CHAPTER - 11

CONCLUSION, CONSTRAINTS AND STRATEGIES
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11.1 CONCLUSION

Increasing population pressure on land has resulted in division and fragmentation of the holdings due to the laws of succession and the willful attempts to by pass the land ceiling laws. The sequel is in increase in the number of small and marginal holdings. This increase alongwith decrease in size of holding has put a question mark regarding the economic viability of small and marginal farms. About 69 percent of the population of Himachal Pradesh, depends directly or indirectly on agriculture. Agriculture in the state is characterized by traditional cropping pattern and methods of cultivation. The farming is done on sloping and fragmented lands. The large dependence on rains makes the farming less remunerative and unviable especially for marginal and small farmers. It has been indicated in the study that the number and holdings under marginal and small categories of holdings has been continuously increasing over the time. As a result about 84 percent of the farmers in the state have holdings of less than two hectares. To determine the state of viability of such farms along with the diversification and sustainability of such farms is of paramount importance for the welfare of the farming sector in the state. The study has focused on this objective and the scope of diversification for increasing the farm income and how a sustainable agricultural system can be adopted without harming the environment and human society. Study of alternative strategies/programmes that could be used for imparting viability to the non-viable farms another objective of the study.
11.2 Methodology and Coverage

Himachal Pradesh lies in the lap of Himalayas and the altitude varies from North to South. Because of the varying altitude, the agro-climatic conditions also vary and the conditions prevailing at one particular place may be totally different from another. This has important consequences as far as the input structure and the production pattern etc. are concerned, which may have important bearing on the viability of farms. Consequently the state has been divided into two parts viz., tribal and non-tribal areas. The multistages stratified random cum purposive sampling technique has been used in the present study. The primary sampling unit for tribal area is tehsil and for non-tribal area it is district the selected district being divided into tehsils. One tehsil each from tribal and non-tribal area were selected. The selected tehsils have been delineated into revenue villages. Two villages have been randomly selected and lastly sample of 30 marginal and small farmers from each village was taken in probability proportion to their actual number. Thus the study has been based on 120 marginal and small farmers located in tribal and non-tribal areas of the state.

Both primary and secondary data have been used in the present study. Primary data have been used from sampled farmers including their land use pattern, cropping and production pattern, size of holdings, cost of cultivation and gross return etc. Secondary data were collected from various govt. offices and published reports and journals and unpublished sources. Simple tabular analysis has been used to arrive at results. In the present study the viability has been worked out at three stages. At the first stage viability of farm is measured over paid out costs. In second stage it is measured over cost C and finally after considering the consumption expenditure of the farming families. Herfindhal and Entropy indices used to determine the pattern of crop diversification where as Compound
Growth Rates are used to measure the growth in number and area of operational holdings in the state.

11.3 **Socio-Economic Profile of Sampled Farmers**

The present study indicates that there is pre-dominance of marginal and small farms in both selected areas under the study, where 79.17 percent sampled farmers were marginal and 20.83 percent were small. The average size of farms among both the marginal and small farms in tribal area was 0.57 hectare while in the non-tribal area it was 0.66 hectare indicating average farm size to be comparatively smaller in tribal region. The land utilization pattern in both regions has been found to be more and less the same. No practice of leasing in and leasing out was present in both the areas. The area operated per farm has been found to be larger in non-tribal region.

The study indicates that the small and marginal farmers are facing economic problems due to poor resource position. This problem was found comparatively acute in the tribal area. The poor resource endowment resulted in unemployment in the farming sector. The lack of alternative sources of employment resulted in the unemployment and disguised unemployment in the farming sector of the state. This problem has been taken care of through employment generation from animal husbandry sector which is an integral part of agriculture sector in the state. There is also great scope for employment and income generation through diversification towards horticulture and other high pay off crops like vegetables, floriculture etc. But the adoption of such activities has been poor except for certain areas and pockets in the state.

11.3.1 **Occupation**

The marginal and small farmers are mainly dependent on crop husbandry. The income through crop, horticulture and animal
husbandry increased with the increase in the size of farm. In the tribal area the average total income (farm and non-farm income) per farm was less as compared to non-tribal area.

