

# Role of Urban Planning as a Tool to Mitigate the Environmental Repercussions Due to Peri-Urbanization

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**Abstract:** India, with the second largest urban population in the world (more than 300 million today) and its mega-cities, provides a pertinent backdrop to examine the issues of population, habitat and environment in the metropolitan peripheries: an emerging country whose total population recently passed the one billion mark, and where the challenges of urban and peri-urban growth echo the demographic pressure. Peri-urban areas, lying between cities and villages, the extreme peripheries of urban areas suffer from a lack of definition and yet, in most regions of the world, these areas are expanding rapidly with an increasing number of people are occupying them and provide essential life support services for urban residents. Peri-urbanization can be regarded both as a driver and an effector of global environmental changes. The impacts of urbanization on the world's environment and populations is one of the most pressing issues facing the world today. In rapidly urbanizing cities of India, urbanization is a rapid and ever-growing challenge to regional and urban planners where traditional challenges, i.e., issues of governance, funding, rapid growth (geographic and population), increasing need for support infrastructure, expanding social services, pollution, slums, etc. are exacerbated by the need to more fully accommodate the direct and indirect impacts of climate change and ecosystem loss in the planning process. The paper examines the repercussions of peri-urbanization with a specific focus on environmental degradation. The paper discusses the role of urban planning as a tool to mitigate and control the environmental changes caused due to peri-urbanization.

**Keywords:** Urban Planning, Environmental degradation, peri-urban areas, peri-urbanization

## 1. PERI-URBAN

The areas in the extreme boundaries of urban areas, situated between cities and villages lacks a clearly outlined formal statement to define them. These are still the rapidly expanding areas in most regions of the world, and also occupied by an increasing number of people. The peripheral areas of the metropolis have been defined, conceptualized and delimited in various ways [1]. In the late 1980's the Office of Rural and Institutional Development (ORID) used the term 'peri-urban' for the first time while explaining schemes of development

assistance aid to priority areas<sup>1</sup>. However few other terms have been inter-changingly and extensively used before and later along with or in lieu of 'peri-urban' i.e. – *metropolitan fringe/urban fringe, rural urban fringe, metropolitan peripheries* or just as a 'semi-urbanized'/ 'urban transition zone' [2]. However it is evident from available literature that 'peri-urban' is defined basically as an area with a mix of urban as well as rural development processes, situated on the periphery of cities.

The Peri Urban Interface (PUI) constitutes an unstable phenomenon often observed as either by the loss of 'rural' values such as loss of fertile soil, natural rural-scape, etc. or the deficit of "urban" attributes such as lower densities, lack of accessibility, basic services and infrastructure, etc. [3].

## 2. PERI-URBANIZATION

From the various definitions of peri-urban area and peri-urban interface, the term peri-urbanization refers to a process, often a highly dynamic one where rural areas situated on the boundaries of cities are transformed into more urban character which occurs in physical, economic and social terms and often very gradually. In peri-urban areas, small agrarian communities are compelled to adjust to an urban or industrial lifestyle results in a short duration and thus a rapid social change results in a haphazard peri-urban development. [1]

The drivers of peripheral expansion of various urban areas tend to be in terms of large scale investment; foreign direct investment; public policy explicitly supporting dispersal of manufacturing away from the core, and even suburban areas; availability of relatively inexpensive labor, both in situ, in rural areas that are being enveloped by peri-urbanisation, and in-migrants, particularly from poor regions seeking employment opportunities; residential development, which

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<sup>1</sup> DFID (1999) Literature Review on Peri-Urban Natural Resource and Management Approaches – Project Report. London, Natural Systems Programme, Department for International Development. Unpublished Final Technical Report, by University of Nottingham and University of Liverpool.

can be termed as sub-urbanization; public policy to relocate slum settlements out of the center city, or to relocate rural communities for large projects [4].

