Local Government & Community Development Department

Punjab Cities Program

Gap Analysis

of

Municipal Services infrastructure & service delivery

in

Kamoke City

Punjab municipal Development Fund Company

Section-1 City Background

1.1. District Status

The city is the headquarter of Kamoke Tehsil, which is an administrative subdivision of the district Gujranwala and is subdivided into 8 Union Councils. Kamoke city was settled in the era of Akbar. It was declared a tehsil in 1992.

Kamonki is administered by Town Municipal Administration under City District Government Gujranwala. It has Tehsil Civil Courts, its own circle of police, and a tehsil headquarters hospital. Kamoke is known for its rice, which are grown in its surrounding areas. Kamoke is also the largest rice market in the sub-continent where almost all kinds of rice, which include, Basmati, Super Basmati, Karnal etc. are grown, processed and exported to the world.

1.2. Location

It is located on the Grand Trunk Road 21 km from Gujranwala at its south and 46 km from Lahore at its North on N-5 which was originally designated as Gran Trunk Road (GT Road). Kamoki is also located at the main Lahore-Rawalpindi section of Pakistan Railway track

1.3. The Climate

Kamoke has a hot semi-arid climate and changes throughout the year. During summer (June to September), the temperature reaches 36–45 °C. The coldest months are usually November to February, when the temperature can drop to an average of 7 °C. The highest-precipitation months are usually July and August, when the monsoon reaches the Punjab Province. During other months, the average rainfall is about 30 millimeters (0.98 in). The driest months are usually November to April, with little rainfall.

1.4. Demographic status

The population census report of year 2017 has not been published by Government of Pakistan. However the provisional data available for this census shows the population of 249,767 persons for the city within municipal limits. A land scan process was done to estimate the population of entire inhabited areas of city in close approximation which was found to be 314,129 persons in the year 2017 with an annual growth rate of 1.57 and it is expected to rise to 367,176 persons in the year 2027. Some inhabitation has developed outside the municipal limits of the city and the municipal limits need to be extended.

1.5. Data collection

The formats for the data collection about the municipal services were designed and sent to the Municipal Committee. After receipt of these formats, the city was visited to;

1) Verify and correct the data provided by the Municipal Committee.
2) Update the descriptive maps of all the services in consultation with MC staff & Public Health Engineering Department local staff.
3) Identify the required improvements and extension of the municipal services infrastructure.

4) Identification of Public Private Partnership projects already executed.
5) Identify the capacity of the key officers to undertake the PPP projects and collaborative projects with other government agencies and MCs.
6) Public opinion surveys regarding the delivery of municipal services.

1.6. Situation analysis and Gap analysis

Situation analysis of the existing municipal services infrastructure and the quality of service delivery was done. Gap analysis was done to identify the problems, bottlenecks and shortcomings in the infrastructure itself and its operation & maintenance for each municipal service along with the correction/updating of descriptive maps which has been described in the following sections.

Section-2 Water supply system

2.1. Existing situation

The city has contaminated shallow sub soil water which is unfit for human consumption. An irrigation distributary is flowing though the north western region of the city whereas Khori seepage drain is flowing on the north western periphery of the city. A new storm water drain is under construction by Irrigation Department on south eastern periphery of the city to protect the city from flooding.

In respect of water supply system the city is divided into two zones; Zone-I (Eastern Zone) & Zone-2 (Western Zone) divided by Lahore-Rawalpindi GT Road. Deep tubewells have been installed to supply water to the citizen.

Both zones, served, un-served, contaminated and water shortage areas have been marked on the map attached with the report.

2.2 Water source & storage

Tube wells have been installed at different locations of the city to harness the deep underground fresh water. In all 8 tubewells have been installed out of which 5 Nos tubewells have been abandoned due to various factors. Water from the three operational tubewells is directly fed to the distribution system. Only one overhead reservoir is operative in the entire water supply system which is used to feed water to filtration plant.

2.3 Installation of tubewells

Zone-1 (Eastern Zone):

Around 60% of the area of the Eastern Zone is unserved. Rest is served with the very old water supply facility constructed by PHED department in 1981. Three tubewells were initially installed in this zone out of which two tube wells are functional and one has been abandoned. The two functional tubewells are blowing sand and hence require replacement. Two overhead reservoirs constructed in this zone have been abandoned and water is being supplied through direct pumping.

Many areas in this zone have contamination problems which are required to be addresses by detection of the actual causes of contamination and their solution. The possible causes may be the leakages in the distribution system pipelines and leaking consumer connections in the underground.

Zone-2 (Western Zone):

Five tubewells were installed initially to serve this zone out of which 4 tubewells have been closed along with closure of two overhead reservoirs out of total three Nos. Only one tube well is operational near Mohalla Muslim Ganj, which supplies water only to a water filtration through an operational OHR.

As such entire Western Zone is currently unserved. The area was equipped with distribution system in the year 1981 which is damaged because of laying of other services.

In Mohalla Pak town and Mohalla Dehra Gujran, water supply system was provided in 2007-2009 by PHED Department, but these water supply pipe lines have also been

damaged due to laying of the sewerage system subsequently. As such the water supply system in entire western zone (Zone-2) of the city is presently abandoned.

Total tubewells installed in the city along with functional status and source capacity has been given in the table below;

Table-1 Total Source capacity

Zone	No. of tube wells	Capacity each (cusecs)	Total capacity (cusecs)	No of tube wells		Present working hours per day	Daily water production (mgpd)
				in working order	Abandoned		
Zone-1	3	1.0	3.0	2	1	12	0.54
Zone-2	5	1.0	5.0	1	4	12	0.27
Grand total	**8**	**1**	**8**	**3**	**5**	**12**	**0.81**
Present population of the city							314,129
Possible water production per capita per day							2.6

The present source capacity is too meager to fulfill the city demand. A comprehensive water supply system is required to planned and executed for this city.

