

UNPLANNED URBANISATION AND ENVIRONMENTAL DEGRADATION

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Abstract:-

Urbanization is an inevitable phenomenon for the country like Bangladesh. The push and pull factors help to migrate people from rural area to urban area. As a result haphazard and unplanned urbanization create environmental degradation. Survey data reveals that inadequate solid waste disposal services, lack of adequate public water supply, traffic congestion, water logging, air pollution, noise pollution, hill cutting are the main problems in the city area. Concentration of dust as well as SO_x, NO_x exceeded the allowable limit at the selected points. Groundwater level of Sylhet city has a considerable lowering over the last few decades. It has lowered from 3380 mm below ground in 1982 to 7880 mm below ground. Sylhet is located in highly seismic risk zone but most of the buildings and other structures in this area are constructed without considering earthquake risk. Environmental degradation index was calculated based on economic condition of the country.

Key words:-*Environmental degradation, urbanization, Pollution, Environmental index, Water logging*

INTRODUCTION:

Urban population in India is growing at rate of 2.3% per annum and global urban population is increasing from 220 million in 1900 to 3.2 billion in 2005 and is projected to step up to 4.9 billion by 2030 (Ramachandra et al., 2012a). There are about 48 urban cities having a population of more than one million in 2011. Unplanned urbanization and urban sprawl in the metropolitan area have posed serious problems like lack of infrastructure and basic amenities (like supply of treated water, electricity, sanitation facilities), loss of wetlands, green spaces, and increases in the concentration of greenhouse gas (GHG) emissions (Ramachandra et al., 2012b).

Carbon footprint refers to the measure of carbon dioxide and its equivalent emitted due to various anthropogenic sources such as electricity, industry, agriculture, transportation and waste disposal sector. It is mainly employed to quantify the emission sources and its constituents which in turn help to mitigate the carbon dioxide emission from the sources into the environment. In developing countries like India, the urban population is growing at rate of 2.3% per annum and global urban population is increasing from 220 million in 1900 to 3.2 billion in 2005 and is projected to step up to 4.9 billion by 2030 (Ramachandra et al., 2012a). There are about 48 urban cities having a population of more than one million in 2011. Unplanned urbanization and urban sprawl in the metropolitan area have posed serious problems like lack of infrastructure and basic amenities (like supply of treated water, electricity, sanitation facilities), loss of wetlands, green spaces, and increases in the concentration of greenhouse gas (GHG) emissions (Ramachandra et al., 2012b, 2015).

Biggest challenge during the 21st century is to provide clean air, water, energy, land, with the sustainable livelihood options for billion people.

Rapid urbanization (figure 1) consequent to globalization in cities like Bangalore, has led to large scale land cover changes with the serious environmental degradation, posing serious challenges to the decision makers in the city planning and management process involving plethora of issues like infrastructure development, traffic congestion, enhanced pollution levels (land, water, air and environment), basic amenities (electricity, water, and sanitation), etc. ***Apart from this, major implications of urbanization are:***

Loss of wet lands and green spaces:

Urbanization (925% concretization or paved surface increase) hastening influences on the natural resources such as decline in green spaces (78% decline in vegetation) including wet lands (79% decline) and/ or depleting ground watertable. Quantification of number of trees in the region using remote sensing data with field census reveal 1.5 million trees and human population is 9.5 million, indicating one tree for seven persons in the city. This is insufficient even to sequester respiratory carbon (due to breathing which ranges from 540-900 g per person per day)

