



BUSINESS PLAN

JACOBABAD WATER SUPPLY SYSTEM



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1. INTRODUCTION

Jacobabad is a city in Sindh, Pakistan, serving as both the capital city of Jacobabad District and the administrative center of Jacobabad Taluka, an administrative subdivision of the district. By population, it is the 43rd largest city of Pakistan and it is also the hottest place in South Asia. The temperature is usually high in the second half of July and August.

The Government of Sindh with the help of USAID has taken specific measures to improve health and sanitation services in Jacobabad city. The basic objective through this partnership is the development of the water supply infrastructure of Jacobabad, to provide Water Supply System and Solid Waste Management system by developing a water supply system, the project aims to supply clean and safe drinking water to approximately 33,000 households. Before this infrastructure upgrade, there was no water supply system available in the city. The population of the city procured groundwater for drinking purposes from tube wells. The water from the tube wells was delivered to houses in 30-liter jerry cans by donkey cart. Under the most recent constitutional amendment-the Sindh Local Government Act-2013, municipal councils have compulsory responsibilities to provide water supply, sanitation services, and drainage of wastewater to their jurisdictions.

As a result of a Supreme Court of Pakistan ruling issued in March 2017 and subsequent notifications from the Sindh Local Government Department, ownership of infrastructure assets along with the responsibility of services delivery has been transferred to Jacobabad Municipality. Water is a valuable resource but it is expensive to purify and manage its supply equitably. In Jacobabad it is a complex process to turn raw water from Khirthar Canal into clean drinking water and deliver it to the general population as clean safe drinking water or even for domestic use.

To achieve their goals Municipal Committee Jacobabad (MCJ) has prepared a three years business plan to provide safe and secure drinking water to households, to provide an increase in the total number of connections, an increase in the number of people receiving improved service quality from an existing but improved drinking water source, timely response to complaints regarding water services and management of their resources in an optimum manner.

2. POLICY LEGISLATION

As per Sindh Drinking Water Policy, access to safely managed drinking water is a fundamental right of every citizen and it is the responsibility of the government to ensure to provide safe drinking water to all citizens.

To safeguard the available water resources and prevention from loss there is a dire need for amendment and up-gradation of existing Policy legislation which are insufficient to protect the proper utilization of water resources. Legislation to restricting/ appropriation the utilization of groundwater resources is extremely essential. Use of water for a lower category purpose from a purpose meant for a higher category shall be prohibited and if repeatedly done would be

punishable. . Allocation of drinking water shall be given priority over all other uses, irrespective of whether these are domestic or commercial. Municipal water can be categorized by the type of usage such as potable and non-potable domestic water, commercial, industrial, institutional and environmental.

As per Sindh Local Government Act-2013, a Municipal Committee within the limits of the funds at its disposal provide or cause to be provided, a supply of whole-some water sufficient for public and private purpose. All private sources of water supply within the local area concerned shall be subject to control, regulation, and inspection by the Municipal Committee. Right to water is implied, being recognized as right to life, in article 9 of the 1973 constitution. Sindh assembly can legislate and introduce new laws as well as amend the existing laws to ensure the provision of the basic necessity of clean drinking water at the doorstep of every citizen.

3. PLAN PROVISION

For the establishment of Water & Sanitation services MCJ's Business Plan is a comprehensive document that provides the road map to the Water Supply System of Jacobabad for the achievement of its business objectives and continuous improvement of services by monitoring and evaluation through Key Performance Indicators. For effective monitoring and evaluation should be done by an independent third party.

The main purpose of this business plan is to comply with all regulatory requirements to operate, sustain, expand and maintain waterworks infrastructure for efficiently delivering high quality and reliable water supply to Jacobabad's customers for all drinking, recreational, sanitary, fire protection, and institutional/commercial needs, while also providing education and encouraging water conservation.

The MCJ's initial business plan covers a three-year period from July 1, 2020, to June 30, 2023. The purpose of this plan constitutes of following elements:

- To provide a comprehensive guideline for providing water supply connection of every household in Jacobabad.
- To assist Municipal Committee Jacobabad for cost-effective management and sustainability of the Water Supply System.
- To assist the Municipal Committee Jacobabad in describing activities and challenges, expected revenues and expenditures, and key performance indicators.

4. PROJECT OBJECTIVES AND ITS RELATIONSHIP WITH SECTORAL OBJECTIVES

To undertake continued efforts to provide an uninterrupted, cost-competitive supply of safe drinking water to the Jacobabad population. This is to be achieved by ensuring the best standards and meeting current regulatory requirements.

The MCJ has the vision to upgrade the number of water connections and maintain the highest level of service that can potentially match customer expectations, distinguished by quality, quantity, and reliability.

Municipal Committee Jacobabad has the vision to develop and implement a computerized information management system and to bring the utility's maintenance and workflow management up to industry standards. This will result in staff resource efficiencies, enhance documentation, and cost tracking of maintenance activities, while also ensuring compliance with regulatory requirements. It will also enhance consumer relationships and build the trust level at MCJ.



Municipal Committee Jacobabad will be operated as a financially viable, self-sustaining entity that will be run under commercial principles and promote private sector participation through public-private partnership (PPP). The MCJ has focused on continuous delivery of a financially sustainable utility in the near term and infrastructure sustainability as the 25year capital investment plan is implemented.

Municipal Committee will be regulated with due consideration to the principle that the provision of water and wastewater services represents a natural monopoly that requires accountable, participative, transparent, regulatory supervision to ensure best practices.

5. FACILITY PLAN

Current Demographic

As per census 2017, the population of Jacobabad city is 191,076 with a 1.69 % annual growth rate. With this growth rate population of Jacobabad city is approximately around 204,000 by 30th June-2021. As per census 2017, Jacobabad city has 34,530 houses, we take 6 number of persons per household if the growth rate of 1.69% persist the population of Jacobabad would be equal to 214,300 by the end of June 2024.

By developing an accurate assessment of water demand, the utility can form the basis for all planning studies to include the preparation of the Business Plan. Water Demand Management (WDM) has always been a priority issue in the management of a water utility, whether the water supply system is based on gravity flow or mechanical pumping.

As per WHO standard the water consumption is approx. 30 gallons per capita per day to ensure most basic needs are met and few health concerns arise. To meet the demand of Jacobabad approx. 4.33 MGD water per day is needed to supply.

Currently, 12,005 registered household connections are connected through this water supply and 2.16 MGD water is being supplied.

SUMMARY							
STATISTICS	2022	2023	2024	FINANCIALS (M)	2022	2023	2024
Population	207,183	210,711	214,300	Govt. Grants	144	144	120
No. of Houses	34,530	35,119	35,717	Electricity Cost	75	101	88
No of Connections	15,375	19,691	25,220	Generator Cost	2	2	2
Water Demand in MGD	3.426	4.388	5.101	Chemical Cost	11	15	18
System Capacity in MGD	14.50	14.50	14.50	Repair & Maintenance cost	21	23	25

i) Service-oriented objectives:

- Achievement of a financially sustainable project, providing service-oriented utility and evaluating the maintenance characteristics of the project
- Increase the number of connections to serve the overall population of the city.
- Improving on the current level of service being provided

- Implement Billing, Collection, and Complain Management System

ii) The above factors are being spurred by:

- Customer expectations from the project
- Project spear-head expectations
- Commitment to the strategic goals of the project
- Municipal Committee Jacobabad

iii) The key challenges envisaged in the achievement of the above service-oriented objectives are:

- Financial grants
- Lack of access to funds
- Infrastructural upkeep and maintenance in terms of wear and tear
- Increasing cost drivers such as labor and fuel
- Unskilled labor force from the local environment
- Regulatory policies that may be subject to change
- Customer expectations due to the initial level of service provided
- Specific compliance issues that may arise from time to time
- Intermittent water supply due to power failure.
- Understaffing water supply at the Municipal level is a big issue in the proper operation of water supply.
- Water consumption data is unavailable due to unmetered water supply which leads to insufficient revenue and weak financial capacity.
- Water quality is expected to be altered due to climate change which drastically impacts surface water channels such as rivers and lakes. Variation in rainfall patterns and temperature increase will also affect the Khirthar Canal and water supply can increase or decrease accordingly.

Current Infra Structure

The exiting water supply system is upgraded by the Government of Sind & USAID and the capacity of water supply is 14.5 MGD, all infrastructure has been designed and develop accordingly.

