

Segufta Hossain

IMPACTS OF INTERNAL MIGRATION ON URBAN ENVIRONMENT: BANGLADESH PERSPECTIVE

Abstract

Internal migration and rapid urbanization are two intertwined issues. Rapid urbanization accelerates economic and social development activities which gradually affect the environment of the urban areas in negative ways. Bangladesh is also experiencing internal migration induced rapid urbanization throughout the last few decades. Rapid urbanization in Bangladesh is very negatively deteriorating the urban environment of the country. Dhaka being the centre of all administrative and commercial activities attracts more people which instigates rapid urbanization and urban environmental deterioration accelerated with the rapid urbanization. Existing literature mainly focusses on the issue of environment and environmental changes as the causes of internal migration. Impacts of internal migration on the environment of the destination have attracted very little attention. The present research has taken Dhaka city as a case study as it is the prime destination of internal migrants of the country and highlights how internal migration is affecting the environment of the city. The study has found that unplanned rapid urbanization due to internal migration is putting the environment of Dhaka city at high risk. Rapid urbanization has led to the conversion of land use and land cover, the highest level of air pollution, water pollution and encroachment of water bodies, etc. Environmental impacts of Dhaka city may be seen as a natural consequence, but it is grossly related to overpopulation which is created by internal migration. Properly planned urbanization could be beneficial for the environment and, at the same time, sustainable, environment-friendly, planned urbanization could reduce the negative impacts of rapid urbanization on the urban environment.

Keywords: Internal Migration, Rapid Urbanization, Urban Environment, Environmental Impacts, Water Pollution, Air Pollution

1. Introduction

Human migration is the most common phenomenon of recent time which is increasing with the rapid rate of urbanization and affecting all the aspects of human life. According to Louis Writh, “the growth of cities and urbanization of the world is one of the most impressive facts of modern times which brought profound

changes in virtually every phase of social life.”¹ Urbanization creates better job opportunities, new employment, improved infrastructural and technological facilities, improved market potentials, better utility services, etc. These facilities attract people from remote areas and, as a result, they migrate to urban areas. Rapid urbanization is working as pull factor for internal migration in developing countries. Historically, people across the world used to live in communities over the past centuries. Recently, a dramatic shift has taken place to this scenario and mass migration of population from rural areas to urban areas has increased in the last few decades. According to a United Nations (UN) report of 2017, “the current world population of 7.6 billion is expected to become 8.6 billion in 2030, 9.8 billion in 2050 and 11.2 billion in 2100.”² These projections also show a tendency for the population to be concentrated in urban areas, so that by 2000, almost 50 per cent and by 2025 more than 60 per cent will live in cities.³ Bangladesh is also not a different case. For the last few decades, Bangladesh is experiencing rapid urbanization like other developing countries of the world. In Bangladesh, the urban population growth rate has always been higher than the national population growth rate since 1901.⁴

Encyclopaedia Britannica has categorized human migration into several broad categories, first, internal and international migration; and second, voluntary or forced.⁵ Globally, urbanization has seen a rapid upward trend from the last century. As a consequence, urban growth since World War II has been very rapid in much of the world, particularly in developing countries and the dominant trend in internal migration during the 20th century was the movement from rural to urban areas.⁶ The UN has projected the global urban population to rise to 68 per cent of the world’s population by 2050, up from the current value of 55 per cent.⁷

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¹ Louis Writh, “Urbanism as a Way of Life,” *The American Journal of Sociology* XLIV, no. 1 (July 1938): 1-24.

² Department of Economic and Social Affairs, United Nations (Website), *The World Population Prospects: The 2017 Revision*, accessed February 1, 2021, <https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html>.

³ “The World Population Prospects: The 2017 Revision,” Department of Economic and Social Affairs, United Nations.

⁴ Government of Bangladesh, Ministry of Planning, Bangladesh Bureau of Statistics (BBS), Statistics and Informatics Division (SID), *Changing Patterns of Urbanization in Bangladesh: An Analysis of Census Data, Population Monograph of Bangladesh* Vol. 12 (Dhaka: SID, November 2015).

⁵ “Human Migration,” *Encyclopaedia Britannica*, accessed February 1, 2021, <https://www.britannica.com/topic/human-migration>.

⁶ “Human Migration,” *Encyclopaedia Britannica*.

⁷ Yuerong Zhou, Alvin C. G. Varquez and Manabu Kanda, “High-Resolution Global Urban Growth Projection Based on Multiple Applications of The SLEUTH Urban Growth Model,” *Sci Data* 6, no. 34 (2019), <https://doi.org/10.1038/s41597-019-0048-z>.