2.4 Overhead reservoirs

5 Nos. overhead reservoirs are available in the system out of which only one OHR is operative and that too feeds the filtration plant constructed near to the OHR. Remaining 4 Nos. are abandoned due for repairs. AS such no OHR is being used for supply of water to the distribution system. The detail of OHR's is given below:

Zone	Location	Nos.	Capacity each (Gallons)	Operational Status	Type of repairs required
Zone-1	Rasool Nagar road	1	50,000	Abandoned	Major repairs required such as Civil works, rising mains, sluice valves and gauges etc.
	Mandiala road	1	50,000	do	do
Zone-2	Mohalla Mubarak pura	1	50,000	do	do
	Girls college	1	100,000	do	working
	Mohalla Dera Gujran	1	100,000	do	Minor repairs needed
	Total	**5**	350,000		

2.5 Problems and gaps in the system

The problems, shortcoming and bottlenecks existing in the water supply system are given below;

2.5.1 Abandoned areas:

Water supply in entire western zone (Zone-2) of the city has been completely abandoned. The detail of the parts of the city where these systems have been abandoned is given below;

1- Mohallah Dera Gujran	2- Mohallah Pak Town	3- Mohallah Islamabad
4- Sattelite Town	5- Mohallah Sardar abad	6- Mohallah Aziz Pura
7- Mohallah Purani abadi	8- Mohallah Mohammad pura	9- Mohallah Faiz e Madina
10- Mohallah Daulat pura	11- Mohallah Virk pura	12- Mohallah Faiz town
13- Mohallah Bilal park	14- Mohallah Akbar town	15- Mohallah Mubarik pura

2.5.2 Un-served areas: (shown in pink color in the map)

Under mentioned areas of the city have still not been provided with the facility of water supply.

1- Model town	2- Mohallah Noor Islam	3- Mohallah Mehboob Nagar
4- Mohallah Olakh abad	5- Kot Rafique	6- Mohallah Karman wala
7- Mohallah Tibba Mohammad Nagar	8- Gulshan Chowk Area	9- Mohallah Darbarian Khoo
10- Madina Town	11- Dilawar Colony	12- Sadiq Colony
13- Mohallah Sharif pura	14- Fiaz Town	15- Mohallah Karachi
16- Mohallah Darvesh pura	17- Mohallah Habib pura	18- Muhallah Dera Baba Jani

2.5.3 Contaminated water zones:

The areas given below are being supplied with contaminated water and required steps to eliminate the contamination of water are required to be taken up.

1- Ghulam abad	2- Raza abad	3- Salamat pura
4- Mohallah Ghalla Mandi	5- Mohallah Haidri	6- Mohallah Hajveri
7- Mandiala road area		

Causes of contamination

- Main source of contamination is old and substandard consumer connections because of rusted and perforated GI service pipe resulting in ex-filtration and infiltration. Substandard saddles used in the consumer connections are also causes ultimate water contamination.
- Old and rusted main pipes are also leaking and producing contamination in the system. These pipes need replacement.

- The sluice valve chambers are filled with dirt and water and are one of the main sources of water contamination. This is due to non-packing of the valves stuffing boxes which is part of a routine maintenance.
- Non-cleaning and non-disinfection of the reservoirs develop bacteria and ultimately contaminate the system.
- Unfortunately the disinfection of the water is not regular. Either it is done in intervals or the disinfectant quality and dosage are not up to the mark which do not inject required amount of chlorine in the system and the contamination remains in place.

2.6 Water supply hours and consumer connections

Water is being supplied to the city in only in Zone-1 in the below given timings.

Water Supply hours				Consumer connections			
Morning	**Midday**	**Evening**	**Total**	**Domestic**	**Commercial**	**Industrial**	**Total**
4	2	4	10	1576	Nil	Nil	1576

In Zone-I and the water shortage prevails at remote ends of the distribution system because of closure of one tubewell and unequal distribution of water in the absence of consumer metering.

In Zone-2 entire area is without water except for one functional tubewell which is supplying water to filtration plant only.

2.7 Total coverage of the city

The presently served area of water supply in the city is just 20% wherein the mostly contaminated water is being supplied. Entire rest of the city is without water supply at present.

2.8 Tariff structure

The consumer connections are not metered giving rise to the water wastage near the tubewells and water shortage at the remote ends. The tariff comprises of flat rates not even levied according to the area of houses. The water rates are given below;

Tariff Rates per month		
Domestic	**Com.**	**Ind.**
Rs. 70	Nil	Nil

2.9 Required rehabilitation of the system

Under mentioned components of the existing system need rehabilitation. Component wise details are given below;

2.9.1 Tube wells

a) Replacement of tubewells &b pumping machinery

In Zone-1 (Eastern zone) 3 Nos tubewells were installed in 1981 out of which one tubewell was closed because of sand blowing at Mandiala road water works. One more tubewell in Rasoolnagar road water works has reduced the discharge and is

also pumping sand and will be closed soon. This zone is facing acute water shortage. Energy Audit report recommends the replacement of two tubewells: one at Girls College Road and another is Rasool Nagar water works. MC staff was consulted in this behalf and their contention is that the tubewell at Girls College road is supplying water to one filtration plant only and they intend to install a smaller tubewell for the filtration plant out of their own sources whereas in view of the acute water shortage in the eastern zone, they want to replace the tubewell already abandoned at Mandiala road. This will improve the system pressure. Hence two tubewells in this zone will be replaced.

In Zone-2 only one tubewell out of five Nos is functional and all of the rest 4 Nos have been abandoned due to sand blowing. The functional tubewell is supplying water to filtration plant only as mentioned above. As reported by the MC staff, the other 4 tubewells will not be replaced because entire distribution system served by these tubewells has been damaged by laying of sewerage system.

As such only 2 tubewells will be replaced presently and for the rest of the city new water supply will have to be designed and executed.

b) Power Factor Improvement

As per energy audit report, the power factor at Mandiala road tubewell, Girrls college road tubewells & Rasoolnagar tubewell is less than 0.9 and hence power factor improvement equipment of 10 KVAR is required to be installed on each tubewell to improve the power factor and eliminate the penalty being paid by MC due to less power factor

2.9.2 Repair / Replacement of Pump Houses:

Due to replacement of two tubewells, new pump house will need to be constructed.

