

## Session Four: Priorities for a Regional Collaborative Training Programme

Session Four was chaired by **Dr. V.C. Thakur**. Two papers were presented in the session: the first paper outlined the proposed regional collaborative training programme (A detailed schedule of the training course and time period for individual chapters is presented in Annex 1.) This was followed by a paper on the monitoring activities of the Disaster Prevention Technical Centre (DPTC).

- o Guidelines and Proprieties for a Regional Training Course on Landslide Hazard Management and Control in the Hindu Kush-Himalayan Region -- Li Tianchi*

**Professor Li** presented the proposed outline for a training course on the above-mentioned subject. He suggested that the number of trainees should not exceed 15-20 persons, with backgrounds in either hydrology/meteorology, forestry, civil or rural engineering, and with experience in landslide hazard management and control. The training is to be conducted over four weeks including a weeklong field work. A list of the resource persons required to conduct the training has also been given in the paper. The ICIMOD complex has been proposed as the site for theoretical classes, and five different landslide areas have been proposed as field sites.

### Discussions

After the presentation, there was a discussion on various issues. It was felt by some participants that incorporation of certain sections from the Mountain Risk Engineering Hazard publication, for instance, the section on stability analysis, would be important for the training.

The possibility of some institutes/universities including this training programme as a post-graduate degree was also discussed. It was felt by some that the selection of trainees for such a programme should be by the focal points identified for landslide hazard mitigation/ investigation work.

- o Landslides in Nepal - I. Kitahara*

The second paper, presented by **Mr. I Kitahara**, was on "Landslides in Nepal". An introduction to the monitoring methods employed by the DPTC in its various study sites was given in the presentation. The 'model sites' of the DPTC are in three different areas: at a distance of 19 km along the Kathmandu-Trisuli road and on the right bank of the Tinau River at Butwal. The DPTC has used moving pegs and extensometers for monitoring the surface movement of landslides, tiltmeters for measurement of potential ground fluctuations, and the use of guideline tiltmeters and wired-bed dislocation meters for subsurface (underground) displacement. Most of the equipment used is either locally-made or imported from Japan.

### Discussions

Many questions were raised after the two presentations. One participant doubted whether real landslide slip zone identification of large depth with a 50cm probe was possible. Use of pictometers instead of measurement on boreholes by water logger was suggested along with the use of guideline tiltmeters instead of using a bed-dislocation meter. The problem of management and coordination of equipment was also raised.

It was suggested that selection of the candidates for training would need to keep in mind the academic and professional background of the candidates, including age. Suggestions were made to include

stereo plotting in the course. It was also expressed by some participants that, in the case of hazard assessment, the possibility of occurrence needed to be further emphasised. The relevance of groundwater temperature survey and water quality analysis was questioned by some participants, as it was felt that these were not directly concerned with landslides. Some suggested that, as all participants to the training may not be of the same academic background, very simplified methods of stability analysis, such as the slice-method, should be included.

The need to look into the economics of on-site and off-site hazards of landslides was also thought to be important. Some participants requested that avalanches and glaciology should be included in the course.

On behalf of ICIMOD, it was stated that the course would be an integrated one and useful to the main disciplines related to landslides. Collaboration with interested and concerned institutions from different countries of the Hindu Kush-Himalayan region would be maintained in organising the course.

It was suggested that courses for the technician's level and for policy/decision-makers were also essential. It was expected, however, that after completion of training, the trainees would be able to train junior technicians.

Some of the participants suggested that a chapter on statistical analysis should be included. Professor Li explained that the course had been designed primarily for mid-level officers working in the field of landslides, and opined that further courses for others, e.g., policy-makers would be important.

The Chairman suggested that rock mechanics and remote sensing should be included in the course. He suggested age criteria for the trainees; and that they should be 35 years and below.

After concluding the session, **Mr. B. Tiwari** (DPTC) briefed the participants on the field visit.