*Key characteristics of the peri-urbanization process*, particularly in developing countries include [4]:

- Changing economic structure, encompassing a shift from an agriculturally based to a manufacturing dominated economy;
- Changing employment structure shifting from agriculture to manufacturing;
- Rapid population growth and urbanization, a phenomenon often not captured in official data because the populations of peri-urban regions tend to be significantly under counted in many countries, in migrants do not officially register as local residents. Many peri-urban areas, furthermore, are
- Changing spatial development patterns and rising land costs.

### 2.1 Peri-urbanization in India

More than half of the world's population about 54%, approximately 3.9 billion people, is estimated to live in urban areas in the year 2014<sup>2</sup>. According to World Urbanization Prospects, the 2014 Revision, over 66 percent of the world's population will live in cities by 2050. The number of mega-cities has nearly tripled since 1990; and by 2030, 41 urban agglomerations are projected to house at least 10 million inhabitants each.

As per World Urbanization Prospects, the 2014 Revision India's urban population is over 30%, approximately 388 million urban population out of 124 billion total population and till 2050 it is projected to add 404 million urban dwellers to the world's urban population. As per 2011 census, there are three very large urban agglomerations with more than 10 million people in the country, known as Mega Cities, 468 towns with a population of at least 1 million people out of which are 53 million plus urban agglomerations/cities. It is observed that the fastest growing urban areas are medium sized cities. Although these cities face similar problems to those of mega-cities, they have significantly fewer resources to devote to the complex infrastructural, social and environmental issues associated with rapid urbanization [1]. Thus, India provides a pertinent backdrop to examine the issues of population, habitat and environment in the metropolitan peripheries, where the challenges of urban and peri-urban growth echo the demographic pressure.

<sup>2</sup> World Urbanization Prospects, the 2014 Revision, United Nations Department of Economic and Social Affairs, <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>

### 3. PERI-URBANIZATION AND ENVIRONMENTAL DEGRADATION

Peri-urban areas associated with urban centers have become more numerous, larger and complex with rapid urbanization and the associated transition of large populations from rural to urban lifestyles. Typically, these complex peri-urban areas have strong interactions with the urban center and are often characterized by similar physical, demographic and occupational characteristics. A major difference is that in many cases the peri-urban area residents have varying access to urban services and facilities and more importantly they have only a limited voice in urban planning and development. Peri-urban areas, which might include valuable protected areas, forested hills, preserved woodlands, prime agricultural lands and important wetlands, can provide essential life support services for urban residents. McGranahan et al. (2004) observed that peri-urban zones are often far more environmentally unstable than either urban or rural settings. The loss of agricultural and undeveloped lands, unauthorized urban development (sprawl) and industrial operations, environmental degradation and overall a significant alteration of critical ecosystems are serious and ever increasing problems faced by peri-urban areas. Ecologically, the transformation of the peri-urban areas to alternative use is potentially the most serious aspect of the rural-urban transformation; the resulting impacts are in many cases irreversible, have broad complex linkages throughout the urban environment and are presently largely unrecognized. Among the pressures exerted to peri-urban systems are inadequate development processes, unequal distribution of services and investments, the relationship between households' assets and consumption, the conditions of the natural environment, the inadequate localization and functioning of economic activities, the lack of provision of adequate services, the scale and nature of demographic growth, the absence of institutional management capacities, etc. These pressures often result in [3]:

- *environmental hazards* threatening the quality of life, such as the depletion and degradation of environmental resources, loss of agricultural land, etc.;
- *ill-health and malnutrition* for the poorest and other conditions derived from precarious living environments;
- *Other environmental hazards* resulting from the disposal of wastes beyond the local and regional absorptive capacities.

