

Use of Marginal Land to Improve the Livelihoods of Mountain People: Experiences from Himachal Pradesh

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The mountain ecosystem is characterised by abundant marginal lands that include sloping lands. These lands have been variously called resource poor lands, fragile lands, vulnerable lands, or degraded lands; in data reporting systems, they are reported under different categories like cultivable land, barren and uncultivated land, and pastures. As a result, the mountains have a very small amount of cultivated land. For example, in the HKH region, only 11% of the total geographical land is suitable for cultivation. While the population density per sq. km is very low, it is extremely high relative to the available agricultural land. However, because of varied agro-climatic conditions, reflected in diverse niches, there is a huge potential for growing different high value cash crops on the marginal lands. Experiences in different HKH regions have shown that the adoption of high value cash crops, compatible with the mountain niches, has helped some pocket areas in multiple ways. In Himachal Pradesh this has been achieved first, by converting the abundant marginal land into more productive land and harnessing local niches; second, by maintaining and improving the ecology and environment of the region in terms of soil conservation and increasing soil fertility; and third, by making a qualitative impact on the economic conditions of the people, which helped break the so-called poverty-environmental degradation-poverty cycle. Thus, contrary to popular beliefs and notions, the evidence from these areas suggests that the processes of development and conservation of ecology and environment can be mutually supportive and reinforcing. The present study was undertaken to study the trends in the process of marginalisation of holdings, and the availability of marginal lands for expanding farming in different areas of the state of Himachal Pradesh (HP). The study, drawing on the experiences of fruit farming in the state, highlights the impact of the use of marginal lands on the quality of life, equity, ecology, and environment of the local area. The emerging challenges and the need to evolve new technologies for the productive use of marginal lands are also discussed.

The Marginalisation of Holdings

In HP, small holdings comprise more than 80% of the total landholdings in most areas and districts, including high hill districts. There is a declining trend in the per capita availability of agricultural land, thus increasing the number of marginal/small farmers. The continuous sub-division of holdings in the absence of alternative employment opportunities has accelerated the process of marginalisation of holdings. Over time most of the holdings are becoming economically non-viable and becoming non-marginalised in the production process, endangering the livelihoods of the mountain people. In view of this, the availability of huge areas of marginal land offers a ray of hope if suitable crops that could be grown in these areas can be identified and a technology for growing them evolved (Partap 1998, 1999) The experience of Himachal Pradesh has shown that these

lands can be used productively with positive economic and environmental effects. Before reviewing the available evidence, we present the current status of the availability of marginal lands in different areas and districts of the state.

Availability of Marginal Lands

A significant amount of marginal land, which includes cultivable wastes, current fallows, other fallows, and so on, is available for expanding farming and easing the huge pressure on land in both the high hill and low hill areas. In the high hill areas, the marginal land potentially available for farming varied from as high as 11.4% to as low as 1.4%. Another important feature is the availability of a significant amount of land under grasslands, which varied from one-fourth to two-thirds of the total geographical land. In the low hill districts, marginal land that can be made available for farming varied from 3.1% to 19.5%. The land under grasslands was significantly lower in the low hill areas than in high hill areas. In all areas a substantial amount of land under forests would be productively used if the present forest laws were amended to allow the farmers to select forest plantations according to their requirements and to involve them in management and benefit sharing. In brief, a significant amount of marginal land is available for expanding farming.

Table 1 shows the potential for growing different cash crops in different agro-climatic regions of the state. While crops like vegetables, off-season vegetables, and floriculture require good quality irrigated land, fruits and medicinal plants can be grown on unirrigated sloping marginal lands. The studies carried out by the Institute of Himalayan Bio-Resources, Palampur, have shown that a number of aromatic and medicinal plants can be successfully grown in temperate and dry temperate regions of the state where abundant marginal lands are available.

Table 1: Potential for growing high value cash crops in different agro-climatic zones of Himachal Pradesh				
	Low hills (350-650 metres)	Mid hills (650-1800 m)	High hills (1800-2200 m)	High hill dry zone (2000-3500 m)
Irrigated Crop Area				
Vegetables	vegetables	off-season vegetables	seed potato, temperate vegetable seeds, off-season vegetables	peas, seed potato, off-season vegetables, vegetable seeds, kuth, saffron, hops, kalazira
Flowers	gladiolus, rose, chrysanthemum, dahlia, bird of paradise	gladiolus, rose, chrysanthemum, dahlia, bird of paradise	tulip, lilies, carnation, daffodil, iris	-
Unirrigated Marginal Land				
Fruit crops	mango, citrus fruits	stone fruits, citrus fruits	apple, kiwi, cherry, almond,	apple, dry fruits, nuts, chilgoza
Medicinal and aromatic plants	<i>Terminalia chebula</i> , <i>T. bellinica</i> , <i>Embllica officinalis</i> , <i>Cymbopogan nardus</i> , <i>Rosa officinalis</i>	<i>Viola</i> sp, <i>Nardostachys</i> , <i>Centella asiatica</i> , <i>Origanum vulgare</i> L., <i>Ficus palmata</i> Forsk	<i>Polophyllum</i> , <i>Taxus baccata</i> , <i>Angelica glauca</i> , <i>Berberis aristata</i> Dc., <i>Acorus calamus</i> , <i>Picrorhiza</i> , <i>Swertia chirita</i> , <i>Jurinea</i> , <i>Nardostachys grandiflora</i>	<i>Aconitum ferox</i> , <i>A. heterophyllum</i> , <i>Saussurea costus</i> (Falc.) Lipsch, <i>Artemisia</i> spp., <i>Dactylorhiza hatagirea</i> , <i>Artemisia benthamii</i> , <i>Hippophae</i> sp.

