

**ECONOMIC BENEFITS AND CONSERVATION
LINKAGES FROM TOURISM DEVELOPMENT
IN THE SIKKIM HIMALAYA**

Thesis submitted for the Degree of
DOCTOR OF PHILOSOPHY
in
Geography and Applied Geography
In the Faculty of Science of
THE UNIVERSITY OF NORTH BENGAL

By
IYATTA MAHARANA

**G.B. Pant Institute of Himalayan Environment and Development
Sikkim Unit, P.O. Tadong, Sikkim-737102, INDIA**

2000

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Dedicated

As a token of personal regards

to

My revered parents

Mr Krishna Chandra Maharana

&

Mrs Kamalini Maharana

who have been a source of constant

inspiration and encouragement

in all my academic pursuits



G.B. Pant Institute of Himalayan Environment and Development

(गोविन्द बल्लभ पंत हिमालय पर्यावरण एवं विकास संस्थान)

SIKKIM UNIT, TADONG, GANGTOK, SIKKIM - 737 102, INDIA

Dr Suresh C. Rai
Scientist "C "

I have a great pleasure in forwarding the thesis of Miss Iyatta Maharana, M.A. (Geography), entitled "*Economic Benefits and Conservation Linkages from Tourism Development in the Sikkim Himalaya*" for the degree of **DOCTOR OF PHILOSOPHY IN GEOGRAPHY AND APPLIED GEOGRAPHY**.

This is to certify that the research work presented in the thesis is original and taken up by her under our supervision at the GBPIHED, Sikkim Unit and Department of Geography and Applied Geography, North Bengal University. I recommend that she has fulfilled all the requirements according to the rules of the University of North Bengal and the Institute regarding the works embodied in her thesis.

S. Rai 11/12/2000

(Suresh C. Rai)
Supervisor

DEPARTMENT OF GEOGRAPHY AND APPLIED GEOGRAPHY
UNIVERSITY OF NORTH BENGAL

P.O. NORTH BENGAL UNIVERSITY, DIST. DARJILING
PIN : 734430, INDIA, ☎ : 91-0353-581430 (D)

W-279, N.B.U. CAMPUS
P.O. N. B. UNIVERSITY
DIST. DARJILING, W. B.
PIN - 734 430, INDIA
☎ :91-0353-581245 (R)
FAX : 91-0353-581546 (O)
E-mail : balasun@dtc.vsnl.net.in

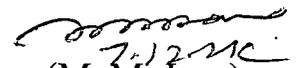


Dr. M.M. Jana, Professor

M.Sc., Ph.D. (Cal.), P.G. Dip in R.S. Application
F.G.S.I., (Cal), F.I.N.C.A., F.A.A.G. (USA)

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(M. M. Jana)
Co-Supervisor

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Acknowledgement

I express my sincere gratitude to my supervisor, Dr. S. C. Rai, G.B. Pant Institute of Himalayan Environment and Development for his constructive guidance and encouragement throughout the period of study. I also express my sincere thanks to my co-supervisor Professor M. M. Jana, Department of Geography and Applied Geography, The North Bengal University for his continuous guidance and support. I am thankful to the Director, G. B. Pant Institute of Himalayan Environment and Development for his valuable suggestions and providing facilities. I am very much thankful to Dr. Eklabya Sharma, Scientist In-charge of the Sikkim unit of the G.B. Pant Institute of Himalayan Environment and Development for his humble guidance and creative suggestions from time to time.

I am highly grateful to Professor J.S. Singh, Department of Botany, Banaras Hindu University, for his constructive and technical suggestions time and again. I am highly obliged to Dr. Rodeny Jackson, who has been available to me at time to time for consultation and helped in statistical analysis using window-based software.

I have been benefited much from discussions with Professor Kanchan Chopra, Institute of Economic Growth, University of Delhi, Professor. B. Thakur, and Dr. R. B. Singh, Department of Geography, Delhi School of Economics, University of Delhi, Dr. T. R. Manoharan, Information Research System for the non-aligned and other developing countries, India Habitat Center, New Delhi and Dr. J. Gabriel Campbel, Former Asia Program Director, The Mountain Institute, U.S.A.

I express my sincere gratitude to Professor. A. N. Purohit, Director, High Altitude Plant Physiology Research Center, Srinagar, Garhwal, for his kind suggestion, inspiration and support. Thanks are also due to Dr. R. C. Sundriyal, Dr. Manju Sundriyal and Dr. Drupad Choudhary of North-East unit of G.B. Pant Institute of Himalayan Environment and Development for their suggestions and encouragement.

I would like to thank Ms. Nandita Jain, Project Manager (SBE) for all the help she rendered during the project tenure. I am indeed very much indebted to Mr Renzino Lepcha, Project Officer, Sikkim Biodiversity and Ecotourism project and all TAAS (Travel Agent Association of Sikkim) members and community people for providing me all the required information without hesitation.

I wish to put on record my sincere thanks to various Government Departments of Sikkim government, especially Forest, Tourism, Agriculture, Survey and Settlements and other organizations, Census Directorate of Sikkim and Sikkim Government College.

Words are inadequate to express my gratitude to my parents, uncle Mr I. L. Uprety, aunty Mrs Anita Uprety, Manoj, sister and brothers without whose constant support and help, the present work could not have materialized. I was fortunate to have the help and support of my younger brother Swastik during the crucial phase of writing. I would like to thank my friend Shailesh, who has been the inspiring spirit behind this work.

The study would not have been possible without support and cooperation of the following staff Er. A. P. Krishna, Dr. K.K. Singh, L.K. Rai, Dr. Y.K Rai, Dr. Rita Sharma, Shri R.K. Das, Sabita Krishna, J. Dhakal, P.K. Tamang, Shyambir, Musafir Rai, Mohan Thapa, Arun Tamang, P. B. Chettri and Sunil Balmiki of the G.B. Pant Institute of Himalayan Environment and Development, Sikkim Unit.

I acknowledge deep gratitude and thanks to M.V.S Manian for his technical support in the compilation, graphic and presentation. I acknowledge my friends Nakul Chettri, Alka Jain, and H. Bir Kumar Singh, who deserve special mention for their moral support and helping me the hard times and sharing with me the good. Bidya Pradhan and Bhanuraj Sharma were my sole source of assistance in the field, his help and care in the field went way beyond the call of duty. Thanks are also to all Yuksam and Khecheopalri communities who provided constant moral support without which this work wouldn't have been possible and easier.

Lastly, I am thankful to the Biodiversity Conservation Network under Biodiversity Support Program (BSP), United States Agency for International Development (USAID) and IDRC Canada for their financial support.

Iyatta Maharana
Iyatta Maharana

Glossary

ACS	Annual Consumer Surplus
BCN	Biodiversity Conservation Network
BNP	Borvli National Park
BSP	Biodiversity Support Program
COC	Code of Conduct
CVM	Contingent Valuation Method
DBDC	Double Bounded Dichotomous Choice
FCC	False Colour Composite
FITs	Free and Independent Travellers
ft ³	Cubic feet
GNP	Gross National Products
GBPIHED	G.B. Pant Institute of Himalayan Environment and Development
ha	Hectare
ha ⁻¹	Per hectare
HMI	Himalayan Mountaineering Institute
IATA	International Air Transport Association
IRS	Indian Remote Sensing
IUCN	International Union for Conservation of Nature; The World Conservation Union
IUOTO	International Union of Official Travel Organizations
KCC	Khangchendzonga Conservation Committee
KNP	Khangchendzonga National Park
Kholas/Chus	Stream
Km ⁻²	Per Kilometer Square
LISS	Linear Image Self Scanning
LPG	Liquid Petroleum Gas
Mg	Mega Gram (tonne)
NGOs	Non Governmental Organizations
NTFP	Non-timber Forest Product
OLS	Ordinary Least Squares
PATA	Pacific Area Travel Association
PHC	Primary Health Centre
PLA	Participatory Learning and Action

PRA	Participatory Rural Appraisal
PTR	Perriyar Tigar Reserves
SBE	Sikkim Biodiversity and Ecotourism
SDP	State Domestic Product
TAAN	Trekking Agent Association of Nepal
TAAS	Travel Agent Association of Sikkim
TCM	Travel Cost Method
UN	United Nation
USA	United State of America
UNCED's	United Nations Commission for Environment Development
USAID	United State Agency for International Development
WTO	World Tourism Organization
WTTC	World Travel and Tourism Council
WTP	Willingness - to - Pay
yr	Year
yr ⁻¹	Per year

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CHAPTER - I

Chapter I

INTRODUCTION

Tourism is one of the most rapidly expanding sectors within the world's largest and fastest growing industry and emerging as a growing sector of economic development. Since the last century tourism has been increasing and showing more flows of people into the mountain regions. This sector is remaining high on the international agenda of development. The 7th session of the Commission on Sustainable Development focussed on tourism and subsequently work programs on sustainable tourism are being developed. Also the Convention on Biological Diversity is embarking on tourism programs and bilateral and multilateral financial institutions placed tourism high on their priority lists. The UN declared 2002 as the International Year of Ecotourism and the World Tourism Organization adopted a Global Code of Ethics for Tourism at its General Assembly, held in Santiago de Chile, from September 27 until October 1, 1999 (Groth 2000).

Majorities of the tourists visit places for leisure, contributing to the world's largest industry, which employs 212 million people (a tenth of the world's workforce) with an output of US\$3.4 trillion, 6% of world gross national product. The total global capital investments (10.7%), worldwide consumer spending (10.9%), and the world's international

trade in goods and services (6.8%) make tourism one of the three top categories of trade (WTTC 1995). Understanding its high multiplier effect, the governments around the world are taking more proactive roles to attract more tourists, recognizing tourism as an effective tool for economic diversification where traditional industries are failing and as a source of foreign exchange earnings and better employment opportunities. The World Tourism Organization forecasts that there will be 702 million international arrivals in the year 2000, that arrivals will top 1 billion in the year 2010 and that by 2020 it will reach 1.6 billion nearly three times the number of international trips made in 1996, which was 592 million (Groth 2000).

Travelers of the 21st century will go farther and farther. The Tourism 2020 Vision forecast predicts that by 2020 one out of every three trips will be a long-haul journey to another region of the world (Groth 2000). World Travel and Tourism Council (WTTC) says that tourism earnings by 2005 AD will be double its current gross income and generate 90% more jobs. Its capital investment is expected to increase three-fold to US\$1.7 trillion, and attract more than twice the current level of consumer spending amounting to US\$4.6 trillion.

For a number of developing countries their natural environments continue to be a source of significant economic benefits, attracting international and domestic visitors often in search of an authentic natural

and, to a lesser degree, cultural experience. Detailed information on the numbers of visitors visiting natural areas and the amount of resultant economic activity in the developing countries is both difficult to obtain and often unreliable. Tourism associated with natural and protected areas has been and continues to be a growing sector in the global tourism industry (Whelan 1991 and Brandon & Hawkins 1996). Of the estimated US\$55 billion in tourism receipts in the Third World, a significant portion of this in the early 1990s was the result of nature tourism activities (Whelan 1991). Although not always concerned with protected areas, it is estimated that annual global expenditure on adventure-related travel amount to US\$110 billion (Adventure Travel Society 1998). Perhaps difficult to generalize, for many developing countries, their natural heritage is a primary attraction for international visitors and the increasing numbers of domestic tourists.

Tourism development in India, given its federal character, remains a state subject and, therefore, the politics of the states concerned have a greater bearing on the aspects of policy implementation. The Eighth Five-Year Plan (1992-1997) document of India lays emphasis on tourism sector promotion. The national action plan for tourism development has emphasized enhancing of the socio-economic status of the people, increase in employment opportunities, diversification of the tourism product and preservation of cultural heritage and environment.

The Hindu-Kush Himalayan region is a unique area in the world offering rich biodiversity, culture, socio-economic traditions, history and lifestyles. Since time immemorial lofty mountain ranges of the Himalaya have attracted tourists, pilgrims, naturalists, explorers, trekkers, mountaineers, and other various adventure travelers. Tourism can play a key role in the development of the remote mountain areas. Development of tourism activities may help in the diversification of the mountain economy, and provide viable alternative livelihood opportunities for the mountain people.

In view of limited industrial growth in Sikkim, tourism can become a potential source of income generation in the remote hilly regions and generate employment opportunities to the local community. Over recent years this area has experienced significant changes as a result of tourism growth. Since 1990, there has been a tremendous growth in visitation number (Rai & Sundriyal 1997). Tourism is a highly seasonal activity in the state, October through November and March through June being the two peak seasons. The high growth rate of tourism recently has caused some serious threats on the natural environment. Most of the tourism activities in Sikkim are either in protected areas or cultural sites. Protected areas are the State properties where ownership, control and management of resources and claims rest with the government, however, usufructuary rights for tourism purposes are with a variety of users

including local entrepreneurs, communities, commercial tour operators (residents and also from outside the area and some times the region) and government agencies such as the Forest and Tourism Departments. Cultural sites of tourism interest such as monasteries and their sacred forests are under the control of local institutions. There is unique example of Khecheopalri Sacred Lake where the legal rights lie with the State Government but the operational rights seem to be with a local institution, viz. Khecheopalri Holy Lake Welfare Committee.

The problems facing the region call for the promotion of activities that are based on the region's comparative advantage, which help in the diversification of the mountain economy, provide alternative livelihood opportunities for the local people and at the same time actively promote environmental care so that the twin issues of economic development and environmental degradation can be simultaneously addressed. Tourism in the mountains has the potential of addressing all these concerns and providing alternative and environment friendly income and employment opportunities all across the region.

As concern grows over the loss of natural heritage in the area, it appears that this is the ideal time to facilitate ecologically and socially responsible tourism at key destinations to conserve the biological diversity of the area. Therefore, the present study was undertaken to provide robust empirical evidence on the environmental, economic and

social impacts of tourism, and attempts are being made to make the tourism environmentally friendly, and involve local communities as a promising stakeholders so that they can get direct benefits from the tourists and at the same time protect the biodiversity and cultural heritage of the area.

1.1 The Sikkim Biodiversity and Ecotourism Project

The “Sikkim Biodiversity and Ecotourism (SBE) project”, was supported by Biodiversity Conservation Network (BCN) under the Biodiversity Support Program (BSP), USAID. The project was a collaborative effort of the G.B. Pant Institute of Himalayan Environment and Development, The Mountain Institute, USA, The Travel Agent Association of Sikkim, The Green Circle and local NGOs with communities, implemented in the west district of Sikkim. The Government of Sikkim has also played a key role at the various stages of the project implementation. The Project’s overall objective is to “develop viable ecotourism enterprises at the key destinations in Sikkim which provide sustained incentives and support for local communities and the Sikkimese tourism industry to effectively protect and enhance the high biodiversity found at these sites and the State as a whole”. The project worked to support community-based enterprise development approaches for the conservation of Sikkim’s unique biological diversity; was a collaborative initiative designed to conserve the biological diversity of

key destinations in Sikkim. The specific objectives of the project was (i) increase the interest and capacity of local communities, tour operators and local NGOs to initiate and implement effective participatory biodiversity conservation of the project sites, (ii) increase market demand for Travel Agents Association of Sikkim (TAAS) and community member ecotourism products, (iii) improve the quality and diversity of the ecotourism products offered by local communities and TAAS members and the returns to investment and labor, (iv) improve the policy environment and knowledge base for development of more effective biodiversity conservation and ecotourism linkages, and (v) planning, monitoring and applied research which included planning and policy development, enterprise monitoring, socio-economic monitoring, biodiversity monitoring and community resource management research. The present piece of work was undertaken as a part of monitoring and applied research in two destinations viz. Yuksam-Dzongri-Goechha La trekking corridor and Sacred Khecheopalri Lake with a goal to increase knowledge of key relationship between economic benefits and its relation to conservation through tourism development.

1.2 Core Hypothesis

- The effectiveness of biodiversity conservation (forest) is closely related to the degree to which local people obtain direct and indirect economic benefits from tourism and are well informed on environmental issues and conservation activities.
- Ecotourism activities will lead to increase revenue from tourism-related activities for stakeholder groups and local households directly or indirectly involved in the tourism sector.

1.3 Objectives

- To study and compare the relationships between tourism growth, market trends and tourism-related revenue distribution patterns in two sites.
- To assess and identify possible interventions that strengthen the capabilities of local people and local communities to derive maximum employment and income benefits from tourism.
- To identify mechanisms used for increasing entrepreneurial skills and capacities to expand resources among local

stakeholders involved in ecologically sound and socially responsible ecotourism and other development activities.

1.4 Design of the Thesis

The present study has been divided into seven chapters dealing with varied but interrelated aspects. Chapter one deals with an introductory outline of the tourism, hypothesis and objectives. Chapter two introduces the review of literature indicating the chronological development and changing content of the concept. Since not much study have been carried out on the topic in the Indian context, more attention is paid to review studies carried out in other countries, particularly in developed countries. In addition, attempt has been made here to review some of the specific valuation studies on non-marketed commodities. The third chapter is devoted to describe the study area, deals with physical setting, cultural setting and infrastructure facilities. Dynamics of tourism, visitor profile, nature and characteristics of tourism, tourist product and tourist reaction has been examined in the fourth chapter. It is followed by an appraisal of human resources and socio-economic development (chapter fifth). The economic evaluation of environmental damage to natural ecosystems has been discussed in chapter six that is carried out using travel cost method (TCM) and contingent valuation method (CVM). In addition to this, the nature and extent of dependency of

stakeholder groups on KNP and Lake area are also described in this chapter. Tourism, economic significance, participation of government and non-government agency in tourism and environmental conservation has been described in seven chapters. It recapitulates as a prelude the observations made in preceding chapters and suggests a requisite planning. Keeping in view the defined objectives some relevant aspects of planning for tourism development in mountain regions have been critically examined prior to formulation of an integrated framework. The end of the study is marked by a summary of basic elements and references.

1.5 Limitations

Following are some of the important limitations of the present study:

- The major constraint was inaccessibility of the area due to steep slopes in many parts of the trekking corridor. Unpredicted weather conditions and natural hazards like landslide, continuous rain and extreme cold weather disrupted the workplan and many times the schedule was missed or covered later.
- The TCM technique is applied to estimate the ecotourism value of visitors from Sikkim State only. The consumer surplus of visitors from other state and abroad may generally be higher than the estimated amount. The travel cost method for foreign tourists can be applied, but

its application in both the sites have not been carried out due to budgetary constraints. In both the sites most of the visits from abroad are as a part of multiple destination trips. The economic value of such recreation visits cannot be estimated by simple travel cost method.

- The sites have some unique recreation characteristics and the value of specific characteristics such as the viewing value of Red Panda, Butterfly and other wild animals, the value of trekking experience etc. are not estimated separately. There are certain methods such as Hedonic Travel Cost Method to estimate the recreation value of such specific characteristics but that has not been applied in this study.
- There is very little secondary information related to research available for tourism. Tourism activities are highly seasonal and operative only in two seasons.
- Indigenous items of tourism interest are not properly marketed by local communities, tour operator and government.
- Very little information available on government regulations related to protected area management where tourism is operative.
- Planning totally devoid of local control and programs irrelevant to the local environment.
- Lack of investment potential locally and concerted effort by the government to induce local investments.

- Lack of proper tourism policy and institutional development.

The Indian subcontinent is one of the ten mega-biodiversity centres of the World. The eastern Himalayan region is the most important biodiversity hotspot of the Indian subcontinent and harbors the largest number of endemics and endangered species (Khoshoo 1992). Khangchendzonga National Park and Khecheopalri Lake area in Sikkim is very important biodiversity oriented tourist destination. Therefore, this study deals on the economic benefits and conservation linked tourism development in the western part of Sikkim encompassing above two destinations.

CHAPTER - II

Chapter II

REVIEW OF LITERATURE

2.1 Evolution of Tourism

The term “tourist”, meaning “an individual who travels for the pleasure of travelling, out of curiosity” made its first appearance around 1800 (Ceballos-Lascurain 1996). But the origins of this activity go back considerably further. Humankind has always had the desire to travel, to visit exotic places and to encounter different cultures. In the 18th and 19th centuries, the “Grand Tour” became extremely fashionable among European aristocrats for adventure and discovery as the new motivations for travel. However, tourism did not become more accessible to the population in general until the time of the Industrial revolution (Wood & House 1991). During this time a considerable amount of travel for pleasure was essentially a quest for spectacular scenery. This was the beginning of travel for pleasure and of the transformation of travel into tourism. The era of organized tourism had started (Sarkar & Dhar 1998). This period also witnessed the first serious environmental impacts attributable to tourism.

Early this century by which time summer holidays were taken regularly by European and American, the improvements in international and intra-national tourist facilities, especially the introduction of

chartered flights, increasing cheaper and varied tourist attractions have further stimulated and provided essential conditions for the growth of tourism. However, by about this time, tourism started to earn itself a very bad name due to thoughtless development, and disruption of local cultures, values and economics. During the birth of mass international travel, beginning in the late 1940s, and continuing through most of the 1960s, tourism was often regarded as a panacea for developing countries, that could raise foreign exchange earnings, GNP and tax revenue, and also increase employment. But growth in public concern about the environment, and the negative impacts of mass tourism, ultimately led to reexamination of this notion. Purported economic benefits from tourism came under harsh scrutiny and recognition of the problems involved in measuring the economic benefits of tourism led to increased analysis of its costs (Lawrence 1992). At the same time, conservation organizations were formed to lobby governments to set aside land not just for the enjoyment of tourists, or for the sake of showy animals, but to preserve the natural integrity of whole ecosystems.

After the Second World War for the first time tourism was viewed as an engine for economic development. This made the governments start assuming responsibility for the promotion of tourism. Official tourist organizations at the national levels were established in most European countries. Considering the international character of tourism the post war

years also saw the emergence of a number of international organizations concerned with travel and tourism. Among them were the International Union of Official Travel Organizations (IUOTO), now an inter-governmental agency called the World Tourism Organization (WTO); the International Air Transport Association (IATA); and the Pacific Area Travel Association (PATA). India was among the first developing countries to become a member of IUOTO in 1951 (Sarkar & Dhar 1998).

2.2 Nature Based Tourism and Ecotourism

Nature tourism denotes all tourism directly dependent on the use of natural resources in a relatively undeveloped state, including scenery, topography, water features, vegetation and wildlife etc. Thus it includes hunting, countryside motorbiking, and white-water rafting, even if the use of the natural resources by the tourist is neither wise nor sustainable (Butler 1992; Healy 1992 and Ceballos-Lascurain 1996). Like traditional tourism, it can be negatively influenced by various external factors. This accounts for its instability as a source of income. Nevertheless, nature based tourism (which includes ecotourism), is a rapidly growing sector of the tourism economy. Its global value for 1988 has been estimated to have been as high as US\$1 trillion (Filion *et al.* 1992). So it has often proved to be a powerful incentive for conservation in many parts of the world. But at the same time, uncontrolled mass tourism has and continues to contribute to the degradation of many areas of natural and cultural

significance, entailing the loss of biological and cultural diversity, as well as of important sources of income. Clearly, what is needed is an environmentally responsible approach to tourism or “sustainable tourism”.

Sustainable tourism, as defined by Ceballos-Lascurain (1996), is “tourism that is developed and managed in such a way that all tourism activity which in some way focuses on a heritage resource (be it natural or cultural) can continue indefinitely”. In other words it does not detract from efforts to maintain that resource in perpetuity (FNNPE 1992). Sustainable tourism as the broadest descriptor, employed to denote all types of tourism, whether based on natural or human-made resources, that contribute to sustainable development (Healy 1992).

In recent years a specific category of nature-based tourism has developed along these lines. “Ecological tourism” or “Ecotourism” as defined by IUCN’s Ecotourism Program is “environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature that promotes conservation, has low visitor impacts, and provides for beneficially active socio-economic involvement of local population” (Ceballos-Lascurain 1993). The Ecotourism Society definition is similar “ecotourism is responsible travel to natural areas that conserves the environment and sustains the well-being of local people” (Boo 1990; Blangy & Wood 1992; Lindberg & Hawkins 1993 and

Hvenegaard & Dearden 1998). Research documenting the association between ecotourism and conservation, though limited, has intensified recently. On the supply side, efforts have focused on potential sites for ecotourism (Boyd *et al.* 1994), environmental impacts (Johnson *et al.* 1996), local communities (Brockelman & Dearden 1990), and planning (Nelson 1994). On the demand side, researches have explored economic impacts (Tobian & Mendelsohn 1991), marketing (Wight 1994), and characteristics of ecotourists (Weiler & Richins 1995). Studies that evaluate ecotourism's achievement of specific conservation and development principles are also beginning to emerge (Lindberg *et al.* 1996 and Wallace & Pierce 1996).

Farrel & Runyan (1991) distinguished between nature tourism and ecotourism by describing the latter's as "more exclusively purposeful and focused on the enhancement or maintenance of natural systems". Thus we can distinguish between, for example; traditional tour operators and principled ecotourism operators. The former frequently show no commitment to conservation or natural area management, merely offering clients an opportunity to experience exotic places and people before they change or disappear. Ecotourism operators, on the other hand, have begun to form partnerships with protected area managers and local people, with the intention of contributing to the long-term protection of natural

resources and local development, and in the hope of improving mutual understanding between hosts and visitors (Wallace 1992).

Ecotourism is reliant on natural phenomena in relatively undisturbed sites (Boyed *et al.* 1994), such as protected areas. Before being promoted, the impacts of ecotourism must be thoroughly examined in the context of a protected area's mandate. Tour operators call themselves "ecotourism" operator, with varying standards for conservation and development goals. However, monitoring has been proposed recently for some jurisdictions (Allcock *et al.* 1994).

Economically, ecotourism can affect the sustainability of natural resource use at ecotourism sites in several ways (Steele 1995). One, ecotourism may generate higher economic returns than other resource activities (Threshers 1981 and Tobias & Mendelsohn 1991). Two, ecotourism may benefit local economies, providing an incentive to ensure sustainable use of biodiversity (McNeely 1988 and McNeely & Dobias 1991). However, local expenditures can be seasonal, inflationary, transitory, or sensitive to political or economic situations (Groom *et al.* 1991 and Wells 1993). Three, these economic benefits may serve as a stimulus for the establishment of protected areas (Ceballos-Lascurian 1996; Dabrowski 1994 and Sewell *et al.* 1989). Finally, ecotourists may contribute to the conservation and management of ecotourism sites,

through mechanisms such as entry fees and donations (Wallace & Pierce 1996).

2.3 Mountain Tourism

Tourism is the most important non-farm activity in the mountain areas. The growth of population and the increasing demand at individual level for various non-farm items have expanded the demands for goods beyond the traditional technological practices of hill communities. The lack of adequate linkages with markets outside has also led to stagnation in farm level activities. This has necessitated the search for non-farm occupations. Tourism is one of the prime sectors that can support more people, if carefully planned and well worked economic “niche” are created (Sreedhar 1995 a & b).

The UNCED’s Agenda 21, chapter 13 identified tourism as one of the key activities to provide alternative livelihood opportunities to mountain people in the process of attaining sustainable mountain development (Keating 1993). The fragility of High Mountain environment and their vulnerability to outside disturbance is well documented (Price 1981 and Poore 1992). Over the last 20 to 40 years, mountaineering and trekking have inflicted significant impacts upon alpine and sub-alpine landscapes in many parts of the Himalaya (Pawson et al. 1984; Karan & Mather 1985; Banskota & Upadhyay 1991; Stevens

et al. 1991; Wells *et al.* 1991; Singh 1992; Price 1992; Sarkar 1994; Price *et al.* 1997 and Rai & Sundriyal 1997).

Zurick (1992) in his study analyzed adventure travel in Nepal and places it within the theoretical frameworks of tourism models and sustainable development. Building on core-periphery tourism theory, an adventure travel spatial linkage model was proposed that connect Nepal's remote frontiers with the global economy. Stevens (1993) in his study on tourism, change, and continuity in the Mount Everest Region, Nepal, examined the increasing role of tourism in the Sherpa economy and assessed changes in land-use, environment and culture. Increasing regional differentiation in wealth, inflation, out-migration, and changes in pastoralism and forest use may have long adverse effects. Shackley (1994) argued that despite the strict enforcement of environmental regulations it was clear that the cultural carrying capacity of Lo has already been exceeded with minimal economic benefits to local people. Broadus *et al.* (1987), Sreedhar (1995 a & b) and Sharma (1997) have argued on economic benefits for mountain communities on the development of tourism in mountain regions. However, despite this there has been no structured analysis of the merits of tourism related activity was done.

Mountain tourism has been an area long neglected in the National Tourism Agenda of India. The limited tourism growth that has occurred

in the country was largely an outcome of pilgrim traffic and extension of road networks into the hills. Private initiatives were also restricted in the past by rigid controls. It is only in the last decades that the government has recognized tourism as an industry and has setup a high power committee to promote the sector.

2.4 Economic Value of Ecotourism

A few studies have estimated the economic values of either tourism in specific protected areas, or ecotourism, let alone the overall economic value of protected areas around the world. This is partly because data on ecotourism are not collected systematically by the private sector, governments, or the UN-WTO. This in turn is attributable to the fact that ecotourism is a relatively recent phenomenon. In short, ecotourism and wildlife related tourism is big business. It was estimated, for instance, that in 1988 there were between 157 and 236 million international ecotourists worldwide. It was also estimated that between 79 and 157 million people could be considered wildlife oriented (Ceballos-Lascurain 1996). If the above estimators and multipliers were applied to the UN-WTO data, the results suggested that ecotourism contributed between US\$93 and US\$233 billion to the national income of various countries. It was further estimated that wildlife oriented tourism generated revenue ranged from US\$47 to US\$155 billion. More specifically, bird related tourism may have attracted as many as 78 million travelers with economic impacts as

high as US\$78 billion for the economies of the countries they visited (Filion *et al.* 1992).

Moreover, high as the above international figure may seem, Filion *et al.* (1992) emphasized that they do not reflect the true magnitude of ecotourism. In fact, the actual figures may be five or seven times as large as those given above. They argue that the reason for this underestimation was that international tourism accounted for only 9% of global tourism receipts, whereas domestic tourism 91% (Travel Industry World Yearbook 1990). The UN-WTO data also revealed a tourism shift that has occurred in the last 20 years and that favors developing countries. Those countries with the diverse flora, fauna, and ecosystems, have the greatest potential for ecotourism, and are increasingly preferred by tourists.

The Hindu-Kush Himalayan region offers varieties of tourism products to attract the visitors. The tourists visiting the region have been growing very fast during recent years. The data on tourist flow in the Himalayan region was not properly recorded and maintained, though its implications and contribution in the mountain economy was quite significant (Rai *et al.* 1998). The share of domestic tourist in the economy of the region remains quite high. The western, central and eastern Himalayan region hosts about 96% domestic tourists of the total visitor flow (Sreedhar 1995 a & b and Rai & Sundriyal 1997). A similar situation prevails in other parts of the Hindu-Kush Himalayan region. But

in smaller economies of the region such as Nepal and Bhutan, the concept of domestic tourism is not properly accounted. The magnitude of tourist flow may testify to the increasing economic importance of tourism. This sector contributes about 2 to 2.5 billion rupees annually to the economy of Himachal Pradesh. The values for the U.P. hills were 2.5 to 2.75 billion while 50 million rupees in Sikkim (Sreedhar 1995 a & b and Rai & Sundriyal 1997). There is a general perception that the majority of the tourists come for recreation but in the case of the central Himalaya, there is a predominance of pilgrimage (60%). Now ecotourism has emerged as an important activity in the Himalayan region, which includes trekking, mountaineering, river rafting and other nature-oriented activities.

2.4.1 Economic valuation of ecosystem services

The economic valuation of natural ecosystems is very limited in developing countries, although there are a number of studies on the topic, majorities of them have been carried out in developed countries. Here, an attempt is made to review only the important studies on the topic, which are relevant to the present work.

The Clawson-Knetsch (1966) uses travel related expenditures as a reflection of the recreational value, which an individual places, on a protected area. The travel cost method has been widely used because of its appealing use of observed consumer behavior. Walsh *et al.* (1978) employed contingent valuation method to estimate the value of

recreational benefits of improved water quality in South Platte River Basin in Colorado. The viability of fish population was selected as the key characteristics for the contingent valuation study. The study estimated option, existence, and bequest values. The recreation use value was estimated as US\$56 per household whereas the option value for the same was US\$22. To estimate the existence values the respondents were asked to state their willingness to pay for the benefit. The existence value estimates for the users and non-users households were found to be US\$34 and US\$25 respectively. The respective bequest value estimates for these categories were US\$33 and US\$17. Bouwes & Schneider (1979) measured recreational trips to Pike Lake, Wisconsin, as a result of change in water quality measured by Uttormark's Lake Condition Index (LCI) applying travel cost method. They estimated the total mean annual consumer surplus US\$85721 and the aggregate benefit was US\$ 730 x10³.

Brookshire *et al.* (1983) carried out a study by applying CVM to estimate the economic value of big horn sheep and grizzly bears in Wyoming. The grizzly bear was an endangered species and its hunting had been prohibited. Questionnaires were distributed to local residents to elicit the respondent's willingness to pay for hypothetical future permits to hunt big horn sheep and grizzly bears. It was estimated that the range of hunting bids was between US\$10 and US\$30 per respondent. They

also estimated the existence and observation values (the economic value for viewing wildlife species) from the questionnaire. The observation option bids in the open vicinity was estimated as US\$20 for both animals. The existence value estimate for big horn sheep was US\$7 and that for grizzly bear was US\$15. The study gives evidence that the non-use values are as significant as use values.

Desvougas *et al.* (1987) conducted CVM study to estimate the value of improved water quality in Monongahelia River in Pennsylvania. The estimated option value per household was in the range of US\$10-38. The existence value for users and non-users of the specified non-market good was US\$66 and US\$42, respectively. Henry *et al.* (1988) estimated benefits associated with specified improvements of water quality on Lake Bemidji, of Minnesota using contingent valuation techniques. The estimated benefit to improved quality was US\$88. Arge & Shogren (1989) conducted another study to estimate per square-foot value of Lakeshore property associated with a qualitative increase in water quality from boating/fishing levels to a swimming/drinking level. All residents who own lake front property on the east and west lake of Okoboji, Iowa has taken a sample unit. The estimated benefit per square foot was US\$11.

Brown & Henry (1989) estimated the viewing value of elephants on safaris in Kenya, by employing both travel cost and contingent

valuation methods. Based on the data collected from safari tourists, a demand curve for recreational use was derived and the consumer surplus for safaris was estimated. The study revealed the finding that the loss of elephants will directly affect the number of visitors to the park. Dixon & Sherman (1990) in their study in Khao Yai National Park, Thailand advocate the application of travel cost and contingent valuation method. These methods are widely applied in estimating the economic value of non-market goods and services.

Tobias & Mendelsohn (1991) and Monkhaus & Lober (1996) estimated the value of ecotourism in a tropical rainforest reserve in Costa Rica by applying travel cost method. The study provides the first published estimates of value of a tropical rainforest in a developing nation. It was estimated that the recreation value of the reserve for domestic users was US\$35 per visit and it generated an annual value between US\$97.5 to US\$116.2 thousand. By including foreign tourists at the same rate, the site would generate an additional value of US\$400 to US\$500 thousand annually. Per hectare recreational value of that area is about US\$1250. This value is several times higher than the price given to acquire the near by lands of protected area for expansion.

Maille & Mendelsohn (1993) estimated the value of ecotourism per foreign visitor who visits a tropical forest reserve in Medegascar using travel cost method. The per visitor consumer surplus was estimated as

US\$276 and US\$360 respectively. Navrud & Mungatana (1994) estimated the environmental and recreational value of wildlife viewing in Lake Nakuru National Park in Kenya. This study revealed that the travel cost and contingent valuation methods could be successfully applied to value natural resources in developing countries. The annual recreational value of wildlife viewing in the park was found to be US\$7.5 to 15 million. They emphasized the challenge for the developing countries and to realize the economic potential as well as on the importance of preservation of wildlife.

Munasinghe (1993) drawn the conclusion that non-market valuation techniques can provide useful information for economic evaluation of national parks, and the results of such valuation can be incorporated more fully in benefit-cost analysis including conservation components to determine their viability. He used entirely different method in his valuation study. The results of opportunity cost and contingent valuation analysis were remarkably similar (US\$91 and US\$108 per household per year). The estimates of tourist benefits based on the travel cost and contingent valuation method were somewhat more disparate (US\$24 verses US\$65 per trips). Costanza *et al.* (1997) estimated the current economic value of 17 ecosystem services for 16 bloomes. For the entire biosphere, the value (most of which was outside

the market) was estimated to be in the range of US\$16-54 trillion per year, with an average of US\$33 trillion.

Loomis & Ekstrand (1998) in their study on Mexican spotted owl, explored the sources and patterns of respondents uncertainty regarding their willingness to pay and presented alternative approaches for incorporating this uncertainty into estimation of logit model. A regression model was used to determine the significant determinants of respondent uncertainty.

In developing countries like India, the economic valuations of natural ecosystems are very few. Murthy & Menkhuas (1994) first time conducted a study on the economic aspects of wildlife protection in Keolado National Park, Bharatpur, Rajasthan State, India. The main objective of the study was to evaluate the application of recent techniques used in wildlife economics in the context of developing countries and to propose possible policy options for using economics to improve people-park relations in India. Open-ended questions were used for the survey, which simply asked the respondents "How much would you be willing to pay". The CVM estimates showed that average willingness to pay per person for non-use value was Rs 519 and Rs 495 in the domestic and foreign groups. The costs and benefits of the park during 1992-93 were first estimated, and distributional weights were derived for 10-year benefit cost flow.

Manoharan (1996) conducted study on economics of protected areas of Periyar Tiger Reserves (PTR) of Kerala, India. The Periyar Tiger Reserve is one of the well-known Indian protected areas for nature tourism. Economic valuation of PTR has been examined in a benefit-cost analysis framework. He used the concept of total economic value to enumerate and quantify the total benefits. The total cost of the PTR was estimated as Rs 88.18 million of which the direct cost is Rs 19.13 million accounting for only 22% of the total cost. The opportunity cost was estimated as Rs 69.06 million. The benefit-cost ratio was 1.30.

