

**ECOTOURISM AND SUSTAINABLE DEVELOPMENT:
A CASE STUDY OF BHUTAN**

*Dissertation submitted to Jawaharlal Nehru University in partial
fulfillment of the requirements for the award of the degree of*

MASTER OF PHILOSOPHY

KUMAR VEER DHIRENDRA



**Political Geography Division.
Centre for International Politics,
Organisation and Disarmament.
School of International Studies
JAWAHARLAL NEHRU UNIVERSITY
New Delhi-110067
YEAR - 2006**



DECLARATION AND CERTIFICATE

Date: 27th July, 2006

DECLARATION

I declare that the dissertation entitled **“Ecotourism and Sustainable Development: A Case Study of Bhutan”** submitted by me for the award of the degree of **Master of Philosophy** of Jawaharlal Nehru University is my own work. The dissertation has not been submitted for any other degree of this university or any other university.

Kumar Veer Dhirendra
Kumar Veer Dhirendra

CERTIFICATE

We recommend that this dissertation be placed before the examiners for evaluation.

Prof. Varun Sahni

CHAIRPERSON

Chairperson
Centre for International Politics,
Organization & Disarmament
School of International Studies
J.N.U., New Delhi

Dr. S.S. Deora

SUPERVISOR

28.7.2006

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Kumar Veer Dhirendra

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LIST OF ACRONYMS

BTC	-	Bhutan Tourism Corporation
BTCL	-	Bhutan Tourism Corporation Ltd.
BTF	-	Bhutan Trust Fund for Environmental Conservation
EIA	-	Environmental Impact Assessment
FRDD	-	Forest Resource Development Division
FSD	-	Forestry Service Division
JSWNP	-	Jigme Singye Wangchuk National Park
MOP	-	Ministry of Planning
MPFD	-	Master Plan for Forestry Development
MTI	-	Ministry of Trade and Industry
NEAP	-	National Environmental Action Plan
NEPA	-	National Environmental Protection Act
NES	-	National Environmental Strategy
NGO	-	Non-Governmental Organization
RGOB	-	Royal Government of Bhutan
RMNP	-	Royal Manas National Park
RSPN	-	Royal Society for the Protection of Nature
SAARC	-	South Asian Association for Regional Co-operation
SDA	-	Sustainable Development Agreement
SI	-	Seasonality Index
SWS	-	Sakten Wildlife Sanctuary
TAB	-	Tourism Authority of Bhutan
TNP	-	Thrumshingla National Park.
TSNR	-	Torsa Strict Nature Reserve
UN	-	United Nations
UNCED	-	United Nations Conference on Environmental and Development Programme
WWF	-	World Wildlife Fund

GLOSSARY

Chhu	-	River
Driglam	-	Namzha – Code of Conduct
Dungkhag	-	Sub-district
Dzon	-	Fortress or Monastery
Dzong Khag	-	District
Dzongdag	-	District Administrator
Gakid	-	Happiness and peace
Geog	-	Administrative Block under the district
Goong	-	A Household
Kam-zhing	-	Rain –fed dryland
Lhakang	-	Temple
Lhenkhag	-	Ministry
Rigney	-	Buddhist study
Sheda	-	Buddhist College
Thrimshung Chenmo	-	Supreme Laws
Tsa –Wa-Sum	-	The King, the Country and the People.
Tsechu	-	Annual Festival
Tseri	-	Shifting cultivation
Tshachhu	-	Hot Spring
Tshogdu	-	National Assembly
Zondu	-	Community meeting

CHAPTER 1

INTRODUCTION AND LITERATURE SURVEY

1.1 Introduction

In the old Tibetan Texts, Bhutan was called as 'Land of the Mon,' referring to the *Monpa* aboriginal inhabitants of the Himalayas. Another characteristics name of this region was 'Realm of Healing Herbs'. The southern slopes of the Himalayas have been known from time immemorial for medical herb plants. There is also good motive why the ancient block prints refer to Bhutan as paradise of the South and Lotus Garden of the Gods – Rich in Forests of Sandalwood and Sweet – Scented Herb.

