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WARNING SIGNALS FROM HILL FARMERS AND FARMING

ADDRESSING CONCERNS

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applications to enable mountain farmers practice farming that brings them economic prosperity and to the environment ecological stability. The last chapter sums up issues and general recommendations which can be adopted as broad guidelines by the national and state government agencies/ institutions and local institutions/ agencies, working for the welfare of the marginal mountain farmer.

There is an acknowledged saying in the international development circles, “ the mountain development is a knowledge intensive business” and we feel truly so. The broad analysis presented in this report and the possible alternative mountain perspective based path ways shall need further, deeper knowledge and information from across the Himalayan region, call it ground data or impirical information. Therefore, before suggesting concrete specific measures along with cost estimates, the authors feel that more impirical information from the hill states will be need to be collected, analysed and presented in the final report. The final report will also include perceptions and information gathered during the interactions, that have been organized by IFC in Barapani and Shimla in the coming weeks of April and May. Therefore, in this draft, we have deliberately avoided making action plan type efforts.

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Chapter 1.

The State of the Himalayan Farmers and Farming

Among the 34 million people that inhabit the Himalayan region, large percentage is of hill, mountain and highland farming communities. They sustain on largely subsistence farming which they practice on marginal rainfed and some irrigated farmlands occupying 15.8 % of the total area of the Himalayas i.e. 53.8 million hectares. Rest of the Himalayan landscape, includes rangelands, pastures, wasteland (support land) the so called bush lands- the grazing areas and actual forests accounting for nearly 69 % of the Himalayan area. Another 15.2% is under permanent snow cover and rocky mountains and serves as perennial source of clean water to the hill people as well as to rest of the nation.

The mountain farming communities are widely spread over the hill and mountain landscape in varying densities or 2- more than 100 per sq.km. Agriculture is their main occupation providing direct employment to about 71% of the working population. Agriculture is the primary sector of the economy, contributing 45% to the total regional income of the inhabitants (Tulachan 2001). The net cultivated area is higher in the western Himalayan region (15.8%) than the north eastern region (9.8%). Even this has large variation within each region, e.g. 2.9% in Arunachal Pradesh to 40.9% in the Darjeeling district.

The Himalayan hill and mountain agroecosystems have been classified by NARS broadly into five agroecological zones. The western Himalayan agroecological zone in the south of Great Himalaya, the trans Himalayan cold and arid agro-ecological zone, The central Himalayan agroecological zone and the warm and humid north eastern Himalayan agro-ecological zone. The agroecological zone comprising hot dry foot hills and valleys are represented by Shiwaliks. They represent wide variations in climate from cold arid to warm and humid. Annual rainfall in the region varies from <150mm to 2600mm, and the mean annual temperature from 8C to 22C. The growing periods for different crops range from 90 to 270 days in a year.

The great majority of the farming households in the Himalayan states are marginal subsistence farmers with landholdings of less than 0.5 ha or small landholders with farms of 0.5 to 1.0 ha. While average land holding in Himachal Pradesh is about 1.2 ha it is even smaller (0.97ha) in Uttranchal .

In the north- eastern Indian Himalayas the predominant land use system is shifting cultivation or "jhum" accounts for 85% of the total cultivated area of NEHR region. It supports over 1.6 million farming communities (represented by several indigenous

upland communities- the NE tribes) over an area of 426 million hectares (Partap and Watson, 1994).

Shifting cultivation is an agricultural system in which the area to be cultivated , forest area, is cleared by fire, and cultivated for a period of 2-3 years and then fallowed for several years (10-15 years). Not that whole land is crop land but the very nature of shifting cultivation underpins the philosophy of using natural land mass in rotation. There has been a trend of increasingly reducing fallow periods, i.e. from 14 to 5 years. Families once food self sufficient are now barely able to produce enough food for the whole year.

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The production system is a response to the difficulties of establishing settled agriculture in the humid tropical region and an extremely successful human adaptation to the rigours and constraints of the humid tropics. The swiddeners have developed an agroecosystem that is diverse and is able to respond to environmental uncertainties. The swiddeners of NE spread over several states used their knowledge of the natural environment to identify most suitable sites for swiddens. Knowledge of both the environment and the needs of the tropical crop repertoire is used to develop and manage the micro sites of their fields. Specific crop needs are matched to specific soils- a diversity of crops meshed with a diversity of micro climates.