Urbanisation in Greater Bangalore

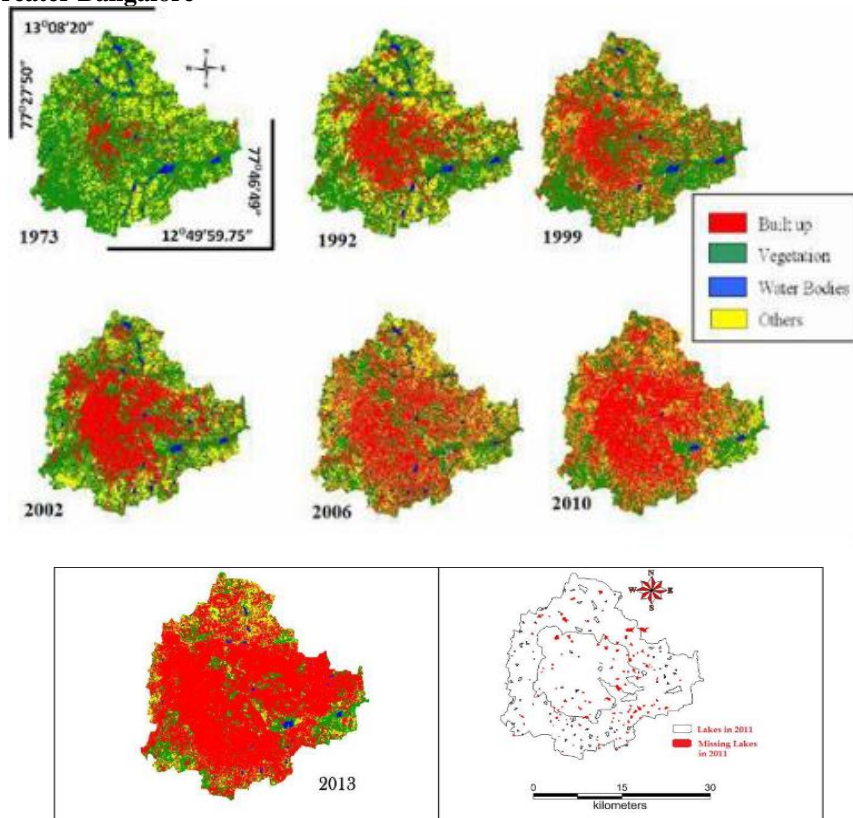


Figure 1: Land use dynamics since 1973 (Spectre of unplanned urbanisation)

Floods: Conversion of wetlands to residential and commercial layouts has compounded the problem by removing the interconnectivities in an undulating terrain. Encroachment of natural drains, alteration of topography involving the construction of high-rise buildings, removal of vegetative cover, reclamation of wetlands are the prime reasons for frequent flooding even during normal rainfall post 2000.

Decline in groundwater table: Studies reveal the removal of wetlands has led to the decline in water table. Water table has declined to 300 m from 28 m over a period of 20 years after the reclamation of lake with its catchment for commercial activities. In addition, groundwater table in intensely urbanized area such as Whitefield, etc. has now dropped to 400 to 500m.

Heat island: Surface and atmospheric temperatures are increased by anthropogenic heat discharge due to energy consumption, increased land surface coverage by artificial materials having high heat capacities and conductivities, and the associated decreases in vegetation and water pervious surfaces, which reduce surface temperature through evapotranspiration. . The study unravels the pattern of growth in Greater Bangalore and its implication on local climate (an increase of ~2 to 2.5 °C during the last decade) and also on the natural resources (78% decline in vegetation cover and 79% decline in water bodies), necessitating appropriate strategies for the sustainable management of natural resources.

Increased carbon footprint: Due to the adoption of inappropriate building architecture, the consumption of electricity has increased in certain corporation wards drastically. The building design conducive to tropical climate would have reduced the dependence on electricity. Adoption of building architecture unsuitable for Bangalore climate has contributed to higher electricity consumption and hence higher GHG (Greenhouse gases). Per capita electricity consumption in the zones dominated by high rise building with glass facades require 14000-17000 units (kWh) per year compared to the zones with eco-friendly buildings (1300-1500 units/person/year) Higher energy consumption, enhanced pollution levels due to the increase of private vehicles, traffic bottlenecks have contributed to carbon emissions significantly. Apart from these, mismanagement of solid and liquid wastes has aggravated the situation.

Bangalore is experiencing unprecedented urbanization and sprawl in recent times due to concentrated developmental activities with impetus on industrialization for the economic development of the region. This concentrated growth has resulted in the increase in population and consequent pressure on infrastructure, natural resources and ultimately giving rise to a plethora of serious challenges such as climate change, enhanced green- house gases emissions, lack of appropriate infrastructure, traffic congestion, and lack of basic amenities (electricity, water, and sanitation) in many localities, etc. Of all the sectors, the domestic sector is one of the dominant sectors accounting 45% of total primary energy and final energy consumption is of 30% (excluding energy used for transport). During past few decades, the energy consumption pattern, land use patterns, technological advancements which lead to increase in the quantum of urban MSW generation has changed due to the rise in the economic level, change in the demographic structure, consumer attitude and lifestyle of the residents. The change in the lifestyle provokes the transition of end-use energy in the household sector. Such as from using fuel wood to kerosene, kerosene to LPG and electricity for cooking and fuel wood to solar heater and electrical heater for water heating.