11.3.2 Family Size

The average family size of the sampled farmers was 6.29 persons and the average family size of small farmers was invariably large as compared to that of the marginal farmers. The study also highlighted that the extent of literacy was low in tribal area and was lower in females in both areas under the study. The average agricultural force per family was 2.67 persons and it was higher for small farms at over all level. The dependency ratio was 0.52 persons per worker. Among the total workers, 64.65 percent were engaged as crop production, whereas only 10.71 percent were engaged in non-agricultural labour and about 9.29 percent were found engaged in business.

11.3.3 Land Utilization

The land utilization pattern indicated that about 85.26 percent of the total owned land was under field crops and out of this only about 26 percent was irrigated. The orchards were observed to be occupying unirrigated area and were established on about 5.15 percent of the total owned land. About 9.29 percent of the area was uncultivated. The cropping intensity at overall level was observed to be about 171 percent and non-tribal farmers were observed to be having higher cropping intensity. There was considerable variation in the cropping pattern of tribal and non-tribal areas. However, maize and paddy were the important Kharif crops, while wheat and barley were the dominant crops of rabi season.
11.3.4 Livestock

The livestock profile of the sampled farmers indicated that at overall level there were about 9.14 heads of livestock in each family of which 2.01 were milch cattle and about 1.77 were draught cattle. The rest were goats and sheep, and young stock (about 5.36) per family. It was observed that number of livestock reared by each family was higher in tribal area as compared to non-tribal area.

11.4 Viability of Farms

The viability is generally considered to be a situation where the resource generated from the farming activities are enough to meet out the expenditure incurred in such enterprises. In the present study the viability has been worked out considering the three different criteria i.e. viability over paid out costs, costs C and viability over the consumption expenditure.

The results indicated that all the farms in tribal and non-tribal areas were found financially viable, i.e. they were capable of meeting out the paid out costs and cost C incurred on bringing out the production on such farms. However, when it was analysed that whether the farms were truly viable in the sense of being able to bear the household expenditure, it was found that none of the farms were viable in the both areas.

When it comes to the analysis of viability over the consumption expenditure it was found that none of farms in both the study areas were viable. This is despite the fact that not only the returns from crops were considered but it also included the returns from horticulture and animal husbandry. The study indicated that that total cost of cultivation of maize was Rs.4455 per farm and for wheat it was Rs. 3377 per farm. The cultivation of barley involved an investment of Rs. 1063 per farm. The cultivation of paddy involved a total cost of Rs. 1136 per farm. The costs and returns from the
horticultural crops have also been worked out in the study and it was revealed that the farmers located in the tribal area on an average incurred a cost of Rs. 12,388 per farm for the cultivation of apples. This includes marketing cost also. The gross returns from the horticulture was Rs. 14044 per farm while it brought net returns over paid out cost Rs. 5673 per farm. The rearing of livestock is an integral part of the farming families which brought net return of Rs. 4672 per farm at overall level.

The consumption pattern of the farm families shows not only their standard of living but also the relative importance of various items in the total expenditure. For this purpose existing consumption pattern of the farming families has been analysed and divided into two broad categories viz. food items and non-food items. It was found that each farming family at the overall level required a consumption of Rs. 31046 out of which about 52.18 percent was found on food items and left 47.82 percent was on non food items. There was large variation in the total consumption expenditure in both tribal and non-tribal areas. The expenditure incurred by farmers of the non-tribal area was higher (Rs. 35203/ farm/ annum) as compared to the tribal area (Rs. 26884/farm/annum)). The study found that this consumption expenditure could not be met from the income generated from farming sector including animal husbandry and horticulture. The deficit in this regard was met from non-farm income. Although non-farm income is not at all correlated with the farm size or its viability, however, it is a source of farm investment. It was found that at the overall level farmers were able to earn an income of Rs. 22786 per farm annual from various sources like government and private services, business and non-farm labour etc. Again total income from non-farm activities in non-tribal area was more as compared to tribal area. It has been observed that the status of viability in the state and the efforts of farmers for improving this
status is adversely affected by various problems being faced by them in the fields of production and marketing. More specifically these problems pertain to lack of irrigation facilities, traditional cropping pattern, inadequate credit facilities etc are more serious in tribal area whereas higher pressure of population on land, lack of diversification etc. are the main problems faced by non-tribal farmers. It is therefore, imperative that such problems be taken care of by the way of development interventions, and ensuring the farmers participation for the development of farming sector in general and marginal and small farmers in particular.