Cropping systems – food grain crops

About 76% of the gross cropped area of entire Himalayan region is under staple food grain crops. Therefore, the main cropping systems in the different agro-climatic zones are largely food grain dominated. The analysis shows that the production of food grains has not declined in the Himalayas as much as is often thought. The production in many areas has increased as a result of improved input supplies, and wheat in the best example of it. There seems little prospect that the area under food grain production will increase. Infact over the years, the per capita food grain production may decline, for many reasons, such as shift to cash crops farming, of decline in over all production of food grains and the population increase in hills and mountains.

However, the two Himalayan regions, west and east, show distinct crop preferences. In the western Himalayan region, wheat is the main crop occupying 37% area followed by rice 30.7% and maize 26%. The major food crops grown in the area rice, wheat, maize, millets, barely and buckwheat. In addition variety of pulses are also niche crops of the Himalayas, such as beans, peas, kidney beans, black gram, horse gram, black soybean, lentils, green gram, and the oil seeds include rapeseed, mustard, sesame seed, and linseed. In the north east rice is the staple food crop and occupies about 81% of the cropland area under food crops followed by maize. a diverse mixture of 8 to 10 crops is grown

in a mixed farming system . Over the years both productivity and production levels have been declining under the shifting cultivation for various reasons.

By and large valley bottoms and river basins with assured irrigation are used for growing rice and wheat as summer and winter crops, respectively. Maize is cultivated on upland rainfed sloping crop lands and terraces. Central Himalayas- Uttranchal is unique in the sense that it has more area under millets and pulses. In addition, potatoes and variety of vegetables off season vegetables, spices, and fruit are widely grown too.

Tulachan (2001) analysed the general trend of cultivation of major food crops in the entire Himalayan region. He picked up paddy, wheat and maize crops and three states Himachal, Uttranchal and Meghalaya and using time series data assessed comparative economic indicators of the state of food grain crops. His assessment showed that the area under paddy and maize is declining all over but area under wheat has not changed. This reduction in area is largely because of shift towards cash crops like fruits and vegetables.

Horticulture and cash crop

The Himalayan ecosystem has a sub tropical to temperate climate favourable for growing a wide range of fruits, vegetables and other cash crops. Small areas with their own micro climatic conditions can provide suitable sites for growing particular crops. The products include fruit such as apples, citrus fruits, walnuts, plums, peaches, bananas, mangoes and pineapples; vegetables such as tomatoes, radish, potatoes, cabbage, cauliflower, other cash crops like ginger, chillies, cardamom and saffron; and flowers such as orchids, gladioli, marigolds and chrysanthemums. The total area under fruit and vegetables in the Indian Himalayan states is around 16% of the gross cropped area. It is much higher than the all India average of 4%, but not even. Infact , the proportion of farmlands under fruit crops is much higher in the western Himalayas (20%) , then in the central and eastern Himalaya(5%).

Himachal Pradesh is case in example (also described later as a success story) in fruit production. It started with an area of 792 h in 1950s and by 2004 had over 200,000ha of fruit orchards. In the 4.4% of the farmlands that fruit crops occupy apples account for over 40%, such is the significance of this one fruit crop for Himachal Pradesh. (more data ?)

In Uttranchal too there has been considerable shifts in land use towards fruit farming. The climate of the state is suitable for growing a range of temperate, subtropical and tropical fruits as well as vegetables, flowers, ornamentals, mushrooms and medicinal plants. (Data ?)

J&K is yet another fruit state of India . Horticulture contributes significantly to the states economy. The variety of agroecological zones state comprises and the agro climatic conditions are just perfect for growing all kinds of fruits, vegetable, flowers and medicinal herbs. Saffron, apples, walnuts, cherries are already its niche crops. And produce of a wild shrub seabuckthorn has also entered the market from Nubra valley of Ladakh, under the brand name of LEH BERRY. .

