

Abstract

Agricultural intensification is unavoidable due to the food requirements of a growing population, market availability and access to agro-products, and limited productive agricultural areas in Nepal. A shift from cultivating cereal crops towards vegetables and other cash crops has evolved through the process of agricultural intensification in the hills of the Himalayan region. With increased market access and road links to urban centres, settled agriculture in Nepal is becoming transformed into intensified cropping, especially in peri- and semi- urban areas.

This study reviewed the historic development of intensification, its evolution and adoption by farmers, and its effects on society and the environment in Ansikhola watershed of Kavre district in Nepal. For the historic and socio-economic aspects, personal interviews, discussions with key farmers, specific case studies, and focus group discussions with different wealth and caste groups were conducted. For the environmental aspects, field erosion plots were established to measure the runoff, soil loss and nutrient losses from agricultural lands. The eroded sediment samples and river water samples were analysed for major soil nutrients, chemicals, and aquatic macro-invertebrates. The effect of crop intensification on stream water quality is based on the comparison of two mid-hill watersheds with different degrees of intensification.

The study revealed that intensive agricultural practices diversified the crop production system, shifting it from need-based cereal crops to market-demanded vegetable and cash crops. About 90 per cent of the farmers perceived that this shift has improved their socio-economic condition. Positive changes in wealth and social status, migration from rural to urban areas, and shifts in social division of labour are some of the important impacts. Environmentally, however, intensification has had a number of negative effects. Concentration of nitrate was found to be higher (13-28 mg/L) in stream water adjacent to areas practising intensification. Higher concentrations of sodium (9 mg/L) and potassium (5 mg/L) ions in Ansikhola were thought to be due to soil and nutrient losses from frequent agricultural activities in the watershed. Increases in biomass and abundance with concurrent decrease in species richness of indicative macro-invertebrate species in stream water reflected the impacts of rising agricultural intensification. The study found that intensified agriculture altered water chemistry, microbiology, as well as, aquatic organisms. However, only less than 10 per cent of the farmers were aware of the linkages

between intensification and environmental degradation. Despite soil nutrient loss, erosion, water pollution, and increase in workload of farmers, agricultural intensification is regarded as a viable option for increasing land productivity, diversifying the appropriate crops, increasing farmer's income, and transforming the social structure of the community. The study highlights and recommends an urgent need to address the emerging issues of livelihood and food security in Nepal through a more sustainable agricultural intensification.

Key words: agricultural intensification, socio-economic conditions, food security, soil erosion, water quality, sustainable development, Ansikhola