

Resource Management: Human and Natural

Perspective on North-East Region



Edited by
Samhita Chaudhuri
Dulal Chandra Roy

Proper management of resources both human and natural has become the key of development particularly in the age of scarcity of resources. The book deals with the entire spectrum of resource studies i.e. land, water, forest, agriculture, mountain and all biotic and abiotic components. The resource management issue has been handled from social, economic, physical, biological, and data base perspective and a good quantity of observations, analyses and recommendations have been analysed. These can be used as substantial input to rationalise the conflict between man and environment, help impact assessment cum planning and execution of sustainable development and strategic management like conservation of resources.

The risk of uncontrolled population growth vis-à-vis unplanned urbanisation has by far crossed the threshold limit of safety and security of the habitats. This has been echoed in most of the articles of the book. Ethnic harmony is another issue which has been logically viewed and analysed by the social scientists. Anxiety over forest depletion and degradation has been focused and possible control measures have also been envisaged like use of pre-fabricated bamboo houses in earthquake and landslide prone areas and conservation of biodiversity of flora and fauna towards maintaining sylvan landscapes of the Himalayan region. Gender issue and role of women have been discussed which reflect the improved social values in the fast changing society. Tourism and aesthetic component of the Himalayan tract of West Bengal and Sikkim has been well documented in the book.

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First published in 2012

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ISBN 978-81-87891-47-5

Published by

Tandrita Chandra for
Readers Service

59/5A, Garfa Main Road, Kolkata 700 075

Phone : 033 2499 1171

Cover illustrated by

Souvik Chatterjee

Typeset at

Copycat

90A, Selimpur Road, Kolkata 700 031

Printed at

The Hallmark

68/1B, Sikdar Bagan Street, Kolkata 700 004

Call No.:

Acc No.: **GB-826**

Price : Rs. 800.00

Preface

Nature is the store-house of resources – renewable and non-renewable. Human beings use some of the natural resources directly while some others are used after applying human labour, mental and physical. The natural endowments like land, water bodies, forest, mountain etc remain the main source for the survival of human being in the world. There exists a close tie and relationship between human being and natural resources. Initially the nature was plentiful and there was no need of proper management of resources but with the increasing number of population, nature is used both intensively and extensively and in some cases the nature has been over used and over exploited. Sometimes nature sets the limit of human exploitation. The requirements of human being are restricted by the limited availability of natural endowments. Here lies the importance and relevance of resource management which can enhance the proper resource utilisation for each and every citizen at all levels and reduce the internal conflict as well as maintain the sustainability aspect of country's resource utilisation which includes increasing efficiency in natural resource utilisation, human resource development, resource conservation and demand management.

The issue of resource management is a multi-disciplinary aspect and need to be handled by experts from different disciplines. The present publication is in real sense a multidisciplinary approach where scholars, researchers and experts from different branches of knowledge like geography, economics, sociology, anthropology, political science, history, commerce, chemistry, botany, zoology, environmental science, geology etc have contributed research articles. The present book is the collection of articles presented at the national seminar on 'Inter-disciplinary Approach to Resource Management in Eastern Himalayan Region:

Human and Natural' held at Kalimpong College, Kalimpong, Darjeeling, West Bengal during 24th and 25th March 2012.

The seminar truly dealt with proper management of resources both human and natural has become the key of development particularly in the age of scarcity of resources. The seminar truly dealt with the entire spectrum of resource studies i.e. land, water, forest, agriculture, mountain and all biotic and abiotic components. The resource management issue has been handled from social, economic, physical, biological, and data base perspective and a good quanta of observations, analyses and recommendations have been analysed. These can be used as substantial input to rationalise the conflict between man and environment, help impact assessment cum planning and execution of sustainable development and strategic management like conservation of resources.

The seminar may be considered a success since the cultural ethos of the Himalayan habitats has also been taken into consideration as reflected during the course of deleberation. An attempt towards capacity building amongst the hill people is a priority and this can be possible through appropriate knowledge transfer cum control techniques. The vast input of the seminar can be directly utilised into various awareness programmes in the rural areas leading to human resource development.

Out of 42 presentations, 13 were on general topic, 20 were on regional aspects and 9 were case studies.

The risk of uncontrolled population growth vis-à-vis unplanned urbanisation has by far crossed the threshold limit of safety and security of the habitats. This has been echoed in most of the articles of the book. Ethnic harmony is another issue which has been logically viewed and analysed by the social scientiests. Anxiety over forest depletion and degradation has been focused and possible control measures have also been envisaged like use of pre-fabricated bamboo houses in earthquake and landslide prone areas and conservation of biodiversity of flora and fauna towards maintaining sylvan landscpes of the Himalayan region. Gender issue and role of women have been discussed which reflect the improved social values in the fast changing society. Tourism and aesthetic component of the Himalayan tract of West Bengal and Sikkim has been well documented.

We are sorry to state that out of 42 participants in the seminar we could include only 31 articles in this book. Some of the wise participants presented their paper with scholarly outlook but subsequently reluctant for the cause better known to them in sending

their full paper for publication. The book could have been enriched much by their contribution but we could no more wait with uncertainty and expect to incorporate them, if possible, in the next edition. We are sorry for not to include some articles in this present volume for being either the articles are irrelevant of the theme or not up to the standard set by the editorial board.

The book has been divided in two sections: section I deals with Human resource Management and section II deals with Natural Resource Management. The first section contains 18 articles contributed by scholars and experts mainly from the social sciences and the second section contains 13 articles that are contributed mainly by the experts from natural sciences.

Scholars on human resource management discuss the impact and relevance of human resource from the angles of area, community, land use pattern, urbanisation, rural set up, gender perspective, cultural issues and the like. Interaction between human and the nature remain the key issue of the book. Diverse action of human on nature has been explained with their immediate impact, possible outcome, crisis and necessary solutions. Most articles come out with specific recommendations for the problems they are finding and may be helpful for the policy makers to deal with the problems connected with the human resource management.

The natural scientists are more concern about the natural calamities, ground water, flood, genetic resources, green chemistry, aecanut plantation, orange farming, climate change etc in Sikkim Himalaya and Sub-Himalayan belt of West Bengal and North Eastern region. The articles are well designed and based mainly on primary data collected by the scholars from the field. Scientific techniques have been used to assess the hypothesis and depicts both interdependence and conflicting relation between human being and nature. The question of crisis in the use of natural resource has been pointed out with their possible solution through sustainable development.

It is hoped that the scholars, researchers, general readers and the policy makers will use the book widely and all our efforts will be fruitful.

15th August, 2012
Kalimpong, Darjeeling

Samhita Chaudhuri
Dulal Chandra Roy

Obituary

Biren Sarkar

November 1, 1928 – June 7, 2012



A Civil Engineer from Pune Engineering College (1952) having long list of illustrious contribution to various industries like M.E.S., Hindustan Steel, Burma Shell and finally Tata Fison which was later taken over by Rallies India group. His engineering skill coupled with innovative scientific acumen not only established the scholastic countenance but became a real benefactor to researchers of outstanding Universities and Institutions of India. He became the member of International Road Congress which India should be proud of. The divinity and beauty in him was his productivity in scientific and technological fields till the last day. He was a superb designer, architect and fabricator in all kinds of engineering fields and a real expert in wood work. His association with APIL (Arunachal Plywood India Ltd) during last few years gave him the opportunity to fulfill his dreams i.e.. low cost prefabricated bamboo houses and furniture which could save forests from depletion. It is apparent from his contribution to this Seminar too held in Kalimpong. His innumerable ideas were always translated into action and his actions into service to mankind. Whoever came in contact with him remained his follower.

Acknowledgement

The credit of present publication goes to University Grants Commission for sponsoring the National seminar entitled 'Interdisciplinary Approach to Resource Management in Eastern Himalayan Region: Human and Natural' organised by the Departments of Geography and Economics, Kalimpong College during 24th and 25th March, 2012. The present volume is the revised edition of some of the papers presented by the scholars, researchers and experts on the topic. What made the venture of publication possible is the compulsion of UGC to come out the seminar papers either in the form of proceedings or in book form. We accepted the second option that enables us to reach large number of readers who could not attend the seminar but are interested about the topic.

We most thankfully acknowledge and express our appreciation to University Grants Commission for recognising and accepting our Seminar proposal and extending necessary fund for organising the seminar and publishing the seminar proceedings in the book form.

We are thankful to Dr. R.P.Dhakar, Principal, Kalimpong College for his leadership and thoughtful engagement and encouragements in organising the seminar in the College. The other faculty members of the College also extended whole hearted support in organisational activities and publication work and we are really thankful to all of them.

As conveners of the seminar we express our thanks to all resource persons and participants for sparing their valuable time for participating, exchanging views and interacting in the seminar and also for their permission to publish their research articles in the book.

We like to put on record our thanks and appreciation to Readers Service, Kolkata for publishing the book in time.

15th August, 2012
Kalimpong, Darjeeling

Samhita Chaudhuri
Dulal Chandra Roy

Introduction

India is the richest treasure houses of resources. Along with its biological diversity, this country is well-known for the diverse culture of human races and home of a large number of ethnic groups of the world. People here have lived in harmony with nature, seeking to understand the rhythms of nature through their traditional knowledge. The age-long intrinsic relationship between these ethnic groups of people and the environmental resources provide a meaningful way for the protection of traditional knowledge and conservation of local resources for the future use. The present study focuses on the observed and potential relationships between land-water-forest resources and livelihood of the human being. The papers aim at identifying the fields of population and resource relationship, both- human resource as well as natural resource in the country in order to formulate a roadmap for sustainable management of local resources. Traditional sense of respect for the mountain environment, large alluvial tracts and coastal areas symbolizes deep concern in the cultural ethos of various communities. Thus in the present study, a proper policy framework has also been suggested to conserve the natural resources and also to protect the traditional knowledge of people of India in general and of mountain region in particular.

