

# Challenges Posed by Rapid Urbanization and Scarce Resources

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**Abstract.** It is estimated that over 50% of the world's population now lives in cities and urban areas. These large communities provide both challenges and opportunities for environmentally-conscious developers, and there are distinct advantages to further defining and working towards the goals of sustainable cities. With people and resource located so close to one another it is possible to save energy and resources things such as food transportation and mass transit systems. This paper includes problems and challenges of modern urban areas regarding sustainability and their scenario in future if present development trend continues.

**Keywords:** Cities, Sustainability, Development, Resources

## 1. Introduction

By 2050 the number of people living in cities will have nearly doubled, from 3.6 billion in 2011 to more than 6 billion. Yet the world's urban areas are already overcrowded and, particularly in developing countries, suffer from shortages of clean water, electricity, and other resources essential to the support of their exploding populations and fragile economies. China, India, and Brazil are among the world's most rapidly urbanizing nations. In China, experts predict that by 2030 more than 70 percent of its people will live in cities, and that 221 cities will have at least one million residents. In India and Brazil, urban growth is explosive, expanding existing cities and creating new ones. In all three nations, cities have the potential to lift millions of people out of poverty and become powerful engines for social progress.

Rapid urbanization, however, poses substantial challenges. Poorly-planned, sprawling cities have the potential to undermine efforts to sustain economic growth, improve energy efficiency, curb greenhouse gas emissions, and secure clean water supplies. Although China, India, and Brazil are rethinking their approach to urban growth to prevent such setbacks, the leaders of many growing cities lack the training and tools needed to translate concerns into practical, cost-effective action. As a result, these cities risk making poorly-informed development decisions that will have long-lasting consequences.

## 2. Definition

### 2.1. Sustainable city

A sustainable city or eco-city is a city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food, and waste output of heat, air pollution-CO<sub>2</sub>, methane, and water pollution.

### 2.2. Urbanization

Urbanization is the physical growth of urban areas which result in rural migration and even suburban concentration into cities, particularly the very large ones. It can describe a specific condition at a set time, i.e. the proportion of total population or area in cities or towns, or the term can describe the increase of this proportion over time. So the term urbanization can represent the level of urban development relative to overall population, or it can represent the rate at which the urban proportion is increasing.

### 2.3. Scarce resources

A resource with an available quantity is less than its desired use. Scarce resources are also called factors of production. Scarce goods are also termed economic goods. Scarce resources are used to produce scarce goods. Like the more general society-wide condition of scarcity, a given resource is scarce because it has a

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limited availability in combination with a greater (potentially unlimited) productive use. It's both of these that make it scarce. In other words, even though an item is quite limited it will not be a scarce resource if it has few if any uses (think pocket lint and free good).

### 3. Facts and Figures

1. Half of humanity-3.5 billion people-lives in cities today.
2. By 2030, almost 60 per cent of the world's population will live in urban areas.
3. 95 per cent of urban expansion in the next decades will take place in developing world.
4. 828 million people live in slums today and the number keeps rising.
5. The world's cities occupy just 2 per cent of the Earth's land, but account for 60-80 per cent of energy consumption and 75 per cent of carbon emissions.
6. Rapid urbanization is exerting pressure on fresh water supplies, sewage, the living environment, and public health.
7. But the high density of cities can bring efficiency gains and technological innovation while reducing resource and energy consumption.

### 4. Practical Reaching

These ecological cities are achieved through various means, such as:

- Different agricultural systems such as agricultural plots within the city (suburbs or centre). This reduces the distance food has to travel from field to fork. Practical work out of this may be done by either small scale/private farming plots or through larger scale agriculture (e.g. farm scrapers).
- Renewable energy sources, such as wind turbines, solar panels, or bio-gas created from sewage. Cities
- Provide economies of scale that make such energy sources viable.
- Various methods to reduce the need for air conditioning (a massive energy demand), such as planting
- Trees and lightening surface colours, natural ventilation systems, an increase in water features, and green spaces equalling at least 20% of the city's surface. These measures counter the "heat island effect" caused by an abundance of tarmac and asphalt, which can make urban areas several degrees warmer than surrounding rural areas-as much as six degrees Celsius during the evening.
- Improved public transport and an increase in pedestrianization to reduce car emissions. This requires a radically different approach to city planning, with integrated business, industrial, and residential zones. Roads may be designed to make driving difficult.
- Optimal building density to make public transport viable but avoid the creation of urban heat islands.
- Solutions to decrease urban sprawl, by seeking new ways of allowing people to live closer to the workspace. Since the workplace tends to be in the city, downtown, or urban centre, they are seeking a way to increase density by changing the antiquated attitudes many suburbanites have towards inner-city areas. One of the new ways to achieve this is by solutions worked out by the Smart Growth Movement.
- Green roofs
- Zero-emission transport
- Zero-energy building
- Sustainable urban drainage systems or SUDS
- Energy conservation systems/devices
- Xeriscaping-garden and landscape design for water conservation

### 5. Problems

The Cabinet has approved the proposal of the Department of Land Resources , Ministry of Rural Development, Government of India to merge the two existing Centrally-sponsored schemes of Computerization of Land Records (CLR) and Strengthening of Revenue Administration & Updating of Land Records (SRA&ULR) and to replace them with a modified Centrally-sponsored scheme in the shape of the

National Land Records Modernization Programme (NLRMP), with the ultimate goal of ushering in the system of conclusive titles with title guarantee in the country.

## **5.1 Housing**

The most important problem in all cities has been housing the sudden and large scale influx of migrants from rural areas to urban areas especially the metropolises and state capitals. Due to lack of housing, in every city almost fifty percent population lives in slums. Slums are actually illegally created colonies of housing on open spaces in the cities. The structures are temporary they are very crowded and rows of such houses are separated by very narrow lanes through which household drainage is allowed to flow. As these are illegal colonies, they do not have any civic amenities like drinking water, sewage, electricity etc. As the slums start growing a local mafia gang takes over the control of the area through muscle power and both old residents and new entrants have to keep the mafia gang happy by paying regular doles. In return the gang assures the inhabitants security.

Many slums in big cities have been there for two or three generations. Families residing there develop their own inter linkages, mutual help, service providers of all sorts, retail shops and so on. Usually when a new slum comes up, it is first outside the city at that time but very soon, as the city grows the slums become a part of the city itself. Very often real estate dealers eye such slums for clearance so that they can build luxury apartments and make huge profits both on land value and on the apartments. The slum dwellers are uprooted and resettled in the outskirts of the city far away from their place of work. In addition the slum dwellers are broken up into groups and resettled in different locations thus causing much misery as the old linkages and mutual dependence are disrupted. On the eve of elections some of the unauthorized slums are regularized by the party in power to garner votes of the residents. Certain civic amenities like public taps, public toilets are provided. These facilities do not make much difference to the slum dweller because after elections, the facilities are neglected by the authorities. The slums however gain permanency.

At the other end, colonies of old houses of well to do families are demolished and multi-storied apartments are built to accommodate the richer immigrants to the cities. The old owners are usually compensated by allotting a few flats in the new building or partly through cash and partly through flats. Thus in these colonies where a few hundred families were living the number of inhabitants suddenly increases many fold putting tremendous strain on the civic amenities in the area like water supply, sewage, roads etc. Very often the municipal water supply is supplemented with a bore well. As more and more apartments get built, the ground water table sinks deeper and bore wells have to be drilled deeper. In many cases, the quantity of ground water taken out is much more than the replenishing rate and hence in due course existing bore wells go dry and new ones have to be drilled to greater depth. The strain on sewage disposal system is a different story. Individual apartments can do nothing in the matter. It requires the local administration to intervene and lay new drainage lines with larger diameter pipes. This involves major work and also damages the existing roads. For lack of funds, this work is not undertaken easily and the residents find existing sewage lines completely clogged and the sewage overflowing on to the roads.

Ideally, slums should be cleared and modest housing apartment buildings constructed by the government to accommodate all the slum dwellers. Preferably the flats should be leased out at affordable rents to the occupants. This way the slum dwellers remain in the area where they used to live and the linkages among the residents retained.