Bhutan is a small landlocked country in the Eastern Himalayas. Although, it is situated in a geographically unfavorable position but commanding a very good location in terms of ecotourism. Bhutan's 72 per cent of the land area is covered by virgin forests and has one of the richest biodiversities in the world for a country of its size. Its wild life varies from almost tropical to extreme cold polar species. It has a vast potential to become one of the world's greatest ecotourism destinations. Although it remained secluded from the rest of the world till early 1960s nevertheless it began to develop its economy through cautiously planned development programmes, as it has always been conscious of the value and fragility of its marvelous natural environment.

After centuries of self imposed seclusion, the kingdom of Bhutan has emerged into the 20th century with an extensive forest cover and a larger intact natural resources base. It has been recognized as one of the 10th "hot spots" of the world, due to its delicate mountain ecosystems and extremely high level of biodiversity. Until 1964, the kingdom of Bhutan was accessible only by foot through the high passes of Tibet. However, the construction of a road from Phuntsholing on the Indian border to Thimphu and Paro towards Bhutan side has made the travel possible and since then its doors were opened in a controlled way in 1974. Visitors have been fascinated after having a look of the nature's treasure in the country. In 1980s, an international airport was constructed in Paro, 55 km from the Lapatol of Bhutan.

Bhutan's tourism industry mainly began in 1974 with the primary purpose of generating revenue, especially foreign exchange to contribute to the country's socio-economic development. It has great possibility to translate its ecotourism potential into economic prosperity and well being of the people of Bhutan. However it has always been aware that an unrestricted flow of

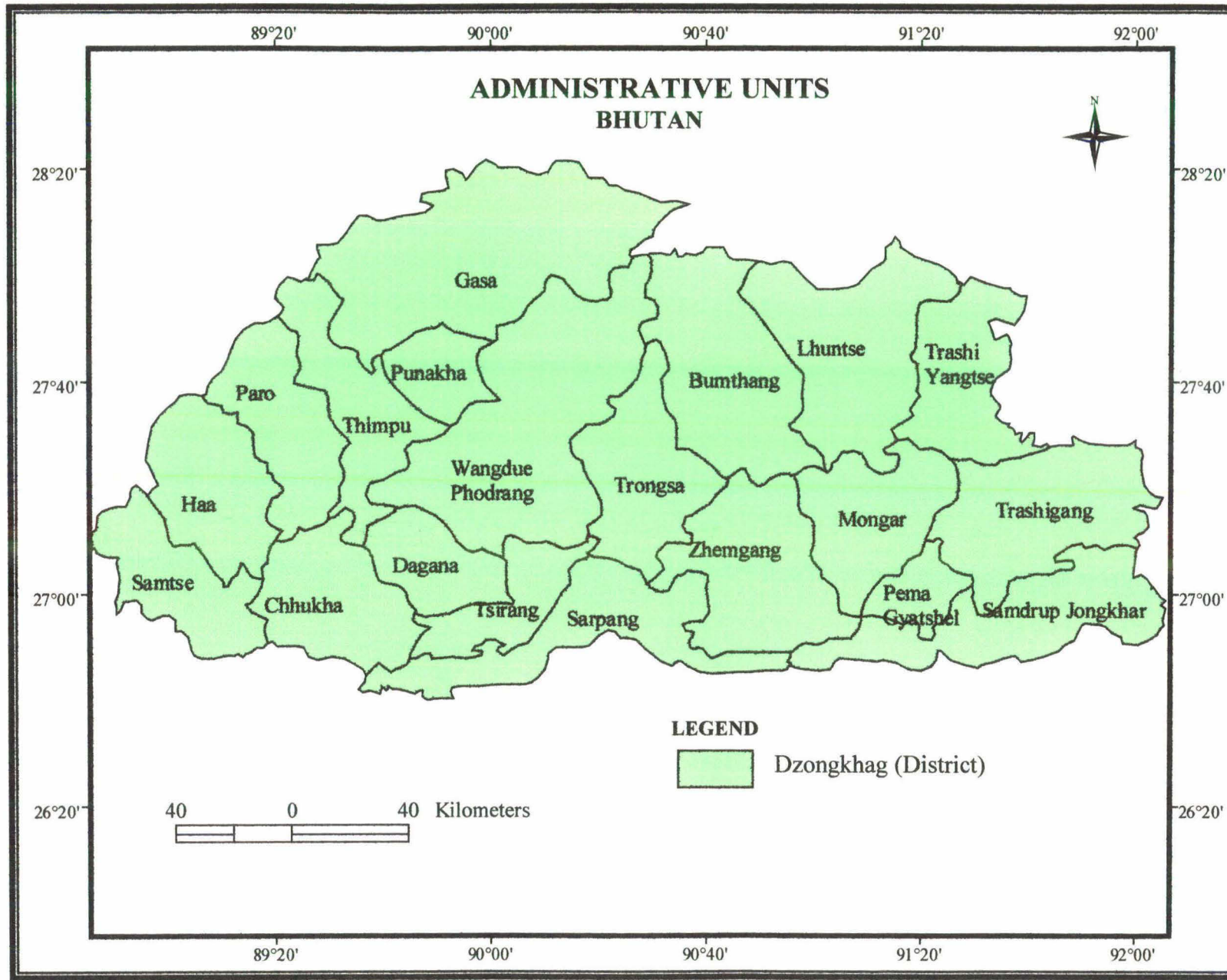
tourists can have negative impact upon Bhutan's fragile environment and its rich and distinctive culture. Now it is making serious efforts to harmonize ecotourism, sustainable development and economic well being of the nation. Bhutan faces problems such as economic backwardness, poverty, lack of basic amenities and infrastructure, which can be solved by maximizing the revenue and employment etc. while maintaining the sustainable development.

