

Photo 3.21. Different stages of sewage treatment of the plant

3.7. Sewerage Management

Dhaka Water Supply and Sewerage Authority (DWASA) under the Ministry of Local Government and Rural Development (LGRD) is presently responsible for operation and maintenance of the sewerage system and sewage treatment plants, the total sewerage management, and supply of drinking water within the defined area of Dhaka city.

3.7.1 Sewerage System Of Dhaka City

There exists six WASA zones in Dhaka city for this crucial utility service. Zones 1 and 2

mainly cover the southern part of Dhaka (Hazaribagh, Lalbagh, Sutrapur, Motijheel, Shampur), Zone 3 the western side (Dhanmondi and Mohammadpur), Zone 4 the northern part (Kallyanpur, Agargaon and Mirpur), Zone 5 covers partly central and north-east Dhaka (Tejgaon, Gulshan, Baridhara, Uttara) and lastly Zone 6 covers eastern and central parts of Dhaka (Khilgaon, Shabujbag, Ramna) (Figure 3.15). According to WASA, the existing sewerage system holds 49,803 sewer connections, 26 sewage lift stations and 785.82 km long sewers (WASA, 2004). The length of the sewer lines varies in different zones with the maximum in Zone 1 that holds 168 km and minimum in Zone 5 that covers 88 km. The size of the sewer line also varies from 4 inches to 72 inches in diameter. However, the area and the type of current sanitation coverage of Dhaka city is as follows (personal communication and The Daily Star, 13 July 2003).

- Conventional water borne sewerage system (30 %)
- Separate sewerage system (20 %)
- Septic tank (11 %)
- Pit sanitation (18 %)

3.7.2. Sewage Treatment Plant

DWASA operates a sewage treatment plant a Pagla, namely Pagla Sewage Treatment Plant (PSTP) that treats wastewater of millions of people of Dhaka city. The capacity of this treatment plant is only 0.12 million m³, while the total sewage generated by the city, as estimated by DWASA, is about 1.3 million m³. However, the following are the current flagrant concerns that require immediate consideration by the policy makers for environmental sustainability of the city.

3.7.3. Damage of Sewerage System

A recent study by JICA on the sewerage system reveals that Dhaka city sewerage suffer from extreme improper management and operation. Many points of the sewerage network are extensively damaged, for example, the sewerage lines from Tejgaon to Pagla either have leakages or are broken (The Daily Star,

