CORRESPONDENCE

SIGNIFICANCE OF URBAN GEOSCIENCE IN THE 21st CENTURY

The art of city building began about 5,000 years ago and the ruins of the Indus Valley Civilization in northern India and Pakistan give glimpses of it. The journey from the Mohenjo-daro-Harappan times to the present has been a long one and the metropolitan cities of today's world speak volumes about human achievement in this direction. But along with this we have inherited a series of environmental problems that are becoming increasingly difficult to handle and which is directly affecting the standards of living.

Global population is growing at an alarming rate, thereby resulting in the explosive growth of urban centres around the world, which in fact are pockets of concrete jungles destroying the delicate balance of the nature. Given the present trend of development, cities are going to revolutionize the early 21st century and there will be heavy demand on the land and water resources. According to UN estimate, the world's population will cross 7 billion by the year 2010, when there will be some 22 mega cities around the world with more than 10 million inhabitants, which include the Indian cities of Calcutta, Mumbai and Delhi.

Modern cities present an entirely different canvas to the earth scientist where the conventional paradigms no longer apply and a different set of processes operate. This due to the highly artificial nature of the urban land-water-air environment, that is much different from the natural one seen in the rural areas. Urban land surfaces are mostly covered with concrete or tar, their natural slopes are modified, and air and water flow either checked or restricted. Text book descriptions of the geological processes are of little help in analyzing the urban geomorphological and geohydrological systems, since the terrain is a highly modified one, where man is the chief geological agent, eroding landforms and changing drainage patterns at a rate much faster than that of nature. Geomorphic agents such as moving air and water operate upon artificial surfaces and follow courses set by man rather than their original ones. Precipitation mostly falls on paved surfaces and percolation is very limited and sporadic, as most of the run-off is conducted out of the city through the drains. The consequent land-water-climate problems such as water logging, lowering of the groundwater table and changes in the meteorological parameters such as rainfall, air temperature and wind pattern are becoming increasingly difficult to cope up with.

Proper knowledge about the working of the geological processes in the urban areas is of paramount importance for devising better ways of land and water management. The basic philosophy of science has been to adapt to fresh challenge thrown by man and nature, and it is put to test again in the light of the urban revolution that has already taken us to the next century. In this context, developing the subject of urban science as a separate discipline to understand and manage the city landscape is highly important to improve the quality of living. This subject is being discussed and analysed in various fora in an informal way, but concrete steps to popularize the discipline are yet to be taken. We have to refashion our priorities. At the university level this should be included in the educational curriculum of Geoscience and more research should be encouraged in this field. The Central and State Governments should take special interest in taking up problems related to urban land-water management targeting in vulnerable areas.

As earth scientists we can effect significant and positive changes towards sustainable urban development by popularising urban geoscience.

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