Reliable knowledge of natural systems used by humans is essential if a sustainable economy is to be achieved. Management of natural resources takes place against a dynamic background which is impossible to sort out the effects of management from those of subsequent changes in the natural environment. Managing is different from exploiting, which requires knowledge of how to capture and how to utilize. Every part of India is exceptionally rich in bio-diversity. In spite of homogeneity in

terms of expanse and biological richness, diversity exists in geology, geography, soil, climate and slopes which give rise to many macro and micro habitats and their unique socio-cultural attributes. The diversity of biological resources in the Himalayan region from east to west reflects both vertical and horizontal differences in the distributional pattern and it results in a degree of complexity. With the flow of Monsoon, variations can be identified in the occurrences of biological species from east to the west. For example, broadleaved, wet, tropical rain forests in Assam, coniferous mixed in the central and western Nepal, coniferous, arid, sub-tropical thorn steppe in Punjab, cold-loving and drought-tolerant conifers in Pakistan and so on.¹ This region is known as 'biodiversity hotspots', which has been currently scaled up as 'Indo-Burma Hotspot' with an area of 2, 20, 60,000 sq km. This biodiversity region is the second largest in the world and next to the Mediterranean basin. This Eastern Himalayan biodiversity region extends from central Nepal to North-East India, Andaman and Nicobar islands to further east to Indo-China and south in Malaysian Peninsula. In India, the region covers the state of Sikkim, Darjeeling Hill of West Bengal, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura.² This region is also known for diverse culture of human races and home of large number of ethnic people of India. Topography is the main reason behind the diversity in socio-cultural characteristics of mountain society. A large number of indigenous and immigrant tribal groups inhabit in this region. More than 200 different tribes with different dialect, custom, belief, heritage and socio-cultural tradition settled in this region. This part of the country, thus, is believed as an important corridor for human migration.³

On the other hand, the vast oceans also are the home of wide variety of resources.

Ethnic Diversity

A large number of indigenous and immigrant tribal and ethnic groups are inhabit in this part of the country. Such diversity in population scenario is the result of unique natural diversity. About 200 different tribal groups with their unique custom, cultural attributes, beliefs, heritage, dialects and above all their distinct socio-economic traditions settled in Eastern Himalayan region. From various part of the world, people used Indian sub-continent as a crucial corridor for migration. There are some elements of complicated interplay of factors that take

place in the pre-existing society of this region, which originate from large scale international migration. The role of ethnicity in shaping patterns of migration and the resultant cultural change has effect a large on the whole society of Eastern Himalayan region. Ethnic communities have always generated and passed on traditional knowledge from generation to generation. This knowledge is based on their needs, instinct, observation, trial and error and long experience. Such knowledge is often an important part of their cultural identities. The cultural aspects of human lives, whether in physical manifestations like buildings and landscapes or non-physical forms like languages, traditions, beliefs etc have both inherent and functional values. Traditional knowledge, as for example, has played and still plays a vital role in the daily lives of mountain people.

A healthy mountain ecosystem, local communities and their unique cultures are all interlinked and all these form the strong base for building a 'vocabulary of place' where cultural attributes are inextricably bound to daily routines and the practical use of natural resource management. With urbanization and rapid change in mountain environment, there is a growing recognition that a greater appreciation of culture of indigenous people of Eastern Himalayan region can play a critical role in determining the rate of change. Such changes in socio-cultural aspects of the Eastern Himalayan communities have triggered by several processes including physical, human, socio-economic as well as cultural and political. Deforestation, landslides, soil erosion, large-scale downstream flooding, rapid growth of population, increasing poverty, malnutrition, rapid increase in built environment throughout the mountain lands and above all high rate of urbanization – all are forcing the mountain ecology towards environmental and socio-economic collapse. This pattern of thinking has been widely accepted by large number of scholars. Ives and Messerli (1989) has shown these features in their work as 'Theory of Himalayan Environmental Degradation'. They summarized like, the introduction of modern health care and medicine and reduction of diseases has led to population explosion in Himalayan region. Such an increase in population in subsistence mountain societies has led to reduction in the amount of land per family, deepening poverty and resultant massive deforestation. The deforestation will result in total loss of all accessible forest cover in the countries existing in Himalaya in near future⁴.

Anthropogenic pressure can bring huge changes in mountain topography as it can cause uncontrolled influences on the floral and faunal diversity, habitat, landscape, soil degradation and many more which lead to considerable alterations in the environmental conditions. Rural livelihoods depend on farming in general and subsistence farming in particular. A large number of people in Eastern Himalayan belt depend on forest products. Some traditional societies in this region utilize their natural resource base based on their perceptions, experience, traditions, religious beliefs and response to patterns of resource use by other mountain communities. In other way, timber extraction from forests to a large extent contributes to the shrinkage in forest cover. Economical, indirect and quick benefits from forests are much higher than the direct and sustained benefits. The mountain ecosystem, once dominated by dense forests, has rapidly deteriorated in recent times due to interaction of a number of interdependent factors affecting the livelihood system of the hill people.

Section-II

Ethnicity is defined as a human product, which manifests when a group makes use of primordial bases as culture, race, religion and territory to secure the interests of its members. The ever growing literature on ethnicity indicates the increasing trends of ethnic consciousness across the globe. In her paper, **Dr Sandhya Thapa**, attempted to discuss how ethnicity has acquired a new potential as an instrument for securing rights over resources in the small Himalayan state of Sikkim. The paper takes into account how the competition for political power and material resources like land and employment contributes to re-definition of ethnic identity.

The degree of interconnectedness between nature and the tribe is so high and intrinsic that tribal life is fully endowed with nature. They mostly live in forest, mountain and inaccessible areas among the natural environment. Nature directly supplies all items of the livelihood of the tribes. Nature is the sole provider of life support system of the tribes. Because of their close association tribes can understand, know, read, judge, assess and interpret nature more correctly and accurately than the non-tribes. There is a pure and intrinsic bond between the tribe and the nature. **Dr. Dulal Chandra Roy** in his paper aims at examining the degree of inter-dependency between the nature and

the Lepchas, the aboriginal inhabitants of the Eastern Himalayan region through their religious beliefs.

Agricultural Marketing has become an essential aspect of human activities as it consists all the operations including the agencies conducting them get involved in the movement of all types of food materials and raw materials also to consumers. The agricultural marketing in India is generally composed of two main sub-systems which are Product marketing and Input marketing. **Mr. Indraneel Mandal**, in his paper, attempted to identify the major problems in agricultural marketing in Sikkim and has recommended some possible way out in view from the existing resource for the agricultural marketing in this mountain state. The author also mentioned that, in Sikkim, the main difficulty with agricultural marketing is the absence of a proper mechanism for the marketing of agricultural products which generally come from two main sources, viz., finance and infrastructure. Thus, possible solution lies in taking concrete step in this direction. Besides, he also pointed out that, steps should be taken to train farmers on the latest techniques, strengthening the self help movement at the grassroot level and also opening the sector to FDI.

Rapid population growth and urbanization have caused sever problem in managing solid waste in the city and town areas. Gangtok is a capital town located in the Eastern Himalayan region. It is also the main base for tourism in Sikkim. Solid waste generated from Gangtok and adjoining areas is approximately 50 metric tones per day, which has created a sever problem in managing the solid waste in the area. Managing solid waste in a hilly town with steep slope and inaccessible land areas is of a great challenge for the Urban Development and Housing Department (UD & HD) today. **Dr. Sujata Basnet**, in her paper has attempted to show how the management of solid waste in a hill town is important.

Solid Waste management is an obligatory function of each and every Urban Local Bodies (U.L.Bs.) in India. In majority of towns in the country, this service is poorly performed resulting in problems related to health, sanitation and also environmental degradation. **Bishal Chhetri and Kabita Lepcha**, in their essay, tried to assess the status of solid waste management system in Darjeeling municipal Town and also suggested some guidelines for an improved and sustainable system of solid waste management.

Rapid urbanization and industrial diversification has led to generation of considerable quantities of municipal waste (households, plastic, hazardous and biomedical). Improper disposal of waste often results in spread of diseases and contamination of water bodies and soils. The impacts of these wastes on the economy cannot be ignored. The demand for good services from the ULB of the habitats is mounting day by day. The demands may be of two types such as soft demands as well as hard demands. Taking case study from Kalimpong Municipality, **Mr. Asit Karmakar and Dr. D. C. Roy** in their paper investigate that the municipal waste may be converted into wealth and ULB can generate revenues by selling that waste recycling product if proper management system is applied.

A well defined Public Policy on rural development and its management and planning has not been developed in India. Policies have been adhoc and fragmented which are geared to solve the urgent needs only. **Dr. Rajendra Prasad Dhakal**, in his paper intends to argue that the all round sustainable development requires sensitive approach which is flexible, adaptable to changes in the planning, that assumes the actors involved in formulation and implementation of the plans as “instigators and catalyst “with the ability to understand and adapt to situation to achieve effectiveness in fulfilling goals. The Paper will illustrate few experiences from the working of the development programme from the hill areas of Darjeeling district.