Following are the main components of the distribution system;

- Old and new high lift and low lift pumping stations with a common 900mm diameter manifold.

- 6 Overhead reservoirs 25 to 28 meters above ground level to supply water to respective distribution zones.
- 600 mm diameter transmission Loop feeding 6 Overhead Reservoirs.
- Distribution System in 6 individual zones from overhead reservoirs.
- Flow Meters to be provided on water transmission from Manifold and supplies to individual overhead reservoirs.
- The water supply distribution to the city consists of 6 overhead reservoirs strategically located in various parts of the city and the distribution line of various pipe sizes in between 75 mm to 350 mm .a transmission loop starting from the manifold supply 6 overhead reservoir and these overhead reservoirs distribute the water supply in 6 zones of the city.
- Two storage lagoons having a capacity of 110MG each and one additional lagoon having the capacity of 140 MG near the intake works. The lagoons store water for the canal closure period which is normally 45 days. Provided that all 3 lagoons are filled at the start of the closure period, more than 8 MGD water can be provided to Jacobabad city for up to 45 days.

Total water storage capacity of three lagoons = 110 + 110 +140 = 360 MG

The Low Lift Pumping Station has two pump houses at the Khirthar canal. The purpose of the Low Lift Pumping Station is to supply canal water to the storage lagoons when the water level in the canal is low and gravity flow from the canal is not sufficient to feed the lagoons.

Six similar pumps are installed at the Low Lift Pumping station, three in each room. Each pump has a capacity of 286.4 m³/hr. and is horizontally coupled with a 25 Hp motor. Each set of three pumps is operating in parallel discharging in a common header of 16-inch diameter.

The water transmission system from the Khirthar Canal to Jacobabad city has two parts:

- High Lift pumping system pumping raw water from the lagoons to the Water Filtration Plant located 22 km away from the lagoons, in Jacobabad city.
- Filtered water pumped to six overhead reservoirs through a 600 mm dia transmission loop. The old and new pumping stations can pump a total of 14.5 MGD (6.5 MGD from old and 8 MGD from the new pumping room) of water to the filtration plant.

Future Infra Structure Requirement

The expected growth rate for Jacobabad Population is 1.69% by considering the growth factor water demand will increase as directly proportionate. MCJ anticipates 13,004 more connections required as per current demand and growth rate. Any other factor like a migration of population from rural to urban will affect the population and water demand as well.

To cater 13,004 new connections approx. A 5 KM supply line of 90 mm will be required to cover the area where the supply lines are not available.

The available capacity of the water supply system is 14.5 MG/day and the current requirement is 2.2 MG/day, extension to the water main is not required shortly that is 1-10 years unless abnormal factors enhance the demand manifolds.

By creating awareness regarding water conservation through different channel i.e. FM radio, cable advertisement, community involvement, water demand can be suppressed.

Eight number of Toilets are required one each at 6 Overhead Reservoir and two at the filtration plant.

Re-Construction of room and staircase at old high lift pumping Station is required to save the structure.

Efficiency

Some of the proposed ways in which the key challenges can potentially be managed include:

- Obtaining access to funding for maintenance of different areas of the project.
- Trained and permanent positions for infrastructure-based troubleshooting for unskilled labor.
- Assessing energy conservation options
- Building on the community and school awareness campaigns every quarter to enable constant reminders to the local citizens for the upkeep of the infrastructure and prevention of local vandalism.
- Implementation of water consumption meter for those consumers, consuming residential connection into commercial business.
- Periodic review of budgets, especially revenue and expenditure budgets.
- Periodic review of the status of water connections and evaluation of futuristic needs.
- Periodic testing of water standards with a view towards compliance with international regulations for standard drinking and domestic use water quality.
- Assessment of the water pipeline distribution system to maintain the clean quality of water for drinking purposes.
- Draft a five-year plan to mechanize and digitalize operations for more transparency in the system.
- Implementation of the computerized maintenance management system.

Key Indicators

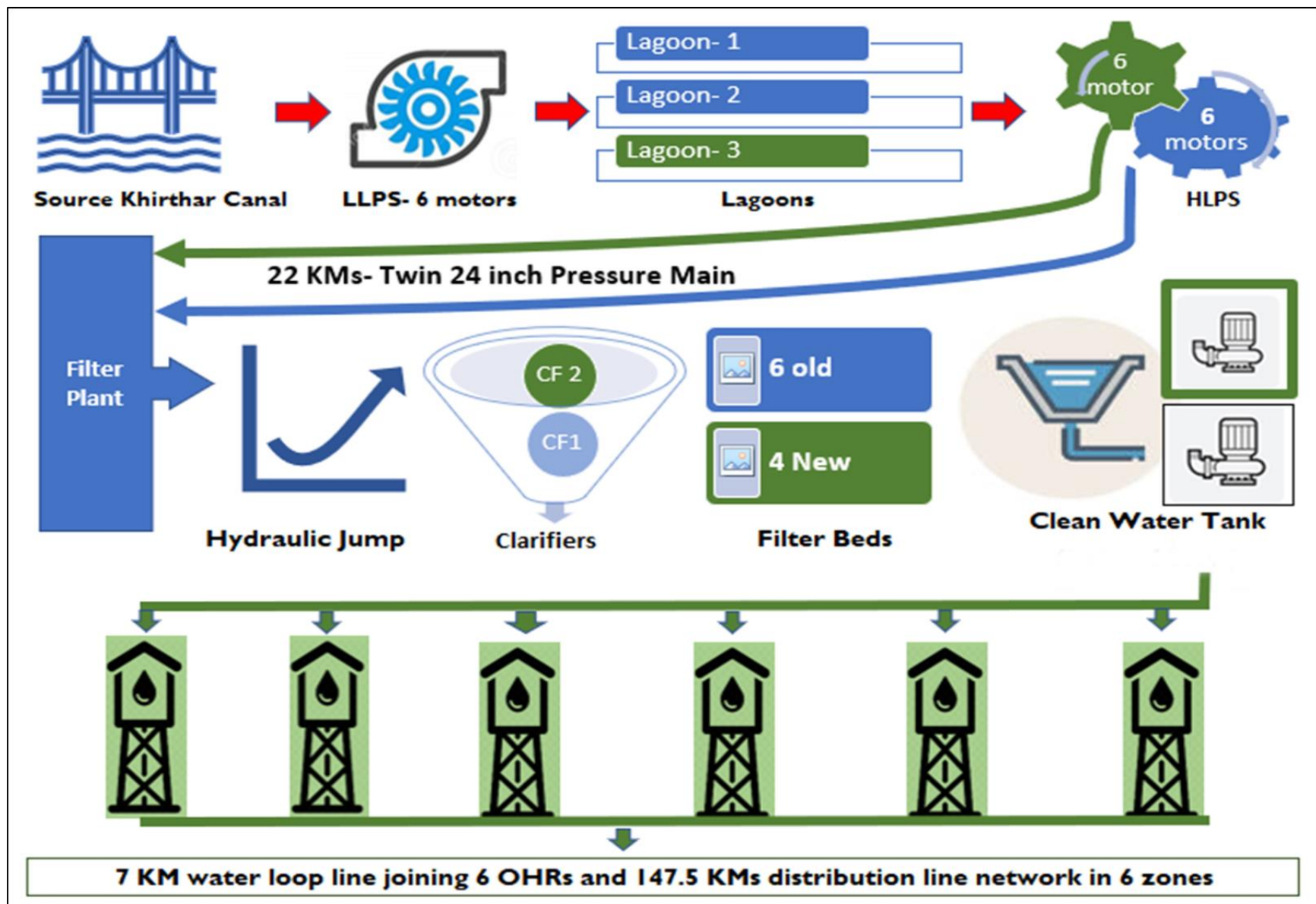
The Water Utility Business Plan looks at how the organization can be improved and how it can provide its services in a reliable way for its customers and its employees. As a result, an assessment of how to provide reliable services is outlined so that Municipal Committee Jacobabad can improve the overall quality of its services for its customers and employees as needed.

