

## GEO-ENVIRONMENTAL EFFECTS OF URBANIZATION IN THE RIVER CHANNEL : A CASE STUDY OF RIVER MOSAM BETWEEN MALEGAON CITY

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Current environmental problems have evolved into a complex set of interdisciplinary issues involving ecological, political, economic, social, as well as physical and biological considerations. Modern environmental studies must include the study of the urban environment as well as the natural environment. Environmental studies are the systematic study of human interaction with their environment. It is a very broad field of study that includes the natural environment, built environments, social environments, organizational environments, and the sets of relationships between them. Environmental studies are distinct from ecology and environmental science.

Environment studies can be defined as the branch of study concerned with environmental issues. It has a broader canvass than environmental science and includes the social aspect of environment deals with the anthropogenetic factors, mainly human intervention. The growth of world's population has continuously been higher than that of the growth of total population. Most of the world's economic activities take place in cities and even a person without any skills can almost always find some means of earning a livelihood in the city. Increasing urbanization, however, place enormous pressure on the local resources of a city. As the city grows its ecological footprint even faster. Environmental problems increase, water scarcity intensifies, more and more waste piles up, the air quality deteriorates, public transport system get overloaded, traffic jam increases and so on. Garbage waste is a major load on the cities and rivers are the best suitable places to dump garbage in cities. We are consuming natural resources at a rate higher than that at which nature can regenerate them. We are polluting the environment at a rate greater than its ability to absorb the pollution. This is an unsustainable way of living and it can only lead through an environmental and social catastrophe.

Urbanization may led to flooding, deposition of the sediment, pollution and changes in drainage basin characteristic in the form change in channel which

alters overall hydraulic geometric of the channel. Most of the rivers in the cities are the examples of these types of changes. River Mosam in Malegaon is not exceptional to the hypothesis that all the types of wastes are dumped in the river.

### Hypothesis:

Rivers in urban area have to change their morphology in order to maintain state of equilibrium.

### Aims and Objectives:

- 1) To study the physiographic characteristics of river basin.
- 2) To study the impact of urbanization of river channel.
- 3) The observation flood channel and achieve channel.
- 4) Locate the construction in river channel.
- 5) To study of sediment of deposition as a stream flows.

**Study Area:** This aspect has been specifically elaborated because Malegaon, the urban center under study, has some relevance to it. In Maharashtra various types of urban region have been developed. Each urban center has its own characteristics form & identify. Malegaon is well-known city for Handloom and power loom. Malegaon is second largest city in respect of population in Nasik district of Maharashtra. As per 2001 census, the population is 790000, presently it is Taluka head quarter.

The city is situated on the 20°32' North latitude & 74°35' East longitude. The average height of city area is 429.4 Mts. above the mean sea level. Malegaon city has an area of 12.95 sq. km. Malegaon city lies on the National Highway No.3. Railway junction Manmad lies at the distance on 36 km to the south of Malegaon the city of Malegaon. The city of Malegaon is on the bank of the river Mosam, which joins the Girna River further to the south. It is a part of Western Ghat which is known as Sahyadri Mountain in this area. Naturally the city lies on the lee-ward side & therefore this area suffers from low rainfall.

Malegaon receives 436.7 mm. Annual Rain fall &

most of it comes during the Monsoon period from June to Sept. Similarly Malegaon experiences a very high temperature during the pre-monsoon period that is April and May (maxi. 44.06° C & mini. 35°C). As well as in rainy season it experience 30° C maxi. temperature at 23°C mini. temperature.

**Source of Data**-Data have been collected through the field work only.

**Methodology**-Surveying methodology of present work is divided in two parts, 1) Pre-field investigations and 2) Post field investigations. In the pre-field observatory location and drainage maps have been prepared from the survey of India toposheet i.e. 46 L/ 10. With the help of the basic map, the detailed investigation have been noted systematically. The data have been analyzed with suitable geo-statistical methods. In the post field investigation, the results of the previous analysis have rechecked in the post field investigation.

**Previous Literature**-It has opined by most of the environmentalist and geomorphologies that we can stop the development but the effects of the urbanization can be controlled by some or other way. Cooke and Doornkamp (1990) has said that the most obvious manifestation of urban development is an increase in impervious cover and the corresponding loss of natural vegetation, land clearing, soil compaction, riparian corridor encroachment and modification to the surface water drainage network all typically accompany urbanization often quantified in terms of the proportion of boon area covered by imperious surfaces.