11.5 DIVERSIFICATION IN AGRICULTURE

The diversification in agriculture is considered as an important mean for the rapid economic growth and development in hilly state like Himachal Pradesh. It includes the shift in cropping pattern i.e growing high value crop in place traditional crops, adoption of allied activities like dairy, poultry, fishery, sheep and goat rearing, horticulture etc. In the present study Herfindhal and Entropy indices are used to determine the pattern of crop diversification in sampled farms. The study depicts that the high level of crop diversification was found in tribal area and among small farmers. During the period 1980-90 and 2005 the number of crops decreased resulting in low level of diversification in the both areas of the state. Infact there was a trend towards specialization as there was drastic decrease in number of crops from 11 to 4 during this period. The profitability and shift in taste and preferences has resulted in the present cropping pattern comprising. The local and inferior crops do not find any place in the present cropping pattern. However there is some tendency towards diversification in form of apple cultivation and vegetables. The area especially under the vegetable is still insignificant but indicates tendency towards diversification.
11.6 **Sustainable Agricultural Development**

The sustainability ensures that development should meet the needs of present without compromising the ability of future generation, to meet their own needs. Basically it aims at maintaining an equilibrium between the human needs and economic development within the parameters of environmental conservation. Every area has its limitation in the use of its natural resources. If a production system is adopted according to the availability of natural resources, the area can become self-dependent and the process of sustainable development should be adopted. Sustainable development can be defined as appropriate use of resources within the environmental and social limitations. With reference to rural areas sustainable development implies sustainable agriculture. Sustainable agriculture is that which should be ecologically sound, economically viable, socially equitable and humanitarian. In order to achieve sustainability in agriculture in both tribal and non-tribal areas of the State some physical and social efforts need to be adopted. Natural farming system, organic farming, utilization of urban garbage, use of live stock energy, tree plantation, appropriate cropping pattern and land management are some of the physical aspects which need proper attention on the field. Distribution of food, proper availability of agricultural implements, improvement of farmers health and nutrition, scientific use of organic fertilizer, provision of proper irrigation and storage facility are some of the important dimensions, which need to be looked into for ensuring sustainable agricultural system.

11.7 **Constraints**

Despite all the development programmes in the state, majority of farmers in both tribal and non-tribal areas still face plenty of problems at every step of production and marketing. The existence and extent of such problems varied from one agro-climatic region to
another and also across different categories of farmers. The problems have been found to vary, depending upon the progressives and backwardness of the areas and also on occupational and social groups. The following main constraints have been identified adversely affecting the viability of marginal and small farms of both the area. The problems faced by these farmers are presented in Table 11.1.