The tourism industry in Bhutan is founded on the principle of sustainability, which means tourism must be environmentally and ecologically friendly, socially and culturally acceptable and economically viable. The numbers of tourists visiting Bhutan are regulated to a manageable level because of the conservation policy and lack of infrastructure.

However the core concerns of the research envisage an unplanned and unregulated tourism growth in natural areas, which can lead to marked negative environmental and cultural impacts. It also reveals that visit to environmental fragile areas, often during sensitive period, can affect key processes such as breeding and rejuvenation as well as enhance environmental degradation of air, water, and soil along with depletion of rich biodiversity. The uncontrolled opening of the area and sites for ecotourism may eventually lead to mass tourism and a range of negative impacts. In the absence of adequate participation of government in planning and management, local communities often bear the costs of tourism development. And in order to raise the living standards of the present population without compromising the country's fragile ecosystem, rich biodiversity or the quality of life for future generations, sustainable development is particularly important for a country like Bhutan.

Nonetheless, there is considerable prospective for ecotourism to provide positive contributions to conservation and economic development at a variety of scales. It can generate revenues for the national government that can be reinvested in the conservation and regeneration of fragile mountain eco-system. At the same time, it can also provide income-generating opportunities to traditionally remote and marginal communities. The challenges are in developing strategies that can help in creating the enabling policy framework, the support and link at various scales and types of operation, which are necessary for creating a broad based support for successful ecotourism.

Map No. 1.1



1.1.1 Meaning of Ecotourism

Thompson (1995) define ecotourism as traveling to relatively uninterrupted or pure natural areas with the specific objective of studying, admiring, and enjoying the panorama and its wild plants and animals as well as any existing cultural manifestations found in these areas.¹ Basically ecotourism or “green travel’ is nothing more than environmentally responsible travel. This includes such activities as hiking, bird watching, photography, river rafting and any form of travel that is not harmful, disturbing or detrimental to the natural surroundings.

‘Orams (1995) and Hvenegaard’ (1994) write that the term lean ecotourism can be traced to the late 1980s, while others “Higgins (1996) suggested that it can be traced to the late 1970s.² By and large, “at the end of the twentieth century environmental concerns begin to exert an influence upon tourism, as suggested by the emergence of ‘new’ forms of tourism such as ‘eco-tourism’.³ Ecotourism came into prominence in the eighties as a strategy for reconciling conservation with development in ecologically rich areas.

1.1.2 Concept of Sustainable Development

There is no single definition for sustainable development. The National Environmental Strategy (NES) task force, during the course of developing the National Environment Strategy, came up with the following definition of sustainable development for Bhutan:

The capacity and political will to effectively address today’s development and environment problems and tomorrow challenges without compromising Bhutan’s unique cultural integrity and historical heritage or the quality of life of future generation of Bhutanese citizens⁴.