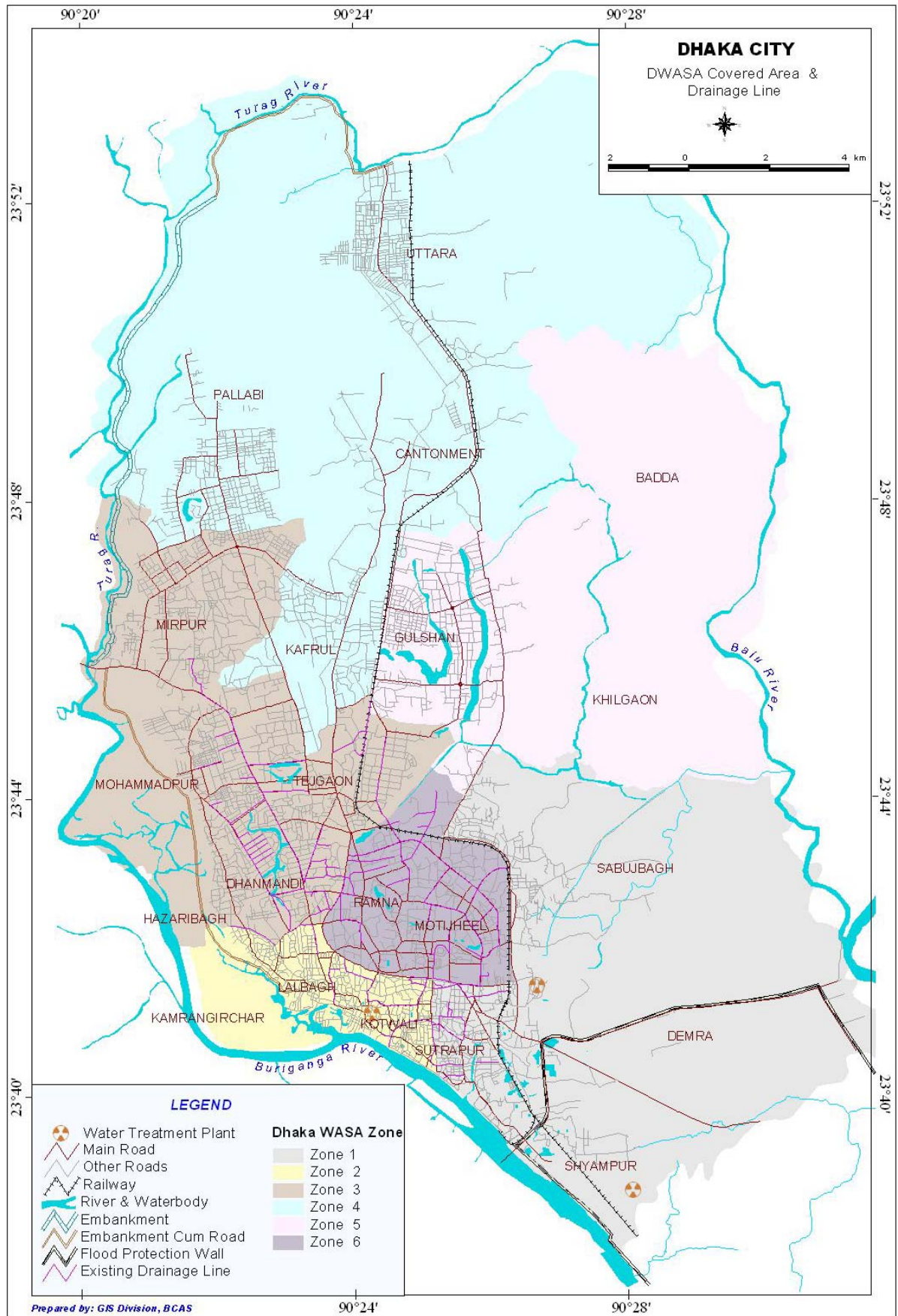


Figure - 3.15. DWASA Coverage Area and Drainage Line



Photo - 3.22. Open manhole in Jatrabari area



Photo - 3.23. Sewage overflow in old Dhaka

13 July 2003). Many areas of Dhaka, particularly the southern part (old city), are home to very unhygienic conditions due to broken and damaged sewerage lines.

Open and lidless manholes (Photo 3.22) are a common phenomenon in most areas of the city. These areas regularly experience overflow of sewerage lines, drains and manholes that makes the surrounding environment unhealthy with bad odor and contamination of air and water (Photo 3.23). WASA has already found microbial contamination of ground water in old Dhaka (WASA, 2003). Also, road transportation and communication become slow and risky due to broken manholes or sewerage lines. Open manholes are also a hazard as there are regular occurrences of people, especially children and older people, falling through the manhole or damaged open sewerage ducts, which sometimes results in death. Moreover, the sewage runoff becomes a nuisance during the flood and in the rainy

season, particularly in the eastern and old parts of Dhaka. The overflow of sewage occurs due to the following reasons.

- Damaged sewerage lines/man-holes (leakage, blocked, broken)
- Ineffective design of existing sewerage system (e.g. gradient of lines)
- Lack of sewerage system rehabilitation
- Inadequate monitoring of sewerage lines and man-holes
- Many pipes are smaller than required in diameter
- Excessive flow of sewage from real estate developments/apartment buildings overloads the system which had not been designed to accommodate the current increased sewage flow
- Lack of proper management and operation of both sewerage system and sewage treatment plant

The abovementioned problems are further compounded by the following:

- Natural disaster (e.g. flood)
- Excessive population
- Management constraints (e.g. financial lacking)
- Lack of transparency and accountability

The government and the international organizations (for example World Bank, Asian Development Bank, Japan International Cooperation Agency) have taken several initiatives for improving the sanitation services in Dhaka city. Messrs McDonald & Partners did the first study on sanitation services of Dhaka city in 1990. The 3rd Dhaka Water Supply Project has repaired some damaged lines and also extended the system (WB, 1996). The World Bank completed a feasibility study on improved sanitation services in South Dhaka in 1996 as part of 4th Dhaka Water Supply Project (Shamsuzzoha, 2002). According to a recent report, WASA has cleared 474 major sewer line blockages out of 479. The report also identified maximum blockages occurring in Zones 1 and 2 (old Dhaka). In fact, the occurrence of damage to

Table 3.28. Sewerage system and sewage scenario of Dhaka city in different year

Year	Sewer line (km)	Sewer connection (Nos.)	Approx. Sewage generation (m ³)	Sewerage system coverage area (%)	Capacity of treatment (m ³)	Actual treatment (m ³)	Lack of proper treatment (m ³)
1998	640	44,000	0.90 million	15	0.12	0.10 million	0.8 million
2003/ June	779	48,777	1.20 million	30	0.12	0.05 million	1.15 million
2004/ June	786	49,707	1.30 million+	30+	0.12	0.05 million	1.25 million

Source: WASA, 2003; WASA, 2004; *The New Age*, 16 April, 2004 and personal communication).