The rapid growth of internal migration is a common feature in developing countries. Most of the literature highlight on migration as a result of environmental, economic, demographic and social crises. The focus of environment and migration research highlights how the environment and environmental changes instigate migration, but the effects of migration on the environment on destination have got less attention. The environment has been seen as a push factor for internal migration in existing literature. Internal migration covers the whole gamut of migration that takes place within the border such as rural-urban, urban-rural, rural-rural and urban-urban, whereas the present study will focus on the rural-urban migration as internal migration. Existing literature mainly focusses on the issue of environment and environmental changes as one of the causes of internal migration. Impacts of internal migration on the environment of the destination have attracted very less attention from the researchers. Against this backdrop, the main objective of the article is to highlight how internal migration is affecting the environmental components of Dhaka city. The research has taken Dhaka city as a case study since the city is the prime destination of internal migrants of the country. The present study is a qualitative one and data and information are collected basically from secondary literature which include mainly books, journal articles, daily newspapers, published documents of government and non-government organizations, etc. To find out the changes of land use as a result of rapid urbanization, the present study uses satellite imageries⁸ which are collected from the website of the United States Geological Survey (USGS) and land use maps are created from these images to observe the sequential changes. The article is divided into five sections. After the introduction, the second section will highlight on South Asian scenario of internal migration and its impacts on the urban environment, the third section will focus on internal migration issues of Bangladesh and the fourth section will discuss how internal migration is affecting the environment of Dhaka city. The fifth section will conclude the article.

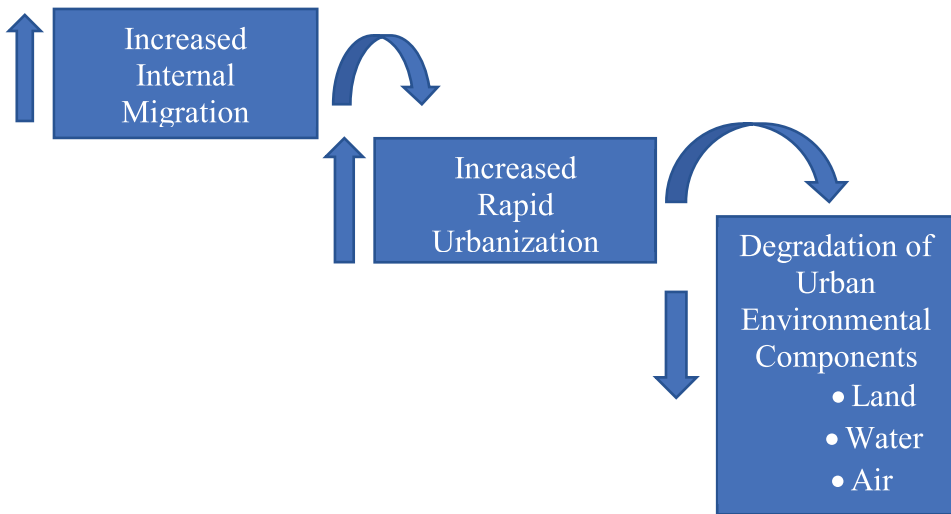
2. Internal Migration and Urban Environment: South Asian Scenario

Rapid urbanization is one of the most gruesome impacts of internal migration. Globally, internal migration has impacted urban environmental components such as land, water and air negatively. Urban population increase is negatively associated with the urban environment through land use and land cover transformation, deforestation, filling up of water bodies and low-lying areas which gradually affect the environmental components of the cities. With the increase of urbanization and urban population, the interaction between urban environment and population has also changed over time. Increased population has affected the urban

⁸ 1990: Landsat-5 (Path & Row- 137-044, Date- 7 January), 2000: Landsat-5 (Path & Row- 137-044, Date- 19 January), 2010: Landsat-5 (Path & Row- 137-044, Date- 30 January) and 2020: Landsat-8 (Path & Row- 137-044, Date- 11 February). These images are collected from the website of United States Geological Survey (USGS).

environment with its changing nature and amount of food and energy consumption, transforming the land cover, water bodies and land use pattern. Figure 1 represents that the increasing internal migration escalates the urbanization rate rapidly which is negatively affecting the urban environmental components like land, water and air.

Figure 1: Inter-Relation between Internal Migration, Rapid Urbanization, and Urban Environmental Components



The Asian countries are characterized by uneven development activities, i.e., urban areas used to get priorities in development planning and rural areas remain underdeveloped. These uneven development activities and inequalities instigate rural people to migrate to urban areas for having a better life. The movement of such a huge number of populations towards urban areas initiates rapid urbanization; and, as rapid urbanization accelerates social and economic activities and developments, it negatively affects the environment of the urban areas. The South Asian countries are also not exceptional from the environmental impacts of rural-urban migration. According to the *Journals of India*, the number of internal migrants in India was 450 million as per the most recent 2011 census which showed an increase of 45 per cent over the 309 million recorded in 200, and internal migrants as a percentage of population increased from 30 per cent in 2001 to 37 per cent in 2011.⁹ A study has found out the conversion of agricultural land, forest and wetlands, intensive and extensive exploitation of natural resources to support urban economy includes excessive extraction of energy resources (including fuelwood),

⁹ “International Migration in India,” *Journals of India*, updated June 2, 2020, <https://journalsofindia.com/internal-migration-in-india/#:~:text=The%20number%20of%20internal%20migrants,2001%20to%2037%25%20in%202011.>

quarrying and excavation of sand, gravel and building materials at large scales and over-extraction of water.¹⁰ Urbanization not only has impacts on the local environment, it has impacts beyond the immediate vicinity which includes pollution of waterways and long-range air pollution.

It has been observed that internal migration in Nepal mainly from Mountain and Hill to urban and Tarai region is the only alternative of the people living in these areas due to lack of employment, infrastructure for self-development, poor health and education facilities, low agriculture production etc.¹¹ Declining environmental quality as the impacts of internal migration in larger urban areas has become a major concern for the urban environmental planners in Nepal.

