

## 1. Introduction

Dhaka, the capital and the most populated city of Bangladesh, is now a member of the “mega-city” family of the world. Dhaka, the fifth largest mega city, comprises Dhaka City Corporation (DCC) and five adjacent municipal areas i.e. Savar, Narayanganj, Gazipur, Kadamrasul and Tongi (Akash and Singha, 2003; BBS, 1991). The area of Dhaka mega city is 1,353 km<sup>2</sup> of which DCC occupies 276 km<sup>2</sup> (BBS, 2001). According to United Nation Population Fund (UNFPA) the total population of Dhaka mega city is now over 12.3 million of which population of DCC is about 8.4 million. According to Bangladesh Bureau of Statistics, population of Dhaka mega city and DCC is about 9.9 millions and 5.3 millions, respectively (BBS, 2001). The population density of DCC is 19,286 per km<sup>2</sup> which is more than double of the mega city average of 7,918 per km<sup>2</sup>.

The city is situated between 23°42' and 23°54' north latitudes and 90°20' and 90°28' east longitudes. It is surrounded by the river Buriganga on the south, Turag on the west, Tongi khal on the north and Balu river on the east (Banglapedia, 2003). The geographical location and administrative units of the city is given in Figure 1.1. The city usually experiences characteristics of tropical monsoon climate with an annual average temperature of 25°C and 2000 mm of average annual rainfall (DOE and IUCN, 2000; Bangla, 2000).

There are a number of service providing organizations. Of them, the key organizations are Dhaka City Corporation (DCC), Dhaka Metropolitan Police (DMP), Dhaka Water and Sewerage Authority (DWASA), Dhaka Electric Supply Authority (DESA), Titas Gas Limited, Bangladesh Telephone and Telegraph Board (BTTB), Rajdhani Unnyan Kortripakhkha (RAJUK), Dhaka Electricity Supply Company (DESCO) and Department of Environment (DoE) serving city dwellers with specific utilities (Siddique *et al.*, 2000). Apart from these, health, education, planning, housing, transportation and other infrastructure related organizations do exist in the city area.

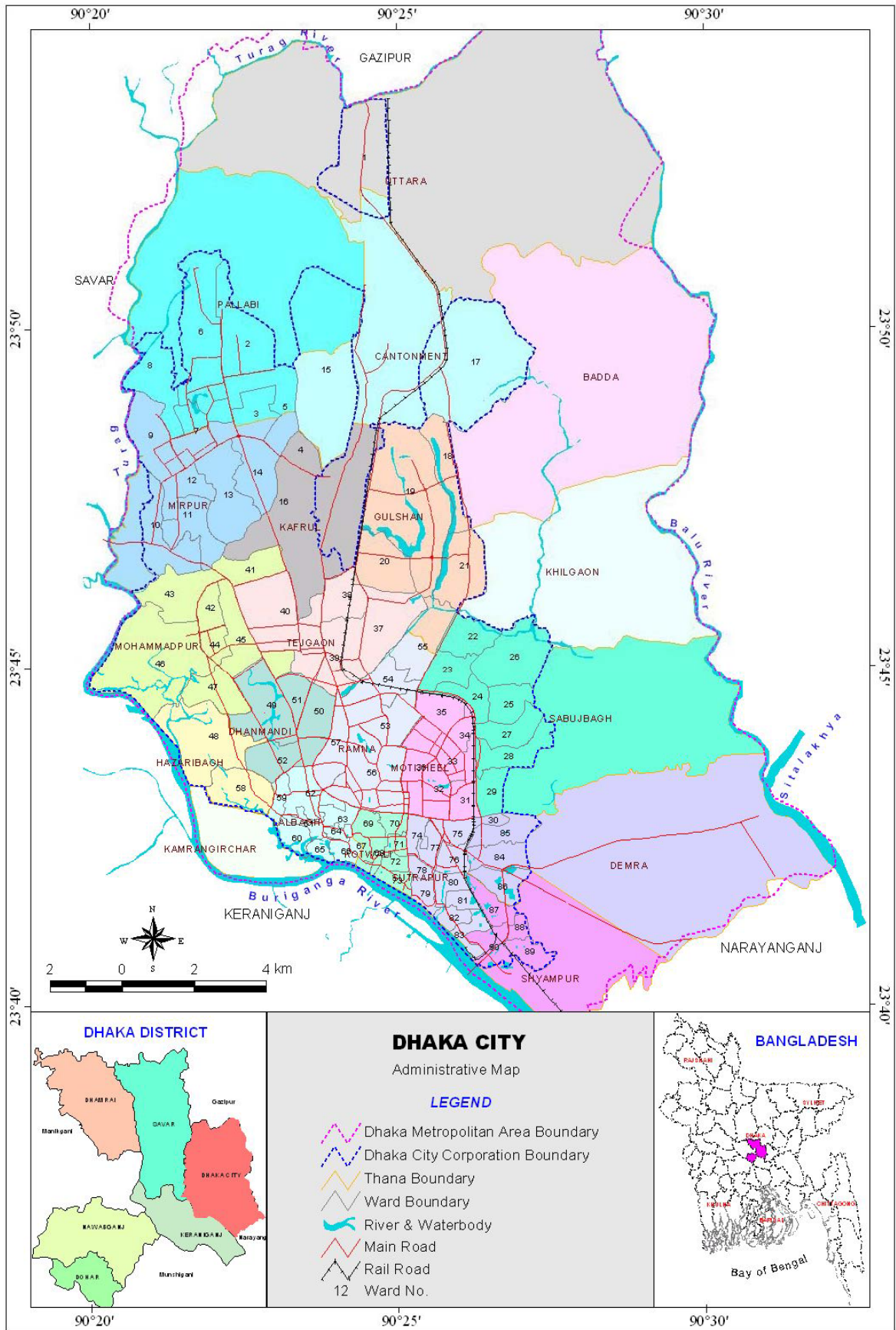
Area under jurisdiction of different authorities serving Dhaka also varies. Dhaka Metropolitan Area (DMA) is somewhat larger than the DCC, and currently holds 21 Police Stations. Dhaka Statistical Metropolitan Area (DSMA), which is considered as Dhaka Mega city. Rajdhani Unnayan Kartripakkha (RAJUK) has a Strategic Planning Zone-wise definition of Dhaka city which is known as Dhaka Metropolitan Development Plan (DMDP). It currently consists of total 26 zones of which 19 may cover Dhaka Statistical Metropolitan Area, though the total area is about 1528 km<sup>2</sup> (DMDP, 1997). Boundary of different authorities, and built up and low-lying areas of Dhaka city given in Figure 1.2a and 1.2b respectively. But it is true that most people think that Dhaka means the municipal corporation and few adjoining developed areas like Mirpur, Uttara, and Baridhara.