11.7.1 Heavy Dependence on Agriculture and Allied Activities for Employment

It has been observed that majority of population in the rural areas predominantly depends on agriculture and allied sector due to lack of alternative employment opportunities in any other sector of the economy. This forces them to work as hired farm workers to supplement their family income. But, the wage employment opportunity in the farm sector is very limited even in the crop season. The employment opportunity in secondary and territory sectors is very low in rural areas. The most important thing with reference to transferring the surplus labour to other sectors of the economy is non-feasibility due to poor skill base. This problem was reported by 67.04 percent farmers in tribal areas and 76.80 percent in non-tribal areas of state. At overall level about 72 percent of the respondents reported this problem.
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Constraints</th>
<th>Tribal Area</th>
<th>Non-Tribal Area</th>
<th>Over All Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Marginal</td>
<td>Small</td>
<td>All</td>
</tr>
<tr>
<td>1.</td>
<td>Heavy dependence on Agriculture and allied activities</td>
<td>69.23</td>
<td>58.29</td>
<td>67.04</td>
</tr>
<tr>
<td>2.</td>
<td>Lack of irrigation facility</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>3.</td>
<td>Traditional cropping pattern</td>
<td>88.09</td>
<td>92.00</td>
<td>88.87</td>
</tr>
<tr>
<td>4.</td>
<td>High pressure of population on land</td>
<td>68.75</td>
<td>58.33</td>
<td>66.67</td>
</tr>
<tr>
<td>5.</td>
<td>Lack of infrastructural facilities</td>
<td>91.67</td>
<td>91.67</td>
<td>91.67</td>
</tr>
<tr>
<td>6.</td>
<td>Poverty and inadequate credit facilities</td>
<td>83.33</td>
<td>66.67</td>
<td>80.00</td>
</tr>
<tr>
<td>7.</td>
<td>Low farm business income, saving and investment</td>
<td>95.83</td>
<td>83.33</td>
<td>93.33</td>
</tr>
<tr>
<td>8.</td>
<td>Lack of diversification of farming system</td>
<td>47.44</td>
<td>54.91</td>
<td>49.33</td>
</tr>
<tr>
<td>9.</td>
<td>Lack of proper drainage, soil conservation and water management facilities</td>
<td>32.17</td>
<td>34.49</td>
<td>32.63</td>
</tr>
<tr>
<td>10.</td>
<td>Lack of technological change and non-availability of modern outputs</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>11.</td>
<td>Lack of enterprising ability</td>
<td>36.23</td>
<td>37.11</td>
<td>36.41</td>
</tr>
<tr>
<td>12.</td>
<td>Imbalance in factors of production</td>
<td>10.11</td>
<td>12.00</td>
<td>10.49</td>
</tr>
<tr>
<td>13.</td>
<td>Poor means of transportation and communication</td>
<td>62.73</td>
<td>64.93</td>
<td>63.17</td>
</tr>
<tr>
<td>14.</td>
<td>Far of location of farm</td>
<td>68.75</td>
<td>50.00</td>
<td>65.00</td>
</tr>
<tr>
<td>15.</td>
<td>No market</td>
<td>77.08</td>
<td>75.00</td>
<td>76.67</td>
</tr>
<tr>
<td>16.</td>
<td>Poor soils</td>
<td>81.25</td>
<td>66.67</td>
<td>78.33</td>
</tr>
<tr>
<td>17.</td>
<td>Lack of extension service</td>
<td>70.83</td>
<td>58.33</td>
<td>68.33</td>
</tr>
</tbody>
</table>

**Source:** *Own Survey*
Hence excessive dependence on agriculture and poor skill are basic constraints responsible for the economic un-viability of the marginal and small farms resulting in high incidence of unemployment and poverty in the rural areas particularly among small cultivators in both tribal and non-tribal areas.

11.7.2 Lack of Irrigation Facilities

Irrigation is a major factor that reduces variations in output besides improving productivity. Provision of irrigation is starting point of agricultural development. Dry land areas are generally caught in vicious circle of high risk, low investment, poor technology and low productivity. In the absence of irrigation even increase in the size of the holding will not generate substantial income unless suitable technology for dry land farming is introduced. However, when the irrigation facility and provided the same holding generates substantial production and income. This calls for, effective implementation of suitable minor irrigation programme in unirrigated areas. The irrigation facilities on the sampled marginal and small farms were found to be grossly inadequate. Most of the farmers of this category depend on weather. Due to this constraint the production is affected adverse to a considerable extent. All farmers of tribal area reported this problem and 35 percent farmers of the non-tribal areas experiences similar constraint.

11.7.3 Traditional Cropping Pattern

The marginal and small farmers in both selected areas were found to be following still traditional cropping pattern on their small and fragmented farms. It was observed that the low rate of production was attributed to low level of adoption of improved technology in crop cultivation. At overall level about 77.59 percent farmers are facing this problem. This percentage was higher for
tribal area (88.87 percent) as compared to (66.30 percent) in non-tribal area of the state.

It was also observed that changes in cropping pattern for substituting traditional crops by more remunerative ones have not been taking place. In some potential areas only the traditional varieties were replaced by the high yielding varieties that too on limited scale. It was however, observed and opined by the sampled farmers that there is scope of changing the cropping pattern additional facilities like irrigation, input supply, credit etc. are made available.