The four main processes of environmental change as per Allen [3] include:

1. land use changes,
2. use of renewable resources (water resources, soils and biomass),

3. use of non-renewable resources (fossil fuels, minerals and biodiversity) and
4. waste generation and pollution (use of the absorptive or sink capacity for wastes)

### 3.1 Land Use Changes

A characteristic of the peri-urban area is that land is under intense pressure due to several processes of land use conversion. Changes in land use from non-urban (rural and/or natural) to urban activities affect in turn the physical form of the environment as well as the economic and social features of the peri-urban area. These changes are not only a result of urban sprawl but also of the loss of farmland in rural areas due to the process of de-agrarianisation, which is an important process in explaining the causes and dynamics of poverty and environmental degradation. It is important to note that the processes of land conversion do not exclusively affect farmland but also natural areas. As per Allen [3] the main processes of land use change to be considered include:

- in-migration of the rural poor who settle in the peri-urban area;
- loss of agricultural land due to the physical expansion of the city (usually along major transport routes) with farm land engulfed in the urban fabric;
- the urban poor moving towards the outskirts where rents and land prices are lower;
- the better-off building new houses in less congested areas;
- land speculation (change in land uses but land remains used for rural purposes);
- industrial location policies

Industrialization in the peri-urban area follows two patterns. On the one hand there is a proliferation of small scale industries associated with construction activities, on the other, large scale industrial estates are leading the process of land conversion in many of the cases examined, particularly (but not exclusively) in the outskirts of large cities [3]. Land conversion from agricultural and natural to residential uses is another typical process taking place in the peri-urban area. This process is connected with both the out-migration of city residents into peri-urban areas seeking more attractive environments, more space and cheaper building land, but also with the in-migration of rural dwellers for whom the peri-urban area offers cheaper land and housing, a more familiar environment and more diversified livelihood sources (rural and urban). In summary, land use changes may respond to different development trends and shifting environmental practices, and affect a series of environmental problems discussed below [3].

- *Uncontrolled Urban Expansion* characterized by low-density development and vacant or derelict land imposes several disadvantages, such as higher infrastructure costs, poorly-planned land use and increasing energy consumption and air pollution due to the greater impact of motorized transport<sup>3</sup>. Environmental impacts are not only associated with the scale of land conversion but with the type of land being lost to urban uses.
- *Development of Special Physical Infrastructure* such as airports, reservoirs and dams, power stations, drinking water and sewage treatment plants, landfills, clubs and military installations, among others, are characteristically situated within the peri-urban interface. Their location is influenced by factors such as the price and the sizes of land required for their development, the location of natural resources, and pollution and safety considerations and they have significant impacts on the environment.
- *Loss and Degradation of Agricultural Land* and in the peri-urban area is a visible consequence of increasing pressures over land for non-agricultural uses, such as the ones described above (notably, due to expanding urban areas and to demand for building materials and landfills). As pressures are diversified, this results in increasing conflicts over land-use priorities between urban based demand and environmentally valuable functions. The further impacts include disruption of life and livelihood of dependents of agricultural production, unavailability of inputs such as food and water in the immediate hinterlands, loss of productive potential of agricultural lands etc.
- *Loss of valuable Ecological Sites and Environmentally protected areas* such as watersheds and wetlands are also impacted by the intensification of agricultural and non-agricultural land uses in the peri-urban area. The loss of singular habitat and biodiversity in these areas is often irreparable.

### 3.2 Use of Renewable Resources

Renewable resources, such as water, food and fuel supplies, are essential for the existence of any system, urban, rural or peri-urban. Environmental problems arise when the renewable resources are exploited beyond their regenerative capacity or, in other words, beyond the “finite limits set by the ecosystem within which they grow” [3]

- *Use of Renewable Energy and Deforestation:* The loss of forested land or woody biomass is a typical characteristic of the peri-urban areas. The sources of this problem are varied, ranging from the impact of air pollution, forest clearing by illegal settlers, or displaced farmers in search

<sup>3</sup> World Resources Institute (WRI), 1996, World Resources. A Guide Publication to the Global Environment. The Urban Environment 1996-97, Oxford University Press, Oxford.

of arable land for cash crops; or simply due to fuel wood collection, mining, logging and hydropower development also tend to produce increasing deforestation which has a high impact on the incidence and distribution of vector-borne disease.