Historical sites and nature spots such as the Lalbagh Fort, Ahsan Manzil Museum, Bahadur Shah Park, Curzon Hall, Baldha Garden, Ramna Green, Suhrawardy Uddyan (Garden), National Park, Botanical Garden, Dhaka Zoo, Shaheed Minar, National Museum stand as witnesses to the legacy of Dhaka. Figure 1.3 depicts location of historical places of Dhaka city.

Most of the government and non-government regulatory and administrative headquarters are situated in Dhaka. The advantage of multi-way communication system with all districts, location of primary international business house, trade and commerce play as the primary pull factor.

Rapid and unplanned urbanization, commercial development, along with population pressure have made Dhaka an environmentally polluted city in the world. Concentration of suspended particulate matter, carbon monoxide, nitrogen oxides, sulphur oxides, etc. often exceed the safety standards of Bangladesh. The surrounding river systems have become badly polluted due to chemical and microbial contamination by the industries situated on the banks of the major rivers and untreated sewerage discharge from large part of the city. The groundwater level of the city is

*Dhaka was a city of 2.8 million in 1981, which rapidly increased to 5.3 million in 2001 while physical expansion of city area was negligible.*



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Figure - 1.1. Location and Administrative Units of Dhaka City



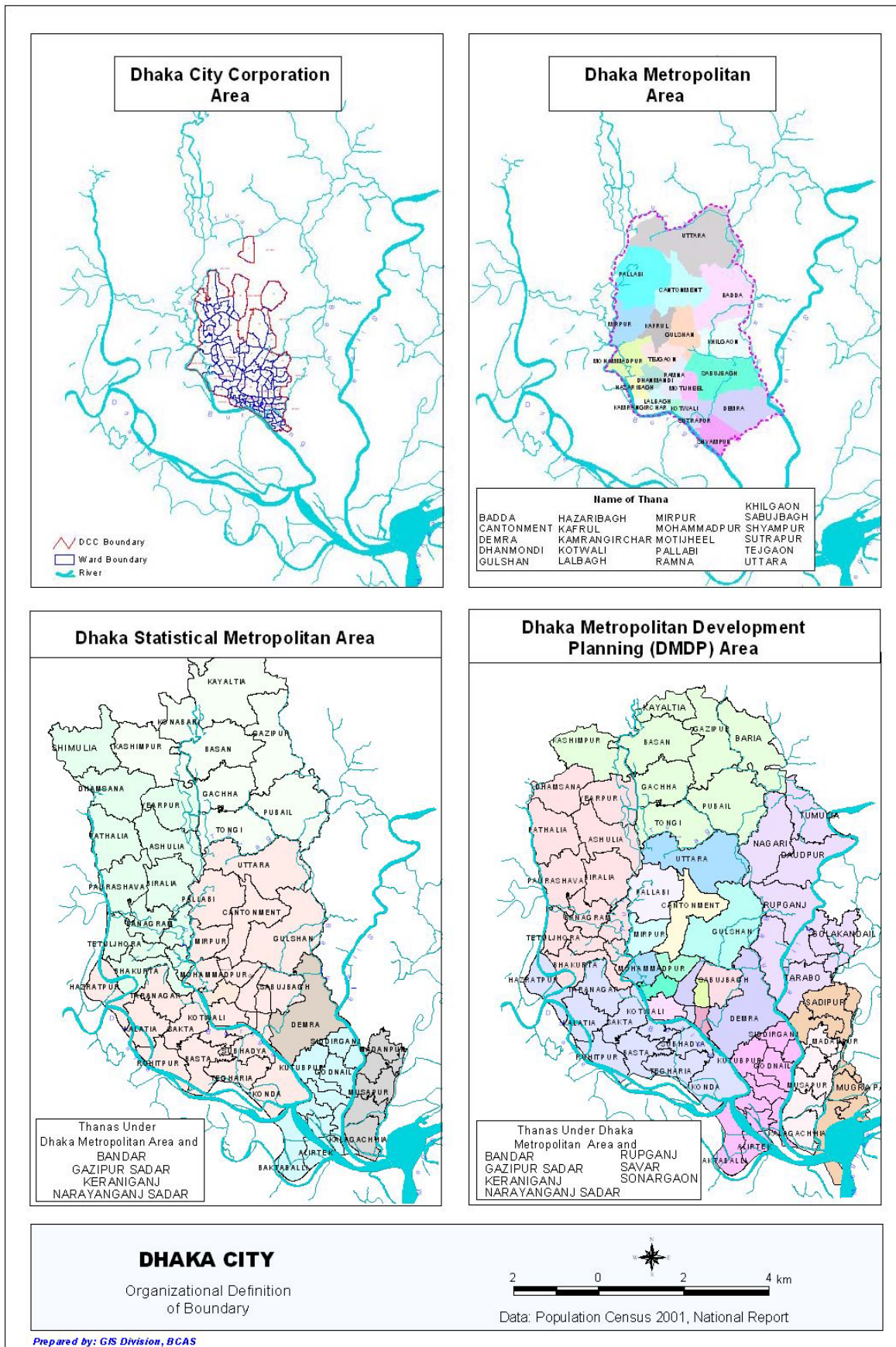


Figure - 1.2a. Area under Jurisdiction of Different Authorities



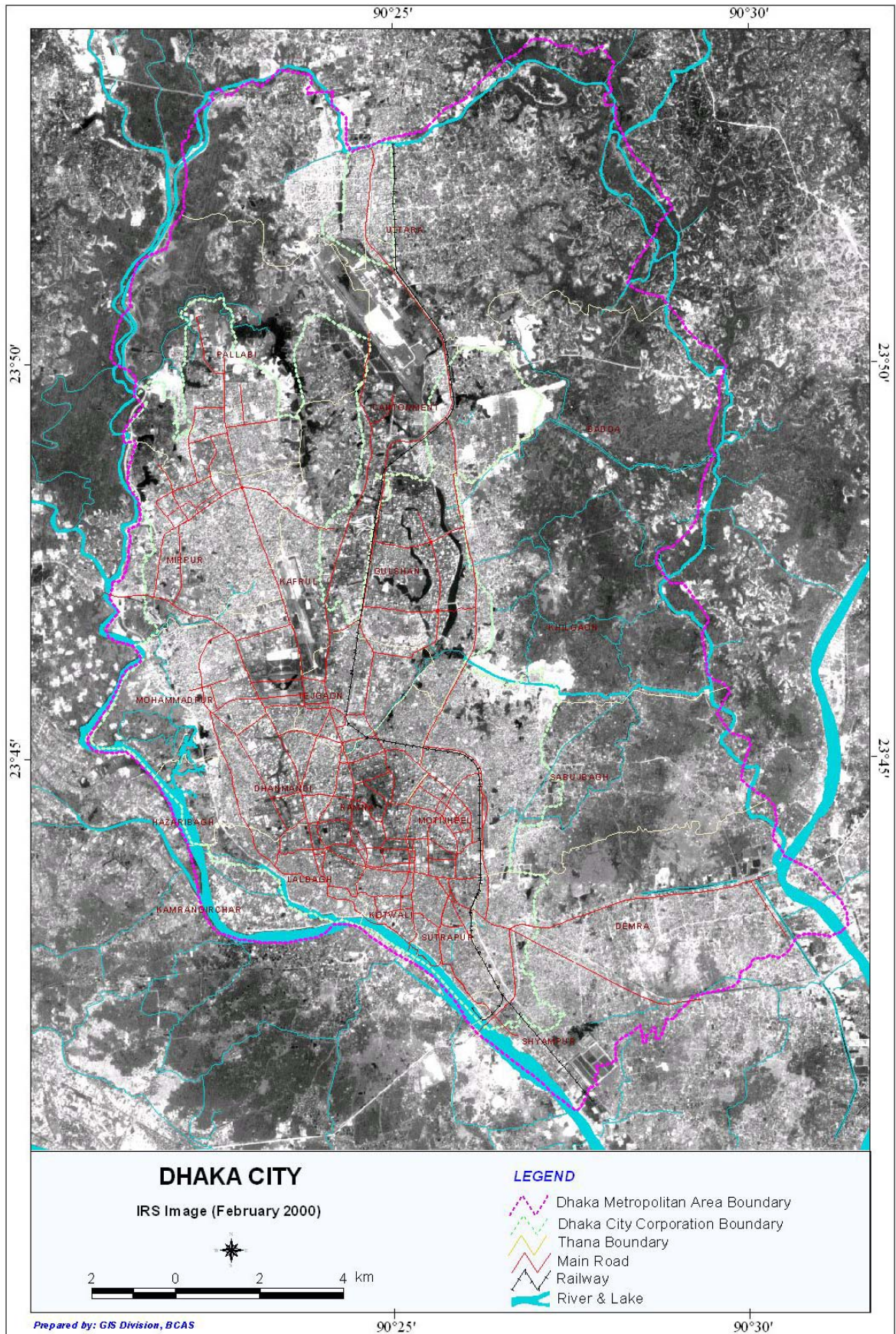


Figure - 1.2b. Built and Low-lying Area of Dhaka



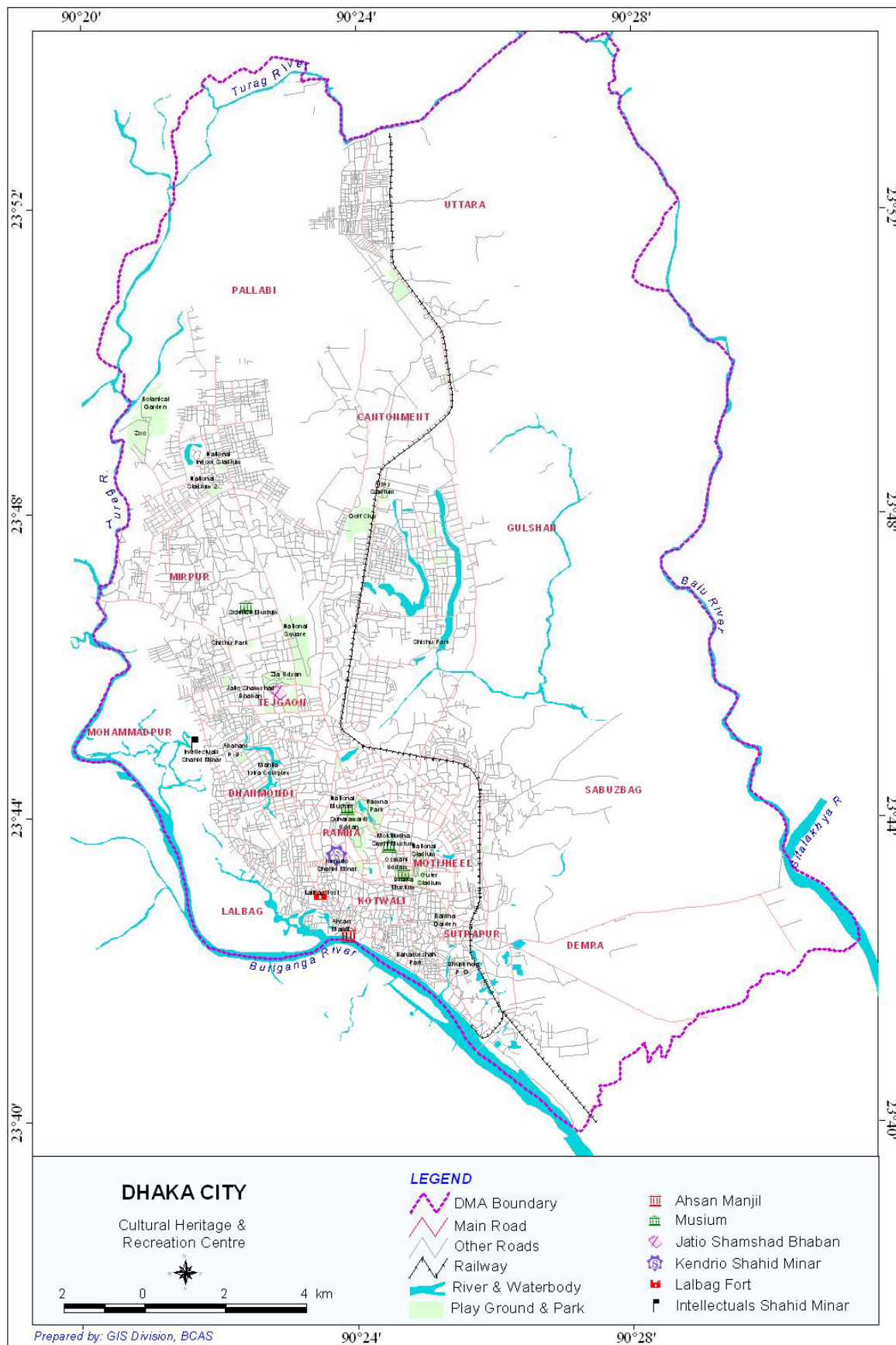


Figure - 1.3. Location of Historical Places of Dhaka City

