CHAPTER 5

INFRASTRUCTURE AND SERVICE DELIVERY

The sustainability and quality of life in urban centres is closely linked to the quality and efficiency of physical infrastructures. Accordingly, providing better physical infrastructure assume critical importance.

5.1 PHYSICAL INFRASTRUCTURE

5.1.1 WATER SUPPLY

Sources of water supply

Kali Bein is the main source of surface water available to the town. Kali Bein, which is a tributary of Beas, flows through the LPA area and is being used for irrigation purposes in those villages from which it passes like Kanjli, Sheikhupur, Lodhi Bholana, Jalal Bholana, Rasulpur Chisty and Hussainpur. Kanjli Lake and Wetland are integral part of Kali Bein. The quality and quantity of the water of Kali Bein is not such that it can be used for portable water supply. Thus, no surface water is available for consumption of town population and town is dependent only on ground water as a preferable resource for water supply.

5.1.1.1 Area and Population Coverage

Municipal Council Kapurthala is the first council of Punjab, which provides piped water supply for 24 hours within its territorial jurisdiction. Punjab Water Supply and Sewerage Board do the entire work of laying down water supply network, planning and design in the town. The total area of M.Cl. is 1947 ha, of which 1772 ha (91%) is covered by water supply, while rest 175 ha (9%) is devoid of water supply lines.

Table 29: Aerial coverage of water supply

Item	Area (In ha)	Area (%)
Covered Area	1772	91%
Uncovered area	175	9%
Total Municipal Area	1947	100%

Source: Punjab Water Supply and Sewerage Board Kapurthala

Fig. 19: Old Water Tank near D.C. Residence

Fig. 20: Water Tank near Improvement Trust Office

Despite the fact that Kapurthala has water supply system, still 9% of the area and 5% of the population remains deprived of water supply. The present level of water supply is 140 lpcd as against the prescribed norms of 135 lpcd. Thus, there is enough water supply in case of Kapurthala town at present but needed to be worked out for the future requirements of the residents. (Refer Table 30)

Table 30: Water Supply Scenario in the town

Items	Percentage/Nos.	Remarks
Length of Water Supply Pipes	133 kms	
Population on 31.03.2008	96901	According to Official figures
Population served (MCK)	95%	5% is unserved.
Water Demand per capita per day (Standard)	135 lpcd	As per UDPFI Guidelines
Water Supply per capita per day	140 lpcd	Dividing total consumption by total population
Total No. of Tube Wells	21	At present 16 are working out of which 6 are operated with generator set.
Total No. of OHSR	4	1.82 ML Capacity each
Total average daily water Discharge capacity in MLD	28.60 MLD.	
Total Average Daily Water Consumption	13.53 MLD	After deducting the water unaccounted
Total Average Daily Water Production	19.07 MLD	Through tube wells/canal
Water unaccounted	29.05%	Water loss during transmission

Source: Punjab Water Supply & Sewerage Division No.2, Jalandhar

Looking at the unaccounted water it has been observed that the losses in the network had been placed at 29.5%, which means 30% of the water is lost in the process of distribution. In order to improve the efficiency it will be critical to reduce transmission losses besides creating additional capacity to meet future requirements.

Water Supply in villages of Kapurthala LPA

Looking at LPA in the context of water supply, it has been observed that out of total 41 villages, 12 villages (38% of total village area) are already covered with piped water supply, whereas 29 villages (62% area) are yet to be provided with potable water supply. However, in

these 29 villages, 16 have been approved under Quality Affected Proposed (QAP) Scheme under the World Bank Project. The QAP Scheme also covers Hussainpur Census Town.

