

Table 3.15. Concentration of heavy metals in the soil of industrial areas of Dhaka city

Industrial Area	Heavy Metals			
	Cd (mg/kg)	Pb (mg/kg)	Zn (mg/kg)	Cr (mg/kg)
Hazaribagh	1.8	99	477	11,000
Tejgaon	2.6	136	685	--
Standard Limit *	1	50	200	100

Source: Kashem & Singh, 1999; Wien and Jordan, 2000\* European Environmental Agency

### 3.3.2. Soil Pollution

Besides the conversion of land with rapid development and unplanned settlement growth, the city also faces a severe soil contamination in the industrial areas especially in Hazaribagh and Tejgaon. Recently, studies were carried out on the soil quality of different industrial areas of Dhaka city by the Norway Agricultural University (1999) and the Austrian Research Center (2000). Table 3.15 shows their findings.

The analysis of the soil of Tejgaon and Hazaribagh industrial area brings to light severe contamination with heavy metals exceeding the environmental quality standards. Mr. Jordan of the Austrian Research Centre also found the soil of Tejgaon to be acidic with pH 5.7. Moreover, improper solid waste management also causes soil pollution through formation of leachate.

Several studies were conducted in different years to determine soil quality by testing the



Photo - 3.12. Political meeting at Jatrabari using loudspeakers

leachate of landfill sites. Table 3.16 shows the leachate characteristics.

The leachates of abandoned and existing landfill sites were also tested by the Bangladesh University of Engineering and Technology (BUET). The Gabtoli site showed pollution with presence of faecal coliform bacteria and an excess of BOD and COD (Bhuiyan, 1999).

The government does not yet have enough effective initiative for monitoring land and soil quality of the city. However, there is a decision to relocate the tannery industries from Hazaribagh, an area that is now severely polluted with chromium. All the industrial areas should be monitored frequently with enforcement of relevant acts, policies and guidelines.

### 3.4 Noise

Level of noise in Dhaka city is now a major concern for the general people because it has

Table 3.16. Characteristics of Leachate in Landfill Sites of Dhaka city

Parameters	Unit	Range of value found in waste disposal sites	Typical value
pH		4.5-6.0	4.75
Suspended solids	mg/L	3000-14000	10000
Chlorides	mg/L	5000-13000	1400
Phosphate	mg/L	0-15	5
Chemical Oxygen demand	mg/L	5000-17000	14000
Biochemical Oxygen demand	mg/L	5000-15000	9000

