

Effects of Urbanisation

Unit 5

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Introduction

In the previous units you have studied the effects of over-exploitation of resources which has resulted in deforestation, desertification, pollution of water and air leading to climatic instability and other deleterious effects resulting from the use of protection chemicals, fertilisers, etc. In this unit you will study that the demographic explosion. Industrialization and modernisation have not only affected the environment, but also the social organisations, family structure, culture and even behaviour of human beings.

Urbanisation

Urbanisation is the process by which large number of people become permanently concentrated in small areas forming cities. The definition of a city or an urban area changes from time to time and place to place. The United Nations Organisation has recommended that member countries regard all places with more than 20,000 inhabitants living close together as urban: but, in fact nations compile their statistics on the basis of many different standards. United States, for instance, uses "urban place" to mean any locality where more than 2,500 people live.

The early human beings led a nomadic life. They were dependent on hunting and food gathering, which was essentially a group activity. During this period people used to explore large areas for their food. There were no permanent settlements. About 10,000 years ago, in the Neolithic period, human beings started living in relatively fixed settlements. But for perhaps 5,000 years such living was confined to the semi-permanent peasant village – semi permanent because, when the nearby soil had been exhausted of nutrients due to relatively primitive methods of cultivation, the entire village was usually compelled to pick up and move elsewhere. Even when the village prospered in one place and the population grew relatively large; it usually had to split into two, so that all cultivators would have ready access to the cultivable land.

The increase in population size converting the village into town and then to the city was accompanied by a great increase in the built-up area. Cities were usually walled to provide protection against enemies. The cities were also provided with adequate water facilities.

The combination of technological and demographic developments led to a momentous increase in the process of urbanisation. Immigrants from rural areas flooded into cities attracted by the availability of employment in the new factories.

Today, only a few cities support population equal to what the total earth supported few hundred years back. For example, at the time of Christ, the world's population was about 250 million. Today only a few cities can account for this population. By 1650 A.D. this population doubled to 500 million. By 1850, the earth population had become 1 billion. Populations of two billion, and 4 billion were recorded in 1930 and 1975 respectively. By 2010 AD the population on this earth is expected to double again and reach 8 billion. Urban centres have attracted a major portion of this increased population, especially during the last 200 years or so.

Effects of Urbanisation on Environment

In the previous section, you have studied that human settlements are growing tremendously throughout the world. This has resulted in environmental degradation in a number of ways, such as,

- 1) encroachment of agricultural and fertile land for housing, industries, construction of roads and dams, etc.
- 2) depletion in water resources due to increase in the water requirement
- 3) pollution from the industrial and other urban activity, and
- 4) emergence of slums, which deteriorate the surrounding areas.

In this section we will discuss the effects of urbanisation on environment in detail.

- 1) **Changes in Land Use** : Towns and cities grow with economic growth of human societies. These, therefore, emerge at locations where land provides a base for some viable economic activity both of agricultural and non-agricultural types. These therefore, subsist on land. As towns grow they invade the productive crop lands and rich forests. Both intra city and regionally open lands are converted into built-up area. Thus, the land with all its biological resources is irreversibly lost.
- 2) **Depletion of Water Resources** : Water requirement of the urban population also increases many times and almost all of it has to be met through the water supply system. With the rapidly increasing urban population, and limited resources it is becoming increasingly difficult to meet the requirements of the municipal water supply.
- 3) **Building Materials** : Construction of houses and other structures need large quantities of building materials.
- 4) **Industries** : Industrial development goes almost hand in hand with urbanisation. Metropolitan towns.
- 5) **Animals and Urbanisation**: Urbanisation results in construction of a large number of buildings, more roads, factories, parking places, etc. For all these, land is secured either by diverting agricultural land or by cutting forests. There may not be even one example where a large urban centre has been developed on barren land. It is always the agricultural land or forest land which is utilised. At some places beaches, lakes and rivers are filled to create land to accommodate the growing population. In these cases too, natural habitat is disturbed or destroyed.