Maintenance however is not simply ensuring that the pipelines remain in a serviceable condition; rather it is also the consistent provision of drinking and sanitation water that the MCJ will be responsible for enabling flow through the infrastructure to the end-user. Additionally, the MCJ team must be well prepared to comply with all the regulatory requirements that are aimed at maintenance and expansion of the waterworks infrastructure for domestic, drinking, and sanitation water use. Towards this end, the following table sets out the core activities that have been addressed in part and are a part of the maintenance project in the following periods:

Activity as part of the MCJ	Work is undertaken already	Estimated Outcomes
Water quality sampling and reporting	Approximately 10,618 tests done till June 2020	approximately 18,308 Microbial, chemical & Instrumental tests every year for the financial period July 2021 to June 2024
Increase Number of connection infrastructure	Approximately 15,500 connections installed and water supply provided until June 2022	Provision for installation of approximately 9,845 new connections for the financial Period July 2021 to June 2024
Repair & maintenance of existing waterworks infrastructure through periodic evaluation	Regular inspection on a daily and weekly basis.	Approximately 30 inspections every month to evaluate the physical condition of waterworks infrastructure for leakages, corrosion, and breaks along the pipelines requiring replacement/ repair
Requirement of human resources for maintenance of waterworks infrastructure	Qualified and efficient human resources employed for installation and waterworks setup	Qualified & trained human resources would participate in upkeep, inspection, and maintenance of physical waterworks infrastructure and for troubleshooting

6. WATER SUPPLY MECHANISM

The water supply system of MCJ is complex. Water comes from the main source that is Khirthar Canal from where it is pumped to Lagoons through Low Lift and high lift Pumping Station where alum is mixed for reducing the turbidity then flows filter bed then to filter gallery where cleaning process and mixing of chemicals has done then the water is ready to distribute. From the filtration, plant water has pumped to the overhead reservoir and then distributed to the household through the distribution network. Flowchart of the water supply system is bellowed;



7. WATER DEMAND FORECAST

This section provides the MCJ with guidance on the assessment of water demand, and addresses the assessment of future water demand, based on registered connections, historical records, future growth, and expected water usage rates by category of customer. Also discussed is the importance of conducting an annual water balance and its benefits to the MCJ. The issues related to the identification and reduction of non-revenue water (NRW), which are increasingly a priority issue for water utilities throughout the country and the province.

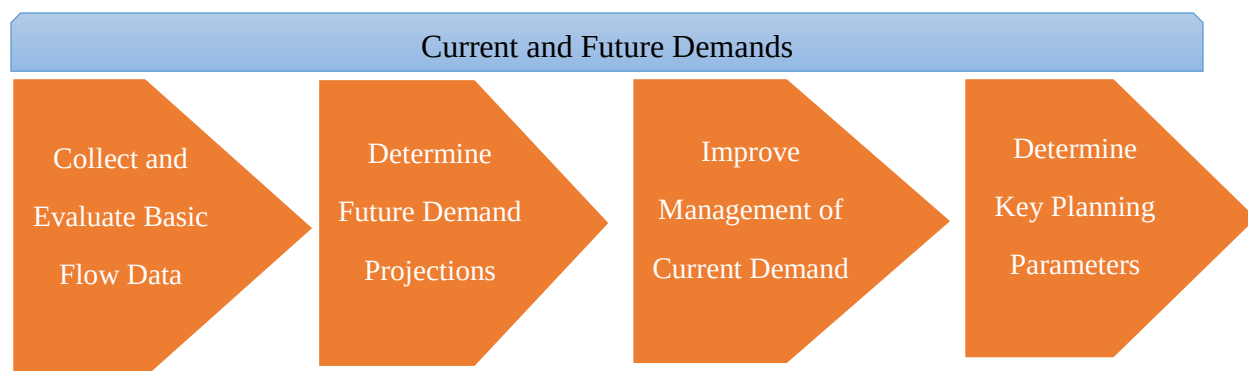
The standard output of a WDM program is a water demand analysis/forecast. A sound water demand forecast, together with an evaluation of existing sources of supply, provides valuable insight in determining when, or if, new sources of water supply must be developed.

Managing water supply and water demand is a function of efficient pricing, effective regulation, and appropriate public education and awareness. At the utility level, it is a process that combines technical, administrative, and financial measures. A critical element of a WDM program is the implementation of a comprehensive, reliable metering program for all types of connections. However, in the case of the MCJ, the metering process is very costly and this may not be affordable for MCJ.

The determination of realistic future water demand should be based on:

- Historical water supply and water sales records;
- Current system performance and customer use patterns;
- Assumed changes in future water use patterns;
- Assumed effectiveness of efforts to reduce non-revenue water; and
- Unserved demand.

A simple graphic, presented, describes what is included in preparing a water demand analysis.



i)Importance of a Water Balance Audit

Conducting a water balance audit is the first step to a comprehensive water demand management program. A water balance audit quantitatively accounts for all the water that is input into the system and identifies how much water is lost and what that loss costs the MCJ.

The overall objective of a water balance audit is to help the MCJ select and implement programs to reduce water losses (non-revenue water) throughout the system. Ultimately, either a reduction in the volume of water being produced (cost reduction) or an increase in the volume of water being sold (revenue increase) should be aspired for.

The benefits of water balance audits to MCJ are:

- Reduced non-revenue water;
- Financial performance improvement;
- Increased knowledge of the distribution system;
- More efficient use of existing supplies;
- Safeguarding public health and property;
- Improved public relations;
- Reduced legal liability;
- Reduced service disruption to customers; and
- Resource conservation.

Metering of the supply sources is an essential first step for water balance calculations. As in the case of the MCJ, the actual metering does not exist, every effort should be made to carefully estimate each component of water usage to determine realistic quantities for the water balance.

The water balance calculation and analysis quantify the total volume of water that enters into the system, the volume of authorized consumption (billed and unbilled, and unmetered), as well as the volume of water losses (apparent and real). This water balance calculation can be best understood by referring to the below table, Components of a Water Balance.

Own Sources	Total System Input	Supplied Water	Authorized Consumption	Billed Authorized Consumption	Billed Unmetered Consumption	Revenue Water
				Unbilled Authorized Consumption	Unbilled Unmetered Consumption	Non-Revenue Water
			Water Losses	Apparent Losses	Unauthorized/Illegal Consumption	
					Customer Provided with excess supply	
					Data Handling Error	

				Real Losses	Leakage on Mains	
					Leakage on Service Lines	
					Leakage and overflows at Storage	

Each component of the annual water balance is presented in terms of volume per year. The MCJ should focus on the areas shaded in red to appreciate the potential negative impacts that Water Losses when combined with Unbilled Authorized Consumption, can have on the financial performance of a utility, when and if these volumes are a significant percentage of the Total System Input. Because of the wide diversity of formats and definitions used globally for water balance calculations, the International Water Association and its Task Force on Water Losses have produced an international best practice approach for water balance calculations. This approach includes definitions of its components as a basis for comparing performance between utilities. The figure in the above table is based on the terminology and standards produced and generally accepted in the water industry for water balances. Brief definitions of these common terminologies are presented in the following table.

Definitions of Water Balance Terminology

Terminology	Definition
Own Sources	The volume of water derived from the sources owned by the MCJ
Total System Input	The volume of water received into the water supply system
Supplied Water	The volume of water available to be sold to system users/consumers
Authorized Consumption	The volume of billed and unbilled water supplied to registered customers of the utility
Water Losses	The volume of water is calculated as the difference between the total volume of system input and the volume of authorized consumption
Billed Authorized Consumption	All consumption that is authorized and billed by the utility
Unbilled Authorized Consumption	All consumption that is authorized but still unbilled by the utility
Apparent Losses	The volume of water attributed to unauthorized consumption and all types of inaccuracies associated with billing
Real Losses	The volume of water attributed to technical conditions and events experienced in the system
Revenue Water	The volume of water billed to a customer of the utility

Non-Revenue Water	Difference between total system input volume and volume of billed consumption
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ii) Non-Revenue Water and Its Impacts on Utility Costs

The reduction in Non-Revenue Water (NRW) remains one of the major challenges facing water supply and wastewater utilities throughout the world. Reducing NRW can significantly impact the financial performance of the utility in either of two ways.

First, water is costly to produce, particularly considering factors such as the development of extraction facilities, any necessary water treatments which require constructed facilities, chemicals, power, and labor, as well as a significant amount of electrical and fuel power for pumping. These costs must be recovered through water sales. If the operations are to be sustained and for utilities that have high percentages of NRW, the consumer ends up paying for the inefficiency through increased water tariffs or a high amount of subsidy need to pay by the Government. Therefore, the reduction of NRW results in the reduction of costs. In many cases with significant electrical energy costs, this reduction can be dramatic.