Source: Nury, 1998 in Bhuiyan and others, 2002

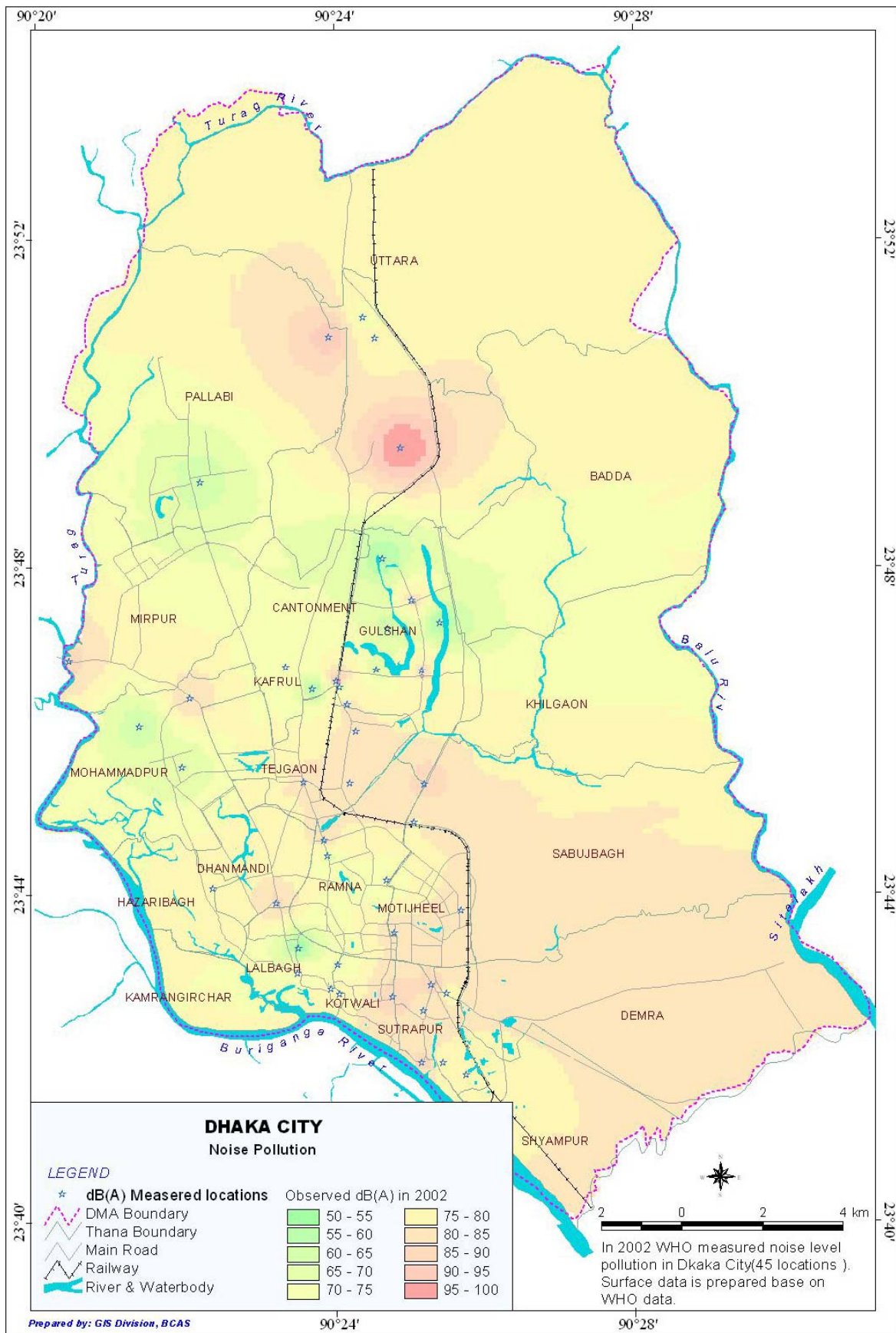


Figure - 3.6. Noise Pollution of Dhaka City

Table 3.17. Noise Level in Silent Zone of Dhaka City

Name of Areas	1999 (dB)	2002 (dB)
I.C.D.D.R.B Hospital	76.5	65.0
Dhaka Medical College Hospital	70.0	70.0
Kakrail Mosque	70.0	70.0
Bangabandhu Sheikh Mujibur Rahman Medical University	68.9	69.0
Shaheen School	67.6	58.0
Titumir College	66.8	66.8
Temple and Church	65.5	85.3
I.P.H. Mosque	60.0	55.0
Dhakeswari Mandir at Bakshi Bazar	53.0	53.0
NIPSOM	50.0	57.0
Standard Limit for Bangladesh	50	50

Source: WHO, 2002

Table 3.18. Noise Level in Residential Areas of Dhaka City

Name of Areas	1999 (dB)	2002 (dB)
Mirpur	79.4	63.0
Shakaripatti	75.5	75.6
Dhaka Cantonment	74.4	73.0
Dhanmondi	67.0	65.0
Banani	61.4	61.4
Mohammadpur	61.0	61.0
Gulshan	56.6	55.0
Standard Limit for Bangladesh	55	55

Source: WHO, 2002

Table 3.19. Noise level in Mixed Areas of Dhaka city

Name of Areas	1999 (dB)	2002 (dB)
Mouchak Round	92.6	80.0
English Road	90.0	90.0
Dhaka Judge's Court	83.7	83.7
Chawk Bazar	77.8	79.0
Shakaripatti	77.5	75.5
Standard Limit for Bangladesh	60	60

Source: WHO, 2002

Table 3.20. Noise level in Commercial Areas of Dhaka City

Name of Areas	1999 (dB)	2002 (dB)
Framgate	90.0	81.0
Rajuk Avenue	87.8	87.8
New market	86.4	86.3
Gulshan	86.3	82.0
Motijheel	82.0	83.0
Standard Limit for Bangladesh	70	70

Source: WHO, 2002

Table 3.21. Noise level in Industrial Areas of Dhaka City

Name of Areas	1999 (dB)	2002 (dB)
Inside of Nabisco, Tejgaon	89.0	85.0
Tejgaon	87.0	84.0
Hazaribagh	80.8	80.0
Standard Limit for Bangladesh	75	75