2.9.3 Overhead reservoirs

Major repairs of all overhead reservoirs is required to maintain the adequate terminal pressure and supply of adequate quantity of water to all consumers.

2.9.4 Distribution system:

- Around 60% of the area of the Eastern Zone is unserved & has no distribution system. Rest of the area is served with the outlived pipe lines laid down by PHED department in 1981. Two tube wells are functional in this zone. New water supply including distribution system is required for supply of clean drinking water in this zone.
- All of the Western Zone is currently abandoned and un-served. Only one tube well is operational near Mohalla Muslim Ganj, which only supplies the water to the water filtration plant through OHR. In Mohalla Pak town and Mohalla Dehra Gujran, water supply system was provided in 2007-2009 by PHED Department, but these water supply lines are damaged due to the subsequent laying of the

sewerage system. So due to these circumstances new water supply system is needed in all the Western Zone.

2.9.5 Replacement of Motor Control Units

- Replacement of 01 Nos. Motor Control Units is required at Girls College tubewell because for other two tubewells to be replaced, the new MCUs will be included in the new pumping units

2.9.6 Repairs & replacement of other components

These components include;

- Repair of hypo-chlorinators = 3 Nos.
- Installation of bulk water meters on 3 Nos. tubewells.
- Replacement of underground piping & saddles of approximately 1500 sub-standard consumer connections. The actual number of connections to be replaced will be identified during investigations for the preparation of feasibility report by the planning & design consultants.

2.10 Repair of water filtration plants

4 Nos. water filtration plants are working in the city which require repair of certain important component to supply potable water to the inhabitants of the city.

2.11 Water wastage & Water management

Lot of water wastage is occurring in the water supply system in below given ways;

a) Some consumer connections have no taps.
b) Some consumers keep the taps open in all water supply hours although they do not need water.
c) Most of the overhead tanks of the consumers have no float valve and when their tank is full, the water flows down to the drains continuously during the supply hours.

The water wastage requires excessive water production and high electricity consumption. It is exerting a large pressure on the municipal budget. Large savings in the electricity bills and ultimately the O&M cost, can be affected by reducing the water wastage at the consumer ends. It will save lot of water and water shortage can be addressed by conservation of water being wasted at present. The best and efficient way to save water and reduce O&M cost is the consumer metering.

2.12 Installation of consumer meters.

The only and the effective way of water preservation and reduction of O&M cost is the consumer metering. Hence all the 1576 consumer connections are required to be metered. This will result in equal distribution of water, addressal of water shortage and supply of adequate water at good terminal pressure to all the consumers in the city. The concept of 24/7 water supply can also be practiced if consumer metering is accomplished.

2.13 O&M Charges and revenue recovery

The operation & maintenance charges and the revenue recovery affected during the last five years is given below;

Year	2013-14	2014-15	2015-16	2016-17	2017-18	Total subsidy in five years
O&M charges (million Rs)	9.134	12.29	13.29	8.44	8.452	**51.6**
Revenue recovery (million Rs)	1.37	2.4	0.87	0.89	1.2	**6.73**
Recovery % as compared with O&M exp.	15.0%	19.5%	6.5%	10.5%	14.2%	13.0%
Subsidy injected (million Rs)	7.8	9.9	12.4	7.5	7.3	44.9

The above mentioned data shows a very weak billing and recovery system of the water revenue which is required to be improved by capacity building of the recovery staff and taking the elected representatives in confidence.

2.14 Manpower deployment

Slot	Sanctioned strength	Existing strength	Vacant post	Manpower on daily wages	Total man power deployed
Tube-well operators	3	3	-	-	3
Chowkidars	2	1	1	-	1
Electricians	1	1	-	-	1
Plumbers	2	2	-	-	2
Plumber helpers	1	1	-	-	1
Water Superintendent	1	1	-	-	1
Total	10	9	1	-	9

2.15 Service delivery & recommendations

1. In Eastern Zone water supply is intermittent and total 10 hours per day. The quantity of water being produced presently is not enough even in this areas because of closure on one tubewell.
2. Quite a large area is being supplied with contaminated water due to leaking pipes and substandard consumer connections. Replacement of these pipe lines is required for reduction of water contamination.
3. Entire water supply system in the western zone is abandoned.
4. Most of the city area is un-served due to lack of distribution system. Water supply facility for these areas needs to be planned & implemented.
5. Service piping and saddles of all existing substandard consumer connections in the underground should be replaced by HDPE piping and saddles.
6. Illegal connection should be detected by consumer surveys and regularized.
7. None of the consumer connection is metered and it is proposed to meter all the consumer connections to conserve water, reduce O&M cost, address water shortage and supply of adequate quantity of water to every consumer.

Section-3 Sewerage system

3.1. Existing situation

3.1.1. Coverage

The city has 60% coverage of sewerage system but only the main and branch sewers have been laid and the lateral sewers have not been provided in most of the city. The city is mostly served by the surface drains discharging in main and branch sewers leading to Sharifpura disposal station.

3.1.2. Drainage zones.

The city has been divided in 2 zones with respect to the waste water drainage. Each zone with its coverage is described below;

a) Zone-1

This zone is comprised of areas lying in north western side of the G.T road. The disposal station on the Mari road for this zone has been abandoned due to old machinery and structures. Currently waste water of this zone is being disposed in Khoth seepage drain through two main sewers under gravity.

b) Zone-2

This zone comprises of almost 85% area of the city. The waste water of this zone is currently disposed through 72" main sewer in to Sharifpura disposal station and ultimately in to Ghania seepage/storm water drain. Sewers in some areas are choked and mentioned in blue color which causes flooding as marked on the map. Two main sullage carriers flowing along both sides of G.T road are discharging into 72" dia outfall sewer and need major rehabilitation. Flooding due to storm water also occurs in some areas as marked on the map. Lateral sewers are missing in major portion of the city. Waste water from primary & secondary drains is collected in to branch sewers without gully grating chambers, which causes chocking of sewers.