Table 31: Water Supply System in Villages/Settlements of LPA

Water Supply Situation	No. of Villages
Covered under Water Supply	12
Approved under Quality Affected Proposed (QAP) Scheme	16
Yet to be provided Water Supply	13
Water Supply under Construction	1

Source: Punjab Water Supply & Sewerage Division No.2, Jalandhar

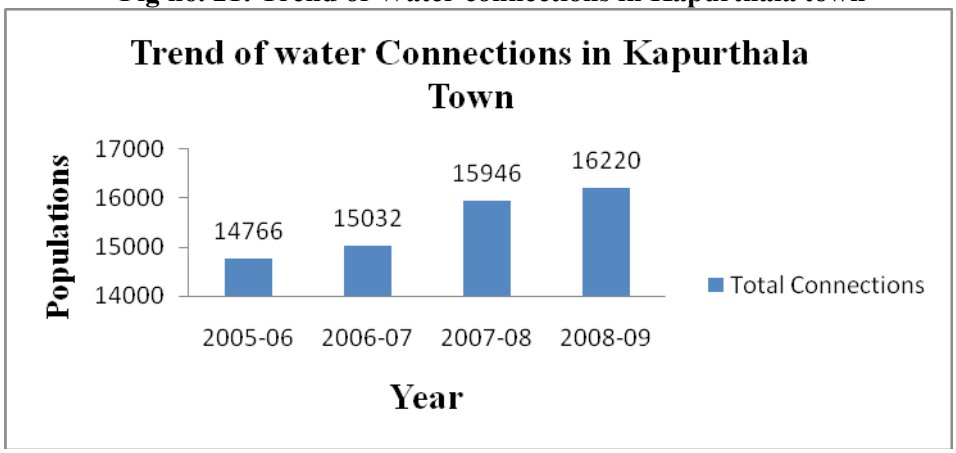
5.1.1.2 Water Sources and Treatment

The main source of water supply in Kapurthala town is ground water and no alternative is being used. There are 21 total number of tube wells in the town, which cater to the water requirements of the residing population (Refer Table. No.30). The average daily water production in the town is 19.07 MLD in comparison to water discharge capacity of tube wells which is 28.60 MLD. The treatment is being done through the system of chlorination, for which chlorination dozer system has been attached with the tubewells for the disinfection of water before supply, however the practice is not as per the standard defined in the BIS {ISI-10500, 1991(clause 3.1)}. There is no water treatment plant that makes the district headquarter poorer on the basis of water quality assessment.

5.1.1.3 Water Connections

Due to rapid increase in population growth, there has been increase in water connections for both domestic and commercial use.

Fig no. 21: Trend of Water connections in Kapurthala town



The trend of water supply connection is on an increase since 2006-2009.In 2007- 08 the water connections are increased to 914 in numbers as compared to 266 increased in 2006-07 and 274 in 2008-09 because of regularization of water supply connections ordered by Punjab Govt. on 12th December 2007.

5.1.1.4 Ongoing Projects /Proposals-

Water supply project covering area between Aman Enclave to DC Chowk, Kapurthala and up to Chandigarh Colony on Nakodar Road has been proposed with an estimate cost of Rs 25 lakhs. The new project is likely to improve the water supply in this town.

5.1.1.5 Key Issues

Considering the rapid growth of Kapurthala town it becomes critical that alternative source of water supply should also be explored so as to minimize dependence on the ground water and to minimize the fast depletion of water table. Appropriate strategies and mechanism needs to be explored including recycling of the waste water by the industry. Mechanism of rain water harvesting should also be encouraged at the household/commercial/institutional/industrial level in order to reduce dependence on the ground water.

- 5% of the population is not covered by water supply network
- 9% of the area is not covered by water supply
- Heavy transmission losses to the tune of 29%.
- Excessive exploitation of ground water.

5.1.2 SEWERAGE

Provision of sewerage facility in the town as well as in LPA is another important area of concern. This is also one of the mandatory functions of Municipal Council. This section deals with the assessment of sewage system, sewage disposal, network, area and population coverage within Kapurthala M.Cl and LPA Villages.