Source: WHO, 2002

exceeded the tolerance level. According to a recent study conducted by WHO at 45 locations of Dhaka city, most of the traffic points and many of the industrial, residential, commercial, silent and mixed areas are suffering noises exceeding the standard limits of Bangladesh. WHO found noise levels of 70 dB in Dhaka Medical College, 75 dB in Shakhari Patti, 90 dB in English Road, 87.8 dB in Rajuk avenue and 85 dB in Tejgaon, though the standard limit for those area are 50, 55, 60, 70 and 75 dB respectively. WHO has also identified several areas as severe red, moderate red, mild red and green zones in terms of noise pollution in Dhaka city (Figure 3.6). These are mainly due to vehicular horns and movement, loudspeakers from processions and meetings, high volume of audio players from roadside small business enterprises and others (see photo 3.13). Another study was conducted in 1999 in the same areas, which had also showed almost similar findings. The noise scenarios of Dhaka city, in fact, show an extreme threat to human health, especially for elderly people and

Table 3.22. Average noise level for different land use categories in Dhaka City in 1999 and 2002

Location	1999 (dB)	2002 (dB)	Standard Limit for Bangladesh (dB) Day-Time
Silent Area	64.8	64.9	50
Residential Area	70.5	64.9	55
Mix Area	84.3	81.6	60
Commercial Area	86.5	84.0	70
Industrial Area	85.6	83.0	75

Source: WHO, 2002

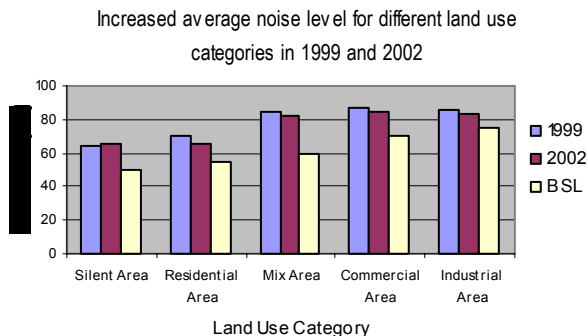


Figure - 3.7. Increased noise level in different areas of Dhaka city

children. Moreover, the traffic personnel, rickshaw pullers, open vehicle drivers, road side workers, small scale business enterprise workers etc are exposed for long-term noise pollution which might cause severe mental and physical health problems. Details of the noise level of different zones of Dhaka city are shown in Table 3.17 to 3.22 and Figure 3.7 indicates the exceeding limits of sound.

However, an average sound level was determined in all the above findings, which is represented in Table 3.22.

Nearly 0.3 million of motor vehicles and over 0.4 millions of non-motorized vehicles are plying the roads and streets of the city. These vehicles on limited road surface cause extreme traffic confesting, especially near the bus terminals and bus stops within the city. Many of the major roads, lanes and by-lanes remain

damaged all year around, which causes collision of vehicles and high levels of noise. Herein follows are the details of noise sources of Dhaka:

### 3.4.1 Vehicular horns

Due to traffic jams on the roads of Dhaka city, most of the vehicles use their horn constantly, which is extremely harmful to human health, especially for children. The World Health Organization (WHO) opines that 60 decibels of sound can make a person deaf (The Daily Bangladesh Observer, 9 April, 2004). The noise level of Dhaka is more or the city have sound level more than the noise quality standard.

The WHO study already identified eight areas in Dhaka city as severe red zones and ten areas as moderate red zone for noise pollution of which Mahakhali, Gabtoli, and Sayedabad bus terminals are on the top for extreme noise pollution. Moreover, due to lack of awareness and inefficiency in driving, many drivers use the horn unnecessarily that increases sound level in the proximity. The practical situation is very severe in the mornings near any primary of secondary school. The drivers constantly blow their horns, which directly expose the students to higher level of sound. Many vehicles with very old engines ply on the city street that sometimes create more noise than the horns. However, proper enforcement of the following policies, acts and guidelines may able to address the noise hazards in the city.

Environment Policy 1992

Environment Conservation Act 1995

Environment Conservation Rules 1997

EIA guidelines for industries to control the noise pollution of the city

Besides the above mentioned policies, acts and rules, recently the government has taken some action to control noise level in the city. Some of these initiatives are as follows.

- Formulation of Noise Control Rules, 2004.
- Banning vehicular hydraulic horns.