Over all, one finds trends of increasing crop diversification and introduction of horticulture crops and other cash crops. There are good prospects for the development of niche based horticulture in the Himalayas. These present trends towards rapid expansion of horticultural crops will have positive

implications for the future development of mountain agriculture, for increased food and economic security and improved living of mountain farmers .

One problem that will keep confronting is the declining productivity trend of the cash crops, which raises concerns about the long term sustainability of these options. Jodha (1995) pointed out that reckless exploitation of mountain niches might result in their elimination. A study shows (Tulachan, 2001) niche based farming of horticulture crops has shown both spatial and temporal dimensions in terms of sustainability. High economic benefits induce a spatial dimension: a particular crop spreads quickly over time. Resulting soil nutrient losses and the appearance of diseases introduce a temporal dimension, with a reduction in the cultivation of a particular crop over time, intensification of land use excessive use of chemical fertilisers and pesticides. In the land mark study by Partap and Partap (1998 ?) “ warning signals from the apple valleys”, serious problem of pollination failures making a dent on productivity of apples has been highlighted.

Thus with the diversification of farming in the hills many second generation issues of unsustainability are also emerging. Perhaps more importantly, the second generation problems of ecological and social issues need to be understood prior to whole sale promotion of high value cash crops. Impact on equity of class, gender and ethnicity, in particular, need to be further explored.

The key challenge facing national and state policy makers, planners, researchers and field workers is how to address emerging environmental and socioeconomic issues in order to ensure that this diversification process stays on course. Steps are needed to further harness the mountain niches, more appropriately, leading to enormous benefits to mountain people

Livestock

Indian Himalayas support about 50 million domestic animals (1.6 animal/ ha). Cattle are the most common (47.5%) followed by goats (15.8%), buffaloes (12.3%) and sheep (10.4%). The livestock produce comprises, dairy products, wool, and manure. Certainly livestock is higher in the Himalayas than in the plains but it also remains a fact that the region has a niche for livestock based livelihoods that one finds in the large area under rangelands and highland pastures.

data
source
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A large proportion of livestock species is raised under mixed cropping systems. The land holdings are small and livestock supplement the family income. Animal dung and bedding material provide manure and compost for the crops. Almost the entire draught energy requirement of hill agriculture is met from bullocks (Rao and Saxena,1994, Singh 1997). In most of the low and mid hill areas, traditional use of dry dung as fuel is a wide spread practice. This area simply uses animals (specially buffaloes) as energy machines to convert fodder grass and crop refuse into dry dung fuel source for cooking food. Even though many castigate it as a wrong practice, the insights into the conversion of grass into fuel source for cooking using animals as machines is a traditional practice, we should not be ignoring or rejecting outright.

In Himachal livestock contribute about 13% of the gross domestic product. The state presently has the highest levels of milk availability among the Himalayan states.

Over a period of decade, the number of cattle has started declining while the buffalo population is increasing. Similarly the number of sheep is declining but the number of goats is increasing. It is largely because milking goats are replacing cows in fodder scarce areas (Tulachan, 2001).

Many reports have been indicating a declining trend in the livestock holding per house hold but because of increased families over all numbers may not have changed much. The indicators have therefore an important message – the recognition by mountain farmers that maintaining larger

livestock holding is not longer profitable. When herd size is reduced there also has been simultaneous shift fro local breeds to hybrid cattle and other animals which induced widespread stall feeding trends.

Constraints to hill agriculture

Hill agriculture has some inherent constraints of remoteness and inaccessibility, marginality, and fragility in terms of moisture stress and the poor soil conditions and a short growing season. Added to these are socioeconomic constraints such as small holdings, poor productivity, poor production management, labour shortages, poor post production management, poor marketing and networks (lack of market development) and lack of entrepreneurship. All these have led to underutilization of resource bases in the hills/ mountains and the limited generation of surpluses I nthe agriculture sector that could be used to invest in and support the growth of the hill economy. Nevertheless, the Himalayan hills/ mountain areas also have specific advantages that can be harnessed to good effect, in particular the wide diversity and the presence of niches particularly suited to certain crops say e.g. the apples in Himachal and saffron in soppore valley of Kashmir, pashmina goats and yak in the highlands of Ladakh or mithun in Arunachal Pradesh. It offers hope to develop these comparative advantages , promote investment in such niche areas as part of the efforts to improve farm economy in sustainable ways.