3.2. Existing pumping / disposal stations

The details of each pumping stations constructed in the city is given below;

Location	Nos of collect. Tanks	Nos of pumps	Discharge each (cusecs)	Total discharge (cusecs)	Motor BHP	Working status	Sullage carrier			Ultimate disposal
							Size (inch)	Length (ft)	Cond.	
Sharifpura disposal station	02	08	8.0	64.0	75	Fair	4'x6'	1500'	Fair	Ghania drain
Mari Road disposal	Abandoned now and waste water from sewers is directly discharged in Ghania storm water drain which may be causing the silting up of sewers.									

3.3. The main issues and problems in the system

The main problems and bottlenecks confronted by the city are given below:

3.3.1. Damaged & surcharging sewers

Some of the sewers have been chocked or damaged and are resulting in surcharging and overflowing of waste water thus damaging public as well as private property. These sewers will require replacement. The detail is given below:

S.N.	From	To	Length in feet	Dia in inches	Problem	Solution
1	Ghausia road	Mughal Chowk	2,000	27”	Chocked	Replacement
2	Mohalla Salamat pura	Railway track	2,000	15”& 12”	Chocked	do
3	Railway track	Sheesh Mehal road	2,000	15”	Chocked	do
4	G.T road	Mohallah Sharif pura	1,500	21”	Chocked	do
5	G.T road	Mohallah Sadiq Colony	1,500	21”	Chocked	do
6	Rajba road	Mari road disposal	6,000	15” & 27”	Chocked	do
7	Durani Chowk	Tolayke Chowk	2,500	15” & 18”	Chocked	do
8	Akbar Town	Mohalla Karachi	5,000	12”	Chocked	do

3.3.2. Areas flooded with waste water

Under mentioned areas of the city are usually subjected to waste water flooding because of sewer surcharging and overflowing.

1- Mohallah Karman wala	2- Salamat pura (partly)	3- Kot Rafique
4- Olakh abad	5- Mehboob Nagar	6- Mohallah Islamabad
7- Mohallah Hajveri	8- Faiz Town	9- Bilal Park
10- Akbar town	11- Mubarikpura	12- Darveshpura
13- Mohallah Karachi		

3.3.3. Areas flooded with storm water

Under mentioned areas of the city in are usually subjected to storm water flooding during rains because of lower elevation and the stagnation period is sometime extended to many days giving unhealthy and problematic living to the inhabitants.

1- Qureshi Chowk area	2- Daulatpura	3- Mohallah Faiz e Madina
4- Purani Abadi	5- Azizpura	6- Mohallah Sardar Abad
7- Ghulam abad		

3.3.4. Problems in the pumping stations

a) Mari Road disposal station

This pumping station has been completely abandoned and the sewers are directly discharging into the Khoth storm water drain which might be silting up these sewers. Complete inventory of the components of this disposal station along with condition of the sewers needs to be prepared after investigation of the sewer conditions. During flood in this storm water drain, backlash of the water occurs which will choke these sewers ultimately. Hence possibility of the rehabilitation of this disposal station needs to be studied and included in the cost estimation.

b) Sharifpura disposal station

This is major pumping station draining almost 85% of the city and was constructed in the year 2009. The capacity of the generating set installed in this station is not enough to take the load of all pumping units installed over here. As such during the load shedding hours the pumping capacity is reduced which creates the sewer surcharging and hence silting up of sewers. Repair of collecting tank & screening chamber is required. Further the approach road to this disposal works in very poor and needs to be constructed.

3.3.5. Power Factor Improvement

As per energy audit report the power factor at Sharifpura Disposal Works on three pumping units is less than 0.9 and hence power factor improvement equipment of 20 KVAR is required to be installed.

3.3.6. Provision of winch machines

1) For de-silting of sewers lines 2 Nos. winch machines are required to eliminate the flooding of sewer line.
2) MC is not desilting the collecting tanks due to which the sewer lines are being choked. Hence 01 No winch machine for the de-silting of collecting tanks will be required to keep the collecting tanks free of silt.
3) Similarly the sullage carrier are being de-silted properly by MC because of dearth of labor and cleaning machinery. These are also responsible for flooding of waste water in the city. Hence at least 01 No back-hoe machine for the de-silting of sullage carriers is required.

3.3.7. Un-served areas

Undermentioned areas of the city have not been provided with sewerage system as yet.

1- Tibaa mohammad Nagar	2- Salamatpura (partly)	3- Mohallah Baba Dera Jani
4- Habibpura	5- Harrad road area	6- Imam Barghah road area

Extension of the facility to the above mentioned un-served areas is needed for serving the entire population of the city.

3.3.8. Provision of gully grating chambers & manhole covers

No gulley grating chambers have been provided at junction of surface drains and the sewers to trap the silt and the floating materials. As such all these materials are flowing into the sewers and are the main reason for chocking the sewers.

The gulley grating chambers to connect the surface drains and storm water with the sewers are required to be provided in the entire sewerage system.

Manhole covers at many places are missing and MC is not attending these complaints because of money constraints. Hence MC will need to replace the missing manhole covers along with some base frames. MC should keep adequate number of manhole covers in stock to replace the covers immediately after these are damaged or sttolen.

3.4. Waste water treatment

Waste water from both zones is either being disposed-off in the Ghania drain or Khoth drain. No treatment facility is available at all discharge points which is polluting the streams and lands. Waste water treatment plants are required be constructed to lower down the BOD level as per National Environmental Quality Standards (NEQS).

3.5. Consumer connections

No consumer sewer/drain connection survey in the city has been conducted by this time. Hence the exact number of connection cannot be estimated at this stage & no drainage fee is being collected from people.

3.6. Tariff structure

All the sewer connections are not being charged by MC Kamoke and the expenditure is being met from other financial resources. The consumers should be charges for the sewer and drain connections by levying user charges.

