Domestic JULY- 2016					
Water Conn	Payers	Water Conn (difference)	Payers (difference)	Billed amount	Received Amount (with Arrear)
112,954	**34,993**	**112,954**	**34,993**	**14,669,815Rs.**	**10,736,180Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
274,787	**58,589**	**161,833**	**23,596**	**22,087,699Rs.**	**16,104,270Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,413	**873**	**2,413**	**873**	**1,634,998Rs.**	**1,217,482Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
20,198	**7,632**	**17,785**	**6,759**	**12,110,832Rs.**	**10,901,090Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
94	**357**	**94**	**357**	**1,803,207Rs.**	**1,608,117Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
927	**561**	**833**	**204**	**5,267,775Rs.**	**4,862,357Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
492	**81**	**492**	**81**	**3,332,111Rs.**	**3,038,778Rs.**

Domestic AUG- 2016					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
110,439	**35,517**	**110,439**	**35,517**	**14,667,437Rs.**	**11,363,124Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
247,484	**66,718**	**137,045**	**31,201**	**22,117,701Rs.**	**17,044,686Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,423	**883**	**2,423**	**883**	**1,638,379Rs.**	**1,284,342Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,246	**7,734**	**17,823**	**6,851**	**12,158,429Rs.**	**11,987,195Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
94	**81**	**94**	**81**	**1,715,910Rs.**	**1,619,905Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
927	**561**	**833**	**480**	**5,278,723Rs.**	**5,544,230Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
493	**357**	**493**	**357**	**3,336,145Rs.**	**3,136,321Rs.**

Domestic SEP- 2016					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
110,631	**33,872**	**110,631**	**33,872**	**14,686,860Rs.**	**10,522,415Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
245,222	**64,051**	**134,591**	**30,179**	**21,929,620Rs.**	**15,783,622Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,423	**873**	**2,423**	**873**	**1,637,413Rs.**	**1,226,222Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,279	**7,501**	**17,856**	**6,628**	**12,255,262Rs.**	**11,158,610Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
94	**78**	**94**	**78**	**1,780,232Rs.**	**1,577,517Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
930	**583**	**836**	**505**	**5,290,082Rs.**	**5,133,137Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
494	**359**	**494**	**359**	**3,337,562Rs.**	**3,055,230Rs.**

Domestic OCT- 2016					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
110,805	**35,576**	**110,805**	**35,576**	**14,703,907Rs.**	**11,204,876Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
246,250	**67,809**	**135,445**	**32,233**	**22,014,558Rs.**	**16,807,314Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,431	**929**	**2,431**	**929**	**1,634,274Rs.**	**1,279,946Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,349	**8,042**	**17,918**	**7,113**	**12,329,205Rs.**	**11,485,508Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
94	**78**	**94**	**78**	**1,755,762Rs.**	**1,575,144Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
930	**543**	**836**	**465**	**5,290,082Rs.**	**4,625,415Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
495	**350**	**495**	**350**	**3,340,042Rs.**	**3,004,717Rs.**

Domestic NOV- 2016					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
112,772	**36,475**	**112,772**	**36,475**	**14,927,361Rs.**	**11,484,333Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
249,219	**68,946**	**136,447**	**32,471**	**22,231,201Rs.**	**17,226,499Rs.**
			Commercial		
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,431	**912**	**2,431**	**912**	**2,466,862Rs.**	**1,949,104Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,406	**8,182**	**17,975**	**7,270**	**19,746,986Rs.**	**15,674,304Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
94	**79**	**94**	**79**	**2,726,334Rs.**	**2,381,672Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
930	**569**	**836**	**490**	**7,007,647Rs.**	**6,780,875Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
493	**351**	**493**	**351**	**4,349,875Rs.**	**3,894,279Rs.**

Domestic DEC- 2016					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
110,973	**35,009**	**110,973**	**35,009**	**14,726,363Rs.**	**10,807,233Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
246,545	**66,268**	**135,572**	**31,259**	**22,053,613Rs.**	**16,210,849Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,433	**931**	**2,433**	**931**	**2,468,103Rs.**	**1,968,493Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,405	**8,187**	**17,972**	**7,256**	**19,737,034Rs.**	**15,836,418Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
93	**73**	**93**	**73**	**2,331,043Rs.**	**1,885,669Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
927	**558**	**834**	**485**	**6,962,826Rs.**	**6,545,162Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
491	**354**	**491**	**354**	**4,327,335Rs.**	**3,783,255Rs.**

Domestic JAN- 2017					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
111,047	**36,473**	**111,047**	**36,473**	**14,740,719Rs.**	**11,432,759Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
246,982	**69,268**	**135,935**	**32,795**	**22,100,367Rs.**	**17,149,139Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,433	**940**	**2,433**	**940**	**2,472,610Rs.**	**1,912,997Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,444	**8,631**	**18,011**	**7,691**	**19,729,611Rs.**	**16,999,646Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
93	**77**	**93**	**77**	**2,228,358Rs.**	**2,021,374Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
926	**577**	**833**	**500**	**7,016,691Rs.**	**6,735,227Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
490	**353**	**490**	**353**	**4,351,347Rs.**	**3,845,526Rs.**

Domestic FEB- 2017					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
111,230	**35,449**	**111,230**	**35,449**	**14,733,432Rs.**	**11,789,721Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
247,059	**74,111**	**135,829**	**38,662**	**21,898,081Rs.**	**17,684,581Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,439	**955**	**2,439**	**955**	**2,482,030Rs.**	**1,502,518Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,566	**8,577**	**18,127**	**7,622**	**19,902,572Rs.**	**12,113,353Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
93	**79**	**93**	**79**	**2,568,119Rs.**	**2,262,467Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
928	**582**	**835**	**503**	**7,030,334Rs.**	**5,956,074Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
494	**346**	**494**	**346**	**4,334,636Rs.**	**3,514,379Rs.**

Domestic MARCH- 2017					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
111,307	**37,874**	**111,307**	**37,874**	**14,771,174Rs.**	**11,633,131Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
245,034	**72,509**	**133,727**	**34,635**	**21,937,960Rs.**	**17,449,696Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,439	**940**	**2,439**	**940**	**2,480,097Rs.**	**1,912,365Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,624	**8,719**	**18,185**	**7,779**	**19,907,233Rs.**	**16,906,523Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
93	**79**	**93**	**79**	**2,548,209Rs.**	**2,247,543Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
928	**570**	**835**	**491**	**6,866,554Rs.**	**6,225,159Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
496	**357**	**496**	**357**	**4,314,125Rs.**	**3,792,197Rs.**

Domestic APRIL- 2017					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
111,542	**36,403**	**111,542**	**36,403**	**14,799,286Rs.**	**10,884,391Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
245,707	**69,385**	**134,165**	**32,982**	**21,996,801Rs.**	**16,326,586Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,440	**892**	**2,440**	**892**	**2,452,669Rs.**	**1,704,065Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,736	**8,025**	**18,296**	**7,133**	**19,940,380Rs.**	**15,706,381Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
93	**77**	**93**	**77**	**2,389,493Rs.**	**2,125,460Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
928	**568**	**835**	**491**	**6,828,710Rs.**	**6,958,949Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
496	**355**	**496**	**355**	**4,318,740Rs.**	**4,053,604Rs.**

Domestic MAY- 2017					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
111,825	**37,726**	**111,825**	**37,726**	**14,837,259Rs.**	**11,047,933Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
246,490	**71,624**	**134,665**	**33,898**	**22,064,947Rs.**	**16,571,901Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,434	**924**	**2,434**	**924**	**2,437,694Rs.**	**1,806,689Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,773	**8,352**	**18,339**	**7,428**	**19,911,041Rs.**	**17,138,991Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
92	**77**	**92**	**77**	**2,442,200Rs.**	**2,302,431Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
928	**561**	**836**	**484**	**6,878,581Rs.**	**6,508,561Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
494	**352**	**494**	**352**	**4,294,270Rs.**	**4,060,783Rs.**

Domestic JUNE- 2017					
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount (with Arrear)
111,887	**35,438**	**111,887**	**35,438**	**14,842,822Rs.**	**10,597,057Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount (with Arrear)
246,896	**67,405**	**135,009**	**31,967**	**22,108,725Rs.**	**15,895,585Rs.**
		Commercial			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
2,429	**896**	**2,429**	**896**	**2,429,723Rs.**	**2,206,996Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
20,805	**8,210**	**18,376**	**7,314**	**19,941,342Rs.**	**18,521,503Rs.**
		Industry			
Water Conn	Payers	Water Conn	Payers	Billed amount	Received Amount
92	**77**	**92**	**77**	**2,448,343Rs.**	**2,306,194Rs.**
Sewer Conn	Payers	Sewer Conn	Payers	Billed Amount	Received Amount
928	**561**	**836**	**484**	**6,843,250Rs.**	**6,661,789Rs.**
Aquifer Con	Payers	Aquifer Conn	Payers	Billed Amount	Received Amount
494	**352**	**494**	**352**	**4,294,270Rs.**	**3,950,226Rs.**

Year WISE RECOVERY REPORT JULY 16 - JUNE 17

DOMESTIC

SR#	Months	Curr Demand	Arrear Demand	Total Demand	Curr Rec	Arrear Rec	Total Rec	Consumers	Payee	%Payees	%C.REC
		Millions RS.	Millions RS.	Millions RS.	Millions RS.	Millions RS.	Millions RS.	Numbers	Numbers		
1	Jul-16	36.75	2,763.89	2,800.64	11.00	14.77	25.77	251,729	62,157	24.7	29.9
2	Aug-16	36.78	2,775.42	2,812.19	11.70	15.98	27.68	252,049	66,979	26.6	31.8
3	Sep-16	36.61	2,766.46	2,803.07	11.36	14.68	26.04	249,821	64,568	25.8	31.0
4	Oct-16	36.71	2,781.39	2,818.10	11.88	15.84	27.88	250,835	68,500	27.3	32.4
5	Nov-16	37.15	2,815.51	2,852.66	12.09	17.54	29.63	253,801	70,404	27.7	32.5
6	Dec-16	36.77	2,799.18	2,835.95	11.69	16.38	28.07	251,113	68,799	27.4	31.8
7	Jan-17	36.83	2,816.44	2,853.27	12.22	17.56	29.79	251,514	71,400	28.4	33.2
8	Feb-17	36.87	2,823.07	2,859.94	12.87	16.57	29.44	251,649	75,110	29.8	34.9
9	Mar-17	36.70	2,823.95	2,860.65	12.70	16.38	29.08	249,590	73,465	29.4	34.6
10	Apr-17	36.79	2,833.83	2,870.62	12.18	14.97	27.15	250,256	70,127	28.0	33.1
11	May-17	36.89	2,847.63	2,884.52	14.16	14.63	28.74	251,056	73,639	29.3	38.4
12	Jun-17	36.95	2,860.64	2,897.59	11.78	13.94	25.71	251,498	67,602	26.9	31.9
	Average	**36.816**	**2808.951**	**2845.767**	**12.135**	**15.771**	**27.915**	**251243**	**69396**	**27.62**	**32.96**

COMMERCIAL

CODE	Month	Current Demand	Arrear Demand	T.Demand	Current Rec	Arrear Rec	Total Rec	Consumers	Payees	% C.REC	% Payees
		Millions RS.	Millions RS.	Millions RS.	Millions RS.	Millions RS.	Millions RS.	Numbers	Numbers		
1	Jul-16	13.72	330.61	344.33	7.81	4.31	12.12	22,582	8,502	56.9%	37.6%
2	Aug-16	13.78	333.76	347.54	8.12	5.08	13.20	22,639	8,586	58.9%	37.9%
3	Sep-16	13.86	334.36	348.22	7.73	3.74	11.46	22,673	8,203	55.8%	36.2%
4	Oct-16	13.94	337.88	351.82	8.17	4.18	12.35	22,752	8,872	58.6%	39.0%
5	Nov-16	22.16	340.43	362.60	12.74	4.66	17.40	22,810	9,114	57.5%	40.0%
6	Dec-16	22.16	345.75	367.91	12.79	4.66	17.45	22,809	9,020	57.7%	39.5%
7	Jan-17	22.21	352.32	374.53	13.33	5.33	18.67	22,831	9,512	60.0%	41.7%
8	Feb-17	22.39	357.13	379.52	13.51	5.84	19.35	22,959	9,530	60.4%	41.5%
9	Mar-17	22.35	361.03	383.38	13.76	5.05	18.81	23,016	9,654	61.5%	41.9%
10	Apr-17	22.36	366.16	388.52	13.11	4.09	17.20	23,130	8,870	58.6%	38.3%
11	May-17	22.31	372.53	394.84	13.40	2.31	17.99	23,161	9,239	60.1%	39.9%
12	Jun-17	22.34	373.88	396.21	13.43	6.24	19.67	23,187	8,942	60.1%	38.6%
	Average	**19.464**	**350.488**	**369.952**	**11.492**	**4.624**	**16.306**	**22879**	**9004**	**59%**	**39%**

