Chapter 6

Summary and Conclusion
Summary of research observations, remarks, findings, recommendations and suggestions are presented in this chapter. The research attempted to study the patterns of socio-economic change and its impact on environment in Nagaland and particularly in Zunheboto district of the state. Introduction to the research topic and concepts, methodology used, objectives of the study and review of literature are included in Chapter 1. In order to know the drive behind the theme, selected for the study area in a better way, one has to first understand geographical settings and socio-economic status of the study area. These two, as a background to the study have been dealt with in Chapter 2.

Nagaland’s demographic history reveals that from a population of 516,449 persons in 1971, the state population rose to 12,09,546 persons in 1991, twice than in 1971 within 20 years. In 2011 Nagaland recorded a total population of 19,78,502. Zunheboto has witnessed a growth in its population since its inception as a district. There has been a positive growth in decadal growth rate from 1981 to 2001 whereas a negative growth from 2001 to 2011. The district has also seen growth in urban population from 23,081 in 2001 to 27,597 in 2011. Agriculture is the main economic activity with jhum cultivation as the major system of cultivation in the district. Shifting cultivation also known as jhum, swidden or slash and burn constitutes 58.95% of the annual total net cultivated area in the state. In spite of immense rate of growth in the last two decades in Nagaland, full coverage of the population in terms of safe water supply, good housing condition, connectivity, toilet facilities and electricity remains a major challenge in the district. Zunheboto district is well connected to other districts by surfaced and unsurfaced roads and has a road length of 1339.50 kms. Land and Forest are the major natural resources serving the socio-economic needs of the district. The people primarily depend on agriculture for their occupation and economy. Cattle are reared for milk and meat. Pigs and poultry are the major livestocks in
the district. However, Nagas as a whole and Sumis in particular are non-vegetarians, and therefore livestock are usually used for household consumption. The land holding system among the Sumis is similar to that of other Naga communities. Apart from community or village reserved forest, the land belongs to the villagers or rather to the Chief. The tradition and culture of the Sumi community is also marked by various beliefs and superstitions. But the advent of Christianity and the development of education system have played a vital and great role in changing the mindset of the people in regard to their traditional beliefs and superstitions.

No society remains stagnant. Every society or community has experienced different phases of changes in social, economic and environment aspects. And Chapter 3 tries to explain and describe how the people living in Zunheboto have changed in terms of social and economic activities so as their relationship with the natural environment has changed. Nagas lived in a world of their own, separated from the rest of the world for many generations. The Nagas like any other tribes are known to have lived in harmony with their natural environment. Though they lived in isolation from the outside world, their close relationship and adaptive nature with the environment enabled them to survive in hostile environment. Land and forest were the most important source of livelihood and thus were considered sacred. The Shifting cultivation they practiced has been considered by many as the main cause of forest depletion, but the Naga traditional way of managing their forest and natural environment has been remarkably preventing the environment from complete destruction. Drastic change in socio-economic life of the people was brought about by their contact with the American missionaries and the British colonists. Christianity, British rule and Modernity have no doubt affected the beliefs regarding nature and environment. These have led to change in the pattern of crops, economic activities, social setup and their
perception on man-environment relationship which has turned from mutual to exploitive.
The mindset of the people is also changing from a sustained livelihood to cash oriented
society, marked by hardworking to easy money culture. Mutual relation has given way to
exploitation of nature due to greed.
Like any Naga group the Sumi Nagas too belong to community-based society. The
collectiveness and the feeling of oneness which are a trademark of the communitarian
society is fast changing, with the availability of government jobs and other business
avenues the society has become individual oriented society. Cash economy or
consumerism has now become one of the important root causes of all social evils and has
also affected the people’s perception on the intricate and close relationship with their
natural environment. There is no more dormitory system, being replaced by modern
education system. The tribes who were known for their honesty, hospitality and hard work
are markedly no longer so.
Thus the development of the modern state order, social and economic development
initiatives through education and various development packages and the globalizing
factors of the modern society have greatly impacted upon the material culture of the Naga
society. Like the case of other Nagas, Sumi Nagas are going through the process of
changes wrought by modernity.
Though less in comparison with many of the Indian states in terms of environment
problems, one cannot just write off the possibilities and consequences of various
developmental activities in the study area. Nagaland is rated as an underdeveloped state.
The reason is not the lack of funds but the major cause is the improper and non
implementation of various development activities. Much of the positive growth has been in
educational sector and in living quality, but one cannot say they are at their best. Developmental activities seem to be implemented without much visionary. Most of the developmental activities in the study area are carried out keeping in mind only the short term profit and not the long term benefits. Environment ethics which was very much an ethos of the tribals including the Sumi Nagas is no longer adhered to.