- *Water Resource Exploitation and Degradation:* The peri-urban interface, due to the higher infiltration capacity, is often the location of water supply facilities, such as reservoirs, or the area where underground water sources are mainly replenished. In regions depending on underground water resources, a large deficit balance between water extraction and replenishment can lead to water becoming a non-renewable resource. Water scarcity has impacts on urban, peri-urban and surrounding rural areas, particularly for the poor with little or no access to infrastructure for water provision and water to be used for irrigation. This problem is aggravated by contamination by combined sources (agricultural, domestic and industrial). The other issues include increasing demand for industrial and domestic use which conflict with agricultural demands, mismanaged water resources, lack of municipal coordination, absence of water bodies, lack of pollution abating infrastructure, etc.

### 3.3 Use of Non-renewable Resources

Most non-renewable resources, such as metals, fossil fuels and other mineral resources are depleted with stock use and consumption. This poses the need to address their finite nature through the reduction and rationalization of wasteful consumption and increasing reuse and recycling. [3]

- *Extraction of Mineral Aggregates and Production of Building Materials:* Due to its comparative locational advantages in terms of accessibility, production, and transport cost and time, the peri-urban is the prime area subjected to extraction of construction materials, which results in increasing natural resource depletion. The nature of small operations often means there is no form of Environmental Impact Assessment (EIA) at any stage of the project. The denser the distribution of these operations in the peri-urban area means the greater are the impacts. Furthermore the occupation of fertile agricultural land, soil erosion, pollution of local water resources are common cited problems associated with aggregate resource exploitation<sup>4</sup>. (Nottingham and Liverpool, Universities of, 1999: 79).
- *Use of Non-renewable Energy:* Urban and peri-urban energy-intensive-use has dramatic ecological impacts, not only because of the depletion of non-renewable resources, but also because it is largely associated with the cause of

severe environmental global problems such as climate change, acid rain and increased risk of radiation release or accidental oil spills. In addition, the provision of grid line energy beyond a certain radius tends to be expensive and unreliable, and this constrains the provision of electricity to fragmented populations in peri-urban areas. [3] For many urban and peri-urban dwellers in the developing world, a large share of energy needs are still met by biomass fuels, particularly in and around smaller cities in Africa and Asia (WRI, 1996). However, urban sprawl and the increasing ease of access to fossil fuels lead to a disregard for the exploitation of regional renewable resources and alternative energy sources.

- There is a strong relationship between land use patterns, overall transport demand and motor vehicle use, which results in greater air pollution and traffic congestion. [3] Many urban and peri-urban areas in the developing world are severely constrained by power shortages. [3] The close interaction between the urban and peri-urban areas, both in terms of raw materials and finished product transfers, indicates strong links. This leads to the energy needs of the urban area being greatly multiplied to address the energy needs of the peri-urban production systems and the supporting civilization. (Birmingham et al., 1998: 76-77).

### 3.4 Generating Wastes and Pollution

Urban wastes are legally or illegally disposed of in the peri-urban areas, often surpassing the absorptive capacity of these areas and having severe impacts on the health of the ecosystems and the population. Because of the availability of open space and good access from urban areas, the peri-urban areas are often the 'backyard' for waste disposal. In the peri-urban villages, waste management is the responsibility of local communities, and village dumps are mainly managed by women, who suffer disproportionately from the health hazards associated with this activity. [3]