INDUSTRIAL

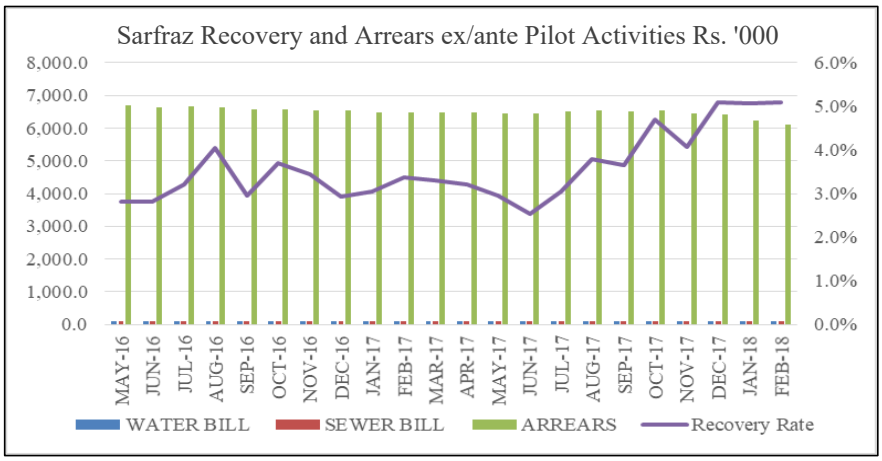
CODE	Month	Current Demand	Arrear Demand	Total Demand	Current Rec	Arrear Rec	Total Rec	Consumers	Payees	%Payee	%C.REC
		Millions RS.	Millions RS.	Millions RS.	Millions RS.	Millions RS.	Millions RS.	Numbers	Numbers		
1	Jul-16	10.42	77.42	87.84	8.12	0.61	8.73	1,516	939	61.94	77.94
2	Aug-16	10.40	78.38	88.78	8.85	1.43	10.27	1,516	947	62.47	85.07
3	Sep-16	10.41	78.37	88.78	8.44	0.73	9.17	1,520	982	64.61	81.13
4	Oct-16	10.39	79.19	89.58	8.64	0.48	9.12	1,521	966	63.51	83.19
5	Nov-16	14.12	80.83	94.96	11.95	1.06	13.02	1,519	995	65.50	84.62
6	Dec-16	13.63	82.02	95.65	11.16	0.84	12.00	1,514	976	64.46	81.88
7	Jan-17	13.58	83.53	97.11	11.46	1.11	12.57	1,511	1,003	66.38	84.37
8	Feb-17	13.95	84.91	98.87	11.69	0.81	12.50	1,516	1,006	66.36	83.80
9	Mar-17	13.73	86.45	100.18	11.47	0.79	12.25	1,517	1,004	66.18	83.53
10	Apr-17	13.53	87.86	101.40	10.82	1.05	11.87	1,517	984	64.86	79.95
11	May-17	13.60	89.61	103.21	14.01	0.37	15.54	1,514	1,079	71.27	102.98
12	Jun-17	13.61	88.47	102.08	10.42	1.15	11.57	1,514	938	61.96	76.57
	Average	**12.61**	**83.09**	**95.70**	**10.59**	**0.87**	**11.55**	**1516**	**985**	**64.96**	**83.75**

Salfaz Colony Pilot Activity Billed and Collected by Service

S#	MONTH	WATER CONN	SEWER CONN	WATER BILL(Rs.)	SEWER BILL(Rs.)	ARREARS (Rs.)	RECOVERY (Rs.)
1	JAN-FEB-15	481	800	191,524	208,846	6,698,686	351,373
2	MAR-APRIL 15	483	802	192,458	209,396	6,663,042	437,348
3	MAY-JUNE 15	486	804	193,522	210,312	6,655,529	312,058
4	JUL-15	486	804	96,909	105,341	6,762,812	195,469
5	AUG-15	482	803	96,253	105,175	6,788,683	216,565
6	SEP-15	483	803	96,398	105,175	6,752,107	181,719
7	OCT-15	480	803	95,672	105,175	6,747,701	178,220
8	NOV-15	479	804	95,572	104,789	6,706,559	176,823
9	DEC-15	477	804	95,088	104,789	6,751,745	154,491
10	JAN-16	477	804	95,088	104,789	6,814,050	250,308
11	FEB-16	476	804	94,943	104,789	6,781,600	207,582
12	MAR-16	477	803	95,185	104,483	6,725,388	186,203
13	APR-16	478	804	95,191	104,488	6,732,572	197,731
14	MAY-16	476	803	94,901	104,391	6,700,745	193,950
15	JUN-16	480	805	95,751	104,571	6,625,347	191,736
16	JUL-16	480	805	95,751	104,571	6,656,721	220,450
17	AUG-16	481	805	96,073	104,571	6,625,044	276,601
18	SEP-16	482	806	96,253	104,626	6,559,584	199,733
19	OCT-16	485	806	96,979	104,626	6,579,975	250,832
20	NOV-16	487	807	97,304	104,787	6,549,659	232,713
21	DEC-16	485	806	97,062	104,626	6,555,557	198,768
22	JAN-17	498	806	99,190	104,626	6,487,069	204,146
23	FEB-17	496	804	98,900	104,529	6,474,693	225,673
24	MAR-17	497	804	99,045	104,529	6,473,028	220,990
25	APR-17	498	804	99,031	104,423	6,473,537	213,597
26	MAY-17	502	806	99,646	104,511	6,448,290	196,577
27	JUN-17	501	806	99,501	104,511	6,452,121	169,079
28	JUL-17	501	812	99,501	105,051	6,512,800	204,708
29	AUG-17	504	814	99,874	105,267	6,529,421	254,782
30	SEP-17	504	814	99,874	105,267	6,498,828	244,349
31	OCT-17	512	820	101,163	105,709	6,529,774	316,803
32	NOV-17	541	824	106,189	106,055	6,453,672	271,384
33	DEC-17	558	827	109,285	106,304	6,415,551	337,198
34	JAN-18	560	828	109,935	106,562	6,230,191	326,842
35	FEB-18	561	832	109,610	106,562	6,098,895	322,160
36	MAR-18	561	834	108,708	106,343	6,047,549	195,561

S#	MONTH	WATER CONN	SEWER CONN	WATER BILL(Rs.)	SEWER BILL(Rs.)	ARREARS (Rs.)	Recovery Rate	RECOVERY (Rs.)
1	JAN-FEB-15	481	800	191.5	208.8	6,698.7	4.9%	351.4
2	MAR-APRIL 15	483	802	192.5	209.4	6,663.0	6.2%	437.3
3	MAY-JUNE 15	486	804	193.5	210.3	6,655.5	4.4%	312.1
4	JUL-15	486	804	96.9	105.3	6,762.8	2.8%	195.5
5	AUG-15	482	803	96.3	105.2	6,788.7	3.1%	216.6
6	SEP-15	483	803	96.4	105.2	6,752.1	2.6%	181.7
7	OCT-15	480	803	95.7	105.2	6,747.7	2.6%	178.2
8	NOV-15	479	804	95.6	104.8	6,706.6	2.6%	176.8
9	DEC-15	477	804	95.1	104.8	6,751.7	2.2%	154.5
10	JAN-16	477	804	95.1	104.8	6,814.1	3.6%	250.3
11	FEB-16	476	804	94.9	104.8	6,781.6	3.0%	207.6
12	MAR-16	477	803	95.2	104.5	6,725.4	2.7%	186.2
13	APR-16	478	804	95.2	104.5	6,732.6	2.9%	197.7

S#	MONTH	WATER BILL (Rs.)	SEWER BILL (Rs.)	ARREARS (Rs.)	Recovery Rate	RECOVERY (Rs.)	WATER CONN	SEWER CONN	Connecion increase rate (WS)	Connecion increase rate (Sanitation)
1	MAY-16	94.9	104.4	6,700.7	2.8%	194.0	476	803		
2	JUN-16	95.8	104.6	6,625.3	2.8%	191.7	480	805	0.9%	0.2%
3	JUL-16	95.8	104.6	6,656.7	3.2%	220.5	480	805	0.0%	0.0%
4	AUG-16	96.1	104.6	6,625.0	4.1%	276.6	481	805	0.3%	0.0%
5	SEP-16	96.3	104.6	6,559.6	3.0%	199.7	482	806	0.2%	0.1%
6	OCT-16	97.0	104.6	6,580.0	3.7%	250.8	485	806	0.8%	0.0%
7	NOV-16	97.3	104.8	6,549.7	3.4%	232.7	487	807	0.3%	0.2%
8	DEC-16	97.1	104.6	6,555.6	2.9%	198.8	485	806	-0.2%	-0.2%
9	JAN-17	99.2	104.6	6,487.1	3.1%	204.1	498	806	2.2%	0.0%
10	FEB-17	98.9	104.5	6,474.7	3.4%	225.7	496	804	-0.3%	-0.1%
11	MAR-17	99.0	104.5	6,473.0	3.3%	221.0	497	804	0.1%	0.0%
12	APR-17	99.0	104.4	6,473.5	3.2%	213.6	498	804	0.0%	-0.1%
13	MAY-17	99.6	104.5	6,448.3	3.0%	196.6	502	806	0.6%	0.1%
14	JUN-17	99.5	104.5	6,452.1	2.5%	169.1	501	806	-0.1%	0.0%
15	JUL-17	99.5	105.1	6,512.8	3.0%	204.7	501	812	0.0%	0.5%
16	AUG-17	99.9	105.3	6,529.4	3.8%	254.8	504	814	0.4%	0.2%
17	SEP-17	99.9	105.3	6,498.8	3.6%	244.3	504	814	0.0%	0.0%
18	OCT-17	101.2	105.7	6,529.8	4.7%	316.8	512	820	1.3%	0.4%
19	NOV-17	106.2	106.1	6,453.7	4.1%	271.4	541	824	5.0%	0.3%
20	DEC-17	109.3	106.3	6,415.6	5.1%	337.2	558	827	2.9%	0.2%
21	JAN-18	109.9	106.6	6,230.2	5.1%	326.8	560	828	0.6%	0.2%
22	FEB-18	109.6	106.6	6,098.9	5.1%	322.2	561	832	-0.3%	0.0%
23	MAR-18	108.7	106.3	6,047.5	3.1%	195.6	561	834	-0.8%	-0.2%



APPENDIX FOR CHAPTER A8 FINDINGS AND ISSUES IN THE WATER SECTOR

AA8.1 Current Problem Analysis and Business Improvement Policy in WASA-F

Procedure for Analyzing Problems and Examining Business Improvement Policy in WASA-F

Analysis of problems in water supply, sewerage and drainage sectors and examination of business improvement in WASA-F was carried out in the following procedure. (See the Figure below)

(A) Implement capacity assessment for WASA-F management.

Based on the basic tool 4 of the JICA Handbook for Capacity Assessment for Urban Water Supply Sector and Water Utilities in Developing Countries (2010), add questions on sewage / drainage sectors. In addition, in the remarks column, describe the numerical values and problems of PI which is the basis of the selected level. Share results with the members of WASA-F about the results.