In Chapter 4 attempts have been made to analyse how environment has been impacted by various human activities in the study area. Major affected areas are on forest and biodiversity, water, soil and land. Conspicuous consequences are: decrease of forest, loss of biodiversity, decrease in source of water, land degradation, soil erosion, landslides etc. Environment and human health are closely related and therefore, degradation and depletion of environment has great consequences on human health in the study area. The main sources of impact on the environment are population growth, change in land use pattern, introduction of exotic/invasive species, monoculture etc.

The main factors of land use change in the Zunheboto district are found to be anthropogenic in the form of agricultural activities, tree plantations and human settlement. Plant invasions are human introduced or of natural means like winds, birds, animals and water. It affects indigenous species diversity, soil ecology and dynamics and economics of agricultural ecosystem. The problem is rampant in Zunheboto with invasive plants such as Argeratum conyzoids L, Eopatorium adenophorum Sp., Mikania micrantha etc covering a large area of wasteland and jhum fallow land. Monoculture forest plantations which are rightly called Green Deserts are fast increasing in Nagaland with no exception of Zunheboto district. Plantations of rubber, pine, gomari, teak etc are striving in the district where large areas of land are being converted to these plantations for different economic
purposes. Such trend in monoculture poses a threat to the biodiversity and environment in the state.

The change in the land use pattern is the chief cause of loss of forest and depletion of biodiversity in Zunheboto district. Approximately 90 percent of the fire accidents in Nagaland are human-induced, intentional or unintentional due to the negligence and poor knowledge of the people. Collection of forest produce, shifting cultivation, cooking food in the forest etc. are the basic anthropogenic causes that ignite forest fires. The decrease in jhum cycle has greatly impacted forest areas that house the source of springs, leading to loss of spring discharge capacity in the study area. Since the entire state is hilly, land is prone to soil erosion. With the increase of population pressure on land and also the advent of development programmes, the hazards of soil erosion are increasing in magnitude. In the study area the construction of road seems to be the major cause of landslides. The district has young land formation which is not stable, and therefore, faulty road cuttings and the vehicular vibration leads to landslides. Land degradation in Nagaland is man-made as well as natural phenomenon. Rapid population growth, improper land use, absence of land use policy, and the growing demands of increasing urbanization are exerting pressure on the environment and on the natural resources of the State. Air quality in Dimapur and Kohima, the commercial hub and the capital city of Nagaland respectively, are reported to be deteriorating due to increase in vehicular emissions and small scale industries. However, this is not the same case in Zunheboto District. The air pollution problems in Zunheboto are not yet felt much due to fewer motorized vehicles and industries. The primary sources of emission are wood and biomass. The major source of air pollution is dust.
The ethics of environment management which used to be part of the ancestor’s approach to the nature seems to be fast depleting, driven by consumerism. Forest cover is destroyed and cleared for cash crops and the plantation of exotic trees. Therefore, there need to be certain strategies as to how one can achieve sustainable development according to the socio-economic set up and need of the study area.