also being affected with a fall of more than 0.75 meter per year (Hasan, 1996). Many areas of the city are already experiencing higher noise level. Increasing incidences of respiratory infections, asthma, cardiac problems, auditory difficulties, emphysema, pneumonia, diarrhea, and gastrointestinal problems, skin diseases etc. especially in children, testify to the environmental degradation of Dhaka city.

### 1.1 History of Dhaka City

Dhaka carries a very long history dating back from the 7<sup>th</sup> century A.D. to present times. The city actually faced a dramatic historical turn-up from its beginnings as a small city with few people, to the tremendously expanded demographic and topographic structure it is today with distinct spatial and demographic characteristics.

According to available literature and documents, the present city once started with only 1 square mile area and then extended to 2 square mile in the 16<sup>th</sup> century with a population of over 3 thousand (Asaduzzam & Rob, 1997 in DCC, 2004). From the 16<sup>th</sup> century till 1981, the total population increased from 3 thousand to over 2.8 million, with the area extended to 208 km<sup>2</sup> (BBS, 2001). Historically, the development of Dhaka city started from the southern part, that is, the present “old town” (Pre-Mughal period), then the extension continued toward the west and the north (Mughal and British period). During Pakistan period, the development advanced primarily towards the north and it continued rapidly and in an unplanned way towards every side of the city. Figure 1.4 shows changing pattern of Dhaka City and its population and the following section provides a brief on city’s physical development at different stages of its growth.

#### 1.1.1 Pre-Mughal Period (before 1608)

The history of the present Dhaka city before the 16<sup>th</sup> century is obscure, but the available documents represent that some parts of the greater Dhaka was ruled by the Buddhist then the Hindus till around the 13<sup>th</sup> century.