Land use and cover changes affect the structure and functioning of the ecosystems, altering the movement of soil, oil and nutrients, and such changes at the local and regional scales ultimately contribute to global processes. Mountain ecosystems encompass about one-fourth of the earth's surface, and sustain a diverse range of ecosystems and life-forms through provision of essential environmental services, useful products, and also serving as the world's water towers. Half of the humanity is dependent on mountain ecosystems in one way or another. Hence, any change in the mountain ecosystems influences far more than their territorial limits and stretches to the surrounding lowlands. **Mr. Gopal Chandra Mandal**, in his paper, has attempted to analyse the pattern and intensity of land use dynamics, investigate the ground level causes for such land use dynamics, and evaluate crop diversification as an adaptive strategy of land management in Darjeeling Himalaya on the basis of secondary as well as field level data.

The development of Darjeeling was started as a sanatorium. Darjeeling plays an important part in Indian Freedom Struggle. Among the several freedom fighters, Subhas Chandra Bose, C.R. Das, Dal Bahadur Giri, Sabitri Devi, Paras Mani Pradhan etc are closely associated with Darjeeling hills. **Mr. Pravat Roy**, the only Historian among the authors of this book, who has attempted boldly to establish the causal relationship between Indian Freedom Struggle and the natural resources of the hill district of Darjeeling.

Various factors are responsible for the sustainable development of enterprises in hilly regions. **Mr. Akash Deep Thapa and Dr. Samhita Chaudhuri**, in their paper attempted to show various processes used in the making of Handmade Paper in three small scale paper industries in Kalimpong sub-division. They have shown that, the entrepreneurs are applying their traditional techniques in the process of paper making by using the bark of a plant called Daphne Papyracea which are collected from local forested areas. Most important feature of these industries is that majority of workers are women. Therefore the handmade paper industries of the region employ local rural female population which is a significant contribution towards the socio-economic development of the whole region.

Population dynamics, globalisation and environment change are underlying drivers of land use change and the transition towards urbanisation, commoditisation and regionalisation. Urbanisation is arguably the most dramatic form of highly irreversible land transformation. In the demographic sphere urbanisation is the resultant of excess birth rate over death rate and net immigrants in the persisting urban regions as well as the inclusion of the persons in the newly developed urban centres. **Mr. Gopal Chandra Mandal and Mr. Palash Kumar Mandal**, in their paper, attempted to analyse the pace and pattern of urbanisation in Darjeeling Himalaya, to co-relate urbanisation with literacy and work participation, and to evaluate the population pressure on land in the wards of Kalimpong Town on the basis of secondary data.

Despite its ubiquitous nature, the phenomenon of urbanization is more common in low land areas. **Dr. Sherap Bhutia**, in his essay has attempted to identify the nature of urbanisation in the present phase and its impact on environment and their future prospect. According to him, though rapid urbanization in Darjeeling hills has triggered the economic emancipation but it has taken a leading role in economic

reorganization of the region. The region is frequently plagued by environmental catastrophes, which are varied and interlinked and owe their origin to ignorance and lack of integrated approach to socio-economic development based on various considerations of the environment. The study reveals that the urban environment of Darjeeling Himalaya is visibly deteriorating at a rapid pace.

The urban quality of life depends on some ingredient such as drinking water supply, sewerage & sanitation, storm water drainage and street lighting. Urban local body is the key institution in the urban area to provide the basic services to the habitat as per 74th constitutional amendment act. The practical situation is that inadequate coverage, low pressure and poor quality are some of the most prominent features of water supply in the cities of west Bengal. Under this backdrop, **Dr.Chanchal Kumar Mandal and Mr. Asit Roy Karmakar**, in their paper examine the condition of service delivery of the Cooch Behar municipality during the periods 1990-1991 to 2007-2008 .The study shows that very poor percentage of amount spends on sewerage, drainage, street lighting and others .It is found that due to shortages of fund services are poor thus the authors make suggestion in the light of such deficiencies so that service delivery system can be improved by the collection of more revenue from own sources.

Human Resource Management (HRM) refers to the systems and processes that focus on efficient and effective management of the Human Capital. **Dr Sadhan C Kar and Mr Surya Narayan Roy**, in their paper focuses on the myths and realities of Human Resource Management in the marginalized areas like Cooch Behar. Using Census data at large the authors extensively discussed different aspects of human resource of Cooch Behar district.

The inner meaning of sustainable development is to fulfill the needs of the present generation without undermining the ability of future generation. This concept was generally devised as a compromise between two aims, one is development of the present and the other is conservation for the future. **Ms. Arundhati Bhattacharyya**, in her paper, has attempted to point out a brief description on the role of women in sustainable development. According to her, theories on development mostly had a Western biases with women and nature exclusion. It generally results in ecological disasters. Women play a vital role in protecting nature also major suppliers of food, fuel and water for domestic purpose in subsistence economies. The author has

stressed on the importance of women in sustainable development of the Eastern Himalayan region.

Ever since planning has been initiated, rural development remains the basic focus of attention of the Indian planners and policy makers. A number of policies and programs have been undertaken by the government of India towards the development of rural sector in general and for the women in particular. But the participation and involvement of women is noteworthy through their engagement in Self Help Group (SHG) in recent days. Beside economic empowerment, SHG plays an important role in social and political empowerment of women. **Mr. Manojit Dasgupta**, in his paper attempts to find the workings and outlook of women associated in the SHG. The hilly areas of Darjeeling district particularly Kalimpong subdivision has been used as case study. A comparative study has been undertaken before and after the formation of SHG in the hilly areas of the district of Darjeeling.

Though the origin of gender inequality is inherent in culture and tradition of a society but the concept of 'planned development' is not less responsible. For mainstream development models development has meant integration of developing countries into the international market systems whereby growth was to be manifested solely in increased economic production. Therefore, women's involvement in development has been measured by their employment in market economy, making them 'invisible' and 'marginalised' in rural subsistence-oriented societies. **Mr. Gopal Chandra Mandal** and **Mr. Manindra Nath Bhattacharya**, in their paper attempted to analyse and evaluate the trend of sex-ratio, gender dimension of literacy and work participation in relative terms of Darjeeling District as well as its different blocks and compare it with that of the state on the basis of secondary data so as to reveal the actual and relative socioeconomic status and its dynamism of women in the Darjeeling Himalaya.

Nature sets the limits within which man can develop his arts to satisfy his wants – according to this concept, nature is the store-house of all natural or tangible resources. The functions of natural resources are related with the capabilities of mankind. The endowment of nature, i.e. soil, water bodies, climate – together, as also the ability of mankind, are the pivotal forces of resources creation. Different cultural innovations, in the form of high technology machines, agricultural inventions and recreational devices enable the human race to extract more and more from nature. In this background, **Ms Rukmini Datta**

tries to examine the intrinsic relationship between the resource and human culture.

Engg. Biren Sarkar and Prof Arabinda Ghosh, in their paper attempted to establish appropriate resource utilization and sustainable development ideally suited in our country especially in the hilly areas of north eastern Himalayas. This is use of bamboo in complete house building and offering safety and security to lives and properties in disaster prone areas. The design and fabrication needs only a few nuts and bolts and rest are all perennial and recyclable materials which has almost zero environmental impact. The Bamboo prefab houses are completely made out of bamboo and are developed on a turnkey project basis. The pre-fabricated houses are designed on modular basis and can be erected in a very short span of time using minimum labour skills. The Pre-Fabricated bamboo houses are not only best suited for hilly areas, disaster zones like tsunami, earth quake zones where the weather and geographical conditions are extreme but they can be also be used for farm houses, guest houses, etc where the construction time is less.

Resource management of wet land, forests, fishery, grazing land, ground water, local common pool etc. has become of great importance in recent times as these provide means of livelihood to a great number of rural people. **Dr. Ruma Kundu**, in her paper, has attempted to examine the extent of deforestation in Sikkim. Having about 82 percent forest cover, the State is now facing tremendous environmental problem as a result of deforestation. This paper ends with discussion of the results from the Logit Regression Model in order to understand the impact of concerned variables on the dependent binary values.

Ground water is considered as the preferred source of water of meeting domestic, industrial and agricultural requirements. Development of ground water gets first priority both at individual as well as governmental level. **Mr. Sonam Yogel Bhutia**, in his paper deals with the concepts and methodologies used in the application of Remote Sensing and Geographical Information System (GIS) for targeting ground water potential.

Flood is a natural calamity. It causes serious problems for the local people. To reduce the effects of flood, Remote Sensing and GIS techniques can be of highly useful in recent years. With the help of Remote Sensing data, GIS tools and also a digital elevation model (DEM), we can identify the high and low flood vulnerable zone and make out proper planning to reduce the loss of life and property from flood. **Mr.**

Chiranjib Nad, in his paper has attempted to locate the flood vulnerable zone and risk zone mapping and its management of Kendrapara and Jagatsinghpur district in Orissa.

The Darjeeling hills are a part of the Indo-Burma Mega Biodiversity Region. Its floral and faunal density and diversity has attracted many of the renowned naturalists like Sir J.D. Hooker. Its potential plant and animal genetic resources have been utilized as forest and agro-based industries. Still there are many under explored genetic resources confined to the local ethnic communities and this has ensured conservation of those valuable natural resources. But due to population exploitation and commercial activities many of such natural resources are in the verge of extinction. A holistic measure for conservation and sustainable use of such natural resources should be adapted to restore them in their natural habitat. Eco Region Base Conservation (ERBC) is one of them and as a component of Global 200, if Kanchenjunga Mountain Ecosystem's management is considered this will bring a suitable approach for management of genetic resources, trans-boundary corridor issues and other natural resources. **Dr Kishore Kumar Thapa**, in his paper attempted to show the genetic resources in the hills of Darjeeling and Sikkim with special reference to their management and conservation.