All across the Himalayas, declining size of landholdings has seen virtual invasion of farming communities on the non farm CPR land—waste land, rangeland, forest areas etc for conversion into cropland. Even then many farming families have not been able to sustain livelihoods on agriculture alone. So, there is an increasing trend of out migration, more specifically from the central Himalayasn region, It has created a unique situation in which sizable percentage of women are today heading farming households and economy of these households is at best known as money order economy.

In states like Himachal increased accessibility and focus on horticulture has created conditions to harness the local mountains to the benefit of farming communities, enabling them better cash income for sustaining and improved livelihoods. With few exceptions, in general, the major constraints to improving horticulture crops in the Himalayas include poor orchard management practices, quality plant material, seeds, and other inputs, little access to extension services and marketing. Across the Himalayan region, farmers face problems in accessing market information, post harvest processing and value adding skills. Because of lack of regular markets and reliable marketing, hills farmers I many areas, despite most suitable agroecological conditions, would find it too risky to diversify into more lucrative high value crops. In the central Himalayan region i.e. Uttranchal, poor orchard management is one of the factors contributing to the poor quality and acceptable productivity levels. The Kashmir farmers also face low productivity problem because of planting material, management and irrigation.

The constraints relating to livestock centre around shortage of fodder and feed quality, specially in the winter months. Even though grazing is open, poor productivity of grasslands means longer migration periods and distances. The rangelands and grasslands are operating at one fourth of their productive potential. The reason is most of the grazing areas and fodder production areas have been infested by non platable invasive species, such as lantana, eupatorium and congress grass. Tulachan (2001) estimates that there may be 40-60% shortage of fodder/ feed being faced by the Himalayan farmers. How is it being coped ? Dry fodder import and migrations.

Overgrazing and open grazing are commonly cited reasons for poor regeneration and degradation of forests, rangelands and pastures. One finds that there is line of thinking in the Himalayan states which a case for reducing livestock, restricting open grazing and encouraging farmers grow fodder. Got interventions are mostly influenced by this thinking line and projects and incentive services are derived from this philosophy. But is it so ? Is the thinking line justified --- may be not. One has to realize that a land resources of the Himalayan region (10% cropland and 70 % non cropland) hold

imperatives to sustainable livelihoods development. The solution lies in not increasing pressure on cropland for fodder resources, not in restricting access to non cropland and leaving them degraded and with poor productivity. There is need for a new thinking, which looks at abundant non farmland as a great resource and strategies are put in place to unleashed the potential of this huge land resource to support livelihoods. An example, only if we could take steps for restoring grazing and fodder productivity potentials of lantana and other weed infested support lands of the Himalayas, there will be fewer reports of fodder shortage.

Table 1. Land and Livelihoods in the Himalayas

Land Category	Estimated Area	Livelihoods & landuse practices	Imperatives of managing hill livelihoods
1. Range lands / pasturelands	41 %	Pastoralism /Nomadism Subsistence Systems	Explore niches of pastoral systems to make these systems ecologically and economically sustainable
2. Forests, shrub land/ marginal waste land "support land"	32%	Fodder fuel timber, grazing and subsistence livelihood needs of farmers	Integration of support land management planning with agriculture and livelihood development planning for proper use and management
3. Cropland	11%	Food grains and high value crops, declining fertility and increasing non agricultural use	Improve/ maintain soil fertility through SWNM , intensify land use and diversify cropping to high value crops. Taking institutional initiatives to halt the process of crop land loss through conversion for non agric. Purposes
4. Shifting Cultivation Area	3%	Slash and burn agric. land degradation, falling productivity and food insecurity / poverty	Exploring alternative production systems which can link NRM with improving food security & livelihoods.
5. Marginal Farmland	6.5 % of crop land	Mixed crop-livestock farming systems	Exploring marginal farmland niches for alternative production options that are economically more productive and enhance ecological stability
5. Cropland >5-25 ° Slope	35 % of Cropland	Extensive cropping with & without terraces	Improve SWNM along with niche based farming options
7. Cropland >25 ° Slope	14.2 % of Cropland	Cultivation of land races of mountain crops / poor production/ food insecurity-poverty	Initiating search for steep sloping land niches oriented production systems combining NRM with adequate economic benefits to farmers
8. Very shallow soil	60%	Wasteland / grazing land- poor productivity	Change perspective to support land , identify production niches to improve biomass regeneration and economic outputs
9. Shallow soil	25%	Range lands/ grazing lands/ waste lands	Identify production niches to improve biomass regeneration and economic outputs from support lands
15. Deep soil	15%	Farming , community lands	Explore ways for expanding and intensify cropping on this land Conserve the deep soil crop lands
16. Crop land holding- 0.25 to 1h	75%		