Hadker *et al.* (1997) conducted another study to examine the willingness to pay function for the Borvli National Park of Maharashtra, India. The study was conducted to survey the residents of Bombay and elicit their willingness to pay for the maintenance and preservation of park using the contingent valuation techniques. The CV method has come under considerable criticism on account of biases that are either inherent to or generated by the survey process. The study acknowledges those, and adopts techniques to either circumvent or then minimize them. The study gave proper attention to hypothetical bias, starting point bias, embedding effects and part-whole biases. The authors argue that indeed it is possible to improve the quality of a CV by using special survey as well as statistical techniques so that CV results can be used for the purpose of realistic decision making.

CHAPTER - III

Chapter III

BACKGROUND OF THE STUDY AREA

Introduction

Sikkim as a whole is an attractive destination for tourists; it is situated within the eastern Himalayan biogeographic zone. It has a mountainous terrain where two major livelihood options, namely farming and tourism are prevalent. A number of factors, which influenced the process of regional development of any area, the physical, cultural and infrastructure facilities and amenities stands forth, as it presents a platform for various human activities. This triological frame of visualization is helpful in comprehending the perception of a given environment. In study area these processes have played a significant role in shaping the various patterns of development. Their varied forms and ways have induced the growth and development of Sikkim as a center of tourist's attraction. Therefore a brief appraisal of the important constituents of the study area has been presented in the pages to follow.

For the convenience the whole chapter has been divided into three subparts: (i) Physical setting, (ii) Cultural setting, and (iii) Institution and infrastructure.

3.1 Geographical Location

Himalaya is one of the youngest and greatest mountain systems of the world stretching almost 2500 km east-west. The Himalayan ranges are between 240 to 340 km wide and rise from low-lying Indian plains to over 8000 m. Sikkim situated in the eastern Himalayan biogeographic zone became the 22nd state of India. Few areas in the world offer such unique blend of breath-taking natural beauty and a rich diversity of culture, socio-economic traditions, history and lifestyles as the north-eastern Himalayan region. From the time immemorial these lofty mountain ranges have attracted people- pilgrims, ascetics, naturalists, explorers and the like- from far and wide. In the contemporary context tourism in the Himalayan region is a manifestation of the comparative advantage for pleasure and sight seeing, trekking, mountaineering and cultural tourism.

Sikkim or Sukhim (Sukhim means New House) is a tiny state with an area of 7096 km² (0.22% of total geographical area of India) and a population of 405505, with an average density of 57 persons per km² in 1991. The state extends between 27^o 4' 46'' to 28^o 7' 48'' N and 88^o 58'' to 88^o 55' 25'' E. It is bounded on the west by Nepal, on the north by Tibet, on the east by Bhutan and Tibet, and with the Darjeeling district of West Bengal stretching along its southern boundary. The state is situated in the most magnificent range of Snowclad Mountains with the World's third

highest mountain peak, i.e., Khanchendzonga (8598m). Other important peaks in the Khangchendzonga range are Kabru (7338m), Siniolchu (6887m), Simvo (6811m), Pandim (6691m), Jopuno (5936m) and Narsing (5825m), which are main attractions to trekkers (Plate 1a). The area represents the main nature tour destinations and are all adjacent to biologically significant national parks or sanctuaries (Fig. 3.1). Sikkim is widely acknowledged as India's most significant biodiversity "Hot Spot" (Kumar 1993 and Shenga 1994) and one of the most critical center of biodiversity and endemism (Myers 1990 and WCMC 1992) with 81 species of mammals, 550 species of birds, 650 species of butterflies, 33 species of reptiles, 16 species of amphibians, 48 species of fishes, 550 species of orchids, 36 species of rhododendrons, 4500 species of flowering plants and 175 species of wild edible plants, sacred lakes, monasteries and cultural heterogeneity with distinctive ethnic groups, including Lepchas, Bhutias, Nepalese, Limbu and Tibetan refugees live in this culturally and historically rich area (Rai 1992). They have different festivals, dances and ways of living (food habits, marriage system and dresses).

Two sites have been selected for detailed studies, i.e., Yuksam-Dzongri-Goechha La for trekking and mountaineering courses and the Khecheopalri Lake, which is used for recreation and pilgrimage. These sites represent the main nature tour destinations in Sikkim and are all-

adjacent to biologically significant Khangchendzonga National Park (KNP) (Fig. 3.2). KNP falls in the north and West districts of Sikkim. It was designated as a national park in August 1977, with a total area of 850 km². The area was originally under reserve forest status prior to the designation as a national park. In 1996, the area of this national park was extended to 1784 km² (25.14 % of the total geographical area of Sikkim) realizing its importance for having diverse habitats, floral and faunal diversity. Many villages such as at Yuksam, Sakyong, Chungthang, Mensithang, Lachen and Monguthang surrounding the park depend on the park's natural resources for subsistence living (Fig. 3.2). The central government has recently (February 2000) included more areas in this park and designated it as a biosphere reserve. Most of the areas in the buffer zone of the biosphere have been identified for ecotourism and are also accessible to the villagers. The topography and the peaks along with the forest wilderness in the park areas form the main attraction of KNP.

3.1a Yuksam-Dzongri-Goechha La Trekking Corridor

The Yuksam-Dzongri-Goechha La trekking corridor is 45 km long trek located in the southwestern part of Khangchendzonga National Park (Fig. 3.2). The entire area right from Khangchendzonga to the Yuksam lowlands is considered to be sacred by the Sikkimese Buddhists according to the sacred text *Nyol*. The area below mount Khangchendzonga in West Sikkim, referred to as *Demojong* (the hidden

valley of rice), is the most sacred of all, being the abode of deities (Fig. 3.3). Northern half of the KNP is in restricted zone and therefore this part is not accessible to the visitors. Entry into the park is allowed only with a valid permit, which is for 15 days for foreign tourists. On this trail Yuksam is the only settled habitation, with 11 villages, 274 households, and a total population of 1572. The last village, with 9 households, is located 16 km away from Yuksam at Tshoka on the trail with a total population of 59 people (Tibetan refugees) (Plate 1b). The most dominant ethnic group in Yuksam is the Limbu followed by Bhutia, Lepcha, Nepali and Tibetan refugees. Most of them pursue traditional agricultural livelihoods. Some have associated themselves in tourism related activities in recent years. About 110 persons worked as porters for tourist trek, 8 families have lodge/hotels, 25 families rear Yak/Dzo to provide pack animals and 6 individuals are trained local guides.

3.1b Sacred Khecheopalri Lake

The Khecheopalri Lake is known as a “Wish Fulfilling Lake” and is considered to be the most sacred by the Sikkimese people. Folklore and many legends are associated with its formation and shape. The lake water is used for rites and rituals only. A Khecheopalri lake festival takes place during March every year, when a large number of local pilgrims visit the lake. Fishing and any other recreational activities on the Lake are strictly prohibited. A strong belief prevails among the community that any

disturbance on the Holy Lake may bring calamities and unwelcome events. This lake is situated amidst pristine forest at an altitude of 1700 m ($27^{\circ} 22' 24''$ N and $88^{\circ} 12' 30''$ E) in the West District of Sikkim (Fig. 3.2 & Plate 1c). The lake represents the original "neve" region of an ancient hanging glacier, the depression being formed by the scooping action of the glacier (Raina 1966). The lake is surrounded by a broad-leaved mixed temperate forest, and has a catchment area of 12 km^2 with 72 households and 440 persons living in it. The Lepcha is the main ethnic group in the Khecheopalri area. Traditional agriculture is the main livelihood and recently some households have been engaged in tourism. The influx of tourists is high with visible impacts of disturbance on the Lake and its watershed. Besides visitors, communities also exploit natural resources of the Lake watershed by extraction of fuel, fodder and timber, and by livestock grazing. The Lake is also a resting place for Trans-Himalayan migratory birds and supports commercial and recreational tourism.

3.2 Physical Setting

3.2.1 Physiography

Major part of the area is hilly, rising from an elevation of about 1785m near Yuksam and 8548m in Khangchendzonga. The topography progressively becomes rugged from south towards north. The northern part of the area is dominated by very steeply sloping surfaces (more than 50%) and deep cut gorges valleys and perpetual snow, with numerous

“Kholas” or “Chus”. The area has a number of glacial lakes in the higher reaches. These are sacred lakes. The Rathongchu, itself a sacred river (Plate 1d), is said to have its source in nine holy lakes closer to the mountain peaks in the higher elevation. Moreover, the river in the Yuksam region is itself considered to have 109 hidden lakes (Ramakrishnan 1996). The Rathongchu River constitutes the major drainage system and is the focus of religious rituals. Minor streams viz., Chockchu, Rangchu and Prekchu feed Rathongchu. Rathongchu River and its tributaries are the striking example of hanging valley. This hangs about 600m above the bed of Rathongchu (Pascoe 1964). The extreme northern part of the study sites is covered by snow throughout the year and has two important glaciers namely, East Rathong and Onglakthang and both the glaciers are said to be retreating rapidly.

3.2.2 Geology

Geologically, the study sites are located on the Lesser Himalayan Zone. Three important groups of rocks have been recorded in both the sites viz., the Darjeeling Group, the Daling Group and the Gondwana Group. Other group, i.e., Lingtse gneiss, occurs only as a thick linear band across the Rangit river (GSI 1984). Major part of the area is chiefly made up of Darjeeling gneiss. The upper part of the area is covered with snow throughout the year.

The Darjeeling Group comprises chiefly high grade gneiss containing quartz, feldspar, with streaks of biotite. Besides gneiss, quartzite, sandstone, dolomite and shale are also found. A streaky, sheared granite gneiss known as Lingtse Gneiss occur as a NE-SW trending strip of rocks in the central and eastern part of the area (GSI 1984).

3.2.3 Climate

The region displays all the characteristics of a mountain climate where location, aspect and altitude are of prime importance in conditioning the climate of a locality. The climate varies from tropical in valleys to snowfields and glaciers at higher altitudes. The climate of the area is monsoonic and divisible into three seasons, viz., rainy (June to October), winter (November to February), and summer (March to May). Sikkim receives an average annual rainfall that varies from 1300 mm (at about 300m elevation) to 4300 mm (above 2000m elevation) and 60-75% of this rainfall recorded during the monsoon season, i.e., June to September. The average maximum temperature at this time varies from 21⁰ to 37⁰ C and the average minimum temperature from 13⁰ to 23⁰ C. The humidity remains high during this period (85-97%) (Rai & Sundriyal 1997).

Temperature and rainfall data were recorded for three climatic zones in the Yuksa-Dzongri-Goechha La corridor during the study period.

The three weather stations were located at Yuksam (1700 m), Tshoka (3000 m) and Dzungri (3900 m). These locations were selected keeping in view of the three ecological zones viz., temperate, sub-alpine and alpine. The major portion of the area experiences a temperate climate, where the mean temperature varies from 3.8°C in January to 24°C in August. Sub-alpine ecological zone was bit cooler with maximum temperature of 16.1°C (September) and minimum of -3°C (January). Alpine zone was under snow cover for at least five (November to March) months, Hence, the maximum and minimum temperatures were recorded as 13°C (August-September) and -8°C (January), respectively (Fig. 3.4).

Distribution of rainfall also follows the topographical trends. At Yuksam, the mean annual rainfall is approximately 3760 mm, while Tshoka and Dzungri experience respectively 3648 mm and 2319 mm of rainfall (Fig. 3.4). The maximum rainfall was recorded during the month of August at all the locations.

The other study site, Khecheopalri Lake, falls in a temperate belt and maximum temperature ranged from 4°C in January to 24°C in July-August during 1997-1998. Minimum temperature varied between 2.7°C in January to 17°C in August in the same period. The average annual precipitation was 3899 mm in 1997 and 3776 mm in 1998. The temporal distribution of rainfall and temperatures during 1997 and 1998 are presented in Fig. 3.5.

3.2.4 Soils and vegetation

The area is endowed with diversified natural vegetation. Ranging from alpine scrub vegetation in the higher reaches to sub-tropical moist evergreen forests down below, the vegetation of the region is varied. Sikkim Himalaya is richly endowed with biological resources spread over a variety of ecosystem types and range of altitudes; from the alpine rhododendron dominated scrub forest through conifer forests with *Abies densa* and *Tsuga domosa* down to mixed evergreen forests, dominated by species such as *Castanopsis spp.*, *Quercus lamellosa*, *Lithocarpus spicatus*, *Elaeocarpus lanceaefolius*, *Michilus edulis*, and *Michela spp.* The region of Yuksam and Khecheopalri has all these species over a very short transect, running down from the alpine to the sub-tropical zone. Orchids are abundant and there is rich wildlife of Himalayan black bear, musk deer, and fishing cat, leopard cat, red panda, black-capped langur and diverse bird life. Besides this the area is also rich in valuable medicinal plants and herbs.

The soils of the area are highly variegated. The general soils of Sikkim is acidic in nature and were excessively drained with coarse-loamy to fine loamy in texture. The soil texture of Yuksam-Dzongri-Goechha La corridor is sandy loam and sandy, whereas Khecheopalri lake area is dominated by sandy loam texture. The very steep slopes (>50%) represented by Typic Hapludolls and Dystic Eutrochrepts were largely

under temperate forests. On the other hand, steep slopes (30-50%) with umbric Dystrochrepts and Cumulic Hapludolls experienced thermic soil temperature regime. The steep slopes having mesic soil temperature regime were represented by Entic Haplumbrepts and Typic Cryorthents. These were largely found under coniferous forests. The steep slopes of isofriged soil temperature regime were represented in general by shallow soils under alpine pasture (Das *et al.* 1998).

3.3 Cultural Setting

3.3.1 History

In 1975, Sikkim was merged as the 22nd state of India. The early history of Sikkim is mainly based on Lepcha tradition. The history of the emergence of the kingdom of Sikkim can be traced back to 17th century (Risley 1968). Sikkim has a long tradition of Buddhist religion. Since the rule of Chogyal dynasty, when the first Chogyal (King) of Sikkim was crowned in 1642 in Norbugang in Yuksom, Buddhist traditions have become deeply ingrained into the psyche of the Sikkimese people (plate 1e). Yet in proportional terms, Buddhism is practiced by about 25% of the local population, while the majority religion is Hinduism (70%). However, Buddhism is evident in all walks of life; in rituals and festivals; in tapestries, richly woven with symbols from Buddhist myths and legends; in the typical Sikkimese architecture; and in the large number of monasteries and stupas dotting the landscape throughout the state. It is

important to note, however, that this unique culture which has developed in Sikkim represents a blend of the shared traditions of three communities; the Buddhism of the Lepchas and the Bhutias, and the Hinduism of the majority Nepalese.

Of the four Buddhist sects, the Nyngmepa, Kagupa, Gelugpa and Sakyapa represented in Sikkim, the Nyngmepa sect, initiated by the Buddha incarnate, Maha Guru Padmasambhava, is the most significant. Whilst Sikkim, as a whole, is considered to be sacred by Sikkimese Buddhists. Padmasambhava, who is highly revered and worshipped by Sikkimese Buddhist, is considered to have blessed Yuksam and surrounding landscape of Demojong, in the western part of Sikkim, by having placed within it a large number of hidden treasures (*ters*). Many of the sacred treasures by Lhabstsun Namkha Jigme in the Yuksam region, and it is believed that these *ters* will only be slowly revealed to enlightened lamas and discovered at appropriate times. Conserving and protecting these treasures from polluting and disturbing influences considered being vitally important for human welfare.

The area below Mount Khangchendzonga in the landscape of Demojong is the core of the sacred land of Sikkim. Yuksam is considered to be a 'Lakhang' (altar) and 'Mandala' where offerings are made to protective deities. Any major disruption in the landscape would disturb the ruling deities of the 109 hidden lakes of the river Rathongchu, thus

leading to serious calamities. During a period of bloodshed in the past, for example, the lake Khecheopalari is thought to have moved away from the river. Many folklore and legends are associated with its formation and shape. As per the legend of the Sikkimes people the lake looks like the foot shape of Goddess Tara Jetsun Dolma.

3.3.2 Ethnic groups, distribution and characteristics

Sikkim is rich in cultural diversity and having multi ethnic composition such as the Lepcha, Bhutia, Nepalese and Limbu. The Lepchas are the original settlers of the state. A later arrival to this area includes the Bhutia from Tibet. The recent immigrants include Nepali ethnic groups in the nineteenth century and Tibetan refugees. From 1891 to till date the Nepali population increased several times due to encouragement given to Nepali settlers in the first phase of the British protectorate (Rai 1992).

The Lepchas are believed to be indigenous to Sikkim and known to Bonpo Shamanists. According to Lepcha tradition they originated in Mayel, a legendary valley in the vicinity of Khangchendzonga, and have no tradition of migration (Gowloog 1998). The Lepcha, who were known as Rong-pa or valley folk, were fairly widely distributed throughout Sikkim. Now Lepcha generally sought assimilation to Bhutia culture. Inter-marriage between the two communities is common and instances of Lepcha marrying Nepalese are not unusual, particularly amongst the

Lepchas of western part of Sikkim. Traditionally Lepchas are hunters, food-gathers and preferred animal husbandry. Their economy is mainly based on land and forest. They have their own dress, food habits and festivals. The Lepcha women dress up themselves in *Gada* and menfolk dress in *Gyado*. About 12% of the total population of the Yuksam area belong to Lepcha community, whereas Khecheoplari Lake mostly dominated by Lepcha (96%).

Bhutias in Sikkim are of Tibetan origin. They wore Tibetan style clothes and their language also has Tibetan origin. The Bhutia women dress up in *Bakkhu* a long double-breasted gown akin to Japanese *Kimono*. This gown is fitted on the body with the help of a cloth piece tied around the waist. Inside this gown the women wear a loose blouse (*hanju*) with long sleeves. This dress is locally known as *Kho*. The married women hand a lined apron (*pangden*) like cloth on the front from the waistcloth often brocaded on both corners. The Bhutia men also wear *Bakkhu* with long sleeves. However, the use of trousers and cap has become common. Intermarriage has become an increasingly frequent occurrence, particularly since the closer of Tibet. The Bhutias are Buddhist by religion and belong to the scheduled tribe. They constitute about 31% of the total population of Yuksam and 2% of the Khecheoplari lake. The main festival of this community is Sagadawa, Bum Chu rituals, Pang Lhabsol and Losser. It is no wonder that the Rathongchu River is

the focus of religious rituals. Bum Chu rituals, is considered the holiest of all festivals, and held annually at Tashiding monastery. Rathongchu River is said to turn white and start singing and water is collected from the point where Rathongchu meets the Ringnyachu. It attracts thousands of devotees from around Sikkim and the neighboring region. Other widespread rituals reflect the respect with which this region of sacred landscapes is worshiped and revered by its people. The generalized ritual practiced during “Pang Lhabsol” to propitiate the various ruling deities of the mountain peak of the Khangchendzonga, the midland region of the Yuksam and the lowland down below, is carried out by Buddhists throughout Sikkim.

The Nepalese who constitute the major bulk of the Sikkimese population are migrated from Nepal in nineteenth century. They have retained a cultural identity distinct from the racial amalgam, which had become Sikkimese. They dressed differently and spoke Nepali and Hindi. The Nepali women tie a cloth or Sari (*gunyu*) around their waist as a skirt with *patuka* and cover their torso with blouse (*cholo*). The head is covered with a two meter long *majetro*, a kind of scarf. This dress is locally known as *Fariya cholo* or *Gunyu cholo*. Nepali men folk dress up themselves with *Dawra* (shirt), *Surwal* (trousers), coat and Nepali cap. The study sites constitute about 17% of the total population of Yuksam and 2% of Khecheoplari lake. Desain is the biggest and most popular

festival celebrated by the Hindu Nepali. The other important festival is *Tiwar* (the festival of light). In this festival the Goddess Laxmi is worshiped. In the evening on this day, women, young and old visit door to door singing *Bhailo* and accepting *Bhaili* offering money. On the third day, brothers are blessed by sisters and male folk visit door to door of the village community singing *Deoshirey*.

3.3.3 Religion

Buddhism and Hinduism are the two main predominant religions of both the study sites. Besides these there are Christians. The Lamaist Buddhist tradition and culture has left its indelible mark on the Sikkimese life. The Lamaist tradition of worship still continues and there are no less than 200 monasteries in Sikkim today. Prayer flags are seen fluttering everywhere and turning the prayer wheels is still regarded as a step towards cleansing of the sins (plate 1f). The offering of “Khada” (or silken white and cream scarf) on any occasion, signifies honor and respect and has become an integral part of the Sikkimese culture today. The lakes all over Sikkim has great religious significance attached to them and Sikkimese of different races and religions deeply revere them.

3.3.4 Food habits

Leaving aside a small fraction of Hindu populous, the Sikkimese is non-vegetarians and beef eating is not uncommon. Even some Nepali Hindus take beef. Drinking of liquor is quite common among all the communities. *Raksi* and *Chhang* are the local brews prepared from rice and millet, respectively. Among the delicious food, *Chhou-chhou* a Sikkimese parallel of Tibetan *Chowmein*, is relished by all communities. The other local foods are *Gunduruk*, *Kenema* etc.

In spite of its great heterogeneity, Sikkim has religious harmony and cultural co-existence. Festivals irrespective of any ethnic group are celebrated by all with great joy and enthusiasm. The state in itself presents a unique example of cultural amalgamation of all ethnic groups.

3.4 Institution and Infrastructure

Infrastructure facilities provide a strong base for economic development of an area. A region with abundant resources may well remain backward unless its resources have suitable channels for exploitation. A good network of transport and communication and provision of other services and amenities, at reasonable terms, would make the area susceptible to economic development than an area lacking in these facilities (Dobhal 1987). This section deals with the existing institutional and infrastructure facilities in both the sites.

3.4.1 Education

As regard to the Sikkim, the overall literacy condition in general, is not very poor in the state. According to 1991 census, the percentage of literate persons was 56%, which is higher than the national average (52%). In the study sites, the literacy rate was 54% in Yuksam area and 42% in Khecheopalri area in 1997. Educational facilities in remote areas of the state are not sufficient. In Yuksam village there are five primary (including one lower primary) schools and 289 students and 15 teachers in 1997, the children from local households are reported to have attended school regularly. The Yuksam village has one secondary school (Table 3.1).

Student enrollment from primary to secondary school is given in Table 3.1. About 60% of the school age population are actually enrolled. The dropout rate is greater in higher classes. This is a serious issue and the less educated population will continue to increase in near future. The ratio of boys and girls students enrolled in Yuksam is 49:51. Of the total number of students enrolled, 74% are in primary schools, 22 % in middle school and 4 % in high school. This indicates either a large dropout from the primary to mid-level and high school, or low opportunities for higher education.

School attendance ranged from 40 to 50%. The most obvious problem was absenteeism of teachers and students. In addition, parents

most of, whom are illiterate, do not encourage their children to attend school regularly. However, some parents send their children to attend school regularly. Some parents send their children in urban areas to get higher and better education. Non-formal and functional education is urgently needed in this area. There is a need to establish a higher secondary school with hostel facilities in the area.

The other site, Khecheopalri has only one lower primary school with a total number of 25 students (Table 3.1). Villagers are depending mostly on Pelling and Gyalshing for further education.

3.4.2 Health and sanitation

Modern health facilities in both the sites are extremely poor. A primary health center (PHC) with a capacity of 10 beds encountered in Yuksam had scanty supply of medicine. It has two doctors with 6 supporting staffs. The health care workers were often absent. The Khecheopalri Lake lacks this facility and villagers are depend in other areas. Thus the local people are forced to rely upon traditional methods of treatment and the use of native herbs and medicinal plants. In general, people are not health conscious and do not use preventive health measures. Basic hygiene is very poor in homes. The incidence of tuberculosis, stomach pain, anemia, leucorrhoea was found to be relatively high among the patients. This is mainly due to the poor diet and drinking habits of the people.

3.4.3 Trails and roads

The terrain is hilly and rugged and extremely difficult. The existing road network is far short of the needs of the region. The area is connected by metalled road, which takes off from the National Highway No.31A near Melli and passes through Jorethang town of south district and crosses Rangit river to Nayabazar. From Nayabazar, the state highway proceeds northwards and ultimately reaches Gyalsingh via Legship town. From Namchi town of south district and Singtam town of east district, state highway runs west, joins together and enters west district at Legship where it merges with the state highway coming up north from Jorethang. A state highway continues further northwards from Legship, reaches Tashiding and then extends upto Yuksam. A state highway also connects Khecheopalri lake via Pelling. At present, most trekkers (70%) come here via Gangtok, and others through Darjeeling town of West Bengal.

The physiographic structure determined the directions of the trail route mostly from north to south, along the river. Trekking in this area follows an age-old pattern of movement within the mountains. There are traditional migratory routes and seasonal encampments among highland pastures, which were used for grazing the animals and lead tourist expeditions into the remote areas. Among them the important ones are mentioned here. The trekkers and HMI mountaineers usually followed from Yuksam. The trail approaching Tshoka through Bakhim, passing

through a steep slope, is very narrow (Plate 2a). From Bakhim to Tshoka, about 2 km of the trail is not in good condition and is especially dangerous for children and old age trekkers. The trail width from Tshoka to Dzungri is wide, made of wooden planks in some places that serve as a path on the steep slope. Trekkers usually follow this trail. The HMI (Himalayan Mountaineering Institute) trainees follow the same route upto Tshoka. From Tshoka they follow other route (Zamlingaon, Chaurithang, Bikbari and Chaurigang) to reach the base camp. It takes about four days. Another important trail in this site starts from Tashiding and follows the Labdong, Kasturioralo, Lampokhri route to reach Thangsing. This trail is not very popular but a few trekkers have followed this trail route in recent years.

The transportation facilities have improved now due to flow of tourists in the area. Presently the state transport department is plying two buses connecting Yuksam with Gyalshing and Jorethang. Besides this, the private taxis are also running in between Yuksam to Gyalshing, Jorethang and Gangtok. The Khecheopalri Lake is also connected by bus services from Gyalshing.

3.4.4 Marketing

It is observed that both the site lacks even the basic marketing facilities both in terms of quantity and quality. The existence of merely 8 multipurpose shops, 5 groceries shops, 4 teashops, 3 wine shops and 3

low quality restaurant and a few other miscellaneous shops character Yuksam. While the Khecheopalri Lake has only 2 teashops and one multipurpose shop. The needs of the people for medicines and other household items are fulfilled chiefly by the district headquarters at Gyalshing.

3.4.5 Communication

Communication facilities at both the sites are very limited and not accessible to local people and trekkers (Table 3.1). The Yuksam area has only one sub-post office, whereas Khecheopalri area people dependent for this facility to near by villages. The police checkpost at Yuksam has a wireless set and connected to all police checkpost and police headquarters at Gangtok. The Yuksam-Dzongri-Goechha La trek corridor is remote, therefore, improved communications along the trekking route are necessary. Establishment of wireless sets at various locations will help develop communications in this inaccessible area. Most importantly, a communication system with a wireless radio at Tshoka, Dzongri, Thansing and Goechha La needs to be established in Yuksam-Dzongri-Goechha La corridor and another set at Khecheoplari lake site.

3.4.6 Institutional framework

The Village council is the main political organization at the village level with the mandates to develop the village and make wise use of natural and cultural resources and to promote income-generating

activities. Each village council gets a nominal payment under Jawahar Rozgar Yojna from the district as grant to be used for development activities. Discussions with council members and community leaders indicated that they have a fair knowledge of their villages, the surroundings and the problems and possible options of development. They seemed eager to take part in the planning, development and implementation of tourism projects. Besides the village council, local communities at both the sites formed non-governmental organization viz., Khangchendzonga Conservation Committee (KCC) in Yuksam area and Khecheopalri Holly Lake Welfare Committee (KHLWC) in Khecheopalri lake site. The main functions of these organizations are to create awareness among villagers, school children and visitors about the local environment and its conservation.

Yuksam is the last settlement in this trekking corridor having one government guesthouse, trekkers hut, hotel/lodges, police check post, village council bhawan and wildlife interpretation center. The tourism department has made trekkers hut at Tshoka, Dzungri, Thansing and Samitti for trekkers in this trail route. Besides this, one forest guesthouse is available for tourist at Bakhim. In contrary to this, the other site Khecheopalri Lake lacks all these facilities except having one trekkers hut.

Table 3.1. Infrastructure facilities available at the study sites

Parameters	Sites	
	Yuksam-Dzongri- Goechha La	Khecheopalri Lake
Educational Facilities		
Secondary School	1	--
Enrolled Students	456	--
Teacher student ratio	23	--
Primary & Lower primary school	7	1
Enrolled Students	361	25
Teacher students ratio	28	12
Health Facilities		
Primary Health Center (PHC)	1	--
Doctor	2	--
Other Staff	8	--
Animal Husbandry	1	--
Doctor	1	--
Other Staff	3	--
Transport and Communication		
Government Bus	2	1
Taxi services	5	--
Sub-post office	1	--
Telephone	1	--
Institutional Facilities		
Police Check Post	1	--
Village Council Bhawan	1	--
Wildlife Interpretation Center	1	--
Government guest house	3	--
Trekker's Hut	2	1
Hotel/Lodges	8	--

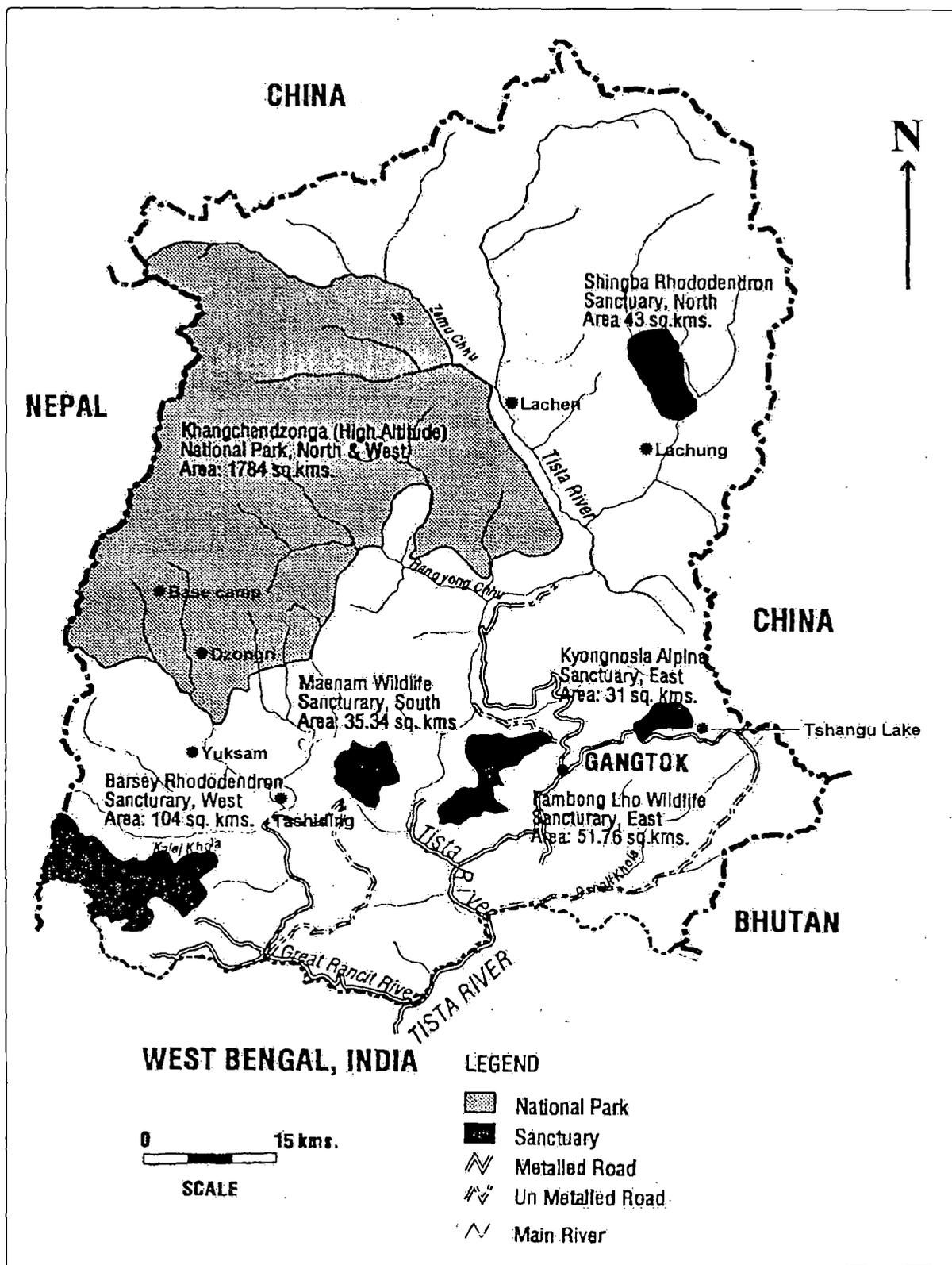


Fig. 3.1 Map of Sikkim showing tourist spots, national park, sanctuaries and road network

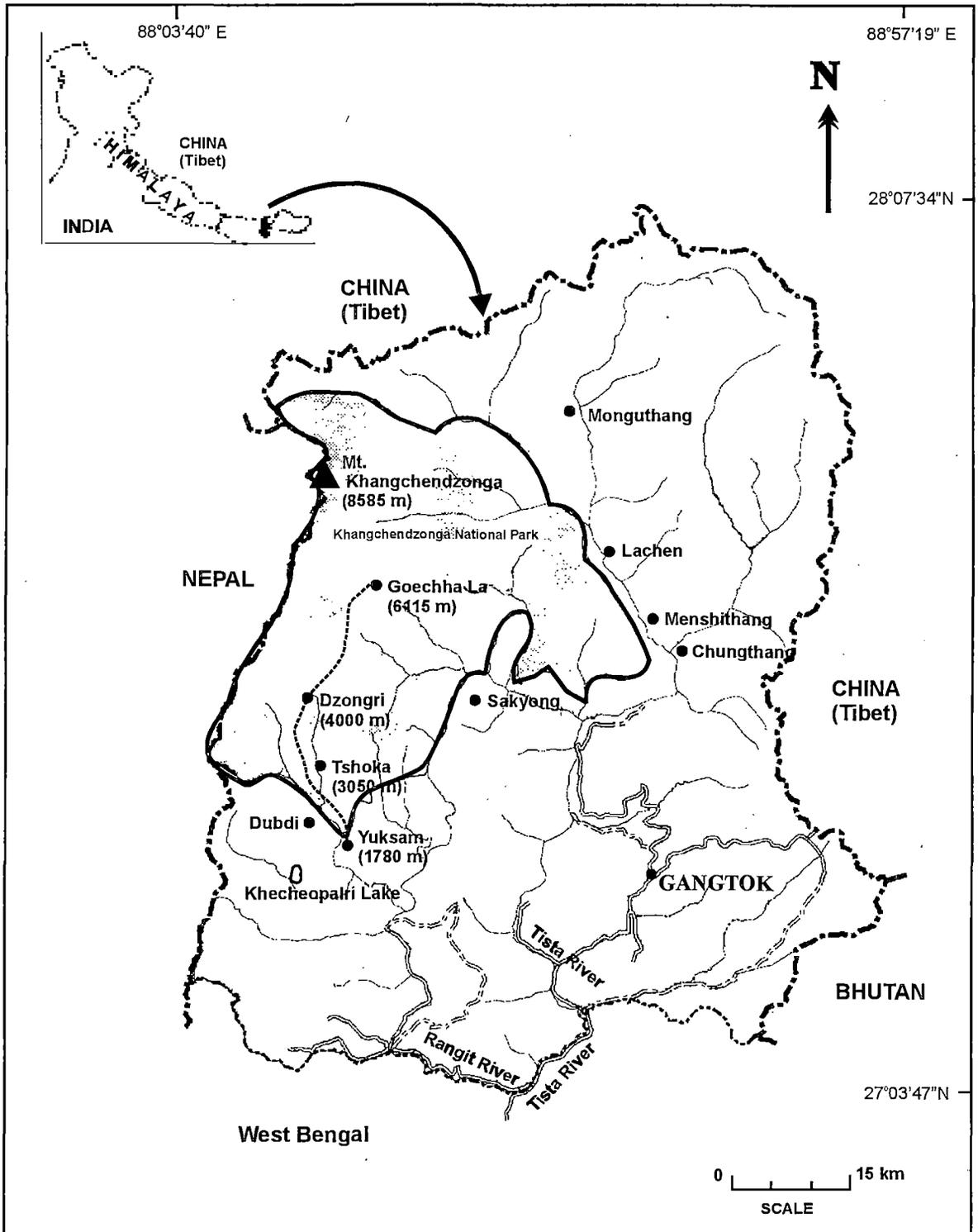


Fig. 3.2 Location map showing the Yuksam-Dzongri-Goechha La trekking corridor of Khangchendzonga National Park and sacred Khecheopalri Lake