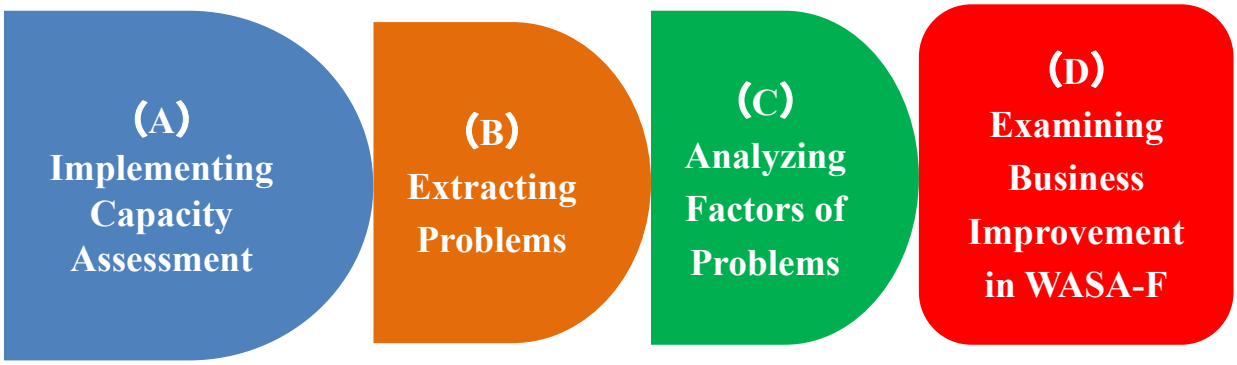
(B) Extract problems and weak points in the administration and operation of WASA-F from (A).

(C) Analyze the factors of the problem, to solve the problems extracted in (B).

Firstly, JMT analyzed the problems and their causes comprehensively in the tree diagram, but since the extracted problems are related to each other and some are caused by the same factor, factor analysis using the relationship diagram was carried out, JMT decided to analyze common factors and factors that are the basis. As a factor analysis procedure, JMT first conducted brainstorming within JMT members, then conducted brainstorming in collaboration with WASA-F members.

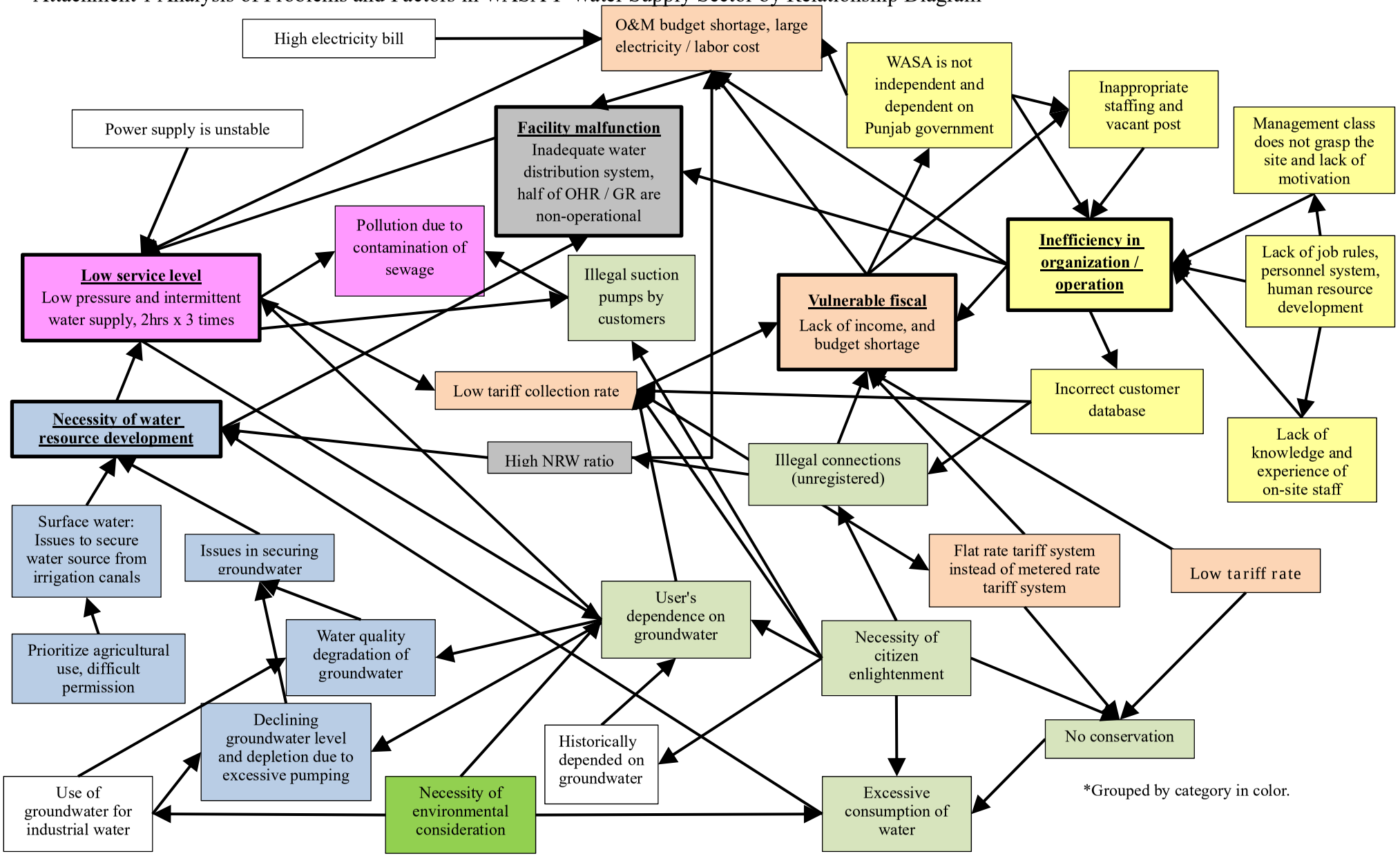
(D) Examine the policy for improving the management of WASA-F based on the factor analysis result of (C),

In order to improve the management and management of WASA-F in a comprehensive and effective manner, carefully examine the core part of the factor analysis and decide the policy to change the negative spiral so far into a positive spiral.

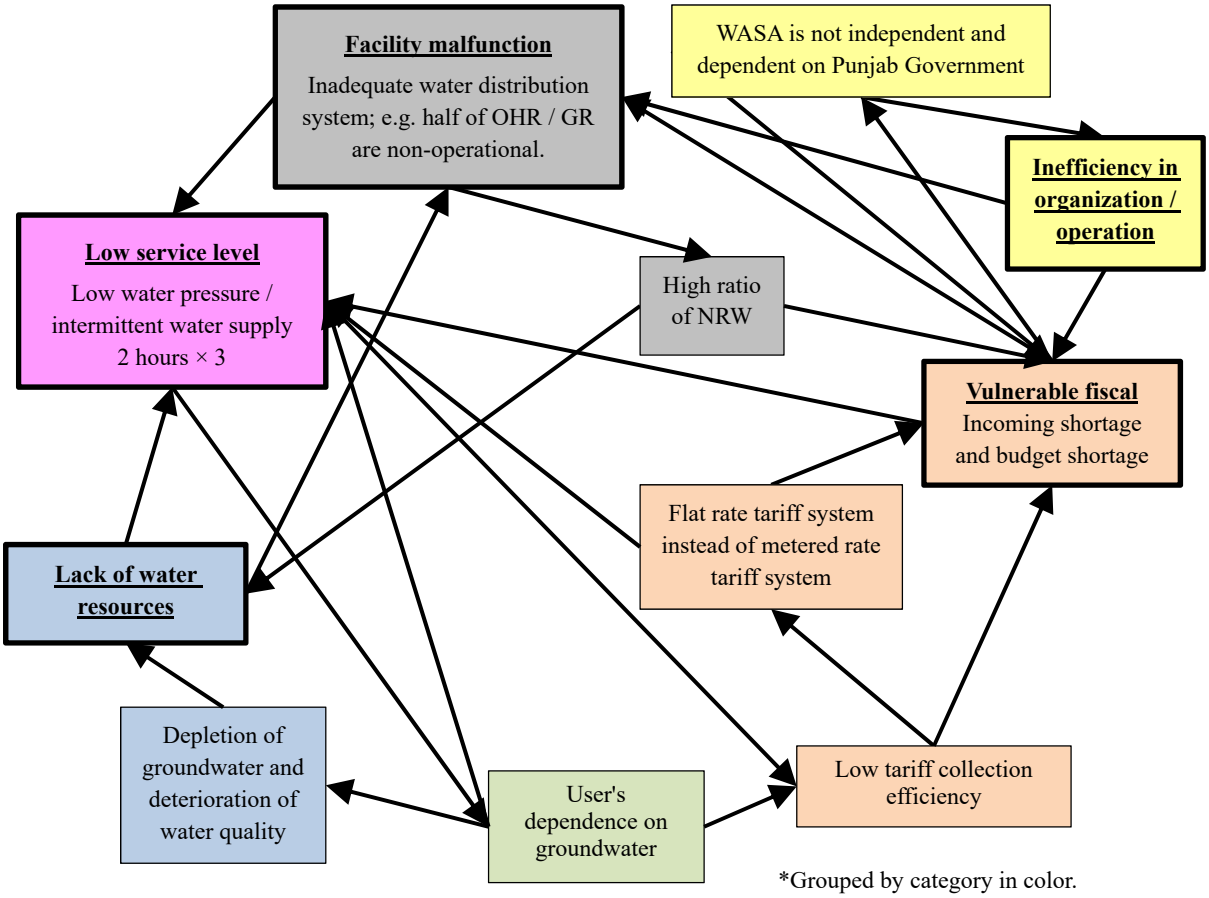


Attachment 1 Analysis of Problems and Factors in WASA-F Water Supply Sector by Relationship Diagram
Attachment 2 Determination of Business Improvement in Water Supply Sector
Attachment 3 Analysis of Problems and Factors in WASA-F Sewerage and Drainage Sector by Relationship Diagram
Attachment 4 Determination of Business Improvement in WASA-F Sewerage and Drainage Sector

Attachment 1 Analysis of Problems and Factors in WASA-F Water Supply Sector by Relationship Diagram



Problems and Factors in WASA-F Water Supply Sector (Core Part)



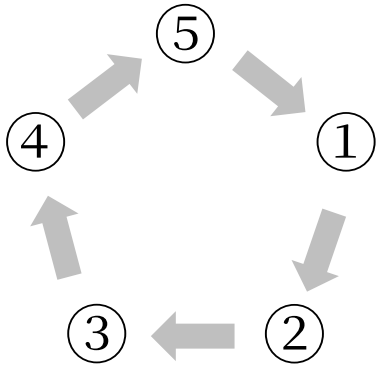
*Grouped by category in color.