Sustainability in science and technology begins with the problem solving perspective of scholars. With a continuously increasing population and limited resources, the idea of sustainable development is the utmost important for present and future generations. Chemistry, being a science of matter and its transformation, plays a vital role in this direction. **Mr. Sanjay Saha**, in his paper attempted to provide clear evidence by saying that, awareness, creativity and looking ahead is important to bring reactions and chemical processes to maximum efficiency. Chemical processes after careful optimization may results into a maximum in efficiency. The author has used the term 'Green Chemistry' in this regard which incorporates a new approach to the synthesis, processings and application of chemical substances in such a manner as to reduce threats to health and the environment. The more successful chemical manufacturing companies of the future will be those who would include an appropriate value of green chemistry in innovation and also a clean technology approach to chemical manufacturing plants.

In the process of economic development, the four basic resources of nature – air, water, soil and bio diversity – have all been severely

damaged and depleted. From this, the concept of sustainable development gets impetus. **Mr. Malay Homray**, in his paper, has discussed the various natural resources and their harmful effects with the development of technology. He mentioned that, any activity that is expected to bring economic growth must consider from the environmental perspective. Many development projects have severe environmental consequences and thus, these must be studied scientifically and also a strict Environmental Impact Assessment strategy should be implemented in this regard.

Plantation crops are high value commercial crops of great economic importance. Arecanut is an important plantation crops which plays a vital role in socio-religious life in India and is believed to have some medicinal properties. **Mr. Malay Bhattacharya**, in his paper, has attempted to find out the economic improvement in villages by planting arecanut in unutilized village land. The data for the study was obtained from various small scale arecanut plantations on unutilized or underutilized land in ten small scale areca plantations in Jalpaiguri district. The results indicate that significant income can be achieved by planting arecanut in unutilized land of the district.

Orange farming in the hilly terrains of Darjeeling district has a great potentialities to sustain a better rural livelihood and a possible way to generate an employment opportunities to the local people. The orange growing areas of Jinglam and Gielle in Rangli-Rangliot block has been taken for the study by **Vinay Llimbu**. The paper tries to find out the prospect of orange farming and its affect on the livelihood pattern of the farmers' in Darjeeling hills. He has used primary survey data to understand the different aspects of orange farming considering the better future prospects of livelihood. Darjeeling mandarin is the only variety of orange grown here using mostly organic manures. Though the area has greater scope regarding orange farming, but the farmers' present status has worsened the production. Besides, the absence of market with no storage facilities along with the lack of proper transport system results in very high market value of this fruit. In this present scenario, the author has tried to find out the reasons for declining trend in the orange production and also suggested measures for the betterment of orange farming in the studied area.

Since 1901, the population of Darjeeling sub-Himalayas has recorded a continuously increasing trend which results in huge change in region's land use pattern as well as the utilization of available natural

resources day by day. With the growth of population, the extraction activities of construction materials directly from the river bed and from adjoining floodplains have become an important source of income for the local villagers. **Lakpa Tamang and Sonam Lama**, in their paper, have pointed out the extraction of bed materials from Balason river is quite high as compared to Rakthi, Rohini, Mahananda etc. The study is an attempt towards the assessment of the extent and possible effects of extraction of river bed materials especially from the Balason River.

Eastern Himalayan region is enormously rich in biodiversity and forest resources, recognized as an integral part of mega diversity 'hotspots' in India. Forests are the most worthy natural asset with inconceivable follow-up results. They protect our biodiversity by reducing soil erosion, floods and droughts; by providing shelter to wild lives and by producing a large variety of natural resources having enormous economic importances. The Sikkim Himalayas is the shelter of some most endangered wild species both flora and fauna. But rapid growth of human population and corresponding developmental activities exert immense pressure on forest and land resources. In this background, **Mr Pradip Chauhan, Mr Ranjan Karmakar and Mr Mritunjoy Roy**, in their paper tried to show the causes of deforestation & its impacts on existing biodiversity and its management procedures in this exotic nature.

Climate change has potential to alter these ecosystems and the services they provide to each other and to human society at large. Sikkim remains under great threat unprepared to prevent and respond to catastrophic attacks by nature. **Ms Savita Mishra**, in her paper discusses the impacts and vulnerability of climate change in Sikkim. The paper deals with the causes of deforestation and its environmental impacts in the environmentally rich state like Sikkim. The author recommended some policies to be adopted in order to regain the lost forest.

Erosion is a natural process which is now increased dramatically by various anthropogenic activities. Steep slopes with high rainfall are often subjected to soil loss by water erosion and landslides or land slips. Four erosion classes have been identified in Sikkim like slight erosion, moderate erosion, severe erosion and very severe erosion. Rapid urban development and increasing land use changes due to population and economic growth in selected landscapes is being witnessed of late in Sikkim. Factors of land degradation are mainly

biophysical (e.g., land use and land management, including deforestation and tillage methods), socioeconomic (e.g. land tenure, marketing, institutional support, income and human health), which determine also the rate of degradation, including erosion, salinization and so on. **Miss Sita Chetri**, in her paper, tried to show that climate change is contributing a large scale impacts on the soil erosion in all the four districts of Sikkim state. The author has proved with some statistics and also recommended some controlling measures to reduce the loss of fertile soil in various parts of the Sikkim Himalaya.

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Section-I
Human Resource

Resource Distribution & Ethnic Reproduction: A Study in Sikkim

Sandhya Thapa

Introduction

The ethnic group ordinarily denotes a group of people with common bio- social and bio-cultural traits who are backed by common identity. Ethnicity thus is defined as a human product, which manifests when a group makes use of primordial bases as culture, race, religion and territory to secure the interests of its members (Cf. Thomson and Rudolph, 1986, p.26). Ethnicity is often seen as a viable means of obtaining highly valued goods. (Chazan, 1986:137). So ethnicity is often guarded by various ethnic groups either to defend the privileges or to overcome obstruction towards development (Glazer & Moynihan, 1975: 15). The government often legitimizes ethnicity by channelizing development or distributing rewards along ethnic lines (ibid: 10).

Against this backdrop, the paper would be an endeavor to comprehend, how ethnicity has acquired a new potential as an instrument for securing rights over material and human resources in the small himalayan state of Sikkim. In the transition from the feudal set- up of theocratic Sikkim to the modern democratic state, the three dominant communities of Sikkim viz; Lepchas, Bhutias and Nepalis are more concerned with the maintenance of their cultural and primordial distinction as a mechanism for bargaining and resource mobilization.

Rationale

Sikkim's economy is basically agrarian and hence land occupies the place of immense importance. However, the multiplication of population led to the competition among the various ethnic groups as

the land has become scarce over the years. With the introduction of a democratic set up and its merger with India, the development process in the State has accelerated. There has been expansion of bureaucracy and administrative structure creating lot of employment avenues and need of human resources. Due to topographical constraints, large scale industrial expansion is not feasible in Sikkim. Therefore government service sector has emerged as the largest employment generating agency in the post merger Sikkim. However, the three major ethnic groups may not be equally equipped to take advantage of the new opportunities. There may thus be an ethnic dimension to resource distribution and an unequal access to education, occupational opportunities and other developmental opportunities. Therefore, the paper would like to examine the relative control and access over the land and human resources particularly the employment in government sector by three ethnic communities and explore how the resulting feeling of deprivation breeds ethnic process. The paper would like to appraise if the competition for material and human resource contributes to redefinition of ethnic identity.

Demographic Transition

Lepchas are widely accepted as the indigenous population. The establishment of Bhutia Kingdom in 1642 and Nepali's immigration changed the demographic scenario of Sikkim. The term Nepalis is a broad and generic term and encompasses a number of hill tribes as well as Hindu castes.

A close scrutiny of the trend of population growth over the last hundred years brings to light that there has been a tremendous multiplication of population figures in Sikkim. The Lepcha-Bhutia combine constituted 35 percent of total population in 1891. Hundred years later their share of total population (along with others who are included in Scheduled Tribes) has tumbled down to 22.36 percent in 1991. The State Socio- Economic Census of Sikkim, 2006 records the Lepcha population as low as 7.7 percent while the Bhutia population constitutes 13.08 percent. This fall in their percentage has obviously tilted in favour of Nepalis, who emerged as the largest social group and a political force comprising nearly 70 percent of the total population (Table 1). The change in the demographic scenario had great social, economic and political consequences, which had wide repercussions in the inter-ethnic relationships.

Table.1: Community-wise population percentage of 1891/ 1991/ 2006

Communities	1891	1991		2006
Bhutias	16.06	Ts	22.36 77.64	13.08
Lepchas	18.91			7.70
Nepalese	64.02			69.8
Others	0.80			9.29
Total	30,458 (100.00)	4,06,457 (100.00)		5,81,546 (100.00)

- Source: H.H Rishley- Gazetteer of Sikkim
- Census 1991, State Socio-economic Census, 2006,

Land Issues in Historical Milieu

The Lepchas are considered as the original inhabitants of the State and they controlled most of its land in the beginning. After enthronement of Bhutia ruler, the landed property changed hands, the Lepchas got exposed to outside world and thus a primitive community got transformed into a peasant society. Since then the ownership of cultivable land had been transferred to the Bhutia ruler, who used to gift portions of it to his chattels, courtiers, Kazis etc. in return of their services (Thapa, 2002).