However, Muslims arrived to colonize Dhaka and the nearby areas after 1275. The Turks and the Pathans ruled Dhaka till the arrival of the Mughals (Islam, 1999). At that time, present Dhaka city had an area of only 2 km<sup>2</sup> with a small population as mentioned earlier.

#### 1.1.2 Mughal Period (1608-1764)

The Mughals came to Dhaka in 1606 when Qutubuddin Kokah and Jahangir Kuli Khan were temporary governors under Emperor Jahangir, keeping their headquarters at Akbarnagar (Rajmahal). In 1608, Sheikh Alauddin was permanently appointed as governor of the province with the title of Islam Khan (Bangladesh District Gazetteers, Dacca [Dhaka], 1975). Islam Khan made Dhaka the permanent capital of the province and renamed it as Jahangir Nagar. Road communication from Chawk Bazar to Babu Bazar, and the expansion of the present “old town” to Sadar Ghat were done by Islam Khan from 1606 until his death in 1613. He also constructed a canal beside Tantibazar and Malitola to connect the Buriganga and Dolai khal (BDG, 1993).

After Islam Khan, Ibrahim Khan (1617-1624) took over and built Dhaka as a prime centre of business and trade in South Asia. The Europeans (Portuguese, Dutch, English, French, Armenians and Greeks) took advantage of this opportunity for trade but unfortunately, it did not last due to shifting the capital from Dhaka (Jahangirnagar) to Rajmahal by Shah Shuza (1639-60) in 1640, though Mir Jumla (1660-63) relocated the capital from Rajmahal to Dhaka again. Mir Jumla was well known for his development activities of Dhaka city--the Tongi-Jamalpur and Dhaka-Fatulla connecting roads were constructed during his period (Alam and Huq, 2002).

However, most of the development and settlement of the city took place during the Mughal period (1608-1764). During his reign, the construction of a road from the Buriganga to Tongi (South-North, 22 km) and Dolaikhal to Babupura (East-West) and set up many industries and factories took place (GOB, 1993). Dhaka was then called the “City of 52 bazaars (markets) and 53 lanes”. In

