

ABSTRACT

With the rapid pace of urbanisation worldwide, urban sustainability has become a very important issue today. On one hand urbanisation has been a vehicle of economic and social progress; on the other hand it has led to serious environmental and socio-economic problems. The sheer magnitude of the growing urban population and its concentration in particular areas have a damaging effect on the environment once the carrying and renewal capacity of the ecosystem is exceeded. Unless properly planned and managed, this alarming growth is increasingly resulting in haphazard urban sprawl, mounting stress on infrastructure, creation of slums, a widening rich–poor divide, degradation in quality of urban services, increase in energy use, depletion of non-renewable resources, environmental pollution and poor quality of life and deterioration in the social fabric.

The decision makers are now well aware of the contradictions and dilemmas associated with urban development. The course taken by urban development over the next few decades will play a crucial role in the trajectory of fundamental health and wellbeing of the human species and all forms of life on earth. There is a pressing need that the planners and policy makers focus on to what level the urbanisation could be permitted, so that either the impact on the environment stays within sustainable limits or there is a possibility of replenishing resources and recovering from impact on environment within a reasonable time frame. When the former seems to be a more viable option.

The city planners and policy makers require a set of tools to arrive at a sequence of logical actions which could help them in making judicious resource allocation and informed decisions for continual improvement of human settlements. The ‘Agenda 21’ adopted at Earth Summit in 1992 recognised the importance of development of sustainability indicators by

countries to make informed decisions at all levels concerning sustainable urban development for protection of the natural environment and livable built environment with low pollution levels. At the global level the various initiatives associated with sustainable urban development have gained momentum and taken a formal shape in the last few decades. However in the developing countries like India these efforts have helped mostly in raising awareness about the future urban development challenges and environmental crisis. India though a regular participant in various international conferences on environment and sustainable urban development, is dedicated and resolute to follow global commitments there seems to be lack of concerted efforts and action at local level in this direction. The tackling of these issues on the local ground requires a different perspective as the urbanisation and environmental problems are different in nature, scale and focus in the developing countries.

The concept of sustainable development and its interpretations could make the scope of research work very vast, because it brings together various disciplines like sociology, economics, public health, environment, development and planning. The present study focuses primarily on urban environmental sustainability and issues of economic and social sustainability have been touched upon. However, apart from the physical environment those areas where social and economic factors exert an environmental effect have been considered suitably as necessary.

The present study is based on the research premise that the urbanisation need not be there at the cost of quality of environment and the pace of urban development requires informed monitoring and control. Environmental sustainability of an urban settlement requires fulfilment of basic needs of its inhabitants through judicious use of natural resources and minimisation of waste output so as not to exceed ecological carrying and renewal capacity of the ecosystem.

The research study reviews few major existing sustainable development indicator initiatives at global and regional (Asia) level which are varied in terms of their structural framework, salient approach and methodology, coverage of aspect of sustainability and area of study and implementation.

The study emphasises on importance of developing a set of simple and effective sustainability indicators in India at various levels. The careful framing, monitoring and interpreting of the indicators would help the urban areas in India to assess the present state of the sustainability, highlight critical aspect of the environmental status of the system and to devise future action plans or policies to ensure inter-generation and intra-generation equity. Apart from broader indicator sets at national /city and local level, it also emphasises on developing a comprehensive micro-level urban ecosystem sustainability assessment indicators to overcome the hindrance of data availability and for successful implementation of action plans with community awareness, education and participation.

The research study recommends a conceptual approach, a methodology and a structural framework for formulating the sustainability indicators set at various levels for urban settlements in India. The approach is based on a framework which focuses on resource dynamics of urban settlements and a domain based classification has been followed wherein domains have been identified based on essential natural, built in, human resources and capital resources. The eight domains focused on are air, water, land, housing, infrastructure, energy, population and finance. Furthermore, each domain environmental sustainability determinants have been recognised and based on them multilevel indicators identified with a goal of greater livability and improved quality of life.

The indicators represent primarily a tool to assess the state of the environment, to keep track of the changes in the environment, to do a

performance review of the environmental policies, to inform the general public about the state of the environment and raise their awareness and sensitivity. It will also provide a guidance to policy makers and potentially assist in decision-making and formulating local strategies/plans.

The study further investigates if the present pattern of urban development in India is sustainable from the environmental perspective by using the formulated set of indicators in measuring the environmental performance of the urban settlements in India at both macro and micro level. The state of the environment has been assessed and compared with the national standards or threshold levels and a composite Environmental Performance Index (Macro) has been developed for the eight most populous metropolitan cities in India (with population of five million plus) , namely Mumbai, Delhi, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad and Pune. Weightages through experts opinion have been calculated and assigned to the eight domains. The cities have been ranked accordingly. The data from thirty two indicators from eight domains have been correlated to find out if relation exists between the indicators of the same or different domains. At the micro level three settlements (within close proximity) in Delhi at micro level Environmental Performance Index (Micro), namely CPWD Colony, Mohammadpur Urban Village, a cluster of Squatter Settlements (jhuggi jhompri / slums) selected for their varying density, planning and socio-economic character.

Measuring the environmental performance of urban settlements presents many challenges. The collection of reliable data and organisation of information in a way that is valid, efficient, comparable across cities to address the various sustainability issues are the major challenges. Planning norms and national standards have been used as benchmark wherever available. At the micro level because of the non-availability of detailed and reliable data on many parameters, data collection has been done primarily through field survey, from local urban bodies, offices of the elected representatives at various levels of the settlement.

The outcome of the study is in the form of policy guidelines and action agenda for incorporation of environmental sustainability in the spatial planning process and development plans in a decentralised system of governance through formulation of sustainability indicators to strengthen the data collection for plan preparation process and provide useful inputs at different stages of planning, monitoring and review of development plans and policies.

It is suggested to replicate the designed sustainability indicator tool for assessment of environmental performance of urban settlements at various scales incorporating the modifications as per the local context. The study also strongly recommends introducing an environmental performance based incentive system for allocation of funds and resources at the city and the local governance level to make the local bodies more responsive to the various environmental issues and creating an atmosphere of public participation.