The environmental impacts of liquid and solid wastes depend on their source, composition, volume and whether they are informally dumped into rivers or onto vacant land, burnt or disposed of in official dumps or landfills. This involves both poor management conditions for wastes generated in peri-urban areas and the neglect of the impacts of urban waste management on the wider region. Thus peri-urban areas require specific management approaches given the combination of different pollutants from multiple sources (domestic, industrial and agricultural). Industrial wastes demand particular attention due to the large amounts of potentially hazardous materials that they often contain. Heavy soil and water pollution by industries tends to impact agricultural land in the peri-urban area, resulting in declining productivity. Air pollutants from industrial urban and peri-urban-based activities also impose severe environmental impacts on a wider region. [3]

<sup>4</sup> Nottingham and Liverpool Universities, 1999, "Literature Review on Peri-Urban Natural Resource Conceptualization and Management Approaches", Peri-Urban Production Systems Research, Natural Resources Systems Programme, DFID (Project No. R6949), Final Technical Report, London.

#### 4. ROLE OF URBAN PLANNING

The above discussed processes of environmental changes caused due to peri-urbanization are amongst the most pressing global issues. In rapidly expanding peri-urban areas of Indian cities, these environmental pressures are individually and collectively an ever growing challenge to regional and urban planners where traditional challenges, i.e., issues of governance, funding, rapid growth (geographic and population), increasing need for support infrastructure (transportation, water, sanitation), expanding social services, pollution, slums, etc. are exacerbated by the need to more fully accommodate the direct and indirect impacts of environmental degradation and ecosystem loss in the planning process.

##### 4.1 Controlling the land use changes in peri-urban areas

Green belt concept has been attempted in India with the objective to control the development in the periphery and accordingly, green belts were provided around the cities in the master plans. Some of the cities were, New Delhi, Bengaluru, Jaipur and Chandigarh. In recent context, green belt concept was first adopted in Delhi Master Plan, 1962, in order to preserve land under intensive agriculture and to prevent over spilling of premature urban growth and subsequently followed in various other cities and towns. In the planned city of India, Chandigarh, the Punjab New Capital (Peripheral Control) Act, 1952 prescribes 8km radius green belt around the Master Plan area to prevent occurrence of slums and unwanted or unintended haphazard growth. Yet, there were physical developments in violation of Periphery control act which includes development of SEZs, SAS Nagar, unplanned conglomerate of industries without any supporting infrastructure and unauthorized constructions [5].

Jaipur Master Plan 1991 provides for green belt district which covers all peripheral areas between the urbanizable limits of 1991 and Jaipur Urban Area notified. Jaipur Master Plan 2011 with an objective to control the peripheral areas which are prone to urban expansion, proposed a peripheral control belt, extending beyond the proposed urban development. In this area, urban activities were proposed to be fully checked and only rural activities were allowed to continue. Although during the discussions in preparation of JMP 2012<sup>1</sup> it was given to understand that the concept of green belt may be diluted. In the case of Bengaluru city, Comprehensive Development Plan (CDP) 2001, was provisionally approved for conurbation area and green belt are. The public opinion was taken for adopting measures to improve the climate of Bengaluru by controlling encroachments on green belt, and not to shift green belt as far as possible. Revised Master Plan 2015, Vision Document also underlines that green belt in Bengaluru played a very useful role in limiting urban sprawl.

In all above cases the relevance of green belt, as a tool for protecting or controlling the periphery and thus controlling the

urban sprawl, has not been successful rather misused not only by the private sector and individuals but also by the law makers – central and state governments [5].

##### 4.2 Renewable and Non-renewable resources

World-wide, the construction industry is responsible for unsustainable practices of exploitation on renewable and non-renewable resources. According to UNCHS<sup>5</sup> “the consumption of energy in the manufacture of building materials and components is about 75 per cent of the energy requirement for the production of a building, the remaining 25 per cent being primarily used during on-site construction activities”. The production of building materials constitutes a livelihood opportunity for a large number of people in peri-urban areas and the displacement of sources of construction materials further away from urban areas can have a knock-on effect on their costs, at the same time, depriving people of their source of income and demanding more energy for the transportation of building materials. The environmental impacts of the mining activities and the manufacture of building materials can be certainly reduced through appropriate environmental management practices, for instance paying attention to the location of such activities in less vulnerable areas and to the implementation of rehabilitation measures. Energy management in the peri-urban area offers several opportunities for the use of renewable resources and a more decentralized approach to energy provision. [3]