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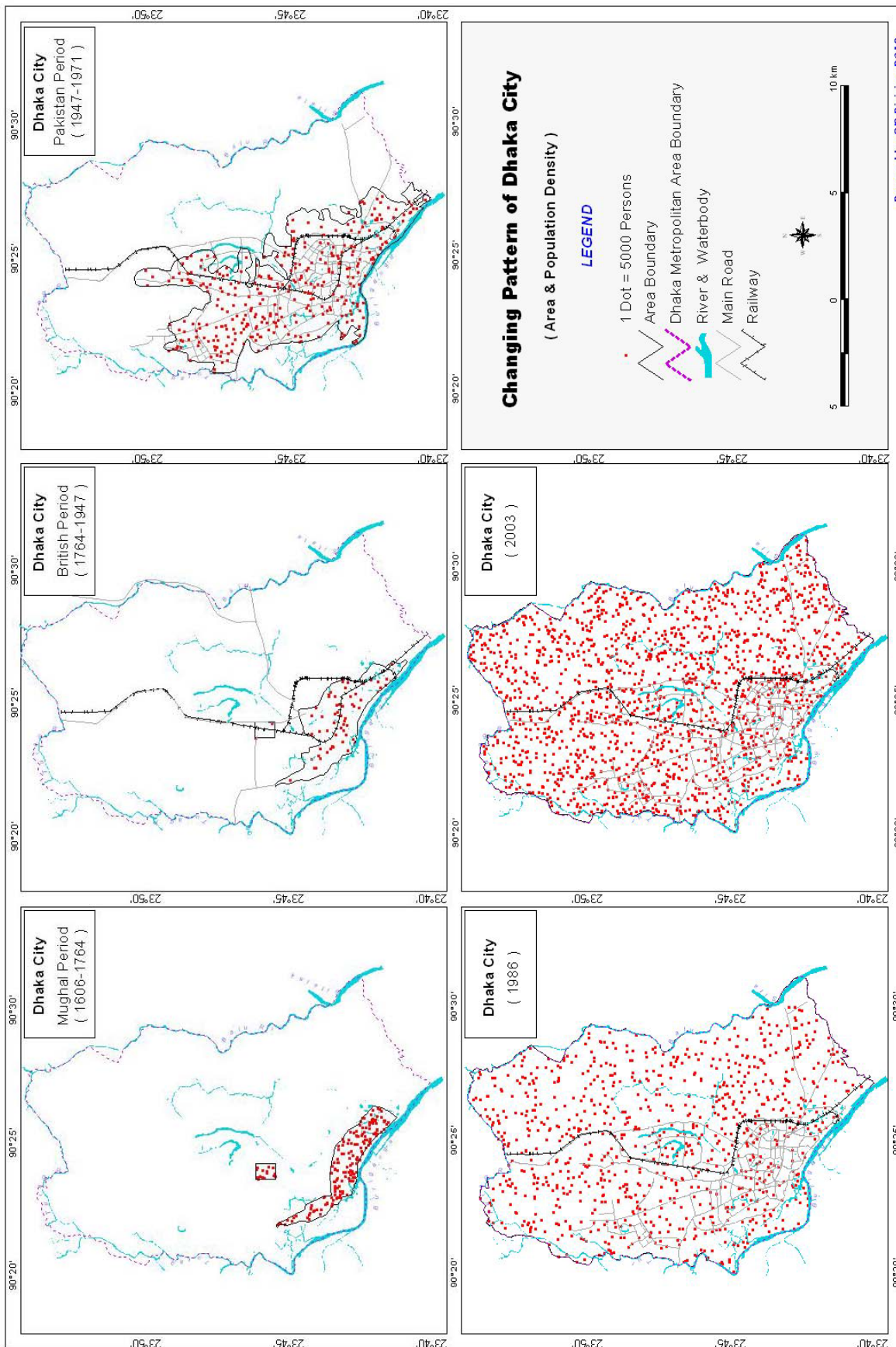


Figure - 1.4. Changing Pattern of Dhaka City and Its Population



comparison with commercial and industrial development in the Mughal period, road communication development was lagging behind. However, in 1717 the capital was again shifted from Dhaka to Rajmahal (Murshidabad), which resulted in a serious declination of demographic and urban structure of Dhaka city (Mamun, 1994). The population of Dhaka city in the Mughal period was 0.9 million living within its 50 km<sup>2</sup> area (DCC, 2004).

### **1.1.3 British Period (1764-1947)**

At the beginning of the British period Dhaka experienced famines, floods, disease epidemics and loss of trade and business etc. that resulted in dramatic decrease in population. The population of Dhaka fell to 0.2 million and the area to 8 km<sup>2</sup> in the 18<sup>th</sup> century due to the adverse situation (DCC, 2004). However, both population and area of Dhaka recovered and started to expand again with housing, transport, utility services and especially due to development of health and educational facilities. The noticeable development in the educational sector included establishment of Dhaka College in 1835, Jagannath College in 1858, Eden College in 1880, Teachers' Training College in 1909, and the Dhaka University in 1921 (Mamun, 1994).

The people of Dhaka started using piped water supply and electricity in 1874 and 1878 respectively, which caused a great change in lifestyle of the city's people. The Dhaka Municipality was established in 1864, when the development of the city advanced from the east to the eastern fringes of Gandaria and towards the west up to Nawabganj. Also, this period saw many changes and rearrangement in the residential patterns and development in Wari, Ramna and Purana Palton areas. Development of railway communication and road transport were also remarkable. Government administrative control was updated, forming two units located at Ramna and near Victoria Park. Then the declaration of capital in 1905 changed the population figure of Dhaka, though it lost administrative control again in 1911. However, the population of Dhaka at the end of British period was nearly

0.3 million within 64.7 km<sup>2</sup> of area (DCC, 2004).

### **1.1.4 Pakistan Period (1947-1971)**

After partition of India in 1947, Dhaka was made the capital of the province of East Pakistan. The new capital then had to face tense situations like communal riots and political crisis over the state language issue that resulted in a substantial decrease of population growth of Dhaka in 1951. However, the rapid development of housing, factory/industry, business and government offices took place in Mohammedpur, Mirpur, Tejagaon, Ramna, Purana Palton, Segun Bagicha and some other adjoining areas during this period. Some of these areas were expanded during this period and many were recognized by Dhaka Improvement Trust (DIT) for development after 1956.

The Dhaka Improvement Trust (DIT) was transformed into Rajdhani Unnayan Kortripakhkha in 1987 (Alam and Huq, 2003). The DIT showed a significant success in the development of Gulshan, Banani, Uttara and Baridhara Model Towns, and in improving the road transport system of Dhaka city. However, most of these model towns became congested due to new housing, commercial development and mixed land use practices. Dhaka actually faced many challenges during the Pakistan period, mostly in the early years, though it neither seriously affected its population growth nor development of different sectors, for example, housing, industry/factory and infrastructure. In 1974, the city population was over 2 millions.

### **1.1.5 Bangladesh Period (1971-Onward)**

Dhaka rearranged itself again as the capital city of Bangladesh after the liberation war in 1971. It accommodates all public and private factories and industries, and commercial establishments. The significant influx and natural growth of population after liberation war made this one of the most populated cities in the world.

In the recent year, the model towns of



Dhanmondi, Uttara, Gulshan, Banani and Baridhara became congested due to mixed and semi-planned development practices. Informal settlements (slums and squatters) were established in the central part of Dhaka. Nearly one-third of the total population of Dhaka basically reside in slum areas and support the city with cheap labour like rickshaw pulling, construction activities, working in workshops and factories, small business and trade, hawking and as household domestic help. Figure 1.5 shows the historical development and growth of Dhaka.

Most of the utility services were expanded or newly developed to support the vast number of city dwellers in last few decades. However, the core authorities of the city are still unable to fulfill the basic requirements like water supply and sanitation, solid waste management, power supply etc. Health and education sectors were also quite developed compared to other periods through the initiatives of both the government and non-government organizations. However, the quality of these services may be questionable.