Secondly, if NRW is the result of non-metered systems or systems with a high percentage of illegal, non-registered connections, then reducing NRW will result in increased sales and therefore, increased revenues for the utility. During various meetings with the household registered connection consumers, it was noted that the number of joint families, owners of two-story houses were registered as a single connection household with the MCJ. Such families utilizing water for more than one household and will pay for a single connection. We recommend MCJ mobilize such consumers to register a separate connection for each house. Due to such a process, the number of registered connection holders will be increased, however, the water consumption will remain the same.

The components of NRW can be determined by conducting a Water Balance Audit. This is based on the measurement or estimation of water produced, consumed (sold), and lost water.

iii) Determining Current Real Water Demand of the Utility

This subsection is intended to provide the user with a common foundation of information for considering water demand and the concerns of all utilities with water losses. Furthermore, it also presents a methodology for the utility's senior management, to determine the current real water demand of the utility for each of the MCJ customer categories.

In preparing a water demand forecast, first, determine the "total" and "served" population, as well as the "water demand per capita per day".

It is in the best interest of water utilities to be as objective as possible in determining the size of the population in its defined area of Jacobabad and from which, the size of the population is served by others. The two primary sources for the population data of the area are the respective census-2017 and the UNICEF baseline study in the year 2015 and another study "Willingness to Pay" in

the year 2017. The final values determined by the MCJ are considered the most accurate are entered in the Base Year column as illustrated by the sample data in the below table.

Upon consideration of the population in the Jacobabad City and the population served by others, the management estimated the growth rate for the three-year planning period.

Population / Customer profile	Note	Year 2020-2021 Base Year	Year 2021- 2022	Year 2022- 2023	Year 2023- 2024
Population of MC Jacobabad	1	204,000	207,183	210,711	214,300
Population served by water supply system	2	72,030	92,250	118,146	151,320
Population not connected with the water supply system		131,970	114,933	92,565	62,980
Percentage of population provided water services		35.3%	44.5%	56%	70%
Registered Household connections (approx.)		12,005	15,375	19,691	25,220
Additional connection	3		3,370	4,316	5,529

Note:

1. It is assumed that the 34,000 households in Jacobabad City, six persons per household leads the total population to approximately 204,000 in 2021. The increase of the population for each of the three years in the Business Plan is calculated based on percentage growth per year and demand estimated based on the registration trend of connections.
2. A number of registered household connections with the number of people per connection to give the population served by the registered connections. The number of persons per household per registered connection is assumed to be 6 persons as explained in above note 1.
3. An additional connection is required to serve the remaining population.

To estimate the “served population”, the MCJ management considered the customer records of the MCJ. To establish this number for the Base Year, the MCJ uses the number of registered household connections (non-metered), as officially recorded by the MCJ. This entry is made for each type of consumer in the base year. Unless the MCJ has a better source of information, it should obtain data on the “average household size” and “average number of households per dwelling”. Multiplying average household size by the number of connected household dwellings provides a good approximation of the number of people per connection. Accordingly, we can calculate the served population for the Base Year and all of the Business Plan years.

Dividing the Served Population by the Serviceable Population, which is the difference between the population in the MCJ area and the population served by others, provides a piece of Profile Information regarding the utility, which is referred to as the Service Coverage Ratio. The MCJ has, as one of its Strategic Goals, to achieve a desired service coverage ratio within a stated timeframe.

iv) Current Water Demand and Demand per Capita

Most urban water demand forecasting approaches use a statistical appraisal of per capita or per customer water use rates. The widely preferred water consumption indicator from the International Benchmarking Network for Water Utilities is expressed in terms of liters/capita/day. This methodology is based on establishing a demand norm per capita for the served population and relating it to data that is available for the served population. The demand norm per capita for household connections is the total consumption for all household users divided by the number of household connections and the average number of people per connection. The International Benchmarking Network for Water Utilities recommends the same approach should be undertaken to calculate the demand analysis for Residential, Commercial, Institutional, and Industrial Customer Categories. The per capita demand for these categories is calculated as a ratio of the total consumption for each customer category (Residential, Commercial, Institutional, and Industrial) divided by the population in the Municipality area. The following table has been prepared to illustrate how the utility management should record/input the data on water consumption per category to be able to calculate the per capita demand (liters/capita/day) for each class of consumers.

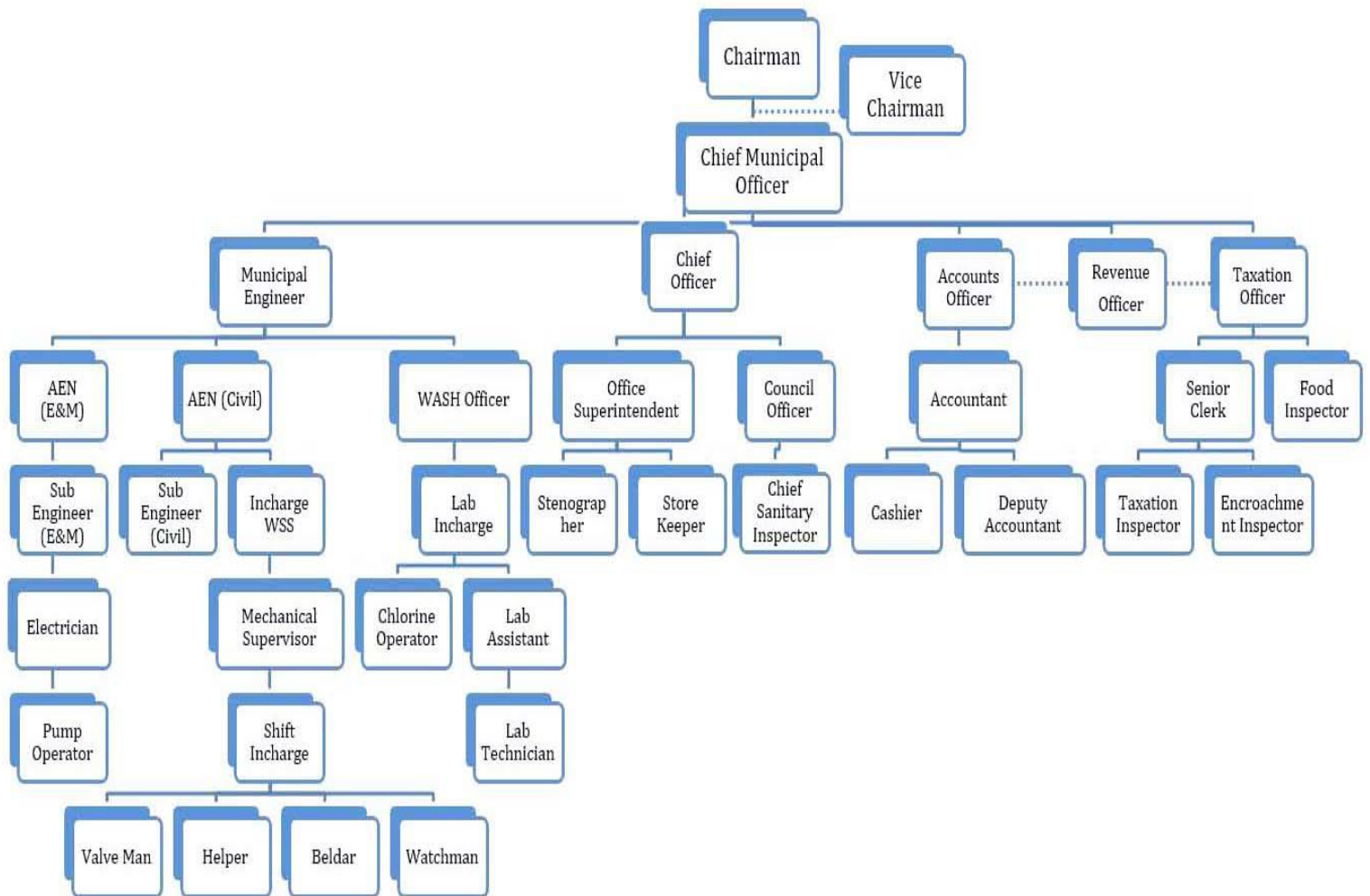
To determine the apparent or current water demand per capita, the volume of water sales for Residential, Commercial and, Bulk connections;

v)Water Demand Forecast

<u>Description</u>	<u>2021-2022</u>	<u>2022-2023</u>	<u>2023-2024</u>
Total Residential water consumption per year	1,010 MG	1,293 MG	1,657 MG
Total Commercial water consumption per year	152 MG	194 MG	248 MG
Leakage / Theft losses @ 20%	232 MG	297 MG	381 MG
Total Demand Per Year	1,394 MG	1,784 MG	2,286 MG

8. ORGANIZATIONAL STRUCTURE OF MUNICIPAL COMMITTEE

JACOBABAD



9. SWOT ANALYSIS

A SWOT analysis is a strategic analysis that identifies the strengths within the organization, weaknesses regarding internal and external factors, opportunities in the market, and threats in the environment. The SWOT analysis is done to identify the areas where the Municipal Committee Jacobabad materialized the water supply operational opportunities.