In Sri Lanka, according to the 2012 census, one in every seven persons (2.7 million of 13.4 per cent of the total population) is an inter-provincial migrant while one in every five persons (4.0 million or 20 per cent of the total population) is an inter district migrant.¹² In Pakistan, income differentials between rural and urban areas are indeed driving economic migration.¹³ In the cases of Sri Lanka and Pakistan, the results imply that urbanization contributes to environmental degradation because due to the growing urban population, the usage of infrastructure, energy and transport upsurges and as a result of inhabitant shift from agricultural to industrial sector which might enlarge pollution of the environment.¹⁴

Overall, the South Asian scenario of internal migration presents a negative notion of its impacts on the urban environment in which it affects all the environmental components negatively.

3. Internal Migration Scenario of Bangladesh

There is a growing tendency among people around the globe to migrate towards urban areas from rural areas. A UN projection has shown that 2.5 billion could be added to the urban areas by 2050.¹⁵ Bangladesh is also not different from

¹⁰ Maosanen Longchar, "Rural-Urban Migration and its Impact on the Urban Environment and Life in Nagaland," *Transactions of the Institute of Indian Geographers* 36, no. 1 (January 2014): 101-07.

¹¹ Central Bureau of Statistics (CBS Nepal) and United Nations Population Fund, *Population Monograph of Nepal 2014 Vol. I: Demographic Analysis* (Kathmandu: CBS, 2014).

¹² E L Sunethra J Perera, "Internal migration patterns and issues in Sri Lanka," accessed February 2, 2021, https://www.researchgate.net/publication/329876855_Internal_migration_patterns_and_issues_in_Sri_Lanka/links/5c1f2e52458515a4c7f2960e/download.

¹³ Rashid Memon, "Pakistan: Internal Migration and Poverty Reduction," accessed February 2, 2021, http://www.researchcollective.org/Documents/Rashid_Memon_migration_paper.pdf.

¹⁴ Muhammad Azam and Abdul Qayyum Khan, "Urbanization and Environmental Degradation: Evidence from Four SAARC Countries—Bangladesh, India, Pakistan, and Sri Lanka," *Environmental Progress & Sustainable Energy* 35, Issue 3 (May 2016): 823-32.

¹⁵ Department of Economic and Social Affairs, United Nations (Website), 68% of the world population projected to live in urban areas by 2050, says UN, accessed 30 September 2021,

the global scenario of internal migration patterns. In Bangladesh, the rapid increase of population has stimulated a rapid increase in internal migration like other developing countries. Urban pull factors, as well as rural push factors, have triggered the internal migration rate of the country. Internal migrants of the country mainly migrate in search of a better livelihood. Lack of job opportunities in rural areas of the country mainly acts as a push factor of internal migration. Apart from this, loss of property due to various environmental reasons, poor educational and medical facilities and perceived better security also act as triggering factors of internal migration. Whereas, pull factors of internal migration in Bangladesh include real or perceived better employment opportunities, better educational, medical and security facilities. Recently, most of the major cities of the country have been observing a rapid increase in their population, but Dhaka being the centre of all activities, attracts more migrants than other cities of the country.

Table 1: Urban Population of Bangladesh at Mid-Year, 1950-2050 (Thousands)

Year	Urban Population at Mid-Year, 1950-2050 (Thousands)
1950	1,623
1960	2,475
1970	4,939
1980	12,009
1990	21,037
2000	31,041
2010	46,347
2020	64,815
2030	84,689
2040	102,422
2050	117,837

Source: United Nations, Department of Economic and Social Affairs, Population Division (2018), World Urbanization Prospects: The 2018 Revision, Online Edition,

https://population.un.org/wup/Download/Files/WUP2018-F03-Urban_Population.xls, accessed on 02 February 2021.

After independence, Dhaka became the national capital of the newly independent country. Being the capital and centre of all administrative and commercial activities, it began to attract people from all over the country. The city suddenly watched a population boom in a very short span of time. A huge number of population in an almost unplanned area made Dhaka mostly an unliveable city. Dhaka was the centre of activities from the past for its central location. It had a population of 69,212 in 1872 at the time of the first census which increased to 1,25,000 in 1911, and in 1941, the population of Dhaka became 2,39,000.¹⁶ In 1951, the population jumped to 3,36,000 with the arrival of migrants from India after the partition of 1947. The city had seen a growth of 44.63 per cent in a decade and the population of Dhaka city became 5,56,000 in 1961.¹⁷ By 1974, population of Dhaka increased to 16,80,000; in 1981, it reached 34, 40,000; and, in 1991, it went up to 61,50,000.¹⁸ Statistics shows a gradual increasing trend of the population in Dhaka city and the reasons behind the overpopulation of the city is mostly internal migration from other parts of the country. For instance, 34.13 per cent people from Rangpur and 26.71 per cent people from the Chittagong divisions migrated to Dhaka followed by Khulna (23.87 per cent), Rajshahi (22.78 per cent) and Barisal (21.20 per cent).¹⁹

Census records from 1961 – 2011 (Division wise level of urbanization) present that, Dhaka has emerged as the highest urbanized region and one of the fastest-growing cities of the world. Being the capital and having different government and non-government offices, commercial organizations, educational institutions and easy employment opportunities work as the triggering factors of internal migration which contribute to the rapid urbanization of Dhaka city. Dhaka has become the favourite destination for internal migrants due to the concentration of all economic and political institutions of the country.