The major problem faced by Dhaka now is due to unplanned development. The city has lost its capacity provide quality living standard to the city dwellers especially in terms of environmental and health requirements. Dhaka was a city of 2.8 million in 1981, which rapidly increased to 5.3 million in 2001 while expansion of city area was negligible i.e. area increased to 276 km<sup>2</sup> from 208 km<sup>2</sup> in the same period.

## 1.2 Culture, Heritage and Beautification

Dhaka City has quite a few wonderful attractions and outstanding historical places such as the Lalbagh Fort, Ahsan Manzil Museum, Bahadur Shah Park, Curzon Hall, Baldha Garden, Ramna Green, Suhrawardy Uddyan, Botanical Garden, Dhaka Zoo, National Museum and several mosques, lakes and water bodies. These are not only recreational sites, but most of these stand as evidence of the bygone days and colorful history of Dhaka city, and Bangladesh as well.



Photo - 1.1. People Celebrating Pahela Baishak (Bengali New Year)

The city has a wide reputation on the practices of cultural activities. People enjoy the celebration of cultural events such as the Pahela Baishak Carnival (Bengali New Year), Ekushey February (21 February), now observed as World Mother Language Day, open-air poetry sessions, street plays, musical performances, and numerous book fairs. Religious gatherings are also mentionable particularly Eid festival, Durga Puja, Bishya Ejtema, Christmas day.

Dhaka City was once known for its serenity, beautiful parks, clean roads and lush greenery, but the present condition is one of overcrowding, traffic congestion, excessive noise and dirt. The past twenty years have seen an explosion of growth and expansion in Dhaka city due to rural-urban migration, combined with unplanned city development, lack of adequate roads for the increased traffic and congestion caused by numerous high-rise buildings. Another issue of contention is the presence of huge billboards on every street corner and decorating the face of buildings, parks, sidewalks.

The programme “Beautification of Dhaka City” was launched in 2004 ahead of the proposed SAARC Summit of 2005 (Photo 1.2 - 1.4). This beautification work has been carried out under the Prime Minister’s Office with the help of the Dhaka City Corporation (DCC). The government has enlisted the services of 54 private and 17 public organizations to carry out works of

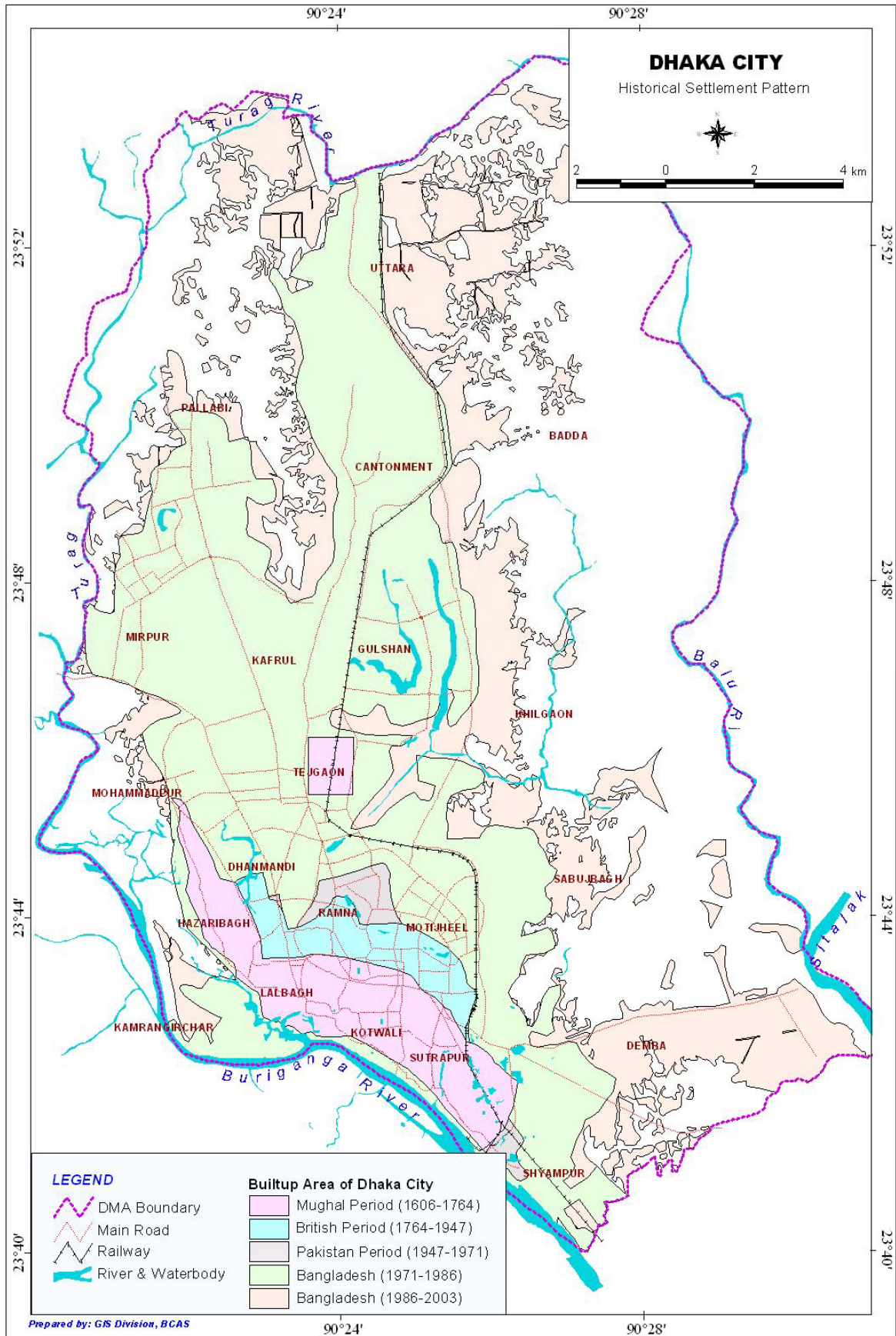


Figure - 1.5. Historical Growth and Development of Dhaka City



beautification in various areas of the city. These 71 organizations and institutions have been allotted 105 different sections of roads and street intersections for beautification and maintenance of these activities until March 2008 (The New Nation, 2004). The organizations are undertaking the beautification work at their own costs without any financial assistance from DCC.

