paper prevented in Session Mountain Commons and Sustantability -II on June 7 charled by Pob- 6 J.S. Gardner and Poy. F. Berkes

LAND USE DYNAMICS AND ECOLOGICAL ENHANCEMENT ISSUES IN HIMALAYAN UPPER KULLU VALLEY WORKSHOP IN POLITICIAL THEORY

R.B. Singh & D.K. Mishra Department of Geography Delhi School of Economics BLOOMINGTON, INDIANA 47403-3186 University of Delhi, Delhi-7 Keprind Files--CPR

INTRODUCTION

The major causes of land use/cover changes are various anthropogenic activites, not only those of present but the integrated past activities. The interaction between human activites and the earth surface, which we call man-earth system or man-environment system, has not been made clear sufficiently. The previous studies of monitoring of ongoing global environmental changes have paid little attention to socioeconomic dimensions of land use avtivities which have induced various types of serious environmental changes.

Upper Beas Basin consists of sound ecological system The together with a penetrated common land and crop land use relationship. Being located in temeperate part of Himalaya, the basin is well suited for orcharding as well as other commercial crops. A few decades earlier there was existing a balanced relationship between cropping intensity and forestry system | but decreasing land-man ratio as well as the ever changing cultivation system has altered the entire bio-physical system of the valley. Apple orchards have been existing in the region since 19th century but the explosive increase in orchards is a phenomena of last 10-15 years. Now, orchards are taking over productive agricultural land as well as common forest land on valley floor. As far as mixed use common land on the valley slope is concerned over exploitation of commons in the area have made the environment fragile and vulnerable. Thus, enhanced land use capability can reduce the vulnerability in the valley.

Present research provides empirical evidences about the changes in land use, the cropping system and encroachment of common land in the Upper Kullu Valley. Taking the duration of 1970-1994 as standard time span, to analyse the impact of changes in the land use system of the village unit and the crop individually. The interval of five years has been taken as standard value and comparisional variations have been computed. Finally, it provides guidelines for optimum use of land together with preventive measures to avoid misuse and over exploitation and to promote conservation of common land resources for sustainable livelihood.

THE STUDY ARBA

The study area consists of the Upper Kullu Valley, the northern most part of the Kullu Valley of Himachal Pradesh. It covers about 120 km and extents between Manali in the south and Rohtang Pass in the north. The elevation varies between 2000 to 4000 meters. The gradient is steep and the region is typified by

~

thin layer of mountain soils. The Beas alongwith two tributaries viz. the Solang, the Manalsu across the region in the east-west directions. Climatically the region lies in the temperate zone due to high elevation snowfall is a common phenomenon, but The natural vegetation is of pine trees with vast grazing land. The proportion of inhabitable area is very low and the settlements are scattered along the valley side slopes of the mountain. Being tourist prone area, the seasonal concentration of tourists is а very common. The developmental activities are increasing rabidly to support the tourism infrastructre. The unprecedented growth of population is putting extremely high pressure on the limited small cultivated land. Apple orcharding is the base of income. Moreover, the high degree of tourist influx and the high rate of urbanization has changed the old traditional attitude of the inhabitants and has made them more materialistic. Hence, theburgeoning population and the change in the age-old developed eco-firendly habits have created various environmental problems and have threatened the livelihood security of the area.

LAND USE DYNAMICS

Human and livestock population pressure on the limited land resources has increased in recent years. This has resulted from the construction of roads, encroachment into forest and more land for horticulture and agricultural expansion. Increased pressure on forest has brought tremendous changes in the pattern of land use including reduction in forest cover.

The expansion of agricultural land can mainly be attributed to population growth and fragmentation of farms owning families, which leave to the enchroachment of forest and culturable wastelands. A bulk of settled agriculture fields in the Upper Beas watershed lie on slopy terraces along the steep hill sides. Slope of some agricultural land exceed 40 deg. but most of them fall between 20 deg. to 35 deg.