Rapid increase of population in the urban areas is affecting all aspects of human life. Massive migration has increased the demand for housing and other necessary services in the city. As a result, rapid expansion is seen in the city both horizontally and vertically. According to the *UN Habitat*, Dhaka is the most crowded city in the world with more than 44,500 people sharing each sq. km. of space. More migrating in from rural areas every day, the capital is literally bursting

¹⁶ Sirajul Islam, ed., *Banglapedia* (Dhaka: Asiatic Society of Bangladesh, 2003), 303.

¹⁷ Islam, *Banglapedia*, 303.

¹⁸ Islam, *Banglapedia*, 303.

¹⁹ Statistics and Informatics Division (SID), *Population Distribution and Internal Migration in Bangladesh, Population Monograph of Bangladesh* (Dhaka: Bangladesh Bureau of Statistics (BBS), Ministry of Planning, Government of the People's Republic of Bangladesh, November 2015), 31.

at the seams and the sewers.²⁰ Existing infrastructures of the city have failed to support these huge populations and to provide accommodation to these enormous numbers of the population. New slums and squatters with extremely low living standards are being established which are mainly illegal. To serve this huge number of population, the number and pattern of the transportation system have also been changed. Roads should ideally take up about 25 per cent of surface area, but Dhaka only has 8 per cent of its total surface area as roads. Though there is an inadequacy in road networks, it is difficult to make new roads due to the scarcity of lands.

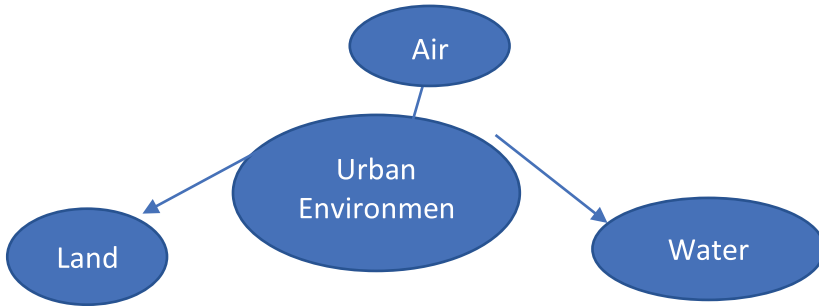
Governance failure, deficiencies of basic urban services, increasing of slums, failure of land administration and increasing of social anxiety have seen an increasing trend with the rapid increase of population in Dhaka city. Although the civic services and urban facilities have increased, it has failed to serve all the people of the city. Extensive urban growth also increases the poverty level and creates impediments for the authority to provide basic urban facilities for the population. Increasing population in the urban areas degrade air and water quality, reduce water availability, create problems in waste and drainage management and increase energy consumption which gradually becomes threat to urban environments.

4. Impacts of Internal Migration on Urban Environment of Bangladesh: Dhaka in Perspective

Dhaka is facing an alarming trend of urbanization for the last couple of decades which has a serious negative impact on the environment of the city. As Dhaka is the most prominent destination for migrants, the city is bearing the brunt of the issue. The city has been developed without considering the physical and environmental aspects, and both the physical and biological components of the urban ecosystem are affected by the huge number of increased populations. Global media has termed the city as one of the most unliveable cities in the world. The city has also been termed as the traffic capital of the world. The huge number of populations have severe impacts not only on the housing, service sectors but also on the socio-economic aspects and especially on the environment. The urban environment of Dhaka city is the most vulnerable and is being degraded frequently. Although economic, social and cultural improvements could be seen as a result of urban growth, but that is for a particular group of people, the overall environmental scenario faces a negative repercussion. The urban environment is comprised of physical components and biological components. The present study will deal with the impacts of internal migration on the physical components of the urban environment which include land, water and air.

²⁰ Poppy McPherson, "The dysfunctional megacity: why Dhaka is bursting at the sewers," *The Guardian*, March 21, 2018.

Figure 2: Components of Urban Environment



The environmental conditions of Dhaka city have deteriorated over time significantly. The city has lost its natural environment, become a hub of infrastructures and a city of pollution. Being the capital, the city is experiencing multi-dimensional problems such as rapid unplanned urbanization, traffic congestion, waterlogging, solid waste disposal, drainage congestion, air pollution, sound pollution, pollution and encroachment of water bodies, etc. The impacts of overpopulation as an effect of internal migration on the environmental components of Dhaka city is discussed as follows:

4.1 Land

Dhaka, one of the fastest-growing cities in the world, could be taken as the best example of human activities induced by environmental changes. The city observed an unplanned horizontal and at the same time vertical expansion without any proper land use planning. Increased economic activities to fulfill the demands of the increasing population affect the limited land of the city which gradually deteriorates the environment and declines the total urban services. Land use and land cover in Dhaka city are transforming very rapidly. Studies have found that they are transforming at an alarming rate in the last few decades. According to UN predictions, Dhaka will become home to more than 20 million people which will be larger than Mexico City, Beijing or Shanghai. For fulfilling the demand of the ever-increasing population, the land inside and surrounding areas of Dhaka city are constantly being converted. The agricultural land of the city has also decreased 39.94 per cent between 1960 and 2014.²¹

