

Nepal: Bio-engineering to mitigate Water-induced Hazards

Preventing water-induced hazards such as flooding, excessive waste water accumulation or erosion are considerations that need to be taken into account in developing and managing refugee camps. Yet, gully or stream bed erosion, undercutting or breaching of river banks, inundation of low-lying areas, and water logging due to high groundwater tables are examples of water induced hazards already experienced in refugee camps in different countries. Such incidences adversely affect the living conditions in camps, mostly for children and women, and should receive more attention in our programmes.

Bhutanese refugees in Jhapa, Nepal, for example, have witnessed the destruction of some of their shelters and community facilities, have access routes cut off – often for weeks at a time – and have had to deal with land degradation and conflicts with host communities on account of such environment-related events. Such hazards could have been avoided had adequate attention been given at the outset to camp site selection and development.

Applying Bio-engineering

Techniques

Supplementing classical engineering approaches with the experience of surrounding communities, Sub-Office Jhapa has in recent years begun to address the problem by employing bio-engineering techniques. In this, native trees, shrubs and grasses are used in conjunction with reinforcing materials to prevent erosion and land degradation. Although it looks straightforward at first, experience has shown that this practice requires a thorough understanding of the bio-physical environment, the choice of plants to encourage root growth, water absorption capacity and the like, and the hydrological, geomorphological and water hydraulics patterns of the area.

In 1999, Sub-Office Jhapa, through its implementing partner the Nepal Red Cross Society, launched a pilot project in Beldangi-I camp employing bio-engineering principles and structural protection measures. This approach was found to be very effective, as bio-engineering techniques alone are not adequate in situations where severe (gully/streambed and riverbank) erosion are experienced. The satellite image contained in Article by Bouchardy/Bjorgo p.7 shows the riverbank next to Beldangi Camp, which has been subject to bio-engineering works.

Several training workshops were organised to raise awareness among refugees and local people of the problems and the approaches being recommended to tackle the problems. Inspiration for this approach came from a successful project in the adjoining Madhumalla village, which, like many other villages in similar situations in Nepal, suffered from flooding and subsequent destruction of valuable agricultural lands during the monsoon season. Since the village launched its project in the early 1990s, it has started to reap benefits, among which are relief from flood hazards, and the reclamation of 80 hectares of land, which will shortly be ready for commercial agroforestry.

This lesson from Nepal points to the fact that bio-engineering is not only less costly and environmentally friendly, but is also easy to implement with local know-how and resources. Indeed, if carefully designed and implemented, this could become a more widely used approach towards mitigating water-induced hazards in refugee camps.

Dinesh Shrestha
Senior Water Development
Officer, EESS