5.1.2.1 Area and Population Coverage

The total area covered by sewerage network in town is 1597 ha and uncovered area is 350 ha. According to Water Supply and Sewerage Board Kapurthala, 82 % of total area of town (2008) is covered with sewerage system and rest 18% of total area is served through septic tanks and independent institutional setup. Total average daily sewage flow in the town is 16.21 MLD (Refer table 33), which is disposed of into Sewerage Treatment Plant (STP) located near the Kushth Ashram in outskirts of the town for treatment. The sewerage water after treatment is released for irrigation purposes to near by areas.

Fig No. 22: Flow of Town's Sewerage Water to Sump

Table 32: Area under Sewerage network coverage

Category	Area (In ha)	Area (%)
Covered Area	1597	82%
Uncovered area	350	18%
Total Municipal Area	1947	100%

Source: Punjab W/S & Sewerage Division. No.2, Kapurthala.

Lack of access to sewerage facility has led to unhygienic conditions in the town area. It further degrades the environment of town and spreads various diseases and effect quality of life. The length of the sewerage network provided is 72.31 kms. Despite the existence of sewerage network, still 18% of the area still remains uncovered besides 35% of the population remains unserved. This population and area primarily depends upon the dry system or system of septic tanks. Out of 16.21 MLD, 15.64 MLD falls under the category of Domestic, Commercial and Institutional, whereas industrial waste accounts for 0.57 MLD. (Refer Table No. 33)

5.1.2.2 Population coverage

Table 33: Sewerage facility

Items	Percentage/Nos.	Remarks
Population served (MCK)	65%	35% is unserved.
Length of the sewerage network in KM	72.31 kms.	
Total waste water Generation in MLD (sewered + Un sewered)	16.21	15.64 (Domestic, Commercial and other Institutions) and Industry is 0.57 MLD.

Source: Punjab W/S & Sewerage Division. No. 2, Kapurthala.

65% of the population is having access to sewerage network, although the area covered is 82%. The sewerage system does not exist in the vllages of LPA. Either there are soak pits built with in individual houses or people use open ground to answer the call of nature.

5.1.2.3 Sewer connections

With increase in population, the number of sewer connections in the town also shows an rapidly increasing trend. However, in 2007-08 Sewer connections has rapidly increase to 73 numbers in comparision to 2006-07 and 2008-09 because of regularization of water supply and Sewerage connections ordered by Punjab Govt. on 12th December 2007.

Table 34: Total Nos of Sewerage connection in Kapurthala town

Year	Total Connections	Increased in Numbers
2006	6940	
2007	6975	35
2008	7048	73
2009	7094	46

Source: Municipal Council Kapurthala

5.1.2.4 Sewerage Treatment/Disposal System

Sewerage generated in Kapurthala is collected through a system of gravity flow due to the availability of sufficient gradient and is disposed off into STP located at Kusht Ashram. In order to treat the sullage collected, a sewerage treatment plant in the western part of the town with a capacity of 25 MLD has been installed. Treated waste is again disposed off into agricultural field and rest into the natural drainage.

5.1.2.5 Ongoing Projects/Proposal

In order to meet the existing shortfall in the area and population coverage to the tune of 18% and 35%, Municipal council has already approved a scheme under Municipal Development Fund scheme for providing the required level of sewerage network. Accordingly, the project costing Rs. 9.42 crores has already been sanctioned for this purpose. (Refer table 35).

Table 35: Sewerage Proposals

Name of the project	Location/Coverage Area	Details
Main Sewer Line Project	Baba Chotay Shah to Puda colony and Sheikhupur to Nawidana mandi.	Cost Estimate –Rs331 Lakh. Laying down of Main Sewer Line
Branch Sewer Line Project	Green Park ,Peer chowdhary, Punjabi Bagh,Satnaam Borian Colony, Sheikhupur	Cost Estimate-Rs120 Lakh Laying down of Branch Sewer

Source: Municipal Council, Kapurthala

5.1.2.6 Key Issues

The key issues involving sewerage system in Kapurthala are:

- 18% of the town area is not covered by the sewerage network.
- 35% of the population is still to be served by the network.
- Mixing of the industrial and domestic/commercial waste thus creates problem to segregate and treat them separately.

