Geophysical Research Abstracts
Vol. 12, EGU2010-680, 2010
EGU General Assembly 2010

An Assessment of Monsoon Triggered Landslides in Western Nepal

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Due to heavy monsoon rain, rugged topography and very young mountains, frequent slope failures and soil erosion are very common in Nepal but in most of cases the natural slopes are disturbed by men to construct a road through it and the situation further aggravated by the Monsoon rain. Summer usually tests the disaster response capacity of Nepal, when the monsoons trigger water induced disasters. This year Nepal's Western regions were most severely affected by floods and landslides. Every year, sadly, it is the same story of mostly poor people living in remote villages succumbing to landslides and flooding and those who survive facing hardships brought on by the disaster.

The tail end of the monsoon in October has triggered flood and landslides in Nepal which affected a total of 14 districts in the mid and far-west regions, of which Kailali, Bardiya, Banke, Dadeldhura, Accham and Kanchapur district are most affected. The affected areas are geographically scattered and remote, and are therefore difficult to access. In this year (2009), flood and landslides have claimed 62 lives, affecting more than 152,000 individuals from 27,000 families. More than 4,000 families are displaced and are taking shelter in schools, open space and forest areas with no protection from the external elements.

In the above context the prevention and mitigation measures for landslides is a great challenge for Nepal. Nepal has been investing its huge amount of resources to stabilize landslides and roadside slope failures, still then it has become unmanageable during Monsoon time.

Considering the above facts, an assessment of landslides which were occurred during the Monsoon (July-October 2009), along Khodpe – Jhota – Chainpur road in far western region of Nepal has been carried out based on the field observation of various landslides. The paper presents the causes and mechanisms of failures of different landslides which are mostly triggered by Monsoon rain. It also suggests some low cost mitigation measures based on field observation and suggests for appropriate structures and their designs.

The main objective of the field assessment of the landslides is to assist the implementing agency (department of roads), to finalize quick remedial measures to open the traffic and provide adequate data and information for future structural design to mitigate the effects of landslides. The main findings of this assessment are: i) The designed slope protection structures (gabion retaining wall and breast walls) are not properly founded on the firm base; ii) The backfill materials are not compacted well iii) The provision of drainage structures are inadequate and most of them became non functional during monsoon period due to lack of regular cleaning of debris; iv) The most of landslides occurred on the northern aspects having moist soil and dense vegetation coverage; v) There is lack of proper water management in design of road alignment and vi) Soil bioengineering techniques to stabilize cut slopes are not implemented properly.

The result of this assessment shows that, proper care should be given in design while designing a road on hills and mountains with fragile geology and heavy Monsoon rain. Similarly, due consideration should be given during construction also to minimize the damages of structures during monsoon and to avoid frequent road closures and reduce the number and extent of possible landslides.