Sources: ICIMOD publications and ????

Chapter 2

The Livelihood Concerns of Hill Farmers

As the world is entering into a regime of globalization; nations, states and the farming communities find themselves under unbelievable circumstances of opportunities and challenges. IN the coming times, traditional agriculture and livelihoods systems may become increasingly unsustainable largely because the region is entering into an environment of opportunities. However opportunities will need to tapped and for that to happen it will be necessary to redesign our systems according to the new challenges. This chapter makes an analysis of the changing circumstances in agriculture and farmers' livelihood needs across the Himalayan region and about opportunities which might be waiting to be harnessed by farming communities of the Himalayas.

Crop land scarcity – inadequate small & marginal farms

Livelihood of the majority of the population in the Himalayan region revolves around agriculture. Here land is the nucleus of all socio-economic activities. For majority of the small and marginal farmers their wealth and poverty is associated with the ownership of the size of land holdings (Partap and Watson, 1994; Partap 1995, 1999). For large number of small and marginal farmers of the Himalayan region, shrinking cropland holdings is a key concern for managing food and livelihoods (Pokhriyal and Bist, 1988; Partap 1998). Rural development efforts across the Himalayan region face a serious challenge of finding a solution to this problem (Partap, 1998). Even though the population density per sq km (2-200 persons per sq km) is not much. However, as a matter of fact, calculating the population density this way for the mountain areas is misleading. The actual picture of human pressure in hills / mountains is revealed by the number of people depending on the available cropland. An overview of state of land resources presented in Table 1, clearly indicates that much of the land resources in the mountains, both in India and elsewhere , are sloping and steep lands and only limited percentage is cropland. While calculating population pressure on total land area it is low to medium. Contrary to this, data in Table 1 shows that per capita available cropland in hilly areas across Indian Himalayan states and even in other countries of the region is already too little to sustain livelihoods. The consequences of this situation to sustaining livelihoods and management of land resources may be serious.

GIS based digital elevation models of the Himalayan region reveals the true picture of the proportion of farm land located on various degrees of sloping terrain (ICIMOD 1998). It provided an idea of the state of available crop land in the region. The 11% cropland available to support livelihoods of disproportionately large number of mountain farmers is further divided into a range of flat and sloping land types. Partap (1999) also reported that 37% of the cropland is sloping land of various degrees, and the Himalayan farmers are even cropping sloping lands beyond 25 and 30 degrees.

Constrained by policies and main stream perceptions, which emphasize promoting forestry on sloping lands, improving farming on sloping farmlands has never been included in the research agenda of the national agricultural research system (NARS). As a result there has been general lack of technological options for promoting sustainable and more productive farming on sloping lands. It is also partly for this reason that the mountain farmers share the blame for land degradation. The new human settlements, urbanization, industrialization and government infrastructure development activities, all are competing for converting the flat valley cropland into non-farm use.

The flat valley land may have served as the food bowl for the hill / mountain people but today, farming on these lands is under transformation. The two emerging scenarios are; first, cropping pattern is changing from grain crops to cash crops like vegetables, floriculture and fruit farming, and the second, across the region valley areas are losing crop land to non agricultural purposes. The new human settlements, urbanisation, industrialisation and government infrastructure development activities, all are competing for converting this valley crop land into non farm use.