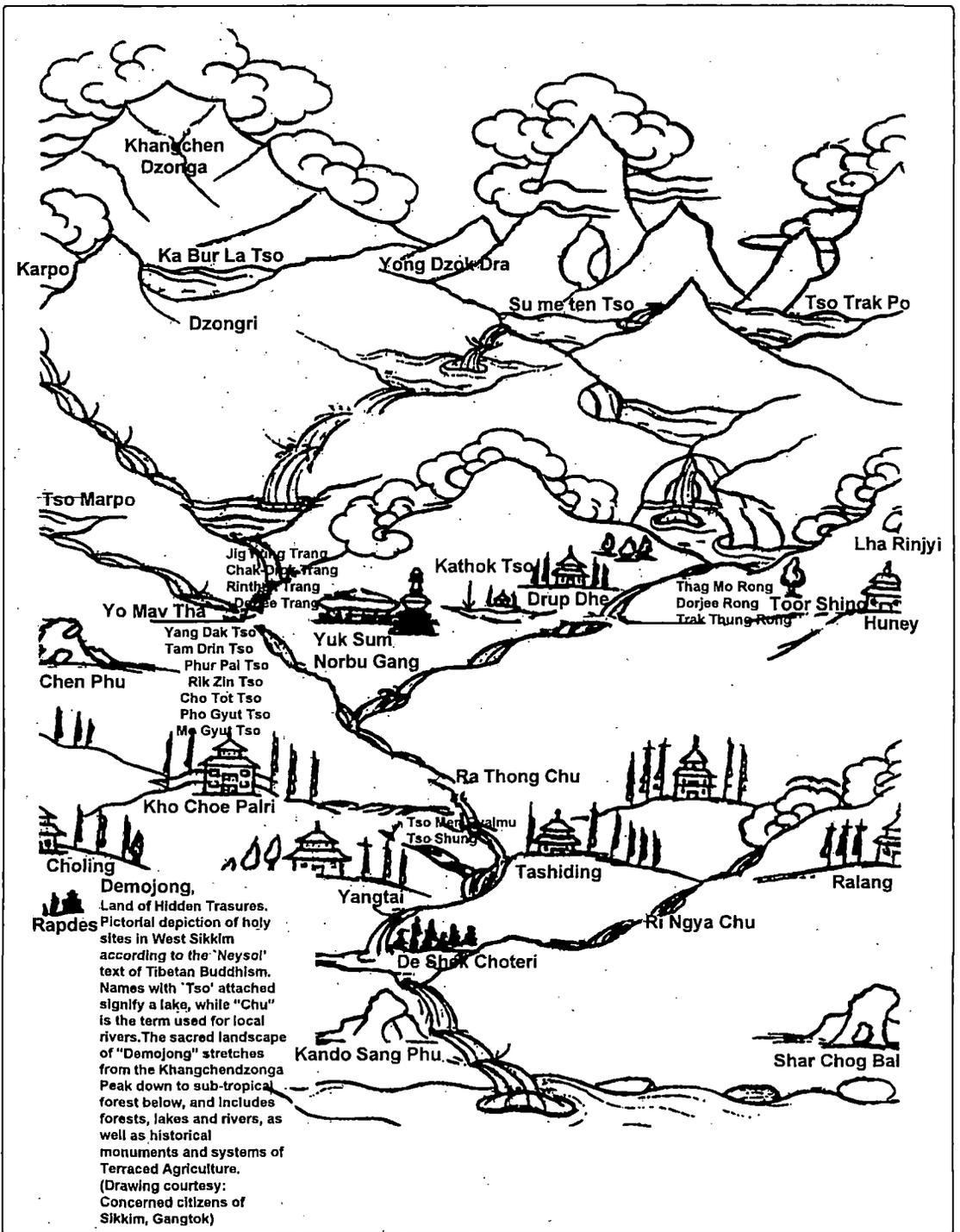


Fig. 3.3. Location of holy sites in Yuksam area

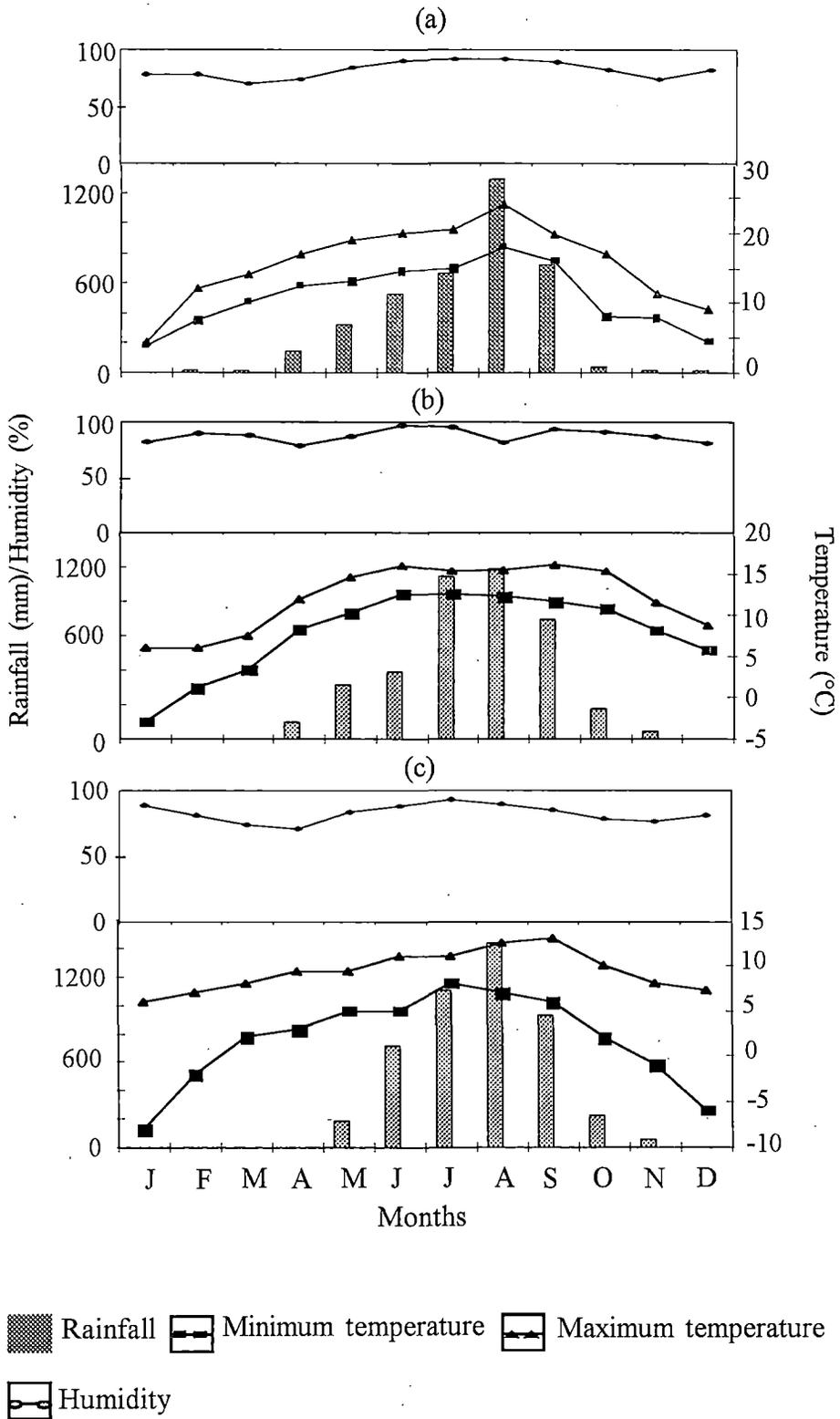


Fig. 3.4. Temporal variation of temperature, rainfall and humidity at three major halting places (a = Yuksam, b = Tshoka, c = Dzongri).

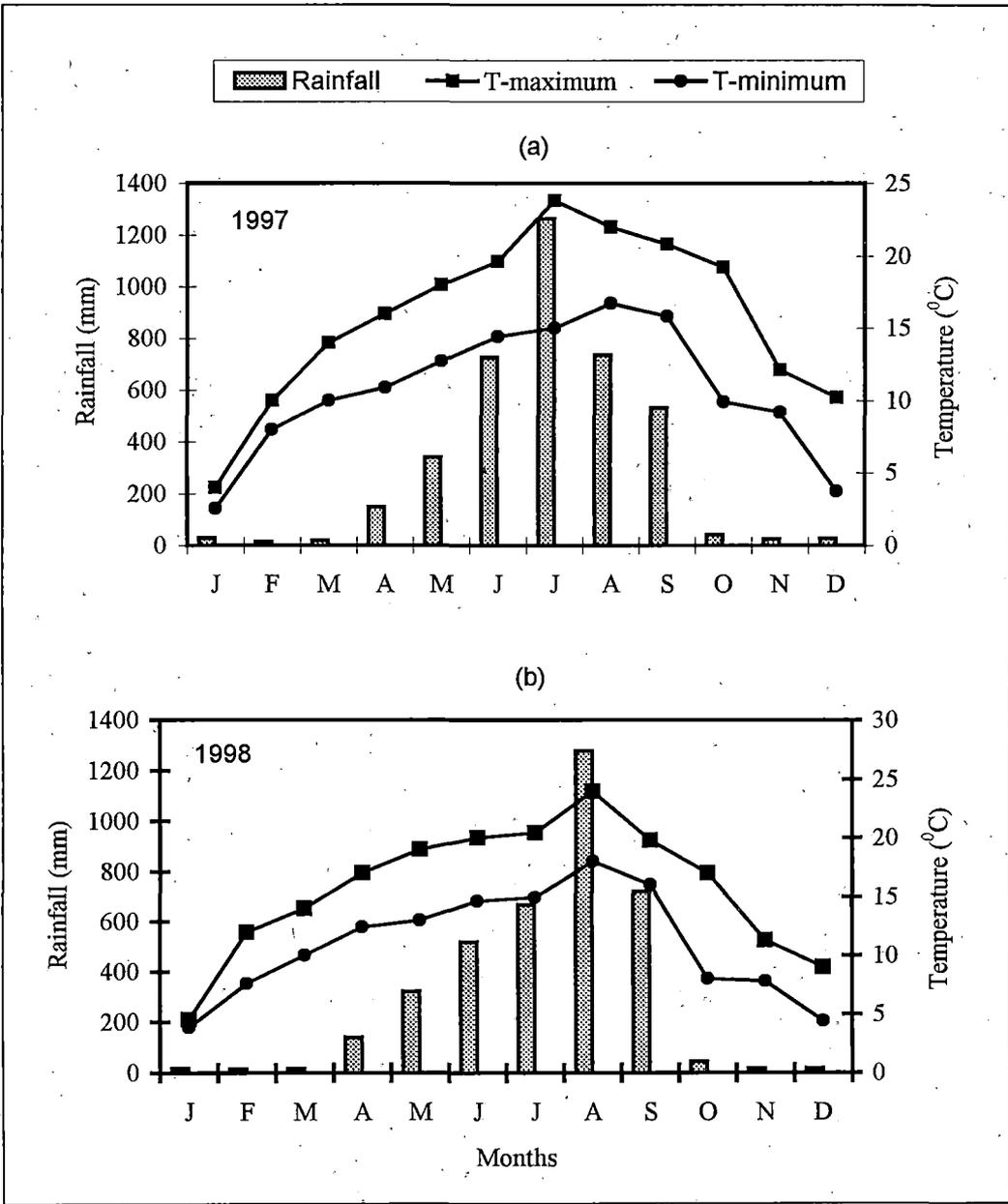


Fig. 3.5 Temporal distribution of rainfall and maximum and minimum temperature at the Khecheopalri lake

CHAPTER - IV

Chapter IV

DYNAMICS OF TOURISM

Introduction

Tourism is now one of the most rapidly expanding sectors within the world's largest and fastest growing industry which emerging as a growing sector of economic development with an estimated annual growth rate of 10-15% (Sreedhar 1995 a & b). Since last two decades tourism sector has been a major growth sector and a major source of employment (WTTC 1995).

The magnificent diverse landscapes and rich cultural heritage of Sikkim have attracted tourists, pilgrims, naturalists, explorers, trekkers, mountaineers and adventure travelers. In view of limited industrial growth in Sikkim, tourism can become a potential source of income generation in the remote mountain regions and generate employment opportunity to local people. Over recent years the area has experienced significant changes as a result of tourism growth. Since, 1990 there has been a tremendous increase in visitors' number and its impact and implications in the area are enormous (Rai & Sundriyal 1997). This chapter describes trekking/recreational travel, its growth pattern, visitor's profession, age-sex structure, income and expenditure pattern and market trend analysis related to tourism growth etc.

4.1 Methods

The scarcity of data has led to the in-depth interviews and group discussions with practicing professionals, visitors (resident, non-resident and FITs), local community leaders, and people directly involved in tourism related activities. This section deals with both primary and secondary data sources. The primary data were collected through structured questionnaire with random sampling of 415 visitors in Yukasam-Dzongri-Goechha La trekking corridor and 225 in Khecheopalri Lake site during 1997-98 using different types of questionnaires. The interviews were conducted over a period of six months (March to May and October to December), corresponding with two-peak tourist seasons, the assumptions of a representative sample plausible. The samplings were done at different times of the day and during all days of the sample week to ensure a representative sample at both the sites.

The main attention of the visitors survey has been on preferences and behavior pattern, the attitude and overall reaction of visitors towards varieties of things such as food, accommodation, transport and communication, recreation and expenses on different items etc. The analysis of tourists' origin, their profession, income, purpose of visit, age-sex structure, and means of transport in the area used is helpful in reflecting the characteristics of tourists' behavior, expenditure pattern and

preferences. Besides visitors, tour operators were also interviewed to collect information on marketing, promotional material used for better marketing and travel industry promotions. The survey was restricted to those who are involved in this industry and in sending visitors to trekking and the Lake sites only. This was to assess the problems faced by marketing and achieving target with diverse partners around the world. The survey divided the tourism industry into following sectors viz., tour operators, travel agents, hotels, tourism associations (TAAS) and Department of Tourism, government of Sikkim. It was originally intended to have a survey of all stakeholders, but limited time and resources made possible only 35 samples. Stakeholders were selected on the basis of activeness, and interviews sought only with senior and decision-making staff. The survey paid particular attention to tour operators because these are most closely involved with sending visitors to both the sites. Before interview, each operator was briefed on the purpose of the interview to avoid the bias. The interview was conducted following face-to-face interview and lasted between 30 and 40 minutes each.

In designing the questionnaire, the major concern has been to ensure that it should not produce pre-determined results either by omitting unfavorable alternations in multiple choice questions or by suggesting desired responses through the phrasing and sequence of questions (Nixon 1954). To avoid these problems, the adopted

questionnaire comprised a series of alternate choice questions and ordering, which were arranged sequentially with a view to minimizing the bias. However, it has been realized that it is not possible to eliminate all potential bias from a questionnaire. Formally, the questionnaires underwent a pre-test examination to eliminate potential weaknesses and to add more clarity and uniformity. This was accomplished by interviewing a few tourists/operators and it was realized that some questions did not always lead to useful results. Therefore, in the final version of the questionnaire, removal of previous sets and addition of newer sets were made in the contents for reducing the pace, time and complexity, on the one hand, and clear answering on the other.

The secondary data were generated for tourist inflow information from the Tourism Department, Police Check Post (entry point), hotel/lodges, tour operators and Himalayan Mountaineering Institute (HMI) records.

4.2 Tourism Growth

The number of tourists visiting Sikkim is growing at a very fast rate during recent years. The main reason of this high growth in tourist influx was mainly due to the relaxation in regulation that opened a number of new areas for both domestic and foreign visitors, and development of tourist facilities in Sikkim as a whole in recent years. The real growth of tourist number in Sikkim has started from 1980 onwards.

Until 1980, the state hosted only 10000 visitors, which eventually increased to more than ten times in 1998. Since 1984 there has been a steady increase in the tourists flow. In 1989 about 46416 visitors arrived in Sikkim in which 96% were domestic and 4% foreign, while in 1998 about 143410 tourists visited Sikkim, out of that 93% were domestic and 7% foreign visitors. There was some indication of a decline in visitors number during 1986 and 1987 due to the Gorkha Land Movement in the adjoining Darjeeling hills of Sikkim (Fig. 4.1). It is expected that by 2008 visitor number in Sikkim may reach upto 154180 requiring a considerable increase in bed space capacity.

Tourism in the mountain region is a highly seasonal activity. Flow of visitors distinctly has two peaks annually with low profile in January to March and July to September and high inflow during mid March to June and October to Mid December. During the spring and autumn season, the Sikkim Himalaya offers ideal conditions for recreation and trekking.

The state hosted the majority of domestic visitors compared to foreign. The majority of domestic visitors were from West Bengal (65%), followed by Delhi (10%), Bombay (6%), Madras (5%) and rest 14% from other parts of the country. The foreign visitors to Sikkim also increased during recent years comprising of the following nationality: UK (24%), USA (15%), Germany (13%), France (10%), Japan (6%), Switzerland (5%) and rest 27% from other countries. More than 85% domestic and

65% foreign visitors visited for recreation, followed by 15% domestic and 35% foreigners came exclusively for trekking. Out of the total visitors, about 42% of visitors listed their main motivation to trekking. This value does not include those visitors who merely do some trekking as part of a pleasure or culture based trip. However, despite this steady increase the reason for visits seem hardly to have changed over several years.

4.2.1 Purpose and length of visit

Concerning the purpose or reason of visit to the area, it is not easy to classify into groups because some how or other some visitors have more than a single purpose. Pleasure is the most important reason for visit for both domestic and foreign visitors. At the second level, pilgrimage is the main cause to visit the Khecheopalri Lake, while trekking has been the main cause for visiting Yuksam-Dzongri-Goechha La corridor (Table 4.1). Among the pilgrimage activities, visits to the monasteries and offering rituals in the lake are the most important. Bird watching and wildlife viewing were other significant reason for travel. It is evident from Table 4.1 that most of the trekking travelers visited the site to enjoy natural beauty and experiencing wilderness.

The “total tourist-visitor-days” is an important factor for the host region, because this ultimately influences the total days spent by the tourists, the requirements of hotel accommodation and catering facilities,

etc. For the visitors, the number of days of their travel and spent are important, because they would like to see as many places as possible within minimum duration. For domestic visitors, the average length of visit in Sikkim has been approximately 10 days in which on an average they spend 5 days in the trekking corridor. In case of foreign visitors, the average length of the entire journey has been 15 days, spending about 8 days in trekking. In the case of Khecheopalri Lake majority (80%) of foreign visitors spent on an average 3 days in the site. A few (20%) spent 3-5 days for viewing the surrounding area.

4.2.2 Pattern of trekking

The Yuksam-Dzongri-Goechha La corridor inside the Khangchendzonga National Park (KNP) recently designated, as a biosphere reserve is the most popular trekking destination in Sikkim. Trekking travel in this trail started in 1960. A Kalimpong based tour operator as stated by local people arranged the first organized trek in 1973. Sikkim State opened its borders to foreigners in 1980. The rise of Sikkim popularity as an adventure travel destination began in 1990. The period 1992-97 showed a steady rise in the number of tourists who entered Sikkim for trekking purposes (Fig. 4.2). In 1997 about 2002 visitors came exclusively to trek in the high mountains. The Himalayan Mountaineering Institute (HMI) also conducts 8 training courses consisting of 1379 trainees. The trail is crowded particularly during

summer and fall seasons (Table 4.2). Foreign visitors need an entry permit to visit Sikkim as well as trekking corridor for a maximum duration of 15 days. The foreign visitors are allowed to go to trek only in groups of at least 4 persons. Tour operators arrange the visit and charge daily rates, including food and guides at rates ranging from US\$ 25 to 50 per person per day. Alternatively, domestic visitors may trek without group. In later case, economic benefits may be dispersed more widely among the local people. But the major source of tourist related income is from guided trek. Thus huge amount of foreign visitors' investment goes to travel agents.

Since ancient time Sikkimese people visited Khecheopalri Lake for pilgrimage purposes. Tourists started coming in this lake after 1980 (according to local people) and the number increased at a high rate since 1990. The data on tourists' flow to this site were not properly recorded and maintained. The magnitude of tourist flows may testify to the increasing economic importance of tourism but in other hand its impact on the lake ecosystem seems serious. Visitors' number has grown rapidly from 16068 in 1997 to 18713 in 1998 (Fig. 4.3). Approximately 55% were domestic followed by 42% Sikkimese pilgrims and 3% foreign visitors. The visit to Khecheopalri Lake is distributed throughout the year. According to local people and observation during survey time, the April and October months are relatively representative of the overall mix of

visitors. The majority of the domestic visitors came from West Bengal State of India. Most of the foreign visitors were free and independent trekkers (FIT's).

4.2.3 Age-sex structure of visitors

Analysis of age structure of tourist arrivals indicates that the middle age-group visitors (21-60 years) had a dominant position at both the sites. It was observed from Table 4.3 that the tourist below the age of 20 years constitute only 1%, while above the age group of 60 have been also estimated 1% each. The percentage of male visitors had been higher than the female for both domestic and foreign visitors mainly due to difficult terrain and inaccessibility.

4.2.4 Educational level and profession of the visitors

In terms of educational qualification of visitors, majorities of both domestic and foreign visitors were bachelor degree holders. A small fraction of domestic and foreign visitors had educational qualification below graduation level (Table 4.4). This shows that the educational qualification did not play major role in trekking travel motivation.

In reference to profession-wise distribution of domestic and foreign visitors, executives (government sector) recorded the highest percentage, followed by students, businessmen and retired personnel at both the sites (Table 4.5).

4.2.5 Mode of travel

It is obvious from Table 4.6 that the principal mode of travel to the sites by both domestic and foreign visitors were reserved taxi, followed by shared taxi and least by government run buses. For non-resident visitors, tour operator organized taxis, while the resident visitors arranged themselves. The FIT's generally preferred government run buses and single seat shared taxi.

4.2.6 Type of accommodation availed

During the survey, it was observed that bulk of domestic and foreign visitors took accommodation in tourist huts, followed by hotel/lodges. But this has changed in 1998 mostly because of construction of 3 star hotel at the Yuksam. Presently more than 50% of the domestic and foreign visitors are staying in hotels at Yuksam. Except one, other hotels are lower budget hotels that offer simple budget accommodation. All budget lodges need to improve their toilets and bathing facilities and housekeeping. But in the Khecheopalri lake site, majority of the visitors (domestic and foreign) stayed in tourist hut as hotel facilities are not available. A very few foreign visitors and Sikkimese pilgrims preferred to stay in monasteries (Table 4.7). About 40% of the domestic visitors preferred to stay at Pelling. Huts at Yuksam, on trekking route and Khecheopalri Lake are not in an appealing condition for trekkers seeking

quality service. Huts need to have basic cleanliness, clean and working toilets and bathrooms, clean sheets and blankets, and also clean kitchens.

4.2.7 Income structure and expenditure pattern

The per capita per day spending of the tourist is an important factor having economic significance. As referred to already, it is influenced by the income of the tourists, the relative prices of different classes of products/services they purchase while on travel. Majority of the domestic visitors belonged to the lower-middle (Rs.2000 to Rs 6000) and middle class (Rs 6000 to Rs 10000) income groups. In the case of foreign visitors, they belonged to the middle and upper middle class (Rs 10000 to Rs 20000) (Table 4.8). During personal conversation, a large number of foreign visitors expressed that visiting India is cheaper than most of the other countries. A positive correlation between the duration of stay and spending capacity was observed, i.e., high income group tourists stayed more and spend more at the sites in comparison to relatively low income group tourists. The major source of tourist related income was from organized treks. Though the trainees of the Himalayan Mountaineering Institute (HMI) is small in number but significant contributor to the overall picture of tourists' activity in the trekking corridor. They frequently employ hundreds of pack animal porters to carry their goods and equipment from Yuksam to base camp, and add a significant amount to the local economy.

The tourist-cum-pilgrims from the Sikkim visited the Khecheopalri Lake more frequently than the tourists from distant areas. The expenditure pattern has been classified into 4 main groups, that is: (i) boarding and lodging, including entertainment, (ii) internal transport, (iii) shopping, and (iv) miscellaneous. In fact, the expenditure pattern is one of the most important, rather the central parameter, in the surveys of tourist traffic, on account of multiplying economic benefits derived from the foreign exchange brought in by the foreign tourists and spent by them. The average per capita expenditure incurred by both domestic and foreign visitors ranged from US\$ 5 to US\$ 45 depending upon the nature of income and type of trek. Food and lodging is the most important item of expenditure. The expenditure on this item is slightly higher in case of foreign visitors than their counterpart at both the sites. Shopping for both types of visitors was placed on second position. Most of the FIT's spend very less as compared to those who come through organized trek. But their expenditure directly goes to the local community.

4.2.8 Visitors opinion and reaction

About the opinion of the "food", majority of the domestic and foreign visitors considered it as "Good" in quality as well as in taste, whereas lack of good restaurants at both the sites have also been noted. When asked about the accommodation facility, most of the visitors stated that it was just about "Average". The trekker huts were over-crowded

during peak tourist season and camping at sites are generally observed (Plate 2b).

The general opinion of visitors about the local people from both the sites is very satisfactory. Both domestic and foreign visitors consider local people as “hospitable, charming, cheerful and very religious” (Table 4.9 & 4.10). A very few domestic visitors contacted the government run Tourist Information Center at Gangtok, on the other hand most of the foreign FITs received information from the tourist information center at Gangtok. Overall, the visitors were satisfied with the assistance and facilities provided by tourist information center as well as tour operators.

A considerable number of the visitors strongly showed their discontentment about the condition of the trail. Most of the domestic and foreign visitors frequently mentioned about the litter along the trail and campsite. In general, most of the visitors expressed their satisfaction about the local hospitality and food. However, a few visitors were disappointed during stay in trekker’s huts. As a whole majority of the domestic and foreign visitors were satisfied with the site appearance. For a sustained rate of growth of the tourist industry, the complaints, however, deserve urgent attention and remedial measures.

4.3 Tourism Marketing

Sikkim does not have visibility in the market compared to other Himalayan destinations such as Nepal, Bhutan, Ladakh and Tibet. In

addition there is a general vague notion in the market that Sikkim is difficult to get into and that permits are difficult to obtain. There is very little coverage on Sikkim in the press media. There is little awareness about Sikkim in the general travel public in India with the exception of West Bengal. Internationally, there is practically no awareness of Sikkim as an ecotourism adventure travel destination in comparison to other Himalayan adventure destinations. There is little or no television coverage because of permit restrictions. This section discusses approaches taken to regulate tourism by operator and institutions involved with sending visitors to trail and the Lake site.

4.3.1 Marketing products

Sikkim's most conspicuous attraction is its excellent biodiversity. This is what sets Sikkim aside from other Himalayan destinations. In addition Sikkim Kargu and Ningmapa monasteries are located at study sites and have an ancient history and the art has largely been well preserved in several monasteries. The monastic culture is well preserved and has not been well exposed to the international market. The high altitude areas especially the Khangchendzonga (the third highest mountain) base camp area and sacred lakes would offer a great tourism product. Yuksam-Dzongri-Goechha La trekking corridor is the only high altitude trek route open for marketing to the serious trekkers in Sikkim. During the spring/summer and autumn trek season, the agency based and

private treks are operated by both TAAS and non-TAAS members. HMI operated its mountaineering training programs. There are non-trekking domestic visitors who also came upto Yuksam and its environs. There are a few visitors to Yuksam in the winter months too. A trek day is operated on similar lines as in Nepal. Breakfast is generally western, packed lunch and hot dinner is served with menus of western, Indian and Sikkimese items. Tour operators were most active with value adding practices such as providing information about destinations (Table 4.11). Before the adventure and trek product can be promoted in particular, Sikkim needs to be promoted as a destination with its special unique selling points both in India as well as in the international market. At the same time, attract and satisfy/maintain quality clients certain products have to be developed. Currently one/two agents are selling diversified trek products in Nepal and Bhutan as well as Tibet in order to be able to have a year round offer of products. Sikkim trek product has a fairly short season in the spring/summer and autumn, which may be diversified to offer year round attractions.

4.3.2 Promotional materials

Maintenance and promotion of natural, social and cultural diversity is essential for long-term sustainable tourism, and creates a resilient base for the industry. In most of the areas there is a lack of tourism promotion in general and trekking in particular. Lack of promotional measures in

Sikkim is a great hindrance for selling its products. Presently the promotional activities adopted by Sikkim based tour operator is advertising in only Indian News Papers and Magazines, selling to direct walk-in clients, a few operators with proven service are handling referral business from Nepal, a few operators are handling business from foreign individual motivators and agents. Some operators have established E-mail and one operator a Website.

TAAS and some operators have developed promotional brochures. These brochures are used for marketing but only 3 or 4 operators have acceptable quality materials for the international market (Table 4.12). Tourism department brochure is mostly aimed at the domestic market with package tour information and two brochures covering destination information and adventure/trek options. A good quality brochure would be of most important for tourism marketing.

4.3.3 Economic worth of the tourism industry

The price of products that offered by tour operator varies between operators and quality of products. About 15 TAAS agents are actively operating treks on the Yuksam-Dzongri-Goechha La route with 303 pax (persons) and non-TAAS members with 591 pax as observed in 1997. A few agents also operated short trek or walk on the Pemayangtse/Khecheopaltri/ Yuksam/ Tashiding route. The trek price for foreign visitors varied between US\$ 25 to 50 per person per day

depending on the group size and services provided. Some times the trek price was as low as US\$ 15 per person per day as has also been quoted in a competitive situation or in the case of walk-in clients where probably service level was sacrificed. Agents who are more aware of the trek market in Nepal and other parts of India seem to have quoted between US\$ 35 to 60 per pax per day to position the product more realistically in terms of competitive trek products in Nepal. But there are also low quality treks being operated by some agents who undertake treks from clients at a given price. The trek price was low for domestic visitors and varied between US\$ 15 to 35 per person per day depending on the quality of service. Most of the income generated by tour operators was from guided trek. Assessing the economic value of the tour operator is a complex task. The estimated total turnover from tourism was at Rs 11728289 (US\$ 286080) in 1998 (Table 4.13). An additional income was also generated from the sale of local crafts to the visitors. About 13 agents are spending between 10% to 25% of their profit or income revenue generally on marketing activity.

4.4 Conclusion

Sikkim has a great wealth of natural and cultural attractions and really does not need large investment in hotel construction. As a matter of fact these would scar the landscape of Sikkim. Adventure/trekking travel is growing very fast and there is a need to link with environmental

awareness among both visitors and host community, with the need to maintain cultural traditions, and the benefits derived from tourism should act as incentives to promote conservation practices and mitigate environmental degradation. Travel agent plays a key role in the development of travel industry with wide coverage in television, besides press and consumer magazine. For better marketing, tour operators should attend some of the important travel marts in Asia and Europe to be able to make contact with foreign agents to generate future business. Time to time press release on travel industry, events, festivals and any new area opening should be sent to travel trade publication and other media. Agent fame trips is the best way to get an agent to see the product first hand and meet with ground operators. Once an agent is excited about the destination and experiences its people's hospitality, there is a good chance he of selling the destination.

Table 4.1. Distribution of tourists classed on the purpose of the visit at the study sites, 1997-1998

Purpose	Yuksam-Dzongri-Goechha La Corridor				Khecheopalri Lake			
	Domestic		Foreign		Domestic		Foreign	
	No	%	No	%	No	%	No	%
Holiday/Pleasure	36	20.34	73	30.67	96	61.94	73	73.00
Trekking/ Mountaineering	123	69.49	155	65.13	3	1.94	19	19.00
Religious/pilgrimage	10	5.65	7	2.94	56	36.12	6	6.00
Others	8	4.52	3	1.26	-	-	2	2.00
Total	177	100.00	238	100.00	155	100.00	100	100.00

Table 4.2. Seasonal variation in visitors inflow to the study sites, 1997-1998

Seasons	Yuksam-Dzongri-Goechha La Corridor						Khecheopalri Lake					
	Domestic		Foreign		HMI		Domestic		Foreign		Local Pilgrims	
	Individual	Groups	Individual	Groups	Individual	Groups	individual	Groups	Individual	Groups	Individual	Groups
Winter	6 (0.94)	2	18 (2.72)	7	315 (22.84)	5	685 (8.65)	98	74 (14.37)	25	178 (3.45)	18
Spring	35 (5.45)	7	146 (22.05)	30	342 (24.80)	5	1900 (23.94)	271	198 (38.45)	66	3440 (66.85)	344
Summer	287 (44.70)	37	145 (21.90)	37	351 (25.45)	6	2253 (28.38)	322	118 (22.92)	39	763 (14.83)	76
Rainy	31 (4.83)	8	26 (3.93)	6	181 (13.13)	4	558 (7.03)	80	37 (7.18)	12	252 (4.89)	25
Fall	283 (44.08)	50	327 (49.40)	52	190 (13.78)	2	2540 (32.00)	363	88 (17.08)	29	514 (9.98)	51
Total	642	104	662	132	1379	22	7936	1134	515	171	5147	514

Values in parentheses are percentages

Table 4.3. Distribution of tourists by age and sex categories in the study sites, 1997-1998

Age-group	Yuksam-Dzongri-Goechha La Corridor								Khecheopalri Lake							
	Domestic				Foreign				Domestic				Foreign			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Below 20	3	1.69	1	0.56	5	2.10	3	1.26	6	3.87	2	1.29	2	2.00	2	2.00
21 – 40	96	54.24	30	16.95	83	34.87	57	23.95	71	45.81	38	24.52	29	29.00	22	22.00
41 – 60	47	26.55	-	-	59	24.79	20	8.40	20	12.90	13	8.38	21	21.00	19	19.00
Above 60	-	-	-	-	8	3.36	3	1.26	2	1.29	3	1.94	4	4.00	1	1.00
Total	146	82.49	31	17.51	155	65.13	83	34.87	99	63.87	56	36.13	56	56.00	44	44.00

Table 4.4. Classification of tourists on educational qualification, 1997-1998

Education level	Yuksam-Dzongri-Goechha La Corridor				Khecheopalri Lake			
	Domestic		Foreign		Domestic		Foreign	
	Number	%	Number	%	Number	%	Number	%
Upto Senior Secondary	35	19.77	38	15.97	69	45.52	18	18.00
Bachelor Degree	110	62.15	140	58.82	75	48.39	63	63.00
Master Degree	22	12.43	49	20.59	5	3.23	8	8.00
Other	10	5.65	11	4.62	6	3.87	11	11.00
Total	177	100.00	238	100.00	155	100.00	100	100.00

Table 4.5. Profession-wise distribution of tourists visiting the study sites, 1997-1998

Profession	Yuksam-Dzongri-Goechha La Corridor				Khecheopalri Lake			
	Domestic		Foreign		Domestic		Foreign	
	No.	%	No.	%	No.	%	No.	%
Govt. Service	99	55.93	96	40.34	93	60.00	38	38.00
Professional / Private Sector	25	14.12	120	50.42	12	7.74	46	46.00
Business	16	9.04	9	3.78	8	5.16	7	7.00
Students	37	20.90	8	3.36	6	3.87	6	6.00
Retired persons	-	-	5	2.10	7	4.52	3	3.00
Others	-	-	-	-	29	18.71	-	-
Total	177	100.00	238	100.00	155	100.00	100	100.00

Table 4.6. Mode of travel of visitors to the study sites,1997-1998

Mode of travel	Yuksam-Dzongri-Goechha La Corridor				Khecheopalri Lake			
	Domestic		Foreign		Domestic		Foreign	
	No	%	No	%	No	%	No	%
SNT (Bus)	17	9.60	26	10.92	30	19.35	75	75.00
Private Bus	31	17.51	37	15.55	-	-	-	-
Reserved Taxi	28	15.82	150	63.03	115	74.19	10	10.00
Shared Taxi	101	57.06	25	10.50	10	6.45	15	15.00
Total	177	100.00	238	100.00	155	100.00	100	100.00

SNT=Sikkim Nationalized Transport

Table 4.7. Distribution of tourists according to the types of accommodation
availed,1997-1998

Accommodation availed	Yuksam-Dzongri-Goechha La trekking corridor				Khecheopalri Lake			
	Domestic		Foreign		Domestic		Foreign	
	No	%	No	%	No	%	No	%
Hotel/lodges	54	30.51	116	48.74	114	73.55	-	-
Trekker's hut	116	65.54	60	25.10	7	4.51	93	93.00
Tent	7	3.95	62	26.05	-	-	-	-
Monastery	-	-	-	-	19	12.26	7	7.00
Others	-	-	-	-	15	9.68	-	-
Total	177	100.00	238	100.00	155	100.00	100	100.00

Table 4.8. Per cent of income level categories of tourists visiting the study sites, 1997-1998

Income level category*	Yuksam-Dzongri-Goecha La trekking corridor		Khecheopalri Lake	
	Domestic	Foreign	Domestic	Foreign
Less than Rs 2000	13.65	-	15.82	-
Rs 2001-6000	56.70	-	59.33	-
Rs 6001-10000	27.18	0.84	22.00	1.14
Rs 10001-20000	2.47	7.45	2.85	9.30
Above Rs 20000	-	91.71	-	89.56

*Income per month

Table 4.9. Opinion of visitors (%) on Yuksam-Dzongri-Goechha La Corridor, 1997-1998

Visitors' Opinion	Likert-scale				
	Very Good	Good	Poor	Very Poor	No opinion
Local people's hospitality	64	27	7	-	2
Quality of local food	19	63	14	1	3
Accommodation at Camp site	7	67	12	8	6
Scenery	78	22	-	-	-
Wildlife sightings	-	2	36	40	22
Environmental awareness of staff	25	49	13	10	3
Litter at Camp-site & along the trail	17	23	51	9	-
Condition of the trail	-	11	60	29	-
Condition of the corridor forest	25	46	19	10	-

Table 4.10. Opinion of visitors (%) on the Khecheopalri Lake, 1997-1998

Visitors' Opinion	Likert-scale				
	Very Good	Good	Poor	Very Poor	No opinion
Local people's hospitality	78	20	-	-	2
Quality of local food	60	22	7	-	11
Accommodation at lake site	36	55	7	-	2
Scenery	74	26	-	-	-
Litter in the lake surrounding area	11	34	25	20	10
Condition of the lake	15	30	24	10	21
Condition of the lake surrounding forest	16	61	6	7	10

Table 4.11.Types of tourism products offered by the tour operators to the visitors,
1997-1998

Products	Tour Operators	
	Number	%
Trekking	6	17
Cultural/Religious Tours	3	9
Mountaineering Expedition	1	3
Bird watching/Butterfly	1	3
Rafting/Water sports	2	6
Rhododendron/Orchid trek	2	6
Package tour/ sight scene	20	56

Table 4.12. Promotional measures used by tour operators, 1997-1998

Promotional measures	Tour operators	
	Number	%
Website	6	17
National News Paper	5	14
Travel Magazine	8	23
Tourism/Trade Fair & Conference	5	14
T. V. Channel (Local)	4	11
Sign Board/Banner	7	21

