**EARLY WARNIG SYSTEMS FOR LAND SLIDE**

Landslide early warning systems at regional scale are used to assess the probability of landslide occurrence over a priori-defined warning zones, typically through forecasting and monitoring of meteorological variables, in order to give generalized warning to communities and institutions working with hazard mitigation measures.

Examples of landslide early warning systems are:

Earth observations

Is used in various types of early warning systems. Some examples of applications includes; To track the path of cyclones, typhoons and hurricanes at sea before they make landfall. To assess the severity of droughts in comparison to historic droughts

ELEMENTS OF LANDSLIDE EARLY WARNING SYSTEMS

RISK KNOWLEDGE

Risk arise from the combination of hazards and vulnerabilities at a particular location. Assessments of risk requires systematic collection and analysis of data and should consider the dynamic nature of hazards and vulnerabilities that arise from processes such as urbanization , rural land-use change, environmental degradation and climate change. Risk assessments and maps help to motivate system needs and guide preparations for disaster prevention and responses.

MONITORING AND WARNING SERVICE

Warning services lie at the core of the system. There must be a sound scientific basis for predicting and forecasting and warning system that operate 24 hours a day. Continuous monitoring of hazards parameters and precursors is essential to generate accurate warnings in a timely fashion. Warning services for different hazards should be coordinated where possible to gain the benefit of shared institutional, procedural and communication networks.

DESSEMINATION AND COMMUNICATION

Warnings must reach those at risk clear messages containing simple, useful information are critical to enable proper responses that will help safeguard lives and livelihoods. Regional, national and community level communication system must be pre-identified and appropriate authoritative voices established. The use of multiple communication channels is necessary to ensure as many people as possible are warned, to avoid failure of any one channel, and to reinforce the warning message.

RESPONSE CAPABILITY

It is essential that communities understand their risks; respect the warning service and know how to react. Education and preparedness programmes play a key role. It is also essential that disaster management plans are in place, well practiced and tested. The community should be well informed on options for safe behavior, available escape routes and how best to avoid damage and loss to property.

EMPLEMENTATION

Prior to implementation, geo-indicators(local geological and meteorological conditions) should be identified and established. Implementation involves setting up gauges and sensors at potential landslide sites that send data to local control center. Relevant mathematical models and forecasting systems should be part of control centre database. Training is important factor in determining the success of the systems. Local staff should be trained in system operation and local populations should be informed of risks and warning responses.

IMPORTANCE OF LANDSLIDE EARLY WARNING SYSTEMS

Timely prevention can help mitigate damage to ecosystems.

Strengthens community preparedness, response and recovery .

Minimizes human fatalities, injuries and health risks, as well as infrastructure damage.

Reduces post-disaster rehabilitation and rebuilding costs.