Also in accordance to the theme of the World Environment Day 2005 “Green Cities-Plan for the Planet!” the government has taken the initiative for the beautification and greening of Dhaka city through tree and flower plantation. The Dhaka Urban Transport Project (DUTP) and Dhaka Transport Coordination Board (DTCB), with the support of different organizations, have been given the responsibility to make the city roads beautiful (DOE, 2005). Results of their efforts can be seen along the Airport Road, Sangsad Bhaban and various important intersections and parks.

Beside plantation of trees and flowering shrubs, water fountains and sculptures have been constructed at various intersections/roads of the city, for instance, at Farmgate, on Airport Road, Bijoy Sarani, Zia Uddan etc. Unpaved parts of roads, footpaths and medians were used for the plantation of decorative plants and shrubs. Also waste bins have been provided at almost every street corner to discourage the pedestrians from littering. So far, the beautification drive has made a positive impact on the people of Dhaka but there is skepticism regarding the



Photo - 1.2. Landscaping along the Airport Road

long-term maintenance of these beautification activities.

Other activities have also been undertaken for the betterment of the city and the city dwellers. Computerized/synchronized traffic signals have been placed all over Dhaka City to streamline and facilitate smooth movement of traffic. Also roads have been set aside for



Photo - 1.3 : Decorative Landscape and water fountain on Manik Miah Avenue, Dhaka



Photo - 1.4. Fountain at Hotel Sonargaon intersection in Panthapath

non-motorized vehicles in order to minimize congestion.

The living conditions in Dhaka city has improved considerably despite the high density of people. Both private and government organizations have to be given credit for their role in the beautification of the city. The past year has heralded a new look for Dhaka city which is now more aesthetically agreeable and environmentally sound. More efforts, activities and basic awareness programs can convert Dhaka from an urban jungle to a garden city once again.

### **1.3 Evolution of State of the Environment Report**

In 1969, the United States of America initiated reporting on the state of the environment (GEO, 2002). This initiative was broadly adopted as a global programme of action at the Stockholm Conference on the Human Environment in 1972. Initially, the state of environment reporting was on biophysical environment e.g. land, freshwater, wildlife etc. But over the years, the process has been developed in an integrated manner to highlight interactions between human and environment. A framework (PSR-pressure-state-response) had been developed in the early days and later, it has also been updated to a new format (DPSIR-driving forces-pressure-state-impact-response) to connect the causes (driving forces and pressures) to environmental consequences (state) to actions (policies and decisions). In 1999, the United Nations Environment Programme (UNEP) has initiated the preparation of national and regional level state of environment report.

The Government of Bangladesh in collaboration with Bangladesh Centre for Advanced Studies (BCAS), the South Asian Cooperative Environment Programme (SACEP), United Nations Environment Programme (UNEP) and Norwegian Agency for Development and Cooperation (NORAD) prepared the Bangladesh State of Environment Report in 2001. A number of environmental issues have been identified as points of national concern. The report has emphasized the

deterioration of urban environmental quality particularly Dhaka among other cities of Bangladesh. As a follow up activity of Bangladesh State of Environment Report: 2001, Dhaka city has been considered for detailing its situation using Integrated Environmental Assessment (IEA) framework and reporting with the title of “Dhaka City State of Environment Report: 2005”.

#### **1.3.1 Background and Objective**

The updated information on the environmental condition is important in the decision-making process for sustainable development. The collection and assessment of this information on a regular basis is also essential. In order to assess and evaluate the issues related to environment, there is an absolute need for a strong information base on all aspects of natural resources and ecosystem, which are to be systematically collected from decentralized multi-sectoral environmental agencies/institutions, analyzed, and presented in a timely manner.

This initiative of preparing Dhaka City State of Environment Report: 2005 is a component of a global programme on building capacities undertaken by the Division of Early Warning and Assessment (DEWA) at UNEP. It will provide a mechanism to transfer the experience and knowledge gained by UNEP through the global GEO process to regional, sub-regional, national, local governments and organizations in developing countries involved in assessment and reporting. By facilitating more widespread adoption of the GEO approach, the project will also increase the compatibility of reporting and assessment processes and products.

The aim of this initiative was to provide capacity building on integrated environmental assessment using specially developed training tools for preparation of the City State of the Environment (SoE) report. The project strengthen the capacity of different government and non-government agencies through provided training and establishing a network. This helped information sharing, data processing, modeling and analysis requirements that supported assessment and



preparation of State of the Environment (SoE) Report. The ultimate aim was to improve the basis for decision making in the handling of important/emerging environment problems towards sustainable development.

### 1.3.2 Methodology

Dhaka, the capital city of Bangladesh was selected for assessing existing environmental condition and preparing the State of Environment for assisting informed decision making. Department of Environment, Ministry of Environment and Forest commissioned Bangladesh Centre for Advanced Studies, a leading research organization of Bangladesh, as Collaborating Centre of UNEP to prepare the report with financial support from UNEP.RRC.AP.

International Institute for Sustainable Development (IISD) and the United Nations Environment Programme (UNEP) in collaboration with Ecologistics International Ltd has referred to two models for preparing Integrated Environmental Assessment and State of Environment Reporting. There were nine key environmental priority issues identified for preparing Dhaka City State of Environment Report: 2005. The assessment of these issues was done following both the following models:

- i. **Questioning model** (Figure 1.6): There are four consecutive questions to be answered to prepare the state of environment report with an integrated assessment manner.
- ii. **Flow chart model** (Figure 1.7): This model has been referred to as possible ideal process for preparing state of environment report. It includes a number of stages from planning and conceptual development to product dissemination.

### 1.4 Structure of the Report

The Dhaka City State of Environment report has been prepared based on the above methodology and format, and is composed of four sections with a number of sub-sections. The sections of the report are as follows:

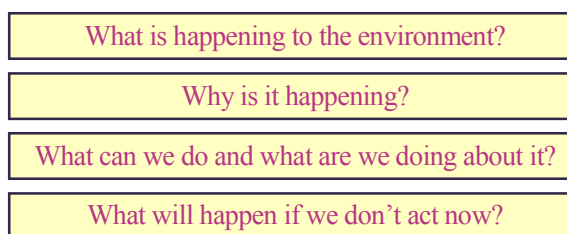


Figure - 1.6. Steps in the integrated environmental reporting process (Printer et al., 2000)

**Chapter One:** This chapter presents an overview of past and present Dhaka city with historical growth. It also presents summary of the methodology and structure of the report.