Table 4.13. Revenue received by TAAS and Non-TAAS members from tourists visiting Sikkim

Years	Revenue (US\$)		
	TAAS members	Non-TAAS members	Total
1996	72240	159320	231560
1997	78968	172976	251944
1998	96960	189120	286080

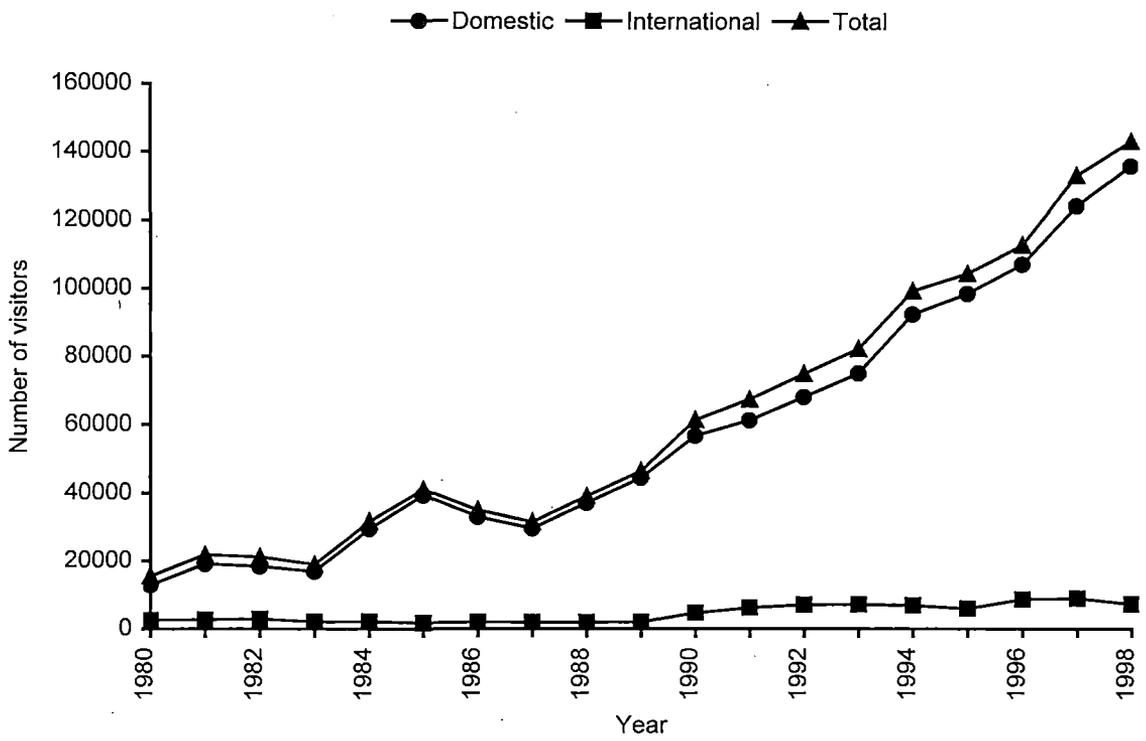


Fig 4.1. Yearly visitor profile from 1980 to 1998 in Sikkim

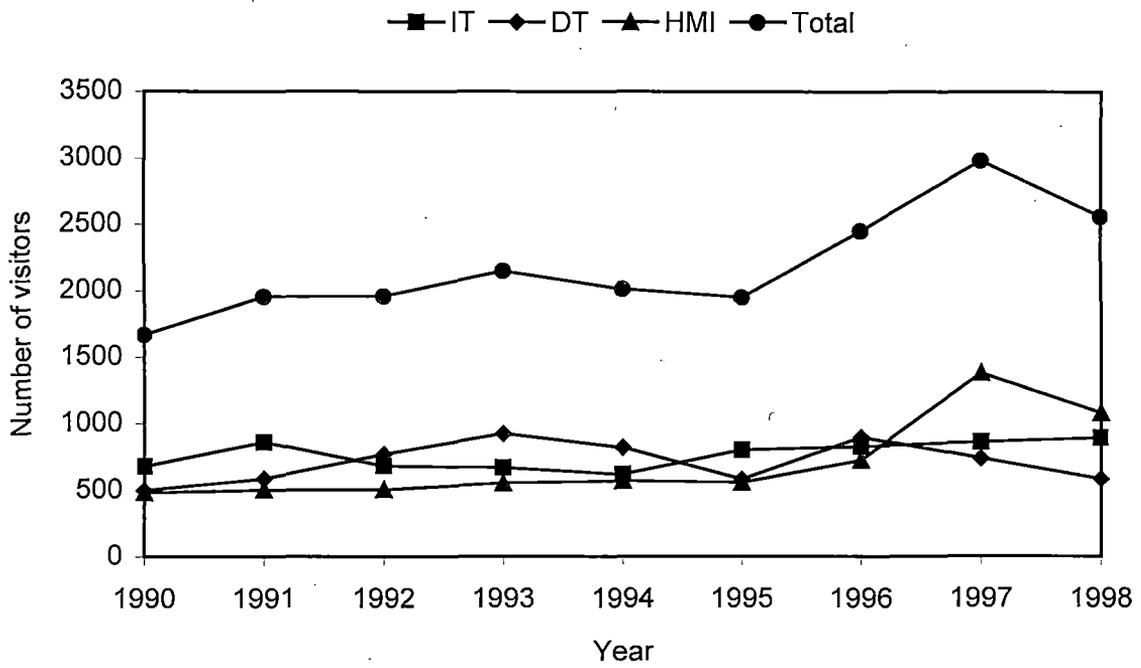


Fig. 4.2. Annual flow of visitors to the Yuksam-Dzongri-Goechha La trekking corridor (IT=International tourist; DT=Domestic tourist; HMI=Himalayan Mountainering Institute)

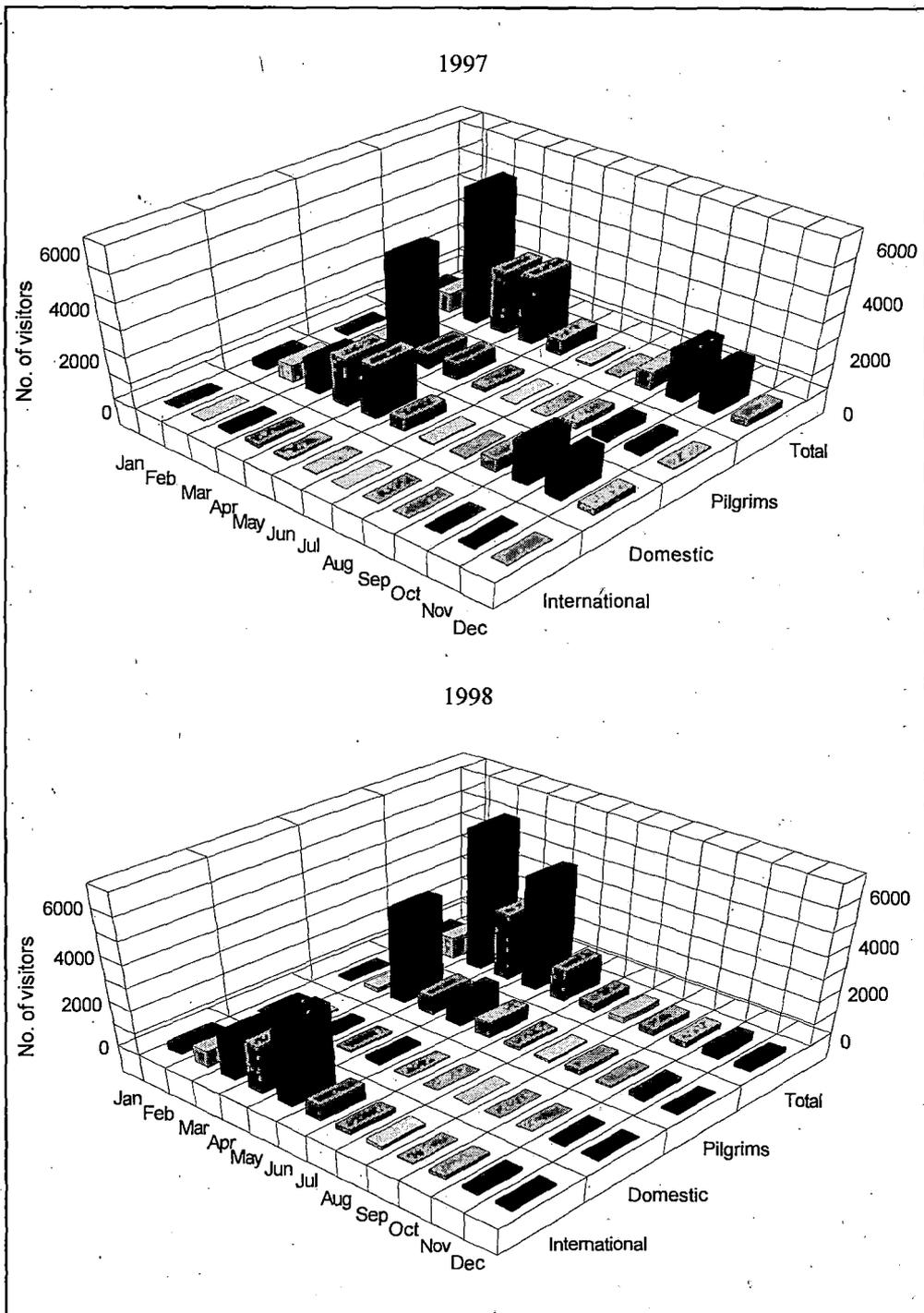


Fig. 4.3 Visitors flow in Khecheopalri lake during 1997 and 1998

CHAPTER - V

Chapter V

SOCIO-ECONOMIC DEVELOPMENT

Introduction

The livelihood in Sikkim is at subsistence level and there are three major options namely, traditional farming, pastoralism and tourism. The major livelihood of the Sikkimese people is farming (Jana 1994). The pastoralism is mainly concentrated in the high altitude pasturelands, which is primarily used for Yak/Dzo grazing. Yak/Dzo reared for various purposes such as wool, meat, milk and milk derived items like churpi and also as pack animals. Tourism has been one of the major economic activities in the Sikkim for the past one decade (Sharma 1997). The local communities involved in tourism related activities as lodge operators, porters, pack animal porters and teashops. The major economic changes that took place after 1990, and have altered not only the economics of the area but also many aspects of their social life. The changes, which took place in food consumption due to economic change, have also received some notice. Diet has also changed over time with economic growth. Therefore, this chapter discusses the socio-economic characteristics, indicators on economic development, inventory of physical assets and quality of life etc.

5.1 Methods

Socio-economic baseline information collected employ qualitative and quantitative procedures and sampling techniques that are widely accepted and scientifically sound. Including group and individual questionnaire interviews, focused topic interviews and meetings, as well as semi-structured and open-ended interviews on various aspects of the household economy as the demographic features, occupational structure, literacy, cropping pattern, consumption pattern, and so on. While analyzing the livelihood options, the socioeconomic aspects of the different stakeholders were used as important factors, along with the physical and institutional infrastructure that shape the nature of livelihood options being practiced by the stakeholders. Thereafter, the effect of livelihood options was analyzed in terms of their impacts on the quality of life and equity.

The data used for consumption pattern are from National Food Balance Sheets based on agricultural production. For over one hundred different foods, the total weight of domestic production in a year is added to imports and any amounts withdrawn from stock. From this total are deducted exports, the amount used for seed and for feed, and those crops destined for other use. An arbitrary 10 % is subtracted for wastage between the farm gate and the real outlet. This final figure is then converted into calories per capita per day, grams of protein per capita per

day and grams of fat per capita per day (FAO 1991 & 1994). The food balance sheet has drawbacks, it is not a measure of consumption but an estimate of the amount of food available at the retail level. Consumption at the household level is lower than those in the food balance sheets that constitute national average (Dowler & Seo 1985 and Smil 1987). The accuracy of the final estimates of food availability is dependent on the reliability of the production. The utilization of crops for seed and feed is not exactly known even in the developed countries (Grigg 1996). Further, a substantial proportion of food is consumed on the farm and not recorded in survey statistics. However, there are only comprehensive international statistics on food availability and they accurately represent major differences in consumption.

5.2 Socio-economic Characteristics

Total population of the Yuksam and Khecheopalri village was 988 and 463 in 1971, which rose to 1930 and 797 in 1991. At the time of survey (1997) population reached 2622 and 958 respectively. The growth rate was thus estimated as 45% and 27% within one decade (1981-91).

The working population in the age group of 20 to 60 years is significantly higher at both the sites (Table 5.1). The percentage of school going children is higher in sacred Khecheopalri lake site than in the Yuksam-Dzongri-Geochha, La corridor. The sex ratio in the state still remains much lower than the national average of 927 and also much

lower than those of the other Himalayan states, apart from Arunachal Pradesh (Sharma & Sharma 1997). In contrary to this, the number of females per thousand males is higher (972) in Yuksam-Dzongri-Geochha La corridor than the Sikkim and national average.

The density of population has increased significantly during the last two decades from 30 km⁻² in 1971 to 57 km⁻² in 1991 in the state. However, taking into account the fact that nearly 25% of the total geographical area of the state is uninhabited. The density of population in the Yuksam-Dzongri-Geochha La corridor and sacred Khecheopalri Lake are slightly higher than the state average. Yet another way of gauging the population pressure on land is the density of population km⁻² of arable land. The density of population km⁻² of arable land comes to as high as 595 and 260 persons indicating a high pressure on arable land.

About 69% of the total households are involved in tourism related activities in Yuksam area. Out of that 5% were engaged in hotel/lodges, 14% pack-animal operator, 66% porters, 9% fair price shop and 6% tea stall. In Khecheopalri area, only 3% of the total population involved in tourism related activities and the rest belongs to non-tourism sector.

5.2.1 Level of education

The extent of human resource development in terms of literacy is significantly higher in Yuksam-Dzongri-Geochha La corridor than in the Sacred Khecheopalri lake (Table 5.2). The female literacy rate (43% &

47%) is lower than the male (53% & 57%) at both the sites. Stakeholder wise, the highest literacy rate was recorded in tourism involved households and lowest in non-tourism involved households (Table 5.2). These differences could be attributed first to the involvement of Bhutias in tourism sector that remained the privileged ruling community and enjoyed state patronage until the state's merger with India in 1975. Secondly, the tourism involved families earn more cash income, enabled them to afford higher and better education outside the area and state. Between tourism and non-tourism involved families, the percentage of illiterate population is higher in non-tourism involved families at both the sites.

5.2.2 Land utilization and agricultural production

The survey revealed the following land-use categories in Yuksam and Khecheopalri villages. The total area of Yuksam and Khecheopalri villages are 1244 ha and 987 ha, respectively. Out of that 35% and 37 % were under net sown area, 28% and 12% under fallow, 8% and 5% under other cultivable land excluding fallow and 3% and 6 % under area not available for cultivation respectively (Fig. 5.1). The per capita land is 0.28 and 0.32 ha in Yuksam and Khecheopalri villages respectively which is quite low as compared to other Himalayan region. Nearly 35% and 50% of the total operational landholdings were small size (1-2 ha) respectively in Yuksam and Khecheopalri villages.

Table 5.3, shows the cropping pattern of both the villages. Large cardamom (*Amomum subulatum*) based agroforestry system accounted for about 47% and 53 % in Yuksam and Khecheopalri villages respectively. Other important crops are maize (*Zea mays*) and potatoes (*Solanum tuberosum*) that accounted for more than 27% and 37%, respectively, in Yuksam and Khecheopalri villages. For the last 10 to 15 years, large cardamom farming has increased rapidly in both the villages. Farmers of Yuksam village converted their paddy field to large cardamom field to get more revenue. Among different categories of farmers, small holding (1-2 ha) farmers devoted more land to maize and potatoes than the large holding (above 10 ha) farmers, who devoted more land to large cardamom cultivation.

The major source of employment and income was overwhelmingly agriculture upto 1996 with 80% of total population engaged in subsistence farming. There has been some minor change in this situation in recent years. Despite this activity, subsistence level nutritional requirements are met by local production or not are doubtful. World Bank (1976) estimates that nutritional needs for normal subsistence should provide an average of 11.3 MJ adult⁻¹ day⁻¹ (9.2 MJ for minimum subsistence). Estimates showed that average nutrient intake actually available to the Yuksam and Khecheopalri area people is 2 MJ person⁻¹ day⁻¹, which indeed appear to be far below the World Bank estimates

(Table 5.3). These low values are calculated based on only local production system and these clearly indicate that at both the sites people are more dependent on outside supplies to meet their daily nutritional requirements. If compared to other similar studies in Nepal Himalayan region, the nutrient intake was 5 MJ person⁻¹ day⁻¹ (Mahat *et al.* 1987), which is quite high to the present study. However, this proves that the mountain region is one of the food deficit areas and the figures are not much different.

5.2.3 Livestock holding

The livestock numbers of both the sites are presented in Table 6.6. It shows that cattle, goats, pigs and sheep and poultry birds are important animals. A total of 1557 livestock was recorded at Yuksam while only 304 at Khecheopalri. The animals include cattle (26%), goat (18%), sheep (27%), dzo (7%), yak (5%), horse (2%) and pigs (15%) in Yuksam area and cattle (36%), goat (35%), sheep (7%) and pig (22%) in Khecheopalri lake area. All most all households keep poultry birds, which besides enriching their diet also enable them to meet emergency cash requirements. The cattle reared are mostly local breeds, which yield less milk. There is a significant difference in the number of animals owned by different stakeholders in both the sites (Table 5.4). A highly significant difference was observed in the case of pack animal operators who reared large number of Yak/Dzo for tourism purposes. Non-tourism involved

families also have large numbers of livestock because their economy is based on animal population.

5.3 Indicators on Economic Development

The role of tourism in local, state and national economic restructuring has been widely stressed (HMSO 1985 and Grolleau 1988). Local communities of both the sites have reoriented their local economy and lifestyles around tourism recently. Until 1996, more than 50% of all community households had income from agriculture sector only. Since then involvement in tourism has risen in most villages, and it has become increasingly common for several members of a household to have tourism-based incomes. For most families tourism earnings come from employment in trekking as guides, pack animal operator and cooks. Some men work exclusively for mountaineering as pack animal operator. Employment in both trekking and mountaineering is seasonal. Hotel/lodges have become an increasingly important part of the local as well as state economy. Most lodges are operated by women of the households, who typically employ one or two non-family persons to help in cooking, water heating and cleaning.

5.3.1 Income

The people of Yuksam and Khecheopalri area have reoriented their local economy around tourism. In 1997, about 46% and 7% of the total household income came from this source in Yuksam and Khecheopalri

area respectively. Since then, involvement in tourism related activities have risen to 69% and 22% in 1998 in these sites and it has become increasingly common for local communities to involve in tourism-related activities. The household earnings yielded through different livelihood options are important indicators of their quality. In this context, Table 5.5 & 5.7, reveal that the average annual income of tourism involved and non-tourism involved families registering an increase of 9% and 4% in Yuksam area and 39% and 2% in Khecheopalri over a period of just one year (1997 to 1998). A sizable amount of the revenue (55%) in Yuksam area came from employment in trekking and mountaineering as portorage (Rs 2755856 equivalent US\$67216); followed by grocery shop (Rs 663749 equivalent US\$16189), hotel/lodge/tea stall (Rs 1574933 equivalent US\$38413), and very minimum to local guides (Rs 24887 equivalent US\$607) in 1998. Tourism sector is the most important source of revenue generation followed by service sector and agriculture (Table 5.5 & 5.7). The pattern was similar for both the sites. In agriculture sector, about 50% of the total household income came from large cardamom alone. However, it may be argued that the household income alone, without taking cognizance of the number of employment days, fails to truly reflect the quality of different livelihood options. Thus, the foregoing discussions revealed that an all round socio-economic

development has taken place in both the sites leading from one sector to another and so on.

The average annual income of all the stakeholders in Yuksam-Dzongri-Goechha La corridor and Khecheopalri lake was Rs 25994 (US\$634) and Rs 14924 (US\$ 364) (average of one year worked out on the basis of constant prices prevalent in the year). The tourism sector in Yuksam area contributed maximum with its share of 70%, whereas the service sector accounted only 18% and rest was the contribution from farm activities. Although the income of pack animal operator and teashop owners decreased due to low domestic visitation number in 1998, but it continued to dominate the hotel/lodge and porters whose income increased by 52% and 6% respectively. Whereas Khecheopalri lake area is concerned the maximum revenue (54%) was generated through farm activities and only 30% come from tourism sector and rest from other sources. It is often said that the economic gains from trekking tourism are more evenly and quickly distributed throughout a regional economy than other type of tourism. This is proved by the fact that much of the gains derived from accommodation and portorage stay within the local community.

5.3.2 Quality of life

It is clearly shown that the quality of life enjoyed by households in the hotel/lodges is far superior to that enjoyed by their counterparts. For

example, per capita expenditure on superior grains, fruits and vegetables, clothing and so on are much better in hotel/lodge owning families (Table 5.5 & 5.8). Per capita expenditure on education is also high in hotel/lodge owners than other stakeholders. Increase in the level of education over a period of time is also an important and qualitative indicator of the economic development. Most of the families who owned hotel/lodges have sent their children to Gangtok, Darjeeling, and other cities of India for better education. Despite the fact that people in tourism involved are economically much better off, their traditions and culture, such as dress, marriage, food habits, and so on, are still intact. This is in contrast to other transformed areas, e.g., Himachal Pradesh, where economic prosperity has dealt a severe blow to these values (Sharma 1996).

The food habits of the people at both the sites have showed some changes during 1997 and 1998. Though the farming system continues to be dominated by maize and potatoes, maize is no longer the staple diet of the people. Practically all households have switched over to rice, though the rice eaten by them is of poor quality. The factors which led to this change are due to an increase in both off-farm and on-farm employment opportunities. While more off-farm job became available in tourism sector, the on-farm employment opportunities received a boost with the spread of the cultivation of large cardamom and vegetable cultivation,

this has led to an increase in the incomes and changes the expenditure patterns.

5.3.3 Consumption pattern

The change in economic structure that took place due to tourism profoundly altered the consumption patterns of all the stakeholders at both the sites. The changes, which took place in food consumption, are another indicator of economic development in the area. The dietary changes in Yuksam-Dzongri-Goechha La and Khecheopalri lake area during 1997 to 1998 have received some notice. It is very difficult to measure the changes in consumption of diet over time or over space and relate it to economic development. Human beings eat an astonishing variety of foods. One way of making this complexity more easily understood is to group foods into classes, such as cereals or dairy products, and measure their relative importance by their caloric content. Even so, classifying the stakeholder wise diets of over more than 200 households caused difficulties. There would thus seem to be an obvious relationship between diet and economic development. The dietary pattern of a mountain people is different from that of the general population, as consumption of a variety of roots and tubers, green leafy vegetables and livestock products are higher in their diet. Fruits and vegetables have a very low caloric and protein content per unit weight, and could not play the role of a staple food. Pulses provide a good source of protein and have

a high caloric content. They are found in nearly all traditional diets as a complement.

A change in consumption pattern and its relationship to change in income structure is not properly analyzed earlier. However, evidence suggests that the consumption pattern increase in the early stages of economic growth (FAO 1958). An increase in incomes leads to different patterns of consumption at different stages of economic growth. In the study area before 1990, majority of the population was very poor, and most of the limited incomes had to be spent upon rice and potatoes, the cheapest sources of calories. Hence any increase in incomes led not only to the purchase of more expensive foods to add diversity to a monotonous diet but also to an increase in the consumption of the meat. The total food caloric supply in study sites increased from 1878 kcal to 1881 kcal in tourism involved and 1764 to 1827 kcal in non-tourism involved families in Yuksam area and 1822 to 1987 kcal in tourism involved and 1593 to 1787 kcal in non-tourism involved families in Khecheopalri lake area during 1997 to 1998. This showed 0.16 % increase in tourism involved and 3.51% in non-tourism involved families in Yuksam area, and 9.05% in tourism involved and 12.18% non-tourism involved families in Khecheopalri lake area. Variation in caloric intake by different stakeholders is presented in Fig. 5.2. A minor decrease in caloric intake was recorded in pack animal operator and faire price shop stakeholders

due to decrease in domestic visitors and HMI trainees number in the Yuksam-Dzongri-Goechha La corridor. According to estimates, meat contributed 127 kcal and 87 kcal (6.76% to 4.93%) to the average daily per capita calories supply in 1997 in tourism and non-tourism based households at Yukasam. Cereals such as rice or wheat, on the other hand, contributed 1112 kcal and 1123 kcal (59% and 64%). Milk and milk products provided 163 kcal and 128 kcal per person per day (Table 5.9). All this has changed in tourism and non-tourism involved families at both the sites. The per capita consumption of meat has increased from 6.76% to 7.28% in tourism involved families during 1997-98. The per capita supply of pulses has decreased in tourism involved families in Yuksam site, while milk and milk product has increased. Vegetables and fruits, for instance, now contributed 4% to the average calorie supply. Tourism-based affluence has brought with it increased economic differentiation in wealth at both the sites and the household levels. For one decade villages have differed sharply not only in the percentage of households with earnings from trekking and mountaineering but also in the proportion of households with income from the services and business. With increased affluence the area's average diet will change further, becoming similar to that of other developed Asian countries in future. Food preference at both the sites are changing rapidly. Today, people not only eat much more meat than earlier, but there is also a trend towards a more diverse diet.

To examine the trends in different stakeholders, calories derived from different sources are plotted against income per capita per month (Fig. 5.3). It is clear from the Fig. 5.3 that the economic growth has led to increased consumption pattern. Increases in income promoted consumers to purchase more of the expensive foods such as sugar, alcoholic beverages, oils, fruit and vegetables, meats, fish and dairy products.

Regressing the calorie intake against income yields a positive correlation with as much as 84% to 92% being influenced by income ($r^2 = 0.837$ and $r^2 = 0.919$) (Fig. 5.4), suggesting a moderately close relationship between the calories and income per capita. Results showed that economic development leads to changes in food consumption as income grows. With an increase in income, total caloric intake and the consumption of other foods have increased.

5.3.4 Household assets

The asset's inventory of sample households of different stakeholders in terms of residential building, cattlesheds, electronic goods and utensils are another indicator of economic development. The amount of assets per stakeholder was more in Yuksam area than in the Khecheoplari area because visitors stay in Yuksam area is longer and they spent more money. In the composition and relative importance of different assets at both the areas, residential building accounted more. The most important difference is, however, in the percentage of non-farm

assets such as television, vehicles and other durable household goods. Stakeholder wise major changes was observed in porters and hotel/lodge owner families due to increase in wage rate and more days and times in trekking.

5.4 Conclusion

Growth of visitors has been responsible for significant changes in employment and income generation, which lead to improve socio-economic condition of the local people and overall national and state GNP. In economically depressed area, the employment and income provided by tourism may help to check out-migration.

Agriculture is still the main occupation of the villagers at both the sites. Crop yield is very low and people purchased food from market to meet out the daily demand. Now the people of Yuksam and Khecheopalri have reoriented their local economy around tourism. In 1997, about 46% and 7% of the households had income from this source. Since then, involvement in tourism related activities have risen to 69% and 22% in 1998 at both the sites.

Economic development leads to change in food consumption pattern as income grows. With an increase in income, total caloric intake, and the consumption of other food increase. When a threshold income growth per capita is reached, further increases in income are devoted to other foods such as animal foods, fruits and vegetable, and sugar.

Table 5.1. Age-sex composition (%) at the study sites in 1998

Age-Group	Yuksam-Dzongri-Goecha La trekking corridor			Khecheopalri Lake		
	Male	Female	Total	Male	Female	Total
0 – 9	9.60	9.47	19.08	13.12	11.32	24.43
10 – 19	9.10	8.78	17.87	10.18	8.82	19.03
20 – 29	8.84	8.10	16.92	8.82	7.01	15.83
30 – 39	8.39	8.14	16.53	8.83	6.33	15.15
40 – 49	6.74	6.80	13.54	7.01	5.88	12.89
50 – 59	4.89	4.53	9.44	3.62	4.53	8.14
Above 60	3.12	3.50	6.62	1.81	2.72	4.53
Total	50.68	49.32	100	53.39	46.61	100

Table 5.2. Per cent literacy rate of stakeholders at the study sites, 1998

Stakeholders	Sites			
	Yuksam-Dzongri-Goechha La trekking corridor		Khecheopalri Lake	
	Male	Female	Male	Female
Tourism involved				
Hotel/Lodges	61.29	38.71	75.00	25.00
Pack-animal operator	57.41	42.59	-	-
Poterage	57.15	42.85	-	-
Fair-price Shop	62.50	37.50	66.66	33.34
Tea Stall	66.66	33.34	45.45	54.55
Non-Tourism	56.00	44.00	56.70	43.30
Total	53.41	46.59	56.75	43.25

Table 5.3. Daily average per capita food intake at the study sites, 1998

Sites	Paddy	Maize	Wheat	Millet	Barley	Potato/other vegetables	Total	Other foods	Grand Total
Yuksam-Dzongri-Goechha La trekking corridor									
Cropped Area (ha) ¹	15.75	98.135	64.38	28.37	7.25	21.44	235.325	-	-
Average Yield (tonne/ha)	0.50	0.98	0.86	0.37	0.198	0.74	-	-	-
Gross Production (tonne)	7.875	96.172	55.366	10.49	1.43	15.86	187.193	-	-
Less (Crop residuals/other) ²	0.787	9.617	5.536	1.04	0.143	1.586	18.709	-	-
Net Balance (tonne)	7.088	86.555	49.830	9.450	1.287	14.274	168.484	-	-
Consumable Proportion (%) ³	85	80	75	90	90	95	-	-	-
Consumable proportion (tonne)	5.902	67.3	35.984	8.320	1.14	13.48	132.136	-	-
Energy Supplied (kJ/g)	14.6	14.4	13.7	13.7	14.0	3.38	-	-	-
Total Energy (J)	86.1692	969.26	492.98	113.98	15.96	45.56	1723.90	-	-
Energy/person/day (MJ) ⁴	-	-	-	-	-	-	1.09	0.66	1.75
Khecheopalri Lake									
Cropped Area (ha) ¹	-	47.36	10.85	3.04	1.25	5.51	68.010	-	-
Average Yield (tonne/ha)	-	0.98	0.86	0.37	0.198	0.74	-	-	-
Gross Production (tonne)	-	46.4128	9.331	1.1248	0.2475	4.0774	61.1935	-	-
Less (Crop residuals/other) ²	-	4.6412	0.9331	0.1124	0.0247	0.4077	6.1191	-	-
Net Balance (tonne)	-	41.4716	8.3979	1.0112	0.228	3.6697	54.7784	-	-
Consumable Proportion (%) ³	-	95	85	90	85	95	-	-	-
Consumable proportion (tonne)	-	39.450	6.9982	0.8992	0.1852	3.4654	50.998	-	-
Energy Supplied (kJ/g)	-	14.4	13.7	13.7	14	3.38	-	-	-
Total Energy (J)	-	568.08	95.875	12.3190	2.5928	11.7130	690.5798	-	-
Energy/person/day (MJ) ⁴	-	-	-	-	-	-	1.56	0.66	2.22

¹= Primary Survey, ² = Rents, Storage and residual losses together calculated at 10 %, ³= Consumable proportion is calculated by asking the local community the amount of consumption from the total production, ⁴= Other foods include mainly sugar, meat, fruit, vegetable oil, milk and milk products etc., and are calculated at c. 15 (%) (Mahat, *et al.* 1987)

Table 5.4. Stakeholder wise ownership of livestock, 1998

Stakeholder	Yuksam-Dzongri-Goechha La trekking corridor		Khecheopalri Lake	
	Number	(%)	Number	(%)
Tourism involved				
Poterage	289	18.56	2	0.79
Pack-animal operator	302	19.40	-	-
Hotel/Lodge	38	2.44	-	-
Fair-price Shop	55	3.53	8	3.16
Tea Stall	7	0.45	-	-
Non-tourism	866	55.62	243	96.05
Total	1557	100	253	100

Table 5.5. Income (Rs) from various sources and percent variation during 1997 and 1998 among stakeholders in the Yuksam-Dzongri-Goechha La trekking corridor

Parameters	Stakeholders											
	S1		S2		S3		S4		S5		NS	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Tourism												
Mean	57375	87350	30555	27264	7035	7487	8281	7503	5717	5472	-	-
Median	30500	29750	29000	2667	6995	8097	7250	5833	4500	4500	-	-
Std.Dev.	83922	174518	8504	7148	2448	2502	3702	4703	4559	4436	-	-
Sum	459000	698800	825000	736120	773825	823626	132500	120050	62890	60195	-	-
% of Variation	52.24		-10.77		6.43		-9.39		-4.28		-	
Agriculture												
Mean	8400	9626	7850	8729	5777	5974	7937	8206	-	-	9544	9950
Median	8000	9980	8500	8571	5800	6457	7000	6925	-	-	7500	8754
Std.Dev.	8253	8478	5299	4144	3006	1993	4161	4478	-	-	5667	5666
Sum	58800	67380	211950	235678	618140	657189	63500	65650	-	-	906690	945295
% of Variation	14.59		11.19		6.31		3.38		-		4.25	
Service												
Mean	109000	115750	7000	8783	-	-	30000	21253	-	-	24665	25196
Median	67500	77250	9000	10500	-	-	39000	21854	-	-	24000	24000
Std.Dev.	113140	113077	6245	8063	-	-	20199	8661	-	-	14260	14499
Sum	436000	463000	21000	26350	-	-	120000	138000	-	-	641300	655100
% of Variation	6.19		25.47		-		15.00		-		2.15	
Others												
Mean	22187	25044	4644	4111	1799	1760	19512	21253	7483	7745	7018	7595
Median	17500	17500	3700	3600	1670	1905	19750	21854	6400	6500	4800	4902
Std.Dev.	20329	111240	4779	2463	955	605	8298	8661	3038	3407	9223	11706
Sum	177500	200350	116100	110990	165500	193650	312200	340043	82310	85197	501770	564986
% of Variation	12.87		-4.40		17		8.91		3.50		1259	
Total												
Mean	141412	178691	41056	41086	14164	14969	39387	41484	13200	13217	20498	21296
Median	104250	112240	42000	40360	15575	16193	32500	32775	10000	10392	14825	15650
Std.Dev.	124779	190438	12158	10920	4886	4998	23943	27370	7196	7422	15991	17694
Sum	1131300	1429530	1108514	1109328	1558009	1646553	630200	663743	145200	145392	2049760	2129600
% of Variation	26.36		0.07		5.68		-4.19		0.13		3.89	

S1=Hotel/Lodges; S2=Pack-animal Operator; S3=Porters; S4=Fair Price Shop; S5=Tea Stall; NS=Non-tourism

Table 5.6. Expenditure (Rs) in various items and percent variation during 1997 and 1998 among stakeholders in Yuksam-Dzongri-Goecha La Trekking Corridor

Parameters	Stakeholders											
	S1		S2		S3		S4		S5		NS	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Tourism related												
Mean	15354	15606	7250	6995	405	428	12559	14012	5700	5836	-	-
Median	10000	8925	7809	7000	445	463	12500	13575	4000	4000	-	-
Std.Dev.	19225	22107	2332	1981	140	143	5693	6795	3635	3925	-	-
Sum	122833	124850	210855	187509	44514	47044	200950	224191	62700	64200	-	-
% of Variation	1.64		-11.07		5.68		11.56		2.39		-	
Farming												
Mean	2800	3208	2053	2281	683	1025	2712	3040	-	-	3795	4252
Median	2667	3327	1889	2131	660	1029	3100	3500	-	-	2945	3130
Std.Dev.	2751	2826	1458	1157	237	204	1130	1246	-	-	2559	3515
Sum	19600	22460	55418	57432	56730	85092	21700	24320	-	-	379512	425160
% of Variation	14.59		3.63		49.99		12.07		-		12.02	
Food												
Mean	18850	19322	14747	13765	6641	6804	10299	10807	4004	3658	9715	10629
Median	15000	15925	14567	13402	7102	7360	10758	11452	3000	3000	7412	7825
Std.Dev.	7549	7695	3748	3392	2114	2272	3535	3526	1691	1943	6451	8789
Sum	150800	154580	398183	361859	730531	748433	164783	172915	44050	40240	971530	1062900
% of Variation	2.50		-9.12		2.45		4.93		-8.64		9.40	
Non-food												
Mean	3900	4384	4740	4419	1894	1871	3595	3906	832	862	2960	3189
Median	3750	4440	4330	4500	2000	2024	3711	4097	550	535	2224	2347
Std.Dev.	1442	1702	1127	1118	736	625	1256	1330	514	560	2034	2637
Sum	31200	35070	127986	119329	208322	205819	57521	62495	9150	9483	296009	318870
% of Variation	12.40		-6.76		-1.20		8.64		3.63		7.72	
Mislenneous												
Mean	3625	4235	2149	2034	567	599	1947	2146	591	591	1742	638
Median	3500	3550	2150	2065	623	648	1975	2125	600	600	1186	470
Std.Dev.	2048	2637	539	525	195	200	606	629	102	102	1634	527
Sum	29000	33880	58019	54928	62370	65862	31150	34332	6500	6500	174205	63774
% of Variation	16.82		-5.32		5.59		10.21		-		-63.39	
Total												
Mean	44179	46355	31498	29896	10022	10475	29756	32391	11127	10947	18212	18707
Median	41750	44353	31567	28931	10688	11467	30519	33246	8100	8135	13787	13772
Std.Dev.	25164	28700	8050	7429	3449	3680	10472	11555	5516	5979	12235	15469
Sum	353433	370840	850461	781151	1102468	1152251	476105	518253	122400	120423	1821256	1870704
% of Variation	4.92		-8.14		4.51		8.85		-1.61		2.71	

S1=Hotel/Lodges; S2=Pack-animal Operator; S3=Porters; S4=Fair Price Shop; S5=Tea Stall; NS=Non-tourism

Table 5.7. Income (Rs) from various sources and percent variation during 1997 and 1998 among stakeholders in the Khecheopalri Lake