Strengths

The current strength of Municipal Committee Jacobabad allows continued growth and sustainability of the water supply system. These strengths improve the stakeholder's trust, customer satisfaction, community support, and stable cost structure.

- Sufficient water resources present
- Water testing facilities are available
- Citizen liaison cell has established

Opportunities

Searching available and creating new opportunities that attain the level of customer satisfaction and maintain the best service for delivery of water.

- Water testing facilities can be expended
- Staff cross-training can enhance the capabilities of the water supply team
- Government subsidy of Rs.15 million per month
- Sales can be increased on commercial ground
- MIS System is being developed
-

Weaknesses

Identifying the Weakness of an organization are playing a very critical and vital role to improve its capability. Self-determination, an outside audit, and community criticism are the methods for identifying the weaknesses.

- Unavailability of the asset management plan
- Geographical challenges
- Lack of highly technical staff
- Mobilization problem due to unavailability of service vehicles

Threats

Threats are always present in water supply operations concerning Water Safety, Infrastructure damages (Wear & Tear), break down, and administrative control.

- Unmetered water supply
- Contamination of water
- Unavailability of qualified staff
- Extreme weather situation
- Unavailability of uninterrupted power supply

10. MANAGEMENT PLAN

MCJ contributes to the nation by providing strong service to an under-served but vibrant and active community. Environmental sustainability is a core mission running parallel with the provision of sustainable pipeline infrastructure. The initial phase of the setup and installation as well as provision of connectivity has been set into motion. This business plan outlines the strategic goals for the maintenance of the set-up, in terms of maintenance of both the physical infrastructure and environmental sustainability.

Plans for envisaged future service status;

- The core project objectives with which the water utility service was established to remain consistent
- Focused attention to be diverted to achieving synergy within four inter-related areas of the project, including existing and envisaged levels of service. These four areas are:
 - Compliance with provincial and national policies,
 - Focus towards the growth of the project,
 - Achieving management-related objectives and
 - Efficient practices and environmental sustainability with periodic physical evaluations.

These four areas will gain precedence irrespective of whether the project is being maintained or futuristic growth prospects are being considered.

- The reasons why focus is aimed at the four target areas listed above are protection and safety of the health of citizens of Jacobabad, meeting provincial and national regulatory policies, ensuring the standards established by project initiation are achieved and exceeded, achievement of efficiencies and economies of scale for cost reductions to basic levels, succession planning, digitalizing the project and giving it a futuristic vision with a focus on infrastructural and environmental sustainability
- Continuous monitoring of the state of the project development, infrastructural and functional requirements, and evaluation with initial scope to exceed project objectives through planning for and acting on consistent standardized maintenance protocols
- Keep abreast of new provincial and national regulatory policies to meet compliance objectives

- Focus on water quality for provision of safe and clean drinking and domestic use water supply
- Work on environmentally sustainable goals through fuel and electricity consumption patterns and models.

a). Compliance:

- Take all measures necessary to eliminate suppressed demand where it exists and to meet the expected growth in demand from residential, commercial, and bulk consumers
- Expansion of the water distribution system to increase coverage to 100 percent of the service area population
- Periodic random inspection of water samples for ensuring the cleanliness of water Tariff Policy
- Conservation of water sources by minimizing waste either through leakages or theft
- Ensure the water safety at sources and distribution network
- Maintaining established pipe-lines by ensuring regular inspections for leakages and corrosion is undertaken
- Increase in water charges collection and reduce the Non-Revenue Water
- Inspect water sources for risk of water pollution and contamination to maintain safe and clean drinkable water
- Focus on best practice environmental sustainability issues and protocols under the local environment

b). Project growth:

- Periodic evaluation and assessment of Master Plan for consistent maintenance and improvements to the original project scope
- Support local initiatives for environmental sustainability through minimization of water leakages and pipeline faults
- Consistent supply of safe, clean water
- Regular cleanup maintenance of pipelines
- Provide and update citizens for an alternative plan of action during the regular pipeline cleanup/ maintenance phase
- Carry out testing and laboratory analyses

C). Efficiency:

- Evaluate sources of energy conservation and build on these sources for maximum efficiency, including new transportation routes that conserve fuel, explore new water sources, invest in technologies that make it more feasible to purify and filter water before transportation

- Evaluate the average consumption per size of household (covered area) to construct water requirements and forecast plans
- Hold regular camps at school and in the main district, inviting students and locals and educate/ remind them regarding judicious use of scarce resources, minimize water wastage, and ration water use.

11. FINANCIAL PLAN

Following are the basis of financial projection

This initial business plan is prepared for three years and it is recommended that the next business plan would be prepared for seven to ten years for better understanding and planning. The population of Jacobabad is calculated based on this assumption that the average number of persons per house is six and the population growth rate as per the statistical bureau of Pakistan is 1.69%. By considering this population growth rate the population of Jacobabad city is approximately 204,000 by the end of June-2021.

As per WHO, water demand per capita per day is 30 gallons which includes drinking, washing clothes, washing utensils, bathing, cooking, and washing house. It is assumed that 35-gallon usage in the summer season of eight months and 20 gallons needed in the winter season for four months. Water losses during supply and distribution will be equal to 20 % of total water demand.

The total number of connection connected till June-2021 are 12,005 and water charges per connection per month are Rs. 500. The one-time connection charges for domestic connection is Rs.3,000 while for commercial connection is Rs.10, 000 and the increase in the number of connections would be around 25% per year connection per year.

The life of the civil structure is assumed as 25 years, 15 years for electrical and mechanical equipment, and 10 years for vehicles. Due to the decline in water level at Khirthar canal, 4 months operation time is assumed for the low lift pumping station.

Collection ratio of domestic water charges is very low in different municipalities and Water and Sanitation Authorities (WASA) of Sindh, same as in KWSB, by considering them we assume 25% of total revenue will be collected in 1st year, 35% in 2nd year and with more efforts of collection agents it will be 45% in 3rd year. Similarly, for commercial revenue, it is assumed that 50% in year-1, 60% in year-2, and 70% in year-3. The inflation rate for the 2nd and 3rd years would be 9.5% and 10.5% respectively.

c) Projected Statement of Income and expenses

MUNICIPAL COMMITTEE JACOBABAD WATER SUPPLY SYSTEM PROJECTED STATEMENT OF INCOME AND EXPENSES			
<u>REVENUE</u>	For the Year Ended June 30, 2022	For the Year Ended June 30, 2023	For the Year Ended June 30, 2024
Monthly Water Charges Domestic (Due)	57,282,623	115,901,259	163,336,415
New Connection Fee Domestic	5,367,584	14,179,042	19,978,265
Revenue from Commercial Connections	4,026,000	9,460,800	9,504,000
New Connection Fee Commercial	2,400,000	-	-
Revenue from Advertisement (billboard)	244,800	268,056	294,864
Revenue from Water Testing Charges	21,645	43,290	69,600
Revenue from Advertisement on water bills	120,000	264,000	300,000
Reimbursement of staff salary	12,278,664	12,278,664	12,278,664
Revenue from Government Grant	144,000,000	144,000,000	120,000,000
Total Revenue	213,462,652	284,116,447	313,483,145
<u>Operating Costs</u>			
Chemical Costs	11,246,706	15,450,336	17,974,234
Electricity Cost	74,788,560	101,112,005	88,003,210
Generator Fuel Cost	840,270	1,173,577	1,176,378
<u>Repair & Maintenance Cost</u>			
OHSR	3,816,857	4,179,458	4,597,404
Generator	1,291,779	1,414,498	1,555,948
Pumps & Valves	7,508,213	8,221,493	9,043,642
Distribution Lines	2,272,742	2,488,653	2,500,016
Supply Line	6,230,444	6,822,336	7,504,570
Total Operational Expenses	107,995,570	140,862,355	132,355,403

