Chapter 7

Summary, Policy Suggestions & Conclusions

7.1 Summary and Conclusions

The economic wellbeing of the population of Sikkim is closely related with the current state of agriculture in the state. In spite of rapid urbanization in the state, agriculture is still the mainstay of Sikkim's economy. However, physical constraints have limited agricultural growth within the state and thus its contribution to the State Domestic Product has not increased like other agricultural states in India. The contribution of agriculture to the Sikkim's economy was 51.59% in 1980-81, and in 1995-96, it became 52.03%. In India, 417gm of food grain per head per day was required during 2001-02 according to the data available from the agricultural department. But, per capita food grain available per day in Sikkim was 153gm in 2002-03 and 158gm in 2003-04. This excess food requirement is imported from other parts of the country. Since 1999-2000, the Gross State Domestic Product figure (Rs.11592/-) became higher than the all India average (Rs.12615/-). It indicates that the state economy is growing rapidly since the early 1990s. The per capita income (Rs.3492/-) was the highest during 1991-92. It is evident from secondary information source that annual growth rate of net state domestic product of Sikkim was positive, sometimes in double digits. The highest growth was during 1987-88. The growth of per capita income was also high during that time. There was a continuous growth from 1986-87 to 1987-88, as a corollary to the growth in per capita income. There might be huge agricultural production (160740 tonnes) including large cardamom (3900 tonnes) during 1985-86, which boosted the hill economy.

The distribution of landholding in Sikkim is very much skewed. As the Government took measures to protect the ST people, who were the indigenous tribes of the state, the size of average holdings of STs did not decline, rather, it increased in all categories except marginal holdings. Though, the percentage of SC population is very low in Sikkim, the average land-holdings declined for all categories, except, the large holdings. Therefore, it can be concluded that the landholdings of SC people have been marginalized more sharply than any other castes, since the merging of Sikkim with

India. The ethnicity-wise land-holdings since the merger of Sikkim with India show that the highest paddy-field holding was with Nepali community, closely followed by Bhutias. Nepali community holds highest dry-lands and wastelands. But, the Lepchas, the oldest tribe, hold the highest cardamom fields. The Bhutia community had 2nd highest cardamom fields, paddy-fields and wastelands.

The earlier chapters have been discussed in view of the research questions in the first chapter. Attempt to answer the question of changing landuse pattern of Sikkim has been tried with the help of secondary data in 2nd chapter and subsequently in the analytical chapters, e.g., chapter 5 & 6. It is found from the data that the land used for cultivation is declining over the years and land under plantations has been increasing, giving way to increasing agroforestry practices, especially in the North and West districts. The declining per capita land due to population pressure is spectacularly high. The percentage of people below poverty-line in Sikkim in 2001 was 36.55, which was much higher than the all-India average, 26.1 percent, and the state was ranked 4th in all-India ranking. The problems of rural poverty and natural resource degradation have close linkages and linkages are not simple in any causal sense. The spatial concentrations of rural poverty are major contributors which are the ecological and geographic constraints of location. Most of the rural poor worldwide are found in these least favoured areas where natural and human factors combine to constrain agricultural production and market access **[Pender, Hazell and Garrett, 2001]**. The ecological conditions are heterogenous in less favoured areas around the world. The nature of soils, slopes, altitude and other microclimatic factors such as water availability, quality and accessibility varies widely over small areas. In such areas, farmers' practices are diverse and spread risk across a wide variety of livelihood strategies that are dependent on multiple resources. Sikkim is a small hill state which has a lot of constraints for agricultural development. The scope for industrial development is also restricted due to its geographic features. People are thus compelled to look for diversified activities. The dependency on cultivation is shrinking over the years. The Millennium Development Goals of UNDP has targeted an eradication of extreme poverty and hunger. The first goal calls for halving the proportion of people who suffer from hunger, between 1990 and 2015. Other goals endorse the need to promote gender equality and to empower women, and to integrate the principles of sustainable development into policies and programmes to reverse the

loss of environmental resources **[World Bank, 2001: 5]**. So, Sikkim has protected forests by enacting various laws, which helped the people to think of alternative landuse system which will be ecologically and economically sustainable. The rural people of Sikkim need to adopt such a landuse system which will be used for multi purposes simultaneously. Agroforestry is such a landuse system where land is used simultaneously for agriculture and forestry. Sikkim has its own indigenous agroforestry system – large cardamom plantation in marginal forests.