* Estimated

sewerage lines has been gradually increasing in all over the city. So, the sustainability of the city environment in term of sewerage management is under severe threat due to the increasing growth of population (especially low income group), in a limited area and lack of utility service capacity, particularly sanitation.

The government might need a detailed study on the existing sewerage system throughout its servicing area. This study must identify the current sewerage lines gradient and its sustainability, reason of damage, blockage and then look for immediate solutions after rigorous assessment of wastewater-associated problems. There is a significant risk of extensively polluting ground water resources with microbial contaminants from damaged sewerage lines. If it occurs widely then life will be really difficult to continue.

3.7.4. Lack of sewerage service and sewage treatment facility

It is mentioned earlier that over three million people live in about 3007 slums in Dhaka city (Islam, 1996). None of them receive any proper sanitation service from the relevant authority. They construct hanging toilets on low-lying land of on water bodies (for example on lake, river). It has been estimated that less than 5% of the total sewage of Dhaka city is treated in PSTP everyday. A large quantity of the rest remains untreated and gets discharged to the surrounding water bodies, particularly the lakes and river systems in Dhaka. This untreated sewage

disposal may be one of the reasons for the deteriorating water quality of the city, the Buriganga and other surrounding rivers. In fact, the sewage generation is increasing with increase of population growth but sewage treatment capacity or actual treatment at PSTP remains the same. Table 3.28 shows development of sewerage system over time.

In addition, both solid and human waste discharge into the surrounding water bodies is causing the following problems.

- Deterioration of surface water quality
- Loss of fishes and aquatic organisms
- Surface water inappropriate for industrial, commercial, agricultural and domestic use
- Microbial contamination
- Threat to human health
- Reduction in quality of industrial and bakery products

WASA also proposed four sewage treatment plants to provide service to the following areas of Dhaka city (personal communication):

- Extreme north: Tongi
- Northeast: Uttara and Baridhara
- Northwest: DOHS and Mirpur
- Southwest: Kamrangirchar

A recent study of JICA on North Dhaka Sewerage System identified the need of at least 3 sewage treatment plants to treat the existing wastewater generated. The PSTP was recently upgraded and the lift stations were also

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Photo - 3.24. Informal settlements in Dhaka City

rehabilitated with financial support of JICA (WB, 1996). The chronic depletion of ground water level of Dhaka city is bound to make us think of protecting the surrounding areas of surface water bodies, even though the rivers Balu, Buriganga and Turag are already polluted. If the Shitalakkhya also gets polluted, WASA might have to find other sources of surface water, which should be far away from the city.

3.8. Slums and Squatters

Slums and squatters are the informal settlements of Dhaka city that accommodate the low-income group of people. According to a study conducted by Center for Urban Studies (CUS), the total number of slums and squatters in DCC area in 1988 was 1,125 with a population of about 1 million. Another study done by the same organization in 1996 found that the number of slums and squatters have increased to 3007 with 1.5 million population (Islam and Shafi, 2004). Based on an estimation of experts of the Housing and Settlement Directorate and other recent reports, it may be said that the existing slums and squatters of Dhaka city accommodate no less than 3 million people (Siddiqui and others, 2004; Akash & Singha, 2003). This population helps to keep the city alive, by working and supporting various sectors, particularly transport, industry, factory, domestic, utility service, business establishments, small shops, super markets, petty trading, etc. These are the people who take the low level jobs and live in informal settlements under terrible conditions.

The population of this low-income group is still increasing in the city, in spite of the number of limitations in the slums and squatters.

3.8.1. Lack of water supply and sanitation facility

Over 3 million people live in slums and squatters of Dhaka city with very little utility service. Water supply has improved a bit, but sanitation service is still very poor and does not meet the requirements of this huge population. Only 55% of the poor households currently receive tap water (Siddiqui and others, 2004). Another report states that less than 40% of the slum dwellers have access to safe drinking water (Sharmin and Rainer, 1999). On the other hand, none of the slums get proper sewerage services from WASA and only 9% of this population manages to get solid waste management services. As a result, both household waste and human generated wastes go directly or indirectly into the low-lying lands, open spaces or water bodies of the city and causes a number of problems. Moreover, inadequate safe drinking water in slums and squatters causes many problems, which are as follows.

- Unsanitary lifestyle.
- Inadequate access to safe drinking water.
- Increased health risks.

The city authority, NGOs and community participation together cannot meet the required supply of water and sanitation services in the slums due to the following reasons.

- Excessive continuous growth of slum population
- Limitation of resources
- Excessive demand of water within service area.

However, the government, the DCC, and other national and international NGOs are working to provide both water and sanitation facility for this huge number of people living in slums and squatters. The DCC has taken a number of initiatives starting in 1993 to improve the water and sanitary conditions of slums and squatters