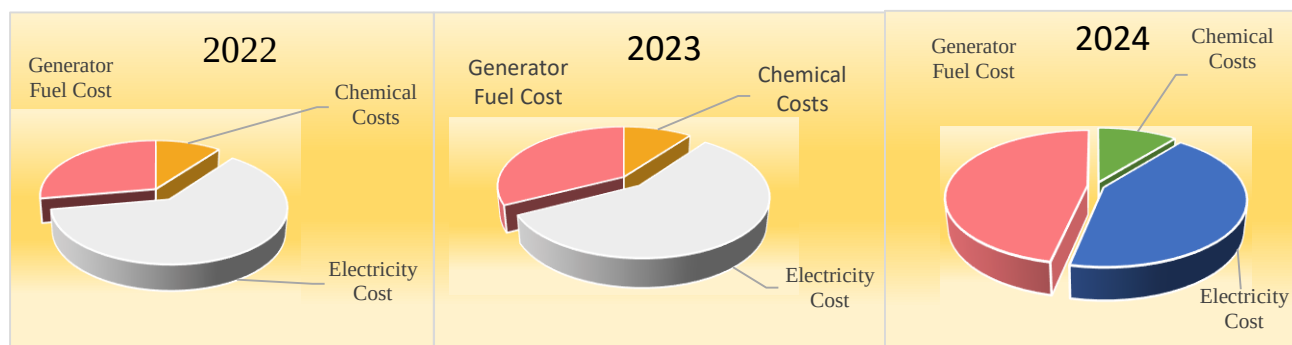
Gross Profit

117,745,746	155,532,756	193,406,406
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Administrative Expenses

Staff Salary	23,201,680	30,704,504	37,911,302
Other Administrative Expenses	9,013,154	11,424,127	11,431,032
Depreciation	80,236,344	81,523,204	82,837,915
Total Administrative Expenses	112,451,178	123,651,835	132,180,250
Contingencies	6,403,880	8,523,493	9,404,494
Net Profit (Loss)	(1,109,312)	23,357,428	51,821,662

Operational Expenses



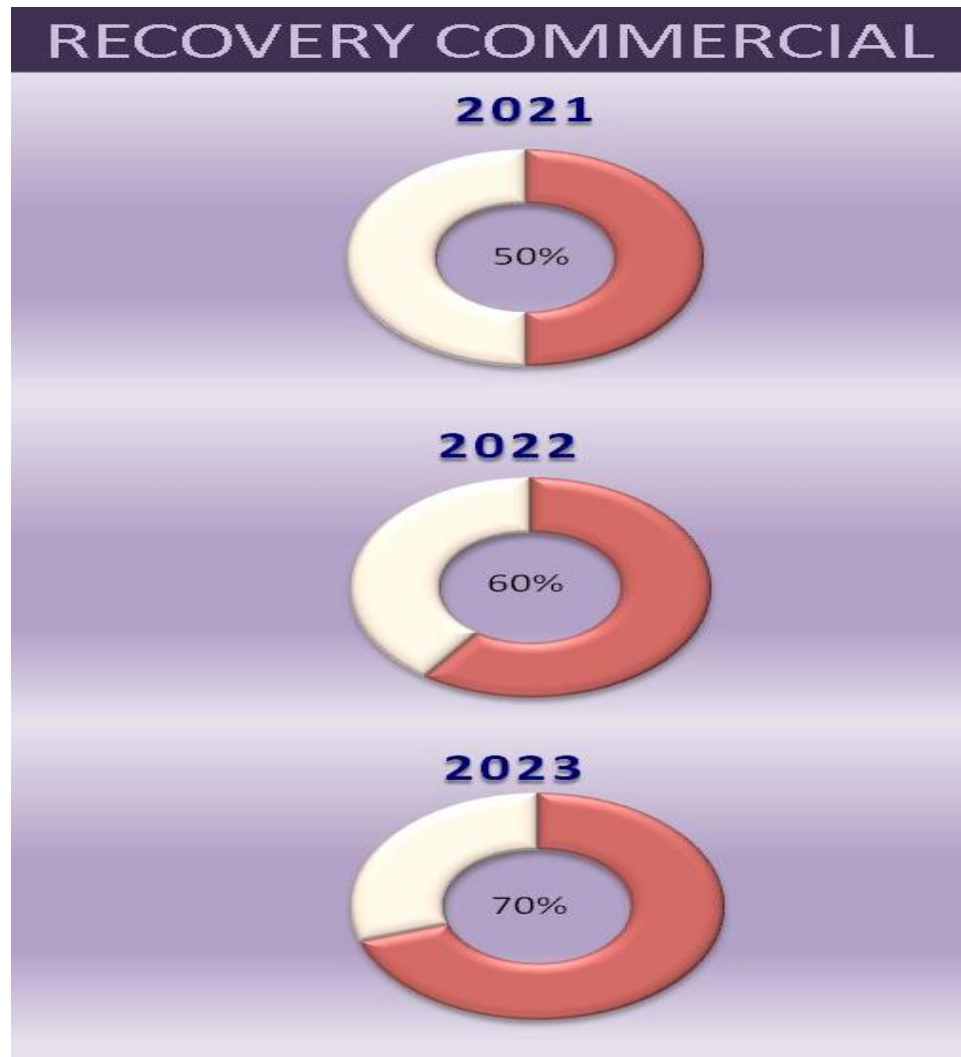
There are three main pillars of operational cost which are indicated here

- Electricity Cost
- Generator Fuel Cost
- And Chemical Cost for water treatment.

Overall expenses are increasing concerning the increase in the number of connections as well as the increase in water demand except for maintenance cost which is almost the same or a bit change.

As per projected Income and Expenditure Account, Municipal Committee will suffer losses due to low recovery of water charges that is 25% in year-1, 35% in Year-2 and 45% in Year -3 expected for domestic connections and 50% in Year-1, 60% in Year-2 and 70% in year -3 expected for commercial connections, but after 2-5 years span of time collection of water charges will increase gradually and dependency on Government Subsidiary reduces.

Following is the graphic representation of collection ratios.



We consider a billing management system that manages the billing and collection of water charges, will be operational in November-2021 with full stream and it will have a positive impact on the collection of water charges.

d) Projected Statement of Financial Position

MUNICIPAL COMMITTEE JACOBABAD WATER SUPPLY SYSTEM PROJECTED STATEMENT OF FINANCIAL POSITION			
	As Of June 30, 2022	As Of June 30, 2023	As Of June 30, 2024
<u>Current Assets</u>			
Cash & Bank	10,680,914	14,160,053	31,284,489
Monthly Fee Receivable (Domestic)	42,961,967	118,297,785	208,132,814
Monthly Fee Receivable (Commercial)	2,013,000	5,797,320	8,648,520
Inventory	2,000,000	2,000,000	2,000,000
<u>Fixed Assets</u>			
Total Plant & Machinery	1,906,576,957	1,929,510,000	1,955,014,466
Less: Allowance for Dep	(80,236,344)	(161,759,548)	(244,597,463)
Total Assets	1,883,996,511	1,908,005,644	1,960,482,878
<u>Current Liabilities</u>			
Accounts payable	1,000,000	1,000,000	1,000,000
Provision for Bonus	1,793,100	2,444,805	3,100,377
<u>Non-Current Liabilities</u>			
Net Holding	1,882,312,723	1,881,203,411	1,904,560,839
<u>Net Profit</u>	(1,109,312)	23,357,428	51,821,662
<u>Total Liabilities</u>	1,883,996,511	1,908,005,644	1,960,482,878

e) Projected Cash Flow Statement for three years

MUNICIPAL COMMITTEE JACOBABAD WATER SUPPLY SYSTEM PROJECTED STATEMENT OF CASH FLOW			
	For the Year Ended June 30, 2022	For the Year Ended June 30, 2023	For the Year Ended June 30, 2024
<u>CASH INFLOWS</u>			
Contribution from Domestic Connections (due)	57,282,623	115,901,259	163,336,415
Recovery from Domestic Connections	14,320,656	40,565,441	73,501,387
Contribution from Commercial Connection (due)	4,026,000	9,460,800	9,504,000
Recovery from Commercial Connections	2,013,000	5,676,480	6,652,800
New Connection Fee Domestic	5,367,584	14,179,042	19,978,265
New Connection Fee Commercial	2,400,000	-	-
Cash inflow from Bill Board Advertisement	244,800	268,056	294,864
Cash inflow from Water Testing	21,646	43,290	69,600
Reimbursement of staff salary	12,278,664	12,278,664	12,278,664
Cash inflow from Water Bill Advertisement	120,000	264,000	300,000
Total Cash Inflows	36,766,349	73,274,973	113,075,580
<u>CASH OUTFLOWS</u>			
<u>Capital Expenditure</u>			
New Supply lines	1,254,000	1,254,000	3,762,000
New Distribution Connections	9,360,235	14,179,042	18,242,467
New Distribution Commercial Connections	2,400,000	-	-
16-inch valve required for police force ground OHRS	800,000	-	-
Chamber Construction Cost	1,200,000	-	-
Construction of old High Lift Pumping Station & stair case	1,800,000	500,000	700,000
Cost of 8 washroom & Guard Room & overhead tank	650,000	700,000	650,000