11.7.4 High Pressure of Population on Land

The high pressure of increasing population on limited land was found to be the most important constraint due to which marginal and small farms of the areas under study have not been found to be economically viable, despite several measures taken by the government in this direction. Further, if the present trend of population growth continues, the continuously increasing pressure of population on land would become more acute in future. The problem was more acute in non-tribal area where about 76.67 percent farmers were facing this problem as compared to 66.67 percent of tribal farmers of the state. At overall level this problem was faced by about 72 percent farmers.

11.7.5 Lack of Infrastructural Facilities

In both the areas under the study, infrastructural facilities particularly storage, marketing, processing, etc. were found to be lacking. This problem was found very much serious in tribal areas of the state where about 91.67 percent farmers suffered on this account while in non-tribal area only 48.33 percent farmers were facing such problems. At overall level about 70 percent farmers were facing the lack of infrastructure facility. This acted as a disincentive for
increasing production, as has been the experience of certain small and marginal and other category of farmers.

**11.7.6 Poverty and Inadequate Credit Facilities**

This problem was faced by 68.33 percent farmers at overall level. In tribal areas about 80 percent farmers were facing this problem whereas in non-tribal area this ratio was about 57 percent. There was preponderance of acute poverty in both the areas particularly among the marginal farmers. There is also shortage of financial institution, these are also located far-off, making the use of such facilities difficult. The dealing of staff was also not conducive for making use of such institutions.

**11.7.7 Low Farm Income, Savings and Investment**

This problem was more acute in tribal area where 93.33 percent farmers were facing this problem compared to 43.33 percent farmers of non-tribal area of the state. The study revealed that the net farm business income of the marginal and small farmers is very low. In tribal area the aggregate net annual farm income is Rs.3254 for marginal and Rs.5052 for small farmers which is considered to be too small amount for a minimum standard of living. These figures for non-tribal area are Rs.5677 and Rs.6303 for marginal and small category of farmers respectively. The consequence of this poor return from crop cultivation do not leave any margin over subsistence of the farm family for savings and farm investment.

**11.7.8 Lack of Diversification of Farming System**

Besides cultivation of crops, there is potential of raising commercial crops, dairy farm, poultry, goatery, sheep, duckery, fishery, bee-keeping, rural industry etc. in the study area. Unfortunately such rural based enterprises have not been developed. In the case of crop husbandry some farmers reported that they diversified their crop production by adding the cultivation of apples
and potatoes. But due to lack of storage and marketing facilities this diversification became un-economic for these farmers. This problem was faced by about 58.58 percent farmers at overall level. This problem was more acute in non-tribal area (68 percent) as compared to tribal area (49.33 percent) of the state. Due to poor resources on their farms the marginal and small farmers are unable to diversify their farming practices in both the areas.

11.7.9 Lack of Proper Drainage, Soil Conservation and Water Management Facilities

It has been observed that development activities of particularly road construction and housing have destroyed the natural drainage making the agricultural lands prone to the water logging. This has been adversely affecting the productivity of such lands. Simultaneously the debris generated from such works has been affecting the soil quality. In the absence of soil conservation measures the problem is becoming acute especially for the farms located down the roads. About 80 percent farmers at overall level were found to be affected by this problem whereas this percentage was 85 and 75 percent for tribal and non-tribal areas respectively.

11.7.10 Lack of Technological Change and Non-Availability of Modern Inputs

The production technique is traditional and there has been no technological change. Non-availability and high prices of modern inputs is another important problem faced by the farmers in both tribal and non-tribal areas. About 89.17 percent farmers were facing this problem at overall level whereas all the farmers of the tribal area reported this problem. In non-tribal area 78.33 percent farmers were facing this problem. Due to their poor purchasing power the marginal and small farmers of both regions were found using the minimum doses of modern and improved inputs such as chemical
fertilizers, insecticides, pesticides, H.Y.V. seeds etc. This affected the yields of crops to a considerable extent. The adoption of new technology in irrigated areas has achieved success in crop yield and crop rotation. The adoption of new technology is more favourable to medium and large farmers as they have the potentiality to invest in seed and fertilizer, which is not the case in respect of marginal and small farmers.

