

# **Geohazard Risk Reduction Studies for Sustainable Development – An Outline**

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## **Abstract**

### **Introduction**

The increased frequency of occurrence of natural disasters is becoming a great challenge for sustainable development as it causes loss of life and loss of property. The earth system is highly dynamic and natural disasters are unavoidable. It is experienced that the adverse effects of natural disasters can be reduced to a reasonable extent by conducting pre-disaster geological studies conditions and suggesting mitigation measures. As the natural disasters seriously affect the sustainable development of the country, the authors in the article attempt to focus on some aspects contributing to drought conditions and role of Engineering Geology and Landslide/Earthquake Divisions of Geological Survey of India (GSI) in the area of Geohazard Risk Reduction and mitigation measures from geological and managerial perspective.

### **Methodology**

Disaster Management and Sustainable Development are multidisciplinary in nature. In this paper, a Geologist and a Public Administrator view the efforts of Engineering Geology and Landslide/Earthquake Divisions of GSI from geological and managerial perspective. The paper is a descriptive case study based on blending of available literature as secondary data source and participatory observation as primary data source. It mainly focuses on the charter of operation of the GSI relating to conduct of multidisciplinary as well as fundamental Geoscientific research and studies in the field of geotechnical investigations, physical, chemical and biological hazard geoinvestigations, climate change geostudies, paleogeostudies

etc., and suggests some mitigation efforts through geological application for socio economic sustainable development.

### **Discussions**

Geologists of the Engineering Geology Divisions in GSI contribute their expertise in geotechnical investigations for water resources projects like dams and canals for irrigation purpose, construction of tunnels for transport, irrigation, communication purpose, construction of big chimneys for manufacturing factories, application of geotechniques in buildings for urban development etc. Besides Engineering Geology division considerably contribute in conservation of monuments and heritage sites and morphometric analysis for neotectonic evaluation of river basins.

The authors mainly discuss on the recent contributions of the Engineering Geology divisions in the area of Geohazard Risk Reduction and Sustainable Development. The new innovative geotechnical approach in exploring the remote and rugged mountains terrain by heliborne geophysical survey method is likely to demonstrate the expertise available in the GSI in reducing the Geohazards in the coming years and also in finding out geological solutions for its mitigation, suggesting ways and means for Sustainable Development. The authors further appreciate the valuable contribution of geologists of the Engineering Geology Divisions for large civil engineering structures including nuclear power plants, hydropower projects with reference to geological conditions and thus ensuring Geohazard Risk Reduction and sustaining the socio economic development activities of the nation.

**Conclusion:** The authors suggest the following points for meeting the challenges of Geohazard Risk Reduction and Sustainable Development

- Increasing the capacity of all Geoscientists in the field of Geohazard Risk Reduction by capacity building through training in National Research Centre for Geohazards and Training.
- Conducting studies related to geological and geophysical conditions as it substantially contribute in predicting geohazards risks related to landslides and earthquake and suggesting ways for disaster management.

- The “Three National Centres of Excellence for Geological Research” will help in integrating the efforts of other Institutions in the related field of sustainable development from “Geoscientific Perspective” for an integrated approach.
- Local communities need to be made aware about the geohazard risk conditions, as such the state and central governments enhance awareness programmes.

The authors conclude that GSI through its emerging three National Centres for Geological Research, Geohazard Research Centre and Training Institute is capable to contribute a lot in Engineering Geology for socio economic sustainable development activities of nation and reducing risks related to Geohazards. The competency of the GSI will be made well known in the papers being presented by the Geoscientists of the GSI in the year 2020 during the International Geological Congress.