## **5.2 Waste disposal**

Another big problem that has arisen due to the large increase in population has been the enormous amount of solid waste generated. In a city like Bengaluru the solid waste generated daily is estimated to be around 5000 tons. The collection, transportation and disposal of this huge quantity of solid waste are posing serious problems to the municipality. Finding dumping grounds for this waste has become difficult. Dumping this sort of waste has created serious problems of pollution, ill-health and stink to inhabitants even a kilometer away. Recycling the solid waste material and converting much of it into usable products seems to be the only solution. Much research needs to be done on the disposal of various types of solid waste without causing any harm to the environment or the people. Incidentally, it has been suggested that even in the case

of human excreta, it would greatly revolutionize the civic amenities provision if a method can be invented to dispose of this waste at the site where it is generated

### **5.3 Public transport**

After housing and waste disposal, another major problem faced by people in urban areas is the lack of adequate public transport. As the cities are growing, distances to be travelled for work and other reasons are increasing. With more than half the population being poor or belonging to low income groups, public transport is a very important facility to be provided in urban areas. Unfortunately while the richer classes are buying more and more two wheeler and four wheeler automobiles, the average and below average citizen does not have access to adequate and affordable transport facility. As the number of motor vehicles increases, roads get cluttered, pollution increases and it takes longer to reach one's destination. Pedestrians and slow moving vehicles do not get sympathetic treatment either by the authorities or the other road users. Only recently local and state governments have woken up to this problem and metro rail systems are being set up at great cost for mass rapid transportation. Calcutta and more recently Delhi have very well managed metro rail systems but they are still not adequate. Mumbai and Chennai have had a long history of local train services but even they are proving inadequate with populations in these cities growing rapidly. Cities like Bengaluru and Hyderabad have just initiated action to provide elevated metro rail on a limited scale. Presently people rely mostly on bus transport but their number is not enough nor the roads able to accommodate all the vehicles now in use. There are frequent traffic jams further delaying people from reaching their destinations. The way forward is to restrict severely individual transport and increase manifold public transport both by road and rail. Public transport must be made much more efficient, regular, punctual, attractive and adequate. Then the need for individual transports will go down and the state would be able to put severe restrictions on use of individual transport as is being done in Singapore.

### **5.4 Shortage of Electric Power**

A very serious problem facing the entire country is the acute shortage of electric power both in urban and rural areas. This can be solved only by generating much more electricity than at present. However, this solution has met with almost a wall-like obstruction. Conventional methods of generation like coal based thermal power; nuclear power and hydroelectric power are being opposed by people for reasons of environmental pollution, displacement of people submergence of land and forests etc. There are some gas based power stations which are less polluting but due to lack of sufficient quantity of natural gas they are working at less than half their load capacity. Non-conventional sources of power like solar power and wind power are not that economically viable or affordable by the consumers. The power generation is also intermittent requiring large storage capacity for energy. One does not know what new problems will arise in storing energy on such large scale.

### **5.5 Security**

Finally a very recent problem in large cities where all sorts of people have settled down has been the security situation. Well to do citizens are being forced to organize their own security. This is the reason for the coming up of gated communities with private security arrangements. Entry to these communities is strictly controlled and monitored by the security staff. This is a sad reflection on the capacity of the authorities to provide security to their citizens. Thus almost all major cities in India are facing serious problems of slum clearance, housing, inadequate civic amenities for a fast growing population, absence of efficient public transport system, the growing insecurity in the cities and so on. Problems will become more acute and may go beyond repair if immediate steps are not taken to solve at least some of these problems. Meanwhile the forecast is that half the country's population will be living in urban areas in another two to three decades. This trend needs to be reversed urgently by providing urban facilities in rural areas and locating several industries and providing employment opportunities in rural areas.

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## **7. References**

- [1] The Big Idea Building sustainable cities, Harvard Business Review, South Asia, July-August 2013. Retrieved from HBRASIA.ORG
- [2] Sustainable Cities, Rio+20 The Future We Wan, Retrieved from UN.ORG
- [3] World Recourse Institute. Cities and transport, what we do. [Online]. Available: [www.wri.org](http://www.wri.org)
- [4] <http://en.wikipedia.org/>