PART – III

SYNTHESES
Chapter 7

SUMMARY AND CONCLUSIONS

7.1 Summary

Throughout the ages, efforts have been made by different scholars to unfold the mystery of the intricate relation of human with nature from various perspectives. Studies to date have mainly examined either a specific theme of nature and/or activities of human within the broad natural framework. There is however enough to explore and understand particularly in the case of life and living of the rural communities in the mountain environment. The man-nature relationship as a part of livelihood system in the mountain environment is more typical than that of the lowlands. The present work has emphasized on the understanding of how the rural societies in mountain areas are responding to their changing environment. Therefore, the aim of this study is to analyze the man-nature relationship with a focus on the livelihood, adaptive strategy and sustainability issues. It attempts at an in-depth micro-regional analysis of the themes identified with respect to the communities inhabiting the mountain areas. Particular attention has been paid to develop and evaluate sustainability indicators relevant to the areas, communities and households located in different biophysical settings.

Three Village Development Committees namely Jitpur, Murtidhunga and Parewadin of southern Arun valley have been chosen as the study area. It covers an area of 54.26 sq km with a total population of 15,684 distributed in as many as 3,030 households. The area has an elevation ranging from 640 to 2700 meters with moderate to high slopes characterized mostly by moderate quality of soil. The area is characterized
not only by diverse terrain but also by diverse communities such as the Limbu, Magar, Brahmin/Chetri, Dalits, Rai, Newar and Sherpa.

The research is basically guided by several philosophical approaches and accomplished by using quantitative as well as qualitative methods and techniques. Rapid rural appraisal, focus group discussion, household survey using structured questionnaire, interview with key respondents and marginal observation are the methods employed to generate primary data for the study. Remote sensing and geographical information system (GIS) have been extensively used in mapping and analysis of the problems of land use dynamics, natural resource management and evaluation of the indicators of sustainability.

The following is the summary prepared on the basis of the findings of the work:

Spatio-temporal analysis of resource utilization in the area has been carried out for the period 1984 - 2004. Except for the year 1992, the overall trend is depicted by an excellent positive ratio of 60:40 for the cultivated and vegetative area. Development of road network triggered human pressure to cause expansion of cultivated area during 1992. However, the awareness and understanding of the people have led to conversion of the marginal lands into cultivated lands maintaining almost the same ratio till 2004.

The whole process caused a spatial change in 30% of the total area: in 14.3% area the change is from agriculture to forest and in 11.2% from forest to agriculture leaving rest of the change to grass land. As a result, almost 70% of the land remained stable and unaffected by these processes. A high positive change had occurred in Jitpur followed by Parewadin VDC. Contrarily an undesirable negative change was observed in the case of Murtidhunga.

The traditional Kipat system of the local communities had proved to be important in terms of resource utilization and management before the implementation of the forest nationalization act of 1956. The management of forestry was under the government till
the initiation of community based forestry system in 1978. Now-a-days, except for some cases, the local forest users are effectively managing the forest resources available around them.

Most of the forest user groups were composed of several communities from around the forests. No specific indigenous knowledge and practice exclusively adopted by a community could be found in the pattern of resource use. The VDC offices, several GOs, NGOs and local participatory groups have been playing different roles in resource management and overall development of the area.

The livelihood pattern of the people of southern Arun valley is associated with a range of activities. Agro-based livelihoods are characterized by several distinct types such as cereal crop farming, horticulture, cash crop farming and a mix of all these. A large number of households from different community shifted to non-agricultural livelihood strategies like business, services, remittance and wage labor. The agricultural sector has experienced a great change in terms of shifting emphasis towards horticulture and cardamom farming.

The findings on livelihood pattern reveal a beginning of diversification among the Magar of Jitpur, Brahmin/Chetri of Murtidhunga and Rai and Limbu of Parewadin while in the case of Sherpa and Brahmin/Chetri communities of Parewadin a notable specialization in horticulture and dairy farming has been found to emerge. The rest of the communities are still reliant on cereal crop based livelihood system.

The important change experienced over the years is that the number of households in farming sector is increasing despite the decrease in participation of household members in farming due to the gradual opening up of avenues in other sectors of the economy. Similarly, the present trend in livestock farming in the area is in favor of keeping less number of improved livestock and reducing environmental degradation which is commonly associated with excessive livestock population and resultant
overgrazing.

A peculiar trend observed in the agricultural areas is the reverse change that started occurring in the livelihoods based on the type of agricultural land, cropping pattern, income generation and overall status of the households. Interestingly, the richer households of the first generation with larger rice fields inhabiting the middle and lower slopes became poorer, while the poor dwellers of the less productive top slopes became richer through horticulture, cash crop farming and livestock raising. However, the location and physical conditions were the sole factors to determine the livelihood practices adopted by the community and their changes through generations.