11.7.11 Lack of Enterprising Ability

Lack of enterprising ability of marginal and small farmers is one of the major problems for which non-farm employment and income generating self-employment schemes could not be implemented fruitfully. It was observed during the study that about 38 percent farmers were facing this problem at overall level. Lack of proper education and lack of skill are the important drawbacks.

11.7.12 Imbalance in Factors of Production

Relative imbalances in factors of production is another problem of marginal and small farmers. It was observed that marginal and small farmers have surplus family labour with inadequate land resources to provide full employment for all its working members. Under-employment and unemployment are observed to be wide-spread among marginal and small farmers. Due to disproportionate factors of production, many families are compelled to subsist on diet inadequate in quality and quantities. About 12.00 percent farmers reported this problem.

It was observed (chapter IV) that the land holdings are becoming smaller and smaller indicating that this problem may become more acute in future.
11.7.13 **Poor Means of Transportation and Communication**

Poor means of transportation and communication was another important constraint faced by the farmers in both tribal and non-tribal areas of the state. This problem was more serious in tribal area where about 63 percent farmers were facing this problem as compared to only 19.75 percent in the non-tribal areas.

11.7.14 **Distant Location of Farms**

The farms were observed to be located away from their residences, the distance exceeded even two K.m. This posed problems of watch and ward of their farms and they were required to carry all the inputs from the residences which also used as stores and the farm production had to be carried to the houses. This added to the cost of production of farm commodities. The farms were also scattered into many fragments making a management of such holdings difficulty and costly. This problem was more acute in tribal area where about 65 percent farmers were facing this problem while in non-tribal area only 30 percent farmers revealed this problem.

11.7.15 **No Market**

The remote locations of farms with respect to the habitation centers, where the market and demand exists, deprived the sampled farmers opportunities to market their produce, in whatever meager quantities. This proved to be a disincentive for increasing the farm production by means of application of modern inputs or by means of diversification etc. Such type of problem was more serious in tribal area where about 77 percent farmers reported this problem as compared to about 52 percent farmers in non-tribal area.

11.7.16 **Poor Soils**

Poor soils was one of the main factors, which inhibits any effort of improving farm production. This is also increasing the cost
of production having serious repercussion for the viability of the farms. Poor soils was found to be one of the most important problems faced by farms in both areas, 64 percent farmers reporting the problem. This problem was more serious in tribal area (78.33 percent) as compared to non-tribal area (50 percent).

11.7.17 Lack of Extension Service

Lack of Extension Service was reported by about 66 percent farmers. Due to this problem farmers are not aware of the use of modern inputs and other technical information.

The state government has introduced various development programmes and schemes aimed at improving the viability of marginal small farmers (mentioned in Chapter 10). Despite these programmes impact on viability of farms has not been appreciable. These farms are facing large number of problems. Some of these problems were found to be more serious in tribal area like, traditional cropping pattern, lack of irrigation facilities, poverty and inadequate facilities etc. While high pressure on land, lack of diversification facilities etc. were the main problems faced by non-tribal farmers. This is the cause for urgent redressal of these problems by shifting the focus of these programmes at the desired place. There is also a scope for initiating new development programs or widening the scope of coverage of existing programmes, so that the effectiveness of these programmes is enhanced for the benefit of marginal and small farms of the state.

11.8 Strategies

The marginal and small farms in the state are growing gradually and due to the growth of population resulting further subdivision and fragmentation of holdings. These farmers are facing economic hardships due to poor resource position and their farm are not able to support the consumption pattern making them unviable.
The following strategic policy framework is offered to make the marginal and small farms economically viable.

11.8.1 Creation of Irrigation Facility

Adequate and timely supply of irrigation is the pre-requisite for making farms viable, particularly in areas where the rainfall is scanty and irregular. Creation of irrigation potential and its optimum utilization should be high priority in the Government planning. It can make small and marginal farms viable with making possible multiple cropping. Watershed development should be given top priority. Dry land farming, soil conservation, mixed and multiple farming should be encouraged.