The definition of livelihood has been formulated in a most comprehensive way by Ellis: "A livelihood comprises the assets (the natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determines the living gained by the individual or household". **[Frank Ellis]** The mountain area is characterized by fragility, marginality and niche. So, the livelihood options are comparatively lower and different than the plains. In Sikkim, the main livelihood options are – terrace cultivation, plantation, service, livestock rearing, petty trade or business and tourism. The question of livelihood change in Sikkim has been discussed in the third chapter. Previously, most of the people were dependent on forestry. The indigenous tribe, Lepcha, was totally dependent on forestry, and sometimes fishing and hunting. Initially, the Nepali people of Sikkim built terrace and started cultivation. Primarily, cereal based crop farming was practiced. Maize, wheat, rice, buck wheat, millet, etc., were cultivated dominantly. The cropping pattern has changed through the years. The population started to shift from traditional farming to cash-crop based farming. They started to produce mustard, potato, ginger and other horticultural crops. In the pre-merger period, more than 70 percent people were dependent on agriculture but in the 1990s it fell below 50 percent. The activity of plantation has increased enormously. In Sikkim, cardamom is the main plantation activity and it is the oldest cash-crop which was introduced by the natives. The plantation of some fruit trees, fodder trees and timber trees can be seen in the homesteads. Tea plantation is also introduced in Temi by the Government. Since agriculture is still at a subsistence level and it is too hard to maintain livelihood by the sole earning from agriculture, people are compelled to think for alternative livelihoods, like rearing livestock. Mainly, goats, pigs, mules, cattle, poultry, yaks, sheep are reared in Sikkim. Almost all households reared one or the other livestock for supplementary source of income. Poultry farming is the most

common form of livestock here. Main livestock produces are milk, cottage cheese, curd, *chhurpi*, butter, eggs, and meat etc., which are consumed domestically and the surplus used for business purposes.

As the population increased in the Sikkim hills and per-capita land diminished, people have tried for new landuse system which could be sustainable in both ecological and economic aspects. Agroforestry practice was found to be the required answer to increasing economic pressure. Agroforestry is defined as: "... *a dynamic, ecologically based, natural resources management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels.*" (ICRAF, Nairobi)

The recent study of ICAR, Tadong Centre, Sikkim, which has been published in the Indian Forester (July, 2007), sketched the various agroforestry systems in different altitudes in a comprehensive manner. According to the study, there are nine major agroforestry systems in the sub-tropical (300-900m amsl) and mid-hill temperate zones (900-1800m amsl). The systems are – agri-horticultural, agri-horti-pastoral, agri-silvi-pastoral, horti-silviculture, agri-horti-silvi-pastoral, livestock-based mixed farming, sericulture-based mixed farming, sericulture-based farming, bamboo-based farming, homesteads and tea plantation.

Among the above mentioned systems, the most popular and indigenous practice is Horti-silviculture and other popular systems are livestock-based mixed farming and homestead gardening. In the horti-silviculture system, large cardamom is cultivated with Utis (*Alnus Nepalensis*). Studies of different organizations show that horti-silviculture is a sustainable practice.

In Sikkim, the Lepchas, the first inhabitants of Sikkim, had collected the cardamom capsules from the natural forests. Eventually when the forests passed into village-ownership, the crop was domesticated. Sikkim is the largest producer of this spice. It has highest production in the world. The shade tree Utis is very popular and suitable to the environment of Sikkim. It is popular for its utility as fuel-wood and light timber. This fuel-wood is used during the processing of the cardamom.

Livestock-based mixed farming system is also very common in the Sikkim Himalaya. In this system, the common livestock (goats, cattle, pig, poultry, etc.) are reared with various species of fodder trees like *Cyperus sp., Ficus sp., Agave sp.*, etc.

Another common agroforestry system is homestead gardening. The farmers of Sikkim are observed to cultivate various vegetables in the surroundings of their dwellings. Usually, they use the small piece of land for homestead gardens. In this system, the Sikkim mandarin, lime, tomato, guava, papaya, avocado, etc. are intercropped with vegetables, medicinal plants, orchids, marigold, gladiolus, tuberose, etc. Even stall-fed animals like cattle, goats, ducks, pigs, etc., are reared within the homestead premise.

The socio-economic aspects of agroforestry in Sikkim have been drawn from the primary data collected through sample survey. It is evident from the secondary data as well as from primary data that the national average literacy rate is 65.38 percent, as against 68.8 percent for Sikkim. Thus, the literacy rate is higher in Sikkim than the national average. But, the enrolment rate in higher education level is substantially low. It is also evident from the secondary as well as primary data that the main livelihood option is agriculture, followed by service.