Current situation and its factors (negative spiral)

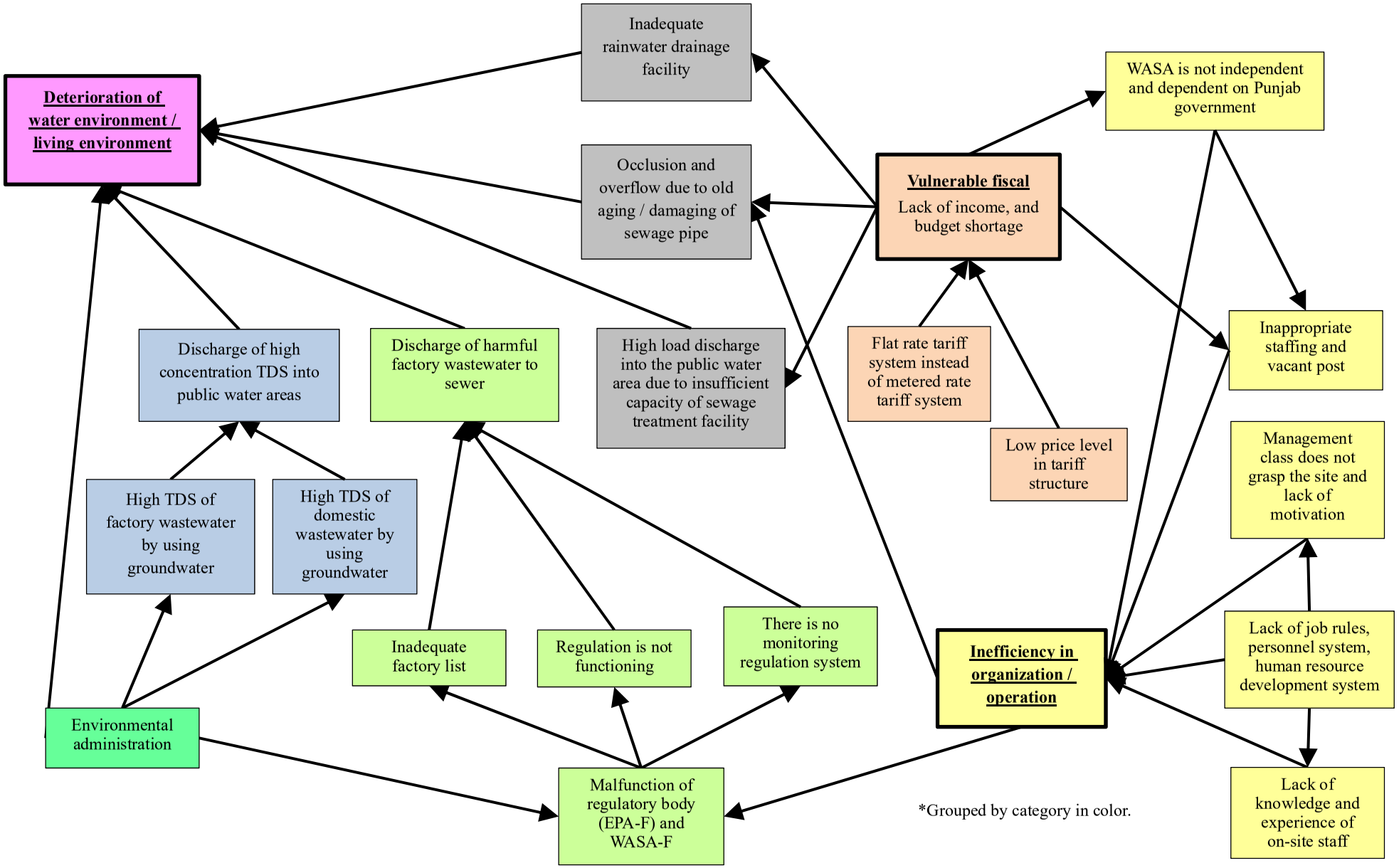
- Intermittent water supply, 2 hours × 3 times, and many areas are low service supply with low water pressure.
- WASA water is not fully utilized, and users depend on the groundwater from private wells as their main water source.
- Because of the low service level, the tariff collection rate is low and also the tariff level is low, so the income is insufficient.
- Due to insufficient income, dependency on Punjab Government is high; WASA-F is not independence organization; operation is inefficient and vulnerable fiscal.
- Facility malfunction has occurred due to insufficient income and budget shortage.
- It is difficult to raise the service level due to insufficient budget (electric fee cannot be paid).

Business Improvement (to positive spiral) in Water Supply Sector

① Improve service level (increase water supply time, necessary water pressure and water volume).
② Improve customer satisfaction and improve tariff collection rate.
③ In order to clarify the amount of water used, shift from the flat rate system to the metered rate system.
④ Implement price increases to appropriate water tariff, leading to increased revenue of WASA-F.
⑤ Improve service level by improving necessary facilities with increased income and integrated urban water management (IUWM) through measures against NRW.

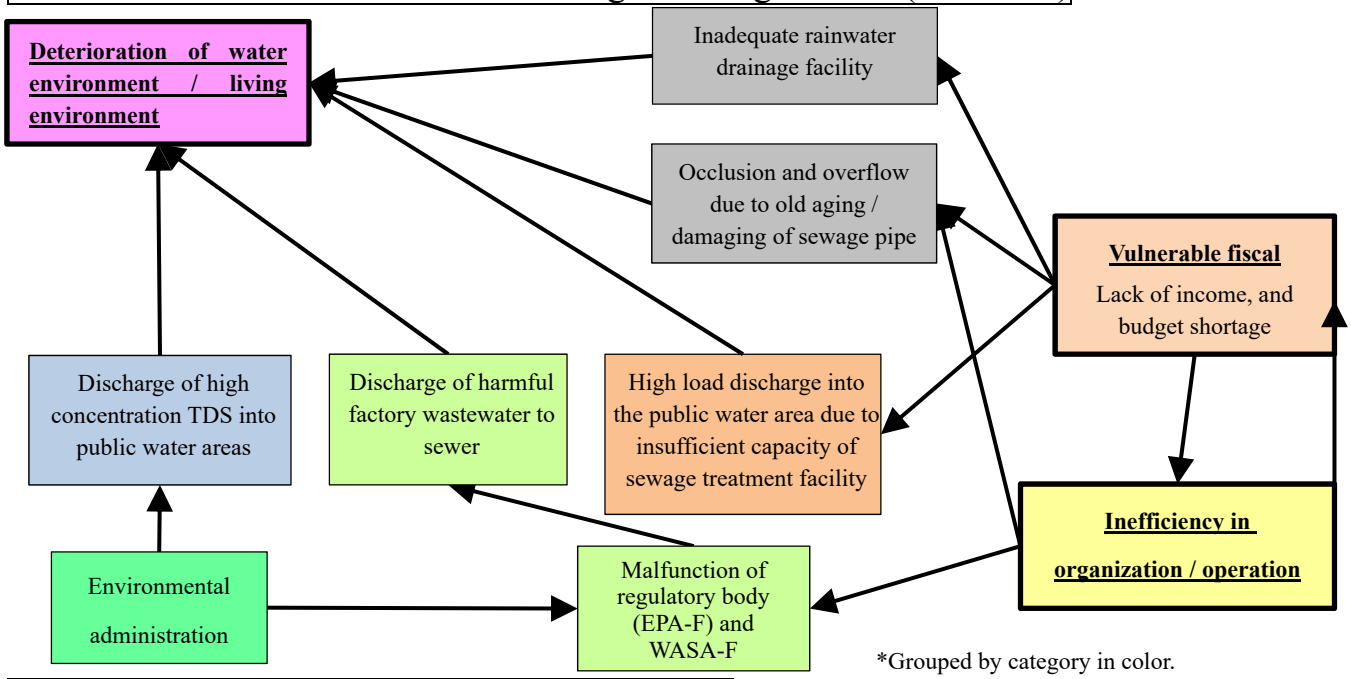


Attachment 3 Analysis of Problems and Factors in WASA-F Sewerage and Drainage Sector by Relationship Diagram



*Grouped by category in color.

Problems and Factors in WASA-F Sewage Drainage Sector (Core Part)



*Grouped by category in color.

Current situation and its factors (negative spiral)

- Occlusion and overflow due to old aging and damaging of sewer pipes cause threatening of living environment.
- The capacity of the sewage treatment facility is small and high-load wastewater is released into the public water area.
- The factory wastewater and domestic wastewater of high concentration TDS due to the use of groundwater are released into the public water area.
- Major rainwater drainage paths are used for draining sewage and slope is slow grade, so it is necessary to dredge accumulated sediment and sediment, which adversely affects living environment, every year.
- Due to malfunction of regulatory agencies (EPA-F) and WASA-F, harmful factory wastewater is discharged to the sewer.
- Dependency on Punjab government is high due to shortage of budget, organization / operation is inefficient and weak financial situation.

Business Improvement (to positive spiral) in Sewerage & Drainage Sector

- Improve sewage pipeline to promptly eliminate sewage (sewage + rainwater) from living environment.
- Reduce the pollution load on public water areas by improving the throughput capacity of the sewage treatment facility.
- By appropriate legislation and strengthening of its operation, only properly pretreated factory wastewater will be accepted into WASA sewerage facility.
- Diffusion and promotion of factory wastewater treatment facilities by the industrial sector will reduce the pollution load caused by industrial wastewater and reduce the release of harmful substances.

Utility Basic Checklist (UBC) for Water and Sewerage Works Entity for Capacity Assessment

Category			Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT①: LPI)	Level				
						1: Very Serious	2: Serious	3: Not Good Enough	4: Good	5: Very Good
Large	Medium	Small				This level reflects the conditions of water utilities which need all-round assistance in all fields.	This level reflects the conditions of water utilities which need broad assistance in many fields.	This level is reflects the conditions of water utilities which need partial assistance in some fields.	This level reflects the conditions which water utilities in developing countries should aim for in the foreseeable future.	This level reflects the conditions of water utilities in developed countries.
Aspects to be improved mainly by Facility Investment (FI)	Overall		FI/CD	1st	Q1: Existence of long or mid-term plan for facility expansion, rehabilitation, etc.	Long or mid-term plan for facility expansion, rehabilitation, etc. does not exist at all.	Long or mid-term plan for facility expansion, rehabilitation, etc. exists but its target year has already passed.	Long or mid-term plan for facility expansion, rehabilitation, etc. exists but it has not been updated, although its target year has not yet passed.	Updated long or mid-term plan for facility expansion, rehabilitation, etc. exists but there are problems with its timely implementation.	Updated long or mid-term plan for facility expansion, rehabilitation, etc. exists and has encountered few or no problems in its implementation.
			FI/CD	1st	Q2: Continuity of supply	Mostly intermittent supply, averaging approx. every 4 days or less.	Mostly intermittent supply, averaging approx. every 1-3 days, with some served areas receiving continuous supply.	Intermittent supply and continuous supply are both common in the served areas.	Mostly continuous supply, but still there are some served areas with intermittent supply due to small utilities' inability to employ operators for 24 hours, high water demand during summer, etc.	Continuous supply in all served areas except for special cases such as serious drought.
		Average_Overall								
	Expansion	Water supply service coverage	FI	1st	Q3: Overall water supply coverage	Less than 50%	50-69%	70-84%	85-94%	95%-100%
		Sewerage service coverage	FI	1st	Q4: Overall sewerage service coverage	Less than 50%	50-69%	70-84%	85-94%	95%-100%
		Purification plant	FI	1st	Q5: Surplus purification capacity	Less than - 30%	Less than -10%	Less than 0%	0 - 5%	More than 5%
		Water source	FI	1st	Q6:Secure water source					
		Wastewater Treatment Plant	FI	1st	Q7: Treatment racio for generated wastewater	Less than 10%	Less than 40%	Less than 60%	Less than 80%	100%
		Average_Expansion								
	Rehabilitation/replacement	Conditions of water supply facilities	FI	1st	Q8: Civil structures (such as basins and chambers in water purification plants)	Water leakage from civil structures is common, and some of these problems can only be solved by replacement rather than partial repair.	Water leakage from civil structures is common, but these problems can probably be solved by partial repair.	Water leakage from civil structures happens sometimes.	Water leakage from civil structures is rare.	Water leakage from civil structures almost never happens unless a strong earthquake hits, as regular assessments of facility strength are undertaken.
			FI	1st	Q9: Transmission and distribution mains	More than 75% of transmission and distribution mains are asbestos pipes, old cast iron pipes (excluding ductile cast iron) or old steel pipes, with rust significantly blocking flow.	50 - 75% of mains are asbestos pipes, old cast iron pipes (excluding ductile cast iron) or old steel pipes, with rust significantly blocking flow.	25 - 49% of mains are asbestos pipes, old cast iron pipes (excluding ductile cast iron) or old steel pipes, with rust significantly blocking flow.	10 - 24% of mains are asbestos pipes, old cast iron pipes (excluding ductile cast iron) or old steel pipes, with rust significantly blocking flow.	Less than 10% of mains are asbestos pipes, old cast iron pipes (excluding ductile cast iron) or old steel pipes, with rust significantly blocking flow.
			FI	1st	Q10: Service connections	95 - 100% of house connections are more than 25 years old.	80 - 94% of house connections are more than 25 years old.	60 - 79% of house connections are more than 25 years old.	40 - 59% of house connections are more than 25 years old.	0 - 39% of house connections are more than 25 years old.
			FI/CD	1st	Q11: Mechanical and electrical equipment	More than 30% of installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are not operated due to serious failures.	10 -30% of installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are not operated due to serious failures.	Less than 10% of installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are not operated due to serious failures.	Most or all installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are operated, however some or many operate with low performance or low efficiency.	Most or all installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are operated. Most operate with appropriate performance and efficiency.
		Conditions of sewerage facilities	FI	1st	Q12: Civil structures (such as basins and chambers in water purification plants)	Water leakage from civil structures is common, and some of these problems can only be solved by replacement rather than partial repair.	Water leakage from civil structures is common, but these problems can probably be solved by partial repair.	Water leakage from civil structures happens sometimes.	Water leakage from civil structures is rare.	Water leakage from civil structures almost never happens unless a strong earthquake hits, as regular assessments of facility strength are undertaken.
			FI	1st	Q13: Condition of sewer pipiline system	More than 50% of sewer pipes are getting old and blockage accidents occur frequently.	More than 40% of sewer pipes are getting aged and blockage accidents occur frequently.	More than 30% of sewer pipes are getting aged and blockage accidents occasionally occur.	The proportion of aged sewer pipe is less than 20%, the occurrence number of blockage etc is small.	The proportion of old sewer pipe is less than 10%, the occurrence number of blockage etc is small.
			FI	1st	Q14: Condition of drainage system	Most drainage facilities are not maintained.	Although some major drainage canals are in place, there are many areas where floods occur, since there is no drainage system connected to it.	Although main drainage canals are in place, there is an area where there is no drainage system connected to it.	From the road side groove to the main drainage canal drainage system is constructed based on the planning standard, but there are areas where drainage facilities are not constructed.	From the road side groove to the main drainage canal drainage system is constructed based on the planning standard.
			FI/CD	1st	Q15: Mechanical and electrical equipment	More than 30% of installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are not operated due to serious failures.	10 -30% of installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are not operated due to serious failures.	Less than 10% of installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are not operated due to serious failures.	Most or all installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are operated, however some or many operate with low performance or low efficiency.	Most or all installed major mechanical and electrical equipment (such as pumps, electrical transformers and generators) are operated. Most operate with appropriate performance and efficiency.
		Average_Rehabilitation/Replacement								
	AVERAGE (FI)									
			CD	1st	Q16: O&M of the facilities	Facilities do not have any O&M manuals.	Facilities have O&M manuals which are not effective, leading to O&M deficiencies.	Facilities have O&M manuals which are not effective, however the current O&M is adequate.	Facilities have effective O&M manuals, which are followed reasonably well.	Facilities have effective and comprehensive O&M manuals, which are followed strictly.