Researchers have reported that in the mountain areas a nuclear family in the hills needs 2.08 ha of rained cropland or 0.54 ha of fully irrigated productive cropland, provided it is put under intensive cash crops farming, for food and income security (Koirala and Thapa, 1997) . By this estimate, large number of mountain farmers in most of the hill and mountain districts are presently operating land holdings and their supporting system of non crop lands, which are much below the critical size needed for sustenance at the present technological levels. It is partly because of small farmland size and under utilization of support lands, that many families of small and marginal hill farmers may be presently experiencing food deficits of varying degrees.

It needs to be emphasised that we do have laws in place to protect conversion of forest land into agriculture or any other use but there is hardly any national or state law / policy in place about hill mountain crop land conservation. Certainly it could have helped contain the ongoing dangerous process of crop land loss. In the absence of laws, farmers find it hard to resist the lucrative land market for non agricultural purposes. Gardner in his land mark study (1996) has issued a serious warning about the implications of global trends in cropland loss to food security and livelihoods of people. In his assessment he indicated that marginal areas, such as the hills and mountains, will be the worst sufferers of the negative implications of cropland loss.

Implications of cropland scarcity in mountain areas are reported in the crisis area studies (Table 2.) by Jodha and Shrestha (1994) These studies give documented evidence of unsustainability of upland agriculture in respect of land resources, production and livelihoods. The documented unsustainability indicators are in fact hidden responses of farmers to lack of access to cropland of adequate size and quality. The state of croplands in the hill region and its impact on the food insecurity and continuing poverty paint a grim picture for sustainable hill/ mountain agriculture. The key issues that emerge are, shrinking size of land holdings, erosion from sloping farmlands and decline in soil fertility and above all widening cycle of inadequate food production-food insecurity-poverty-resource degradation.

It highlights the fact that “*unless solution is found to cropland scarcity, agriculture as a source of sustenance for the small and marginal farmers may lose its significance*”.

Underutilized support land (wasteland)

To cope with the crop land scarcity, the ray of hope lies in finding ways to use available marginal land present in the form of non crop support land, in private possession or as common property or government controlled land. Most of this land lies in between the cropland and actual forests. It is known by various names in different countries of the region, such as waste land, grazing land and range land, shrubland and unclassed or c category forests. Much of this land either common property, government land or even owned privately and used to meet subsistent household needs of the farmers such as fodder , grazing and fuel wood etc. In the present discussion we call it support land which provides crucial support to farming and livelihoods of hill/ mountain farmers.

A study by ICIMOD (1998) revealed that there is relative abundance of the support land in the region. Information gathered from field studies by other scholars (Pokhriyal and Bist, 1988) indicated trends of increasing support land area at the expense of cropland. In the central parts of Indian Himalaya, 14.5 % of the crop land was converted to privately owned supportland, in a period of one and a half decades. In India it is called as “*Culturable wastel*” and is defined by the Indian National Commission of Agriculture as the land that is culturable but not cultivated for years (National Commission on Agriculture, 1976). The studies are indicative of the trends leading to increase in privately owned support land area.

The reasons may be many, including falling productivity of subsistence farming, migration of families in search of better livelihoods or absence of able bodied family members in the households for better management of farmland. Above all it reflected the lack of technological options and institutional support to manage the marginal farmland productively to support food security and a better living for the families. For example there is enough field evidence and knowledge about regeneration of support lands through biomass type production approaches focusing on fodder and fuel wood needs (Hazara et al. 1996; Joshi, 1997). However, in the changed economic context and crop land scarcity, farmers are wanting to put emphasis on harnessing high values products even from the support land (Jodha ,1992, 1998). For that matter they manage the economically productive support land better, which brings them economic benefits, than the unproductive portion of it (Jodha,1992).

The precondition for permitting productive use of support land will be the availability of appropriate technological options that ensure its use in accordance with the ecological principles. To take steps in that direction will mean that mainstream society and institutions will have to get convinced of the necessity to make land use changes in respect of marginal land/ support land. The follow up actions may involve changes in land use policy, investments in research and technology development and other necessary support to the farming communities.