3.7. Operation & maintenance cost vs revenue recovery

The operation & maintenance cost of the sewerage system for the last five years along with the revenue recovery is given below;

O&M Expenditure vs Revenue Recovery (million Rs) (includes manpower, electricity, repairs/replacement & supplies)						
Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**Total for 5 years**
O&M expenditure	2.1	3.01	2.49	3.8	5.22	16.62
Revenue earned	0	0	0	0	0	0
Subsidy given	2.1	3.01	2.49	3.8	5.22	16.62

3.8. Manpower deployed

The manpower deployed presently for the operation & maintenance of the system is given below against the total regular strength of 8 persons.

Pump operators	2
Baildars	1
Supervisors	1
Sewer men	4
Total	8

The manpower deployed presently is not enough to operate and maintain the system and the sewers cannot be de-silted Additional manpower is required to save the system for chocking.

3.9. Service delivery level

The service delivery is not satisfactory.

- Silting up of the sewers is occurring as mentioned already.
- In 40% of the city area no sewerage facilities have been provided.
- Waste water in the entire sewerage system from surface drains is being discharged into the sewers without gulley grating chambers which is allowing all the silt and the floating materials in the sewers. This forms the main reason for chocking of sewers and flooding of the roads and streets.

3.10. Remedy to the main issues

Interventions described below are required to be implemented for satisfactory operation of the system and provision of facility to the unserved areas;

a) Rehabilitation or replacement of chocked sewers.
b) Establishment of the need for Mari road disposal by close inspection of outfall sewers, their invert levels as compared to the full supply level of the drain and rehabilitation of the disposal works.
c) Provision of additional generating set in Sharifpura disposal works
d) Laying of alternate outfall sewers.
e) Laying the facility in the unserved areas.
f) Construction of waste water treatment plants.

Section-4 Solid waste management

4.1 Existing situation

4.1.1 Available resources

a) Equipment & Machinery

Under mentioned collection and transportation machinery is available with MC to handle the solid waste.

S.N	Equipment/machinery	Total available Nos	In working condition
1	Tractor trolleys	4	4
2	Arm roll truck	2	2
3	5.0 m3 containers	29	13
6	Front blade tractors	1	1
7	Front end loaders	2	2
8	Water bowsers	2	2
9	Mechanical sweepers	2	2
10	Hand carts type-I	120	50

The existing machinery is neither sufficient nor cost effective and efficient giving rise to low efficiency of collection and disposal of the waste and as a result of that MC is facing higher waste management cost as well as complaints regarding the insanitary conditions in the city. Presently 16 communal containers and are needing repairs whereas 70 hand carts need to be either repaired or replace.

Efficient and cost effective machinery is needed to increase the efficiency of collection and disposal of waste for improving the sanitary conditions and lowering down the operational and maintenance costs.

b) Manpower Deployed

The manpower deployed for collection, transportation and disposal of the solid waste is given in the table below. As indicated by MC Officers, this manpower is not sufficient to serve the entire city at the given standards. Actual requirement will be identified after detail design and implementation of the project.

Slot	Sanctioned strength	Existing strength	Vacant post	Manpower on daily wages	Total man power deployed
Sanitary workers	140	136	4	-	136
Vehicle drivers	10	8	2	-	8
Supervisors	6	4	2	-	4
Sanitary inspectors	4	2	2	-	2
Clerks	5	4	1	-	4
Total	165	154	11	-	154

The city has un-satisfactory solid waste management system. Limitations in resources are described as under;

4.2 Disposal of waste

- No landfill site is available for dumping of solid waste. Currently waste is being dumped in a private land near Baroke village on Gunaaoor road 7 km away from Sadoke.
- The waste is being openly dumped without compaction and provision of earth covers which is creating all sort of hazards say; pollution of underground water, vector and vector borne diseases, obnoxious smell and highly insanitary conditions

4.3 Reasons for poor service

a) MC is facing shortage of vehicle drivers and other staff.
b) The equipment and machinery is neither efficient nor adequate to serve the entire city
c) The waste is being openly dumped creating above mentioned hazards.

4.4 Un-served and partially served areas

The entire city is not served with solid waste collection and disposal. 35% area of the city is fully served, 15% is partially served and 50% is un-served as marked on the map. In partially served areas service is rendered intermittently depending upon availability of manpower and transportation machinery. The detail of these areas is given below.

a) Partially served areas

No regular service is rendered in the under mentioned areas. The main complaints are attended by sending the machinery & labor once or twice a week.

1	Sheesh Mehal road	2	Sabzi Mandi road	3	Link Tehsil road
4	Mohallah Darbarian Khoo	5	Madina town (partly)		

b) Unserved areas

Under mentioned areas are still unserved;

1	Kot Rafique	2	Olakh abad	3	Mohallah Karman Wala
4	Tibaa Mohammad Nagar	5	Gulshan chowk	6	Nagina chowk
7	Mughal chowk	8	Model town	9	Pak town
10	Dera Gujran	11	Satellite town	12	Rana Nazir road area
13	Habibpura	14	Mohallah Islamabad	15	Dera Baba Jani
16	Fiaz town	17	Bilal park	18	Akbar town
19	Mubarikpura	20	Dilawar colony	21	Darweshpura
22	Sadiq colony	23	Mohallah Karachi	24	Sharifpura
25	Fiaz town	26	Madina town		

4.5 Solid waste Generation & Disposal

The solid waste management efficiency along with present dumping sites are given below;

Total waste generated per day		Total waste collected (Tons)		% Efficiency of disposal	Name of dumping sites with distance in Km from the city center
Cubic meters	Tons	Cubic meters	Tons		Near Chak Barooke 7 km from Sadoke in the west
250	125	120	60	48%	
Distance from city center (Km)					15 KM
Open dumping= **O** Landfill= **LF**					Open dumping

4.6 Landfill development

Approximate area of 17 acres will be required for the next 10 years for construction of landfills for safe and sanitary disposal of the solid waste of the city. Presently the waste is being dumped in depressions belonging to a private land near Baroke village with an area of 8 acres. MC is trying to procure land near kamoke for landfill. The suitability of the landfill site will be determined after detailed surveys and design of the project by catering the requirement of the environmental standards in vogue in Punjab.