**Chapter Two:** Chapter two provides an overview of major environmental resources and socio-economic condition of Dhaka city. This chapter highlights the trend and development in different sectors related to the city environment. The existing environmental management and legislative overview is also included in this chapter.

**Chapter Three:** This chapter includes the key environmental issues and their in-depth description highlighting the driving forces of the problems, impacts and responses of the relevant authority and society to the environmental condition. This chapter indicates the major gaps and offers options for better management and improvement of environment.

**Chapter Four:** Conclusion and recommendations provide possible immediate actions in the arenas of policy, research, and action to combat the situation towards sustainable environmental management and development.

**Appendices:** In addition to the above-mentioned chapters, there are five appendices in this report. Appendix-1 provides acronyms and abbreviations; appendix-2 provides the list of the major sources of data (organization/reports/writer etc.); appendix-3 provides list of participants attended in the IEA/SOE training workshop; appendix-4 provides list of participants attended in the national consultation on draft state of environment report; and appendix-5 provides list of professional reviewers; appendix-6 provides list of editors of the report.

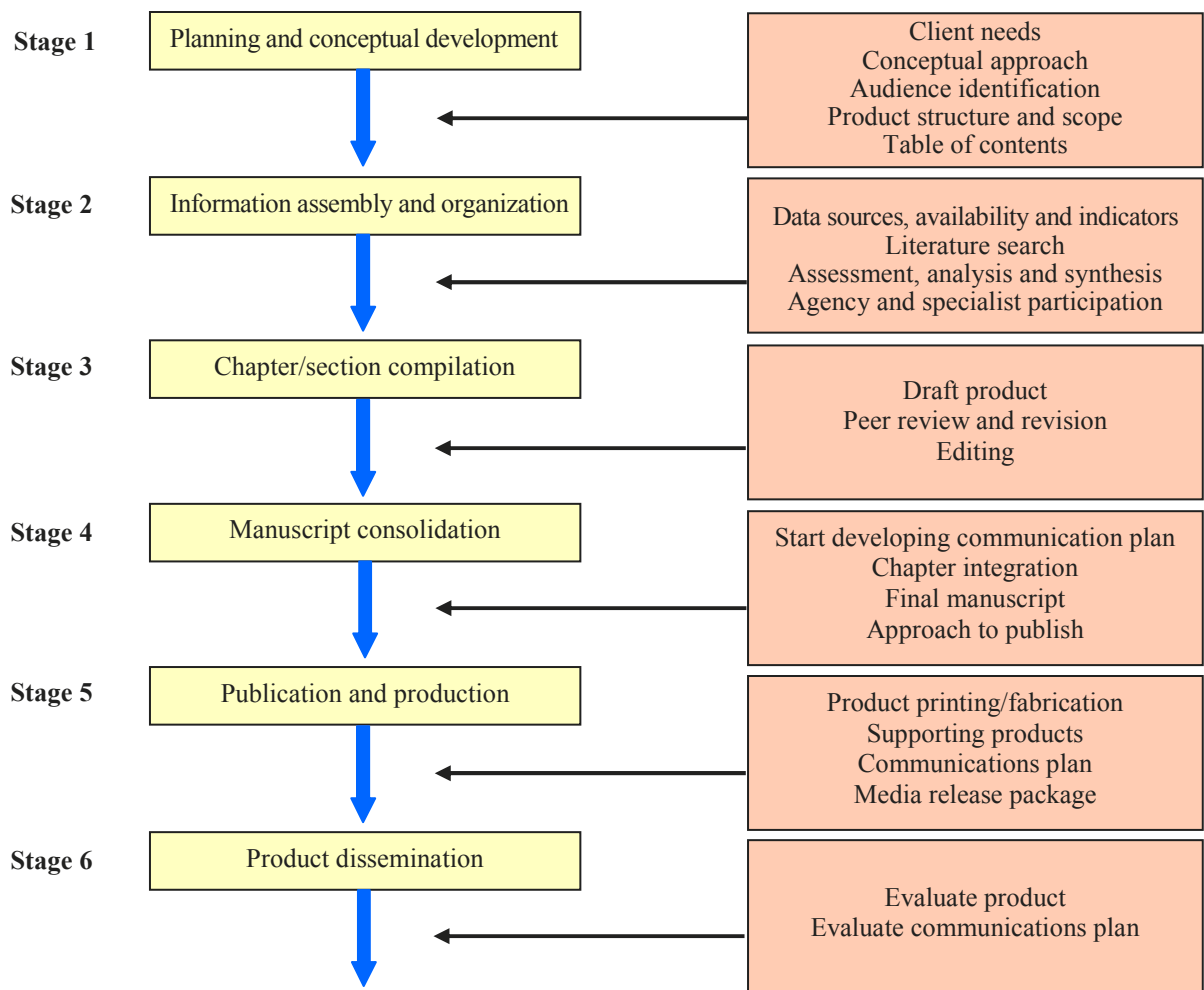


Figure - 1.7. Flow Chart of Different Stage of Methodology

### 1.5 Limitations of the Report

This report has been prepared based on secondary data and information collected from relevant organizations and published reports. Some of the key environmental issues were only supported with updated data. On the other hand, many of the relevant organizations and reports show the different figure of the same data for the same period e.g. solid waste generation, population etc. Therefore, some of the data are incorporated based on assumption. These may lead to certain limitations in the report. The following may be the limitations of the report:

- Different organizations show the different figures for the same issues for the same period.
- Sufficient updated data are not available for all priority issues.
- The data that have been used in this report from different sources may have some inaccuracies. For example, data on air quality of Dhaka city is used from the record of Continuous Air Monitoring Station (CAMS) of Air Quality Management Project (AQMP) but this station may not have covered the whole city. Some of the data have been used from the internet sources (website), which may not be very reliable.
- Though the report is entitled for 2005, some of the data of the priority issues have been used on availability. For example, the air and water issues of this report represent the data of 2005. Photographic documentation also indicates recent record on different issues.
- The issues were prioritized based rather on perception of relevant experts than on any scientific method.