Since, the Anglo-Chinese convention of 1890, which recognized Sikkim as the protectorate of British India, the British encouraged large number of Nepalis settlements, who came as agriculturists, skilled and unskilled laborers. With the introduction of the modified land lease system and their pro- immigration policy, gradually the control over the land resources has completely changed hands. Since all registrations of land transaction were accomplished through the lessee landlords, they could absorb as many newcomers as they wanted. It was in fact easy to extract initial payments in the form of *nazaranas* (Basnet, 1974, Lama p 42) known as *chardam*, which literally means four paisa paid as a kind of *salami*. As the Nepalis were considered industrious and better cultivators, the pro- immigration Thikadars promoted Nepalis immigration and settlement in forests areas. The continued influx resulted in significant change in population balance, which subsequently caused scarcity of cultivable land. The newly introduced terracing technique of cultivation had also contributed in the claim of individual's right over

a certain plot of land (Datta, 1992:170)), which gradually emerged as a basic question in the traditional society of Sikkim.

By the time migration of the Nepalis had started, the Bhutia-Lepcha combine emerged as a composite ethnic group, (Nakane Chie, 1966, 221) as the 'original inhabitants of Sikkim. It had become customary for the Chogyal to refer to Sikkim as a Bhutia-Lepcha homeland (Datta, 1992, 171). By virtue of being the original inhabitants of Sikkim they were identified as the 'Sikkimese'. A threat perception grown out of increasing Nepali population had brought the Bhutias and the Lepchas together. The combine also wanted to retain their hold over the land and the power in the State.

The commencement of the decadal survey of land management in 1951 led to the registration of all landowners and were conferred the tilling right. The arable land which was once with the Lepchas shifted to the Bhutias and subsequently to the Nepali settlers and all have attained the individual tilling right. The conferring of tilling right was viewed as crucial, since the Sikkimese identity and status particularly of the Nepalis was determined on the basis of such right subsequently.

However, the initial journey of Nepalis was subject to various discriminatory practices, which were reflected in the social, economic and political policies of the state. There were fissures in the relationships between the "Sikkimese" and the "Non Sikkimese". By virtue of being the Sikkimese, the Bhutia- Lepcha combine was entitled to certain privileges, which were denied to Nepalis, who were not considered as "Sikkim Subjects". History has abounding instances of the protective policies adopted by the King in matters of Land revenue, Land acquisition and administration for the original inhabitants. The Revenue order no. 1 of 1917 prohibited the alienation of Lepcha- Bhutia land to Nepalis (Revenue Order No 1, 17th May, 1917). The "Sons of Soil" also enjoyed exclusive right to acquisition of land and residence in North Sikkim (Royal proclamation, dated 30 August 1956). While the Bhutia- Lepcha landlords were granted land lease for 15 years, the Nepalis Thikadars were given for 10 years (Datta, 1992, 171). There was protective discrimination in matters of land revenue assessment as well. The Nepalis cultivators were assessed at a higher rate for the same quantity and quality of land (Datta, 1983; 150).

However, this discriminatory treatment to the Nepalis had stopped after the promulgation of Sikkim Subject Regulation Act of 1961, when the Chogyal of Sikkim conferred the earliest Nepalis settlers the status

of Sikkim Subjects equating them as par with other two communities of Sikkim.

As the ownership of individual tilling right was the basis and eligibility for Sikkim subject recognition, those Nepalis, whose names appeared in the individual proprietary rights registration were automatically bestowed the status of Sikkim subject by the Sikkim Subject Regulation Act, 1961. The question of land ownership became so important that the Sikkim Panchayat Act, 1965 conferred the voting right to those who owned landed property and paid land revenue or local tax to the government (Sinha, 1981; 61). The right over a plot of land was necessary for enjoying certain privileges meant for the Sikkimese only. The notification No. 105 of Land Revenue Department, dated 25th February 1961, stated that the 'Non-Sikkimese are not entitled to acquire any immovable properties in Sikkim' and the Nepalis or other non-Sikkimese cannot alienate property from the Lepcha-Bhutia community even by marrying their women.

After Sikkim's merger with Indian Union the legal cultivators, i.e. those with the tilling-cum-proprietary rights, automatically obtained the individual ownership rights over the arable land they cultivated for many decades (Datta, 1992; 173). The Sikkim Citizenship Order, 1975, issued by the Indian Union government, provided that "Every person, who immediately before the 26th day of April, 1975, was a Sikkim subject, under the Sikkim Subject Regulation, 1961, shall be deemed to have become a citizen of India on that day" (Sikkim Government Extra ordinary Gazette, No 11, 21th June, 1975). Therefore, the land helped one to be declared 'Sikkim subject' which in turn qualified him to be an Indian Citizen too. Thus, the question of status, of Sikkimese Nepalis, has been strengthened, confirmed and legalized by the Sikkim Subject Regulation, 1961 and subsequently by The Sikkim Citizenship Act, 1975.

Land Ownership Pattern

The issue of Sikkimese vs. Non-Sikkimese identities, the concept of the 'sons of the soil' has been so much embedded in Sikkim; it holds an important place in the election manifestos of various political parties, since the merger. The state government is committed to protect the 'Revenue Order No. 1', that prohibits alienation of land of Lepcha-Bhutia communities to others. To a large extent, such an electoral promise stemmed out of the fact that the majority Nepalis community outscored

the original Sikkimese i.e., Bhutia-Lepchas in respect of land ownership as indicated by Table 2.

Table 2 shows the figure of 1983 where the Nepalis owns almost 59 percent of total cultivated land and contributes almost 64 percent of the total land revenue generated in the state. In contrast, the land share of the Bhutias and the Lepchas was 20 percent each and their land revenue contribution was 19 percent and 16 percent respectively. It was only with respect to land under cardamom cultivation that Nepalis did not rank first either in terms of owned areas or land revenue. Out of total cardamom field of 21,762 hectares, 33 percent was owned by the Lepchas, followed by the Bhutias (27 percent) and the Nepalis (22 percent).

Table 2: Caste-wise Distribution of Land in Sikkim (1976-83)

(Areas in hectares, Rent in Rs.)

Caste	Percentage	Paddy field	Dry field	Waste land	Cardamom	Total Cultivated land
Bhutia	Area	27.12	16.13	24.18	27.05	20.32
	Rent	25.13	15.37	24.28	—	19.11
Lepcha	Area	14.97	—	17.53	32.72	20.38
	Rent	14.07	18.48	13.42	—	16.15
Nepali	Area	57.19	64.95	62.00	22.37	58.66
	Rent	60.80	67.10	62.25	—	64.74
Total Public	Area	99.28	99.56	99.60	82.15	99.36
	Rent	100	100	100	—	100
Grand Total	Area	11727.1	64739.8	11734.4	21761.7	109963.0
	Rent	93647.9	172986.1	16362.5	—	282996.4

Source: Sikkim Human Development Report, 2001:P. 43

There have been several safeguards for ensuring land rights of the two indigenous tribal communities, the Bhutias and the Lepchas. Revenue Order No. 1, 1917 was reinforced in 1954 vide the Notification No 3082/L.R, dated 24 March 1954, issued by the Land Revenue Department. This notification remained in force even after 1975, and has been strictly implemented (Lama, 2002:43). In the late 1980s, the Sikkim Alienation of Land (Regulation) Bill, 1989, and the Sikkim Transfer of Land (Regulation Bill, 1989) were also passed by the state

legislature (ibid). These bills respectively aimed at restricting alienation of land by the members of Bhutia and Lepcha communities of Sikkimese origin to persons other than Bhutia- Lepcha of Sikkimese origin and also by Sikkimese in favor of non- Sikkimese.

Recently, the new awakening among the Lepchas, the active functioning of Renjong Mutanchi Rong Tarjum, (Sikkim Lepcha Association) which is vigilant against the alienation of Lepcha land has added another dimension making the question of land and ethnicity a triangular one. The association has been demanding amendment of Land Revenue Order No. 1 of 1917, which allows Bhutias and Lepchas for inter/community transfer of land. Since, its formation in early 90's, the organization has been pressing for the amendment to limit the land transaction within Lepchas only, in order to check alienation of Lepcha land even to the Bhutias, who are economically, socially and politically better placed (Thapa, 2002, 205).

The brief discussion so far highlights the way land is related to the question of ethnicity in an industrially backward under-developed agrarian economy like Sikkim. It also underlines how the historical factor of Nepalis immigration had contributed to subtle tension between the Nepalis and the Lepcha - Bhutia, as the former now controls the largest share of land. The trend indicates that perhaps without, the strategy of protective discrimination against land alienation for the minorities and the locals, the situation would have been more aggravated both for minorities and all ethnic groups of Sikkim in general.

Human Resources: Employment in the Public Sector

The massive growth of economy, the modernization and expansion of administrative structure and social services have opened up lots of employment avenues in the post merger Sikkim. All three major communities – Nepalis, Lepchas, Bhutias have responded positively and enjoying the fruits of the developmental activities. So, an examination of the community wise representation of employment profile in the government sector would help us to understand how the three communities have control over the human resources.