ECOLOGICAL ENHANCEMENT ISSUES

Sustainability is the ability of a system to maintain а certain well defined level of performance over time to enhance the same without damaging the essential ecological integrity φf the system (Jodha, 1992). Agricultural systems of Upper Kullu Valley accommodate the increasing pressure of demand and damage their long - term potentialities. Without chemical use support and damage to the inherent capacity of the resource base of the valley, sustainable production is not possible. At present in the area, in comparison to the situation of two decades ago, the extent and magnitude of landslide is increasingly higher. Water potentiality in traditional community irrigation system (Kuhls) changed, affecting the fields of traditional crops in the has area. Diversity of agricultural crops has reduced, time spent by villagers for collection of fodder and fuel from common land has increased many folds. The botanical composition of forests pastures has undergone negative changes while introduction of new and species has become a common feature in the direction of sound forestry and forest management.

2

In the present agricultural system, the valley is not in position to maintain its ecological integrity while supporting livelihood of the community. Many examples may be cited from the areas such as Manali where the apple orcharding was nearby possible during early fifties, which is now-a-days, absolutely empty from apple trees. As per the perspectives of llocal habitants, the quality as well as the quantity of the apple orcharding is shifting towards north. This upward movement can affect the productivity even upto Manali areas damaging economic base and agricultural practices. Keeping this the trend into consideration the other alternatives or substitutes should kept in mind. The integration of traditional crops and to be maintain its identity is of paramount concern for agricultural sustainability in the valley.

GOVERNMENT POLICIES AND THEIR IMPLICATIONS

Various agricultural development programmes were undertaken but highest priority was given for the expansion of roads, which is maintained by the Border Road Organisation (BRO) of the Central Government. Development of hydroelectric power and irrigation potentials were other components of infrastructural development. These initiatives helped the region to harness the potentials of natural resources. Such infrastructural development immensely contributed to horticultural development programmes undertaken in the region in later years.

Apple cultivation had been started much earlier by large land owners. Horticulture is a leading sector for the economic Extensive institutional support transformation of the area. services were provided. A major public sector corporation (HPMC) was established for processing, making and price support (Rana Nadda, 1988). Over the time, other horticultural and and crops have been introduced. Following extensive vegetable deforestation on account of the wooden packing cases used for apple, efforts are currently under way to use other packing materials to avoid the further deforestation. Horticulture based **i**n development has introduced a new type of diversification agricultural uses. This diversity of the production fits well into modern market oriented agriculture (Sikka and Singh, 1988).

The nutrient content of soil is poor which seems to be difficult to sustain. As a result of higher yields of wheat, by the use of chemical fertilizers, which is given by the corporation in many areas. At the time of introduction of chemical fertilizers, the fragile characteristic of the mountain area was not considered.

EFFORTS TO SUSTAIN THE SITUATION

Several initiatives have been taken by the government as well as NGOs to motivate the villagers to promote their traditional crops. The government subsidies, the opening of common institutions as well as initiatives by NGOs are the visible efforts in this regard. The general view of the farmers are aslo shifting from absolute commercial cropping system to

mixed agricultural system.

The initial investments in the hill areas were not undertaken with the objectives of developing the mountain areas. these investments have through market integration, gradually promoted an export based transformation in mountain areas! The development of high-value cash crops, fruits and off-season vegetables as well as the development of tourism, represent important contribution of mountain areas to urban and ldwland These forces will no doubt strengthen, and policy makers areas. will have to give more attention to areas currently unaffected by changes and continuing problems of environmental these degradation. It should be understood that only part of the resource degradation is poverty related. Economic development has also posed enormous pressure on available natural resources. Investment policies must be carefully evaluated for their impact on natural resources in the future. Presently this is not the countries are moving towards integrated case. Many area management approaches for designing development and investment programmes in mountain areas and this is an important step in the right direction.