Category			Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT①: LPI)	Level				
						1: Very Serious	2: Serious	3: Not Good Enough	4: Good	5: Very Good
Large	Medium	Small				This level reflects the conditions of water utilities which need all-round assistance in all fields.	This level reflects the conditions of water utilities which need broad assistance in many fields.	This level is reflects the conditions of water utilities which need partial assistance in some fields.	This level reflects the conditions which water utilities in developing countries should aim for in the foreseeable future.	This level reflects the conditions of water utilities in developed countries.
Aspects to be improved mainly by Capacity Development (CD)	Technical aspects	Distribution network management	CD/FI	1st	Q17: Drawings of pipe facilities	Available paper drawings of existing transmission and distribution trunk mains are quite limited.	Paper drawings are available for most of the existing transmission and distribution trunk mains, but drawings for branch distribution mains are limited.	Small/Medium utilities: Paper drawings are available for most of the existing distribution mains including branch distribution mains. Large utilities: As above, and a primitive GIS has been established for transmission mains, trunk distribution mains, etc.	Small/Medium utilities: Updated CAD files are available for most of the existing transmission and distribution mains. Large utilities: A GIS has been well-established and updated for management of transmission mains and distribution mains, with reasonable accuracy.	Small/Medium utilities: A map book of existing mains has been prepared for referencing and is periodically updated using CAD. Large utilities: A GIS has been well-established and updated for management of transmission, distribution mains, customer
			CD/FI	1st	Q18: Zoning of distribution network	Proper zoning of distribution areas and proper sub-zoning of networks in each distribution area, based on considerations of topology and/or different water sources, rarely exist or do not exist at all.	Proper zoning of distribution areas exists to some extent, but proper sub-zoning of networks in each distribution area rarely exists or does not exist at all.	Most distribution areas are properly zoned, but proper sub-zoning of networks in each distribution area is still limited.	All the distribution areas are properly zoned, and most distribution areas have proper sub-zoning in their distribution network.	All the distribution areas are properly zoned, and most distribution areas have proper sub-zoning in their distribution network. Multiple water sources, multiple lines of distribution trunk mains, and mutual connections between distribution areas and sub-zones are also considered for improving the stability of water supply.
			CD/FI	1st	Q19: Water pressure at customer meter points	At most or all points, pressure is not between 5-45m.	At approximately half of the points, pressure is not between 5-45m.	At approximately a quarter of the points, pressure is not between 10-45m.	At most points, usual pressure is between 10-45m but pressure drops significantly in the season of maximum water demand.	At most points, pressure is between 15-45m without significant pressure drop in the season of maximum water demand; or continuous and direct water supply with higher pressure to high buildings without using customers's receiving and elevated tanks has been introduced for water quality control.
		NRW reduction	CD/FI	1st	Q20: NRW ratio	More than 50%	36 - 50%	21 - 35%	10 - 20%	Less than 10%
			CD/FI	1st	Q21: Customer meters	There are no customer meters due to a flat-rate system, or the majority of existing customer meters are not functioning.	Functioning customer meters are supposed to be installed for every household, but more than 30% of them are missing or not working well.	Functioning customer meters are supposed to be installed for every household and replaced with new ones periodically, but more than 10% of them are missing or not working well.	Most households have well-functioning customer meters due to rigorous periodical meter exchange.	Almost all households have well-functioning customer meters with good accuracy.
			CD/FI	1st	Q22: Bulk meters	Bulk meters for accurate measurement of water production and basic control of distribution are not installed at most of the places where they should be; or most of the existing bulk meters do not work well due to lack of maintenance.	There are not enough functioning bulk meters installed at the places requiring them for accurate measurement of water production and basic control of distribution; and existing bulk meters are not well maintained.	There are enough functioning bulk meters for accurate measurement of water production and basic control of distribution, but not enough for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. Majority of the existing bulk meters are well maintained.	There are enough functioning bulk meters installed for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. Most of the existing bulk meters are well maintained, and important meter readings are recorded periodically.	There are enough functioning bulk meters installed (with good accuracy) for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. All of the existing bulk meters are well maintained, and important meter readings are recorded periodically and analysed effectively.
		Water quality control of drinking water	CD	1st	Q23: Water quality parameters tested at purification plants	Water quality testing is based on a visual observation of water cleanliness.	Water quality testing is based on periodical simple water quality tests for pH, turbidity, chlorine, etc., using handheld water quality testers or pack test kits. The treated water usually meets existing standards for the parameters tested.	Water quality testing is based on periodical laboratory water quality tests for micro-organisms such as coliforms, and general physical and chemical water quality parameters. The treated water usually meets existing standards for the parameters tested.	Water quality testing is based on continuous and daily water quality monitoring using appropriate water quality testing methods and well-maintained apparatus. The treated water usually meets existing standards for basic parameters selected with reference to the WHO guidelines, etc.	Water quality testing is based on continuous and daily water quality monitoring using appropriate water quality testing methods and well-maintained apparatus. The treated water almost always meets existing standards for comprehensive parameters selected in reference to the WHO guidelines, etc.
			CD	1st	Q24: Drinkability of tap water [*11]	In many areas, tap water does not meet water quality criteria for some key parameters (including residual chlorine) and it is not drinkable in some areas even after boiling.	In some areas, tap water does not meet water quality criteria for some key parameters (including residual chlorine), but it become drinkable after boiling in all areas.	In some areas, tap water does not meet water quality criteria for full list of parameters (including residual chlorine), but it become drinkable after boiling in all areas.	In all areas, tap water meets the criteria for the full list of parameters (including residual chlorine) with some exceptions (e.g. in the case of seasonal degradation of water source quality). It is usually drinkable directly from the tap with some risk of water quality degradation due to accidental stoppages of water supply, etc.	In all areas, tap water almost always meets all criteria for the full list of parameters (including residual chlorine), and it is almost always drinkable directly from tap without risk, as long as receiving tanks at end users do not contaminate the water.
		O&M of sewer pipe network	CD	1st	Q25: Drawings of sewer pipe facilities	Drawings of existing sewer mains available are very limited	Although drawings are available for most existing sewer mains, drawings on sewer branch are limited.	Small/Medium utilities: Paper drawings are available for most of the existing sewer mains and branchs. Large utilities: As above, and a primitive GIS has been established for sewer mains, etc.	Small/Medium utilities: Updated CAD files are available for most of the existing sewer mains. Large utilities: A GIS has been well-established and updated for management of sewer pipes, with reasonable accuracy.	Small/Medium utilities: A map book of existing mains has been prepared for referencing and is periodically updated using CAD. Large utilities: A GIS has been well-established and updated for management of sewer pipes, customer information, etc. with good accuracy.
			CD	1st	Q26:Current condition of O&M of sewer pipe network	Proactive O&M of sewer pipes is not implemented, and it is dealt with according to problems such as blockage. There is a case that the correspondence is delayed and the problem is neglected.	Proactive O&M of sewer pipes is not implemented, and it is dealt with according to problems such as blockage.	Proactive O&M of sewer pipe is planned but not implemented.	Proactive O&M of sewer pipe has started to be implemented.	Proactive O&M of sewer pipes is implemented and ther are few problems on O&M of them.