Himachal Farmers livelihood concerns : A representative case study of hill farmers wider concerns

In order to capture the emerging issues in hill agriculture, this section analyses the changing circumstances of hill agriculture in Himachal, the farmers livelihood needs and the emerging opportunities. While these are specific to Himachal but they by and large represent the concerns and opportunities of western, central and east Himalayan farmers. The overview in this section, is intended to understand the complexity of concerns and steps needed to harness.

Agriculture diversification in Himachal : the turning point

Himachal is presently known as a success story of hill agricultural diversification. Its Rs 700 crore annual fruit and vegetable farming has helped improve the livelihoods of small and marginal farmers in several districts. However the present agricultural diversification is already facing second generation problems and the challenge of sustaining and widening benefits of hill agricultural diversification is beset with range of new problems highlighted by the stakeholders.

Large proportion of marginal farmers yet to benefit from agricultural diversification

Food and income security of large number of small and marginal farmers, falling outside the fruit and vegetable zone, will depend very much on the crucial technological inputs which can change the generally perceived limitations of rainfed marginal lands. Promoting alternative high value cash crops farming on these lands, which are most suitable such as medicinal and essential oil plants, holds the key. However, the question is are there off the shelf technological options ? And who will take the lead? Organic agriculture is most suited on such farmlands but major institutional initiatives are presently wanting.

Second generation problems in cash crops farming

The crop diversification in Himachal has largely focused on fruits and vegetables farming and during recent years vegetables have even taken over fruits. However, initial success in many valleys have over the years led to increasing crop husbandry costs and crop failures. Crop pollination based productivity decline in apples, root disease based ginger crop farming failure etc are some examples.

Over the years, the market forces have taken over as decision makers and companies are now supplying seed and decide what farmers should grow. The role of the universities, is thus drastically changing from breeding and releasing crop varieties to advising on crop husbandry and natural resources management. How far institutions are geared to provide

this support is reflected in increasing dimension of the multifarious second generation problems.

New generation of farmers: the educated unemployed youth exploring entrepreneurship opportunities

Today, Himachal has nearly a million (889,000) educated unemployed youth in the state, both men and women. Interestingly majority of them are from the farming families and may be helping their parents/ families in continuing farming while waiting for the jobs. Comprising both men and women, this educated class of young farmers holds great potential for opening self employment opportunities in agriculture / enterprise and boost farm economy of Himachal. Even though many of these educated unemployed youth have acquired traditional knowledge of farming from their families, yet they need to be equipped with necessary knowledge and skill in farming, entrepreneurship and agribusiness. Who can assist in unleashing this dormant agri-enterprise potential of hill farming ? Given success of this initiative, will provide food and income security to a million farming families.

Unexplored comparative advantages of hill agriculture

One of the key benefits that hill agriculture will enjoy due to WTO and liberal markets , will be the comparative advantage of unique farming niches and unique products because of typical mountain climates. Certainly mountain farmers specializing in producing unique hill products will have an edge in the markets. Development experts believe that if the farming communities and governance systems in the hills and mountains are smart they should start focusing on developing their local farming niches for unique products.

If organic farming has natural niche anywhere, it is in the hills and mountains. To organize small and marginal farmers, to help them benefit from comparative advantage of organic farming, building competency for certified organic farming will be the most desired initiative. Market channel for organic produce are fast developing.

Marginal farmlands of Himachal provide excellent advantage for cultivating medicinal and aromatic crops. However the challenge remains for providing access to organic farming technologies, inputs, post harvest operations, value addition, certification and marketing.

Constrained livelihoods because of biological degradation of support lands – the waste lands

Most of the non crop land in the hills is commonly known as waste land. Presently most of the land under this category is under various degrees of biological degradation. All across the Himalayas one finds widespread infestation of such lands by four obnoxious weeds, such as lantana, eupatorium, ageratum and congress grass. The has taken serious proportions in several low and mid hill areas, where people depend on these lands for