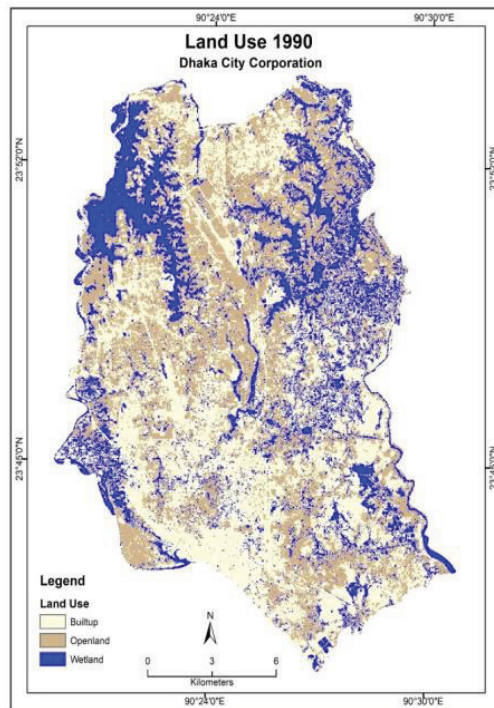
Over the past few decades, Dhaka is becoming urbanized at a very high rate. Dhaka has seen rapid urbanization from the past as it was the political,

²¹ M. N. Uddin, M. F. Anwar, M. T. Rahman and M. N. Mobin, "An Investigation on the Pattern of Land Use Change in Dhaka City Using Remote Sensing and GIS Application," *Journal of Environmental Science and Natural Resources* 7, no. 2 (2015): 105-09.

administrative and economic hub. Between 1960 and 2005, the city has expanded from 11 per cent to 34 per cent.²² Waterbodies, vegetation and open spaces have seen a dire consequence of the rapid urbanization in Dhaka city. Peripheral areas of the city have also been converted at a very fast pace.

The following images and table represent how the land use and land cover of Dhaka city has changed over the last three decades (1990-2020).

Figure 3: Land use and land cover change of Dhaka city from 1990-2020²³



²² Ashraf M. Dewan and Yasushi Yamaguchi, "Using Remote Sensing and GIS Detect and Monitor Land Use and Land Cover Change in Dhaka Metropolitan of Bangladesh during 1960-2005," *Environmental Monitoring and Assessment* 150, no. 1-4 (March 2009): 237-49.

²³ Author has collected the images from the website of United States Geological Survey (USGS). For remote sensing analysis, three satellite images (Landsat TM image of 1990, Landsat TM image of 2000, Landsat TM image of 2010 and Landsat OLI image of 2020) have been collected. The image processing and analysis has been carried out using ERDAS IMAGINE 14 image processing software and landuse maps are created from these images to observe the sequential changes.

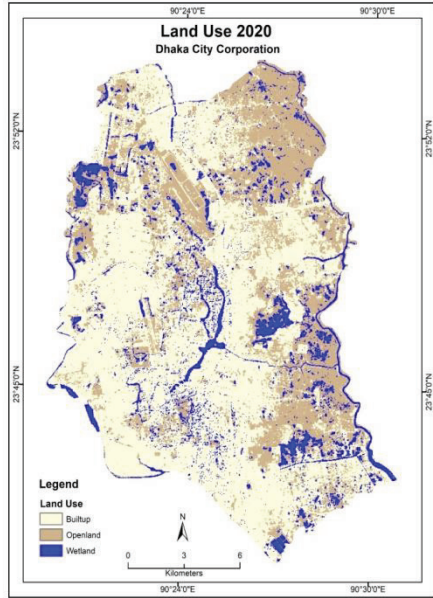
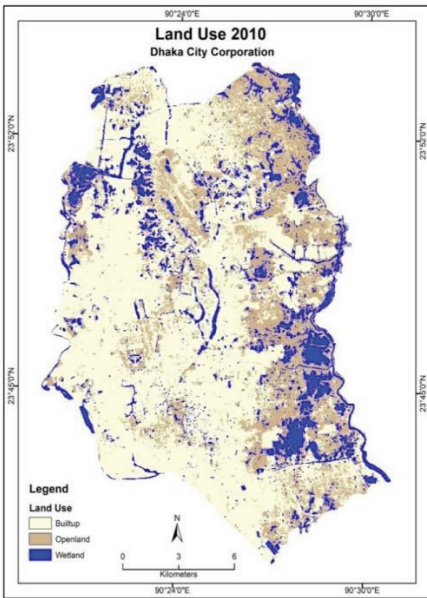
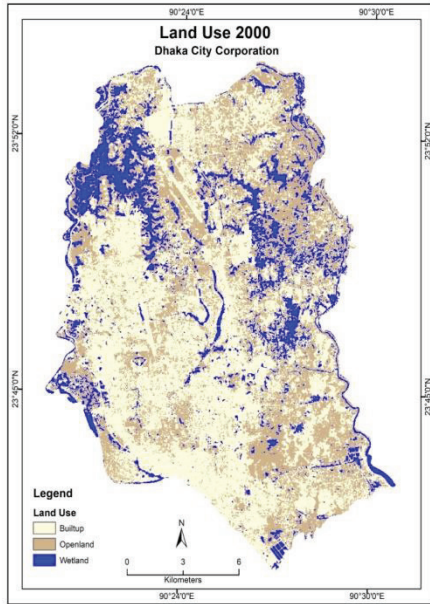