Urbanisation also introduces new types of plants and animals. When human beings occupy any area they prefer to keep those animals and plants which are of immediate value. For example, dogs, horses, cows and other domestic animals, are maintained. Parks and gardens are created where plants of ornamental and economic value are cultivated. There is also another class of animals, which automatically start living in areas which are occupied by humans. There are rats, crows, mosquitoes, houseflies, etc.

Depletion of Wildlife

It is natural to locate cities and urban centres in agricultural regions. These regions supply food and other items of daily use. Seaport cities are usually at the mouth of a river where delta deposits are present. The deltas have rich soils. Similarly, highways follow the easy

terrain of river basins. The river basins have the best agricultural soils. Later urbanization tends to follow the highways. So, urbanisation and agricultural land have serious conflicts. Still, every year thousands of hectares of land which could support agriculture is occupied by urbanisation. You have already studied in the previous sections that to compensate the loss, new areas of land are converted into agricultural land. It is very difficult to convert barren and unvegetated and into agricultural land. So, this process always tends to encroach upon areas occupied by natural fertile ecosystems. Therefore, natural vegetation has to be cleared. With the clearance of natural flora, the animals (fauna) also disappear. Later, when agricultural ecosystem flourishes, entirely new types of plants and animals occupy the area. Certain urban centres have developed wholly at the cost of forests. At the construction of highways and railway tracts a large number of natural fauna and flora are eradicated. The effect of construction of highways and railway tracts is more adverse than the effect due to establishment of urban centres, because highways travel hundreds of kilometers across the forests to connect two urban centres. When urbanisation spreads in coastal areas or on the banks of rivers and lakes, there too the natural plants and animals are disturbed. First, the area adjacent to the water body is occupied, followed by dumping the garbage and soil into the water body. In this way the natural plants and animals present inside and outside the water bodies get eliminated.

When the natural species are eliminated, other species endemic to urban environment such as rats, cockroaches, sparrows, and similar other species take over their place. There is another dimension to this problem too. These species are found only where human beings live. They have the potential to adapt easily to the urban environment. Among these rats are the most successful. They immediately occupy the area and proliferate. Insect pests and weed plants are also in this category. Mosquitoes, house flies and many other insects can be classified in this category. All these then start competing with human population and create various diseases like malaria, plague, etc. Urbanisation, on one hand, eliminates many useful species and on other hand, it gives room to harmful species.

Domestic and Pet Animals

The association of man with animals has been in existence since a very long time. The interaction was first limited to wild animals, later, human beings started domesticating some of these animals for various purposes, like:

- i) for food,
- ii) journey,
- iii) carrying loads, as draught animals for tilling the land and for transport,
- iv) for pleasure.

Animals selected for domestication were generally hardy, docile, faithful or good looking, depending on their use. For example, strong animals like elephants, camels, horses, oxen are domesticated for their strength while dogs are kept for security since they are alert and faithful. Cows, buffaloes, pigs, chickens, etc. are domesticated for obtaining food in the form of meat, milk, eggs, etc. Lambs are kept for obtaining wool, meat, and milk. Cats are domesticated for pleasure as well as for killing rats. Rabbits and different types of birds are domesticated mostly for their ornamental values.

It is evident from the observations mentioned above that with urbanisation large number of species are introduced in areas which were earlier occupied by natural plants and animals.

Problem Focus - Challenges of Urbanization

Environmental Implications

It should be noted that urban growth has a number of positive impacts on the environment and human well-being, i.e. higher population densities mean lower per capita costs of providing energy, health care, infrastructure and services. Also, urbanization has historically been associated with declining birth rates, which reduces population pressure on land and natural resources. Despite all these positive impacts, almost all major cities of the region are increasingly plagued by environmental problems. Some major aspects are as follows:

- (a) As a direct result of urbanization, great threat to health and safety in cities comes from water and air pollution, especially at the households and community levels. While ambient air pollution impairs the health of almost all urban residents in many cities, indoors air pollution is particularly hazardous for women and children of low-income households who are regularly exposed to higher concentrations of air pollutants from cooking and heating sources in poorly-ventilated housing. Waterborne diseases are found most commonly in low-income neighborhoods as a result of inadequate sanitation, drainage and solid waste collection services. Health risks, especially to the poor, are also posed by pesticides and industrial effluents.
- (b) The productivity of many cities is adversely affected by traffic congestion and water pollution. The loss in productivity includes the total productive time wasted in traffic and the associated increase in the costs of operating and maintaining vehicles. The rising costs of treating polluted water for industrial and domestic purposes are damaging the productivity of urban economies. Fisheries are also being severely harmed by water pollution.
- (c) Uncollected and improperly handled solid waste can have serious health consequences. They block drainage systems and contaminate groundwater at landfill sites. In many cities, particularly those in Pacific island countries, it is difficult to secure land for waste disposal facilities, especially onshore landfill sites. Most cities in the region are also unable to manage the increasing amounts of hazardous wastes generated by rapid industrialization.
- (d) Conversion of agricultural land and forest, as well as reclaiming of wetlands, for urban uses and infrastructure, are associated with widespread removal of vegetation to support urban ecosystem and put additional pressure on nearby areas that may be even more ecologically sensitive. Groundwater overdraft has led to land subsidence and a higher frequency of flooding, particularly in the lowest-lying and poorest areas.
- (e) Urbanization in coastal areas often leads to the destruction of sensitive ecosystems and can also alter the hydrology of coasts and their natural features such as mangrove swamps, reefs and beaches that serve as barriers to erosion and form important habitats for species. Urbanization does not have only local environmental impacts but also large so-called 'ecological footprints' beyond their immediate vicinity. Intensive and extensive exploitation of natural resources to support urban economy includes excessive extraction of energy resources (including fuel wood), quarrying and excavation of sand, gravel and building materials at large scales, and over extraction of water. These all contribute to degradation of the natural support systems and irreversible loss of critical ecosystem functions, such as the hydrological cycle, carbon cycle and biological diversity, in addition to conflicts with rural uses of such limited resources. Other effects

can be felt further afield such as pollution of waterways, long-range air pollution that impact on human health as well as on vegetation and soils at a considerable distance.

Poverty

The growth of large cities, particularly in developing countries, has been accompanied by an increase in urban poverty which tends to be concentrated in certain social groups and in particular locations. Pollution especially affects the poor live at the urban periphery, where manufacturing and processing plants are built and where environmental protection is frequently weak. Environmental sensitive sites such as steep hillsides, flood plains, dry land or the most polluted sites near solid waste dumps and next to open drains and sewers are often the only places where low-income groups can live without the fear of eviction. The poorest groups thus suffer the most from the floods, landslides or other disasters that increasingly batter the cities of developing countries.

Waste Recycling - New Challenges of Sustainability

Waste generation in urban areas continues to increase world-wide in tandem with concentration of populations and increase in living standards, and has reached to unmanageable levels in many localities. High proportion of the waste could be recycled, not simply to reduce the amount of waste to be disposed of. The practice also provides an opportunity to generate income for the urban poor, to prevent environmental damages of waste dumping, and further to demonstrate less material- and energy-intensive consumption patterns. Promotion of sustainable consumption should have the far-reaching benefit of fostering domestic enterprises and pushing the production sector towards sustainable pathways. There is a need to develop an integrated approach where the public, private and community sectors work together to develop local solutions promoting sustainable waste management of material recycling.

Causal Factors behind Urbanization

General

The major reasons for increasing urban population are rural to urban migration, including international migration to a lesser extent, and the re-classification or expansion of existing city boundaries to include populations that were hitherto classified as being resident outside the city limits. These are estimated to contribute about 60 per cent of the region's urban growth, while natural increase counts for some 40 per cent.

Rural -Urban Migration

Primary driving forces of rural-urban migration include the opportunities and services offered in urban areas — especially jobs and education, while in some cases, conflict, land degradation and exhaustion of natural resources in rural areas are also important.

