

# **GEOGRAPHIC INFORMATION SYSTEM APPLICATION FOR MONITORING ENVIRONMENTAL CHANGE AND RESTORATION OF ECOLOGICAL SUSTAINABLE DEVELOPMENT OVER DELHI RIDGE**

*Dr. Madan MOHAN, India*

**Key words:**

## **ABSTRACT**

### **1. BRIEF INTRODUCTION**

Over exploitation of land, forests, water and air and the failure to tackle the problem of ecological degradation have exposed humanity to the threat of environmental change. The ecological degradation is increasing, largely because of human activity. Ecological restoration is becoming clear, and heightens rather than reduces our concern about anthropogenic environmental change. Delhi Ridge forest cover has failed to meet reduction targets for greenhouse gases emission in the Delhi due to constant concrete jungle sprawl over the periods. Direct aspects of reducing environmental change include investment in technology to combat emissions; appropriate building and settlement design, fuel-efficient transportation; and reducing fossil-fuel inputs to industry, etc. Whereas, indirect possibilities include the adoption of landuse practices that sequester high volumes of carbon e.g. afforestation, forest conservation and ecological restoration. So, over the Delhi Ridge, there is less concern with ecological change, especially in the face of rapidly growing population of the Delhi. It must be recognised that an almost all-human activity includes either directly or indirectly caused environmental pollution. However, the vulnerable impact of environmental change on Delhi Ridge includes ecological imbalance, deforestation, population growth, quarrying/mining activities, urbanisation, and industrialisation.

### **2. DESCRIPTION OF METHODS**

The new technological tool, the Geographical Information System (GIS) will be applied in order to analyse spatial information for the environmental change implications over Delhi Ridge. The impact of developmental activity and new technology on environmental change brought on by (a) deforestation; (b) quarrying; (c) urbanisation and; (d) industrialisation etc. is to be worked out. Further, sustainable ecodevelopments and applications of integrated GIS approaches should help provide solutions for many of the emerging environmental change problems at local, regional, national and global levels, and may become the preferred environment for ecological modeling.

### 3. SUMMARY OF THE RESULTS

About 100 years ago, geographers, meteorologists and climatologist were concerned with the notion of climate variability, and anthropogenic environmental change due, for instance, to deforestation and reforestation. Forest cover is another the most important biophysical parameters used for monitoring environmental change. Vegetation regulates energy exchange between the earth surface and atmosphere's lower layer. Changes in vegetation cover regulate long-term climatic changes at the micro-region level. So, it is essential to monitor vegetation cover over the periods of time to assess environmental conditions especially in case of the micro-region like Delhi Ridge, which is functioning as a green lung for the Delhi.

There is a rapid increase in the level of air pollution due to the rapid expansion of the urban and industrial activities. The atmospheric pollution in Delhi environment is increasing, largely because of diverse human activities. Rapid population growth and urbanisation are expected to further increase in the Delhi's population by 2010. The Delhi is at risk to the impacts of environmental change, including accelerated global warming. In contrast to historical precedent, a proactive approach is to be recommended towards ecological hazards and changing levels of risk with time. Low-cost measures to maintain or increase future flexibility of response to environmental change need to be identified and implemented as part of an integrated approach to sustainable environment development management for the Delhi Ridge.

The Delhi's population, one of the principal divers of environmental stress, during the 90 years period has grown by about 24.68 per cent per year since 1901. Other trend includes increases in atmospheric CO<sub>2</sub> and ozone depletion. Now, at micro-regional level attention is focused as never before on environmental change problems. A number of steps being taken by the government of Delhi to promote non-conventional energy sources. The use of such sources is not gaining ground as expected in Delhi, due to high initial costs; concerted efforts are needed to achieve this goal. The use of non-conventional sources could reduce... energy-related CO<sub>2</sub> emissions 11.8 per cent below 1988-89 levels by the year 2005-2006. However, to sustain economic growth, energy systems must increase economic productivity and competitiveness, put more people to work, and reduce environmental degradation.

### 4. CONCLUSION

The developmental activities have widely affected the Delhi Ridge environment. Over exploitation of land, forests, water and air and the failure to tackle the problem of climate change and ecological degradation have exposed humanity to the threat of ecological and environmental crisis. It is very important for policy makers to understand these problems, assess their implications and formulate policy guidelines. However, the present research is based on the assumption that development should take place without destroying the environment. What is important is the sustainability of development over a long drawn period of time rather than the ephemeral nature of development the gains of which will only be available by the present generation. Hence, a composite picture of the developmental

impact on the environmental change and ecosystem will be developed with a view to developing prognostic models of man-nature interaction in the ecologically sensitive Delhi ridge.

## **BIOGRAPHICAL NOTES**

Dr Madan Mohan is Lecturer in Geography at Department of Geography, Faculty of Natural Sciences at the Jamia Millia Islamia University in New Delhi. His specialisations are ecology, computer application to GIS and remote sensing and urban development. He has obtained PhD (Ecology and Development) at the Jawaharlal Nehru University in New Delhi 1998.

Dr Madan Mohan has published a book *Ecology and Development*, Jaipur (INDIA), New Delhi, Rawat Publications, 2000.

## **CONTACT**

Dr. Madan Mohan  
Lecturer in Geography  
Department of Geography  
Faculty of Natural Sciences  
JAMIA MILLIA ISLAMIA (Central University)  
New Delhi - 110 025  
INDIA  
Email: madan\_ge@jmi.ernet.in or roshnlal@ndb.vsnl.net.in