- Monitoring mechanism at the main traffic points to determine whether the vehicles follow the orders or not.
- Removal of 4000 nos. of hydraulic horns by the DMP from the vehicles plying on the city street (Hasan, 2003).
- Tejgaon truck terminal would be relocated to a nearby place belonging to the Bangladesh Railway, which might save large parts of Tejgaon and Kawranbazar from severe traffic congestion and hence noise pollution.
- The decision to relocate the Gabtoli, Saidabad, Armanitola and Mohammadpur truck terminals has also been taken which would reduce the noise level in those areas.
- The decision has been made to relocate most of the bus stops, demolish passenger sheds and build new ones at suitable places

### 3.4.2 Industrial Operation

A large number of industries are located in three specific areas, though some are sited in a scattered manner in different parts of the city. Tejgaon and Hazaribagh are the major industrial areas of the city, which are identified as red zone for noise pollution. In fact, all these industrial sites are located very close to the major roads of the city. So throughout the day, transport noise and the noise of industries usually occur together. In Tejgaon industrial area, the sound level was found 87 dB in 1999 and 84 dB in 2002, which shows that the sound level exceeded the standards by more than 10 dB in just 3 years. In Hajaribagh, the noise level was measured to be 80.8 dB in 1999 and 80 dB in 2002; both had exceeded the standards. It has been reported that about 16,000 people work in the Hazaribagh tannery industries with continuous exposure to chemicals and noise (Khan, 2003). Besides the workers, many nearby residents, professionals, school children, and medical patients are also highly exposed to this combined noise effect of industry and transport vehicles. However,



Photo - 3.13. Construction activities



Photo - 3.14. Metal workshop on the street side



Photo - 3.15. Loudspeakers used for selling audiocassettes on the footpath

the industries of the city may be compelled to comply with the above policies and guidelines with a view to reducing the noise level. Enforcement and monitoring on industrial operation is also needed on an emergency basis.

### **3.4.3. Construction and Repair Activities**

The rapid urbanization, economic development and utility management of the city include construction and reconstruction of residential buildings, commercial buildings, roads and highways (Photo 3.13). All these development activities require brick grinding machines, forklifts, metal equipments, generators etc. that create huge amounts of noise during their operation. These activities have tremendously increased in last few years in the city. Besides these, there are a large number of metal workshops on the roadsides, which use metal instruments for cutting and shaping, as necessary. The continuous hammering activities have extreme effect on everyday life and can cause mental disorder in the people living in close proximity of the sound. Such noise should be controlled by enforcing the above rules and policies.

### **3.4.4. Use of Loudspeakers and Microphones**

The most uncomfortable situation for city dwellers arise when the use of loudspeakers in the shops and markets and microphones for political processions, meetings, picnic parties, lottery ticket selling etc goes beyond human tolerance.

Such nuisance and unnecessary use of microphones and loudspeakers are observed mainly in the daytime all over the city, which seriously bother the city dwellers. Students can hardly concentrate in their studies due to the regular blare of microphones in some areas of Dhaka city. Most of the commercial and administrative areas including Motijheel, Farmgate, and Rajuk Avenue have exceeded the standard limit (WHO, 1999 & 2002). Motijheel and Farmgate were identified as red zones in terms of noise pollution due to the loudspeakers used for selling lottery tickets, for political, social, religious and organizational meetings and processions. Such tremendous levels of noises disturb the people in those areas and may also cause mental and physical illness. The health section of the Environment Policy of 1992

strictly states the need for developing healthy environment for urban areas to ensure healthy workplace for workers (BELA, 1996). Upcoming noise rules may be used to address this situation.

### **3.4.5. Vehicular movements on uneven/bumpy road surface**

Much of the city road surface including major roads, link roads, and lanes and by-lanes are not smooth or clean enough for efficient transportation. Moreover, most of the city roads are frequently dug up for construction activities by the different utility services, and in many cases, the reconstruction job of the road is not properly completed. As a result, the road surfaces become uneven, patchy and bumpy, which in turn causes continuous friction with running vehicles. Following are the necessary actions required to overcome the situation:

- Effective coordination between relevant organizations
- Completion of assigned construction or reconstruction of roads activities
- Frequent digging up of roads

Road surface should be smooth and even otherwise it causes noise and accidents too. Continuous bumping on uneven road surface also reduces longevity of the vehicles.

## **3.5 Environmental Health**

Rapid urbanization, economic activities and development as well as population growth in the last decades have changed the physical environment condition of Dhaka, degraded the city environment through over exploitation or utilization, and the mismanagement of its environmental components. The city environment now is far from the ideal due to many factors and issues that primarily originate from human activities and lifestyle. These factors may be psychological (e.g. stress, human relationship etc.), biological (e.g. bacteria, viruses, parasites etc), chemical (e.g. chemicals or chemical compounds, dust etc.), and physical (e.g. noise, climate, workload etc.). There are