ISDR Highlights

ISDR Highlights is published every two months by the Inter-Agency Secretariat of the International Strategy for Disaster Reduction (UN/ISDR).

We welcome your input, ideas and suggestions for future issues, including contributions for the feature article. Please direct all correspondence (including subscription requests) to: isdr@un.org

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The International Strategy for Disaster Reduction (ISDR)

Recognising that natural hazards can threaten any one of us, ISDR builds on partnerships and takes a global approach to disaster reduction, seeking to involve every individual and every community towards the goals of reducing the loss of lives, the socio-economic setbacks and the environmental damages caused by natural hazards. In order to achieve these goals, ISDR promotes four objectives as tools towards reaching disaster reduction for all:

- Increase public awareness to understand risk, vulnerability and disaster reduction globally
- Obtain commitment from public authorities to implement disaster reduction policies and actions
- Stimulate interdisciplinary and intersectoral partnerships, including the expansion of risk reduction networks
- Improve scientific knowledge about disaster reduction

Feature Article

Landslide Risk Warning for Mountain Communities and Rural Infrastructure Planning

By Gareth Hearn

Field discussions with farmers

2002 was the International Year of Mountains. It was also Nepal's most tragic year on record for landslide disasters; newspapers reported 346 human fatalities due to landslides alone, and actual figures were probably much more. In the last ten years a total of 900 deaths have occurred due to landslides, confirming that the tragedies of 2002 were by no means unprecedented. Landslides are therefore not only a fact of geology in Nepal but they are also an unfortunate fact of life. Even in a country with the highest mountains in the world there is a certain resignation that what goes up – must come down. While the average mountain building rate of 1-4 mm per year is imperceptible to most observers, the local rates of denudation or erosion can be catastrophic, leading to loss of life, loss of livelihoods and economic disruption.

> *"Even in a country with the highest mountains in the world there is a certain resignation that what goes up – must come down."*

Of course, Nepal is not alone. During the year 2000, the smaller Himalayan Kingdom of Bhutan (to Nepal's east), suffered major damage to infrastructure and loss of life as a result of landslides and floods. Other parts of the Himalayas in neighbouring India and Pakistan also experienced landslide hazards on a regular basis, due to the combination of steep slopes, frequently intense monsoon rain, unstable and weak geology and man-made effects, such as road construction and adverse land use practices in some instances. Planning for landslides is therefore a critical element in safeguarding rural development, lives and livelihoods in most hilly and mountainous regions of the world.

Despite the huge human and economic impacts of landslides, the data and information required to carry out proper and timely analysis and assessment is often inadequate. Often the lack of data hinders the assessment of

landslide risk during rural road access planning. Furthermore, community risk from landslides cannot be fully evaluated, and therefore disaster preparedness and contingency measures cannot be put into place.

To address these problems, the *Landslide Risk Assessment Project (*funded by the UK Department of International Development, DFID) was implemented by Scott Wilson in conjunction with seconded staff from government departments in Nepal and Bhutan, producing the following outputs:

- Best practice guidelines on the use of remote sensing for landslide assessment
- Rapid desk study methods of landslide hazard mapping
- Surveys of land use and social impacts
- Risk assessment and risk management guidelines for use by district engineers and rural communities Guidelines for route corridor planning, design, construction and management

These outputs were achieved through desk studies, field investigations and analysis carried out in six study areas within the two countries. Local participation in the project involved the full integration with collaborating government departments, non-governmental organisations and universities, secondment of staff, fieldwork and analysis carried out by local practitioners, field discussions with community representatives and workshops and training.

The central theme of the project was the development and testing of rapid methods of landslide susceptibility mapping for rural infrastructure planning purposes. Remote sensing and relatively simple computer analysis of desk study datasets enabled models to be developed that provide an acceptable level of accuracy required for rural road planning purposes. Six study areas were used to derive this model and the results have been successfully applied to test areas.

More importantly, the techniques and outputs from the project were developed and applied by local government authorities concerned with infrastructure planning and rural development. Government staff, combined with local specialists, was responsible for a large part of the data collection and analysis, ensuring the sustainable use of the mapping techniques developed. Interviews and field-based workshops held with local community representatives and farmers enabled an open dialogue on best land use and slope protection practices, hopefully reducing exposure to landslide risk in the future.

The mapping techniques developed by the project were basic and simple in their analysis of remote sensing and their use of geological and topographical data. They proved invaluable – particularly in areas where there was little other data available –for the recognition of areas most susceptible to landslides and consequently most hazardous to rural populations and infrastructure. Government staff and local community representatives alike found the maps easy to understand, subsequently used for a range of planning, engineering and disaster preparedness applications.

Nepal and Bhutan, showing study area locations

While is recognised that simple approaches such as these may not necessarily be applicable when more detailed landslide and slope stability assessments are required (for example, during the detailed design of a road scheme), the project resulted in the development of practical guidelines to assist government officers, rural communities and farmers in the planning and management of land and engineering structures to minimise and mitigate landslide hazards.

This article is an output from the DFID-funded project for the benefit of developing countries. The views expressed are not necessarily those of the DFID. For further information about the Landslide Risk Assessment Project, please refer to www.infrastructureconnect.info/news.asp or contact Mr. Gareth Hearn, Scott Wilson, gareth.hearn@scottwilson.com