Old HLP pumps & Motors	6,000,000	6,000,000	-
Furniture at Filtration Plant	400,000	300,000	300,000
Lab Testing Equipment	250,000	-	-
Vehicle	1,150,000	-	1,850,000

Routine Expenditure

Operating Costs

Staff Cost	21,408,580	30,052,799	37,255,730
Chemical Costs	11,246,706	15,450,336	17,974,234
Electricity Cost	74,788,560	101,112,005	88,003,210
Generator Fuel Cost	840,270	1,173,577	1,176,378
Administrative	9,013,154	11,424,127	11,431,032

Repair & Maintenance Cost

OHS	3,816,857	4,179,458	4,597,404
Generator	1,291,779	1,414,498	1,555,948
Pumps & Valves	7,508,213	8,221,493	9,043,642
Distribution Lines	2,272,742	2,488,653	2,500,016
Supply lines	6,230,444	6,822,336	7,504,570
Contingencies	6,403,880	8,523,493	9,404,494

Total Expected Outflow

170,085,418	213,795,817	215,951,126
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Cash Excess/ (Deficit)

(133,319,070)	(140,520,844)	(102,875,546)
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Government Grants

Cash Opening Balance

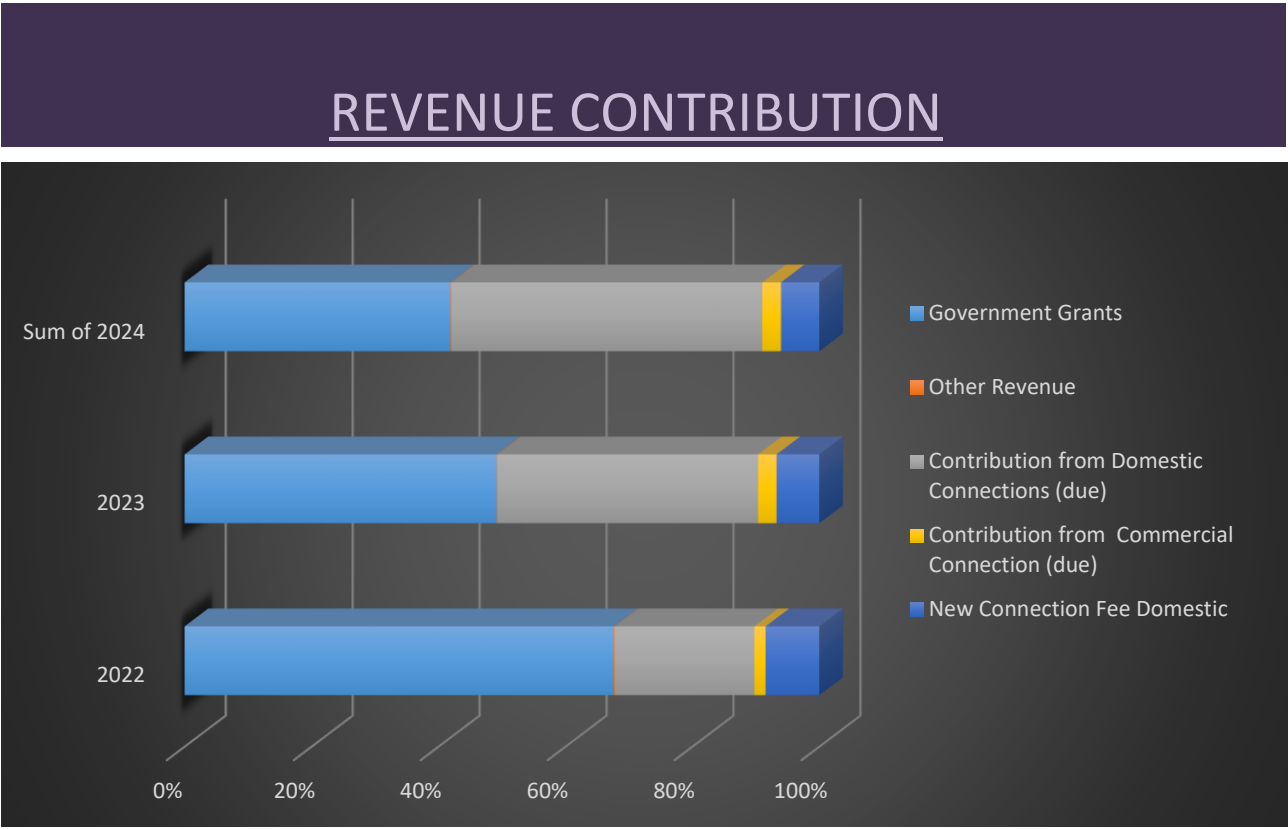
Added/(Consumed)

Closing Balance

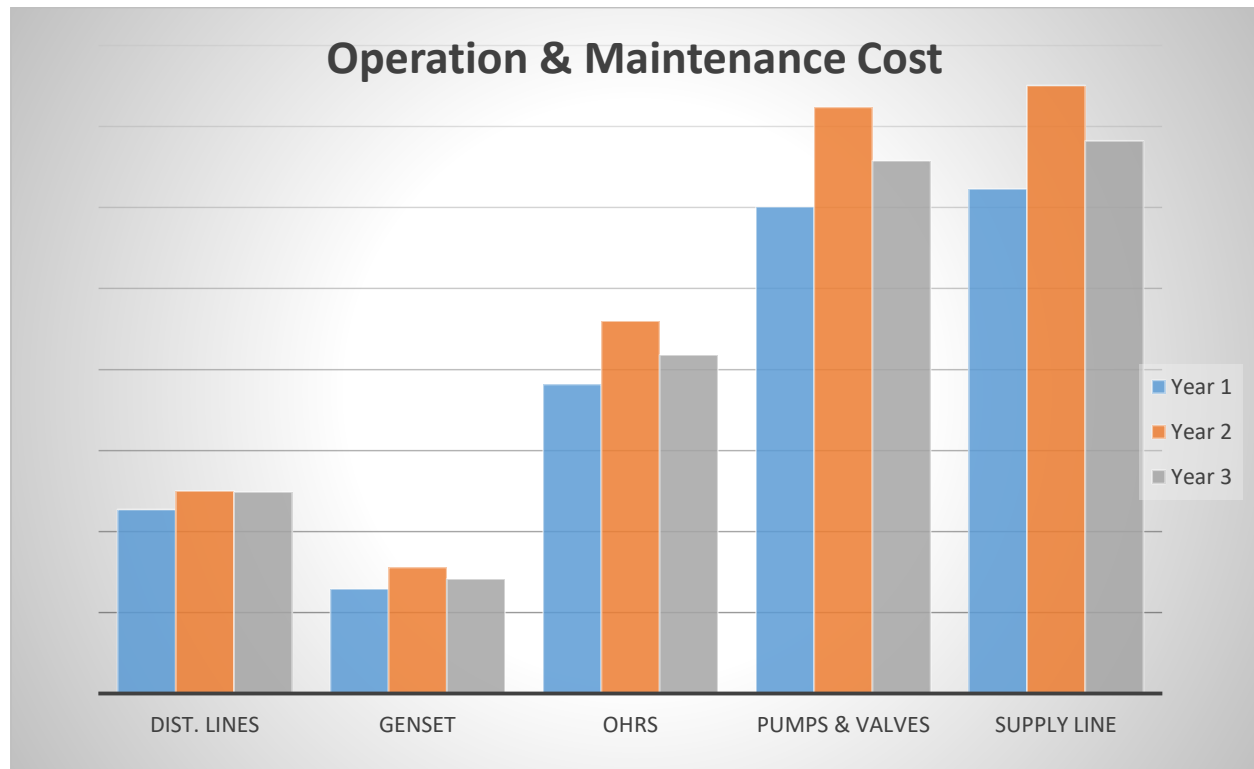
144,000,000	144,000,000	120,000,000
-	10,680,930	14,160,087
10,680,930	3,479,156	17,124,454
10,680,930	14,160,087	31,284,541

The municipal committee mostly depends on the government subsidy. It is expected that dependency on government subsidy will be reduced gradually as the number of connections and

population coverage increases collection of water charges also increase which leads to a decline in Government subsidy requirement.