Category			Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT①: LPI)	Level				
						1: Very Serious	2: Serious	3: Not Good Enough	4: Good	5: Very Good
Large	Medium	Small				This level reflects the conditions of water utilities which need all-round assistance in all fields.	This level reflects the conditions of water utilities which need broad assistance in many fields.	This level is reflects the conditions of water utilities which need partial assistance in some fields.	This level reflects the conditions which water utilities in developing countries should aim for in the foreseeable future.	This level reflects the conditions of water utilities in developed countries.
Aspects to be improved mainly by Capacity Development (CD)			CD	1st	Q27:Own ownership of sewer pipeline O&M equipments	Sewer pipes O&M equipments such as high-pressure wash car and suction car are not possessed.	Sewer pipes O&M equipments such as high pressure wash car, suction car etc. are held, but the number of units is insufficient and the malfunctioning equipments are left unattended.	A certain number of sewer pipes O&M equipments such as high pressure wash car, suction car etc. are held, but the number of units is insufficient and the malfunctioning equipments are left unattended.	A certain number of sewer pipes O&M equipments such as high pressure wash car, suction car etc. are held, and maintenance and inspection necessary for them are implemented.	Necessary number of sewer pipes O&M equipments such as high pressure wash car, suction car etc. are held, and maintenance and inspection necessary for them are implemented.
		Water quality control of wastewater	CD	1st	Q28: Water quality parameters tested at watewater treatment plants	Water quality testing is based on a visual observation of water cleanliness.	Water quality testing is based on periodical simple water quality tests for pH, turbidity, chlorine, etc., using handheld water quality testers or pack test kits. The treated water usually meets existing standards for the parameters tested.	Water quality testing is based on periodical laboratory water quality tests for micro-organisms such as coliforms, and general physical and chemical water quality parameters. The treated wastewater usually meets existing standards for the parameters tested.	Water quality testing is based on continuous and daily water quality monitoring using appropriate water quality testing methods and well-maintained apparatus. The treated water usually meets existing effluent standards for basic parameters.	Water quality testing is based on continuous and daily water quality monitoring using appropriate water quality testing methods and well-maintained apparatus. The treated water almost always meets existing effluent standards for comprehensive parameters.
			CD	1st	Q29:Periodical monitoring of large scale effluents	Sewage service entity does not have acceptance procedures from large-scale effluents and do not grasp the contents.	Sewerage service entity has procedures to accept large-scale effluents, but they do not grasp the contents.	Sewerage service entity has procedures to accept large-scale effluents and grasps the contents, but does not implemrnt monitoring of them.	Sewerage service entity established monitoring plan for large-scale effluents, but does not implement it periodically.	Sewerage service entity regularly monitors large-scale effluent based on the plan.
		Average_Tecnical								
	Non-technical aspects	Financial improvement	CD	1st	Q30: Cost recovery level (OI_4 is the same as IBI_24.1 if the utility provides water supply services only)	Only part of the O&M costs (excluding depreciation of water supply facilities) are covered by water charges. (OI_4 < 1)	All O&M costs (except for depreciation of water supply facilities) are fully covered by water charges. (OI_4 ≧ 1)	All O&M and depreciation costs are covered by water charges. (OI_12 ≧ 1, if not, check OI_14)	All O&M, depreciation and financial costs (interest & capital repayments) are covered by water charges. (1 ≦ OI_13 < 1.01, if not, check OI_15 and OI_16)	All O&M, depreciation and financial costs (interest and capital repayments), and costs for own-capital-funded expansion of facilities (to some extent) are covered by water charges. (OI_13 ≧ 1.01)
			CD	1st	Q31: Collection ratio	Less than 60%	60-74%	75-89%	90-94%	More than 95%
			FI	1st	Q32:Budget allocation status	Quite insufficient	Considarably insufficient	Rather insufficient	Although the necessary amount is not allocated, there is no big problem.	The necessary amount is allocated.
		Organizational development	CD	1st	Q33: Effective personnel management rules and regulations including incentives	Working regulations and base salary systems are not clear.	Working regulations and base salary systems are clear, but there is no incentive scheme in place.	Working regulations and base salary systems are clear, but existing incentive schemes are ineffective.	Working regulations and base salary systems are clear, there are effective incentive schemes in place. Some critical rules on occupational health and safety are communicated to staff.	Working regulations and base salary systems are clear, and there are effective incentive schemes in place. Full set of regulations on occupational health and safety are communicated to staff.
			CD	1st	Q34: Implementation of training	Training is quite rare or not provided at all.	A limited number of training programs on some aspects are provided, however there are no incentives for staff to undertake training programs.	There are minimum levels of training required for important aspects, but incentives for staff to undertake training programs are limited.	An adequate number of training programs are provided on important aspects, including management and technical matters. There are enough incentives for staff to undertake training programs.	A wide range of training programs are available. The completion of these training programs is generally a condition of promotion.
		Public relations	CD	1st	Q35: Complaint handling	A procedure or information system for complaint handling has not been established, and complaints are currently dealt with on an ad-hoc basis.	A procedure or information system for complaint handling has been established, but there is a large backlog of unresolved complaints.	A procedure or information system for complaint handling has been established, but there are usually some complaints resolved.	An effective procedure and information system for complaint handling has been established, and data is recorded and analysed. There can however be a backlog of complaints in a particular season.	An effective procedure and information system for complaint handling has been established, and data is recorded and analysed. Even in peak complaints season, there is no backlog.
			CD	1st	Q36: Awareness-raising on NRW reduction, water saving, collection of water charges, etc.	No or minimal effective awareness-raising activities have been implemented.	A few effective awareness-raising activities have been implemented.	Several effective awareness-raising activities have been implemented.	Many effective awareness-raising activities have been implemented.	Many effective awareness-raising activities are being implemented continuously.
		Average_Non-technica								
	AVERAGE (CD)									
OVERALL AVERAGE (FI & CD)										
Aspects to be improved mainly by Program Approach			CD/FI	1st	Q37: Laws and regulations covering the water sector	A water supply service act or its equivalent does not exist.	A water supply service act or its equivalent exists, but it does not require your utility to have an independent double-entry accounting system.	A water supply service act or its equivalent exists, and it requires your utility to have an independent double-entry accounting system.	Most of the required laws and regulations listed in note have been established.	All of the required laws and regulations listed in note are well established.
Average_Program Approach										

APPENDIX FOR CHAPTER A9 WASA-F OPERATION AND MANAGEMNET IMPROVEMENT PLAN

AA9.1 Performance Indicators (PIs) prepared by WASA-F

PMIs of Coverage

- Service Coverage
  - Water Coverage
  - Sewer Coverage

1. Water Supply Coverage

KPMI

$$\text{Water Supply Coverage} = \frac{\text{Population served with Water supply}}{\text{Total population Served in W\&S Operator area-Water Supply}}$$

In millions

Water Supply Coverage = 61.78% (Year 2015-16)
(November to December)2015

Water Supply Coverage = 60.00% (Year 2014-15)

KPMI

2. Sewerage Coverage

$$\text{Sewerage Coverage} = \frac{\text{Population served with Sewerage}}{\text{Total population Served in W\&S Operator area-Sewerage}}$$

In millions

Sewerage Coverage = 72.93% (Year 2015-16)
(November to December)2015

Sewerage Coverage = 73% (Year 2014-15)

PMIs of Water Production & Consumption

- **Water Production**
- **Water Consumption**
- **Metered Water Consumption**

3a. Water Production

$$\text{Water production} = \frac{\text{Total water produced (m}^3\text{)} \times 1000}{\text{Population served (water supply connections + public points)} \times \text{No of days}}$$

$$\frac{155.147\ (\text{m.m}^3/\text{year}) \times 1000}{1.92\ \text{million} \times 365} = 221.3\ \text{lpcd}\quad (\text{Year 2015-16})$$

$$\frac{155.147\ (\text{m.m}^3/\text{year}) \times 1000}{1.92\ \text{million} \times 365} = 221.3\ \text{lpcd}\quad (\text{Year 2014-15})$$

3b. Water Consumption

$$\text{Water Consumption} = \frac{\text{Total water consumed (m}^3\text{)} \times 1000}{\text{Population served water supply (Direct + Public Points)} \times \text{No of days}}$$

$$\frac{111.69\ (\text{m.m}^3/\text{year}) \times 1000}{2.1\ \text{million} \times 365} = 145.71\text{lpcd}\quad (\text{Year 2015-16})$$

$$\frac{104.089\ (\text{m.m}^3/\text{year}) \times 1000}{1.92\ \text{million} \times 365} = 148.5\ \text{lpcd}\quad (\text{Year 2014-15})$$

3c. Metered Water Consumption

- An ambitious drive has been initiated to install water meters
- 11000 Domestic meters
- 538 in Commercial and Industry
- 51 Bulk meters

PMIs of Non-Revenue Water

- Un-Accounted for Water
- Non Revenue Water

4. Un-Accounted For Water

$$\text{Un Accounted Water} = \frac{\text{Total water produced} - (\text{Total water sold} + \text{Free supplies})}{\text{Total Water Produced}} \times 100$$

$$\frac{(111.694-(77.9+0.84))\ \text{mgd}}{111.694\ \text{mgd}} \times 100 = 29.50\% \quad \text{(Year 2015-16)}$$

$$\frac{(93.5-(62.7+0.94))\ \text{mgd}}{88.5\ \text{mgd}} \times 100 = 31.93\% \quad \text{(Year 2014-15)}$$

5. Non-Revenue Water

KPMI

$$\text{Non Revenue Water} = \frac{\text{Total water produced} - \text{Total water sold}}{\text{Total Water Produced}}$$

$$\frac{(111.694-77.9)\ \text{mgd}}{111.694\ \text{mgd}} \times 100 = 30.25\% \quad \text{(Year 2015-16)}$$

(November to December)2015

$$\frac{(93.5-62.7)\ \text{mgd}}{93.5\ \text{mgd}} \times 100 = 32.90\% \quad \text{(Year 2014-15)}$$

PMIs of Operational Performance

- Pipe Breaks / Bursts
- Sewerage Blockages
- Replacement of Manhole Covers and Covering of Open Manholes
- Pipe Leakage
- Cleaning / desilting of manholes
- Cleaning / desilting of Sewer
- Storm Water drains used as sludge carrier
- Sewer collapse / Crown Failures

8. Pipe Break / Burst

$$\frac{\text{Total No. of Breaks / Bursts}}{\text{Total Length of water Distribution Network}}$$

$\frac{56}{1500}$ = 0.03/Km/3 months (Year 2015-16)
(July to December)2015

$\frac{191}{1385}$ = 0.13/Km/year (Year 2014-15)

KPMI

9. Sewer System Blockage

$$\frac{\text{Total no of blockages}}{\text{Total length of sewer system}}$$

$\frac{221}{1775}$ = 0.125 /Km/6 months (Year 2015-16)
(November to December)2015

$\frac{229}{1768}$ = 0.129 /Km/year (Year 2014-15)

10. Replacement of Manhole Covers

$$\frac{\text{Total no of Manholes covers replaced}}{\text{Total no of Manholes}} \times 100$$

$\frac{3250}{56210}$ X 100 = 5.78 % (Year 2015-16)
(July to December)2015

$\frac{5521}{56000}$ X 100 = 9.85 % (Year 2014-15)

11. Pipe Leakages

KPMI

$$\frac{\text{Total no of Pipe Leakages}}{\text{Total length of Water Distribution System}}$$

$\frac{3243}{1500}$ = 2.16/Km/year (Year 2014-15)

$\frac{3168}{1308}$ = 2.42/Km/year (Year 2013-14)

12. Cleaning / Desilting of Manholes

$$\frac{\text{Total no of Manholes cleaned / desiltated}}{\text{Total no of Manholes}} \times 100$$

$\frac{22460}{56210}$ X 100 = 39.95 % (Year 2015-16)
(July to December)2015

$\frac{33040}{56000}$ X 100 = 59 % (Year 2014-15)

13. Cleaning / Desilting of Sewer

$$\frac{\text{Total length of sewer cleaned}}{\text{Total length of sewer}} \times 100$$

$\frac{478}{1775}$ X 100 = 26.92 % (Year 2015-16)
(July to December)2015

$\frac{1007}{1768}$ X 100 = 57 % (Year 2014-15)

14. Storm Water Drains Used as Sludge Carrier

$$\frac{\text{Total length of storm water drains used as sludge carrier}}{\text{Total length of storm water drainage network}} \times 100$$

$\frac{48.98}{62}$ X 100 = 79 % (Year 2015-16)

$\frac{48.98}{62}$ X 100 = 79 % (Year 2014-15)

15. Sewer Collapse / Crown Failure

$$\frac{\text{Total no of collapse or crown failure}}{\text{Total length of sewers}}$$

$\frac{59}{1775}$ = 0.033 crown failure/Km/Year (Year 2015-16)
(July to December)2015

$\frac{123.2}{1768}$ = 0.069 crown failure/Km/Year (Year 2014-15)

PMIs of Cost and Staffing

- Unit Operational Cost – Water Sold
- Unit Operational Cost – Water Produced
- Staff Per 1000 Water and Sewer Connections
- Water Staff Per 1000 Water Connection
- Sewerage Staff Per 1000 Water Connection
- Salary Cost as % of total operating cost
- Power Electricity Cost as a proportion of total operating cost
- Maintenance cost as % total operating cost
- Contracted out cost

16. Unit Operational Cost- Water Sold

$$\frac{\text{Total Operating Cost}}{\text{Total Water Sold*days}}$$

$\frac{719.211}{0.295*180}$ = Rs. 13.59/ m^3 /6 months(Year 2015-16)

$\frac{1526.23}{0.286*365}$ = Rs. 14.6/ m^3 (Year 2014-15)