Table 3, on caste wise total number of employees based on Sikkim Manpower Review, 2002 shows a significant share for Nepalis holding the highest share (68.08 percent) of state government employment- against 16.14 percent by Bhutias, 7.98 percent by Lepchas, 3.12 percent by Sherpas and 4.65 percent by other communities. It indicates the

fact that, Nepalis has made steady progress and has been successful in establishing themselves to control the major share even in the employment opportunities in government sector too. On the line of preferential policy and protective discrimination for the locals, Sikkimese Nepalis has substantial hold in controlling the human resources generated by the developmental programmes in the post-merger Sikkim. However, among three communities the most favorable percentage is that of Bhutias, whose share in the employment in the public sector is much higher than the population ratio.

**Table. 3: Caste wise Total Number of Employees
(Sikkim Manpower Review)**

Caste	Regular	Work charged	Ad hoc	Master Roll	Others/ PSU	Total
Bhutia	(18.47)	(14.51)	(20.20)	(10.71)	(17.21)	(16.14)
Lepcha	(8.2)	(4.56)	(9.59)	(7.89)	(8.15)	(7.98)
Sherpa	(2.6)	(2.09)	(2.02)	(4.35)	(3.62)	(3.12)
Nepali	(64.6)	(74.27)	(60.00)	(74.63)	(71.00)	(68.08)
Others	(6.03)	(4.55)	(7.57)	(2.40)	0	(4.65)
Total	23139 (100.00)	1578 (100.00)	198 (100.00)	9989 (100.00)	2097 (100.00)	37001 (100.00)

Source: Sikkim: A Statistical Profile, 2004-05, Directorate of Economics, Statistics, Monitoring & Evaluation, Government Of Sikkim; P. 15

* Note (1) Figures in parenthesis denote percentages. (2) The caste wise break-up of Nepali Communities (in original data) has been consolidated here as Nepalis in general. The figures also include Scheduled castes.

Sikkimese Identity as a Protective Mechanism for Locals

In view of the rising competition of the resources and the growing apprehension and anticipation of more influx from other states to avail new developmental benefits, the post merger Sikkim has witnessed the emergence of Sikkimese identity, which is a social-political identity. The Sikkimese identity, which earlier was used to refer to the Bhutia- Lepchas only, has been broadened to include the Nepalis as well with the promulgation of Sikkim Subject Regulation, 1961 by which all the earliest settlers were conferred the status of Sikkim Subject (Sinha, 1981: 61). This in turn became the basis for acquiring the citizenship of India vide The Sikkim Citizenship Order, 1975 issued by

the Indian Union government (Sikkim Government Extra- ordinary Gazette, No. 11, June 21, 1975).

The Sikkimese identity thus has now assumed an inclusive, comprehensive and accommodative connotation. It is now a socio-political identity, which is the blend of the ethnic, social, cultural and political interests of the earliest settlers belonging to Lepcha- Bhutia and the Nepalis communities. It is the synthesis of ethnic, cultural, social and political interests of earliest settlers, belonging to Lepcha- Bhutia and the Nepalis communities. The legal recognition of the "Sikkimese" has been aimed to protect the interest of the earliest settlers in this agriculture-based economy, where land holds an important place as a productive source of livelihood and to check the influx of people from other states. Without this guarantee, the share of the ethnic communities to the state's limited land and human resources would have been dwindled and inter- ethnic relations in the state would have been aggravated.

In order to check the continuous and overwhelming influx in the post merger era, the state government has followed the policy of protective discrimination and preferential policy for the locals in employment opportunities and distribution of the state resources. The state government has strictly followed the "Son of the Soil" policy and has been formulating various rules for issuing Sikkimese local identity from time to time. Apart from those, whose names have been entered in Sikkim Subject Register and the holders of Indian Citizenship Certificate under the Sikkim (Citizenship) Order 1975, as amended in 1989, those who hold agricultural land in the rural areas are entitled to the identification certificate (Notification of Home Department vide 66 / Home 195 dated 29.11.1995). The Sikkimese identity has become a tool for availing socio- economic and political advantage and recently this Sikkimese status has become another criterion for exemption of Central Income tax too.

Mandal Commission and Ethnic Divide

When new identities emerge old ones are discarded and alternative basis of solidarity building are sought (Dube, 1977:5). The proposal of implementation of Mandal Commission Report gave a new twist to the ethnic based politics of Sikkim. Various Nepali sub- cultural stocks began to come up with new identities and demands for recognition as the Other Backward Class in order to reap the benefits of the

recommendations of Mandal Commission. The reservation for jobs adopted by the state governments facilitated the ethnic consolidation among various groups of Nepalis. The backward castes among the Nepalis began to see caste as the new basis for job reservation and other economic opportunities. The recognition of Nepalis of Mongoloid stock as the Other Backward Castes led to the further apprehensions among the higher castes Nepalis of Aryan stock like, Bahun, Cheetri and Newars, who began pressing for their inclusion in the list of Other Backward class category. When the Sikkim Democratic Front Government recognized demand for their inclusion in the list of OBCs, the former OBCs groups were declared as the Most Backward Castes in the state. Now, the inclusion of Limboos and Tamangs as the Scheduled Tribes (Vide SC & ST Order (Amendment) Act, 2002 (No. 10 of 2002) has again added another dimension to the ethnic based state like Sikkim that resulted in the demand for further reservation for these two communities as Scheduled Tribes distinct from BL seat in the state legislative assembly and in the employment sector.

Cultural Resurgence & State intervention

The growing ethnic consciousness among Nepalis sub- cultural stocks fragmented along caste and racial lines- the Aryan and Mongoloid found outlet and expression in the formation of many castes and community organizations of various sub- cultural groups of Nepalis. The state government has given legitimacy to the cultural demand of various ethnic groups by taking several initiatives. State government has recognized 11 official languages: Nepali (which is its lingua franca), Bhutia, Lepcha (since 1977), Limbu (since 1981). The decade of nineties witnessed the recognition of many other languages viz Newari, Rai, Gurung, Mangar, Sherpa, Tamang (since 1995) and Sunwar (since 1996) (Wikipedia: Retrieved on 20.12.2011). English is medium of instruction in schools and used in government documents. Lepcha, Bhutia, Nepali and Limbu are taught till Degree level and other are demanding similar facility. Amongst others initiatives of the government that testifies the cultural renaissance includes:

- Recognition of diverse languages: Promotion of the languages and scripts of their own is clearly evident with appointment of language teachers at school level for these various recognised languages.
- Sikkim Herald, the official weekly is printed in 13 languages.
- The State has declared holidays for festivals of major communities.

- The Review of Constitutional status of caste and communities in Sikkim.
- Cultural resurgence is adequately manifested in release of magazines, primer, and musical albums etc. in varied languages and also community wise cultural performance in various occasions which is a recent phenomenon. All these initiatives have further consolidated the ethnic boundaries and loyalties among various communities in Sikkim.

Job Reservation in Ethnic lines

The state government has responded to the demand of various ethnic communities by providing roster system for the distribution of employment along ethnic lines. The notifications provided by Department of Personnel, Government of Sikkim provides five reserved categories, viz : Bhutia Lepcha (BL- 22 percent), Scheduled tribes (ST- 14 percent), Other Backward Castes (OBC-21 percent) , Most Backward Castes (MBC-21 percent,), and Scheduled Castes (SC-07 percent,).

Conclusion

The study so far highlights that Land, the important resource in Sikkim, has become scarce due to the demographic transformation and multiplication of population over the years. Therefore the state has formulated various defensive measures to prevent the alienation of minority Bhutia- Lepcha land to other community and also that of local's land to non locals. The development process, which has been intensified in the state in the post-merger period, has opened up new opportunities and need of human resources in the state. The adverse impact of the development process has been that the intercommunity inequality has grown and the resources have changed hands from one community to other. The unequal distribution of opportunities, coupled with the social and cultural differences among the communities, has provided enough ground for ethnic group formation.

The emerging socio-economic and political process has accentuated the ethnic cleavages not only between Lepcha- Bhutia and Nepalis ethnic groups but also among the various groups of Nepalis. The policy of protective discrimination through the reservation for various communities has enhanced the ethnic consciousness and consolidated the unqualified loyalties to primordial ties like language, religion, culture among the people at large, which is reflected in revival

and formation of many caste and communities based organizations, culture, and religion. Reproducing ethnic consciousness and assertion of cultural rights has become a tool for seeking protection and patronage from the state government in retaining share and control in states socio-economic and political spheres. The Sikkimese identity has become a defensive mechanism and a uniting force among the plural ethnic groups in order to counter the threat of influx from other state. The preferential policy adopted by the state government is a cohesive force for all ethnic groups of Sikkimese in general.

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Tribe-Nature Interconnectedness: A Study of Lepcha Religious Beliefs

D. C. Roy

Introduction

Nature, the sum total of all living and non-living things, is very special to human being in general and to the tribes in particular. Tribes live in natural environment. The degree of interconnectedness between nature and tribe is so high and intrinsic that tribal life is fully endowed with nature. They mostly live in forest, mountain and inaccessible areas amidst the nature. Nature directly supplies all items of livelihood for the tribes. Nature is the sole provider of life support system to the tribes. There is a close and intimate relationship between the tribe and the nature. Because of their close association tribes can understand, know, read, judge, assess and interpret nature more correctly and accurately than the non-tribes. They are the born botanists, zoologists, environmentalists and what not. Tribes not only use the nature but accommodate and adjust themselves in natural environment without disturbing it.

