

## L199CA23

**Project Title :** Incorporation of local knowledge into soil and water management intervention which minimize nutrient losses in the middle hills of Nepal

**Objectives :** To ensure that nutrient losses due to leaching and erosion are minimized by devising economically and culturally viable land, soil and water management techniques To acquire and prepare a computerized database of local knowledge and perceptions of soil and water conservation methods, To map the distribution of knowledge and perceptions of soil and water conservation methods with respect to spatial and cultural variation, To design and test locally adoptable soil and water management interventions incorporating local knowledge and perceptions, To prepare recommendations of promising soil and water management interventions for promotion in the region. Major

**Accomplishment :** The documentation and analysis of local knowledge revealed that farmers possess a sophisticated knowledge about dynamics of soil erosion and nutrient losses, effect of soil attributes and land features on soil erosion, and effect of cropping pattern and crop management on soil and nutrient losses. Farmers, however, had relatively poor knowledge about below-ground interactions related to soil and water processes. Sharing of scientific knowledge with farmers on such aspects helped them to understand the causal effects of the invisible processes, influenced their decision making, and establish trust and rapport for possible collaborative research partnership with them. The study tour was very effective in helping farmers to acquire new knowledge about soil and water management practices. It also motivated them to think new ways/ideas for better soil and water management in their farms, and encouraged them to experiment with those ideas. Facilitating farmers in designing and managing experiments on their own was quite effective in empowering them to take lead and own the whole process. The results of the two years of farmers' experiments showed that the new interventions designed by farmers were effective in minimising soil and nutrient losses from the bari land. At Landruk and Bandipur with terraced bari land, the vegetative barriers established on the terrace-risers were effective in reducing surface soil loss by reducing the run-on velocity and trapping the eroded soil particles. These vegetative barriers were also effective in minimising leaching loss of nutrients by trapping these nutrients along the terrace risers and producing higher biomass than the local vegetations. The forage production was higher in the intervention plots and nutrient analyses of forage biomass from intervention and control plots showed that the amounts of nitrogen, phosphorus and potassium per unit area of forage biomass from the intervention was higher than that from the control plots. At Nayatola with sloping terrace, all the hedgerow interventions were effective in reducing soil erosion and slope angle, and in making efficient use of the leached nutrients through fodder biomass production. The study indicated that the PTD approach to technology development was more effective in promoting flows of information and materials than researcher managed technology development process. There was a spontaneous farmer-to-farmer dissemination of new interventions within the farming communities. High visibility of farmer experimentation resulting from involvement of farming community in various stages of the PTD process also appeared to contribute to the increased flow of information and materials from the research farmers. The involvement of community in the process also helped initiate community-level actions for interventions applicable at watershed scale, for example construction of diversion canals at strategic locations to reduce the severe effect of run-off on the bari land. The research clearly showed that farmers were both interested and capable of carrying out experiments in developing new soil and water management interventions by themselves and that this process became more effective when they were adequately supported and facilitated by research scientists and other stakeholders.

**Geographical Coverage :** Middle Hills of Western Nepal; specific project sites include Bandipur (1000 metres asl) in Tanahun District, Nayatola (1400 metres asl) in Palpa District and Landruk (1600 metres asl) in Kaski District. **Collaborators :** University of Wales, Bangor, UK; Agricultural Research Station Lumle, NARC, Nepal and International Centre for Integrated Mountain Development (ICIMOD), Nepal **Duration :** October 1999 – March 2003 **Funding Support :** DFID, UK through University of Wales, Bangor, UK **Project Team :** Pratap Kumar Shrestha and Anil Subedi