POLICY INITIATIVES

Farmer's strategies in managing mountainous land use systems have been influenced by the physical and biological characteristics their resources and environment. Rapid of increase in the population and the resultant demand for food have -put a severe strain on mountain ecosystem. The response has been the excessive exploitation of physical, natural resources as a consequence of which there is a real danger that some resources may already have got totally damaged.

-- Public policy on research and development for the mountain areas must therefore be seen as a separate component of overall research and development strategy and not as an extension of the plain-based system.

-- Price subsidies on inputs and price guarantees for outputs should be reexamined for their impact on the sustainability of the mountain environments.

-- The sustainable agro-based industrial promotion policies should be compatible with such a system.

-- In all the sustainable development approaches, top priority should be given for maintaining biodiversity to the fullest possible extent in the Upper Beas Valley, apart from conserving its other renewable resources.

CONCLUSIONS

Infrastructural facilities prevailing in and around the Upper Beas Basin has played a paramount role in building the economy of the region and in changing the traditional subsistence farming systems to transitional farming systems, without damaging

the natural resources. Withdrawing the subsidy these days by the government is an effective initiative to enhance the socioeconomic pursuits. It is well-perceived that land use systems in the area have been changed in response to conventional, ldgical innovations and market forces. However, such changes in the mountains are much recent. A wide scale of agro-orcharding management could be involved applying integrated knowledge of scientists, managers and farmers and through proper linking with forest and livestock resources, making less dependent approach to market oriented inputs in the systems accelerating economy of the dominated marginal farmers as a whole. A number of traditaional crops grown in the area have recently started diminishing due to innovations of HIV crops and fruit trees, which have high efficient energy and monetory values, They could be cultivated for sustainable land use and economic viability in the valley.

REFERENCES

- Government of Himachal Pradesh (1992), The Himachal Pradesh Land Records Mannual, Revenue Department, Shimla, p. 910.
- Jodha, N.S. (1992) Mountain Perspective and Sustainability: A Framework for Development Strategies, Sustainable Mountain Agriculture - Perspectives and Issues (ed.) Vol. 1, p. 59, Oxford & IBH Pub., New Delhi.
- Mibiba, Beacon, (1991) Infrastructure and Sustainable Local Level Development Initiatives : the Potential Driven Versus the Problem Driven, Zimbabwe Journal of Rural Development, (July), pp. 361-75.
- Moles, Jerry A.(1989) Agricultural Sustainability and Traditional Agriculture: Learning from the past and its relevance to Sri Lanka, Human Organisation, Vol. 48 (Spring) pp. 70-8.
- Patrick, Madden (1987) Can Sustainable Agriculture be Profitable Environment. 29 (May) pp. 18-20.

Redclift, M. (1990) Developing Sustainability: Designing Agro-Ecological Zones, Land Use Policy, 7:3, pp. 202-16.

Years	Total area	Total u area	ncult.	Cultivated area	Khali land	Area shown more than once	Total cropped area			
197Ø	1136	329		834	193	639	732			
1975	1148	3Ø4		835	100	672	977			
198Ø	12Ø7	265		891	127	649	1Ø8Ø			
1985	1216	3Ø7		853	91	713	1024			
199Ø	1237	302		894	118	618	1Ø94			
1994	1257	295		912	112	798	1192			

Table 1: Land Use Dynamics of Upper Beas Basin Area in ha

r

.

• • • • • •

· #

- - -

1.2

Table 2: Changes in Crops (Rabi & Kharif) of Upper Beas Basin Area in ha

Years	Crops Saryara	Kodra	Maize	Potato Rice		Wheat	Barley	Mustared
1969-7Ø	83	46	79	66	72	61	18Ø	8
1974-75	89	41	86	62	6Ø	159	154	5
1979-8Ø	74	16	11Ø	158	54	77	166	19
1984-85	38	9	66	96	54	93	52	8
1989-90	13	5	213	36	79	211	131	6Ø
1994-95	3	3	268	21	11Ø	139	93	71