The role of remittance is becoming increasingly important in livelihood maintenance as well as overall status of the households of the area. A total of 58 persons were recorded as remittance earner during the field survey. Thus remittance has a dominant role with a share of 39% of the total income of the surveyed households. More than one-third of the total households reported remittance as the main source of their livelihood maintenance.

Similarly, as many as 41 economically active people are engaged in business and services influencing the livelihood maintenance of 35 households. Interestingly, the Dalits and Sherpa communities do not have any direct participation at all in both business and service activities. Newar of Murtidhunga, Brahmin/Chetri and Magar communities of Jitpur had 32%, 24% and 16% employment in service sector respectively.

The income generated through horticulture, cardamom farming, livestock raising and services account for 21%, 15%, 15% and 10% respectively. The annual average income of the households is NRs. 55,000, while it is NRs. 34,000 in the case of expenditure. In the case of livelihood maintenance, 50% of the households suffer from deficit, while 42% households have savings of varying amounts.
On the basis of income, savings and deficits as well as overall status three categories among the communities may be identified: Magar, Rai and Brahmin/Chetri community of Parewadin with a better position in livelihood maintenances; Brahmin/Chetri and Newar of Jitpur as well as Murtidhunga and Sherpa community of Parewadin with a moderate position and the, Dalits of Jitpur and the Limbus of Parewadin with a severe threat to survival strategy.

Two-thirds of the sample households reported a positive change in the livelihood security during the last 10 years. Caste, ethnicity had no determining role on livelihoods. The livelihood practices are guided by the locational characteristics and suitability of the areas to dairy and/or horticulture and/or cash crop farming.

Adaptive strategies were not homogenous across the villages; different households and settlements have adopted different strategies. Taking loan and selling jewelries/domesticated animals were the common coping strategies of the people. The mortgage and/or sell and out-migration are the last coping options in extreme cases. Similarly, diversification of activities, multiple cropping, market integration and reliance on remittance are some of the other mostly used adaptive strategies.

No any specific coping or adaptive strategy was observed exclusively for a specific community. However, the poor households have limited coping and adaptive options. Working as wage laborer is the principal strategy of the poorer households, particularly the Dalit, Limbu and Newar communities of Jitpur and Murtidhunga VDCs. Wage labor as the coping strategy is adopted by more than 84% of the households of the Dalit community. It is because of the fact that the money lenders do not belief the poor households who neither possess enough assets nor have access to cash cropping or vegetable or dairy farming. The Dalits and several other poor households have the least average amount of jewelries. Therefore, such households have limited option for selling jewelries as an immediate alternative, in case risk arises.
Physical conditions take upper hand in shifting strategies to off-seasonal vegetable or cash crop production. Similarly, road facility is found to be mainly responsible for commercial dairy activities. Therefore, instead of caste and ethnicity, physical and economic characteristics have more role to play in determining the adaptive strategies in the area.

In spite of the limited accessibility, the areas have not been in complete isolation from the growing regional and even global processes, particularly during the recent period. These forces have resulted in changes, among others, in the dietary habit, literacy, health, sanitation and consumption of products from markets which, in turn, have led to forced changes in livelihood and adaptive mechanisms of the communities to meet the demands.

Importantly, the study attempts to devise and evaluate indicators of sustainability in the mountain environment. Evaluation of ecological sustainability has been performed on the basis of the status of forest cover of 2004 and its change during 1984-2004 in relation to elevation, slope, aspect, soil quality and drainage. Jitpur is characterized by a very positive state followed by Parewadin with a moderate state. Contrarily, Murtidhunga suffered a huge loss in all the categories in spite of a superior status in 1984. Lack of required awareness about environment, excessive pressure on cultivated land and limited diversification of the economy have together resulted in the lower state of environmental quality.

Similarly, to evaluate the economic sustainability of the communities indicators like intensity of diversification, average income, participation of households in savings and proportion of poor households are used. The rank and weightage method reveal a descending order of economic sustainability from Magar to Dalit communities.

Likewise seven indicators such as food sufficiency, debt, percentage of illiteracy, number of school-goers and the use of electricity, radio/cassette player and toilet are
employed to evaluate the strength of social sustainability. Both the rank and weightage method indicate that Brahmin/Chetri of Parewadin, Magar, Brahmin/Chetri and Newar communities from Jitpur are at the niche, while Limbu, Dalits and Newar of Murtidhunga are lying far below. The Sherpa, Brahmin/Chetri of Murtidhunga and Rai on the other hand are with a moderate status.