Parameters	Stakeholders										NS	
	S1		S2		S3		S4		S5			
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Tourism												
Mean	-	-	-	-	-	-	17000	20325	7496	10080	-	-
Median	-	-	-	-	-	-	17000	20325	5000	5550	-	-
Std.Dev.	-	-	-	-	-	-	2121	6116	6218	10046	-	-
Sum	55000	86650	-	-	-	-	34000	40650	37480	50400	-	-
% of Variation	57.54		-	-	-	-	19.55		34.47		-	-
Agriculture												
Mean	-	-	-	-	-	-	9775	10150	3050	3050	9205	9319
Median	-	-	-	-	-	-	9775	10150	3050	3050	8800	8850
Std.Dev.	-	-	-	-	-	-	2510	2121	71	71	4340	4083
Sum	6500	7650	-	-	-	-	19550	20300	6100	6100	543085	549825
% of Variation	17.69		-	-	-	-	3.83		-	-	1.24	
Service												
Mean	-	-	-	-	-	-	-	-	-	-	9183	11000
Median	-	-	-	-	-	-	-	-	-	-	12000	15000
Std.Dev.	-	-	-	-	-	-	-	-	-	-	8149	9644
Sum	36000	50400	-	-	-	-	36000	42000	-	-	27500	33000
% of Variation	40		-	-	-	-	16.66		-	-	20	
Others												
Mean	-	-	-	-	-	-	925	2705	1925	2190	4864	4816
Median	-	-	-	-	-	-	925	2705	1750	2105	3725	4150
Std.Dev.	-	-	-	-	-	-	813	3330	789	606	3487	2934
Sum	1500	4300	-	-	-	-	1850	5410	7700	8760	163885	166185
% of Variation	138.88		-	-	-	-	192.43		13.76		1.40	
Total												
Mean	-	-	-	-	-	-	47300	55930	10256	13052	11477	11703
Median	-	-	-	-	-	-	47300	55930	7500	10926	10500	10750
Std.Dev.	-	-	-	-	-	-	23617	29599	7084	8550	5587	5011
Sum	89400	149000	-	-	-	-	94600	111860	51280	65260	734520	749010
% of Variation	50.50		-	-	-	-	18.24		27.26		1.97	

S1=Hotel/Lodges; S2=Pack-animal Operator; S3=Porters; S4=Fair Price Shop; S5=Tea Stall; NS=Non-tourism

Table 5.8. Expenditure (Rs) in various items and percent variation during 1997 and 1998 among stakeholders in Khecheopalri Lake

Parameters	Stakeholders											
	S1		S2		S3		S4		S5		NS	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Tourism related												
Mean	-	-	-	-	-	-	9175	11000	2630	4156	-	-
Median	-	-	-	-	-	-	9175	11000	1500	2650	-	-
Std.Dev.	-	-	-	-	-	-	3783	5657	2741	4859	-	-
Sum	25000	38580	-	-	-	-	18350	22000	13150	20780	-	-
% of Variation	54.32		-	-	-	-	19.89		58.02		-	-
Farming												
Mean	-	-	-	-	-	-	4325	5000	825	875	2850	2904
Median	-	-	-	-	-	-	4325	5000	825	875	2625	2687
Std.Dev.	-	-	-	-	-	-	1662	2121	35	106	1287	1196
Sum	2000	2250	-	-	-	-	8650	10000	1650	1750	182380	185891
% of Variation	12.50		-	-	-	-	1560		6.66		1.92	
Food												
Mean	-	-	-	-	-	-	15775	17030	4830	5140	5643	5757
Median	-	-	-	-	-	-	15775	17030	3750	4500	5250	5375
Std.Dev.	-	-	-	-	-	-	7036	6321	2885	3089	2299	2275
Sum	22000	25650	-	-	-	-	31550	34060	24150	25700	361160	368441
% of Variation	16.59		-	-	-	-	7.95		6.41		2.01	
Non-food												
Mean	-	-	-	-	-	-	5720	6250	1027	1255	1710	1743
Median	-	-	-	-	-	-	5720	6250	1050	1215	1575	1612
Std.Dev.	-	-	-	-	-	-	5487	5303	352	473	772	717
Sum	7500	8750	-	-	-	-	11440	12500	5135	6274	109428	111535
% of Variation	16.66		-	-	-	-	9.26		22.18		1.92	
Mislenneous												
Mean	-	-	-	-	-	-	3311	3375	718	730	798	813
Median	-	-	-	-	-	-	3311	3375	525	567	735	752
Std.Dev.	-	-	-	-	-	-	1653	1590	496	439	360	335
Sum	6500	6500	-	-	-	-	6622	6750	3590	3651	51066	52050
% of Variation	-		-	-	-	-	1.93		1.69		1.92	
Total												
Mean	-	-	-	-	-	-	38306	42655	9535	11411	11000	11217
Median	-	-	-	-	-	-	38306	42655	6700	7400	10185	10427
Std.Dev.	-	-	-	-	-	-	16297	16751	6620	8835	4707	4515
Sum	63000	81730	-	-	-	-	76612	85310	47674	57055	704034	717916
% of Variation	29.73		-	-	-	-	11.35		19.67		1.97	

S1=Hotel/Lodges; S2=Pack-animal Operator; S3=Porters; S4=Fair Price Shop; S5=Tea Stall; NS=Non-tourism

Table 5.9. Average daily food calorie supply at the study sites during 1997 and 1998

Food-items	Yuksam-Dzongri-Goechha La Corridor				Khecheopalri Lake			
	Kcal per person per day							
	Tourism		Non-Tourism		Tourism		Non-Tourism	
	1997	1998	1997	1998	1997	1998	1997	1998
Cereals	1112.16	1126.00	1123.20	1153.20	1108.20	1128.00	1118.40	1140.00
Pulses	64.28	57.72	63.32	65.60	63.41	78.72	32.80	32.80
Leafy Vegetables	41.40	43.40	47.00	50.00	40.00	46.66	42.00	48.00
Other Vegetables	34.20	33.80	28.00	25.00	29.66	34.33	15.00	20.00
Root and Tubers	26.22	33.06	28.50	33.25	32.61	41.48	98.40	158.76
Milk Products	162.73	158.47	127.80	127.80	224.83	253.23	71.00	92.30
Fat & Oils	210.60	210.90	180.00	198.00	147.00	195.00	90.00	135.00
Sugar & Jaggery	85.42	80.13	79.38	86.94	74.34	83.16	37.80	49.14
Meat	126.96	137.44	87.30	87.30	101.95	126.23	87.39	110.69
Grand Total	1877.97	1880.92	1764.50	1827.09	1822.00	1986.81	1592.79	1786.69

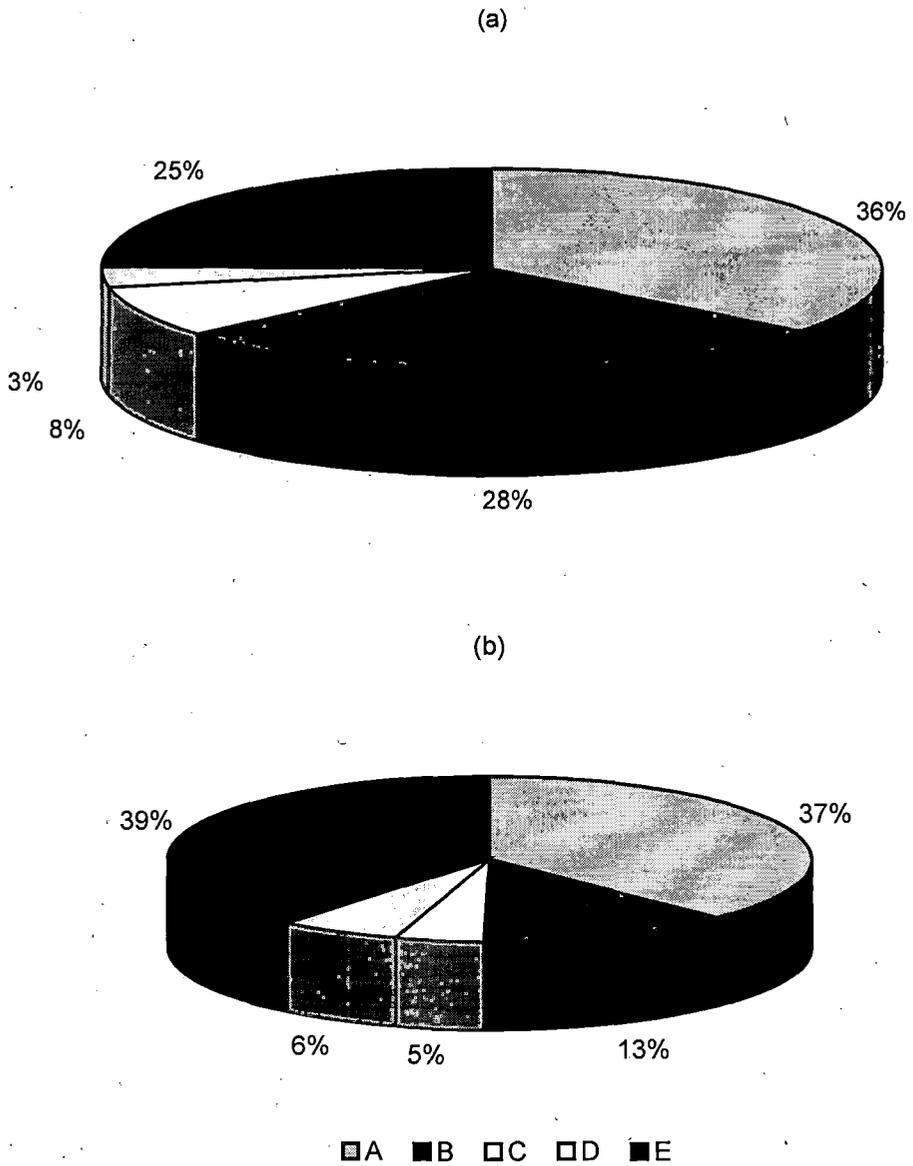


Fig. 5.1 Land utilization pattern of study area (a) Yuksam and (b) Khecheopalri villages, 1997

A-Net area shown; B-Fallow Land; C-Other cultivated land excluding fallow land; D-Area not available for cultivation; E-Forest

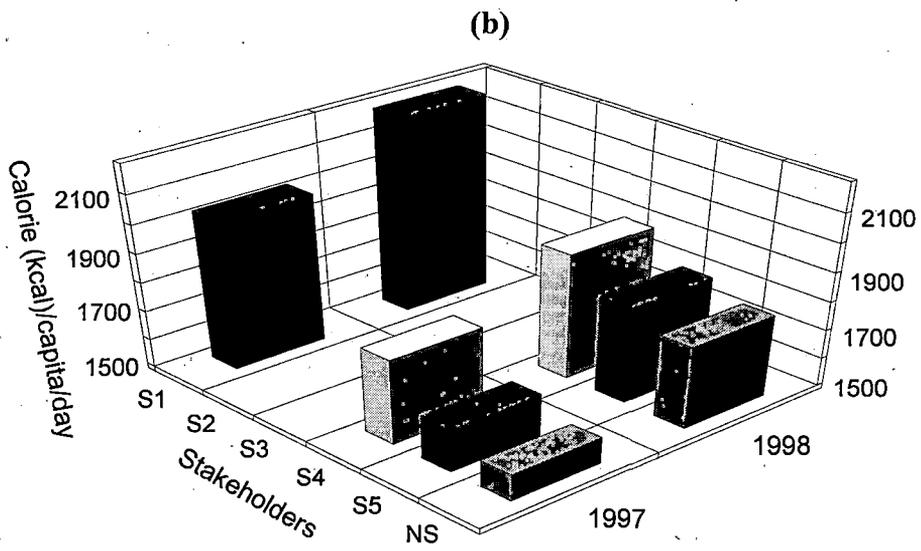
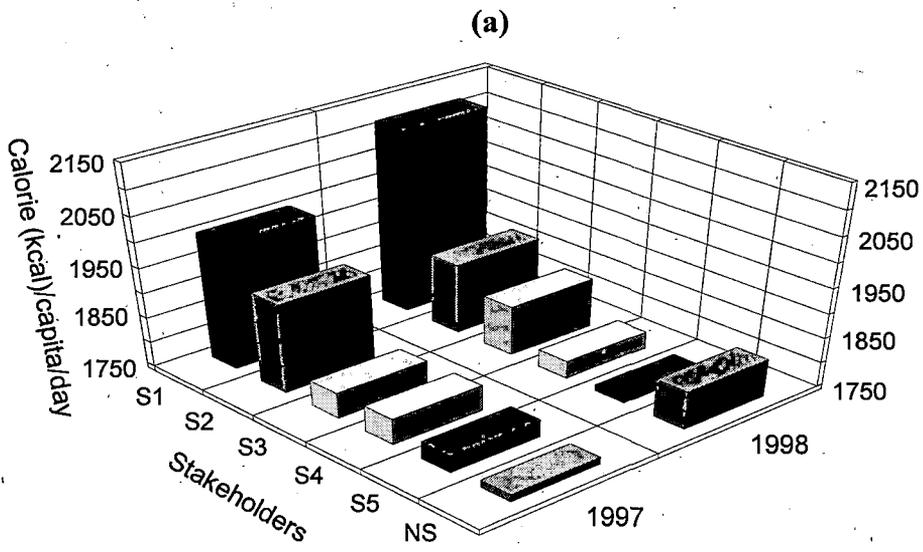


Fig. 5.2. Variation in calorie intake by different stakeholders in (a) Yuksam-Dzongri-Gochha La trekking corridor and (b) Khecheopalri Lake

S1=Hotel/Lodges; S2=Pack-animal Operator; S3=Porter; S4=Fair-price Shop; S5=Tea Stall and NS=Non-tourism families

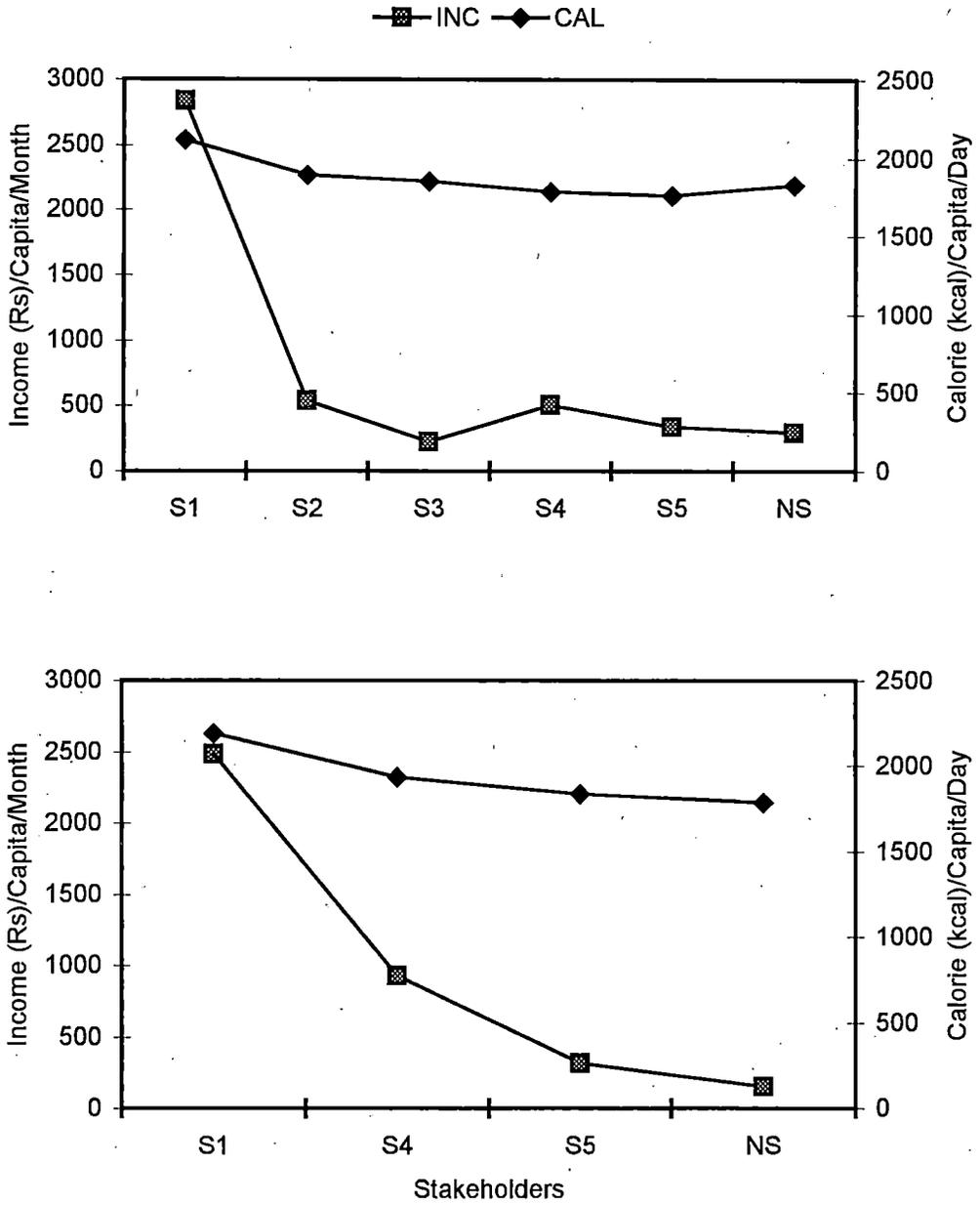


Fig. 5.3. Calories (kcal)/Capita/Day and income (Rs) level per Capita/Month in (a) Yuksam-Dzongri-Gochha La trekking corridor and (b) Khecheopalri Lake by stakeholders

S1=Hotel/Lodges; S2=Pack-animal Operators; S3=Porters; S4=Fair price shop; S5=Tea

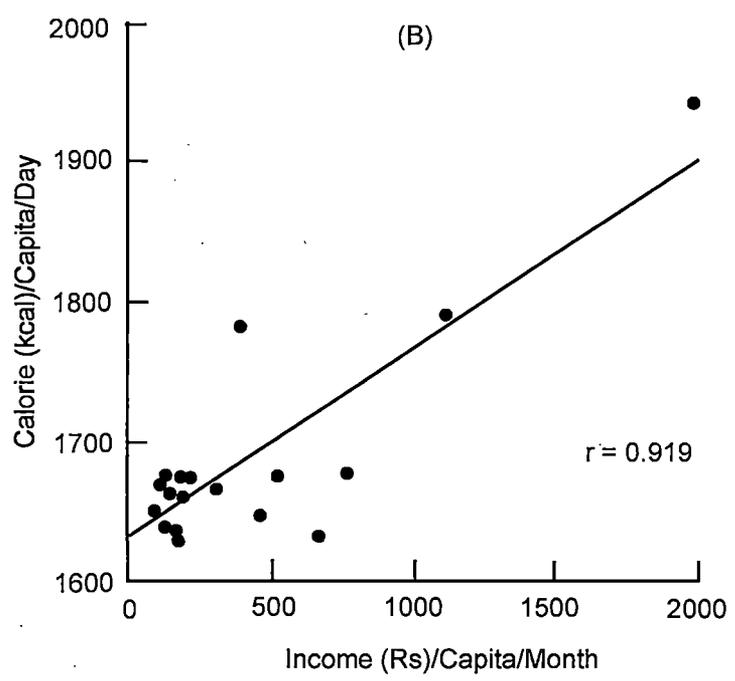
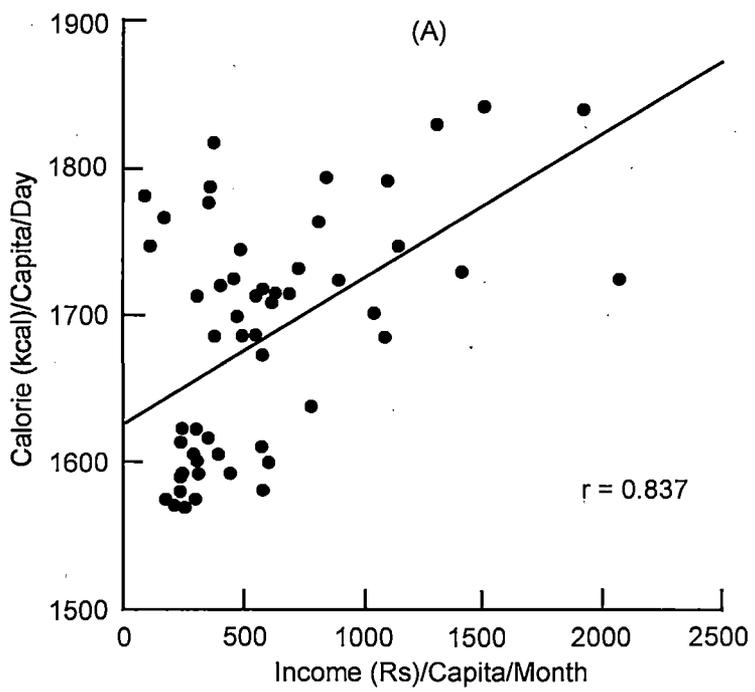


Fig. 5.4. Relationship between income per capita and absolute consumption in (A) Yuksam-Dzongri-Gochha La trekking corridor and (B) Khecheopalri Lake

CHAPTER - VI

Chapter VI

ECONOMIC EVALUATION OF ENVIRONMENTAL DAMAGE TO NATURAL ECOSYSTEMS

Introduction

The fast growing population and visitors number has increased tremendous pressure on the forests. Over the last three decades, there has been growing debate on the effects of tourism in developing countries. Mountaineering and trekking have recently inflicted adverse impacts on environment of high altitude areas (Jeffries 1982; Pawson *et al.* 1984; Karan & Mather 1985; Banskota & Upadhyay 1991; Zurick 1992; and Rai & Sundriyal 1997). The over used of forest resources has led to environmental threats to the Hindu-Kush Himalayan region (Thapa & Weber 1990; Willis & Garrod 1991 and Singh & Singh 1992). Dependence of fuel wood for energy is causing serious deforestation problem in national parks and protected areas of the Himalaya. National parks, wilderness and other protected natural areas represent efforts to preserve our natural heritage from further exploitation. Such areas also provide greater recreational opportunities. Protected areas of biodiversity interest provide a variety of benefits and services, which are essential for the economic development of a region.

Monetary valuation of any natural ecosystem is very difficult (Bergstron *et al.* 1990 and Dixon *et al.* 1994). In past, these areas were

valued only for products such as Timber, fuel, fodder and non-timber forest produce. Intangible benefits of these areas have not been properly accounted by the policy-makers while implementing development programs in developing countries. However, in developed countries, economic valuations of natural resources have been used in conservation and management of protected areas (Pearce *et al.* 1994 and Wilson & Carpenter 1999). Contingent valuation methods are widely applied in estimating the economic value of both marketed and non-marketed goods (Brookshire *et al.* 1983; Majid *et al.* 1983; Walsh *et al.* 1986 and Dixon & Sherman 1990).

The present chapter particularly deals with the quantitative assessment of current forest and other land-use, fuel, fodder and timber consumption pattern, impact of resource extraction on trail and Lake health. Economic valuation of the biologically rich forests of trekking corridor and lake site and valuing recreational/sacredness benefits of lake applying economic model of travel cost and contingent valuation methods. The estimation can prove useful for the added costs of fuel wood, fodder, and timber management prescriptions needed to protect critical habitats of Sikkim Himalaya. An attempt has also been made to demonstrate the practicality of developing WTP functions for managers in estimating the benefits of other environmental values of forests, such as soil erosion and recreation.

6.1 Methods

6.1.1 Analysis of forest and other land-use/covers

Satellite imagery (1: 50000), IRS-IA/IB, LISS-II and IRS-IC, FCC of bands 2, 3 and 4 were interpreted for forest cover and other land-use/cover map of the Yuksam-Dzongri-Goechha La Corridor and Sacred Khecheopalri lake employing a photo interpretation techniques for the year 1988 and 1997, in conjunction with the Survey of India topographical maps (1: 50000). Intensive field investigations were carried out to check the land-use/ cover for ground truth verification. Areas of different forest types and other land-use categories were quantified using digital planimeter.

6.1.2 Extraction of forest products

The study is based on a detailed primary survey conducted in 1997 and 1998. The firewood used and extraction of species by different stakeholders was based on a detailed survey. The samples were selected from different stakeholders using stratified random sampling method. A total of 129 stakeholders in Yuksam-Dzongri-Goechha La trekking corridor consisting of 39 households from the local communities, followed by 5 hotel/lodges, 2 groups (127 trainees and 37 staff members) of HMI trainees, 8 travel agents, 45 FIT's, 6 pack animal operators and 24 number of porters. A total of 15 stakeholders from sacred Khecheopalri lake involving 10 households from local community,

followed by 1 trekker hut and 4 tea /grocery shops. To provide proportionate representation to every socio-economic segment, the community households were stratified on the basis of the size of land holding, income status, ethnicity and caste reflecting social status. Stakeholder wise fuel wood consumption per day in each season (summer, monsoon and winter), supply of fuel wood from different sources, time taken and distance covered in fuel wood collection were collected through questionnaire survey.

The questionnaire is the most widely adopted method for gathering data on collection and consumption quantities of fuel wood. The wide use of questionnaires is probably due to the limitation of time, resources and logistic facilities (Uma Shanker *et al.* 1998). Although extensively used, the questionnaire method generates highly biased data, because most of the respondents do not give accurate information due to lack of interest, inadequate knowledge of the subject, and intentional distortion of information. Inadequate knowledge of quantities might also lead to incorrect reporting (Malhotra *et al.* 1991). However, the questionnaire method is useful for a rapid assessment and to collect qualitative information such as the names of species used for fuel wood. To avoid the biases, estimation of the actual quantity of fuel wood requirement/consumption by each stakeholder was worked out on the basis of personal observation over a period of 24 hours by adopting a

weight survey method. Simultaneously observations were also made in each sample to quantify fuel wood use for various tasks such as cooking, water heating and other purposes. During the survey the interviewer visited each sample stakeholder and requested the head person of the family to monitor the amount of fuel wood that would be burnt during that particular day. The wood was weighed by spring balance and then left in the kitchen (30 kg wood bundle) of each stakeholder with instruction to burn wood only from the given bundle. On the next day, interviewer returned to each sample household, the remaining wood was weighed and deducted from the original bundle to calculate the actual consumption per day. Time spent for fuel wood collection was noted when the members of the households went to the forests. People's response to the resource pressure faced by them, considered to be the most accurate indicators of fuel shortage, were used to examine the severity of the fuel wood problem.

The quantification of biomass utilization was focused on the stall-fed fodder consumption. The magnitude of this is important because this is closely linked and represents the primary direct removal of biomass from forest. Fodder demand was estimated through out the year. This was done by means of a survey of head-loads (weight and composition) collected on a daily basis by each household on both the sites.

Participatory Rural Appraisal (PRA) techniques were also used to collect the information of preferred species for fuel, fodder and timber, through group and key informant discussion. The estimates of the average amount of each forest product collected give some indication of the total volume of non-timber forest product (NTFP). People's response to the resource pressure faced by them, considered to be the most accurate indicators of resource shortage and were used to examine the severity of the problem.

6.1.3 Trail and lake site erosion

Trail erosion, refers specifically to assessments of processes and consequences of soil erosion on the trail tread and lake. Soil loss is particularly important because it is not self-limiting, unlike many other forms of trail impact. Entire trail and Lake site has been visited to select the observation sites. First, assessment was made for trail surface conditions at a sampling point including trail width, evaluate forest cover changes and composition. Stratified point sampling is the most common trail erosion survey due to its simplicity of implementation was followed (Hall & Kuss 1989). The trail side erosion along Yuksam-Dzongri-Goechha La corridor were measured from 5 experimental plots along altitudinal gradients considering slope, aspects, forest density and 12 experimental plots under different land-use/cover combinations in the lake watershed during 1997 and 1998 on three monsoon (pre-monsoon,

mid-monsoon and post-monsoon) season. These were estimated using natural shallow surface runoff channels and artificially delineated plots (Singh *et al.* 1983 and Rai & Sharma 1998). The delineated plot size was 10×3m for estimation of overland flow and soil loss. These plots were bounded with aluminum sheets (6 cm. inserted in the soil and remaining 15 cm. exposed in air) on all side to prevent water from entering from adjacent areas. The plots were located on slopes ranging from 15⁰ to 45⁰. The overland flow and soil losses along the slope were estimated from the collecting tank after each rainfall event. The eroded soils were sampled in the form of sediment settled at the bottom of the collecting tank and as suspended clay material.

6.1.4 Economic valuation

Several methods are available to evaluate the recreational/sacredness value of natural ecosystems. In this study, two independent methods for valuation of environmental goods, the Travel Cost Method (TCM) and the Contingent Valuation Method (CVM) were used. Both methods have been recommended as providing acceptable economic measures of the social benefits of recreational activities for both use and non-use values (Walsh 1986; Navrud 1992 and Cordell & Bergstrom 1993). The other method used in this type of assessment is cost-benefit analysis (Ableson 1979; Kneese 1984 and Haneley & Spash

1993), but it has a long controversial history (Hufschmidt *et al.* 1983). Several models from each of the methods were constructed.

6.1.4.1 Sampling design and data source

The study was based on a random survey of 545 respondents, consisting of 125 domestic visitors, 325 foreign visitors and 95 local community members from Yuksam-Dzongri-Goechha La trekking corridor, and 360 respondents from Khecheopalri lake site, consisting of 50 members of the local community, 140 pilgrims (from within Sikkim), 95 domestic and 75 foreign visitors in 1997-98. Categories of respondents were the international tourists termed as foreign, the Indian tourists as domestic and the people living in the area as local community. Out of the total only respondents 243 (31 local people, 50 domestic visitors and 162 foreign visitors) in trekking corridor and 180 respondents (20 community members, followed by 34 domestic visitors, 51 foreign visitors and 75 pilgrims) showed their willingness-to-pay (WTP) for conservation and protection of the trekking corridor and lake, while others refused. Travel costs incurred by individuals in visiting the lake were estimated using a sample of 140 pilgrims, who completed travel expense information. The interviews were conducted through a structured questionnaire (Bishop & Heborlein 1992 and Arrow *et al.* 1993) over a period of six months (March to May and October to December), corresponding with two peak tourist seasons. The sampling was random and took place at different

times of a day and during all days of the week to ensure a representative sample. At the outset, the interviewer introduced herself to the respondent. Respondents were told about the nature of the work and assured that responses were to be used for research purposes, that their co-operation to this effort was sought, and confidentiality would be maintained. A brochure containing general information about the KNP and lake and about some of the environmentally sensitive issues of both the sites were facing was presented at a specific point in the course of the interview. Hence, all respondents were brought to a minimum level of information about the benefits of preserving and maintaining the sites. This would perhaps act to counter social and peer desirability bias. Face-to-face interviews (Arrow *et al.* 1993) were conducted at both the sites and lasted 30 minutes on an average. Adult visitors, who had a defined source of income, were only interviewed because they were considered to be more realistic in making personal valuations of their recreational/sacredness experiences at trekking corridor and lake sites vis-à-vis their budget constraints (Brown & Henry 1989). The visitor statistics provided information on socio-economic variables like age, sex, educational level, occupation and income.

6.1.4.2 Travel cost method

The Travel Cost Method (TCM) has been widely used in valuing freshwater ecosystems (Caulkins *et al.* 1986 and Dixon *et al.* 1994). It is

an indirect valuation method where visitors' travel costs to a recreational area are used as a proxy for the price of the recreational activity, together with participation rates and visitor attributes to estimate the recreational value of the site. Variations in travel costs and visitation rate can then be used to estimate a demand curve, which is used to compute the consumer surplus of the activity, i.e., the recreational value. The demand curve establishes a function between the price of a good (travel cost) and the quantity of the good consumed (number of visits). It is usually downward sloping because at higher prices, fewer people will visit, while at lower prices, the number of visitors is greater. The consumer surplus or area under the demand curve but above the price, is a measure of the sacredness value of Khecheopalri Lake. Pilgrims and domestic and foreign visitors were distinguished in order to distinguish the pilgrims, who were on single destination trip to the lake. Outside visitors to Sikkim usually undertake multiple destination trips, which include Khecheopalri Lake. Therefore, this part of the analysis focused only on the recreational/sacredness value of local pilgrims. This model provides an estimate of the benefits individuals receive from visiting a site by observing their travel related expenses (Clawson & Knetsch 1966; Krutilla & Fisher 1975; Dixon & Sherman 1991 and Freeman 1993).

Based on the theoretical models, questionnaires were prepared and administered to visitors to the lake. The respondents were asked about the

cost of the current trip to the lake site, the process for deciding about trip destinations, and a series of socio-demographic and economic questions. In addition, a trip diary was developed which elicited detailed itinerary, cost, time and quality information for the current trip to the lake. The travel cost to the lake, distance, household income and other socio-economic variables (age, sex, education and density) were included as independent variables in regression models, which were developed at the zone level based on individual visitor's responses. The travel cost method measures the demand function for visit to a site. A demand function is an empirical relationship between the price of a good and quantity purchased:

$$V_i = f(P_i, X) \quad (1)$$

Where V_i = visitation rate of the i^{th} population from each zone that is estimated by dividing the number of visits from the respective zone by the zone population; P_i = cost of visiting the site from the zone; X = set of socio-economic variables which might shift the demand function, such as income or age.

On the basis of the above demand function (Equation 1), we developed two equations to estimate the demand curve considering travel cost (T) and distance (D), as other variables such as age, literacy, income and density were not significant factors in visitation rate. Distance between the place of origin and destination was derived from the state

motor vehicle department, government of Sikkim. Distance was converted into currency by taking the fare rates. The average value in currency for kilometer distance was estimated for calculating the travel cost:

$$V = f(T, D) \quad (2)$$

$$V = f(T) \quad (3)$$

The linear specification of the above function is:

$$V = \alpha_0 + \alpha_1 T + \alpha_2 D + e \quad (4)$$

where α = parameters; e = error term which is independent and normally distributed.

Regression analysis was used to estimate the parameters for deriving the equation. The consumer surplus value is the willingness-to-pay over and above the price of the trip by the consumer. This is illustrated in Figure 6.1. T_m V_m is the travel cost demand curve. T_m is the maximum travel cost where the visitation rate drops to zero. V_m is the maximum visitation rate where the travel cost is equal to zero. If T_i is the travel cost for the visitors from the i th population zone, V_i will be the corresponding visitation rate. The net benefit is the consumer surplus, which is the additional utility over and above the consumer expenditure (cost) on travel to reach the site. This is, the area below the demand curve and above the price of the trip. In the figure, CS (i) (the shaded portion) is

the consumer surplus for the visitors from i^{th} population zone.

Mathematically, the consumer surplus value [CS (i)] can be estimated as:

$$CS (i) = \int_{T_i}^{T_m} V_i dT \quad (5)$$

Where, V_i = visitation rate from the i^{th} population zone, T_i = actual travel cost from the i^{th} population zone, and T_m = maximum travel cost the visitors willing to pay.

The recreational value of the entire site was achieved by summing up the consumer surplus estimates from all observed users. The total annual consumer surplus (ACS) of the recreation at a site across all the zones was:

$$ACS = \sum_{i=1}^N CS \quad (6)$$

where N = the number of surrounding population zones selected for the study.

The annual consumer surplus (ACS) for the pilgrims was estimated using the real rate of interest for corresponding period; the rate was calculated as the difference between the lending rate of interest of the Reserve Bank of India and the rate of inflation for the year 1997-98. Therefore, the present value of the ACS can be calculated by:

$$PV = ACS/r \quad (7)$$

If the effect of inflation is considered, the real rate of interest (r^*) has to be taken instead of the social rate of discount (r).

Therefore,

$$PV = ACS/r^* \quad (8)$$

6.1.4.3 The contingent valuation method

The contingent valuation method (CVM) attempts to value non-market goods by asking people directly for their willingness-to-pay to obtain specified improvements or to avoid decrements in them, using social scientific survey techniques (Heberlein 1988; Bishop & Heberlein 1992 and Arrow *et al.* 1993). The CVM uses a questionnaire or survey to create a hypothetical market or referendum, and then allows the respondent to use it to state or reveal his or her WTP for recreation, option, existence and bequest values (Mitchell & Carson 1989 and Mullarkey & Bishop 1995). The CVM survey tended to address a greater diversity of lake and terrestrial ecosystem issues. The main concern in using the WTP technique was with the validity of responses; specifically, would the respondents actually pay the money they agreed to pay in survey?

The contingent valuation method (CVM) remains the subject of heated debate within the non-market valuation literature due to hypothetical nature of markets (Hanemann 1994), and its susceptibility to biases (Cummings *et al.* 1986; Mitchell & Carson 1989 and Freeman

1993). Attempts have been made to minimize the biases in order to get a reliable estimate of economic value of recreation. One of the most important potential biases of CVM is scenario misspecification, especially on the amenity to be valued. This is a serious bias in estimating non-use values. In the present study, the bias should have been minimal for use values. Response was taken only when visitors were familiar with the non-use goods after visiting the trekking corridor and the lake. In-person interviews were initiated by informing respondents about the work and background of the Sikkim Biodiversity and Ecotourism project. Respondents were told about the nature of the project. The nature of the interview was explained, and the issue of the trekking corridor and Khecheopalri Lake were introduced. The respondents were also assured that responses were to be used for research purposes, that their cooperation to this effort was sought, and confidentiality would be maintained. The latter would perhaps act to counter social and peer-desirability bias. Face-to-face interviews secure a high response rate as to other survey techniques. People did their best to give an honest answer to the CV questions. In CV exercise, we adopted a double bounded dichotomous choice (DBDC) formulation, as it is more information intensive (Hanemann *et al.* 1991). First, the respondents were asked whether they were willing to pay for the non-market commodity benefits after being given proper information about the commodity. If the answer

was 'no', the process ended there with that particular respondent. If the answer was 'yes', then the second step was to determine the maximum amount he/she was willing to pay. The maximum willingness to pay was determined by the bidding process. The interviewer started the bidding by a particular amount. If it was above his willingness-to-pay, the interviewer reduced the bid gradually until the answer was 'yes' and the value was recorded. If the respondent agreed to the interviewer's initial bidding amount, the interviewer gradually raised the bid until the respondent said 'no'. Respondents who showed inability to pay in cash were considered for willingness to actually do service in the trekking corridor and lake. These respondents were asked if they were willing to contribute their time towards the maintenance of the sites. This provided an opportunity for those who could not pay but had the willingness to actually do service. Respondents were also asked how many days per year they would be willing to voluntary work in the park and Lake site.