17. Unit Operational Cost- Water Produced

$$\frac{\text{Total Operating Cost}}{\text{Total Water Sold}}$$

$\frac{719.211}{0.42280*180}$ = Rs. 9.45/ m^3 (Year 2015-16)
(July to December)2015

$\frac{1526.23}{0.425*365}$ = Rs. 9.84/ m^3 (Year 2014-15)

KPMI

18. Staff per 1000 Water & Sewer Connections

$$\frac{\text{Total staff related to water \& sewer services}}{\text{Total Number of water \& sewer connections/1000}}$$

$\frac{1899}{283572/1000}$ = 6.86 person (Year 2015-16)
(November to December)2015

$\frac{1899}{265080/1000}$ = 7.16 person (Year 2014-15)

19. Water Staff per 1000 Connections

$$\frac{\text{Total Staff of Water supply}}{\text{Total Water Connections/1000}}$$

$\frac{521}{118.531}$ = 4.39 Nos. / 1000 Connection (Year 2015-16)
(July to December)2015

$\frac{521}{113.281}$ = 4.59 Nos. / 1000 Connections (Year 2014-15)

20. Sewer Staff per 1000 Connections

$$\frac{\text{Total staff related to waste water services}}{\text{Total Number of waste water connections/1000}}$$

$\frac{955}{283572/1000}$ = 3.36 Approx. 4 No (Year 2015-16)
(July to December)2015

$\frac{920}{265080/1000}$ = 3.47 Approx. 4 No (Year 2014-15)

Approximately 5 No Staff will be sufficient

21. Salary Cost As % Of Total Operating Cost

$$\frac{\text{Total Salaries Related cost}}{\text{Total Operating cost}} \times 100$$

$\frac{329.249}{719.211}$ X 100 = 45.78 % (Year 2015-16)
(July to December)2015

$\frac{634.249}{1526.230}$ X 100 = 41.557 % (Year 2014-15)

22. Power Electricity Cost as a Proportion of Total Operating Cost

$$\frac{\text{Total Power Electricity Cost}}{\text{Total Operating cost}} \times 100$$

$\frac{271.849}{719.211}$ X 100 = 37.798 % (Year 2015-16)
(July to December)2015

$\frac{602.342}{1526.230}$ X 100 = 39.466 % (Year 2014-15)

23. Maintenance cost as % Total Operating Cost

$$\frac{\text{Total Maintenance Cost}}{\text{Total Operating Cost}} \times 100$$

$\frac{30.751}{719.211}$ X 100 = 4.27% (Year 2015-16)
(July to December)2015

$\frac{102.007}{1526.230}$ X 100 = 6.684% (Year 2014-15)

24. Contracted Out Cost

$$\frac{\text{Service Contracted from Private Sector}}{\text{Total Operating Cost}} \times 100$$

$\frac{2.500}{719.211}$ X 100 = 0.347% (Year 2015-16)
(July to December)2015

$\frac{2.500}{1526.230}$ X 100 = 0.164% (Year 2014-15)

PMIs of Water Quality

- Chemically Unfit Water Samples At Source
- Biologically Unfit Water Samples At Source
- Chemically Unfit Water Samples At User End
- Biologically Unfit Water Samples At User End
- Water Quality-Required Residual chlorine test
- Water Quality-Samples having Residual chlorine

25. Chemically Unfit Water Samples At Source

$$\frac{\text{Total No. of Unfit Sources}}{\text{Total No. of Sources}} \times 100$$

$\frac{0}{592}$ X 100 = 0% (Year 2015-16)
(July to December)2015

$\frac{22}{613}$ X 100 = 3.58% (Year 2014-15)

26. Biologically Unfit Water Samples At Source

$$\frac{\text{Total No. of Unfit Sources}}{\text{Total No. of Sources}} \times 100$$

$\frac{0}{592}$ X 100 = 0% (Year 2015-16)
(July to December)2015

$\frac{0}{613}$ X 100 = 0% (Year 2014-15)

27. Chemically Unfit Water Samples At User End

$$\frac{\text{Total No. of Unfit Samples at Tap}}{\text{Total No. of Samples at Tap}} \times 100$$

$\frac{22}{1501}$ X 100 = 1.46% (Year 2015-16)
(July to December)2015

$\frac{76}{1813}$ X 100 = 4.19% (Year 2014-15)

28. Biologically Unfit Water Samples At User End

$$\frac{\text{Total No. of Unfit Samples at Tap}}{\text{Total No. of Samples at Tap}} \times 100$$

$\frac{31}{1501}$ X 100 = 2.06%(Year 2015-16)
(July to December)2015

$\frac{59}{1813}$ X 100 = 3.25% (Year 2014-15)

29. Water Quality-Required Residual Chlorine Test (source end)

$$\frac{\text{Total no of residual chlorine samples carried out}}{\text{Total no of residual chlorine samples carried out as per standards}} \times 100$$

$\frac{1501}{1501}$ X 100 = 100% (Year 2015-16)
(July to December)2015

$\frac{1848}{1848}$ X 100 = 100% (Year 2014-15)

30. Water Quality-Samples having Residual chlorine (user end)

$$\frac{\text{Total no of residual chlorine samples that passed the relevant standard}}{\text{Total no of residual chlorine samples carried out}} \times 100$$

$\frac{1445}{1501}$ X 100 = 96.2% (Year 2015-16)
(July to December)2015

$\frac{1790}{1848}$ X 100 = 97.3% (Year 2014-15)

PMIs of Quality of Service

- Water Supply Complaints
- Sewerage Complaints
- Revenue / Billing Complaints
- Wastewater Treatment Primary
- Wastewater Treatment Secondary

31a. Water Supply Complaints

$$\frac{\text{Total No. of Water Supply Complaints}}{\text{Total No. of Water Connections}} \times 100$$

$$\frac{828}{118531} \times 100 = 0.698\% \quad \text{(Year 2015-16) (July to December)2015}$$

$$\frac{937}{113259} \times 100 = 0.83\% \quad \text{(Year 2014-15)}$$

31b. Sewerage Complaints

$$\frac{\text{Total No. of Sewerage Complaints}}{\text{Total No. of Sewer Connections}} \times 100$$

$\frac{3648}{283572} \times 100 = 1.286\%$ (Year 2015-16) (July to December)2015

$\frac{4301}{265080} \times 100 = 1.62\%$ (Year 2014-15)

31c. Revenue / Billing Complaints

$$\frac{\text{Total No. of Revenue / Billing Complaints}}{\text{Total No. of Water + Sewer Connections}} \times 100$$

$\frac{159}{395160} \times 100 = 0.040$ (Year 2015-16) (July to December)2015

0.059% for the Year 2014-15

KPMI

32. Wastewater Treatment Primary

$$\frac{\text{Wastewater treated at Primary Level}}{\text{Wastewater Collected}} \times 100$$

$$\frac{0 \text{ mgd}}{338 \text{ mgd}} \times 100 = 0\% \quad \text{(Year 2014-15)}$$

$$\frac{0 \text{ mgd}}{338 \text{ mgd}} \times 100 = 0\% \quad \text{(Year 2013-14)}$$

KPMI

33. Wastewater Treatment Secondary

$$\frac{\text{Wastewater treated at Secondary Level}}{\text{Wastewater Collected}} \times 100$$

$$\frac{20 \text{ mgd}}{338 \text{ mgd}} \times 100 = 5.91\% \quad \text{(Year 2015-16)}$$

$$\frac{20 \text{ mgd}}{338 \text{ mgd}} \times 100 = 5.91\% \quad \text{(Year 2014-15)}$$

PMIs of Billing and Collection

- Average Revenue of Water and Wastewater
- Collection Period
- Billing Efficiency
- Collection Efficiency(Physical)
- Collection Efficiency (Financial)

34. Average Revenue of Water and Wastewater

$$\frac{\text{Total Operating Revenue}}{\text{Total Water Sold}}$$

$\frac{719.993}{53.087}$ = Rs. 13.56/ Cubic Meter (Year 2015-16) (July to December)2015

$\frac{1528.231}{104.039}$ = Rs. 14.689/ Cubic Meter (Year 2014-15)

35. Collection Period

KPMI

$$\frac{\text{Arrears} \quad * \quad \text{Days in Reporting Period}}{\text{Total Operating Revenue}}$$

$\frac{124.07 * 60}{320.241}$ = 24 days (Year 2015-16)
(November to December)2015

$\frac{199.95*365}{647.539}$ = 112days (Year 2014-15)

36. Billing Efficiency

$$\frac{\text{Total No. of Bill Issued } *100}{\text{Total Water Connections}}$$

$\frac{117601}{118531}$ X 100 = 99.21 % (December-2015)

$\frac{112930}{113351}$ X 100 = 99.6% (June-2015)

37. Collection Efficiency (Physical)

KPMI

$$\frac{\text{Total No. of Bills Paid} * 100}{\text{Total No. of Bills Issued}}$$

$\frac{389631}{1610179}$ X 100 = 24.19 % (Year 2015-16)
(November to December)2015

$\frac{471402}{1707964}$ X 100 = 27.60 % (Year 2014-15)

38. Collection Efficiency (Financial)

KPMI

$$\frac{\text{Total Amount of Bills Received} * 100}{\text{Total Amount of Bills Issued}}$$

Figures are in million Rs

$\frac{289.327}{481.02}$ X 100 = 60.14% (Year 2015-16)
(November to December)2015

$\frac{602.799}{943.196}$ X 100 = 63.91% (Year 2014-15)

PMIs of Financial Performance

- Operational Cost Coverage
- Working Ratio
- Debt Service Ratio

39. Operational Cost Coverage

$$\frac{\text{Total Operating Revenue}}{\text{Total Operating Cost}}$$

With Grant $\frac{719.993}{719.211} = 1.001$ (Year 2015-16) (July to December)2015

Without Grant $\frac{589.993}{719.211} = 0.82$ (Year 2015-16) July to Dec 2015

$\frac{1528.230}{1526.230} = 1.001$ (Year 2014-15)

KPMI

40. Working Ratio

$$\frac{\text{Total Expenses}}{\text{Total Revenues}}$$

$\frac{719.211}{719.993}$ = 0.998 (Year 2014-15)
(November to December)2015

$\frac{1430.152}{1358.846}$ = 1.052 (Year 2013-14)

AA9.2 Detailed Input, Output and Outcome of the New Business Plan

Detailed Input, Output and Outcome of the New Business Plan

INPUT	OUTPUT	OUTCOME – Effects of Policy–
Improvement of operation and management of water supply works		
1 Implementation of improvement of bill collection efficiency	1 Increase of revenue and elimination/prevention of arrears/ evasion	1 Financial improvement due to expansion and strengthening of revenue base
2 Expansion of the area with 12hr and more water supply	2 Increase of willingness to pay by providing good water supply service – water supply time, pressure and quality –	2 Ensuring fairness in burden of public works projects supply costs
3 Improvement of the facilities aiming for 24/7 water supply	3 Increase of the number of customers by providing good water supply service – water supply time, pressure and quality –	3 Ensuring fairness of residents concerning access to public services
4 Meter installation in the area with 12hr and more water supply	4 Transfer from ground water use to tap water use and increase of water demand	4 Prevention of water-borne~~infectious~~ diseases and reduction of social burden by providing good water supply
5 Transfer to meter rate tariff system in the area with 12hr and more water supply	5 Measurement of water supply /demand volume and water leakage/NRW volume by meter reading	5 Social satisfaction and ensuring political stability/safety by providing high-quality services targeting all citizens regardless of income classes
6 Build-up and operation of IT based billing and collection system	6 Calculation of water supply cost by measurement of water supply volume and decision of water tariff level by full-cost principle	6 Improvement of social welfare by income cross subsidy by the introduction of meter rate tariff system
	7 Formulation of future infrastructure investment plan by empirical cost calculation and asset management	7 Environmental conservation by transferring from groundwater Use to WASA-F water supply
	8 Find out of water leakage in household and illegal connection by meter reading work	8 Promotion of reduction of DS (Dissolved Solid) in wastewater and reuse of treated wastewater by transferring from groundwater use to WASA-F water supply
	9 Accurate and prompt billing and elimination of arrears and evasion by IT based billing and collection system	9 Reach and expand the awareness of autonomous public enterprise transfer within WASA-F
Improvement of operation and management of sewerage /drainage works		
1 Promotion of connecting to sewer pipe	1 Increase of sewerage tariff	1 Financial improvement due to expansion and strengthening of revenue base
2 Expansion of sewered area by construction of sewer pipe line	2 Connection of the wastewater to sewer system	2 Ensuring fairness in burden of public works projects supply costs
3 Elimination of wastewater discharge into drainage canal	3 Purification of drainage canal by elimination of wastewater discharge into drainage canal	3 Improvement of living environment by discharging wastewater to sewer system
4 Promotion of wastewater treatment by construction of	4 Improvement of concentration of contaminants of drainage canals and	4 Improvement of water environment by promotion of wastewater treatment

