# Multi-Hazard Risk Assessment for Developing Risk Sensitive Land Use Plan Using Geospatial Tools: a Pilot Project from Godawari Municipality, Sudur Paschim Province, Nepal

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**Key words:** Multi-hazard risk assessment; risk sensitive land use plan; Nepal

**SUMMARY**

The multi-hazard risk assessment (MHRA) is relatively a new tool that is based on scientific modeling after analyzing the database obtained from the field and literature. The research work is intended to apply the outcomes of MHRA in developing risk sensitive land use plan (RSLUP) as a pilot project of Godawari Municipality in the Kailali District of Sudur Paschim Province. Since, MHRA is a major component of the RSLUP, commissioned under the DRRM Act 2017, the study has been delineated through analyses of primary and secondary data by incorporating field hazard mapping, collection of information from building footprints, household surveys, institutional surveys, field, and laboratory soil tests and historical hazard events. The KOBO mobile app was used to amass the required information from the field and inserted for both qualitative and quantitative determination and geospatial tools are implemented for the required results. For the scientific modeling, OpenLISEM (for flood hazard), existing literature data (for earthquake hazard), statistical and heuristic methods (for landslide susceptibility maps), global satellite datasets (for wind hazard), Spatial Multi-Criteria Evaluation (for animal attack and fire susceptibility maps) in GIS, globally accepted climate indices (for climate extremes) were applied to obtain individual hazards. On the other hand, elements-at-risk data were collected for building footprints, population, agricultural areas, and roads together with the exposure assessment for all relevant combinations of hazard types and elements-at-risk types to produce a combine hazard map. Hence, obtained MHRA map is utilized for the implementation of the proposed 'development nodes' concept for the two years: up to 2030 and between 2031 and 2050 AD. The concept of Primary, Secondary and Tertiary Development Nodes are recommended for eleven urban uses in the Godawari Municipality. Incorporating the safer and resilient structure under DRM, one CBD at Attariya Bazar area under a primary node, five secondary and five tertiary nodes are recommended for the well-defined urban planning in the entire municipality for the next thirty-year development plan.