Socio-economic details were also collected for regression purposes. Apart from name and addresses, information on age, education, occupation and annual income from all sources were also collected. An attempt was also made to establish the importance of environmental issues perceived by the respondents, and to measure whether or not the respondent demonstrated implicit value for the environment and non-use values. Contained questions about the environmental attitudes of the

respondents e.g., how they will give rank for the justification of biodiversity loss, its avoidance and reasons for visiting to Yuksam-Dzongri-Goechha La trekking corridor and Khecheopalri lake site. These preferences were measured on a five-point scale ranging from "strongly agreed", "agreed", "neutral", "disagreed" to "strongly disagreed".

Community based household information was collected by primary survey using stratified random sampling. Statistical analysis was done using Systat Version 6.0 (1996) considering all the responses including those who protested the bid.

6.2 Forest Cover and Density

The five class I land-uses, were identified occurring in both the sites (Table 6.1). A total of 84% and 77% of the lake and trekking corridor area had forests. The forest cover was divided in to conifer-rhododendron, mixed-broad leaf, and rhododendron, alpine scrub and forest blanks. These forests were most predominant in the trail corridor (Table 6.1 & Plate 2c & 2d). Majority (34%) of the forestland was under degraded category (crown Cover, 20%), 19% open forest (crown cover (21-40%)) and 19% dense (crown cover > 40%), whereas in Khecheopalri lake site it is dominated by open mixed forest (41%), followed by dense mixed (23%) and degraded forest (21%) (Table 6.1).

Agriculture was the predominant non-forest land-use, occupying about 14% of the total area in trekking corridor and 13% in lake site.

About 3% and 1% area fall under wasteland category (rock outcrop and landslide). In case of the lake area, major changes were recorded in the form of bog area expansion (Table 6.1). In 1963 the bog was 3.4 ha that increased to 7 ha in 1997 (Jain *et al.* 2000).

The Conversion of dense mixed forest to open mixed forest and than to degraded forests has been mainly attributed to fuel wood and timber extraction, fodder collection and grazing. Agriculture land expansion in the lake watershed had a major impact on the health of the lake through increased sediment deposition.

6.3 Resource Utilization Pattern

Forest human interaction is an age-old phenomenon for the livelihood of people. The high demand of firewood, fodder and timber provides threats to the forest in surrounding area. Chopping and lopping of highly preserved tree species for firewood, fodder and timber has made tremendous pressure on some selective species. For this, attention was focused on the fuel wood, fodder and timber flows. The magnitudes of these flows are particularly important because they are closely linked and represent the direct removal of biomass from the forests.

6.3.1 Fuel wood consumption

Consumption rate of 24 kg/day was estimated for each household in the area during 1997-98. Consumption of the commercial alternative source of energy, i.e., kerosene and LPG (14% and 3%, respectively) was

insignificant. There was no evidence of non-conventional sources of energy being used by any of the stakeholders. Fuel wood consumption by the different stakeholders is presented in Table 6.2. Domestic cooking is the major consumer of fuel wood. Consumption ranges from a maximum 2264 Mg yr⁻¹ by community and lowest 1.02 Mg yr⁻¹ by pack animal operators. On an average the hotel/lodges consumed about 40 to 50 kg of fuel wood per day. A large quantity (240 kg/day/group) of fuel wood was used by HMI during training period for cooking and other purposes. The porters burn about 2 kg fuel wood per day during trek for cooking and water heating.

Annual (394 Mg) fuel wood consumption for water heating and other purposes was low compared to cooking (Table 6.2). When consumption for cooking, water heating, and other purposes was pooled, the fuel wood required was 2264 Mg yr⁻¹ for community, 101 Mg yr⁻¹ by hotel/lodges, 45 Mg yr⁻¹ by HMI and 26 Mg yr⁻¹ by other stakeholders (Table 6.2). Seasonal differences in firewood use were attributed to colder weather in winter, followed by rainy and lowest were recorded in summer season (Table 6.3). The annual consumption was thus 1222, 814 and 400 Mg respectively in winter, rainy and summer season.

The survey indicates that fuel wood is the most important forest products collected (Table 6.2 & Plate 2e) by users. The average household collects about 2433 Mg yr⁻¹ in Yuksam-Dzongri-Goechha La

corridor and 1126 Mg yr⁻¹ Khecheopalri Lake site or about Rs 3046259 (US\$ 74299) and Rs 1407478 (US\$ 34329) worth of firewood per year. The total value of collected firewood in both the sites are Rs 4535748 (US\$110628) yr⁻¹ (Table 6.2).

Based on assumption that the consumption quantity corresponds to the collection quantity, the total fuel wood consumption calculated earlier could be regarded as the demand or pressure on the forests. If the demand per day (7 Mg) is divided by the total area of the trail (3709 ha) and multiplied by 365, an annual pressure is of 0.68 Mg fuel wood on each hectare forestland. The assumption underlying this calculation is that all the fuel wood required in the area is supplied from the forest alone.

Fuel wood demand by communities and tourism related activities in the mountains are believed to have considerable impact in the forests and wildlife (Bjonness 1980; Byers 1986 and Banskota & Sharma 1994). The demand for forest wood for fire in KNP trekking corridor appears to be at the first instance less (2434 Mg) than the net wood production (21769 Mg). However, the gap between demand and supply is not in fact so small for the following reason. First, the people in the surroundings of the forest area tend to collect fuel wood repeatedly from the same patches of the forestland. The forest cover in close proximity to the settlement and camping sites experience maximum pressure. As the supply decline near by the people walk further and further into the forest widening the

area of impacted zone. The second factor that has put pressure is the selective use of species of choice for fuel. In recent years quality fuel wood trees have become sparse. Now, the quality of fuel wood used is poor and the shortage of good quality has led to widespread switching over to inferior quality fuel wood. The distance covered and time devoted to fuel wood collection from surrounding forests are widely used indicators of fuel wood scarcity. High pressure was observed in Monastery forest at Dubdi (39%) followed by KNP trail (22%), Goucharan (21%) and trail outside KNP (18%) (Table 6.4). It is apparent that if the harvested quantity exceeds the production capacity, one would not lose the growing stock but also biodiversity. The wood for fuel is derived from live, dead and damaged trees and woody shrubs. The large scale felling of trees and shrubs along the trek route and campsite is accelerating the degradation process. Forest is depleted, leading to erosion of topsoil and disturbing the ecology of the area. The drudgery associated with fuel wood collection is generally recognized from many parts of India (Guller 1982; Agarwal 1989 and Sharma 1993) and other developing countries (Soussan *et al.* 1991).

The settlements that depend on firewood from the KNP corridor and other forests are given in Table 6.5. The total consumption of fuel wood is estimated to be 1223 Mg yr⁻¹ in the KNP corridor and 1141 Mg

yr⁻¹ on other forests. Thus the total consumption of fuel wood in and around the KNP is estimated to be 2434 Mg yr⁻¹.

The choice of fuel wood species has now changed from *Castanopsis* spp.(Katus), and *Quercus* spp. (Book and Phalant) to *Alnus nepalensis* (Utish), *Engelhardia spicata* (Mahuwa), *Symplocos theifolia* (Kharane), and many shrub species, due to indiscriminate felling of preferred species. At Dzungri, rhododendron bushes are cut for fire wood purposes. The major impacts on forests are found in the areas of traditional settlements. Forests within about 3 km of Yuksam village have been degraded as a result of fuel wood collection and tree felling. Pair-wise ranking of species used as fuel wood along Yuksam-Dzungri-Gochella corridor is presented in Table 6.6.

6.3.2. Species under pressure

An inventory of species used for fuel wood at low and high altitudes showed that the trees surrounding the village vicinity, irrespective of species, have the maximum pressure of fuel wood extraction. Nevertheless, certain species are preferred over others for fuel use because of their better amount of heat. *Quercus lamellosa*, *Schima wallichii*, *Eurya acuminata*, and *Cedrela toona* are the most preferred species at low altitude. At high altitude, *Rhododendron* spp., *Quercus lineata*, *Quercus lamellosa*, *Betula alnoides*, and *Magnolia* spp. are the preferred firewood species. But the availability of these preferred species

in the forest is on tremendous pressure (Table 6.6). At Tshoka where a major portion of fuel wood consumers are the Tibetan refugees, tourists and HMI trainees form a fairly large portion of fuel wood resource user groups. Still many species from natural forests especially *Rhododendron arboreum*, *R. barbatum*, *Magnolia* spp. are felled for fuel use.

6.3.3 Fodder utilization

Animal husbandries in both the sites are mainly dependent on the surrounding forests (Plate 2f). This dependence and structured biomass utilization are outlined in Table 6.7. These forests are heavily lopped along the trail route and margins of the settlements. The grazing pressure of cattle and Yaks/Dzos are seasonal and more prominent in the study sites (Plate 3a & 3b). During the past five years an emphasis was given in Yak/Dzo rearing. The livestock populations of Yuksam-Dzongri-Goechha La corridor have increased from 1530 in 1996 to 1708 in 1998. The Yak/Dzo and cattle need about 33 kg. of green fodder per day, and a sheep needs about 15 kg per day. Average fodder collection per household is 22 Mg yr⁻¹ at both the sites. The annual consumption was thus 13092 Mg yr⁻¹ and 2193 Mg yr⁻¹ respectively in Yuksam and Khecheoplri Lake site.

The livestock that depend on fodder from the KNP and Lake site are given in Table 6.7. The total consumption of fodder is estimated to be 20728 kg/day in the corridor forests. Pairwise ranking of fodder species

along the Yuksam-Dzongri-Goechha La corridor and Khecheopalri Lake are presented in Table 6.8. Nebara, Kanyu, Gagoon, Dudhilo were the most preferred species because these species are highly nutritious. The other species such as Amliso, Asaray, Pipli are less preferred in both the sites. Major portion (60%) of the fodder demand is fulfilled mainly by forests and 40% from agricultural fields.

6.3.4 Timber utilization

A detailed survey in the surrounding villages of both the sites revealed that a large number of woody species are utilized for different purposes, in house construction and in making agricultural implements (Table 6.9). Nearly 21 different woody species were listed as highly preferred by the villagers in both the sites (Table 6.10). Most of these species are collected from the surrounding forests. Okhar is highly preferred timber species but now is not available because of high extraction. The other preferred species are Chanp, Bajrant and Katus. The least preferred species for timber purposes are Dhuppi, and Uttis.

Family fragmentation in every 20-25 years leads mostly to construction of many new houses and almost all houses are made of wood. A survey of households in the villages of Yuksam and Khecheopalri lake showed that a double-storied building/lodges needs about 600 to 700 ft³ wood. The Government of Sikkim has restricted felling of trees for construction of lodges and the houses, however, huge

amounts of timber are still being used. Generally large timber poles are harvested for making ceilings, doors, windows and beams. Medium size poles are used for furniture and their repair. Small size poles (mainly bamboos) are cut for making cattle sheds or temporary huts (Table 6.9).

Despite the large area of relatively unutilized forests available in both the sites, there is ample evidence of long term degradation. In general, the condition of the forest varies with altitude (distance from the village) and aspects. The forest surrounding the settlements is most degraded. Similar concentric circles of degraded forests surround the villages in other portion of the Indian Himalaya (Pandey and Singh 1984).

6.3.5 Overland flow and soil loss

Water runoff (% of rainfall) was highest in trekking corridor (6.57%) and lowest in the alpine pasture (2.44%). Soil loss was also recorded greatest in the trekking corridor (Table 6.11 & Plate 3c) in Yuksam-Dzongri-Goechha La corridor. The runoff was recorded greatest in wasteland (4.8%) and smallest in cardamom based agroforestry (1.8%). Soil loss was highest in the cropped area while it was lowest in the cardamom based agroforestry system in the Khecheopalri lake area. The overland flow and the soil loss in the large cardamom based agroforestry system were less because of good tree canopy and understory thick large cardamom bush coverage. The total soil loss from the lake watershed was

502 Mg km⁻² yr⁻¹. Soil deposition in the lake was 141 Mg yr⁻¹. The increase in heavily laden pack animals in the trail caused soil erosion.

6.3.6 Solid waste

Garbage has been an ongoing concern for many years in the Yuksam-Dzongri-Goechha La corridor and Lake site. Since 1980, KNP regulations have required mountaineering training and trekking groups to pack out their wastes, but very few groups have complied with. The result has been a continuing accumulation of trash on the route up to Goechha La and HMI base camp and surrounding the sacred lake area. The increasing proliferation of plastic, metals and glasses has been exacerbated not only by careless disposal of trash but also by the increased non-biodegradable, garbage being generated by Khanchendzonga Conservation Committee a village based NGO. The garbage dumps at base camp have become dangerous (Plate 3d). Tourism waste has continued to be an eyesore along the trekking corridor. Garbage dumps induced by tourism have high visibility and raise immediate concern both from the tourists as well as from the host community. In 1996, Khanchendzonga Conservation Committee organized a clean up campaign of the trekking corridor and they collected huge amount of litters i.e., 50 kg. of plastic bags, 100 kg. of empty cans and 100 kg. of bottles during fall season.

6.4 Economic valuation

6.4.1 Socio-economic analysis

(i) *Yuksam-Dzongri-Goechha La trekking corridor*

The preliminary findings and summary statistics of the samples of 545 respondents are presented in Table 6.12. In the case of local community members the sample had a mean age of 36 years, with respondents ranging from 20 to 55 years of age. More than 90% of the samples consisted of male respondents. The mean household size was 5 members and ranged from 2 to 9 members. As far as domestic visitors were concerned, mean age was 33, with respondents ranging from 19 to 65 years of age. The foreign visitors mean age was 39, ranging from 20 to 67 years of age. With respect to educational qualification of the local communities, 15% of the respondents were illiterates and 23% had less than 10 years of schooling. About 34% of the respondents had obtained high school, 9% higher secondary and 19% had a bachelor's degree. The educational qualification of domestic visitors showed that 9% were master degree holders, 81% bachelor degree holders and 10% had higher secondary education. In the case of foreign visitors, 25% respondents had master degree, 60% bachelor degree and 15% had a higher secondary education.

Occupation of local community members showed 31% respondents are from service sector, 32% are from farming and off-farm activities, 21% are from tourism and 16 % are from business people. Occupation of domestic and foreign tourists showed 45% and 40% in government service, 34% and 51% professionals, 10% and 6% business, 10% and 1% students, respectively. Small fractions (1 to 2%) of domestic and foreign visitors were retired persons. Thirty four per cent of the foreign tourists were French and Swedish, 16% Britishers, 11% were Germans, 5% were American and 33% were from other countries.

The attractions for visitors were diverse. A majority came for recreation/trekking, followed by viewing mountain peaks, wilderness and bird watching, and specialized interest groups on flora and culture. Trekking duration ranged from 5 to 15 days with an average of 9 days. Normal daily expenditure by tourists ranged from Rs 190 to 1710, with average value of Rs 988 depending on nature of trek (independent or organized tourism). In response to their interest on protecting the forest/wildlife of the park, about 23% foreign and 26% domestic tourists were “not interested”, 26% foreign and 42% domestic tourists were “fairly interested”, 33% foreign and 12% domestic tourists were “interested”, and 18% foreign and 20% domestic tourists were “very much interested”.

Analysis of visitors' attitude on environment perception towards protection of the KNP revealed that 42% and 59% domestic and foreign visitors considered it "very important", 38% and 32% "important", 12% and 5% "not very important" and 8% and 4% "unimportant", respectively. Perception on biodiversity loss justification in the context of India showed that majority of both domestic and foreign tourists agreed to this point (Table 6.13). A question on the direct relevance of KNP for avoidance of biodiversity loss at any cost was not acceptable to the local community, the reasons being their dependency on natural resources. In contrary, about 50% of both domestic and foreign tourists agreed to the avoidance of biodiversity loss at any cost (Table 6.13).

In response to environmental problems and steps to be taken for conservation, about 10% said that there was no need to conserve the biodiversity of KNP because it is already in good condition, while 90% expressed conservation needs. On the question that who should conserve and maintain the KNP, about 55% was not sure. Of proposed implementing authorities, the majority of international tourists felt that the conservation in the KNP should be a collective effort, with the next ranked being government and community jointly (Table 6.14). The domestic tourists responded similarly, desiring government and community to play the main role, followed by collective effort and then government (Table 6.14). When asked whether they feel responsible for

nthe maintenance of the Yuksam-Dzongri- Goechha La trek route, 855 of the respondents gave a positive response, whereas 15% responded negatively.

(ii) Khecheopalri Lake

The basic statistics of lake site are presented in Table 6.15. The average household size was 6 people and the mean age of the respondents was 43, ranging from 25 to 75 years. About 40% of the community respondents were illiterate, while 45% were educated up to secondary level. Of the respondents 85% were involved in farming-related activities, 13% business/tourism sector and 2% in government sector (Table 6.15).

The mean age of the pilgrims was 43 yrs ranging from 22 to 68 years and the average group size was 8 (Table 6.15). About 20% of the pilgrims were illiterates, 33% passed secondary education, 31% passed higher secondary and 15% bachelor degree holders. The mean monthly income was Rs 6232 and from 2993 to 13981. Majority (48%) of the pilgrims was government service holders, 31% are farmer, 12% are business people and 9% are students.

In case of domestic visitors, the mean age was 33 yrs ranging from 19 to 65 years. The average family size was 4. About 21% of the domestic visitors received higher secondary education, 67% had bachelor degree and remaining 12% had master degree. The average monthly income of domestic visitors was Rs 6724. Majority (78%) of the

respondents was from government sector followed by 18% business people and 4% students.

An average age of foreign visitors was 34 yrs ranging from 20 to 60 years. Majority of the foreign visitors was free and independent trekkers (FITs). The mean monthly income was Rs 65969. About 72% of the foreign visitors were bachelor degree holders, 16% was master degree holders and 12% passed higher secondary. About 53% were engaged in professional occupation, 29% were in government sector, 11% were students and 3% were retired personnel. Total expenditure by the pilgrims at the lake site (including travel, food, and accommodation) varied from Rs 164 to 1474 per visit per group (Fig.6.2). The maximum expenditure was by north zone visitors, and the least by those from the west zone.

About 78% of the pilgrims visited the lake for religious purposes, while the majority (85%) of the domestic visitors came for recreation. Most (65%) of the foreign visitors came to the Lake for recreation, but 19% came for religious purposes and 16% cited the rich biodiversity of the area as their purpose in visiting.

Approximately 56% of foreign visitors, 43% domestic visitors, 35% of local community members and 28% of pilgrims showed some interest in conservation and maintenance of the Lake and its surrounding watersheds. Approximately 53% of domestic visitors, 50% of pilgrims, 45% of community members and 37% of foreign visitors felt that the

state government should take initiation for conserving the Lake watershed, whereas 26% of the local community, 22% of local pilgrims, 20% of domestic and 6% of foreign visitors felt that the village level institutions, in this case the panchayat (village council), should have this responsibility.

6.4.2 Recreational/sacredness value

Across all zones, travel cost for local pilgrims was positively related to visitation rate. Assuming that each zone represents a single average travel cost and opportunity cost of time, a TC model was used to calculate the consumer surplus (Table 6.16). A demand curve was prepared by evaluating the travel expenditures that visitors were willing to make to visit the Lake. Multiple regression analysis was carried out to estimate the parameters of the linear travel cost demand equation.

The coefficients of the first and second equations were statistically significant (Table 6.17). In the second equation, the t values of both variables were statistically significant ($P < 0.01$, $P < 0.05$) although the adjusted R^2 value was low because only one independent variable was considered (Table 6.17). The adjusted R^2 value of the first equation was higher than that of the first, but the t value of distance was not significant. We tried to develop other equations including all the variables, namely travel cost (T), distance (D), income (INC), age (AGE), density (DEN), and literacy (LIT), but these equations were not considered because the

coefficients were not statistically significant. In fact Khecheopalri Lake is a place of religious importance, therefore literacy, age, distance and income did not play an important role for visiting the site. The lending rate of interest of Reserve Bank of India was 10% during 1997-98. The inflation rate showed fluctuations during the year, however the average annual rate of inflation was estimated to be 4.83%. Therefore, the real rate of interest was 5.17%. The present sacredness values presented in Table 6.18. The estimated consumer surplus for visits to Khecheopalri Lake was US\$661 and 1562 from the first and second consumer surplus, respectively (Table 6.16). Recreational/ Sacredness value per visitor was US\$3.87 as calculated from the consumer surplus. The total number of local pilgrims to Khecheopalri Lake was 7800 in 1998, the aggregate annual recreational/sacredness value amounted to US\$30186 for pilgrims. The higher cost of travel and distance of the Lake from various zones restricted visitation rate by pilgrims. The west zone was the closest and exhibited a minimum travel cost, as the Lake is located in this zone, whence the highest visitation rate was recorded (Fig. 6.3).

Time spent by visitors on worship, viewing and photography of the lake was 27% of the total. Assuming a constant sacredness value of time for all activities, the sacredness value of Khecheopalri lake viewing was estimated to be US\$2378 per annum.

The demand curve function for recreational value showed that the probability of visitation increased with decreasing travel cost and distance for local pilgrims (within Sikkim visitors). The consumer surplus of Khecheopalri lake was very low compared to ecotourism demand in Madagascar (Mallie & Mendalsohn 1993) and economic value of elephant viewing in Kenya (Brown & Henry 1989) because of low visitation rate. However, the sacredness value of the lake was fairly intact, and consequently, the biodiversity and recreation values also remained high. An expected growth in tourism may increase the consumer surplus but this may be at the cost of the aesthetic, biodiversity and religious value of the lake. Therefore, a balance between consumer surplus and other values for conservation and preservation has ultimately to be established. The results of the present study are very similar to those from some other sites in tropical India, especially on protected area at a tiger reserve in Kerala and a national park in Bharatpur that showed low values (Chopra *et al.* 1997 and Manoharan *et al.* 1998). However, the present value for the lake were higher, inspite of its low visitation rate and lack of protection compared to the above two destinations.

6.4.3 Analyzing willingness-to-pay

Generally those respondents who are getting direct benefits from the park were considered for the analysis of WTP, but in the present study the WTP was assumed to be a function of the respondents' personal

characteristics and income level. Another variables, education level, was used as an explanatory variable. Greater number of years of schooling would arguably increase the knowledge of a person. Perhaps education would help a person comprehend news about the environmental effects of economic development. Age and gender were also used as explanatory variables. Results of both the sites of the willingness-to-pay (WTP) exercise, for community members, pilgrims, resident visitors and non-resident visitors are presented in Table 6.19 & 6.20. The result shows that the average response rate for Yuksam-Dzongri-Goechha La corridor was 45%, on the question regarding the motivation behind respondents WTP for conservation. Only 31 local community members indicated a willingness to pay for better management of the KNP. About 25 community members said that they were willing to pay, but due to their financial constraints and other responsibilities they were unable to pay. Thirty community members indicated willingness to perform voluntary work by providing manual labour for trail maintenance and cleanup. Respondents who were willing to volunteer agreed to set aside about a day per month. Some of them said they could provide seedlings for plantations in the surrounding areas. Nine community members refused completely to pay in kind or in cash for conservation. In case of foreign tourists, only 49% indicated a positive reaction to WTP for conservation, while 27% agreed on condition that the amount would be utilized in

constructive manner, and 24% refused to pay. In case of domestic tourists, about 60% respondents showed an indifferent attitude towards paying for conservation because they felt that it was the responsibility of the state government and local communities.

An analysis of the WTP provides an opportunity to study the content and context validity of the interview schedule. An Ordinary Least Squares (OLS) regression was used to analyse WTP. The regression revealed that the variables attained the expected signs, as presented in Table 6.21. The R^2 value is encouraging in the present context. Age showed a positive correlation with WTP in the case of all domestic, foreign visitors, and local communities. It was found that the middle age group and older age group of people could spare the money to accept CV bids while the young age group could spare less. This suggests that age is a major factor for all types of respondents to accept the WTP.

Educational qualification did not show a significant correlation with WTP when zero bid was included, however, on exclusion of "refuse the bids" it showed positive correlation with WTP ($P < 0.003$). This was mainly attributed to less educated respondents opting for most of the "refused the bids" for WTP. Fifty five per cent of the total responses were "refuse to pay". Occupation was not a major factor to accept the CV bids. Those people who were directly involved with tourism related activities and getting more economic returns were interested to pay for WTP as

compared to those who were not getting the economic benefits from tourism. The results also indicate that businessmen were willing to pay more than professionals. This finding has important policy implications as businessmen have the most potential for financing environmental improvements. Sex also did not influence the visitation rate and WTP for conservation. The income of visitors significantly influenced their WTP for conservation of the area (Table 6.21).

For the entire samples, using means of variables, the estimated willingness to pay for the management of the KNP was US\$8.84 by foreign visitors per trip, US\$1.91 by domestic visitors per trip, and US\$6.20 by the local community on an annual basis. This shows that the foreign visitors had higher recreational/conservation values than did the domestic visitors and local community members.

The question regarding the confidentiality concerning the right amount for their conservation contribution, about 26% local community members, 22% domestic, and 20% foreign visitors stated that they were "very confident", while 55%, 52% and 40% were "confident", respectively. About 13% local community members, 16% domestic, and 28% foreign visitors were "undecided"; the remaining were "not very confident". These responses suggest that the amount stated by the respondents were valid.

The response rates for Khecheopalri lake against WTP were highest for the foreign visitors (68%), followed by pilgrims (54%), community members (40%) and domestic visitors (36%) (Table 6.20). The regression revealed that the variables attained the expected signs as presented in Table 6.22. Age of the interviewer showed a positive correlation with WTP for all visitors and also in local community members. It was found that the middle age group and older age group people could spare the money to accept CV bids while the young age group spared less. Thus age of the people is a major factor for all types of respondents in WTP. Sex did not influence the visitation rate and WTP for conservation. Occupation, education and income of the visitors significantly influenced their WTP for conservation of the area (Table 6.22). Multiple R was very encouraging and so were the F -statistics. For the entire samples, using means of variables, the estimated annual WTP for the management of Khecheopalri Lake was US\$ 0.88 for local community members per year, and US\$2.16 for local pilgrims, US\$2,51 for domestic visitors, and US\$7.19 for foreign visitors per visit (Table 6.22).

Compared to other parts of India, the frequency of visitors was less at both the sites because most of the visitors seldom return to trek for a second time in the same area. Therefore, the WTP stated by all the visitors was for that particular trek, while a small number of foreign

tourists stated that they would like to help voluntary organizations for community and environmental development in the host region. This study revealed that the visitors' WTP did not depend upon the benefits they would get in preserving the sites, but most of them stated that their WTP was just to keep the beautiful, unexploited landscape and rich biodiversity of these areas intact. The demands for nature/ecotourism in Sikkim by foreign and domestic visitors have also been increasing enormously. Walsh (1986) gave an overview of the price elasticity of demand for various recreational activities. The price elasticity of demand for a recreational activity is generally low when the proportion of income spent on it is low (Walsh 1986). This may be an indication of the income effect at the national income level. As respondents income level grow the income elasticity may improve for environmental goods. The probability of participation increased with age and increasing income. The magnitude of economic problems restricted domestic visitors from visiting the trekking corridor because the entry fees for the park are relatively high as compared to other protected areas. Therefore, visits to the KNP are given low priority by most of the domestic tourists, except for a few rich individuals and people from India's West Bengal, Maharashtra, Delhi and Gujarat State. WTP for all categories of visitors and local community showed significant co-variance. The WTP was significantly related to age, education and income levels. The findings of this study are similar to

those of Walsh (1986), where age and income appeared to be the most important socio-economic variables determining the probability of participation in recreation activity. This was expected, as an increase in income level would show respondents' greater willingness to spend on recreation. Sex did not significantly influence the WTP. The WTP per trip was much higher for foreign tourist than domestic one, which was mainly attributed to higher income levels and environmental awareness. Local residents' WTP for the entire year is no less significant for this group has a long term stake in the area. Aspects of time, services, or traded goods (tree seedlings in the present study), contributed by the local community, are of no less value than WTP. Therefore, contributions by those who are willing to give time and materials for environmental conservation should be a part of WTP. A quantification methodology of this needs to be developed in future studies. Extrapolating to Yuksam-Dzongri-Goechha La corridor and sacred Khecheopalri Lake, using total visitors and community households, annual WTP of US\$ 8777 and US\$ 46940 for the maintenance and preservation looks significant. Application of the TCM and WTP strongly support the enterprise-based community involved biodiversity/nature conservation, and suggest that the concept of ecotourism has percolated to all levels of direct and indirect beneficiaries/stakeholders.

6.5 Conclusion

Dependence on fuel wood for energy is causing serious deforestation problems in trekking corridor and Lake Site. The pressure is far greater in Monastery forest than in the trail forest outside Khangchendzonga National Park. The consumption of fuel wood varied amongst stakeholders with respect to different physical and economic factors causing serious deforestation problems in the trail and Lake Site. The widespread switching over to inferior quality of fuel wood species is the indicator of pressure in the forests of both the sites. The fuel wood continues to be the prime source for cooking in trekking corridor, while commercial alternative energy sources contributed very little. Enhancing the supply of fuel wood through plantations and reducing the fuel wood demand through providing alternate source of energy can facilitate these.

A contingent valuation method was used to estimate the Willingness-to-pay (WTP) for conservation and protection of natural resources in the sites. The results showed that the response is an emphatic positive. The survey received good response from local communities, pilgrims, resident and non-resident visitors for their willingness to conserve the area. The analysis reports a mean WTP per visitor per visit was higher for non-resident visitors than resident visitors. Local community members were willing-to-pay for environmental management. The multiple regression on WTP reveals that the attitudes

of respondents, their visitation rate, and number of aspects of the area they considered valuable, were important determinations of WTP for trekking corridor and lake site. Variables attain the expected sign and they are statistically significant and encouraging for a small study such as the present one.

The CVM may also be useful in providing more relevant information for decision-makers for investment and policy purposes. The study results are very encouraging for trail and lake management. It proves that the local people as well as visitors are aware of the environmental damages caused by increasing visitation rate and over exploitation of natural resources of the area and its importance. It was also clear that a willingness-to-pay in terms of cash or kind exists for contributing towards the upkeep and improvement of trail and lake.

The lake has recreational and biodiversity values for domestic and foreign visitors, and more sacredness values for the Sikkimese. The demand curve function for recreation increased with decrease in travel cost and distance for Sikkimese. The lake showed high recreational/sacredness values that were attributed to conservation of the site for biodiversity and pilgrims.

The study shows that the Travel Cost (TC) and the Contingent Valuation (CV) methods can be successfully applied to evaluate natural resources of the Hindu-Kush Himalayan region. The results of the study

suggest that the both the sites have an economic potential far greater than its realized economic earnings. Therefore, TCM and CVM could be a useful tool in providing more relevant information for decision-makers for investment and policy purposes in biodiversity hot spot and protected area management.

Table 6.1. Area under different land-use/cover categories in Yuksam-Dzongri-GoechhaLa trekking corridor and Sacred Khecheopalri lake site in 1997.

Land-use / Cover	Yuksam-Dzongri-Goechha La Corridor		Khecheopalri Lake	
	ha	%	ha	%
Forest				
Dense mixed forest	689	18	272.20	22.53
Open mixed forest	720	19	492.01	40.69
Degraded forest	1289	35	254.00	21.00
Rhododendron	30	1	-	-
Alpine Scrub	40	1	-	-
Forest blank	100	3	-	-
Settlement and cultivated area	598	16	162.50	13.44
Rock out crop	45	1	17.50	1.45
Land slide area	58	2	-	-
Water surface (river & lakes)	140	4	3.79	0.31
Bog area	-	-	7.01	0.58
Total	3709	100	1209.00	100

Table 6.2. Fuel wood consumption for different purposes by stakeholders and its economic costs

Stakeholders	Purpose			Total (Mg yr ⁻¹)	Cost (Rs)
	Cooking (Mg yr ⁻¹)	Water-heating (Mg yr ⁻¹)	Other (Mg yr ⁻¹)		
Yuksam-Dzongri-Goechha La corridor					
Community	1896	260	109	2264	2829984
Hotel/Lodges	86	12	3	101	126239
HMI	37	6	2	45	56252
Travel Agents	6	1	0.2	7.2	8979
FIT's	1.4	0.3	0.2	1.9	2378
Pack-animal operator	0.8	0.08	0.1	0.98	1230
Porter	13	0.6	2	15.6	19516
Total	2040	280	116	2437	3046259
Khecheopalri lake					
Community	563	737	335	670	837507
Trekker's hut/ Teashops	392	502	137	456	569982
Total	955	1239	472	1126	1407489

Table 6.3. Stakeholder wise seasonal fuel wood consumption pattern

Stakeholders	Consumption (Mg)			Average (Mg d ⁻¹)	Annual (Mg y ⁻¹)
	Summer (61days)	Rainy (122 days)	Winter (182 days)		
Yuksam-Dzongri-Goechha La corridor					
Community	378.32	756.64	1128.76	6.20 ¹	2263.72
Hotel/lodges	16.72	33.45	49.90	0.27 ²	100.07
HMI	2.30	13.07	28.51	0.24 ³	43.88
Travel agent	0.16	3.40	3.56	0.010 ⁴	7.12
FIT's	0.65	0.0	1.30	0.001 ⁵	1.95
Pack-animal operator	0.086	0.41	0.53	0.002 ⁶	1.026
Porter	0.28	6.25	8.85	0.002 ⁷	15.38
Khecheoplri lake					
Community	111.99	223.99	334.15	0.67	670.14
Trekker's hut/ Tea shops	7.625	15.25	22.75	0.046	45.62

1, 2: Community and hotel consumption per day; 3, 4: Per group; 5, 6, 7: per person

Table 6.4. Dependency pattern of local community on trekking corridor and lake surrounding forests

Forest	Household number	User's population	Consumption Pattern		
			Kg d ⁻¹	Kg hh ⁻¹ d ⁻¹	Mg yr ⁻¹
Yuksam-Dzongri-Goechha La Corridor					
KNP trail	58	331	1432	24.68	522
Trail outside KNP	52	306	1188	22.86	434
Monastery forest at Dubdi	107	610	2517	23.52	919
Goucharan	57	325	1341	23.52	489
Khecheopalri area					
Lake surrounding forest	47	282	1213	25.80	443
Other forest	25	160	630	25.20	230

Table 6.5. Settlement wise fuel wood consumption pattern in the study sites

Settlements	Consumption		
	Kg d ⁻¹	Kg capita ⁻¹ d ⁻¹	Mg yr ⁻¹
Yuksam-Dzongri-Goechha La corridor			
Dependent on corridor forest			
Tshoka (inside KNP)	250	4.39	91
Geychen	422	3.52	154
Norbugang	494	4.05	180
Khongtay	893	3.69	326
Yuksam	1292	4.41	472
Total	3351	3.87	1223
Dependent on other forest			
Kopchey	282	4.21	103
Mantabong	518	3.75	189
Tshong	988	5.77	360
Topsing	494	3.66	180
Gufa Danra	141	4.03	52
Dostang	282	3.62	103
Mangsabong	424	3.71	154
Total	3129	4.10	1141
All Settlements (corridor)	6480	4.73	2364
Khecheopalri lake			
Khecheopalri	403	4.2	147
Chojo & Golai	1557	4.5	568
All Settlements (Khecheopalri lake)	1960	4.3	715

Table 6.6. Pair-wise ranking of species used as firewood in both the sites

Species (local name)	Yuksam-Dzongri-Goechha La Corridor		Khecheopalri Lake	
	Preferred	Available	Preferred	Available
<i>Abies densa</i> (Gobre salla)	4	9	-	-
<i>Acer oblongum</i> (Phirphire)	4	4	-	-
<i>Acer papilio</i> (Kapase)	3	4	-	-
<i>Albizia procera</i> (Seris)	-	-	7	0
<i>Alnus nepalensis</i> (Uttis)	2	11	0	1
<i>Arundenaria</i> sp. (Parang)	6	1	-	-
<i>Beilschmiedia sikkimensis</i> (Tarsing)	7	5	-	-
<i>Betula alnoides</i> (Saur)	8	3	-	-
<i>Castonopsis hystrix</i> (Jat katus)	4	10	9	10
<i>Cedrela toona</i> (Tooni)	6	2	-	-
<i>Cryptomeria japonica</i> (Dhuppi)	2	2	-	-
<i>Dendrocalamus</i> sp. (Bans)	1	3	9	4
<i>Edgeworthia gardeneri</i> (Argeli)	-	-	4	12
<i>Engelhardtia spicata</i> (Mahuwa)	-	-	7	6
<i>Eurya acuminata</i> (Jhinguni)	8	8	13	7
<i>Litsaeu elongata</i> (Pahenli)	2	4	-	-
<i>Magnolia campbellii</i> (Ghonge chanp)	6	5	-	-
<i>Magnolia</i> sp. (Phurse chanp)	6	7	-	-
<i>Machilus</i> sp. (Chanp)	-	-	7	2
<i>Michilus edulis</i> (Phumse)	-	-	6	10
<i>Prunus cerasoides</i> (Panyun)	5	1	-	-
<i>Prunus nepaalensis</i> (Arupate)	2	4	-	-
<i>Quercus lamellosa</i> (Bajrant)	10	8	-	-
<i>Quercus linesata</i> (Phalant)	11	3	-	-
<i>Rhododendron arboreum</i> (Lali guras)	6	10	-	-
<i>R. barbatum</i> (Curling)	6	4	-	-
<i>R. falconeri</i> (Curling)	4	14	-	-
<i>Rhus insignis</i> (Bhalayo)	-	-	3	12
<i>R. semialata</i> (Bhakimlo)	-	-	3	7
<i>Schima wallichii</i> (Chilauney)	9	2	-	-
<i>Sorbus</i> sp. (Pansi)	2	2	-	-
<i>Symplocos ramosissima</i> (Kharane)	1	1	10	10
<i>Viburnum codyfolium</i> (Asare)	5	7	11	6

* Availability for species were assigned as per their abundance at the designated plots. Higher the scores, more abundance are the species.