The main agroforestry practices found during the survey are Cardamom Plantations and Homestead Gardening. It is found that homestead gardening is commonly practiced by the lower income group and cardamom plantations are managed by the higher income groups. Cardamom is a relatively more profitable cash crop than the other cash crops or horticultural crops cultivated in homesteads. However, survey findings provide a contradictory picture where the socio economic conditions of the non-agroforestry practicing respondents are comparatively better than the agroforestry practicing respondents. The primary reason behind this as is evident from the survey information is that, most of the non-agroforestry respondents are service holders. The salary earning from the service sector is much higher than the earnings from agriculture. It is therefore evident that the agriculture sector is still at subsistence level though the cropping pattern has been changing from traditional cereal based crops to cash crops. The earning from cash crops or plantations is yet to surpass the earnings from non-farm activities like service in the tertiary sector.

Another important aspect visible from survey data is that the people of ST community are in the most favourable socio-economic conditions, with land-holdings greater than any other community. The percentage of cultivated land holding and also number of service holders are much higher in case of the ST community. The OBC community occupies the second position in terms of economic status, again primarily because of possessing large land holdings supplemented by salary earnings from service. The SC community among the respondents in Sikkim is the worst off due to low percentage of land-holding and no supplementary income sources other than livestock rearing. Thus the ST community is the most privileged community in the Sikkim districts. The enactment of various land protection rules has also been supportive to the ST community lending them a comparative economic advantage over the rest of the population. After the merger of Sikkim with India, the land transfer from the indigenous tribes of the state had been banned.

7.2 Policy Suggestions and Conclusion

The World Bank **[2001:6-7]** has suggested a comprehensive strategy to attack the multidimensional problem of poverty in developing nations. They suggested three ways by which poverty alleviation could be achieved – by promoting opportunity, facilitating empowerment and enhancing security. All three measures are complementary to each other causing pro-poor research to be streamlined towards the focus on assets, rights and institutions, as these provide a structure for opportunities for the poor and reduce their vulnerability, rather than ways to enhance income or expenditure.

On the basis of discussion made above the following policies are suggested for reducing poverty, reducing pressure on fragile resources and natural habitats and proper landuse management:

I) As the expansion of cultivated area on the Sikkim Mountain is constrained by difficult terrain and ecologically fragile bio-hotspots, alternative measures need to be undertaken to feed the growing population. To increase agricultural yields through diversification in agriculture will reduce the need for expansion of cultivated area. There is also a need for research to generate appropriate technologies in every agricultural process.

II) To improve land use planning, a land use map needs to be prepared up to village level and to promote intensification and protect vulnerable natural ecosystem.

III) To make provisions for technical education and agricultural extension to encourage more trained personnel into agriculture and agroforestry.

IV) To simultaneously generate employment opportunities in non-farm sector to reduce the pressure on land. In Sikkim, non-farm employment includes government service, petty trade, cottage industry, small scale industry, etc.

V) Where non-farm employment is limited especially in the North and West, agricultural progress is essential. This may be achieved by encouraging the use of manure, bio-fertilisers, integrated pest management, and good soil management practices for sustainable landuse system. Generally, the use of fertilizer is very limited in Sikkim; sometimes it is lowest in India. But, the scope of manure, bio-fertilisers are wide, which will accelerate the fertility of the soil.

VI) There is a need to promote agroforestry programmes to reduce farmers' dependence on common property resources like the forests, and encourage multiple-use sustainable forestry practices and afforestation programmes.

VII) To provide incentives for agroforestry programmes in low output degraded pastures that may be regenerated through reseeding and fertilisation. Several combinations and rotations of selected grasses and legumes can be made by planting their pasture species.

VIII) To accustom with global biodiversity strategy, the landuse system should be managed in such a way that conserve the biodiversity at present as well as in future.

IX) To protect the forest land, the user rights of local communities and groups should be secured that they can manage and use forest resources. Their security would ensure their cooperation with the government. In Sikkim, the enactment of law for forest conservation has restricted and sometimes

banned grazing. Even the collection of fuelwood was also restricted, which actually restricted the attachment of the local communities with forests.

X) To introduce easy access to credit from financial institutions as an incentive to encourage the local unemployed people to engage in small business ventures as diversion to non-farm employment. Agricultural credit may also be provided to increase investment in agriculture and consequently enhance agricultural production making the venture profitable to the cultivators.

