XII.A.7. Technology, Land Use and Energy Planning in Mountain Ecosystem: A Case Study of Hawaibag Micro-watershed in Indian Himalayas

Subrata Mandal

Ramprasad Sengupta
Research Scholar, Centre for Economic Studies and Planning, Jawaharlal Nehru University, New Delhi - 110 067 and Professor, IIM, Calcutta respectively.

The paper develops an ecological-economic framework for land use planning and estimates it for Hawaibag micro watershed in Almora located in the Indian Himalayas. Three basic land use activities of agriculture, pasture rearing and forestry have been modelled in a linear programming framework. The input requirement and competing uses of local resources for a given level of demand for food, fodder and energy requirement of the human and livestock population of the region have been expressed in the form of linear equations, the demand for agricultural inputs like fertilizer, water and energy for irrigation, draught animals for land preparation and transpiration and human labour requirement have been estimated for all crop growing activities in different seasons in irrigated and rainfed agricultural land. Similar estimation has been done for pasture and forest land. The rural energy requirement for cooking, lighting, space heating and irrigation have so been estimated. Technological intervention like micro-hydel power plant and several energy use options have been allowed. Impact on ecosystem have been quantified in terms of soil erosion from land use and carbon emissions from energy use activities. Costs and revenue parameters of land and energy use activities have been estimated to obtain an objective function for net revenue maximisation and cost minimization exercise.