The case of tribes depending absolutely on nature i.e. the case of the nomads is the story of the past and most tribes of today have habitation with settled cultivation. Even then, tribes continued to maintain close relation with nature through their culture, custom, religious belief. Culture is inherited and transmitted from generation to generation. Tribal culture is mostly nature based and even today, nature occupies a predominant position in the culture and religious beliefs of the tribes. It is true that tribal culture and religion have been influenced and affected by the culture and religion of the dominant community with whom

they live and interact. In fact, most culture and religion of today are mixed and no culture or religious belief can completely be vanished while some elements are always found, may be in the passive form. Culture in its broad spectrum includes beliefs, religion, tradition, folk-tales, folk-songs, music, custom etc. The religious beliefs are linked with folk-tale, folk-song and tradition and are transmitted orally over generations.

Tribes in India

India is the second home for the tribes of the world after Africa. As per 2001 census, India accounts for 8.43 crores of tribes consisting 8.2 percent of the total population of the country. The tribal population has grown at the rate of 24.45 percent during the period 1991-2001. In India the tribal population live in about 15 percent of the country's geographical area in the various ecological and geo-climatic conditions from plains and forests to hills and inaccessible areas. Tribes in India are found at diverse economic stage of life. There are few nomads who live in inaccessible forest land while most of them have adopted settled cultivation and very few of them are in main stream socio-economic life.

The Constitution of India recognized Indian tribes as Scheduled Tribe and enlisted them in the List prepared by the state. Without entering into the debate we generally accept that the Scheduled Tribes are considered as the tribes of the country. At present there are more than 700 STs notified under Article 342 of the Constitution of India who are spreading over different states and Union Territories of the country. Within ST there are 75 tribes who are identified as Primitive Tribal Groups and are treated differently for their economic growth. The distribution of tribal population over different states and UTs has been shown in table-1. The table-1 reveals that tribes are spreading differently over different states and UTs. As the size and total strength of population is different in different states, the percentage figure of ST population of the state to total ST population do not give a clear picture of the status of ST population of the state. Column 4 of the table shows percentage of ST population in the state to total population of the state. It is seen that states like Mizoram, Nagaland, Arunachal Pradesh and UTs like Lakshadweep and Nagar Haveli are heavily populated by the tribes.

Table- 1
State and UT- wise Demographic Statistics of Tribes in India: 2001

Sl No	States/ UTs	% of ST population of the state to total state population	% of ST population of thestate to total ST populationin India
1	India	8.2	—
2	Andhra Pradesh	6.6	5.96
3	Arunachal Pradesh	64.2	0.84
4	Assam	12.4	3.92
5	Bihar	0.9	0.9
6	Chhattisgarh	31.8	7.85
7	Goa	—	0.0001
8	Gujarat	14.8	8.87
9	Haryana	—	—
10	Himachal Pradesh	4.00	0.29
11	Jharkhand	26.3	8.4
12	Karnataka	6.6	4.11
13	Kerala	1.1	0.43
14	Madhya Pradesh	20.3	14.51
15	Maharashtra	8.9	10.17
16	Manipur	34.2	0.88
17	Meghalaya	85.9	2.36
18	Mizoram	94.5	1.00
19	Nagaland	89.1	2.1
20	Orissa	22.1	9.66
21	Punjab	—	—
22	Rajasthan	12.6	8.42
23	Sikkim	20.6	0.13
24	Tamil Nadu	1.00	0.77
25	Tripura	31.1	1.18
26	Uttaranchal	3.00	0.3
27	Uttar Pradesh	0.1	0.13
28	West Bengal	5.5	5.23
29	Andaman & Nichobar Island	8.3	0.03
30	Chandigarh	—	—
31	Dadra & Nagar Haveli	62.2	0.16
32	Daman & Diu	8.8	0.017
33	Delhi	—	—
34	Lakshadweep	94.5	0.07
35	Pondicherry	—	—
36	J & K	10.9	1.31

Source: Government of India: Ministry of Tribal affairs – Annual Report 2007-08.

Tribal religion and animism are synonymous. With the passage of time tribes have converted to different alien religious beliefs. But in the core of their heart they are still the worshippers of the nature. They worship mostly all the natural elements surrounding them. The interconnectedness between the tribe and the nature can be gauged through the cultural behaviour and the practice that include their beliefs, faith, rites, rituals etc. The present article aims at analysing the traditional religious faiths and beliefs of the Lepchas of West Bengal and thereby examines the degree of interconnectedness of the Lepchas with nature. It is an attempt to see the love, respect and relation with nature through their religious beliefs.

The Lepchas

Lepchas are the autochthonous people of the Eastern Himalayas. In the early days their land was spread from Mount Kanchanjunga in the north to Titalia (now in Bangladesh) in the south. In the east, their land had been extended upto Rudak river at Paro valley under Ha province of Bhutan. In the west, Lepcha land had been extended up to Arun and Tambur river (now in Nepal). Actually, the original Lepcha land had been shared by the neighbouring countries like Nepal, Bhutan, Bangladesh and India. In India at present the Lepchas are residing in the states of Sikkim and in Darjeeling district of West Bengal.

Originally the Lepchas were the nature worshippers but in course of time almost all of them were converted into Buddhism and then some of them were again converted into Christianity. Now pure nature worshipper is rare among the Lepchas and nearly sixty percent of them are Buddhists and the rest are Christians. The Buddhist Lepchas even today are maintaining and practising most of their traditional rituals while such rituals are rarely practice by the Christians.

Lepcha-Nature Relationship

By tradition Lepchas are nature worshippers. They worship all natural elements of Eastern Himalayan region. From birth to death, Lepchas are closely connected with the natural elements. Mount Kanchanjunga is their divine deity. They strongly believe that their primogenitors have originated from the virgin snow of Mount Kanchanjunga. They worship all natural elements of the region like the mountain peak, hill, lake, river, sun, moon, tree, plants, shrubs, rain, wind, mist and what not. In Lepcha society there is no class and the

community is divided in terms of clan which they call *moo*. Each clan or *moo* has three distinct nature related elements: *Chu* (peak), *Daa* (lake) and *Lyep* (entry point). They believe that after death their soul reach to their respective *Chu* in the Himalayan range to meet their parents for eternal peace. There is a *Daa* associated with each *Chu* and through *Lyep* they need to enter. It is believed that all the peaks in the Eastern Himalayan range have their Lepcha name which is connected with their *moo*.

Lepcha religion is known as *Bongthimism* or *Munism*. *Bongthing* (Lepcha priest) and *Mun* (Lepcha priestess) remain present in all Lepcha rituals starting from *Tunboang* (Naming ceremony) to *Bri* (marriage) or *Sung Lyaang* (Death rituals). In all occasions, the *Bongthing* and *Mun* first worship Mount Kanchanjunga and then the *Chu*, *Daa* and *Lyep* of the respective clan. Offering *Chi* (indigenous liquor) and narration of Lepcha folk-tales are very common in the rituals. Lepcha nature relationship is very deeper and holistic.

Lepchas have no specific place and construction like Temple, Church, Mosque etc for worshipping. They offer prayer to the Almighty in the open air, outside the house, in the hill top and under the open sky. The Lepcha religious prayer is known as *Faat* and there are a number of *Faats* and all of them are either direct worship of nature or are closely linked with the natural elements. Following *Faats* are important in traditional Lepcha custom:

1. ***Muk-Zik-Ding-Rum Faat***: In Lepcha *Muk* means greenery that pervades the nature around us, *Zik-Ding* means sprouting of grass i.e vegetation, *Rum* means God and *Faat* means offering, prayer or invocation. Thus *Muk-Zik-Ding-Rum Faat* means offering prayer to Mother Nature¹. Lyangsong Tamsang describes that this *Faat* "is a Lepcha festival as well as education in ecology and environment. The *Mun* (Lepcha Priestess) and *Boongthing* (Lepcha Priest) and their loyal followers invoke and offer their prayers to the *Eetboomoo*, the Creator, during the month of February each year for timely mist, cloud, rain, sunshine, clear water to make the soil and earth fertile so that healthy plants, trees, and shrubs may grow in profuse to provide the insect, worm, bird, fish, and animal world including humans, with ever indispensable flowers, fruits, medicines, cereals, food, shade and shelter as well as protect and save them from natural calamities, disasters like flood, landslides, famine, and diseases.

Both *Mun* and *Boongthing* invoke the *Eetboomoo*, the Creator, and request energy, on behalf of all the living things of earth, for their growth, movement, and life. They further ask the Creator for a constant and regular recycling process and balance of the other elements like the air, soil, or earth, water, green plants, worms, insects, birds, animals etc. to live and grow²².

Lepchas perform *Muk-Zik-Ding-Rum-Faat* in the month of February i.e. the beginning of dry spell of the coming summer. It is period for sprouting of all vegetation for which they need timely water and favourable climatic conditions. The *Faat* is an example of true nature lover of the Lepchas. They do not only depend on nature for their livelihood but also worship Her as God. It is a community festival and performed jointly under the arrangement of the Lepcha Association. The interconnectedness between nature and Lepcha is perfect. Nature not only provides food, fodder, shelter but also provides rain, mist, wind, and makes the world habitable. In return the Lepchas show full respect and express their gratitude and thanks for timely and sufficient supply of natural elements for the survival of all living things and plants. It is a pure offering for the preservation of environment for human habitation.

2. TendongLho Rum Faat: Mount Tendong (8675 feet high) known as *Tungrong* to the Lepchas is a mountain top in the south Sikkim. The Lepchas worship this mountain every year in the month of August as a saver of human being from great deluge in the bygone days. They offer *chi*, fruits, rice, flower, vegetables and prey to the *Etboodeboo Rum* for protecting the humanity including the animals, birds and plants from the great natural calamities. The government of Sikkim has declared 8th August as state holiday for the purpose of offering since 1997.