Table 2: Land Use and Land Cover Changes of Dhaka City (1990-2020)²⁴

Land use Types	Year							
	1990		2000		2010		2020	
	Area	%	Area	%	Area	%	Area	%
Built-up	33,590.30	44.50	39,693.10	52.59	45,165.10	59.83	45,340.10	60.07
Open Land	26,325.80	34.88	25,436.00	33.70	20,526.60	27.20	22,844.00	30.27
Wetland	15,563.00	20.62	10,350.00	13.71	9,787.38	12.97	72,95.00	9.66

The above images show how land use and land cover of Dhaka city has observed changes over time. It is seen from the interpretation of the images that, land use and land cover changes of Dhaka city have seen rapid change over the last decade. Waterbodies inside and around the city have been filled up and converted to paved surfaces. Built-up areas of Dhaka city were 44.50 per cent in 1990 which gradually increased to 52.59 per cent in 2000, 59.83 per cent in 2010, and in 2020, the built-up areas of Dhaka city were 60.07 per cent. In Dhaka city, the percentage of open land was 34.88 and 33.70 in 1990 and 2000, respectively. In 2010, the percentage of open land was reduced to 27.20 and it again increased to 30.27 per cent in 2020. It may be noted that the surrounding areas of Dhaka city which were mainly waterbodies and flood flow zone are being filled up which have increased the percentage of open land. These areas are being in the process of conversion to built-up areas. The most striking changes have been observed in the wetland areas. In 1990, 20.62 per cent of areas of Dhaka city were waterbodies. These areas were reduced to 13.71 per cent in 2000 and 12.97 per cent in 2010. In 2020, the wetlands of Dhaka city accounted for only 9.66 per cent of areas.

The land has become one of the scarcest resources of Dhaka. The establishment of the slums and squatters in Dhaka city is closely linked to the increase of population by internal migration. With the increasing number of populations, the numbers of slums and squatters have also increased. Slums and squatter settlements do not have a uniform distribution pattern throughout the city

²⁴ Data collected from analysis of satellite images cited in the previous reference.

and they are mainly concentrated on the urban fringe areas which are mostly low-lying underdeveloped areas and water bodies. The high land prices inside the city have forced the people with lower income to establish slums and squatters in the peripheral cheap lands of Dhaka city. The price of lands has increased which has reduced the accessibility of common people to the lands. More than 70 per cent of the city's population has no access to land.²⁵ Landfilling has become the most common practice to overcome the land crisis issue and these landfilling activities have changed the total atmosphere of the city. The low-lying areas and water bodies both inside and around the city are being filled up for solving the settlement problem of the city. Solid wastes, both domestic and toxic industrial wastes, have been used for landfilling. As the toxic wastes are not treated properly before dumping, it is creating lots of environmental hazards. These industrial toxic discharges have damaged land fertility in the surrounding areas of Dhaka city and affected agricultural production. Not only the low-lying areas and water bodies are converted for settlements, the open spaces which were earlier used as parks and playgrounds are also converted to fulfil the settlement requirements of the increased population.

From the above discussion, it can be seen that land-use changes are becoming a matter of concern for the country for the last couple of years. These land-use changes are taking place due to the rapid increase in population in Dhaka city. As a consequence of this issue, land transformation both inside and around the city are taking place at an inconsistent rate without any accountability. These transformations are creating havoc for the city as the city is losing its open spaces, water bodies inside and around for ensuring shelter for the huge number of people migrating to the city.

4.2 *Water*

Waterbodies inside and around the city have been filled up and converted to paved surfaces in order to fulfil the necessity of increasing population. It may be noted that the surrounding areas of Dhaka city which were mainly waterbodies and flood flow zone are being filled up mainly for establishing settlements. In 1990, 20.62 per cent of areas of Dhaka city were waterbodies. These areas were reduced to 13.71 per cent in 2000 and 12.97 per cent in 2010. In 2020, the wetlands of Dhaka city account for only 9.66 per cent of areas. In Dhaka, almost 3,483 acres of water bodies and lowlands have been filled up in the last decade. Not only private organizations and individuals are involved in the land conversion of Dhaka city, but some government organizations are also involved with this type of heinous activities in some places which have deteriorated the total environment of the city. Adil Mohammad Khan, General Secretary of Bangladesh Institute of Planners mentioned

²⁵ Momtaz Jahan, "Impact of Rural Urban Migration on Physical and Social Environment: The case of Dhaka City," *International Journal of Development and sustainability* 1, no. 2 (2012): 191.

that the city has lost 36 per cent of its water bodies to earth filling, considering the Detailed Area Plan (DAP).

Dhaka has mainly attracted migrants for its scope of employment. The unplanned establishments of industries, which mainly attract migrants, are also linked with the unplanned urbanization of the city. Untreated wastages of the industries are mainly dumped in the water bodies both inside and surrounding areas of the city which gradually decreases the quality of water and pollutes the water. Both light and heavy industries established by the rivers contribute to the pollution of the rivers. Water bodies inside the city are used for the dumping of untreated wastes by the people leaving by the sides of the water bodies. The untreated toxic wastewater of the leather and textile industries used to be channelled to nearby water bodies which would pollute the water. Household wastages are also dumped into the water bodies. The untreated wastages of both industries and households are not only contaminating the water but also reducing the oxygen level of the water and ultimately extinct aquatic lives which leads to the failure of the ecosystem. Aquatic lives of the water bodies of the city are becoming extinct which is hampering the total ecosystem of the city. The water quality of the waterbodies both inside and outside of the city is far below the permissible limit. Inadequate sewage and inefficient waste management system also increases water contamination of the city. The waste dumping sites of Dhaka city are mainly located by the sides of the waterbodies surrounding the city. With the increase of population, health care facilities have also increased in the city which is another source of pollution for both land and water bodies. Hospitals and clinics across the city generate 20t of hazardous and toxic medical waste per day which is mainly dumped into the Buriganga river. In the absence of proper hospital waste management, hospitals of Dhaka city used to discharge their liquid pharmaceutical and chemical waste into the general sewers or drains which then drained out to the rivers and water bodies.