The patterns of rural-urban migration may be city-specific, reflecting, among other things, changes in the city's economic base, labour market and age structure. They also reflect social, economic and political changes within the region and nation and are influenced by economic factors in the surrounding and distant rural areas, such as landowning structure, agricultural practices and crop prices, and overall rural productivity. Most evidence suggests that increasing the income and level of education of rural populations accelerates migration and this phenomenon, coupled with the greater access to urban areas, has led to an inevitable increase in rural populations seeking employment opportunities in urban areas.

Links to Globalization

The steady increase in the level of urbanization reflects the fact that the size of the world's economy has grown many times and has also changed from one dominated by relatively closed national economies or trading blocs to one where most countries have more open economies and where production and the services it needs, including financial services, are increasingly integrated internationally. These trends appear to be strengthening, reinforced especially by the freer and faster flows of information and knowledge under the impact of new information technologies. Technology has increased the already dominant economic role and importance of urban areas worldwide, indicating the growing importance of cities in the global economy.

Mismanagement

It is often pointed out that many urban environmental problems are the result of poor management, poor planning and absence of coherent urban policies rather than of urbanization itself. The problem of urbanization has significantly been exacerbated by inappropriate incentive systems, such as the "growth-first" strategy adopted by the Governments of many countries in the region, especially in developing countries. In order to attract investment, industrial promotion policies are designed to offer privileges and incentive packages, including low-taxes tax regulations and subsidized infrastructure, with target to urban areas. Industrial growth, combined with inadequate infrastructure, inappropriate pricing of resources and services, and inadequate institutional mechanism to ensure environmental protection, further accelerates environmental degradation in urban areas. The 'land market' factors that accounted for exacerbating urbanization problems include inappropriate regulation, lack of tenure security, inadequate infrastructure capacity inadequate information, inadequate pricing and taxation, and weak institutions and poorly coordinated actors in the land market. All these factors necessitate significant improvements in overall urban governance to effectively reduce and bypass the urbanization problems.

Policy Responses and Tools to manage Urbanization

A variety of options in terms of policy responses and tools to cope effectively with the urbanization transition has been proposed and discussed for several decades. These options may be categorized in the following four strategic steps.

- a) National planning to control urbanization to manageable levels
- b) Regional / Urban planning to guide urbanization to manageable situation
- c) Intra-urban management to cope with urbanization problems
- d) Participation, Partnership and Governance
- a) *National planning to control urbanization to manageable levels*

In an attempt to ensure better management of urbanization, Governments have had adopted macroeconomic policies that are designed to mitigate magnitude of urbanization to manageable levels, or to keep people in rural areas. As a primary tool, a National Physical (Spatial) Development Plan could be established to address the mid- and long-term national direction on distribution of population; utilization of land; development of new land, water and energy; provision of infrastructure, housing and transportation that favour decentralized economic development.

Such planning approach, especially when coordinated with the overall economic policy as well as relevant sectoral development programmers covering, in particular, industrial and agricultural productivity, would be effective in establishing an orderly and consistent utilization of land on a national basis and providing the opportunity for urbanization issues to be addressed in the coherent way in the context of overall national development.

b) Regional and Urban Land Use Planning to Guide Urbanization

Following the provisions set by the national development plan, land-use planning and management tools at regional (sub-national, provincial) and urban local levels have long been expected to play a crucial role in avoiding and mitigating the adverse impacts of rapid, unplanned urbanization.

Regional planning tools for the purpose include the planned development of intermediate urban centres, promotion of polycentric regional network of urban centres, and economic development of smaller towns and cities in less concentrated areas in rural provinces.

At the city level, local governments have been encouraged to carry out an integrated land-use planning to comprehensively address adverse impacts of urbanization, including environmental problems. Zoning techniques, which may be applied to implement the master plan and to guide urban development to spatially appropriate areas, include designation of sensitive land resources and areas, establishment of buffer zones, management of hazard-prone lands, protection of cultural resources, conservation of open spaces and urban green, management of prime agricultural land, guiding and discouraging of excessive urban sprawl. Regulatory instruments such as land and household registration / information systems, property tax systems, land tenure systems, and building and land development permits are all important basic tools that can be strengthened for effectively implementing spatial planning and zoning techniques.