XI) To provide responsive extension services to the local communities to develop improved farming and marketing skills. The improved farming will increase productivity, hence, total production and the improved marketing skill will help the farmer to sell the produce with higher profit margin.

XII) The widely accepted and traditional agroforestry practice is homestead gardening. But, there is also scope for forest garden simultaneously with the homesteads. Forest garden is a promising agroforestry practice and is proving to be a suitable practice to protect the forest and at the same time opening new livelihood options.

XIII) Sikkim is a rich state for its forest, water, flora-fauna, rare species of plants, etc., and therefore the policy should be made in such a way that will help to protect the natural resources while ensuring optimum utilization of the resources for the development of the state. For this an appropriate strategy for natural resource management (NRM) is of utmost necessity while protecting the forest cover of Sikkim. The water resources in Sikkim have high potential for hydro-electric power generation.

XIV) The state and local policies should be made on the basis of comparative advantage of the region. The topographic variation within the state has divided the entire state into various agro-climatic zones. Each agro-climatic zone has unique environmental conditions for farming with ensuing environmental comparative advantages for different products.

XV) The geographical constraints of the state create obstacles for development. There is thus a need to increase the investment in physical infrastructure and social infrastructure using environment friendly technologies. The state should enact and implement a suitable legal framework so that the mountain population can access natural resources for their livelihoods.

XVI) To provide scope for greater participation of women in workforce, who are the major stakeholders and backbone of the mountain economy. Though, Sikkim is a state with low FMR, low literacy rate, but there is no social restriction of women for participation in workforce like many communities in the plains. However, the WPR is lower among women than men and thus measures need to be taken to encourage their participation.

XVII) To adopt an effective approach, it should be decentralized and participatory in nature, for development and conservation of mountain areas.

XVIII) The Research & Development efforts should be made to develop technologies and products with unique or comparative advantages in mountain areas.

XIX) Creation of provision for technology transfer among the mountain regions around the world. Generally, mountain areas are backward in comparison to plains throughout the world for their physical constraints. The mountain people are thus mostly the poorer section of the population of the country. But, such features are no longer universally true for all mountain areas, e.g., the mountain area of China and other advanced countries are comparatively advanced and developed. So, it is necessary to import the suitable technology which might be helpful towards the way of mountain development.

XX) To get the positive impact of globalization the human resource should be developed. The skilled human resource only can use the benefit of the globalization. So, it is necessary to provide general as well as technical education to the people of Sikkim.

XXI) Since there is a clear demarcation in the adoption of livelihood strategies between the districts of Sikkim, it is necessary to improve upon the strategies and enhance the living standards of the population. Primary survey has revealed that the segment of population practicing agroforestry is worse of in economic terms than the non-agroforestry practicing population. Thus, maintenance of traditional agroforestry systems and introduction of new strategic agroforestry practices are imperative to initiate the process of development. In Sikkim, Cardamom growing is the age-old agroforestry practice, but the development of this plantation is not upto the mark for various reasons. There is a lack of proper awareness among the farmers. The processing of. cardamom capsule is time consuming. There is a lack of proper marketing, which deprive the farmers from reaping high profit, though the product commands a high price in the world market. All the potential agroforestry practices are to be maintained so that the people can accrue increased benefits from it.

XXII) There is a tremendous scope of tourism in Sikkim. The traditional tourism has to be molded into eco-tourism, which has great potential in this state. The scenic beauty, the forest resources, the greater elevation and multi-vegetation are the important features for the development of Sikkim's tourism. What it requires is attractive wrapping for marketing. The major livelihood of the poor people will depend on this sector in the near future.

XXIII) To enhance the size and diversity of agroforestry practices, selective growing of trees need to be undertaken to bring about improvement of livelihood.

XXIV) Designing proper silviculture and farming practices to optimize food production, carbon sequestration and biodiversity conservation, has become a necessity at present. In Sikkim, the most popular and widely used shade tree in the plantation area of cardamom is Utis. It is a leguminous nitrogen fixing shade tree with carbon sequestration feature. There are several shade trees available, but there is a need to test their environment viability.

XXV) Non Timber Forest Products (NTFPs) market should be strengthened for the forest-dependent community. Forests provide various products like wild fruits, honey, fodder, fuel-wood etc, which help the poor people in their livelihood choice. To reap the benefit, it is necessary to strengthen the market for such products.

XXVI) Domestication of wilder fruit trees for the improvement of mountain livelihood can be an option to widen the livelihood choice.