4.7 Vehicle parking Area:

MC has no built-up parking area at present. Vehicles are parked in the Over Head Reservoir (OHR) premises near main G.T road. Land with area of 5 kanals is available near the OHR, which is required to be converted in to proper parking area by construction of parking sheds, vehicle washing and service arrangements, small office and other allied facilities.

4.8 Levying of sanitation fees

No sanitation fee has been levied by MC and the entire expenditure given below is being met from MC's own resources and the PFC share being given by Provincial government.

3 **Solid waste management financials** (million Rs)

Year	2013-14	2014-15	2015-16	2016-17	2017-18
O&M Expenditure	44.56	50.43	50.22	36.33	84.94
Sanitation fee/month per house hold	0	0	0	0	0
Subsidy injected	44.556	50.432	50.22	36.33	84.94

MC will have to levy the sanitation fee to meet the expenditure on solid waste management or at least to lower down the subsidy presently being injected.

4 Service delivery

At the average, the service delivery level is not good with 48% efficiency only. Some portion of the city is either un-served or partially served because of shortage of sanitary staff and machinery & equipment whereas the existing machinery and equipment is inefficient having costly operation and maintenance. No proper landfill site is available. This is creating hazards like obnoxious smell, sub soil water pollution and breeding of vectors causing water borne and vector diseases. Apart from that this is also creating insanitary conditions resulting in frustration in the citizen.

Section-5 Roads

5.1 City Roads Hierarchy

The main roads in the city and emerging from the city have under mentioned hierarchy;

S.No	Name of the road	Owner department
1	Lahore Gujranwala GT road	NHA
2	Mandiala road	Punjab highway
3	Mari Road	do
4	Main Road Kasooke	do
5	All other roads	Municipal Committee

All these roads have been marked on the map of the city in different colors

5.2 Existing situation

Some of the primary roads in MC Kamoke are in good condition & few main roads need rehabilitation. Further many of the secondary roads/streets require rehabilitation. The detail of the problem roads is given below;

Detail of Problem Roads in the city

S.N	Name of road	Ownership	TST, asphalt or concrete pavers	ROW (ft)	Paved width (ft)	Approx. length (Km)	Condition
1	Abdullah road (Lady park phatak to Kassoki road)	MC	Un-paved	18	18	0.6	Poor
2	Sharif pura road (G.T road to Rajba)	MC	PCC	40	20	1.0	Poor
3	Anmol CNG road (G.T road to Disposal station)	MC	Un-paved	26	20	0.4	Poor
4	Neelam cinema road (G.T road to Graveyard road)	MC	PCC	15	13	0.3	Poor
5	Wapda office road (G.T road to Wapda office)	MC	Un-paved	20	20	0.5	Poor
6	Main Pak town road (G.T to Dera Gujran)	MC	TST	25	12	0.75	Poor
7	Rajba to Dera Gujran road	MC	TST	50	36	0.75	Poor
8	Exchange road (G.T road to Old exchange)	MC	TST	40	16	0.4	Poor
9	Masjid Nimra road (G.T road to Railway road)	MC	PCC	40	20	0.5	Poor
10	Iqbal Aziz road (G.T road to Railway station)	MC	TST	40	12	0.5	Poor
11	Bola peer to Neelam cinema raod.	MC	Un-paved	38	26	0.75	Poor
12	Mandiala road to Sabzi mandi	MC	TST	28	20	0.75	Poor
13	Masjid Qualian road	MC	Un-paved	18	14	0.6	Poor
14	New Chajoke road	MC	Un-paved	20	15	0.5	Poor
15	Graveyard road	MC	Un-paved	20	16	0.25	Poor
16	Haidri road	MC	Un-paved	20	16	0.6	Poor
17	Tibba road to Christian colony	MC	TST	20	16	1.0	Poor
18	Graveyard Baharshah to masjid Al-Farooq road.	MC	TST	20	16	0.75	Poor
19	Rajba Road	MC	TST	30	16	6	Poor
20	Dera Baba Jani road	MC	TST	40	30	2	Poor

5.3 Widening & improvement of roads

3 roads in the city need rehabilitation by widening & improvement as enlisted below.

Sr. No	Name of road	ROW	Length	Pavement width	
				Existing	Proposed
		Ft	Km	Ft	Ft
W1	Main Pak town road (G.T to Dera Gujran)	25	0.75	12	25
W2	Exchange road (G.T road to Old exchange)	40	0.4	16	20
W3	Iqbal Aziz road (G.T road to Railway station)	40	0.5	12	20

5.4 Resurfacing of roads

A total of 6 roads in the city need resurfacing, which are enlisted in the table below.

Sr. No	Name of road	ROW	Length	Pavement width
		Ft	Km	Ft
R1	Rajba to Dera Gujran road	50	0.75	36
R2	Mandiala road to Sabzi mandi	28	0.75	20
R3	Tibba road to Christian colony	20	1.0	16
R4	Graveyard Baharshah to masjid Al-Farooq road.	20	0.75	16
R5	Rajba Road	30	6.0	16
R6	Dera Baba Jani road	40	2.0	30

5.5.2 Construction of new roads

Sr. No.	Name of road	ROW	Concrete Pavers	
			Length	Width
		Ft	Km	Ft
C-1	Abdullah road (Lady park phatak to Kassoki road)	18	0.6	18
C-2	Sharif pura road (G.T road to Rajba)	40	1.0	20
C-3	Anmol CNG road (G.T road to Disposal station)	26	0.4	20
C-4	Neelam cinema road (G.T road to Graveyard road)	15	0.3	13
C-5	Wapda office road (G.T road to Wapda office)	20	0.5	20
C-6	Masjid Nimra road (G.T road to Railway road)	40	0.5	20
C-7	Bola peer to Neelam cinema raod.	38	0.75	26

