GIS BASED GEM POTENTIAL MAP: A CASE STUDY FROM MORAGAHAKANDA RESERVOIR AREA, NAULA

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ABSTRACT

Gem potential mapping is a complex of analytical process, which requires consideration and integration of a number of spatial evidences like geological, geomorphological, topographical etc., using the capability of analytical tools of Geographic Information System (GIS). Though the study reveals that in the Amban Ganga and its catchment area promise to have a tremendous gem potential, the area is to be inundated by the proposed Moragahakanda reservoir. As a result, these resources are to be screened forever and country will lose considerable export revenue.

This modeling is an attempt to re-examine the huge inventory of spatial as well as attribute data in GIS datasets in the light of certain evidences recognizable on a regional scale – the existing exploration model, favorable for formation of gem deposits. The input data for the analysis include lithological, geomorphological, topographical, structural and remote-sensed (satellite imagery) evidences.

A knowledge driven weight on evidence approach was employed to establish relationship between the input datasets and exploration model. In this approach, individual basic layers of evidences are integrated in maps on the basis of a score assigned, according to their influence towards formation of gem deposits. Each element of the input layer used as evidence is assigned a different score (weight) to generate secondary factor maps. In the next phase, the factor maps were combined with different map weight depending on their relevance towards the formation of gem deposits. Finally, all the factor maps were

integrated to generate a gem potential map by additive union using index overlay method. The resulting gem potential map in probability scale was cross validated by plotting the known mineral deposits, the model shows good match. It further identifies gem potential localities in categories as high potential, potential, moderate potential, law or no potential in the study area.

The study suggests that the Remote Sensing and GIS can be used not only as a powerful tool but also as a modeling tool for gem exploration.