Table 6.7. Fodder consumption rate of different livestock in the study sites

Livestock	Number		Consumption			
	Yuksam	Khecheopalri	(kg d ⁻¹)		(Mg yr ⁻¹)	
			Sites			
			Yuksam	Khecheopalri	Yuksam	Khecheopalri
Cattle	454	110	13620	3300	4971	1204
Goat	311	106	4665	1590	1703	580
Sheep	461	22	6915	330	2524	120
Pig	260	66	3120	792	1139	289
Dzo	122	-	4270	-	1558	-
Yak	78	-	2730	-	996	-
Horse	22	-	550	-	201	-

Table 6.8. Pair-wise ranking of preferred and available species of fodder in study sites

Species (local name)	Yuksam-Dzongri-Goechha La Corridor		Khecheopalri lake	
	Preferred	Available	Preferred	Available
<i>Acer oblongum</i> (Phirphire)	1	2	-	2
<i>Acer papilio</i> (Kapase)	1	6	-	8
<i>Aconogonum molle</i> (Thotne)	-	-	6	14
<i>Albizia procera</i> (Siris)	-	-	8	4
<i>Artemesia vulgaris</i> (Teteypaty)	9	13	1	12
<i>Arundinaria</i> sp. (Parang)	9	3	14	8
<i>Beilschmiedia sikkimensis</i> (Tarsing)	17	15	-	-
<i>Betula alnoides</i> (Saur)	3	6	-	-
<i>Bassaiopsis mitis</i> (Phutta)	-	-	21	10
<i>Cedrela toona</i> (Tooni)	6	1	20	6
<i>Cyperus</i> sp. (Bukki)	7	3	-	-
<i>Dendrocalamus</i> sp. (Bans)	8	4	14	12
<i>Elastosima sessile</i> (Gagleto)	14	17	7	20
<i>Engelhardtia spicata</i> (Mahuwa)	-	-	4	10
<i>Eragrostis tenella</i> (Banso)	16	12	-	-
<i>Ficus nemoralis</i> (Dudhilo)	19	11	19	8
<i>Ficus roxburghii</i> (Nebera)	22	20	25	17
<i>Ficus foerestata</i> (Dudhe lahara)	-	-	23	11
<i>Koelaria cristata</i> (Seeru)	10	13	-	-
<i>Litsaea citrata</i> (Siltimur)	-	-	14	6
<i>Litsaea elongata</i> (Pahenli)	10	4	-	-
<i>Macaranga pustulata</i> (Malata)	-	-	13	10
<i>Machilus edulis</i> (Phunse)	-	-	7	20
<i>Magnolia</i> sp. (Phusre chanp)	1	8	-	-
<i>Pauzolzia viminea</i> (Chiple)	15	14	13	23
<i>Paveta indica</i> (Kanyu)	21	2	-	-
<i>Prunus cerosoides</i> (Panyun)	3	20	14	-
<i>Prunus rufa</i> (Lekh panyun)	4	2	-	-
<i>Pentapanax leschenaultii</i> (Chinde)	-	-	2	-
<i>Quercus lamellosa</i> (Bajrant)	4	6	-	-

<i>Rhaphidophora</i> sp. (Kanchirna)	-	-	22	8
<i>Saurauia nepaulensis</i> (Gagoon)	20	9	23	14
<i>Symingtonia populnea</i> (Pipli)	2	9	4	-
<i>Symplocos ramosissima</i> (Kharane)	1	1	-	23
<i>Thysanlaena maxima</i> (Amliso)	17	18	17	18
<i>Viburnum cordifolium</i> (Asare)	1	18	3	20

* Availability for species were assigned as per their abundance at the designated plots. Higher the scores, more abundance are the species.

Table 6.9. Other uses of forest products (house construction and maintenance) for an average household

Large size poles	
Time interval (years)	15 – 25
Tree number	2 - 5
Average (DBH) size	20 – 40 cm
Wood volume required	2.35 – 4.77 m ³
Medium size poles)	
Time interval (years)	5 – 7
Tree number	10 – 15
Average size (DBH) size	10 – 20 cm
Wood volume required	2.16 – 7.1 m ³
Small size poles (mainly bamboo)	
Time intervals (years)	3 – 5 years
Number of poles required	80 – 120
Average(DBH) size	< 10 cm

Table 6.10. Pair-wise ranking of preferred and available species of timber in study sites

Species (local name)	Yuksam-Dzongri-Goechha La corridor		Khecheopalri Lake	
	Preferred	Available	Preferred	Available
<i>Abies densa</i> (Gobre salla)	11	12	-	-
<i>Acer laevigatum</i> (Putli)	4	1	-	-
<i>Acer oblongum</i> (Phirphire)	8	3	-	-
<i>Albizia procera</i> (Siris)	-	-	5	10
<i>Alnus nepalensis</i> (Uttis)	1	11	10	3
<i>Beilschmiedia sikkimensis</i> (Tarsing)	2	5	12	2
<i>Betula alnoides</i> (Saur)	8	11	10	8
<i>Castonopsis hystrix</i> (Jat katus)	7	8	11	12
<i>Cedrela toona</i> (Tooni)	7	4	6	6
<i>Dendrocalamus</i> spp (Bans)	1	9	-	-
<i>Elaeocarpus lanceaefolius</i> (Bhadrase)	-	-	7	7
<i>Engelhardtia spicata</i> (Mahuwa)	-	-	7	0
<i>Juglans regia</i> (Okhar)	11	2	9	12
<i>Machilus</i> sp. (<i>Bhaise kawlo</i>)	-	-	13	5
<i>Machilus edulis</i> (<i>Phunse</i>)	5	8	11	9
<i>Machilus odoratissima</i> (Lali kaula)	5	2	-	-
<i>Magnolia campbellii</i> (Ghoge chanp)	4	13	-	-
<i>Michelia exelsa</i> (Rani chanp)	10	2	2	14
<i>Michelia</i> sp. (Bhalay chanp)	-	-	1	12
<i>Prunus nepaulensis</i> (Arupate)	3	5	-	-
<i>Quercus lamellosa</i> (Bajrant)	16	14	3	13
<i>Quercus lineata</i> (Phalant)	8	4	-	-
<i>Rhaphidophora</i> sp (Kanchirna)	6	5	-	-
<i>Schima wallichii</i> (Chilaune)	6	2	7	7
<i>Spondias axillaris</i> (Lapsi)	-	-	-	-
<i>Symingtonia populnea</i> (Pipli)	8	9	15	13
<i>Weigtia gigantia</i> (Bauni kat)	2	3	-	-

- Availability for species was assigned as per their abundance at the designated plots. Higher the scores, more abundance are the species.

Table 6.11. Overland flow and soil loss of different land-use/cover from the study sites

Land-use	Yuksam – Dzungri – Goechha La Corridor		Khecheopalri Lake	
	Overland flow (% of precipitation)	Soil loss (Kg ha ⁻¹)	Overland Flow (% of precipitation)	Soil loss (Kg ha ⁻¹)
Maize field	5.15	335.56	3.79	405
Cardamom field	2.27	49.41	1.79	15
Wasteland	3.15	88.34	4.77	156
Trail corridor	6.57	661.81	-	-
Forest cover	3.46	105.82	2.06	25
Alpine Pasture land	2.44	41.90	-	-

Table 6.12. Basic statistics of important variables in Yuksam-Dzongri-Goechha La trekking corridor

Respondents	Variables					
	AGE	SEX	EDQ	OCU	INC (\$)	WTP (\$)
Foreign Visitors						
Mean	38.96	1.41	15.11	4.25	4011	8.84
Std. Dev	11.73	0.49	1.50	0.82	4281	11.94
Domestic Visitors						
Mean	32.71	1.18	14.90	4.01	159	1.91
Std. Dev	8.29	0.38	1.12	1.23	66	4.05
Local Community						
Mean	36.20	1.09	8.53	3.19	832	6.20
Std. Dev	8.67	0.29	4.76	1.42	375	19.08

AGE: Respondent's age in years; SEX: Male-1, Female-2; EDQ: Year of schooling; INC: Income (households annual income for local community and monthly for visitors); OCU: Occupation; Service-5, Professional-4, Business-3, retired-2 and student-1 for visitors and Tourism involved-5, Service-4, Business-3, Labourer-2, and Agriculture-1 for community members; WTP: Willingness to Pay (per trip for visitors and annually for local community).

Table 6.13. Respondents perception on the importance of environmental issues (%) in Yuksam-Dzongri-Goechha La trekking corridor

Opinion	Respondents	Questions	
		Biodiversity loss justification in the context of India	Avoidance of KNP biodiversity loss at any cost
Strongly disagreed	LC	-	28
	DT	3	2
	IT	1	2
Disagreed	LC	-	40
	DT	4	24
	IT	1	28
Neutral	LC	-	17
	DT	19	19
	IT	22	13
Agreed	LC	-	13
	DT	64	48
	IT	63	50
Strongly agreed	LC	-	2
	DT	10	7
	IT	13	7

LC = local community; DT = domestic tourist; IT = international tourist

(-) This question was not asked to the local community

Table 6.14. Respondents attitude for the protection of Yuksam-Dzongri-Goechha La trekking corridor

Implementing authority	Visitors			
	International		Domestic	
	Number	(%)	Number	(%)
Government	38	12	19	15
Non-Government Organization (NGO)	10	3	9	7
Local Community	10	3	12	10
Government and Community	123	38	49	39
Collective effort*	142	43	30	24
Can't Say	2	1	6	5

*Includes visitors, local community, travel operators, NGOs, and government

Table 6.15. Basic statistics of important variables in Khecheopalri Lake

Respondents	Variables					
	AGE	SEX	EDQ	OCU	INC (\$)	WTP (\$)
Local Community						
Mean	43.42	1.26	5.38	2.08	415.39	0.88
Standard deviation	13.25	0.44	4.39	1.48	392.83	1.57
Local Pilgrims						
Mean	42.67	1.32	10.39	3.80	152.43	2.16
Standard deviation	11.84	0.46	5.09	1.43	68.26	3.50
Domestic Tourist						
Mean	33.04	1.18	14.85	4.10	163.54	2.51
Standard deviation	8.61	0.39	1.13	1.16	67.32	4.48
Foreign Tourist						
Mean	33.84	1.38	14.44	4.25	1608.88	7.19
Standard deviation	9.59	0.49	1.73	1.05	563.31	8.94

AGE: Respondent's age in years; SEX: Male-1, Female-2; EDQ: Year of schooling; INC: income (household annual income for local community and monthly for visitors); OCU: Occupation; Service-5, Professional-4, Business-3 Retired-2, and Student-1 for visitors and Tourism involved-5, Service-4, Business-3, Labourer-2, and Agriculture-1 for community members; WTP: Willingness to pay (per trip for visitors and annually for local community).

Table 6.16. Zone wise sacredness value of Khecheopalri lake by the local Sikkimese pilgrimage

Zone (within Sikkim)	Visitation Rate (%)	Travel Cost (US\$)*	Mean Distance (km)	Density (km ²)	Literacy (%)	Sacredness Value Consumer Surplus (US\$)*	
						CS1	CS2
North	23	9.14	225	75	42	12	173
East	29	5.85	129	388	54	109	308
South	32	3.90	72	239	44	189	417
West	45	1.82	55	235	37	351	664
Total	-	-	-	-	-	661	1562

CS = Consumer Surplus,

- Calculated at 1 US\$ = Rs. 41/- (Average conversion rate calculated for the year 1998)

CS1 calculated based on travel cost and distance, and CS2 calculated based on travel cost only.

Table 6.17. Functional characteristics of travel cost demand curve for valuing sacredness of Khecheopalri Lake

Equation Number	Travel Cost Model	Estimated equation	R ²	P-value
I	V = (T, D)	V = 47.959 - 0.184T + 0.196D	0.997	0.03
II	V = (T)	V = 46.988 - 0.069 T	0.845	0.05

V = Visitation rate, T = Travel cost, D = Distance

Table 6.18. Present sacredness value of Khecheopalri Lake by local pilgrims based on the travel cost method

Travel cost model	Total value for 1998	Present value per person	
	(Rsx10 ³)	(US\$.)*	(Rs.)
V = f(T, D)	380	1.19	49
V = f(T)	910	2.85	117

V = Visitation rate, T= Travel cost and D= Distance

* Calculated at 1 US\$ = Rs. 41/- (Average conversion rate calculated for the year 1998).

Table 6.19. Summary results from the contingent valuation (CV) question from Yuksam-Dzongri-Goechha La trekking corridor

Variables	WTP		
	Foreign visitors	Domestic visitors	Local community
Mean value per visitor (US\$)	8.84	1.91	6.20
**Aggregate value for all visitors (US\$.)	5852	1226	1699
*Respondents with WTP (%)	50	40	33
+Response rate (%)	49	19	35

WTP: Willingness to pay, US\$ 1 = Rs.38/- (as per the conversion rate in 1997)

** The non-respondents were assumed to have a WTP equal to those that answered

* Based on total respondents who responded positively for WTP

+ Based on total visitors/House holds

Table 6.20. Summary result from the contingent valuation in Khecheopalri Lake

Variables	WTP			
	LC	LP	DT	IT
Mean value per respondents (US\$)*	0.88	2.16	2.51	7.19
Aggregate value for all respondents (US\$)**	63	16848	25943	4149
Respondents with WTP (%) +	40	54	36	68
Response rate (%) #	69	76	59	80

LC = Local Community, LP = Local Pilgrims, DT = Domestic Tourist, IT = International Tourist, WTP = Willingness-to-pay

* Calculated at 1 US\$ = Rs. 41/- (Average conversion rate calculated for the year 1998).

** The non-respondents were assumed to have a WTP equal to those that answered

+ Based on total respondents who responded positively for WTP

Based on sampled visitors/ Households

Table 6.21. Result of multiple regression estimation in Yuksam-Dzongri-Goechha La trekking corridor

Components	
Dependent Variables	WTP
No. of observation	243
Multiple R	0.348
Squared multiple R	0.121
Adjusted squared multiple R	0.103
Standard error	489.155

Variables	Coefficient	Std. Error	t value	P<
AGE	9.534	2.860	3.334	0.001
SEX	-41.927	68.196	-0.615	0.539
EDQ	34.167	11.195	3.052	0.003
OCU	-6.886	31.567	-0.218	0.828
INC	0.005	0.002	3.148	0.002

Analysis of variance

	Sum-of-squares	DF	Mean-Squares	F-Ratio	P<
Regression	7828703.690	5	1565740.738	6.544	0.000
Residual	5.67075E+07	237	239272.254		

AGE= Age, SEX= Sex, EDQ= Educational qualification, OCU=Occupation, INC=Income

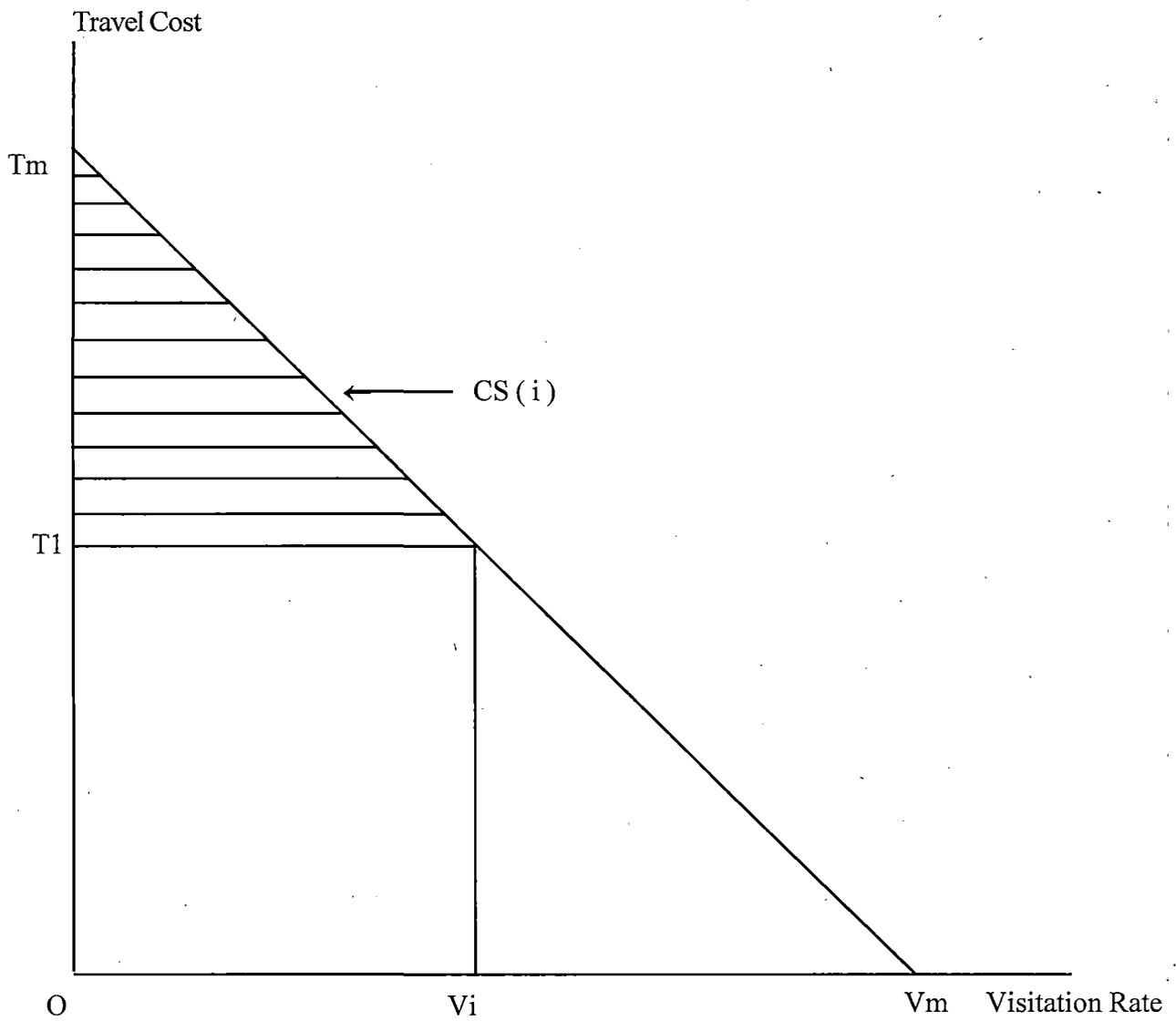
Table 6.22. Result of multiple regression estimation in Khecheopalri Lake

Components				
Dependent Variable	WTP			
Number of observation	360			
Multiple R	0.492			
Squared multiple R	0.242			
Adjusted squared multiple R	0.231			
Standard error of estimate	4.683			

Variables	Coefficient	Std. Error	t-value	P (2 Tail)	
AGE	0.092	0.024	3.762	0.000	
SEX	-0.349	0.545	-0.641	0.522	
EDQ	0.228	0.062	3.702	0.000	
OCU	-0.290	0.147	-1.974	0.049	
INC	0.003	0.000	8.118	0.000	

Analysis of Variance					
Source	Sum-of-squares	DF	Mean-square	F-ratio	P <
Regression	2474.004	5	494.801	22.56	0.000
Residual	7763.96	354	21.932		

AGE: Age of the respondent, Sex: Gender, EDQ: Educational Qualification, OCU: Occupation, INC: Income, WTP: Willingness to pay



$CS(i)$ is the consumer surplus for the i th population zone (shaded portion)

Fig. 6.1 Travel cost demand curve

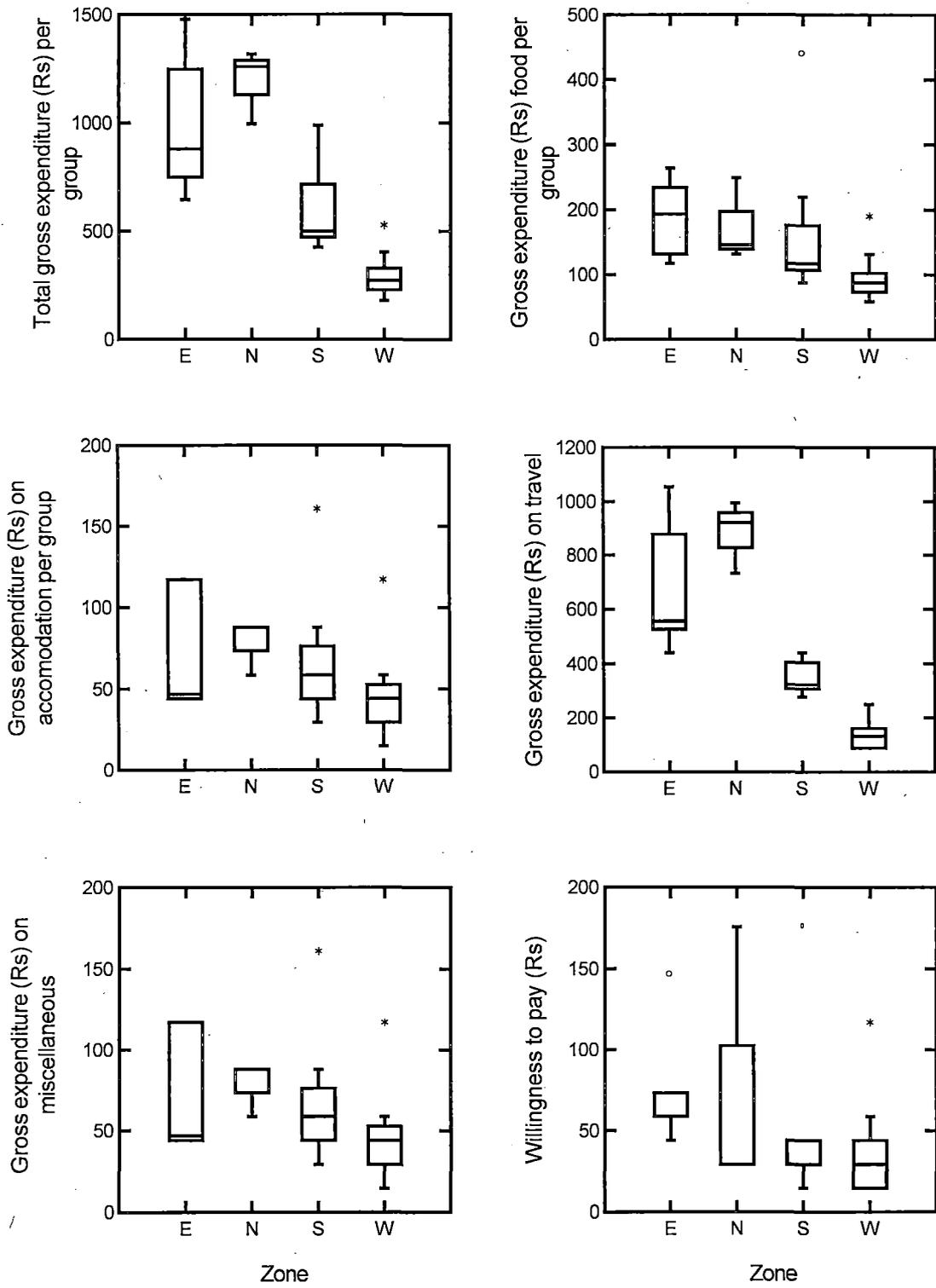


Fig. 6.2 Box-whisker plot showing expenditure and willingness to pay for conservation by visitors from four zonal (E=east, N=north, S=south, and W=west) areas of Sikkim. The central horizontal lines mark the medians of samples, the edges of the boxes mark the first and third quintiles and the whiskers show the range of the values. Values outside the inner fences are called 'outside values' and plotted with asterisks, and values outside the outer fences, called 'far outside values', are plotted with empty circles.

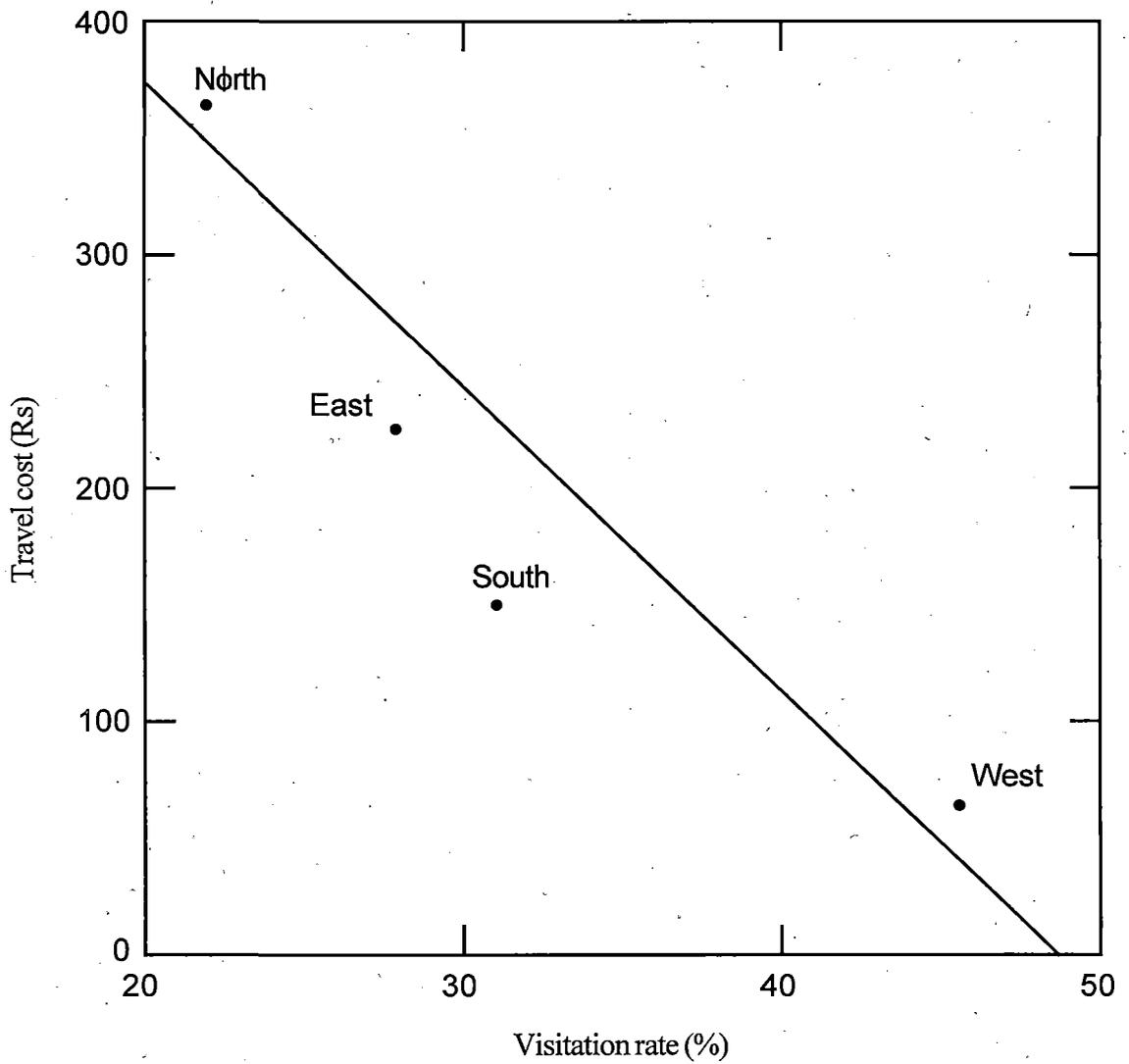


Fig. 6.3. Travel cost and visitation rate of local pilgrims to Khecheopalri Lake from the four zones (east, north, south, and west). The lake is located in the west district.

CHAPTER - VII

Chapter VII

TOURISM, ECONOMIC DEVELOPMENT AND CONSERVATION

Introduction

Sikkim Himalaya is a site of high biodiversity value, and one that is facing growing threats from a variety of sources including commercial logging, farming practices and tourism. As concern grows over the loss of both natural and cultural heritage in this region, attention is turning to strategies, which seek to link conservation with tourism development and generate incentives to conserve the resources on which economic benefits depend. Sikkim is growing in popularity, and likely to attract increasing numbers of tourists in the visiting area's cultural sites and protected areas of high biodiversity value. The economic significance of tourism industry is multifarious. Tourism development has a great deal of appeal for its role in the economic development of remote mountain regions and its impact on local society, economy, and the environment. The most important economic benefits of tourism are the earnings of convertible foreign exchange (Malhotra 1998). But the criticism of tourism parallels a general paradigm shift away from purely growth-oriented economic development towards more sustainable forms of development (Friedmann *et al.* 1980; Redclift 1987 and Brookfield 1988). The new paradigm requires programs that limit the negative effects of economic behaviour

on local environments and cultures. It proposes linkages between economy, culture and ecology in what Norgaard (1984) calls "Co-evolutionary development" and what others have termed "eco-development" (Farvar & Glaeser 1979). Lee (1988) observes "there is no other international trading activity which involves such a critical interplay among economic, political, environmental, and social elements as tourism". Bröckelman (1988) and Mckean (1989), view tourism as a way to foster meaningful cross-cultural relationships as well as to promote environmental conservation and a more equitable distribution of tourism earnings.

This chapter describes tourism in Sikkim, where tourists visit remote natural and cultural settings and discusses its contribution to the state and local economy. This chapter specifically links tourism in mountain regions with sustainable development by examining how tourism connects different stakeholder with wider economic development and act to conserve valuable biological resources.

7.1 Methods

Participatory Rural Appraisal (PRA) approaches and methods were used to generate the information. The study made use of a range of PRA tools, including key informant interviews with elderly people, group discussions, and transect walks. The techniques were modified to a great extent and many other innovative approaches were included during the

study period at both the sites. Participants were involved in skill development training program right from the initial stages of the planning process for conservation management. The secondary data were generated from government departments.

The study included visits to various government and private agencies for information on national/state tourism policy and travel industry promotions.

7.2 Tourism and Development of Local and Regional Economy

Tourism is a multifaceted economic asset. By itself, it is an smokeless industry and is a representation of a cross section of the whole economy. As such, it is an effective tool of economic growth as far as the tourist places are concerned. A popular tourism attraction is a bonanza for a place. Thus tourism attractions are distinct and unique economic resources. Therefore, the people of Sikkim have oriented their economy towards tourism. Since 1990, involvement in tourism related activities increased in most part of the State. Most of the tourism earnings come from organized pack tour. Some people work exclusively for Himalayan Mountaineering Institute (HMI) training courses as pack animal porters. However, employment opportunities for women are negligible in trekking and mountaineering courses. A small number of women working in tour operators offices as receptionist. Employment in trekking and mountaineering is seasonal. Most porters, pack-animal operators and

cooks work not more than four to five months a year, but most men are employed on a long-standing basis by Gangtok-based tour operator. The same situation is also prevalent in the Nepal Himalaya (Adams 1992). Skilled tour guides and cooks receive salaries year-round, even though they work less than half the year. This employment has little opportunity cost; other wage-earning employment in Yuksam and Khecheopalri is scarce, and it is mainly low-paid day labour.

Yuksam people began to establish tourism business in 1960s, and by the 1998 about 69% of all households operated lodge/hotels and shops and porters. These establishments offer visitors, snackfood, canned goods, and souvenirs. Lodges have become an increasingly important part of the regional economy. An immensely popular investment in tourism since 1990s is purchasing and keeping packstock for trekking and mountaineering courses.

The multiplier effects of the cash earned in tourism have both increased non-tourism employment and enlarged the market for local agricultural products. The net State Domestic Product (SDP) of Sikkim at constant prices significantly increased from Rs 3316867904 in 1991-92 to Rs 5856043839 (Personal Communication, Bureau of economics and Statistics, Government of Sikkim).

The sectoral distribution indicates that the tertiary sector predominates, contributing nearly 43% of the total SDP. The annual

economic growth rate has been below the national growth rates over the past few years. Thus tourism is a major sector and should be considered the prime area for promoting sustainable development initiatives.

7.3 Government Investments

The ninth five-year plan of the Sikkim Government had only Rs 40 million directly allocated to the tourism sector. However, with the ushering in of the present regime in 1995, a greater focus on tourism has been witnessed. A specific tourism “Master Plan” for five years, beginning that year, with an anticipated budget of over Rs 30 crores , has been drawn up, to develop tourism industry as a sustainable economic activity. The department prepared five-circuit project report, in which two on religious/heritage trails and three on for nature trails. The Government of India allotted Rs 20 million and the State Government Rs 12 million for infrastructure development, promotion and refurbishment of monasteries and heritage sites (Anonymous 1997).

The investment in key infrastructure development by the State Government was Rs 41715000 in 1998-99. The thrust of the State investments means to foster and develop tourism. Out of the total investments, major portion (50%) for accommodation and transport services, followed by 12% in advertisements, 5% in event organizations, 1% each in printing and public relations and 30% for other purposes (Anonymous 1997).

Assistance from the Central Government is often less available than anticipated. One case that is illustrative is the development of Helicopter services in the State. The State Government expected the Centre to provide almost full assistance.

7.4 Components of Ecotourism and Conservation

The study focuses its work in three key areas that link conservation with ecotourism enterprises. As part of strategy of biodiversity conservation, increase stakeholder participation in tourism development and natural resource conservation through activities in the investigated areas. The hypothesis is that if income generation is dependent on the continued availability of biodiversity, then those entrepreneurs and stakeholders will have to act upon economic incentives to conserve the resources (protected areas and other natural features) on which income depends.

7.4.1 Participatory ecotourism planning

Innovation and empowerment through learning and skill development feature strongly in the Sikkim Biodiversity and Ecotourism project. Participants in community ecotourism plans, training courses and conservation management are all using and developing new participatory learning tools that build upon best practices and positive attributes of Sikkim's natural and cultural heritage. A combination of Appreciative Inquiry and modified Participatory Learning and Action (PLA) tools

provides the basis for planning, implementing and evaluating community ecotourism activities (Sharma, *et al.* 2000).

A critical element of planning and subsequent actions in ecotourism is a focus on appreciative inquiry, finding and building upon positive attributes and values in local environments and groups of stakeholders. In May, 1996, participatory community ecotourism planning was conducted in Yuksam and Khecheopalri lake area by Sikkim Biodiversity and Ecotourism Project (Plate 3e & 3f). The participants gathered information and generated site-specific ideas for linking tourism-related income-generating activities to conservation efforts, with a view to encourage visitors to extend their stay in the village and conserve natural resources in the area. Local community members felt that the opportunity for increased income generation lay in trying to extend the stay of visitors to the area.

The critical element of planning and subsequent actions in ecotourism is the focus upon positive attributes and values of local environment. All participants were asked to "Discover" the elements in their environment and community that represent the best of what they are and what they do. In addition to the activities identified in May, in October, 1996, 28 village members organized their own clean-up campaign of the major trekking route, generating a small initial amount of funds for further activities through recycling bottles and tins. Yuksam and

Khecheopalri residents have readily accepted the principle of local contributions to conservation activities and enthusiastically attended the training courses, as well as showed a keen interest in enterprises such as low-cost covered vegetable production. As a result of the lodge operators training, participants have developed an agreed tariff and standardized menus. Operators now maintain visitors' registers and issue receipts to customers. Community-wide events connected with income-generation through extended visits, such as clean-ups and afforestation, were particularly well attended. During May to December 1996, a series of project and other events catalyzed community members to form a local conservation organization, the Khangchendzonga Conservation Committee (KCC). KCC has developed a Code of Conduct for visitors and tour operators to follow the ethics of conservation in the area (Table 7.1). Signboards with the code and paid for by KCC have been erected in Yuksam, and visitors now receive a copy of the code at the lodges/hotels. Yuksam community members participated as resource persons for a community ecotourism planning effort at Sacred Khecheopalri Lake site.

The Code of Conduct (COC) was broadly divided into seven points. The compliance of code of conduct were measure in a five-point scale ranging from "strongly agreed", "agreed", "neutral", "disagreed", and "strongly disagreed". Table 7.1 reveals the details of the indexing and response rate of the tour operators complying with the COC. Among all

the issues it has been observed that 58% of the tour operator strongly agreed for complying properly the COC.

7.4.2 Participatory conservation practices

Despite all the claims of good governance and sustainable management, it is clear that the tremendous growth of nature-based tourism has not been matched by official efforts to adequately plan, implement and monitor developments through an administrative and legal mechanism. A community based conservation approach to achieve the sustainable tourism is being tested in the study sites. This program can foster changes in local attitudes towards conservation and ultimately have the intended result. A critical element developed by the community participants during participatory planning was conservation-related activities, viz. clean-up campaign, site beautification and tree plantation in and around their village. In the first phase, a local clean-up of the village was done by school teachers, children, and community members (Plate 4a & 4b) while during the second phase, villagers proposed to raise funds for garbage management and environmental awareness drive for visitors as well as for the community members. The positive reaction generated among the village community members was evident as shopkeepers and Sunday market hawkers collected their trash and burned all the refuse. The shops have been advised to minimize the use of plastic bags, mineral water bottles and to keep trash bins for collection of

garbage. In addition to the activities identified by the local community members, the Khangchendzonga Conservation Committee organized their own clean-up campaign of the major trekking route, generating an initial fund for further activities through the sale of bottle and tins collected during the clean-up campaign (Table 7.2).

In order to beautify the surrounding locality, indigenous fruit and flower-bearing species were sorted out and planted with the active participation of schoolchildren and the village community. The choice of the species was participatory. At Tshoka, along the trekking trail, the village community contributed significantly in constructing a toilet, mainly for the porters and trekking support staff. The evaluation of these activities that were done annually reflected the pride taken by the local people and ensured their continuity.

