

MANAGEMENT OF DEGRADED CHURE HILLS THROUGH SOIL CONSERVATION PRACTICES

A CASE STUDY OF HARIWAN MUNICIPALITY-1, SARLAHI DISTRICT OF NEPAL

LOCATION

The Chure range is situated parallelly along the south of the Himalayan range in Nepal. It covers 36 (currently 37) districts in Nepal extending east-west as a continuous landscape. And it occupies about 12.78 % of the country area. Land degradation of Chure hills is currently a major challenge faced in Nepal. This research aims to look at the degraded land of Chure hills and its management through soil conservation practices. This research was executed in the Chure hills of Hariwan Municipality-01, Sarlahi District. The area of Sarlahi lies between latitude 26°58'08.04" north, longitude 85°34'06.24" east. Sarlahi Chure hills lie from 245m to 650m. The area of Sarlahi Chure hills is 23,493.3ha.

Problems

Land degradation has accelerated in Hariwan Municipality ward no 1 due to fragile geological structure, landslides, river damaged area, deforestation, overgrazing, unplanned construction work. Young people had shifted to terai or other foreign countries for seeking jobs so there is a labor problem to manage the land properly and land degraded in that area. Chure lands are fragile so runoff erodes the soil easily and it was concluded that 80% of land degrades in monsoon season. During KII, it was found that a 4-6 cm topsoil layer often disappears during a single monsoon.

According to the farmer's view average soil loss in each affected

household in Upland (bari land) is 208 kg/ha/yr and in Lowland is 63 kg/ha/yr which were through surface runoff in monsoon season and small stream bank cutting. This showed that bari land (Upland) is more degraded than khet land (low land). The lowland paddy fields are characterized by level bench terraces in that area so there is a minimum of soil losses by erosion.

In contrast, upland areas have made inward sloping terraces by the farmer of that area with different breadths hence having varying rates of soil erosion. Every farmer has the vision to join the road system near their houses, farmlands and to fulfill these dreams, without viewing the land condition several unplanned road construction works was also done in Hariwan municipality ward no.1. Due to the fragile geological structure of the Hariwan Municipality Chure hills small landslides, gully erosion was mostly held in newly constructed roads.

Farmer's however known about several soil conservation practices. Soil conservation practices like mulching, conservation tillage, grassed waterways, agroforestry system, the formation of terraces, bamboo plantation were used there to conserve the soil in farmland and bamboo fencing gabion wire box check dams were used to control gully erosion.

Solutions

To reduce the overgrazing system and to emphasize the stall feeding system, several Agroforestry species were distributed and planted there. A small number of farmers who had already practiced the agroforestry system flaunt that it minimizes the human pressure on natural forests. Grasses like Napier (*Pennisetum purpureum*), Molasses (*Melinis minutiflora*), and Broom grass (*Thysanolaena maxima*) were planted there by farmers on the runoff route, natural channels, in their edges of terraces, and in several forest areas to conserve the soil from degradation. Farmers' experience shows that Broom Grass (*Thysanolaena maxima*) is excellent in soil binding capacity in comparison to Napier (*Pennisetum purpureum*) and Molasses (*Melinis minutiflora*). 16% communicator displayed, a Grassed waterway is best to conserve the eroded lands.

Farmers of Hariwan Municipality primarily used dry leaves, Ashuro (*Justicia adhatoda*), Titepati (*Artemisia vulgaris*), and hay for the mulching process and nowadays some model farmer of that area were using polyethylene sheet to cover up the soil. Farmer's expertise that mulching materials minimize the effect of splash erosion to a considerable extent as it prevents raindrops from directly hitting the soil. Farmers' perception revealed that 1-hectare farmland needed 1800kg - 2000kg mulching material. For low land (khet), the farmer had made level bench terraces with 2-3 meter width and for upland (bari land), mostly inward sloping bench terraces were formed in that area. 41% communicator displayed, the formation of terraces is best in their farmlands to conserve the soil from eroded. Farmer's opinions crystallize that Terraces reduce the velocity of flowing water and minimize erosion from the land.

More than 3000 species of Chabo bamboo (*Bambusa tulda*) and Bhalu bamboo (*Dendrocalamus hookeri*) were planted along the Chappini River of Hariwan Municipality to make a green belt along the river and to stabilize Chappini Riverbank. And bamboos were also used there as fencing in their degraded farmland for these both freshly cut and air-dried bamboos were used there in fencing. Dhumbe River of Hariwan Municipality-01 had created several gully erosion and eroded soils. Gabion wire box check dam's construction work in Dhumbe River was done there. Construction was done from gabion boxes with wire mesh. 10 and 8 gauge GI wire mesh size 10 by 10 cm was used. The maximum height of gabion check dams was 1-2.5m.

The majority of the study farmers perceived soil conservation practices positively because it conserves the soil from eroded, provides fodder and fuelwood, agroforestry practices maintain greenery and reduce the siltation effects in downstream. However, there were some constraints in soil conservation practices in the study area. The most common constraints on farmers were lack of knowledge on several soil conservation practices, soils around them, and their traditional thought, so training for farmers about soil conservation practices should provide more in that area.

There is a huge opportunity to manage the degraded lands of farmers through soil conservation practices in Hariwan Municipality ward no.1 and it can be effective if farmers and local communities are fully involved in its planning, development, and implementation phase and follow of existing rules/ regulation (including forest act/ regulation, environment act/regulation, Procedures, and standards to be adopted while developing activities in the Chure region).

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