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Risk Assessments for street networks in developing countries: challenges and opportunities

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Technical infrastructure – such as transportation, water supply, telecommunication, and electrical networks – forms an essential element of modern society and facilitates economic activities. The street network, as one of the primary components of infrastructure, enables the flow of traffic, employees, services, and goods. The linear structures of road networks are particularly prone to natural hazards. During the occurrence of natural hazards, the road network may be physically affected, but also a number of cascade effects may occur that adversely influence the social and economic sector (e.g. delays in the transport of goods and interruption of essential supplies, obstruction of movement of people and work force, indirect impact on tourism, etc.). It is clear that risk assessment of road networks should involve the assessment of exposure, vulnerability, hazard intensity and probability, and the different loss dimensions (direct, consequential, and indirect). While comprehensive risk assessment approaches have been developed for several developed countries, risk assessments for emerging nations are inhibited by poor data availability and quality (infrastructure data as well as hazard information). Saint Lucia – a Small Island Developing State (SIDS) in the Caribbean exposed to various natural hazards such as floods caused by heavy rainfall, tropical storms and hurricanes, earthquakes and landslides – serves as a case study, highlighting the emerging challenges of a multiple hazard risk assessment for the street network. Moving from reactive risk management to strategic risk reduction in Saint Lucia will require a systematic and sustained change in financial, physical, and infrastructure planning, as well as in asset management practices based on a multi-hazard risk approach. A transparent and objective assessment of risks along the road network and the identification of multi-hazard risk hotspots is presented, that may support the government of Saint Lucia in the task of disaster risk reduction, impact-oriented control of investments, and allocation of resources. However, along this path of development, the application of methods that are capable of considering different loss dimensions, a closure of data gaps, a determination of responsibilities and a change in risk perception have to be promoted.