7.4.3 Skill development training program

Ecotourism programs are based on tourism management plans developed in consultation with the local people. The community identified the different training programs and these were designed at the project sites with inputs from different stakeholder groups. Some of the major training imparted by the project to the local people and the operators were naturalist guides training, lodge operation, trek cooks and porters and ecotourism product marketing exclusively for the operators (Table 7.3 & Plate 4c & 4d).

The porters' training highlighted the responsible role played by the porters in trekking and mountaineering and how they could significantly contribute to conservation by observing and practicing. The impact of the porters' training was quite significant as porters adopted responsible practices and earned recognition by the government, tourists and different stakeholders. In a particular incident, a porter-cum-guide refused to collect firewood for a group of trekkers up in the mountains. He was a trained person and hence his conservation effort was later appreciated and highlighted in the national papers.

Trek cooks' training emphasizes menu planning, incorporation of indigenous food in the trekking menu, use of alternative fuel, safety, hygiene and sanitation. Lodge operators were trained in house-keeping, managing the accounts, menu planning, use of alternative fuel for heating and cooking purposes, hygiene and sanitation and preparation of local cuisine. To boost the local economy of the farmers, ply-house technology, bio-composting and vegetable seed production training was imparted.

7.4.4 Study tours and exchanges

Study tours and exchange have been a very effective means of learning the positive and negative impacts of tourism and protected area management. The Sikkim Biodiversity and Ecotourism project organize several such tours within and outside Sikkim for different levels of

stakeholders. The farmer's exposure trip at St. Alphonsus at Kurseyang, boosted the enthusiasm and knowledge of the farmers who later successfully adopted some of the techniques.

To understand the various impacts of tourism on mountain environments, to learn about the cultural and traditional practices of a similar site in Nepal, a mixed group of community participants from Sikkim was taken to Langtang, Nepal. The trip was successful as the participants could learn how the people of Langtang had devised mechanisms for conservation of their natural and cultural resources. A policy-level study tour was also organized in early 1998 to Buxa Tiger Reserve and Royal Chitwan National Park in Nepal where the group comprised government officials from the Planning and Tourism Departments, the private sector and community members. This was an opportunity to learn about conservation and tourism related issues in and around the protected areas. The visit provides an excellent opportunity for interaction among the participants to learn about community forest management for ecotourism purposes and to meet the natural resource requirements of the people.

As part of the hypothesis to increase income from responsible ecotourism, the trade association of Sikkim and Travel Agent Association of Sikkim (TAAS) were encouraged to build links with an equivalent association in Nepal, The trekking Agent Association of Nepal (TAAN)

(Plate 4e). Two reciprocal visits were organized for TAAN and TAAS where on both occasions workshops were held on mountain tourism management.

7.4.5 Tourism policy

The sectoral approach of different departments was inadequate in addressing the management aspects in holistic manner. The various private sector stakeholders who were engaged in tourism operation had their own problems and expected incentives from the government. The local community, which is an integral component of ecotourism development, had a limited approach with the government, but this was significantly strengthened during the implementation of Sikkim Biodiversity and Ecotourism project. In due course of time the local community-based conservation group KCC has been empowered by various agencies to monitor and implement conservation activities. Workshops and meetings organized by Sikkim Biodiversity and Ecotourism project have increased the level of public and private sector interaction and awareness of tourism and conservation-related issues. The State Government has incorporated some of the policy issues in the master plan and establishing Tourism Development Corporation has moved a step towards privatization for sustainable development.

Conservation requires a range of interventions, and while the enterprise approach will be a key component of future programs in

Sikkim, it will not necessarily be the only one. For entrepreneurs to undertake and continue conservation actions that support their livelihoods, it seems critical that they have some level of decision-making power over the resources in question. It appears that unless this is possible, economic benefits from an enterprise are unlikely to be effective as incentives to conserve. In Sikkim, there was little decision-making power over natural resources among the range of entrepreneurs, thus there would seem a little chance of economic incentives turning into actions to conserve biodiversity on which tourism depends. In Sikkim, the natural resources have for the most part been managed by the State Government with permits and rights for subsistence extraction given by State departments. Little exists in the way of community management of forests. But, by engaging stakeholders in a debate over the value of biodiversity in the State economy and the most efficient way this can be conserved, local stakeholder at the study sites are now participating in the on-going discussions over how biodiversity conservation can be conducted. The traditional decision-makers, such as government, are now increasingly highlighting the important role that local institution can play. In Sikkim, the most important features of the enterprise-based approach was to provide a framework in which to analyze and develop the potential of tourism for more than one type of stakeholder. Furthermore, it provided a means to argue that long-term benefits from tourism would be

possible only if those, whose income depended on the activity, had a greater decision-making power in natural resource management. As the numbers of visitors both domestic and foreign increases, the need to be proactive on promoting and supporting a responsible tourism ethic among consumers, suppliers and producers alike is imperative. A number of activities have been identified and presented in Table 7.4. The players in sustainable development and management are tourists, tour operators, government authorities, and the general publics are therefore called on to find new forms of coexistence and the right solutions for themselves for the survival of the industry. Sikkim has a great potential to increase its revenue through planned tourism if adopting policies suitable for tourism development.

7.5 Suggestions for Future Management of Tourism

After making an inventory of various tourist attractions, their important features, historical, religious, social and cultural and scenic aspects, and discussing various other significant considerations of tourism and its related phenomenon. Its existing and potential resources, problems and prospects can be analysed for the overall planned development of tourism and also for the betterment and maintenance of the sites and heritage. It is important to have an overall evaluation of the tourist resources in the light of the market potentiality.

A number of potential suggestive measures for the management of tourism in mountain areas are as follows:

- ☛ Consider applying for the entire study area to be scheduled as a World Heritage Site and implement the site management strategies that this would necessitate. Such a designation would protect the sites, act as a stimulus for high-quality tourism, have considerable publicity value and result in increased tourism revenue.
- ☛ Complete a detailed survey of religious sites in the region with an architectural survey. No records currently exist of the contents of most of the major *Gompas* in the study sites. Funding should be sought for stabilization and restoration of important *Gompas* frescoes, which are often in poor condition and have suffered from *ad hoc* treatments. There is a major tourism resource of the area and as such should benefit as soon as possible from part of the tourism revenues or else they may not survive.
- ☛ Consider limiting visitor numbers, raising the royalty and implementing a ban on camping-based tourism combined with investment in upgrading existing traditional inns to provide unique visitor accommodation. During peak season, a paying guest system may be introduced. This can be done with the co-operation of the local communities, which will enhance their income.

- ☛ The higher per capita consumer surplus value and willingness-to-pay by the foreign tourists indicates that an increase in the existing entrance fee for foreign tourists is not likely to affect their visitation rates. Rather, this could generate a considerable income to the park and Lake Authorities. The foreigners are willing to pay a higher entrance fee and other charges. This will be evident from the income and expenditure statements of hotel/lodges at Yuksam. The hotel/lodges are highly profitable and their demand is ever increasing. The existing entrance fee for foreign tourists may be enhanced.
- ☛ Improve the existing facilities of interpretation center at Yuksam in association with any proposed museum development. Such a center could brief visitors on the unique social and cultural heritage of the region, especially if displays include ethnographic material and if a trained person is available to discuss and interpret material for visitors.
- ☛ High quality tourism in both the sites could be self-sustaining with minimal environmental and cultural damage if a sensible management plan were to be implemented. However, continued enforcement of the present policy will result in destruction of the unique character of the area with the result that visitor numbers (and revenue) will fall. Wisely managed tourism in both the sites could provide sustained economic benefits.

- ☛ Revenue generated from tourism in protected areas be channeled into the protection and management of the resources.
- ☛ Limiting visitor numbers has been exceptionally successful in Bhutan and could be equally so in Sikkim as well as in the study sites, but government policy must be clearly established and consistent in order to project an image of a well-managed “quality” industry. Ill-advised pressure from trekking agents in Sikkim should be avoided.
- ☛ It would be possible to smooth out the seasonality of visits to Sikkim by increasing trekking royalties during the popular (March to May and October to November) period or extend, the “Shoulder period”, by organize special attractions in the off-season, for example, organizing promotional fairs, cultural shows, music festivals, and tea festivals etc. Offering fabulous discount on accommodation and meals, rebate on shopping prices is another way of attracting tourists in off-season. Moreover, collective advertisements with press release to Embassies and travel trade showing all these benefits to a tourist will prove much fruitful. The other method of attracting the tourist in off-season is to arrange and offer special rates for conventions, conferences and seminars, games and tournaments in various educational institutions.
- ☛ It was widely proved that local people should be enabled to play a major role in protected area management and that the appropriate partners for protected area tourism would indeed usually be local

communities. This may also offer some compensation for local people, especially if they have been displaced or if their access to resources has been reduced or curtailed. In such circumstances compensation may take the form of capital assistance to develop the tourism venture.

☛ There is a delicate relationship between the lake ecosystem and community beliefs. The religious and cultural practices have high value in local communities. The traditional and cultural practices have to be linked while drawing up a management and restoration plan. The ecotourism favors the concept of cultural, biological and nature conservation, and also stresses on the economic benefits going down to local community. Therefore, Khecheopalri Lake being an important tourism and pilgrimage destination be developed in a participatory way by implementing activities related to ecotourism.

☛ Monitoring is a key tool, but one that is poorly or infrequently used. Monitoring the quality of experience of visitors or the use made of protected areas by local communities should include, and in the following order: identification; analysis for a particular site; placement of this in a regional context; and monitoring over time.

Table 7.1. Perception of tour operators on compliance of Code of Conduct (%)

Code of Conduct	Strongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
Conserve Sikkim's natural and cultural heritage					
Do not trample high altitude vegetation, do not pick any flowers or medicinal plants	27	33	15	15	10
Do not disturb wildlife or its habitats	21	30	15	24	10
Do not allow clients to purchase endangered animal parts or antique cultural artifacts	58	21	18	3	-
Support local conservation efforts and income generation activities	43	18	27	12	-
Avoid use of fuelwood; use alternative fuels					
Use kerosene, L.P.G. (or other non-wood fuel) for all purpose by all the group members	12	27	27	31	3
Discourage campfires, encourage camp fun	-	13	10	46	3
Follow safely rules when carrying, storing and using kerosene and gas	7	21	30	39	3
Leave all camps and trails clean					
Dispose of litter and all non-biodegradable materials	3	10	6	42	39
Use toilet tents on all treks in an environmentally friendly manner	10	21	6	45	18
Use established campsites and avoid trenching around tents	6	18	3	24	49
Practice Conservation					
Avoid fuel-consumptive menu items, e.g. backed foods and large menu selections	10	15	30	24	21
Re-package food into reusable plastic containers to reduce wastes	6	18	9	24	43
Reduce waste by disposing and repackaging also	-	12	42	46	-
Practice proper hygiene and sanitation					
Teach all staff about personal hygiene, sanitary, kitchen and camp routines	3	33	15	34	15
Properly treat the drinking water and uncooked vegetables for clients	12	45	33	10	-
Dispose of washing and bathing water well away from streams, use biodegradable soaps	4	33	15	33	15
Take responsibility for staff and porter welfare					
Provide adequate warm clothing and other essentialities	3	18	10	69	-
Periodically train staff in first aid, guide responsibilities and sanitation etc.	6	24	7	45	18
Properly brief clients before leaving on a trek					
Address cultural do's and don'ts	3	18	9	70	-
Plan days for proper altitude acclimatization	7	24	6	45	18

Table 7.2 Participation of local communities in conservation related activities in the study sites

Activities	Yuksam-Dzongri-Goechha La trekking Corridor			Khecheopalri Lake		
	Male	Female	Total	Male	Female	Total
Clean-up campaign	61	44	105	15	11	26
Tree plantation	104	43	147	10	7	17
Trail maintenance	28	11	39	-	-	-
Lake clean-up	7	3	10	7	6	13
Renovation of monastery	-	-	-	21	4	25
Total	208	101	309	53	28	81

Table 7.3 Skill development training program organized in the study sites and number of participants

Training Type	Duration (day)	Participants		
		Male	Female	Total
Porters	2	120	4	124
Cooks	8	31	4	35
Trek cooks	4	20	-	20
Lodge operators	7	26	14	40
Green vegetable production	4	7	2	9
Seed production and vegetable growing	4	13	10	23
Naturalist guide	6	17	2	19
TAAS guide	4	11	2	13
TAAS marketing course	2	13	3	16
Institutional strengthening	2	6	4	10

Table 7.4 Components and responsibility for sustainable tourism

Components of responsible tourism	Travel Agencies and Tour Operator	Government Authorities	Lodge/Hotels and Restaurants	Local Community	Tourists
Information for the tourists	Encourage code of conduct that respects the wildlife and culture in the destination	Provide information about the area's natural and cultural values	Provide information on public transport and complementary activities	Organize activities that provide a chance to get to know local values	Find out about local values and problems
Safeguard Destination	Guides are well acquainted with natural values and local environmental problems	Area planning follows environmental criteria and respects the architectural heritage	Carry out environmental impact studies; put restoration before new construction	Plan activities so that they do not have a negative impact	Choose offers that do not have an environmental impact; do not expect star facilities
Maintain Biodiversity	Destinations whose biodiversity is threatened or vulnerable are not offered	Protect and signpost valuable on vulnerable areas	Buildings and grounds are planned to blend with landscape	Always avoid risking disturbance or damage	Respect animals and plants; do not buy them as souvenirs
Culture	Guides have a good knowledge of the culture and religion of the host place	Maintain cultural identity; plan tourism so that it benefits all local residents	Provide comfort in keeping with local living standards; offer traditional food	Help integrate tourists in the local way of life	Meet the local population; buy traditional arts and crafts
Save Energy	The visits on offer are nearby and/or accessible by public transport and encourage alternative for fuel wood	Facilitate public transport rather than motor cars; protect pedestrian areas	Adopt energy saving measures and encourage clients to collaborate	Avoid activities that consume fossil fuels	Use public transport, trek; discharge campfires, encourage alternatives to fuel wood
Save Water	Destinations with problems of water shortage or purification are not offered	Install treatment plants and promote economy measures	Install economy mechanisms and encourage clients to collaborate	Avoid activities that squander water or that have an impact on water resources	Save water and avoid wasteful activities
Solid waste	Advertising leaflets; use recycled paper; provide solid waste disposals	Organize selective collection and recycling; carry out awareness campaigns	Reduce the use of non-recyclable materials	Use equipment and materials that do not generate waste	Avoid non-recyclable containers; always use litter baskets

SUMMARY

Summary

The magnificent diverse landscapes and rich cultural heritage of the Sikkim have contributed to the rapid growth of tourism. The Sikkim Himalaya became the foremost center of trekking and mountaineering in the Hindu-Kush Himalayan region. Its unique flora and fauna, rugged terrain and religio-cultural history make it a place of environmental pilgrimage. Trekking travels link this once relatively remote part of the world with the global economy and provide new opportunities for economic development. There has been a considerable economic benefit to the local population, which was previously largely dependent on subsistence farming or the government sector for employment. The changes is most strikingly evident in the Yuksam and Khecheopalri Lake area where the economic development of the different stakeholders contrasts sharply with the living standards of nearby people who have not become involved in tourism sector. It is too early to proclaim that this region is a model for achieving local development through tourism. But the experience to date suggests that locally based tourism development is possible in formerly remote areas and offers hope that the environmental and socio-cultural effects of tourism can be addressed through the combined efforts of local residents, community institutions, national and

state policies and institutions, concerned operators of tourism business, and responsible tourists.

The present study on “Economic Benefits and Conservation Linkages from Tourism Development in the Sikkim Himlaya” was undertaken with the following main objectives: (i) to study and compare the relationships between tourism, market trends, tourism-related revenue distribution patterns and to predict the impact of future growth in two sites (Yuksam and Khecheopalri) of West Sikkim; (ii) to assess and identify possible interventions that strengthen the capability of local people and local communities to derive maximum economic benefits from tourism and (iii) to identify mechanisms for increasing entrepreneurial skills and capacities to expand resources among local stakeholders involved in ecologically sound and socially responsible tourism and other development activities.

The Yuksam-Dzongri-Goechha La trekking corridor with an altitudinal variation of 1750-3700 m asl is a 45 km long trek located in the southwestern part of Khangchendzonga National Park. On this corridor Yuksam is the only settled village, with 11 settlements and 274 households with a total population of 1572. Another sites the sacred Khecheoplari Lake, is situated in the amidst of forest revealing its pristine set up at an altitude of 1700m asl in the western part of Sikkim. The lake

has the watershed area of 12 km² of which 91 ha drains directly to the lake and bog.

Salient findings

1. The number of tourists visiting to Sikkim is growing in a very fast rate during recent year. The main reason of this high growth in tourist influx was mainly due to the relaxation in regulation that opened a number of new areas for both domestic and foreign visitors, and the tourist facilities developed in Sikkim as a whole in recent years. The real growth of tourist number in Sikkim has started from 1980 onwards. Until 1980, the state hosted only 10,000 visitors, which eventually increased to more than ten times in 1998. In 1989 about 46416 visitors arrived in Sikkim in which 96% were domestic and 4% foreign visitors, while in 1998 about 143410 tourists visited Sikkim, out of that 93% were domestic and 7% foreign visitors.
2. Tourism in the study sites is a highly seasonal activity. Flow of visitors distinctly has two peaks annually with low profile in January to March and July to September and high inflow during mid March to June and October to Mid December. During the spring and autumn seasons, the Sikkim Himalaya offers ideal conditions for recreation and trekking.

3. The Yuksam-Dzongri-Goechha La corridor inside the Khangchendzonga National Park is the most popular trekking destination in Sikkim. Trekking/adventure travel in this trail started in 1960. Sikkim State opened its borders to foreigners in 1980. The rise of Sikkim popularity as a nature travel destination began in 1990. The period 1992-97 showed a steady rise in the number of tourists who entered for trekking purposes. In 1997 about 2002 visitors came exclusively to trek in the high mountains. The Himalayan Mountaineering Institute (HMI) also conducted 8 training courses consisting of 1379 trainees.
4. In 1998 out of 143410 visitors coming to Sikkim only 13% arrived Khecheopalri Lake. There is a general perception that the majority of the tourists come for recreation but in case of Khecheopalri lake the visitors came for both recreation and pilgrimage. The data on tourist's flow in this lake were not properly recorded and maintained. The visitor numbers have grown from 16068 in 1997 to 18713 in 1998. During 1998 visitor arrivals comprised of 10913 tourists and 7800 pilgrims.
5. As per the purpose or reason of visit to the area, pleasure (45%) is the most important reason for visit for all categories of tourists. It has been observed that pilgrimage is the main purpose of visiting

the Khecheopalri Lake, while Yuksam-Dzongri-Goechha La corridor has been used mainly for trekking purposes.

6. Lack of promotional measures in Sikkim is a great hindrance to selling its tourism products. Presently the promotional activities adopted by Sikkim based tour operators are advertising in Indian News Papers and Magazines, selling to direct walk-in clients, few operators with proven service are handling referral business from Nepal, and a few of them are handling business from foreign individual motivators and agents. Some operators have established electronic communication while one has a website.
7. About 15 TAAS (Travel Agent Association of Sikkim) agents actively operated treks on the Yuksam-Dzongri-Goechha La route with 303 pax (persons) and non-TAAS members for 591 pax in 1997. A few agents also operated short trek or walk on the Pemayangtse/Khecheopalri/Yuksam/Tashiding route. The trek price for foreign visitors varied between US\$25 to US\$50 per person per day depending on the group size and services provided. Some times the trek price as low as US\$15 per person per day has been quoted in a competitive situation or in the case of walk-in clients where probably service level was sacrificed. Agents who are more aware of the trek market in Nepal and other parts of India seem to have quoted between US\$35 to US\$60 per pax per day to position the

product more realistically in terms of competitive trek products in Nepal. But there are also low quality treks being operated by some agents who undertake treks from clients at a given price. The trek price was low for domestic visitors and varied between US\$15 to US\$35 per person per day depending on the quality of service. Most of the income generated by tour operator is from guided trek. The estimated total turnover from tourism was at Rs 11729280 (US\$286080) in 1998. Only 13 agents are spending 10 to 25% of revenue on marketing activity.

8. The multiplier effect of the revenue earned in tourism have both increased non-tourism employment and enlarged the market for local agricultural products. The net State Domestic Product of Sikkim (SDP) at constant prices significantly increased from Rs 3316867904 in 1993-94 to Rs 5856043839 in 1997-98. The sectoral distribution indicates that the tertiary sector predominates, contributing nearly 43% of the total SDP.
9. The overall literacy rate is significantly higher in Yuksam area than in the Khecheopalri. The female literacy rate (43% and 46%) is lower than the male (54% and 57%) at both the sites. Stakeholder wise in Yuksam and Khecheopalri area, the highest literacy rate (74% and 80%) was recorded in hotel/lodge owner families.

10. In 1996 out of the total 274 households only 133 households were involved in tourism sector, which has increased to 174 in 1997 and reached 189 by the end of 1998. In Yuksam, 69% of the total households are involved in tourism related activities. Out of that 5% were engaged in hotel/lodges, followed by 14% pack-animal operator, 66% porters, 9% fair price shop and 6% tea stall. In Khecheopalri Lake site, only 3% of the total population is involved in tourism sector because majority of the tourist are day visitors and spend 2 to 3 hours only.
11. In Yuksam-Dzongri-Goechha La corridor, about 13.07% of the land owned by the lodge/hotel owner, followed by 11.40% by pack-animal operators and 11.68% by the porter. The fair-price shop owners have only 1.65% of the total land and rest by non-tourism involved families. The teashop owner does not possess any land in Yuksam as most of them are outsiders and migrated to Yuksam from Bihar. In Khecheopalri Lake site, only 11% of the land are owned by the households involved in tourism sector and 89% by the non-tourism involved families.
12. Growth of visitors has been responsible for significant changes in employment and income generation, which lead to improve socio-economic condition of the local people. People of both the sites have reoriented their local economy around tourism. In 1997, about

46% and 7% of the households had income from this source. Since then, involvement in tourism related activities have risen to 69% and 22% in 1998.

13. The economic well being of any region is normally refers to the accumulation of various possession by the family and the source of income. In 1997, the total income of all the stakeholders in Yuksam and Khecheopalri area were Rs. 6622983 and Rs 969800 which has increased to Rs. 7124146 and Rs 1075130 in 1998. In 1998 out of the total income the people involved in tourism sector contributed 70% of the total income, whereas 30% by non-tourism sector in Yuksam area and 30% by tourism and 70% by non-tourism in Khecheopalri. The economic development leads to change in food consumption pattern as income grows. With an increase in income, total calorie intake and the consumption of other food increase.
14. Analysis of forest and other land-uses revealed that dense mixed forest decreased in the past few decades with increase of open mixed and degraded forests. The five class-I land-uses, were identified occurring in both the sites. A total of 84% and 77% of the lake and trekking corridor area had forests. Majority (34%) of the forestland was under degraded category (crown cover, 20%), 19% open forest (crown cover 21-40%) and 19% dense (crown cover > 40%) in Yuksam-Dzongri-GoechhaLa corridor, whereas in

Khecheopalri lake site it is dominated by open mixed forest (41%), followed by dense mixed (23%) and degraded forest (21%). Agriculture was the predominant non-forest land-use, occupying about 14% of the total area in trekking corridor and 13% at the lake site. About 3% and 1% area fall under wasteland category (rock outcrop and landslide). In case of the lake area, major changes were recorded in the form of bog area expansion. The Conversion of dense mixed forest to open mixed forest and then to degraded forests has been mainly attributed to fuel wood and timber extraction, fodder collection and grazing. Agriculture land expansion in the lake watershed had a major impact on the lake ecosystem through increased sediment deposition.

15. The high demand of firewood, fodder and timber provides threats to the surrounding area of the Yuksam-Dzongri-Goechha La corridor and Khecheopalri Lake. Chopping and lopping of highly preserved tree species for firewood, fodder and timber has made tremendous pressure on some selective species in this area.
16. The fuel wood consumption rate was 24 kg/day, as estimated for household in the area during 1997-98. Consumption of the commercial alternative source of energy, i.e., kerosene and LPG (14% and 3%, respectively) was insignificant. There was no evidence of non-conventional sources of energy being used by any

of the stakeholders. The consumption rate of fuel wood varies as per different stakeholders. Total 2437 Mg yr⁻¹ fuel wood was consumed by stakeholders at the Yuksam village out of which 2264 Mg yr⁻¹ consumed by local community followed by 101 Mg yr⁻¹ by hotel and lodges, 45 Mg yr⁻¹ by HMI, and 26 Mg yr⁻¹ by other stakeholders. Whereas in case of Khecheopalri total 1126 Mg yr⁻¹ was consumed out of that 670 Mg yr⁻¹ by local community and 456 Mg yr⁻¹ by trekker's hut and tea shops.

17. Animal husbandry in both the sites is mainly dependent on the surrounding forests. These forests are heavily lopped along the trail route, lake surrounding forests and margins of the settlements. The grazing pressure of Yaks and Dzos are seasonal and more prominent in the alpine zone. The livestock populations of Yuksam-Dzongri-Goechha La corridor have increased from 1530 in 1996 to 1708 in 1998. Where as there were 304 domesticated animals in Khecheopalri lake area. The Yak/Dzo and cattle need about 33 kg of green fodder per day, whereas sheep and goats required about 15 kg per day.
18. A survey of households in the villages of Yuksam and Khecheopalri Lake showed that a double-storied building/lodges needs about 600 to 700 ft³ wood. Generally large timber poles are harvested for making ceilings, doors, windows and beams. Medium size poles are

used for furniture and repairs. Small size poles (mainly bamboos) are cut for making cattle sheds or temporary huts.

19. Dependence on fuel wood for energy is causing serious deforestation problems in trekking corridor and Lake Site. The pressure is far greater in Monastery forest than in the trail forest outside Khangchendzonga National Park. The consumption of fuel wood varied amongst stakeholders with respect to different physical and economic factors causing serious deforestation problems in the trail and Lake Site. The widespread switching over to inferior quality of fuel wood species is the indicator of pressure in the forests of both the sites. The fuel wood continues to be the prime source for cooking in trekking corridor, while commercial alternative energy sources contributed very little. Enhancing the supply of fuel wood through plantations and reducing the fuel wood demand through providing alternate source of energy can facilitate these.
20. The heavy inflow of visitors during the religious festival showed some negative impacts on the serenity of the lake specially in the form of noise, littering, garbage dumps, and resource extraction. Garbage quantification in 1998 after the festival showed that the total garbage collected was 452 kg out of which 625 was biodegradable and 38% non-biodegradable wastes. The total

garbage collected during the tourist season was 2375 kg in and around the lake.

21. The economic valuation of ecotourism was conducted in Yuksam-Dzongri-Goechha La corridor and Khecheopalri lake area. A contingent valuation method was used to estimate the Willingness-to-pay (WTP) for conservation and protection of natural resources in both the sites. The results showed that the response is emphatically positive. The survey received good response from local communities, pilgrims, domestic and foreign visitors for their willingness to conserve the area. The analysis reports a mean WTP per visitor per visit that was higher for foreign visitors than domestic visitors. Local community members were also willing-to-pay for environmental management. The multiple regression on WTP reveals that the attitudes of respondents, their visitation rate, and number of aspects of the area they considered valuable, were important determinations of WTP for trekking corridor and lake site. Variables attain the expected sign and they are statistically significant.
22. As per the contingent valuation method for the entire sample, using mean of variables, the estimated willingness-to-pay for the management of trekking corridor and Sacred Khecheopalri Lake are US\$8.84 and US\$7.19 by the foreign visitors and US\$1.91 and US\$

2.51 by domestic visitors per trip, whereas US\$6.20 and US\$0.88 for local community annually and US\$2.16 for local pilgrims per visit, respectively. This shows that the foreign visitors had higher recreational/conservation value than the domestic visitors and local community members.

23. Incorporating with the estimated values of the consumer surplus for their visit to Khecheopalri Lake was derived as US\$661 and US\$1562 in the first and second equations, respectively as per the travel cost method. Recreational/Sacredness value per visitor was US\$3.87 as per the consumer surplus. Total number of local pilgrims to Khecheopalri Lake was 7800 in 1998, the annual aggregate recreational/sacredness value for the pilgrims amounted to US\$30186.
24. The lake has recreational and biodiversity values for domestic and foreign visitors, and more sacredness value for the Sikkimese people. The demand curve function for recreation increased with decrease in travel cost and distance for Sikkimese pilgrims. The lake showed high recreational/sacredness values that were attributed to conservation of the site for biodiversity and pilgrims.
25. The hypothesis “ if income generation is dependent on the continued availability of biodiversity, then those entrepreneurs and stakeholders will have to act upon economic incentives to conserve

the resources on which income depend”, this hypothesis held true at both the sites. A number of conservation related activities organized by stakeholders to conserve and clean the area.

26. The issues addressed in this study regarding conservation involvement, socio-economics, and substitutability should allow further understanding of ecotourism’s role in conservation.

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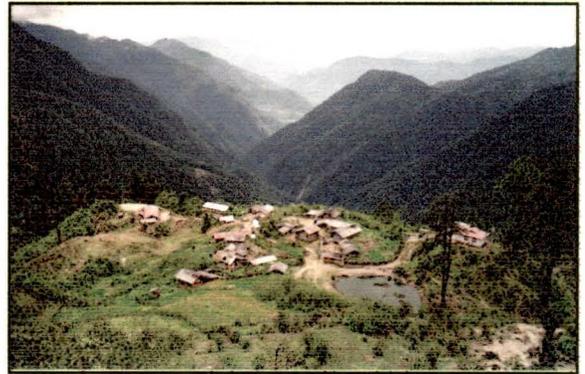
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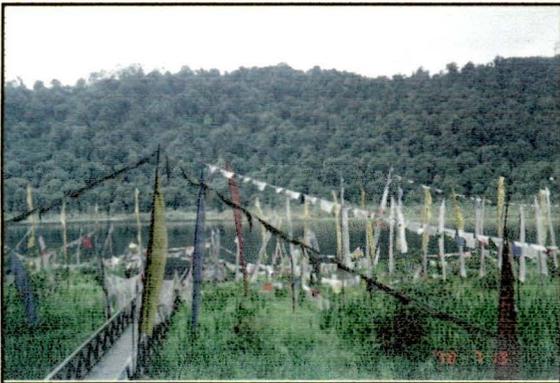
PHOTO PLATES



(a) View of snowclad mountains from Dzungri is one of the major attraction for the tourists



(b) Tshoka, the last settlement along trekking corridor at 3000 m



(c) Khecheopalri - a sacred lake



(d) Stream trumbling to meet sacred Rathong Chu



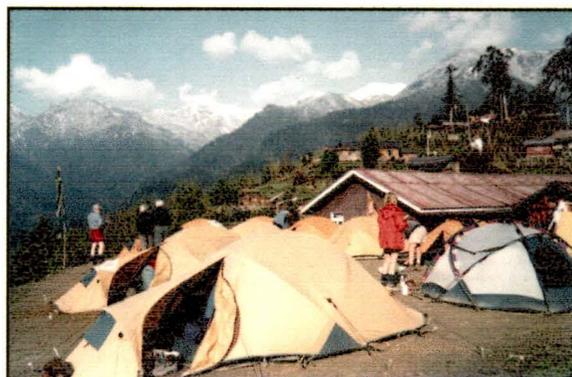
(e) Norbugang - 1st Chogyal enthroned in 1642



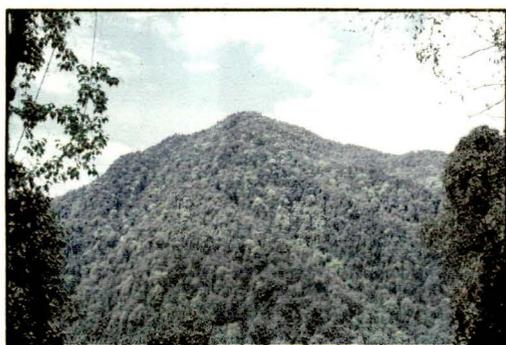
(f) Dubdi monastery near Yuksom



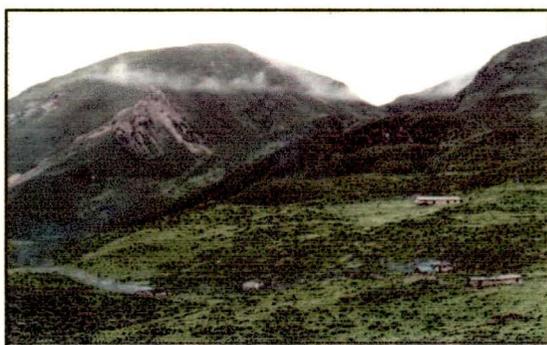
(a) Trekking trail condition at higher elevation



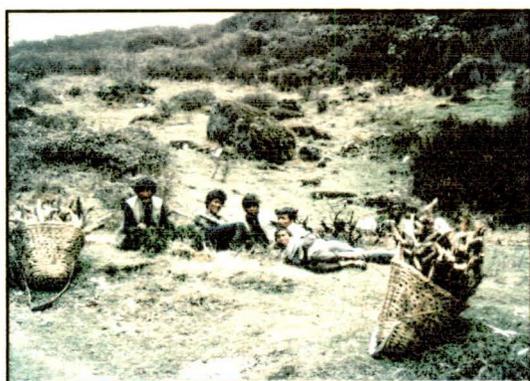
(b) Tourist camps at Tshoka on the trail



(c) A pristine temperate broadleaved forest at some inaccessible areas of KNP



(d) Alpine scrub land with Rhododendrons, Junipers and the permanent goth at Dzongri



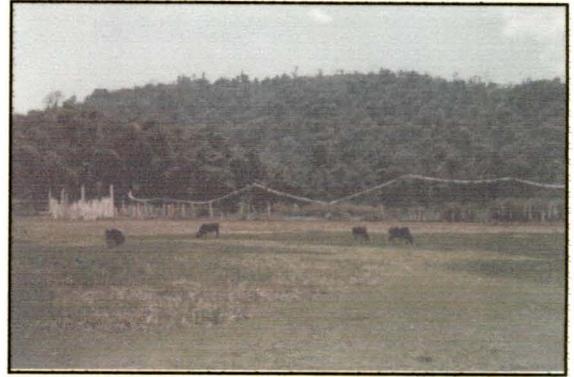
(e) Fuel wood collection by porters at higher elevations has been one of the major sources of habitat destruction



(f) Tree fodder collection: a daily schedule of the locals



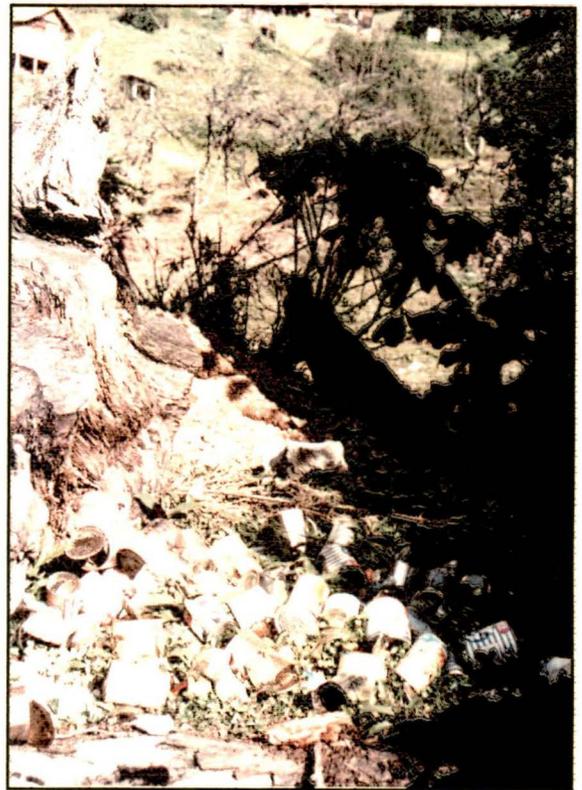
(a) Pack animals grazing and trampling along the trail



(b) Livestock grazing on the Khecheopalri lake



(c) Habitat degradation along the trail are responsible for trail erosion



(d) Non-biodegradable garbage disposal near a campsite on the trail



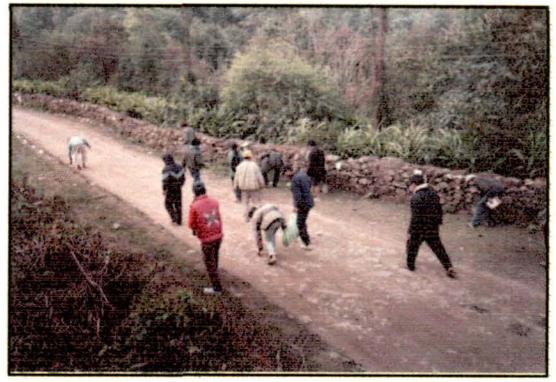
(e) Participatory Rural Appraisal exercise at the Yuksam village



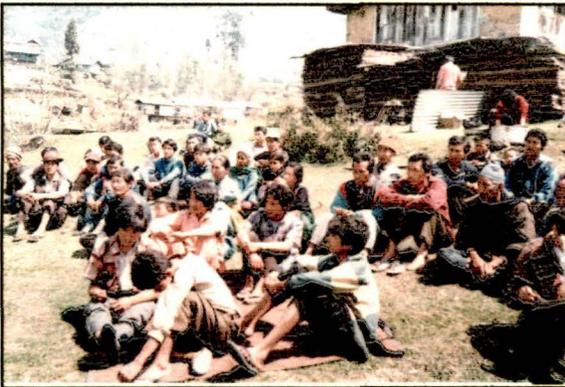
(f) Participatory Rural Appraisal exercise at the Khecheopalri village



(a) Clean-up campaign in Yuksam village



(b) Clean-up campaign in the Khecheopalri lake surroundings by involving local community



(c) Awareness drive for porters



(d) Skill development training for hotel/lodge owners in Yuksam village



(e) Exchange of experiences and expertise; Travel Agent Association of Sikkim (TAAS) and Travel Agent Association of Nepal (TAAN)