INPUT	OUTPUT	OUTCOME – Effects of Policy–
sewage treatment plants 5 Improvement of sewer pipes O&M method by removal of sand/silt and preventive maintenance management 6 Implementation of local flood control measures 7 Investigation of effective measures for industrial wastewater 8 Construction of facilities for reusing treated wastewater as irrigation water	rivers 5 Reduction of the frequency of blockage and overflow issues, and reduction of O&M cost of sewer system from a long-term perspective 6 Reduction of flooding frequency in the flood strike areas 7 Connection of industrial wastewater of factories to sewer pipeline if it has sufficient capacity. 8 Increase of the amount of reused treated wastewater to irrigation	 5Prevention of water borne-diseases and reduction of social burden by improvement of living and water environment 6 Prevention of water borne-diseases and reduction of social burden due to decrease of untreated wastewater use for irrigation water by promotion of treated wastewater reuse for irrigation water 7 Improvement of living and local environment by connecting industrial wastewater to sewer system 8 Effective utilization of resources by reusing treated wastewater for irrigation water 9 Securing of water resource by reusing treated wastewater for irrigation water
Financial Advisory Services 1 Preparation and implementation of transition from semi-cash basis accounting to accrual basis accounting 2 Separation of current one accounting to three accountings according to the type of business, water supply, sewerage and arainage. 3 Study and trial of asset management and implementation of stricker cash and payment management ~~43~~ Study of independent accounting from provincial government ~~54~~ Study on the proper water and sewerage tariff level based on the average costs	 1 Computerization of accounting and trial implementation of accrual accounting 2 Pilot trial of separated water supply accounting, sewerage accounting and drainage accounting 3 Estimation of depreciation and reconstruction cost by asset management 4 Confirmation of laws and ordinances prior to introduction of accrual accounting and formulation of revision proposal when necessary 5 Estimate the average cost based on cost accounting and cost recovery principles based on accrual accounting and inter-income fairness (measures for poor people), and formulate and discuss tiered tariff schemes by level	 1 Reinforcement of financial soundness and autonomy by expansion of revenue base aiming at optimization of the management 2 Rehabilitation and extension of public works supply system and consciousness towards revision of laws and regulations along with the introduction of accrual-based accounting to ensure independent profitability and financial autonomy in WASA-F/provincial government 3 Maximize social justice (satisfaction felt by people in many income classes) by extending the fee system based on fairness 4 Raise the awareness of autonomous public enterprise transfer within WASA-F

Source: JICA Mission Team

AA9.3 Proposed Action Plans

INPUT (Action Plans)	Evaluation of OUTPUT	Target Value
1 Business Plan Joint Meeting (BPJM) ・Periodical BPJM, report of progress of action plans and discussion on the issues	・ Record of meeting	・ Implementation of monthly meeting
Improvement plan for waterworks management		
1 Increase of revenue ・ Periodical meeting on increase of revenue ・ Discussion on the measures for revenue increase ・ Decision of target tariff collection efficiency and check of it ・ Report of performance at meeting	・ Record of meeting ・ Report of measures ・ Report of current tariff collection efficiency – physical base and monetary base	・ Physical tariff collection efficiency will be ○○% ・ Financial tariff collection efficiency will be ○○%
3 Enlargement of the area with 12hr and more water supply ・ Continuous implementation of SMART WASA ・ Selection of targeted area and decision of the schedule	・ Minutes of Meeting of SMART WASA ・ Confirmation of selected target areas	・ Implementation of bi-monthly meeting ・ ○○areas will be with service of 12hr more water supply ・ Report at BPJM
・ Decide required tasks for 12hr and more water service including construction works	・ Confirmation of required tasks	・ Report at BPJM
・ Implementation organization and securing budget ・ Implementation of required tasks ・ Increase of customer number	・ Confirmation of implementation organization and budget ・ Confirmation of the progress ・ Confirmation of the progress	・ Report at BPJM ・ Customer number will be ○○ at ○○ ・ Meter installation and reading No. will be ○○ at ○○ ・ Implementation of bi-monthly meeting ・ Report at BPJM
4 Install of water meter and start of meter reading ・ Continue of SMART WASA activities ・ Decide meter install area ・ Creation of work plan, implementation organization and securing budget ・ Training for meter installing and meter reading staff ・ Implementation of meter installing	・ Discussion at SMART WASA ・ Confirmation of areas ・ Confirmation of work plan etc. ・ Report of trainings	・ Report at BPJM ・ Report at BPJM ・ Report at BPJM ・ Report at BPJM ・ Report at BPJM
・ Start of meter reading ・ Establishment of meter reading job specification ・ Recruitment of meter reading staffs	・ Report of the progress of meter installation ・ Report of the progress	・ Report at BPJM ・ ○○ areas will be transfer to meter rate tariff system until ○○
5 Transfer to meter rate tariff system for area with 12hr and more water supply service ・ Decision of target area and target date for meter rate tariff system	・ Report of the progress ・ Report of the progress	・ ○○ colony will be transfer to meter rate tariff system until ○○ ・ Report at BPJM and SMART WASA meeting
・ Implementation of explanation and communication for customers	・ Discussion and decision at SMART WASA meeting	・ Report at BPJM and SMART WASA meeting
・ Implementation of meter rate tariff system	・ Report of the progress	・ Report at BPJM and SMART WASA meeting
6 IT-based determination of water usage volume, build-up and operation of billing and collection system ・ Continuous implementation of SMART WASA	・ Report of the progress	・ Decide until ○○ ・ Finish study until ○○
・ Study and decision of IT system to be build-up ・ Study on meter reading tool – smart phone ・ Study on decision method of consumed water volume ・ Construction of effective billing and collection system of water tariff ・ Securing of budget and development	・ Discussion at SMART WASA ・ Report of the progress ・ Report of the progress ・ Confirmation of the decision	・ Construct until ○○ ・ Report at BPJM and SMART WASA meeting

INPUT (Action Plans)	Evaluation of OUTPUT	Target Value
/implementation of the system	・ Report of the progress ・ Report of the progress	
Improvement plan for sewerage/drainage management 1 Promotion of connection to sewer system ・ Confirmation of un-connected households or area to sewer system and establishment of the plan ・ Promotion of connection to sewer system for un-connected households or areas 2 Step by step phased out of wastewater discharge to drainage canals from sewer system ・ Review of MP and conformation of the priority of phased out plan ・ Study of the measures related with the construction of WWTPs 3 Step by step construction or expansion of WWTP ・ Review of MP and confirmation of the priority of the plan ・ Study on the phased out plan of wastewater discharge related with the construction of interceptors ・ Construction of WWTP 4 Improvement of sewer pipe O&M method ・ Establishment of Task Force to study on the improvement of sewer pipe O&M method ・ Study on the improvement of sewer pipe O&M method ・ Plan and implementation of a pilot project ・ Plan and implement procurement of equipment ・ Expand the improved method O&M area step by step 5 Implementation of measures for local flooding area ・ Review of proposed measure for local flooding in MP ・ Study on the feasibility of the proposed plan 6 Study on the measures for industrial wastewater ・ Establishment of Task Force ・ Study on the measures for industrial wastewater ・ Implementation of cooperation with EPA ・ Implementation of communication with factories 7 Construction works for reuse of treated wastewater for irrigation ・ Review of reuse plan in MP ・ Study on the reuse plan relating with construction plan of WWTPs	・ Conformation of the current state and establishment of the promotion plan ・ Report of the progress ・ Increase of sewerage tariff revenue ・ Improvement of local drainage canal ・ Confirmation of the results ・ Confirmation of the results ・ Confirmation of the results ・ Establishment of Task Force ・ Report on the study ・ Report of the plan and progress ・ Report of the plan and progress ・ Report of the progress ・ Report on the study ・ Study on the feasible measures ・ Establishment of Task Force ・ Report on the study ・ Implementation of meeting with EPA ・ Confirmation of communication method with factories ・ Report on the study ・ Report on the study	・ Establish plan until ○○ ・ Report at BPJM ・ Report at BPJM ・ Report at BPJM ・ Implement study until ○○ ・ Report at BPJM ・ Report at BPJM ・ Establish Task Force until ○○ ・ Report at BPJM ・ Implement a pilot project until ○○ ・ Report at BPJM ・ Implement until ○○ ・ Study until ○○ ・ Establish Task Force until ○○ ・ Finish study until ○○ ・ Start meeting until ○○ ・ Start communication until ○○ ・ Finish study until ○○

INPUT (Action Plans)	Evaluation of OUTPUT	Target Value
Financial Services 1 Computerization of accounting ・ Establishment of network between each directorate ・ Identification of issues and implementation of solutions ・ Establishment of computerization of accounting ・ Establishment of budget with higher accuracy – estimation of income and expenditure ・ Capacity development on establishment of intermediate financial forecast by WASA-F staffs 2 Trial estimation and implementation of separated accounting of water works, sewerage works and drainage works ・ Trial estimation ・ Meeting with provincial government on the separation of accounting ・ Implementation of the separation of accounting 3 Trial estimation by accrual accounting and transfer to accrual accounting ・ Trial estimation, identification of issues and implementation of measures ・ Meeting with provincial government on the transfer to accrual accounting ・ Establishment of asset management system ・ Trial estimation of accrual accounting including depreciation ・ Implementation of transfer to accrual accounting 4 Study on the establishment of an independent special accounting from provincial government ・ Study on the establishment of an independent special accounting ・ Meeting with provincial government on the change of accounting rule ・ Establishment of an independent special accounting 5 Trial estimation of unit costs of water works and sewerage works ・ Trial estimation of unit costs of water and sewage based of the results of separated accountings and data of metered water consumption volume ・ Comparison of estimated unit costs with those in MP 6 Study on the proper tariff level based on the estimated unit costs ・ Estimation of actual unit costs ・ Estimation of unit costs in future forecast and comparison with those in MP ・ Study on the revision method and time of current low level price of tariffs	・ Confirmation of issues ・ Confirmation of implementation of solutions ・ Establishment of financial statement by computerized system ・ Establishment of budget by this system ・ Establishment of intermediate financial forecast by WASA-F staffs ・ Confirmation of the results of trial estimation ・ Report of the results of the meeting ・ Confirmation of the results of the separated accounting ・ Confirmation of the results of trial estimation ・ Report on the results of the meeting ・ Confirmation of established asset management system ・ Confirmation of the results ・ Confirmation of the results of accounting ・ Confirmation of the results of the study ・ Confirmation of the results of the meeting ・ Confirmation of the implementation ・ Confirmation of the results of trial estimation of unit costs ・ Confirmation of the results ・ Confirmation of the results of trial estimation of unit costs ・ Confirmation of the results ・ Establishment of the report of the results of the study	・ Report at BPJM on the issues and solutions ・ Establishment of intermediate financial forecast until ○○ ・ Implementation of the separation of accounting and issue of the statement of accounting until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○ ・ Implementation until ○○

Source: JICA Mission Team