Solid waste is also an important factor in the emission of 60% Methane (CH₄) and 40% Carbon Dioxide (CO₂) to the atmosphere due to the anaerobic decomposition. Solid waste is commonly known as garbage which consists of biodegradable and non-biodegradable components produced by the various activities in the society. Municipal solid waste has become the serious problem in the recent years because about 3/4th of MSW generated from urban areas are being disposed in an unscientific way which in turn possess the serious threat to the ecosystem and human health.

Changing built environment:

Rapid urbanisation in the rural-urban fringe affects not only the physical environment but also the residential environment. Within the old villages, especially those located close to the built-up area; there has been an appreciable amount of transformation of the housing stock. This has taken the form of some households rebuilding their houses with more permanent building materials, for example, sand Crete instead of mud. Others have extended their compound houses in order to provide extra space for household members or for rental purposes. A few new houses have also been built within the old settlements, but there is increasingly a lack of space which can be used for the expansion of the indigenous villages as much of the land has been sold leasehold to new land acquirers. These land transactions have led to the development of new residential areas, which in some cases now entirely surround the old villages.

As the peri-urban area becomes increasingly urbanised, the ways in which the environment can be used, as either a source or means of disposal of services, changes. Here, three of the most essential services will be dwelt on: the changing nature of the water supply, the mode of liquid waste disposal, and solid waste disposal.

Water supply:

A supply of water, which is easily accessible, potable, and affordable, is a prerequisite to good hygiene and sanitation and hence central to the general welfare of a household. In the past, the inhabitants of the indigenous villages relied on streams and ponds for their supply of water. With increasing urbanisation, these sources have in most cases either become polluted or have dried up resulting in the inhabitants seeking alternative sources. In theory, much of periurban Accra should be

supplied by piped water, but in practice this supply is very poor. In several areas, the pipelines that have been laid are too small in diameter to carry the amount of water demanded. Even where the pipes are of an adequate size, the demand for water exceeds the supply to such an extent that the pressure is so low that the water does not flow. As a result, some of the periurban areas are only served by water one day a week and others not at all. Of the settlements studied, La Bawaleshie and Gbawe have a relatively reliable water supply, but Ashale Botwe, Agbogba and Pantang have an acute water supply problem.

The main source of water thus varied between the settlements. In La Bawaleshie and Gbawe, all the households interviewed obtained their water from a tap. However, only a few (approximately 3 percent) of these households had the exclusive use of a tap with an additional 10 percent having a tap in their compound. Most households bought water from the few households who had their own tap, hence had to go outside of their compound to fetch water. In Ashale Botwe, the main water supply for almost all the households was water sold from privately owned, large storage containers, which were regularly filled from tankers. For three-quarters of the population of Agbogba, their main water source was still a stream, but this was often supplemented by water bought from private taps in houses in the newly developing area. In Pantang, for the majority (84 percent) of households, their main source of water was a nearby pond, though this was often supplemented by water bought from a private vendor who sold treated water. These changes have resulted in the vast majority of the households in the indigenous settlements (85 percent) no longer having access to a free supply of water, but now having to pay for their water, usually by the bucket or container. Those who rely entirely on natural water sources run a high risk of contracting illnesses if they do not boil the water before drinking it, as the sources are polluted.

In the new residential areas, the inhabitants fared rather better. Two-thirds of the new house owners had private taps in their homes, 18 percent obtained water from private taps in other nearby homes and 16 percent purchased water from private water tanker operators. Many of the new house owners complained, though, that their water supply was very unreliable. Households in the indigenous settlements and the newly developing areas paid a remarkably similar amount on a monthly basis for water, despite the consumption of the former being considerably less, as it is.

Liquid waste disposal:

In rural settlements, the bush can be used for the disposal of human waste, however, as areas become increasingly urbanised, this possibility rapidly diminishes. In urban areas, the adequate disposal of human waste is essential to maintain public health and the quality of the environment. Most of GAMA does not have adequate sanitation facilities (Ministry of Local Government, 1992). None of the houses in the peri-urban area are attached to a mains sewerage system and the facilities available vary widely between the settlements. In Ashale Botwe and Gbawe where improved pit latrines (KVIPs) have been constructed, they are the toilet facility used by the majority of inhabitants (Table 2). Despite La Bawaleshie being the most centrally located of the villages studied, most households still use pit/pan latrines as no KVIP has been constructed in the area. In Ashale Botwe and Pantang, the toilet facilities are even more limited and the majority of the inhabitants use the 'free range' mode.