Compact development techniques such as 'smart growth' movement and sustainable city initiatives have been advocated to combat urban sprawl, promoting the build-up within an already urbanized area, redeveloping on cleaned-up contaminated sites or 'brown fields', and cluster development on reduced-size lots.

As a reaction to the shortcomings of traditional planning approaches, and more recently to address the needs of sustainable development, various countries have adopted new processes and approaches to urban planning. **Action planning** is a 'learning by doing' approach to resolve urbanization problems in a short term perspective, with minimum data collection and planning procedures. Local community participation in decision-making is deemed a key to success. **Strategic planning** is also a participatory approach to integrated urban development to achieve growth management and remedial actions at both the city-wide and community scales. The output of the process is not just a physical development plan but a set of inter-related strategies for city development covering land, infrastructure, finance and institutions

There are a number of technical tools which are now becoming widely used as part of effective urban planning approaches. Amongst others, **Geographical information systems (GIS)** are gaining increasing importance as a tool for decision-making in planning. The essence of GIS is to link together different data sets and present them clearly and concisely in a variety of ways. GIS can also aid short-staffed local governments in better managing rapid urban growth. **Land market assessments** provides accurate and up-to date information on land prices, supply of serviced land, present and future land projects, housing typologies, and other aspects of the housing and land market, and thus is used to support government planning and decision making, the evaluation of government policies and actions, private sector investment and development decisions and structuring of land based taxation systems. There are also a number of improved zoning techniques, such as mixed zoning, floating zoning, conditional or contract zoning and phased zoning.

Both rational decision-making regarding overall policies and implementing specific programmes to effectively address urbanization requires a sense of comparative risks. Environmental and socio-economic impact assessment and risk ranking are useful planning tools for this purpose. In addition to traditional zoning procedures, new techniques such as strategic environmental assessment are being adopted, as a means of integrating potential environmental considerations at the early stages of strategic policy formulation.

c) Intra-urban management to cope with urbanization problems

Despite all the policy responses to better manage the urbanization, as outlined in a) and b) above, the chances to prevent the urbanization transition would still be slim from practical point of view. Then, the challenge to many city managers still remains as to project and build the necessary infrastructure and services (housing, public transport; and sewage, water supply, and waste disposal systems) outpacing the wave of rural-urban migrants suffocate the existing urban agglomerations.

Successful urban environmental management may include the following sectoral elements; increases in resource efficiency, reductions in waste generation, improving urban infrastructure for water supply, the management and conservation of water resources in urban areas by improved waste water treatment and through legislation, setting up of recycling schemes, development of more effective waste collection systems, strict legislation for the treatment of hazardous waste, waste collection through public-private partnership, adoption of energy technologies by industry and households, and restoration of brown fields.

d) Participation, Partnership and Governance

Through experience, it has been learned that no amount of finance, technology or expertise can secure environmentally sustainable urban development — or protect the environment — if the fundamentals of governance are not participatory, democratic and pluralistic. Many developing countries have developed extensive regulations on pollution, most of which are not applied effectively because of the lack of proper institutions, legal systems, political will and competent governance. Unfortunately, particularly where economic and social change is rapid, established political and administrative institutions have proved highly resistant to change.

Improving the urban governance, in particular, through increasing transparency and accountability of policy formulation and decision making processes, is a key to success in implementing any urban management policies and plans. Participation of all stakeholders who are benefiting from relevant decisions and actions should be ensured at all levels of planning activities, in combination with greater access to relevant information and enhancement of public awareness of urbanization issues. Efforts to improve urban governance essentially involve activities promoting participatory processes; developing effective partnerships with and among all actors of civil society, particularly the private and community sectors; securing greater effective empowerment of local government, including greater autonomy in finance and legislation; and reform of unresponsive organizations and bureaucratic structures.