4.3 *Air*

Air pollution is one of the most threatening problems that developing countries are facing nowadays which has negative impacts on human health at the same time polluting the environment. There is a lack of awareness about air pollution among the people of developing countries like Bangladesh and most of the time the impacts of air pollution are overlooked or ignored. In developing countries, the sources of air pollution include biomass burning, brick making and traffic.²⁶ Bangladesh is also not out of the scenario and the capital city is becoming uninhabitable day by day. Dhaka scored 196 on the Real-time Air Quality Index

²⁶ Bilkis A. Begum, Philip K. Hopke and Andreas Markwitz, "Air pollution by fine particulate matter in Bangladesh," *Atmospheric Pollution Research* 4 (2013): 75-86.

(AQI)²⁷ measured at the US Embassy in Dhaka at 8 pm on 30th November 2020.²⁸ A wide range of Greenhouse Gases (GHG) which include Carbon Dioxide (CO₂), Methane (CH₄), Carbon Monoxide (CO), Ozone (O₃) and sulphur dioxide (SO₂) are emitted to the atmosphere every day for the activities of the people. The precipitation pattern has also changed for the existence of excessive dust and the GHG as dust can condensate the water vapour into rain droplets. According to Architect Iqbal Habib, joint secretary of Bangladesh Paribesh Andolon (BAPA), “Dhaka’s air turned most unhealthy in the winter due to the negligence of the authorities concerned. It is possible to control air and dust pollution in Dhaka if the authorities concerned become active.”²⁹ In Dhaka, the density of particulate matter (PM) which is 2.5 micrometres or smaller³⁰ has been found to be 9.0 times higher than the National Ambient Air Quality Standard (NAAQS) of Bangladesh recommendation and during the dry season (October-March) ambient air in the city becomes extremely polluted due to inadequate rainfall and activation of the brick kilns. The air quality of Dhaka city has deteriorated in the last few years with the increasing amount of poisonous elements in the air which sometimes become lethal for the human body.

Industries located inside and around the city are polluting the air of the city very badly. With the increase of population in the city, the necessity to assure shelters for the migrants also increases. Bricks are one of the most important elements for the construction of shelters. According to the environmentalists, the number of brickfields in the country is around 10,000 and half of them are located around the capital and these brick kilns are primarily associated with PM, CO, SO₂, volatile organic compounds, nitrogen oxides (NO_x) and heavy metals depending on the type of fuel burnt. But a recent survey has found drastic changes in the major sources of air pollution of Dhaka city. According to a study by the Department of Chemistry of Dhaka University, vehicles powered by fossil fuels make up 50 per cent of the contributors to air pollution, the source of around 40 per cent of air pollution is burning straw, firewood, husks and small particles and burning coal in the brick kilns causes the remaining 10 per cent of air pollution.³¹

²⁷ A numerical value between 151 and 200 indicates that everyone may begin to experience health effects. Members of sensitive groups may experience more serious health effects. Air quality between 201 and 300 is classified as “very unhealthy.” If the score is between 301 and 500, then it is classified as “hazardous.” “Dhaka’s ‘unhealthy’ air ranks second worst in AQI,” *New Age*, April 29, 2020.

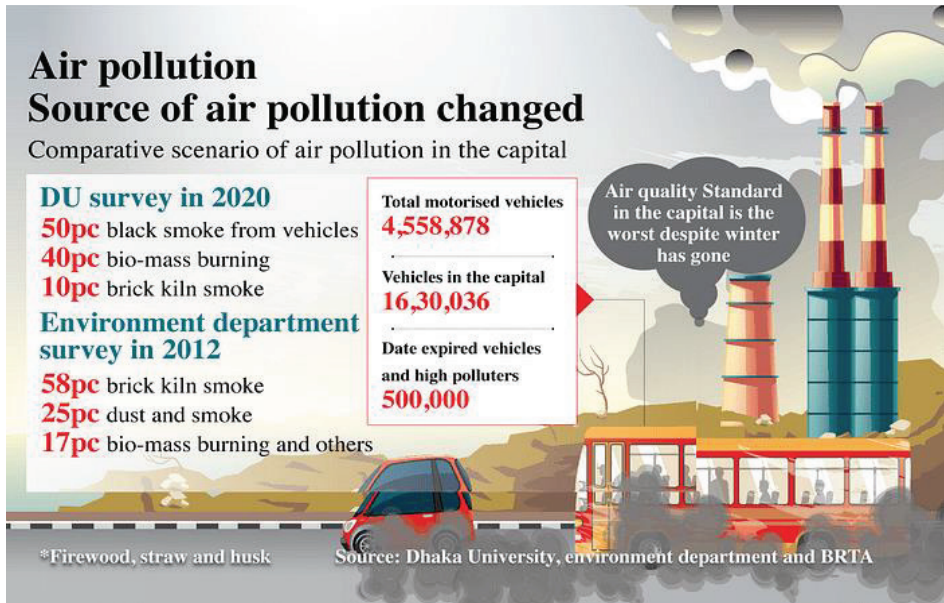
²⁸ Ashif Islam Shaon and Shohel Mamun, “Why is Dhaka’s Dust Pollution Still out of Control,” *Dhaka Tribune*, December 1, 2020.