Though development is necessary, proper implementation and mitigation of the developmental activities are essential. For a development to be called sustainable it should bring into consideration of all the three pillars of sustainable development i.e. social, economic and environment. Any development that overlooks any of these three aspects cannot be considered sustainable. Chapter 5 tries to understand the development and environmental situation and suggests measures towards sustainable development of the area. At present most of the developmental activities in Nagaland seem to be haphazard, leading to environmental problems. Very recently the people as well as the Government of Nagaland are coming to the realization that if unless the trend is checked, future will be bleak. Though Government of Nagaland is doing its share in pursuing sustainable development as well as conserving the rich biodiversity of the state, exceptional credit is to be given to the people as most of the conservation initiatives are carried out by the people who depend on forest for their livelihood through Community Conserved Area (CCA). Community Conserved Area is not a new phenomenon for the Nagas. Though the name was different with different tribes and villages, Nagas were known to set aside a community forest where jhuming or other agricultural activities were prohibited. At present more than 500 CCAs are known to exist. A study of Nagaland’s CCAs conducted by TERI and the Forest Department of Nagaland found that almost one-third of Nagaland’s
villages have constituted CCAs and as many as 82% of these 407 CCAs have completely or partially banned tree felling and/or hunting within the CCAs and enforce various regulations for forest protection (TERI, 2015). Nagaland as a whole and Zunheboto in particular with its scenic beauty coupled with socio-economic ethos has a great potential for improving the development of tourism specially Ecotourism and Cultural tourism. Nagas’ being a community based society there is a strong tradition of village councils and community participatory initiatives. Therefore, any development or conservation efforts or initiatives should be community based having a participatory approach. Keeping this in mind sustainable development with social, economy and environment as its pillars has been suggested for the study area.

Chapter 6 sums up all the preceding chapters and brings out the results and findings with further suggestions and conclusion.

6.1 Findings

1. Though not much change is seen in the crop production and yield, there has been change in harvest time. The farmers bewailed that the harvest time is becoming late as they used to harvest at the end of August and early September. But now they harvest in mid and late September of the year. This trend has been evident since two to three years before and can be attributed to climate change.

2. It is observed that with the passage of time, production in terms of rice and other crops (vegetables) has seen changes. When rice yield is good other
crops yield is less or fails and vice versa. This is a recent trend, since in olden days this phenomenon was not prevalent.

3. Jhum cultivation is wholly dependent on monsoon rain. Erratic rainfall has been a hindrance to the farmers, for deciding the time of sowing and harvesting. In 2014, monsoon started late which led to poor yield in paddy and in 2015, it rained till the end of September, which made it difficult to harvest, and the already ripened rice germinated from the plant leading to less harvest.

4. Traditionally preserved seeds are being replaced by hybrid seeds, supplied seed and market seeds which pose a threat to the future of traditional seed and agro-biodiversity.

5. In the course of field survey, villagers lamented that the seeds they preserved traditionally are infested by storage grain pests which are of recent occurrence making it difficult to store and preserve seeds for the next sowing season. The reason behind this can be the harvesting and storing of seeds at a time when moisture content in the air is high or these is rise in temperature. Pest population increases at higher rate at higher temperature, which can be linked to global warming.

6. Area under jhum cultivation is decreasing even though there is increase in number of households of jhum cultivators in the district, mainly because of decrease in labor force.
7. Invasive/exotic plants and weeds which are not found in some villages are now wrecking havoc in their field. The farmers have knowledge to handle old indigenous weeds but have less knowledge on handling the new invasive/exotic weeds.

8. Use of more sophisticated tools for hunting and fishing has lead to decrease in wildlife in the district.

9. In the course of field survey majority of the respondents or a member of the family has respiratory/chest problem. This is caused mainly by smoke inhalation during jhum burning, improper ventilated kitchen as well as dust pollution.

10. Though landslide in the study area is caused mainly by the soil and slope nature of the area, landslides are mostly triggered by human activities such as clearing forest for construction purpose and mainly road construction. Taking into account the questionnaire response and field surveys, majority of the landslides in the district occurs along the road especially newly constructed roads.