##### 4.3 Waste re-use and pollution reduction

Waste Re-use in Hubli-Dharwad (India) illustrates some of the environmental problems and opportunities associated with waste utilization in the case of Hubli-Dharwad. However, in absence of proper methodologies there is a risk of creating new health hazards and attracting insect pests, which in turn requires the use of pesticides [3]. In the Hubli-Dharwad city-region there are two main industrial areas. One is Bellur, an industrial estate north of Dharwad, and the second is along Gokul Road on the outskirts of Hubli, a zone increasingly engulfed by residential areas. Although the existing plants have treatment facilities, the Karnataka State Pollution Control Board (KSPCB) foresees problems in ensuring that the new plants comply with the existing regulation. The second industrial area is a cluster of small industries. Most wastewater produced by these industries is inadequately treated, although there are preliminary plans by the State to subsidize the construction of communal treatment facilities, many industries are unwilling to invest in pollution control. In the Hubli-Dharwad conurbation there is a long standing tradition of waste re-use and recycling. Solid waste is sold to farmers through auctioning at dumpsites or by tractor-loads for a set price. The waste that is being used is generated both within the

<sup>5</sup> UNCHS, 1996b, ‘An Urbanising World - Global Report on Human Settlements 1996’, Oxford University Press, Oxford.

urban area and outside. Garbage from the municipal dumpsites is composted and sold as soil fertilizer<sup>6</sup>.

Most waste generated in peri-urban villages is composted by the household and the small quantities of compost produced are generally enough to be used only on small household vegetable patches. Agro-industrial waste (dung, poultry manure, sawdust, and rice and oil waste) is widely used in agriculture as well as for fuel (dung cakes and sawdust). Untreated waste water is used for irrigation but it might also contribute to health hazards as well as to more weeds and insect pests in the fields, which in turn leads to greater use of pesticides. Night soil from pit latrines and septic tank waste is also used as soil fertilizer. Despite the decline in the market for municipal waste, the increase in waste production in the coming years will on the one hand create problems of disposal, pollution and health hazards within and outside the urban area, while on the other it will also enhance the potential for re-use in agricultural production, energy production (biogas) and for recycling [3].

#### **4.4 Urban planning – an unused or underused tool**

In cities, democratically elected bodies and institutions pertaining to State authorities may uphold contradictory policies concerning urban development. However, appropriate institutions have generally been set up to manage cities. But the rapidity of urban growth has brought forth situations that are difficult to manage, especially in the distant fringes of cities, where these institutions have no authority and where prevailing regulations, when they do exist, do not suffice to deal with urbanization-related development issues. [1]

The introduction and expanded use of urban ecosystem analyses in urban planning and urban development is central to meeting these challenges. In particular, urban ecosystem management requires social, environmental, economic, and decision making tools and institutions that are flexible and can adapt quickly to changes in one or more of its components. Nowhere is this change more needed and urgent than in the immediate and adjacent areas of urban centers and peri-urban areas where the impacts are most concentrated. [6]

Unfortunately, urban ecosystem analyses of individual urban centers and their surrounding fringe areas represent a largely unused or underused tool in urban planning for the following reasons:

**“benign neglect” of ecosystems in urban planning:** Poor understanding of the urban ecosystem in terms of its constituent parts, poorly delineated in terms of its geographic

boundaries, and under-valued (if valued at all) in terms of its monetary and non-monetary benefits.

**“Carrying capacity”** i.e., ability to accommodate external influences such as pollution and other forms of environmental damage, has not been (or is not perceived to have been) exceeded. This represents a major compounding of risk to ecosystems in that in many cases environmental and ecological impacts must reach a “tipping point” before they are addressed.