Almost half of the houses in the newly developing areas have flush toilets that empty into septic tanks in the garden. Almost 40 percent, though, are still dependent on pit/pan latrines while a few use the free range system. Most of the houses will eventually have flush toilets but as many of the houses lack an adequate water supply they have yet to obtain them.

In the indigenous settlements, sullage waste from body washing and the washing of utensils and clothes is usually just thrown onto the ground where it is either channelled into a roadside ditch or forms its own cesspool (Fig 4). Stagnant sullage pools often result which becomes the breeding ground for mosquitoes and let off unpleasant odours.

Conclusions and policy recommendations:

The environment of the peri-urban area of Accra has changed dramatically during the past few decades. There are far fewer trees today as land has been converted to agricultural and more recently residential use. Water courses have been altered, ponds have dried up and erosion has increased. These changes to the environment have resulted in a reduction in the variety and number of birds and animals found in the area. There is now an urgent need to protect the natural environment from further degradation.

As the development of the urban fringe area has not been specifically considered in the current structure plan of Accra, the district assemblies, particularly Ga District Assembly, will have to produce a physical development plan to guide the development of the peri-urban area. This will have to be done in close consultation with the landowners, civil society and service delivery agencies. Pressure on land resources will continue to increase in the future and without a framework to structure the utilisation of land resources, a balance cannot be struck between the various competing needs for land. Such a framework should ensure that rich agricultural lands are zoned and reserved to stem the tide of urban encroachment, and those ecologically sensitive areas such as water courses, river valleys and wetlands are protected from further destruction. The district assemblies, the various communities in the peri-urban area, and NGOs could all help combat environmental degradation by mounting educational campaigns on the need to protect the environment. For example, anti-bush fire campaigns can help reduce the incidence of bush fires and lead to the implementation of community

afforestation programmes. These programmes can help reduce soil erosion and the siltation of rivers, streams and ponds, which are important sources of water for livestock and for domestic use.

The residential environment has also undergone severe changes. As the areas surrounding the indigenous villages are increasingly urbanised, their traditional sources of water and modes of liquid waste and garbage disposal are no longer sustainable. Both the indigenous villages and the newly developing areas are inadequately serviced today. The water supply, or rather lack of one, is the most acute problem for many residents of peri-urban Accra. The extent of the problem varies between areas in the urban fringe but is shared by new and old residents alike. However, those who end up paying the highest price for their water are the poorest households who buy water by the bucket. It can be hoped, though it is by no means certain, that the current reorganisation of GWSC, with increased private sector participation, will lead to improved services.

There is also a very real need for the provision of public toilets in the indigenous settlements as the traditional free-range mode is no longer a viable option. Likewise, the current system of disposing of waste on empty land can no longer be sustained. A more acceptable and safer means of waste disposal needs to be introduced. This should be supplemented by a culture of waste disposal which would have to be supported at a community level rather than a high authority level. The electricity supply is also inadequate in many areas and beyond the price range of most poor households who continue to rely on firewood and charcoal as their main sources of cooking fuel. Women now have to travel much further in search of firewood than in the past and in the long run the use of wood fuel is unsustainable. The possibility of using other forms of energy, such as biogas or liquefied petroleum gas, needs to be explored and promoted.

Side 99:

The responsibility for service provision is shared between national level agencies and the local level district assemblies. The precise division of their responsibilities, however, is not always clear. There is a lack of co-ordination between the departments involved, but all of them suffer from inadequate resources. The capacity of the district assemblies needs to be enhanced in the planning, development and provision of environmental services. This should be supplemented by increased inter-district co-ordination, especially in the case of waste management, and technical support needs to be sought by the district assemblies from the appropriate state agencies.

As the needs of the peri-urban communities have not featured in any development plans, new actors have emerged in the field of service provision in the peri-urban area. In the indigenous villages, people are turning more to the assemblymen/women to solve their problems rather than the traditional authorities. The new land acquirers have established residents' associations which fulfil a range of social, economic and practical functions. One of their major roles is to actively participate in service provision, both financially and manually. Their efforts to improve the residential environment need to be recognised and supported by both the service providing agencies and the district assemblies.

The peri-urban area of Accra has been neglected by planners and aid agencies alike with severe consequences for the environment. As there are very few studies of the peri-urban areas of other African cities, it is difficult to know what the consequences of urbanisation on the environment are elsewhere. However, it is generally applicable that the needs of peri-urban areas should be recognised as it is much easier to plan in advance than solve problems later on. Although the needs of some inner city areas may appear more pressing at the moment, unless the problems being faced by the residents of the urban fringe are tackled now, they too in time will become problems on a massive scale.

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