11.8.2 Diversification of Farming Systems

Cultivation of cash crops like potato, ginger, off season vegetables and vegetables seeds and pulses should be given emphasis. In order to improve the agricultural base of marginal and small farmers avenues have to be created to help them set up supplementary viable enterprises like dairy farming, poultry farming, piggery, goatery, duckery, fishery and bee-keeping etc. for which there is surplus labour force in marginal and small farms.

11.8.3 Improved Crop Production Technology

It includes area specific high yielding varieties, optimum fertilizer use, improved farm implements, establishment of agro-sales centers, crop insurance and cheep credit facilities etc. The possibility of increase in agricultural production through diversification of cropping pattern is known to the marginal and small farmers.
11.8.4 Co-ordination and Linkages Between Various Development Departments

Agriculture and Horticulture Department, District Rural Development Agency, Banks, Irrigation and Public Health Department etc. should work in a more co-ordinated manner to make a real break-through in the field of agriculture.

11.8.5 Human Resource Development and Control of Population

It was however observed that the long term solution lies in control of the growth of population in rural areas which results in sub-division and fragmentation of small holdings. Due to fragmentation of land holdings, the farm size has becoming uneconomical. There is a need to shift the rural population from agriculture to industry sector. Thus small-scale agro and other industries need to be encouraged in rural areas. Along with various measures taken for the development of marginal and small farmers the development of human resources with skill base be undertaken to make them fully conversant with non-farm enterprises.

11.8.6 Agricultural Extension Services

Agricultural extension services should be strengthened to disseminate the technical information by imparting trainings etc. The farmers in general, should be made aware of new production and marketing techniques. Fruit particularly apple need greater attention, the packing and marketing of apple and other fruits need immediate alternation.

11.8.7 Infrastructural Development

The increased production of fruits and vegetables should be matched with marketing and infrastructural facilities so that the farmers may be able to sell their produce at reasonable price. The
land based agricultural programmes which may help the vulnerable class of marginal and small farmers should be implemented in the problem pockets.

**11.8.8 Horticulture Enterprises**

Optimum utilization of land in hills by shifting area towards fruit crops, promoting environmental conservation, promotion of citrus and other subtropical fruits, proper management of orchards, strengthening storage and improved quality of planting material etc. are required. Horticulture is most appropriate cropping system for hilly conditions leading to the optimum utilization of the land, climatic and vegetative resources. Although the area of tribal is well suited for growing large range of horticulture crops, the growers are not receiving adequate return on their investments. There should be great scientific management of fruit orchards and the appropriate post harvest technology, apart from providing quality, nursery plants. Efforts should be made to bring additional area under fruit through involvement of small and marginal farmers of tribal area offering them suitable incentive and adequate credit. The research activities regarding horticulture by the government should be increased and are needed to be strengthened and streamlined in tribal area.

**11.8.9 Hops**

The cold and dry region of tribal areas in the state offers good potentialities for the cultivation of hops. The hops has got market in breweries and at present the country largely depends on imports. Thus it is suggested that the cultivation of this crop should be encouraged in tribal area of the state.
11.8.10 Floriculture

Both tribal and non-tribal areas of the state have potentialities for cultivation of flowers and ornamental plants. In addition to beautification of the local landscape which will help tourism industry, benefiting local farmers, will generate higher profits. Flowers can also be grown as an intercrop in plantation crops. Flower cultivation is not presently popular among the farmers because of higher capital and labour requirements and perishable nature of crops which needs quick and efficient marketing. To develop floriculture, technical know-how, do-how, marketing and credit facilities should be provided to the growers.

11.8.11 Oil Seeds and Pulses

The selected tribal area under the study is famous for good quality of Rajmah and pulses farmers require more facilities in the form of HYV seeds, plant protection material etc. Cultivation of pulses should also be encouraged in the basin of fruit trees as it will give double advantages.

11.8.12 Livestock Enterprise

Animal husbandry has been observed to be an important source of income. This sector needs further boost by introduction of cross bred cows and improved breed of cattle, sheep and goats in both area of the state. Maintenance of improved and cross bred milch animals can help marginal and small farmers in increasing their milk production and making their small farms economically viable.