11. Scarcity of water is yet another problem faced by the people in the district. This is one of the many reasons why people practice jhum cultivation in the district. Dry season starts from November and lasts till February. This is due to the presence of very few perennial rivers in the district. Moreover with the decrease of forest cover ponds, rivers and other water sources get
dried up in winter. It is observed that villages having vast forest cover have abundant water than those with less forest cover.

12. Traditional knowledge on forest management and sustainable agricultural practice are fast fading. Nagas have oral tradition, where all knowledge regarding social, economic and ecological aspects are passed on through oral narration. However, with little or no interest from the younger western influenced generations and with the passing away of the older generations, the traditional knowledge is dying away.

13. Under the constraints, particularly the very nature of topography prompts the people to migrate to plain, fertile and fast developing district like Dimapur district. Unless the measures are taken up in all earnestness, tendency to migrate or the outflow of people from the district will continue even affecting the demographic profile of the district. Retention of people needs to be stressed by putting more efforts to develop the district.

14. From various field observations and interviews, one understands that larger numbers of population are ignorant of the various programmes of State and Central government as well as other agencies. Though VDB has been operational for more than three decades, its performance is not up to the mark in most of the villages visited. There are also skill and knowledge issues in implementing the schemes and programmes. The Village Councils and VDBs should be equipped with the functioning of the programmes and their responsibilities in implementing the programmes. These can be done
through proper training and exposures to the developed or the positively developing villages.

15. Most of the interviewed individuals are of the view that the NGOs in the district are not effective. They feel that the NGOs should and can play a vital role in the overall development in the district.

16. Jhuming/Shifting cultivation from very ancient times has made the state difficult to have vast virgin forest. However, in spite of practicing jhum for many years, there are community forest and CCAs in almost all the villages. Therefore, these areas can be promoted as new sustainable alternatives through Ecotourism and Sustainable Tourism Development for sustainable livelihood.

17. Though some villages have successfully started and achieved better livelihood and sustainable tourism, many are unaware of the potentials. But, many of the visited communities lamented that in spite of their awareness of the potentials and benefits of tourism, they do not get any help from the state government. Most lament that, since the village communities depend on the forest and its produce for their daily need, it is not easy to force the villagers to stop collecting from the forest. Therefore, at least in the initial stage of tourism development state government should give the assistance.

18. Hunting is considered one of the reasons for decline in wildlife in the state, but in the course of field work, it was learned that every village visited
maintains the tradition of allowing every wildlife to breed without disturbance or killing, during their breeding season.

19. In course of field work and interviews many villagers were not aware of the environmental issues as well as the importance of conservation.

20. The autonomy given to the people of Nagaland under Sixth Schedule in their administration, legislation and financial matters, which was served to protect them from domination and exploitation from external forces, seems to be going in a different direction. People are taking advantage and abusing the land by exploiting the natural resources

6.2 Recommendations and Suggestions

➢ Very few of the government projects, developmental activities and policies are based on improving the quality of jhum, but rather on eradicating it. Encouragement of plantation of exotic plants by the government is rather a threat to the biodiversity and environment. Encouragement of improving the quality of jhuming such as increasing jhum cycle, prevention of soil erosion, pollarding and coppicing, growing of nitrogen fixing trees such as Alder and planting of native plants instead of exotic ones, is the need of the hour.

➢ The Sumi Nagas like other Nagas have unique environmental management practice which is fast diminishing with the change in social and economic life of the people. Management of land and environment through traditional knowledge and modern techniques should coexist. There is a need for encouragement and development of Terrace Rice Cultivation with proper irrigation system. People’s age long
knowledge of maintaining the soil fertility and organic fertilizers practices has a better scope for not only increasing the production but also for sustainable management of land and environment.

- Environment and Development go hand in hand, and thus not only environment constrains developmental activities, but developmental activities also affect and constrains the environmental quality. The area under study must come up to its highest level of development in order to be on par with the mainland India. And for this Environmental Management and Sustainable Development become an absolute necessity. The primary aim of environmental management is to facilitate economic development without environmental damage. In other words, it should be ‘Sustainable Development’. Although modern environment management is done by technically trained people with advanced techniques, there is a need to use indigenous and traditional methods of environmental management.