Source: Compiled by the author in consultation with scientists of IHBT, Palampur

Use of Marginal Land in Himachal Pradesh

The state of Himachal Pradesh has made rapid strides in fruit farming and has acquired the status of fruit bowl of the country. The state's development strategy has been considered a model for other hill and mountainous states. The adoption of a development strategy in conformity with mountain specificities has been the single most important factor in triggering the process of sustainable agricultural development. The strategy focused on providing a sound physical and institutional infrastructure. Empirical studies have documented the diverse effects of the spread of fruit farming on the economy and environment. More precisely, studies have shown how fruit farming, which mostly uses marginal and sloping lands, has affected the quality of life, equity, and ecology and environment of the local people and area. The results of one such study conducted in the Kullu Valley of Himachal Pradesh that compared the economic and ecological effects of fruit farming with those of subsistence crop farming are presented here.

To begin with, we compared the livelihood options and their contribution towards total household incomes in the fruit farming region with those of the subsistence-farming region. Household incomes in the fruit farming region were nearly double those in the subsistence farming region. Further, while there was not much difference in the configuration of the livelihood options in the two regions, their importance differed significantly. For example, fruit farming contributed more than two-fifths of the household income in the fruit farming region as compared to less than one-fifth in the subsistence-farming region. Likewise, the contribution of crop production was much less in the former compared with the latter region. Options like agricultural labour and non-agricultural labour were not important in the fruit farming region, whereas they contributed a significant proportion of household income in the subsistence region. In brief, the livelihood options in the fruit farming region, most of which is on marginal and sloping lands, were far superior to those in the subsistence region.

The high quality livelihood options have made significant contributions to improving the quality of life of the people in the fruit farming region areas like health and nutrition, human resource development, access to basic amenities, and general economic status. Although some poverty remained in the fruit farming region, it was much less than the 30% found in the subsistence farming region.

The impact on equity, one of the essential conditions for ensuring sustainable agriculture, was studied in terms of different indicators, some conventional and some non-conventional (Table 2). The degree of inequality, including gender inequality, was much lower in the fruit farming region than in the subsistence farming region. The high degree of gender

Indicators	Fruit farming	Subsistence farming
Male wage (agriculture) (US \$/day)	1	0.87
Female wage (US \$/day)	0.87	0.71
Income distribution (Gini ratio)	0.37	0.40
Female literacy (%)	43	34
Male literacy (%)	61	54
Percentage of female participation in households' decision making	90	40
Percentage of females with secondary and higher level education	41	13

equity is also reflected in the flexible sexual division of labour. Women now perform a number of activities that were earlier considered as male prerogatives, and they enjoy more freedom than their counterparts in the subsistence farming region.

The implications of fruit farming for ecological and environmental sustainability were studied in terms of different indicators like livestock population, investment in agriculture, crop yields, and cropping patterns. A number of features have significant positive implications that augur well for ecological and environmental sustainability. For example, the decline in the livestock population accompanied by improvement in breeds and the switch to stall feeding has resulted in higher milk yields and higher availability of farmyard manure (FYM). Likewise, the improvement in the quality of life has lessened the pressure on forests as sources of fodder and fuel wood. Another important indicator is that 30-40% of household income is being invested to improve and conserve natural resources like soil and water. These indicators and the process of change underlying them refute the notion that there is inherent incompatibility between development and environment. The evidence shows that the abundant marginal lands can be productively utilised with a significant positive impact both on the economy and the environment.

Conclusions and Challenges

To recapitulate, the mountains and hills are facing an acute scarcity of agricultural land because of increasing population pressure. The lack of alternative employment opportunities and continuous sub-division of land holdings is rendering most of the holdings non-viable. In their desperate bid to maintain subsistence levels of agriculture, farmers have extended cultivation to steep slopes, leading to falling yields, rapid environmental degradation, and ultimately, endemic poverty and impoverishment. The whole process is manifested in the so-called poverty-environmental degradation-poverty cycle. This has posed a serious problem in ensuring sufficient livelihoods for the mountain people. Happily, however, a significant amount of marginal land currently reported under fallows, cultivable wastes, barren, and uncultivable land is available for productive use if suitable crops that can be grown on these lands are identified and the technology for growing them evolved. Experience has shown that wherever options are available to the farmers of such lands, they have been used productively to make significant improvements in the livelihoods, and this has also had a positive ecological and environmental effect. However, R & D efforts focusing on these lands have not received much attention. This poses a serious challenge to the scientists, technologists, and policy makers seeking to use these lands more productively.

References

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