Finally the composite index of sustainability compounding the three imperatives reveals the lowest value for the Limbu and the highest value for the Magar communities. Brahmin/Chetri of Parewadin, Newar and Brahmin/Chetri of Jitpur are in the second category with moderate status. Similarly Rai, Sherpa and Brahmin/Chetri of Murtidhunga exhibit a marginal status. With a very low figure, the Dalits, Newar of Murtidhunga and Limbu from Parewadin are at bottom level so far the level of sustainability is concerned.

The communities are found to be conscious about the roles of steep slopes, higher elevation, poor soil quality and hazard-prone drainage in resource use and management. The computer model incorporating the areas under the above four variables shows that more than 71% overlap area is with the forest cover of 2004. It helps to make a conclusion that the mountain communities of the area have appreciably preserved more than 71% area under forest which in the present context are not unsuitable for any other uses. Such an effort on the part of the people is quite significant in the context of the fragile terrain, difficult livelihood security and prevalence of illiteracy in the area. These indicate that two important changes and developments are taking place in the attitude and practices of the mountain people due to growing consciousness generated by global to local awareness programs. Environmental awareness and understanding have made people to behave as an integral part of the ecosystem which in turn led them to consider their livelihoods and adaptive strategies in the framework of local resource bases and harmonious living with nature. The other change is related with the participatory approaches in resource management and rural developmental activities.
7.2 Conclusions

The study was initiated with the aim of exploring life and living of the rural communities in the mountain areas of Nepal. It has provided a glimpse of the mountain environment particularly of southern Arun valley area which is inhabited by several communities with varying of livelihood activities and adaptation strategies for survivals. Also an attempt was made to evaluate the sustainability levels of different communities living in different biophysical settings of a mountain environment. The following are some of the important conclusions that can be derived on the basis of the present research work:

The use of several philosophical approaches accompanied by a methodology with necessary quantitative as well as qualitative techniques to handle a variety of data and information collected from a range of sources has been considered to be a strength of the study. In the same way, the extensive use of recently developed tools like remote sensing and geographical information system in analyzing various components of sustainability in relation to natural resource management practices of the communities sharing a mountain ecosystem proved fruitful. Generalization through quantitative method and specific analysis through qualitative method are found useful in exploring, understanding and explaining the reality.

The role of locational characteristics and influence of natural factors have been found significant in diversification of agricultural livelihoods among the different communities of southern Arun valley. Likewise, the development of community based forest management system has not only helped to increase the spatial coverage but also empowered the groups in many ways. Furthermore, the success of community based forestry system has created necessary background to initiate community based developmental approach in the area.
Similarly, the study of overall status of environment and use of resources in relation to biophysical variables such as soil quality, elevation, slope, slope aspect and drainage proved that the traditional knowledge of the local people in selecting lands for agriculture and forestry are in accordance with the maintenance of ecological sustainability. Except for some cases, the status of economic sustainability in the area has been found to be not discouraging. Similarly, there are ample opportunities to improve the level of social sustainability also. Thus the use of the concept of sustainability in ecological, economic and cultural contexts both at village and household levels may be considered to be a unique feature of the present study.

Finally, it may be concluded that the mountain environments are changing perceptibly both in their natural and socioeconomic settings. Changes are also taking place in the attitude and behavior of the communities resulting in a kind of convergence in the pattern of social organization, land use and resource management practices. Therefore a changing state with declining role of culture, caste and ethnicity has been the apparent manifestation of the present-day mountain environment.

7.3 Recommendations

The study was carried out in a mountainous area where motorable road passes through only one of the VDCs chosen for analysis. The farthest VDC area without road connection needed three hours walk from the road network to reach which is not remote in the context of the Nepali mountain dwellers. Therefore, the present study seriously feels the need of another in depth analysis on a remote area to at least further verify the role of communities in livelihood maintenance, adaptive strategy, resource management and utilization. It may help further to generalize the changes that are taking place in the remote mountainous areas.
Similarly, the present research has used the whole VDC area for the evaluation of ecological sustainability. A question arises here as to the merit of mapping and analysis of the situations by demarcating only the areas associated with a specific community. Although it is beyond the scope of the present study, other researchers can think in that line in order to make the analysis more specific and realistic.

There is ample scope to develop or include some other indicators of ecological, economic and social sustainability. Moreover, scope is even there to develop methodology for evaluating sustainability at micro level. So further research with all such initiatives would be certainly helpful in devising a concrete evaluating system to benefit the planners and developmental agencies with more accurate and relevant results.

Last but not the least, the present study recommends to use satellite images of higher resolution in mapping the land resources. The present study has missed several details of the objects smaller than the resolution limit of 24 meters which could have been valuable in deriving further explanation on the availability and use of natural resources at micro spatial eco-social levels.