²⁹ Shaon and Mamun, Why is Dhaka’s, December 1, 2020.

³⁰ Airborne particulates are considered more harmful when they are 10 micrometres or smaller in diameter.

³¹ Iftekhar Mahmud, “Air pollution: Vehicle smoke responsible for 50pc,” *Prothom Alo*, March 06, 2021.

Figure 3: Changing Sources of Air Pollution in Dhaka City³²



At an emergency inter-ministerial meeting, H.E. Md. Shahab Uddin, MP, Minister of Environment, Forest and Climate Change mentioned that “the level of air pollution is alarming and the smog from brick kilns, smoke from unfit vehicles and dust generated from public and private constructions sites, including those of the mega projects taken by the government, were the main sources of air pollution.”³³

To fulfil the demand of a huge number of people, the number of transports of the city has also increased. Lack of public transportation facilities has increased the necessity of private cars and motorcycles in the city. According to the Bangladesh Road Transport Authority (BRTA), every year around 37,000 cars are added to Dhaka’s roads of which 80 per cent are private cars. The absence of a proper public transportation system has triggered the necessity of using private transportation which increases the traffic congestion of the city and at the same time using fossil fuel in those cars increases air pollution. As per statistics of 2020, the registered motorized vehicles are 45, 58,878, out of which a total of 16, 30,036

³² Mahmud, “Air pollution”; Department of Environment, *Sources of Air Pollution in Bangladesh (brick kiln & vehicle emission scenario)* (Dhaka: Clean Air and Sustainable Environment Project, Department of Environment, Ministry of Environment, Forest and Climate Change of the Government of Bangladesh, March, 2019).

³³ Rezaul Karim Byron and Pinaki Roy, “Dhaka Gasping for Fresh Air,” *The Daily Star*, November 26, 2019.

vehicles are in the capital.³⁴ In this way, the densely populated capital of the country dominates in the list of cities of the world with the worst air quality.

5. Conclusion

Internal migration especially rural-urban migration is considered as the main driving force of growth in developing countries. Migration is thought to be a strategy for the rural people for improving their livelihood. Socio-economic disparities between rural and urban areas have triggered the rate of rural-urban migration in developing countries like Bangladesh. Apart from this, natural disasters in some parts of the country also force people to shift to the cities. Thousands of rural people move to the urban areas with the hope of a better life which is gradually increasing the number of populations in the urban areas.

Between 1975 and 2005, Dhaka has experienced urban population growth higher than 2.4. Dhaka was a destination for the migrants for a long time, but the rate of in-migration towards Dhaka was triggered from the early 1990s. Unplanned urban development also got impetus from that time and within the last three decades, it has become a chronic problem that is hampering every aspect of human lives as well as the environment. Dhaka has been branded as one of the most unliveable cities in the world. According to The Global Liveability Index 2019, Dhaka is the third least liveable city in the world just after the war-torn Syrian capital Damascus and Lagos. Unplanned rapid urbanization due to internal migration is putting the environment of Dhaka city at high risk. Rapid urbanization has led to the conversion of land use and land cover, increased amount of waste generation, the highest level of air pollution, water pollution and encroachment of water bodies, etc. Although the country has sufficient policies and legal frameworks for environment conservation, unfortunately, they have failed to control the environmental deterioration of Dhaka city. Environmental impacts of Dhaka city may be seen as a natural consequence, but it is grossly related with overpopulation which is created by internal migration of the country.

According to the Zila Report: Dhaka 2015, the population density of Dhaka is 1521 per sq. km. whereas the country has a population density of 976 per sq. km. It is mentioned in the paper that being the centre of all activities how Dhaka attracts people from all over the country. The present trend shows that internal migration towards Dhaka will likely be increased in the future. It is obvious that if the internal migration will increase, urbanization will also be expanded to fulfil the demand of an increased number of population which will definitely have negative effects on the urban environmental components. To reduce the negative impacts on the environmental components of Dhaka city, it is necessary to reduce the burden of

³⁴ Mahmud, "Air pollution."

overpopulation of the city. As internal migration is a driving force for the rapid rate of urbanization of Dhaka, internal migration especially rural-urban migration towards Dhaka could be demotivated. As the centrality of all activities of Dhaka city attracts internal migrants, decentralization of administrative and commercial activities can act as a demotivating factor for internal migration.

Traditionally, it is thought that urbanization is detrimental to the environment as various development initiatives, taken for a large number of people, affect the environment. As urbanization is an important factor for the economic prosperity of any country, properly planned urbanization with an appropriate number of populations could be beneficial for the environment. Sustainable environment-friendly planned urbanization could be a solution to this problem. Environment-friendly infrastructures, innovations involving green technologies can reduce the negative impacts of urbanization on the environment and can make the urban areas more liveable.