TendongLho Rum Faat is related to the belief and the folk-tale of the Lepchas regarding the love affairs of two main rivers i.e. Rangnyu (Teesta) and Rongeet. As per Lepcha folk-tale these two rivers "were lovers and they used to meet secretly, but when their love was known and exposed, they decided to leave the place and go down to the plains of India. As they did not know their way, they decided to take guides to lead them. River Rongeet, the male, was guided by a bird, '*Tut Fo*', and the river Rangnyu, the female, was guided by a snake, '*Paril Bu*'. Their guides agreed to take the two lovers to an appointed place at

Pazaok, meaning dense forest in Lepcha, but now incorrectly called 'Pashok' near Teesta Bazaar.

As river Rangeet was led by a bird, it travelled through circuitous routes in search of food; therefore, he arrived at the appointed place, *Pazoak*, late. If you observe this river carefully, it zig-zags, twists and turns and flows slowly up to Peshok. The female river, Rangnyu, led by a snake travelled straight to the appointed place on time and waited for her lover, Rangeet river. Rangnyu flows straight like a snake running fast with its head held high. When river Rangeet finally arrived at the appointed place, he was very, very surprised and shocked to see his lover, Rangnyu, already there waiting for him. In anger he uttered out 'Thi-Sthaa!' meaning, 'already arrived!' Unable to pronounce this monosyllabic Lepcha word, 'Thi-Sthaa' properly, the non-Lepchas, today, call it 'Teestaa'; therefore Rangnyu is also known by the name of Teesta today. River Rangeet was very, very angry, disappointed, upset and ashamed because, being a male, he should have arrived first at the appointed place. He decides to return to his original place, the Himalaya. As a result, a great deluge occurred in the land of the Lepchas, *Nye Mayaal Lyaang*, the present day Sikkim and the Darjeeling district"³.

In *TendongLho Rum Faat*, the Lepchas not only offer prayer and express their gratitude for saving the Lepchas in the past but request the mountain to do so in the future also. Lepchas use all natural things like *Chi*, fruits, vegetables, rice, in the offerings.

3. *Chu Rum Faat*: In Lepcha, *Chu* means the mountain peak *Rum* means the God and *Faat* is the offering. Thus *Chu Rum Faat* is the worship directly to the mountain peak. Lepchas offer special prayer to mount Kanchanjunga, the guardian deity of the community. They believe that their primogenitors, *Fudongthing* and *Nazoangnu* were originated from the pure and virgin snow of Mount Kanchanjunga. Since then this mountain peak is Godly to the Lepchas and they worship it in all occasions: In all rituals, the *Bongthing* and *Mun*, the Lepcha priest and priestess first offer *Chi* to Mount Kanchanjunga, thank her for creating the world, and make it habitable for human being.

There is a natal relation between the Lepchas and the different peaks of the Eastern Himalayan region. Lepcha community is casteless but they are divided in different *Put-so* or clan which they all *moo*. They believe that each clan or *moo* has its own *Chu* or mountain peak in the Himalayan region. As per their folk-tale they originate from their

particular peak and after death their soul return to the same peak where their ancestors are waiting to receive them. It is the duty of the *Mun* to guide the soul to return to their peak for eternal rest. Each clan is sentimentally connected to Mount Kanchanjunga in general and to their clan-peak in particular. In all rituals the *Bongthing* and *Mun* utter the names and offer prayer to Mount Kanchanjunga and the community peak from where they have originated. Blessing from Mount Kanchanjunga is sought for the well-being of the community and from the community peak for the well-being of the individual member, family and the clan.

4. *Lyang Rum Faat*: In Lepcha *Lyang* means the land or earth and *Lyang Rum Faat* is connected with offerings to Mother Nature. Lepchas thank mother Earth for the supply of food, providing shelter and all that make the human habitation possible in this earth. Mother Earth looks after all the natural elements including the human being, animals, birds, insects, butterflies, plants, trees, shrubs, creepers and what not. Lepchas realise the necessity of co-existence of all natural elements and believe that the survival of all natural beings are mutually dependent. The concept and importance of bio-diversity is being reflected in the Lepcha prayer of *Lyang Rum Faat*.

It is a community ritual and is organised by the *Kyong Shezong*, the Village Level Lepcha Association where at least one member from each family must send their representative to participate. Every year in the month of April-May the Lepchas assemble in the village hill top and prey in the open air under the sky and request the Mother earth to protect the community from natural calamities. They also pray for timely and sufficient rain which is vital for agriculture and habitation. It is told that in the evening of the *Faat* the village witness at least one shower of rain as a symbol of blessing from the Mother earth. It is a community picnic where all contribute in the feast.⁴

Holy book of prayer and offering of *Lyang Rum Faat* has been published by Indigenous Lepcha Tribal Association and the *Bongthing* read out the book during the *Faat*.

5. *Sugi-Rum-Faat*: Lepchas are born botanists. "They live on whatever they can find, whether animal or vegetable. Fern-tops, roots of Scitaminea, and their flower-buds, various leaves, and fungi, are chopped up, fried with a little oil, and eaten"⁵. They know the plants,

trees, shrubs, creepers and all vegetation of the region. They are so dependent and acquainted with the plants that they "can tell you the names of all, they can distinguish at a glance the difference in the species of each genus of plants, which would require the skill of a practised botanist to perceive; and this information and nomenclature extends to beasts, to birds, to insects, and to everything around them, animate and inanimate; without instruction, they seem to acquire their knowledge by intuition alone. The trees and the flowers, and the birds, and the insects have been their friends and companies"⁶.

The *Bongthing* or *Mun* is the bare-footed medicinal person of the village who prescribes and supplies herbal medicine on all occasions. They possess sufficient knowledge about the diseases and know their remedial measures. All Lepchas in the village primarily depend on the village medicine man for their treatment. The medicine person on the other hand believes that the plants, shrubs, creepers etc need to praise by worshipping for keeping their medicinal power intact. *Sugi Rum Faat* is the occasion when all the herbal plants are kept in front of the *Faat* place and offer prayer so as to renew their knowledge about the herbs and offer thanks to the Almighty for preserving their medicinal values. In fact "it is the *Faat* connected with ovation and thanks giving to their respective teachers. All the *Bongthings* and *Muns* assemble in one place to offer their respect, admiration and reverence to *Thikoong Azaor*, first *Bongthing* and *Nyookoong Nyoolik*, the first *Mun* and to their respective teachers who taught them the skill of doing the religious activities. They ask for their continuous help and blessings in this regard, so that they can help the community in their development. Once a year in the month of October, *Bongthing* and *Mun* of any locality assemble to offer their thanks giving. All the medicinal plants are to be placed in front of the prayer for retaining their herbal power for the benefit of the human being"⁷.

6. Mut Rum- Faat or Pong Rum-Faat: *Mut-Rum* is the jungle spirit. The Lepchas worship this spirit both before and after hunting. Hunting was the main source of livelihood of the Lepchas in the bygone days. Before setting for hunting, the Lepchas worship the spirit for their safety return from the jungle and for good hunting. After hunting, the hunted beasts or birds or animals are first offered to the spirit and then they make use of them for domestic consumption. They also thank the spirit for fruits, roots and all eatables available in the jungle. The spirit

is also believed to protect and save the cultivable land and the crops and vegetables from rats, insects, animals and human beings. Every year the male members of the family assemble in a place far away from the house to worship the *Mut-Rum* spirit. They need to surrender all their weapons before the spirit and pray for their power. The female members are strictly prohibited from appearing in the worship place.

7. *Sakyao Rum- Faat:* *Sakyao Rum* is the good spirit who protects and guards the grains collected and stored in the grain house. The spirit also protects the kitchen garden and orchard from the animals, human being, birds, insects and all those who can destroy the fruits and flowers. Normally Lepchas do not protect their orchard by fencing but no outsiders can dare to enter the land due to the fear of the spirit. Unauthorised person gets severe pain in hands and legs which may comatose any organ of the body due to the evil eye of the spirit. In that case, only a *Bongthing* or *Mun* can cure him/her by offering *Chi*, egg, hen, fruits and some vegetables to the spirit ⁸.

Lepchas not only worship natural elements but use natural ingredients which are available locally. The most common item offered in all occasion is *Chi* (community fermented liquor made from domestically produced maize, and yeast). The other items are: fruit, flower, rice, egg, fish, hen, etc. Lepchas prefer hill top or stream side, open air, under the blue sky as the holy place for worship. No image or construction of house is needed for worship. They are the nature worshippers and perform their ritual in the natural environment.

Conclusion

Lepcha-nature relationship is based on their interdependency. Nature is close to the Lepchas wherever they live in. They feel homely in the natural environment and they inculcate a sense of belongingness in the natural environment. This belongingness gives rise to the sense of worship and respect to natural elements. The Lepchas use nature for their survival but worship it and feel oneness with the nature. All elements of nature starting from mountain, river, lake, plants, stones, rocks, hills are objects of Lepcha worshipping. The Lepchas worship God through nature and hence they are truly known as the nature worshipper. The degree of interconnectedness between nature and the Lepchas is very high and intrinsic.

The present environmental crisis and the danger of human existence can be solved from the outlook of the tribes in general and the Lepchas in particular towards their love, respect and use of nature. Tribes are the user, preserver, and worshipper of nature. The practice of eco-friendliness can be learnt from the Lepchas for better tomorrow of the world.

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