The study worked out by Gilewska (1964) focuses on the effects of hydraulic geometry of the Ekulu river in Enuke south eastern Nigeria the three section of river properties upstream of the town within the town and down stream of the town-urban hydrological routine due to urban drainage human traffic across the river banks. Gidding (2005) opined that landscape changes associated with urbanization have been showed to after flow regimes of stream that in turn after channel morphology aquatic habitat and biological communities in order to mitigate the effects of urbanization on biological communities, it, is, important to understand the hydrologic links between these infractions. Stream bank vegetation significantly the morphology of streams in the piedmont region of the rivers allowing us to determine the combined influence of riparian vegetation and urbanization on

channel morphology (Kale and Gupta, 2002). Rajgopalan (2005) in his environmental studies discussed the severe environmental degradation due to urbanization in which example of river Meethi and Dharavi slum is focused. Many others have also discussed many more aspects of urbanization on changing hydraulic geometry of river.

**Discussion**-The investigations have been completed with taking observations from different sites. The selection of these various observation points have based on the primary observations, considering their geo-environmental characteristics. The selected observatory sites and results of the analysis are as fallows.

**1. Vadgaon-Camp site**- This is the initial site of where river Mosam entered in Malegaon city. This site is to the north part of Malegaon. It flows to the north-south direction. It is an active channel but narrow. It is because of waste material, filling the banks by the people and barrier of vegetation cover. In summer and winter seasons the width of channel decrease from 3.0 to 2.0 m. Though it comes in urban area it is also filed to garbage material which effects on surrounding environment towards the other activities.

**2. Dyane-Camp Site**-It's the unique example close to Shreeram-nagar side, channel or natural river situation have been disappeared due to the construction of the river banks. Consequently the natural channel width and depth have been reduce due to impact on urban morphology but such process will be harmful for nearby surrounding area in rainy season. So the flood situation is occur in narrow channel belt such situation presently observe front of Dyane-camp site or Shreeram-nagar side.

**3. Mosam pool (bridge) Site**-Generally we can observe that downstream of river channel; vegetation cover is seen as well as at some patches has been used for brick making activities as well as cowshed. For this activity people acquire large place for brick industry and cowshed as well as some place acquire for cow-dung collection. These people provides bricks for building construction and cow-dung for agriculture. It is clearly show that the people have encroached the channel.

**4. Sandawa-Ramsetu Site**-Not only building construction or urban morphology influence of river channel downstream of Mosam river near by Mosam-pool, Sandawa-pool as well as Ramsetu between

Malegaon and Sangmeshwar. This is the central part of Malegaon city and Mosam river. Channel is show the polluted water in this stretch. Consequently , channel flow depth reduced and channel network width is stable due to bank construction. In this way saline channel proportion is increases and its impact on surrounding environment and under- ground water table . Such condition is very danger for futures environment and its living organism.

**5. Mahadeo mandir site-**This is the last site of Mosam river where river leave Malegaon city and joins river Girna on the height of 420.4m. above mean sea level. Urbanization morphometry rates are influence on downstream of Mosam river. In this river channel same conditions have been occurred its major caused garbage material , brick industry , cowshed and vegetation cover. At many places , new constructions ( i.e. Huts , slums) are observed on the bank of such small patches and the rate of garbage, thrown in the river sites is growing day by day.

**Findings-**Through the development takes place with urbanization but it should be in planned manner. Increased population close to river definitely disturb and intervenient the channel. On the basis of

observation during the field work and the analysis done with the help of survey the following point have to taken in to conservation.

1) Cross section of the area reduced on large scale. 2) Actual channel flow is very narrow and banks are flanked by vegetation or garbage deposition 3) Velocity has been reduced because of the repair vegetation and deposition in mid channel. Besides these changes which have altered the channel geometry, following things are also important as part of pollution which can have effect on human health of adjoining areas.

1) Deposited waste materials, e.g. hospital and domestic wastes, plastic garbage, etc.

2) Development of big industries along channel and their sewage water.

3) Development of garden going to causes alteration in channel.

**Suggestions:** 1) Solid waste should be dump in river. 2) Sewage water should be stopped. 3) Brick industry affect both way hence it should be taken away from the river. 4) Corporation should have arrangement of solid waste as well as sewage.

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