5.1.3 STORM WATER DRAINAGE

5.1.3.1 Area and Population Coverage

Kapurthala has the advantage of having general slope of east to west. The Natural storm water drainage is carried out through the system of open drains and nallahs existing in the area. Wadala Drain flowing in the west of the town is used for storm water drainage for the Muncipal area. Wadala Drain ultimately merges with the The Kali Bein.

Fig No. 23: Wadala drain at Kanjli road

Length of the Wadala drain is about 29 km. The drain gives relief to numerous Villages from

water logging in Kapurthala and Kartarpur (Jalandhar) area. Due to the absence of proper drainage network, many places of the town area faces numerous water logging problems during the rainy season like Seenpur, Kottu Chowk (City Thana) and Harnam Nagar (Devi Talab). Due to the existence of open drain system, the water generally overflows due to lack of adequate drainage capacity and blockage of drains due to dumping of plastic and domestic wastes. Kapurthala generally lacks drainage system only within old town, 65% is covered with drainage network constituting 110 Kms length.

Fig. 24: Mixing of plastic and domestic wastes

Fig. 25: Open Drain at Jatpura area.

5.1.3.2 Key Issues

Key issues identified in the area of storm water drainage include:

- Only 65% of the old town area is covered by the drainage network.
- Lack of proper drainage system leading to the flooding of low-lying area during rains.
- Existence of open drainage system allows the mixing of garbage with drain water and thus creating overflow and spillage problem.
- No new proposal.

5.1.4 SOLID WASTE MANAGEMENT

The solid waste management system in the town of Kapurthala lies with Municipal Council Kapurthala. Sanitory inspector of the Council has been vested with the overall responsibility for management of the solid waste .There is only one sanitary inspector in the Council who coordinates the collection and transportation of the solid waste.

5.1.4.1 Generation

According to the data made available by the Municipal Council Kapurthala, the total solid waste generated on daily basis in the town is of the order of 25 tonnes in the year 2008. Which appear realistic w.r.t UDPFI norms of 250 grams per person per day. Out of the total,

80% waste (20 tonnes) is domestic waste and rest 20 % (5 tonnes) waste is from Green sabzi Mandi.

5.1.4.2 Composition

Solid waste comprises of waste generated from different sources. Major sources of generation are individuals, households, industries, trade and commerce, hotels and restaurants, health care institutions including dispensaries, hospital, animals and floating populations in terms of tourists, hawkers etc. Solid waste generated can be broadly classified into four categories i.e. Organic Waste, which includes kitchen waste (food items, leaves etc), Recyclable Waste, which includes paper, plastic, glass, metal, rags, packing materials, twigs, bark etc., Inert Waste including bricks, cement, building debris, furniture waste etc, and Industrial Waste. Construction waste also creates problems for its disposal due to its volume, weight and bulk. Use of plastics has added a new dimension to the composition of solid waste due to its non degradable character. In addition, large amount of hazardous waste is also generated by number of hospitals, Dispensaries and other Health Care Institutions, which are operational in the town.

5.1.4.3 Collection and Segregation

Collection and Transportation

Solid waste is collected from house to house on daily basis between 8 am to 1.30, and again from 2 pm to 5 pm. The municipal staffs collect and remove the garbage from dustbin. The total waste collected is of the order of 25 tons per day in 2008. The entire town is covered under the collection process. Approximately15500 houses are covered during the collection process. Since in a town the waste generated from households cover maximum percentage, which is generally nontoxic in nature and consists of organic and inorganic waste.

Fig. 26: Open dumping near circular road.

Fig. 27: Mixing of Organic and inorganic waste