C-8	Masjid Qualian road	18	0.6	14
C-9	New Chajoke road	20	0.5	15
C-10	Graveyard road	20	0.25	16
C-11	Haidri road	20	0.6	16

Section-6 Parks and open spaces

6.1. Existing parks

Kamoke city has three main parks as mentioned below;

S.N.	Name of park	Area in acres	Maintained by
1	Municipal/Lady Park	5.0	Municipal Committee Kamoke
2	Children Park	0.75	do
3	Madni Park	1.0	do

6.1.1 Inventory of existing parks in MC Kamoke

S No	Name of Park	1	2	3
		Municipal/Lady Park	**Children park**	**Madni Park**
1	**Location**	Municipal Park road	Mohallah Pak town	Educator road
2	**Area in acres**	5-Acre	0.75-Acre	1-Acre
3	**Watering & Irrigation**			
a	Tube well	Yes	Yes	Yes
b	Water Supply from municipal system	No	No	No
c	Underground water tank	No	No	No
d	Pumping unit	Yes	Yes	Yes
e	Distribution pipe lines	No	No	No
f	Valves	Yes	Yes	Yes
g	Sprinkler system	No	No	No
4	**Landscaping & Plantation**			
a	Grass beds	Yes	No	No
b	Flower beds	yes	No	No
c	Hedges	No	No	No
d	Plants	Yes	Yes	Yes
5	**Lights**			
a	Poles and masts	Yes	No	Yes
b	Cables	Yes	No	Yes
c	Brackets and lights	No	No	No
d	Bulbs and tubes	Yes	Yes	Yes
e	Control units	Yes	No	No
6	**Structures**			
a	Buildings	Yes	Yes	Yes
b	Fountains & water fall structure	Yes	No	No

c	Walkways	Yes	Yes	Yes
d	Bridges & culverts	No	No	No
e	Boundary wall & gate	Rehab req	Yes	Yes
f	Toilets	Yes	Yes	Yes
g	Lakes & brooks	Yes	No	No
7	**Mechanical equipment**			
a	Pumping units	Goldamatic pump	Goldamatic pump	Yes
b	Swings	Yes	Yes	Yes
c	Children games	No	No	No
d	Fixtures	No	No	No
e	Benches	Yes	Yes	Yes
8	**Sanitation & water supply**			
a	Litter bins	No	No	No
b	Toilet fixtures	Yes	Yes	Yes
c	Sewerage system	No	Yes	Yes
d	Vegetation cuttings & disposal	No	No	No
e	Drinking water	Yes	No	No
f	Water pipes	Yes	Yes	Yes

6.2. Rehabilitation of the existing parks

Some of the facilities in these parks are working in good condition but some of these are in poor condition and need to be rehabilitated. On the other hand some important facilities are missing and need to be provided. The detail of required interventions in these parks are given blow for their upgrading;

S.N.	Name of Park	Area (acres)	Details of rehabilitation and extension of facilities
1	Municipal/ Lady Park	5.0	1) Improvement of lawn watering system. 2) New 1 HP pump required. 3) Rehabilitation of lake 4) Provision of sprinkler lawn watering system. 5) Repair of Fountain. 6) Replacement of park lights by LED lights 7) Replacement of benches 8) Construction of additional toilets. 9) Provision of additional swings and children outdoor games. 10) Provision of canopy. 11) Rehabilitation of main gate. 12) Rehabilitation of boundary wall railing. 13) Rehabilitation of drainage system.

2	Children park	0.75	1) Provision of sprinkler lawn watering system. 2) Replacement of park lights by LED lights. 3) Provision of additional benches. 4) Provision of additional swings and children outdoor games. 5) Provision of additional toilets. 6) Provision of drinking water arrangements.
3	Madni park	1.0	1) Provision of lawn sprinkling system 2) Installation of new park (LED) lights. 3) Provision of additional benches 4) Construction of additional toilets. 5) Provision of additional swings and children outdoor games. 6) Provision of drinking water arrangements.

6.3. Open spaces

No open spaces are available in the city.

6.4. Green Belts

A Park in the shape of green belt has been developed by MC along the lady park road which is required to be rehabilitated.

6.5. Expenditure on Maintenance of Parks

Under mentioned expenditure has been incurred on the upkeep of parks during the last 5 years;

(All figures in million Rs.)

Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**
O&M cost	1.02	1.02	1.01	1.34	1.95
Revenue earned	0	0	0	0	0
Subsidy injected	1.02	1.02	1.01	1.34	1.95

Section-7 Street Light

7.1 **Existing Situation**

Street light facility is available only one road. No proper poles have been installed for street light. MC requires the street lights on major roads and streets.

7.2 **Replacement of luminaries**

Replacement of existing lights by LED's has been proposed on the following roads.

Sr #	Name of road/street	Length (Km)	No. of Luminaries to be replaced	Installation of Photo Electric switch
R1	Lady park road	0.5	26	01
R2	Underpass Road	0.4	14	01

Photoelectric switches are required to be installed for in time switching of the lights.

7.3 **Provisions of new street lights**

The detail of the proposed provision of services is as follows.

Sr #	Name of road/street	Length (Km)
N1	Neelum cinema Road	0.5
N2	Main Bazar road Kamoke	0.4
N3	Imam Barghah road	0.6
N4	Harar road to Baharshah graveyard	0.8
N5	Rasool Nagar road	0.8
N6	Kasoki road	2.0
N7	Tiba Muhammad Nagar road	2.25
N8	Mandiala road to Phatak	0.6
N9	GT road to Chowk Ghausia	0.3
N10	Mari Road	0.7
N11	Tatle Wali road	0.7
N12	Ghalla mandi (exchange road)	0.5
N13	Masjid Nimra road to Neelam Cinema road along G.T road	4.0

7.3 Expenditure on street lights

Under mentioned expenditure on the Operation & Maintenance of the existing street lights has been incurred by MC Kamoke during the last 5 years. This includes the energy cost, manpower, cost of repairs and replacements.