The expected monthly cash outflow will be PKR 14 M in year-1, 18 M in Year-2, and 18 M in year-3. Out of that cash outflow requirement, 12 M per month are being provided through Government subsidy and the remaining portion is contributed by water charges recovered from connection holders. This will reduce to 10M in year three, it is expected it will further reduce as far as connection growth increases, and monthly recovery will also increase by putting more effort by MCJ.

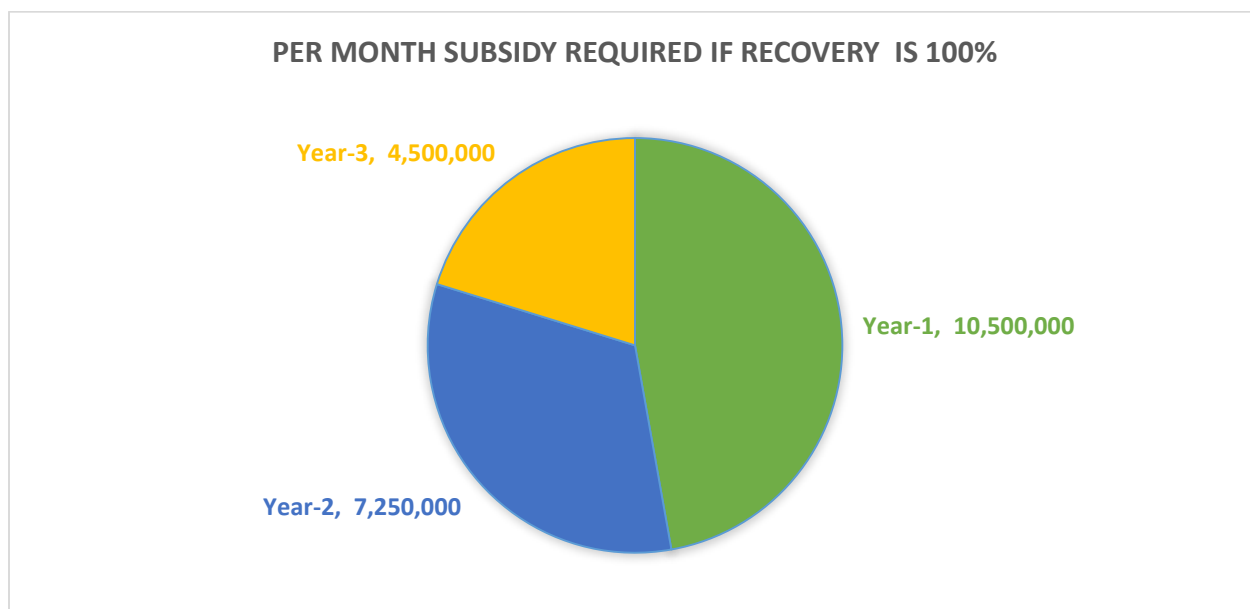


Repair and maintenance cost is also a big chunk of operational cost which is an essential part of the water supply system of Jacobabad. To retain the system in running condition preventive maintenance and timely repair are the most important part of the annual work plan. Repair & maintenance of supply lines and pumps & valves cover the major part of repair & maintenance costs. Preventive maintenance should be planned and done on time to reduce the risk of damages for uninterrupted water supply.

12. SCENARIOS WITH DIFFERENT PERCENTAGES OF COLLECTION

Following are the different options of collection mix and their impact on requirement government subsidy.

Scenario-1

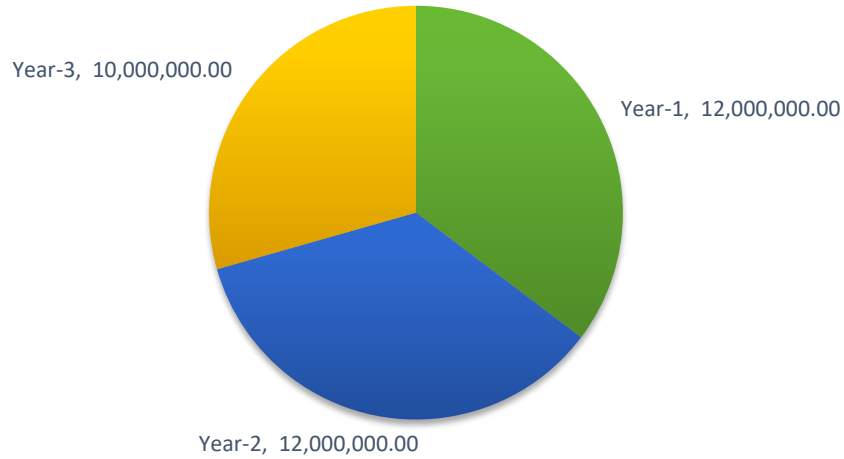


Description	Year-1	Year-2	Year-3
Recovery from Domestic Connections	100%	100%	100%
Recovery from Commercial Connections	100%	100%	100%

If the water charges collection is 100% then the cash flow deficit reduces gradually. The decline in Government subsidy is prominently visible from Year-1 to Year- 3 from 10.5 Million in year-1 to 4.5 Million in Year-3.

Scenario-2

per month subsidy required if Domestic Recovery is 25% & Commercial 50%

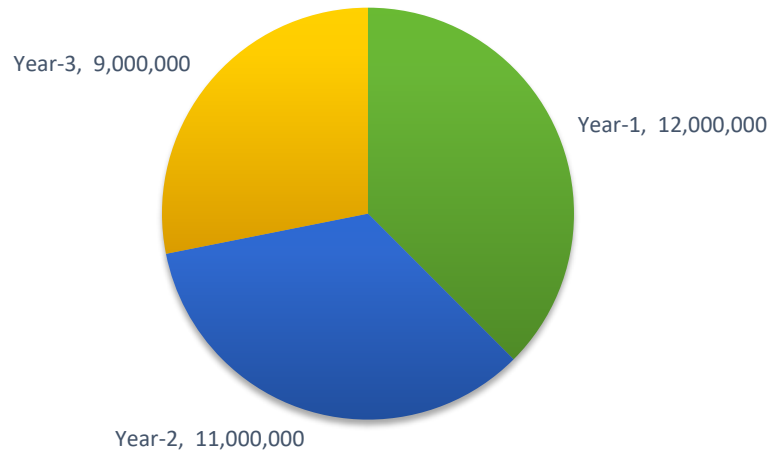


Description	Year-1	Year-2	Year-3
Recovery from Domestic Connections	25%	25%	25%
Recovery from Commercial Connections	50%	50%	50%

As per the collection trend of water charges in other municipal committees in Sindh Province is approx. 25% to 45% for domestic connections and 45% to 65% for commercial connections. If the water charges collection is 25% for domestic connections and 50% for commercial connections then the deficit in cash flow would increase so that the required Government subsidy.

Scenario 3

**Per month subsidy required If Domestic Recovery 25%,35%,45% &
Commercial is 50%, 60%, 70%**



Description	Year-1	Year-2	Year-3
Recovery from Domestic Connections	25%	35%	45%
Recovery from Commercial Connections	50%	60%	70%

If the collection of water charges increases year by year then the deficit of cash flow would reduce gradually. From the third year and so on the required subsidy would be decreasing. The losses would be reduced and dependency on government (Placeholder1)

(n.d.).

grants will be declined in later years.