- Conservation is not a new thing in Naga society. Nagas have been protecting and conserving natural environment directly or indirectly and intentionally or unintentionally. Conservation efforts have always been community based. Therefore, any development activities or conservation efforts have to be based on community, having a participatory approach.

- Strategies for Sustainable Development should be formulated and implemented taking into consideration the social, economic and environment aspects of development. Under social aspects- education, livelihood and health of the people should be improved. Under Economy- improvement in agricultural system, increase of jhum cycle, proper use and implementation of government funds and schemes and developmental plans in line with traditional and culture of the people.
Under environment- Traditional environment management, modern conservation technology/techniques and community based environment protection and conservation should be persuaded.

- The above strategies can be achieved through the creation of awareness, encouraging traditional and indigenous knowledge of agricultural and forest management, integration of modern technology and traditional environment management techniques and mitigation and monitoring of various developmental activities.

- In order to achieve or succeed in any of the plans and strategies, co-operation and combine efforts from all the sections of society is indispensable.

- The various Non Governmental Organizations can play a more vital role in educating the people on various environmental issues and encouraging sustainable development in the state.

6.3 Conclusion

Man is an important part of the biotic component of the environment and simultaneously is also an important factor of the environment. Thus, man plays important roles in the natural environmental system in different capacities such as biological or physical man, social man, economic man and technological man. All the natural functions of human beings such as birth, growth, health and death are affected and determined by the natural environment in the same manner as the cases of other organisms. But man being most developed and advanced animal, both physically and mentally and hence technologically, is capable of making substantial changes in natural environment so as to make it suitable for his own living. Humans in their quest for comfort have been developing in every aspect
of life through inventions, discoveries and innovative ideas. But as man learned to know that it can use natural resources to meet their needs, there has been drastic change in perspective and actions made by human on natural environment. The role of most primitive biological or physical man in the functions of natural environmental system was fundamentally that of user of environmental resources. Thus, man played the role of a factor of the environment, but as the skills and technology of man developed with cultural development, his roles towards natural environment also changed progressively such as from user through modifier and changer to destroyer of the environment. With development in science and technology man has not only exploited and polluted the earth’s environment but is also filling the space with satellites which is termed as space junk. Though development is essential yet one should not forget the environmental ethics. Development should be done in such a way that the needs of the present are met without compromising the future generation.

Environment is the source of life on earth and it not only directs but also determines the existence, growth and development of mankind and all its activities. As the basic law of ecology goes, that everything is connected to everything else and that one cannot change just one thing in nature. So, as environment and development also are connected and related to one another. Environment and development issues and the links or relation between them are of vital significance. It is, therefore, essential to have a close understanding of the inter-relationship between environment and development for formulation and implementation of any strategy that safeguards all concerned aspects. Hence, this research has attempted to connect social, economic and environment aspect of Nagaland in general and Zunheboto district in particular.
Nagaland as far as economic development is concerned is still in infant stage. Though the State has seen and experienced development in terms of infrastructures, the district still has enormous task ahead in order to cope up with the other developed districts of India. It is to be noted that Nagaland with its rich and high potentialities is still struggling with basic amenities and infrastructure. As discussed, the cause of this underdevelopment can be attributed to improper implementations of various schemes and various environmental constrains. Zunheboto like any other parts of the world has started experiencing global environmental problems, such as environmental degradation, global warming, climate change etc which need to be addressed immediately. In course of interviews almost all the villages visited, shared on the rise of temperature and its impact on crop production. There is a need for sustainable development that can be achieved through environmental management and conservation. A proper environmental management system will help in generating a healthy environment, which will lead to a healthy economy for the present and for the future generations. One needs to develop keeping in mind the environmental ethics, that we are a part of the environment and by harming and destroying the environment, we are harming ourselves. What we inherit, we inherit from the past, what we can gift to the future generation is a better environment.