(All figures in million Rs)

Year	2013-14	2014-15	2015-16	2016-17	2017-18
O&M Expenditures	1.66	1.847	1.989	1.67	3.032

The expenditure is quite low as the energy cost is lesser because of energy saver luminaries.

Section-8

Public Private Partnership projects & Collaborative Projects executed by MC

8.1. Planning & Execution of PPP projects

As informed by Chief Officer no project in the Public Private Partnership Mode & Collaborative Mode has ever been executed by the Municipal Committee or defunct TMA Kamoke. As such the key officers and staff have no experience as well as capacity for planning estimation and execution of such projects.

Section-9

Budgetary provisions on development of services infrastructure and O&M Cost

9.1. Development expenditure

The expenditure incurred on the development projects from year 2013-14 to the current financial year & source of financing is given below

(All figures in million Rs)

Description	2013-14	2014-15	2015-16	2016-17	2017-18
Expenditure on Development Projects	38.33	33.32	14.238	12.722	35.67
Source of Financing of Development Projects	Own source revenue	ADP grants	PFC Share	PPP	Others (Specify)
	Own sources & PFC Share				
Expenditure on O&M of services and revenue generated					
Water supply					
Total O&M cost	9.134	12.29	13.29	8.4373	8.452
Revenue earned	1.37	2.4	0.87	0.89	1.2
% revenue earned vs O&M charges	15.0	19.5	6.5	10.5	14.2
Subsidy injected	7.8	9.9	12.4	7.5	7.3
Sewerage/drainage					
Total O&M cost	2.1	3.01	2.49	3.8	5.22
Revenue earned	0	0	0	0	0
% revenue earned vs O&M charges	0	0	0	0	0
Subsidy injected	2.1	3.01	2.49	3.8	5.22
Solid waste management					

O&M cost	44.556	50.432	50.22	36.33	84.94
Revenue earned	0	0	0	0	0
Subsidy injected	44.556	50.432	50.22	36.33	84.94
Parks					
O&M cost	1.02	1.02	1.01	1.34	1.95
Revenue earned	0	0	0	0	0
Subsidy injected	1.02	1.02	1.01	1.34	1.95
Slaughter houses					
O&M cost	0.35	0.45	0.55	0.5	0.6
Revenue earned	0	0	0	0	0
Subsidy injected (-) Income (+)	0.35	0.45	0.55	0.5	0.6
Street Light					
Total Expenditure	1.66	1.847	1.989	1.67	3.032
Revenue earned	The service is not charged.				

Section-10 Manpower deployment & shortage

The manpower deployed by MC Kamoke in various Municipal Services is given below. MC is experiencing manpower shortage in some of the services which is also explained herein.

S.No	Description	Sanctioned Regular strength	Actual Regular deployment	Regular Vacant Slots	Employed on daily basis	Shortage of regular personnel
A	**Office manpower**					
1	Key officers (BPS-17 & above)	10	9	1	0	1
2	Sub engineers	4	4	0	0	0
3	Support staff (BPS-16 & below	69	68	1	0	1
	Total office manpower (A)	83	81	2	0	2
B	**Municipal services**					
1	Water supply	10	9	1	0	1
2	Sewerage	8	8	0	0	0
3	Solid waste management	165	154	11	0	11
4	Parks	9	6	3	0	3
5	Roads	0	0	0	0	0
6	Street lights	6	5	1	0	1
7	Slaughter houses	2	2	0	0	0
	Total municipal services (B)	200	184	16	0	16
	Grand Total (A+B)	283	265	18	0	18

Section-11
Summary public opinion surveys regarding the municipal service delivery

S. No.	Name of Service	Total persons interviewed	Opinion of the persons interviewed				Average consumer opinion
			Poor (Nos)	Fair (Nos)	Good (Nos)	Excellent (Nos)	
1	Water supply quantity	8	4	3	1	0	Poor
2	Water supply quality	8	3	3	2	0	Fair
3	Sewerage	8	6	1	1	0	Poor
4	Drain cleaning	8	4	3	1	0	Poor
5	Street sweeping	8	0	6	2	0	Good
6	Solid waste collection & disposal	8	5	2	1	0	Poor
7	Condition Parks & play grounds	8	4	3	1	0	Poor
8	Slaughter house functioning	8	2	6	0	0	Fair
9	Street light functioning	8	6	2	0	0	Poor
10	General condition of roads	8	3	3	2	0	Good
11	Complaint attending capability	8	3	3	2	0	Good

Survey of Public general view over service delivery

S. No	Name of person interviewed	Muhallah or colony	Water supply		Sewerage	Drain cleaning	Street sweeping	Solid waste collection & disposal	Roads	Parks & play grounds	Slaughter houses	Street light	Complaint addressal
			Quantity	Quality									
1	Ammar virk	Mohallah aziz pura	Fair	poor	Poor	Fair	Fair	poor	Fair	Fair	Fair	Poor	good
2	Anwar Salman	Mohallah ghalla mandi	poor	good	Poor	Fair	Fair	Fair	poor	Fair	poor	Poor	Fair
3	Abdul Ghani	Mohalla ghalla mandi	poor	poor	Poor	Poor	Fair	poor	poor	poor	Fair	Poor	poor
4	Javed Mushtaq	Mohallah virk town	poor	poor	Poor	Poor	Fair	poor	poor	poor	Fair	Poor	Fair
5	M. Haneef	Mohallah karman wala	Fair	Fair	Poor	Poor	Fair	poor	Fair	poor	Fair	Poor	poor
6	Ansar Ali	Mohallah akbar town	poor	Fair	Poor	Poor	Fair	poor	Fair	poor	Fair	Poor	Fair
7	M. Shahid	Mohallah darvesh pura	good	good	Fair	good	good	Fair	good	Fair	Fair	Fair	poor
8	Faheem Khan	Model town	Fair	Fair	good	Fair	good	good	good	good	poor	Fair	good