**Poor understanding of geographic extent of an urban ecosystem** which is particularly true in the case of urban watershed ecosystems

**The issue of governance** is particularly important to address in the process of urbanization and especially in terms of coordination of urban planning for the urban center and that of local planners within the fringe zones. This issue is even more complex in terms of the planning and management of urban ecosystems. As noted above, because of their size, many urban ecosystems encompass complex jurisdictions of sub-national planning responsibility, such as those associated with large urban areas to local villages that in turn may lie within the planning for larger regional, provincial or special development zones. This system is further complicated by the overprint of planning emerging from the responsibilities of national ministries such as water, construction, environment and development. The lack of an integrated advocacy group for integrated urban planning for the fringe areas is arguable the largest single hurdle to overcome. Compounding the problem is that the local governments of the fringe areas often have only limited town/urban planning rules, regulations or planning capacity. As a result, their existing “urban planning” is at best incomplete and at worst non-existent. Similarly, the vastness and diversity of fringe areas and the piece-meal nature of development makes it almost impossible for local government to monitor and manage. [2]

#### **4.5 Integrating environment into urban planning**

For a city to grow and develop in the long term and to be effective and efficient, it must consciously integrate the environment into its planning and management mechanisms. The environment cuts across all sectors, income groups and management areas. Local governments are adopting innovative approaches and are becoming increasingly aware of the benefits of citizen participation in urban decision-making. Governance approaches which encourage urban stakeholders to have a say in the management of their city provide several entry points for the inclusion of environmental issues in urban planning.

Apart from sustainable development the various benefits through integrating environment in urban planning includes benefits to city budget from environmental policies which

<sup>6</sup>Birmingham, Nottingham and Wales, Universities of, 1998, Baseline Study and Introductory Workshop for Hubli-Dharwad City-region, Karnataka, India. Final Technical Report, Volume 1, Peri-urban Interface Production Systems Research.

encourage recycling and produce income from the sale of recyclable resources, while at the same time needing less landfill space. Energy efficiency can reduce municipal spending. Eco-efficiency can result in lower operating costs for local businesses, giving the city a competitive advantage [7].

Some of the instruments suggested by Cities Alliance study [7], that a city can use to integrate the environment into urban planning and management fall into several categories: policy instruments, process instruments, planning instruments and management instruments.

- *Policy instruments* provide guiding principles for urban decision-makers.
- *Process instruments* provide ways of doing something, steps that can be taken to reach a desired goal.
- *Planning instruments* offer a variety of methods by which urban development plans can be developed and implemented.
- *Management instruments* provide tools to direct and administer urban planning decisions.

## 5. CONCLUSION

Specific forms of urbanization are evolving on the peripheries of the large developing metropolises. These processes of peri-urbanization result in the formation of “mixed spaces”, midway between urban centers and rural spaces -transitional spaces subject to rapid and multiple transformations: physical, morphological, socio-demographic, cultural, economic and functional. Rapid urban expansion places an enormous burden on the planning process, i.e. planning for new development while simultaneously planning for the improvement and upgrading of the existing urban environment. As a result, in most urban centers the existing planning capacity is simply inadequate to an ever increasing task. The process and the resulting spatial form of urbanization is a function of many factors and are arguably different for each urban center. Local governments have an enormous influence on how urban-environment relationships develop, and on how their cities interact with their hinterlands and with the wider global community. Effective local governance can make cities more competitive, more efficient and more attractive to investors and workers by promoting the sustainable development of the urban environment. The urban planners are one of the key managers of cities and must give considerable amount of attention to include environmental considerations right from the beginning of any project and should also include suggestions on how to sustain environmental action within the context of the urban strategy and peri-urban systems. On the similar lines, municipal and public awareness on the environmental degradation and peri-urbanization issues have to be raised.

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