



Vegetated Bamboo crib wall- A suitable alternative to stabilise road side slopes in Nepal

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Stabilising the natural as well as man-made slopes in mountains and hills of Nepal is a challenging job. Due to heavy monsoon rain, rugged topography and very young mountains, frequent slope failures and soil erosion are very common in Nepal. In most of cases such delicate natural slopes are further disturbed by men to construct a road through it. Nepal has been investing its huge amount of resources to stabilise such roadside slopes. Generally, conventional retaining structures (masonry, concrete or gabion walls) are constructed to reinstate such slopes. The cost of such walls is increasing every year due to increased cost of construction materials.

On the other hand, Nepal is very rich in natural resources. There are varieties of species of plants in Nepal, which can be used in soil bioengineering purpose. In recent years different organisations have been practicing the soil bioengineering in Nepal successfully. Till now the use of soil bioengineering in Nepal is limited to control the surface erosion and to prevent shallow seated slope failures. Soil bioengineering as a major function of retaining soil mass has not been practiced so far, although some farmers have been using this technique in traditional way (making wattle fence) for long time.

Bamboos are found everywhere in Nepal and are extensively used for various purposes. The use of bamboos to stabilise slopes and its use in erosion control has a very long history in Nepal. Farmers in Nepal have been using bamboos to control erosions at riverbanks and canals, making dykes and steps in farm fields in conventional style. Thus the use of bamboo to perform its engineering functions as a retaining structure is only limited to the construction of wattle fences of small dimensions.

A new soil bioengineering approach to stabilise slopes using bamboos and plants in the form of crib construction is tested for the first time in Nepal. For the experimental purpose about 150 running metres of vegetated bamboo crib walls on hill slopes and about 100 m long vegetative crib embankment at a river bank are constructed. The objective of this research work is to examine how the vegetated bamboo crib walls can be constructed and how it will take loads from the slope or embankment at the initial stage of construction and how the load will be transferred to the plants in long run and stabilise the slope. The performance of this type of construction has been monitored since last two years. This monitoring results will help to review the design and construction procedure and determine the strength and durability of bamboo crib walls reinforced with vegetations.

The results of this experimental works are more encouraging. The introduction of plants inside the bamboo crib wall will not only increases the life of such wall but also increases the stability of whole slope in long run. Results show that the old technique of making crib wall using the locally available material (bamboo) in stabilising slopes might be an economic alternative to conventional gabion or masonry walls.