Sustainable development depends upon efficient natural resources management, integrated environment and regional planning; and all these developmental planning and management should be sensitive to traditional Bhutanese culture and values. As far as, relationship between ecotourism and

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1. Fennell, A. David (1999), *Eco-tourism: An introduction*, London and New York: Routledge. p. 30.
 2. Ibid p.30
 3. Andrew Holden (2003), *Environment and Tourism*, New York: Routledge. p.10.
 4. National Environment Commission (1998), Royal Government of Bhutan, *The Middle Path Nation Environment Strategy for Bhutan*. 3

sustainable development is concerned. It should not be competitive rather it should be compatible to each other. Ecotourism can generate economic benefits at local to national level and thus create incentives to preserve the resources on which it depends. Furthermore, ecotourism is a tool to build public support for conservation and to encourage the sharing of private sector in conservation efforts. Clearly at a time when traditional conservation through enforced protection of natural areas was being questioned for its effectiveness and social impacts strategies such as ecotourism has offered considerable potential for integrating conservation with sustainable development.

1.2 Geographical Location and Area

Bhutan is a landlocked country situated in the eastern Himalayas and is mostly mountainous and heavily forested. It is bordered for 470 kilometers by Tibet (China's Xigazong Autonomous Region) to the north and northwest and for 605 Kilometers by India's state of Sikkim to the West, West Bengal to the Southwest Assam to the South and Southeast and Arunachal Pradesh [formerly the North-East Frontier Agency (NEFA)] to the east. Sikkim and its eighty-eight kilometer wide territory divides Bhutan from Nepal and West Bengal separates Bhutan from Bangladesh by only sixty kilometers. Its East West and North-South dimension are 300 kilometers and 170 kilometers respectively, forming a total area of 46,500 square kilometers, an area one-third the size of Nepal.

1.2.1 Physiography

Bhutan is one of the most rugged mountain terrains in the world. It has a varying elevation ranging from 160 meters to more than 7,000 meters above the sea level. Its highest peak, north central *Kulha Gangri* (7554 meters above sea level), which is close to border with china and the second highest peak, *Chomo Lhari* is overlooking the *Chumbi* Valley in the west (7314 meters above sea level). Nineteen other peaks also exceed 7,000 meters.

In the South, the Southern hills or Siwalik hills, the Foothills of the Himalayas, are covered with dense deciduous forest, alluvial lowland river valleys and mountains that reach to around 1,500 meters above sea level. "As far as the physiographic aspects are concerned, the lower foothills of the Himalayas are

made up of *Gondwanas (Damudas) Baxoas or Daling* sediments and their respective metamorphic.”⁵

The foothills descend into the subtropical *Duars* plain. Most of the *Duar* plain proper is located in India, and ten to fifteen kilometers penetrate inside Bhutan. In the north, the snowcapped Great Himalayan ranges reaches heights of over 7500 meters above sea level and extend along the Bhutan - China border; the Inner Himalayas are southward spurs of the Great Himalayan Range.

The Block Mountains, the central Bhutan, form a divide between two major river systems, the MO Chhu and the Drangme Chhu (Chhu means river). Peaks in the block mountains range between 1,500 meters and 2,700 meters above sea level, and the fast flowing rivers have carved out spectacular gorges in the lower mountain areas. These gorges are longitudinal. Apart from this, several fertile valleys include the Paro valley, which lies in the heart of the country⁶.

The terrain of the land makes the mountain state of Bhutan generally inaccessible both from the north and also from the east and the west. Inaccessibility, therefore, is one of the characteristics of the country. Coelho has rightly pointed out that “the first paved road from the border town of phuntsholing to the capital Thimphu was completed as recently as 1962, making it possible to undertake a journey in seven hours that previously took twice as many days”⁷.

1.2.2 Climate

The climate of Bhutan is affected by monsoon. The western Bhutan is particularly affected by it. Bhutan has three climate zones. The *Duars* plain in the outer foothills has a subtropical climate with high humidity and heavy rainfall, averaging 508 to 629 cm. (200 to 250 inch) in a year. The central belt of flat valleys has cool winter and hot summer with moderate rainfall. The uplands and high valleys over 3650 meters have cold winter and cool summer with an annual average rainfall of 102 to 152 cm. (40 to 60 inch). Over 5000 meters the land is permanently covered with snow and glaciers.

Temperature also varies according to elevation. Temperature in Thimphu, located at 2,200 meters above the sea level in West-central Bhutan, ranges from

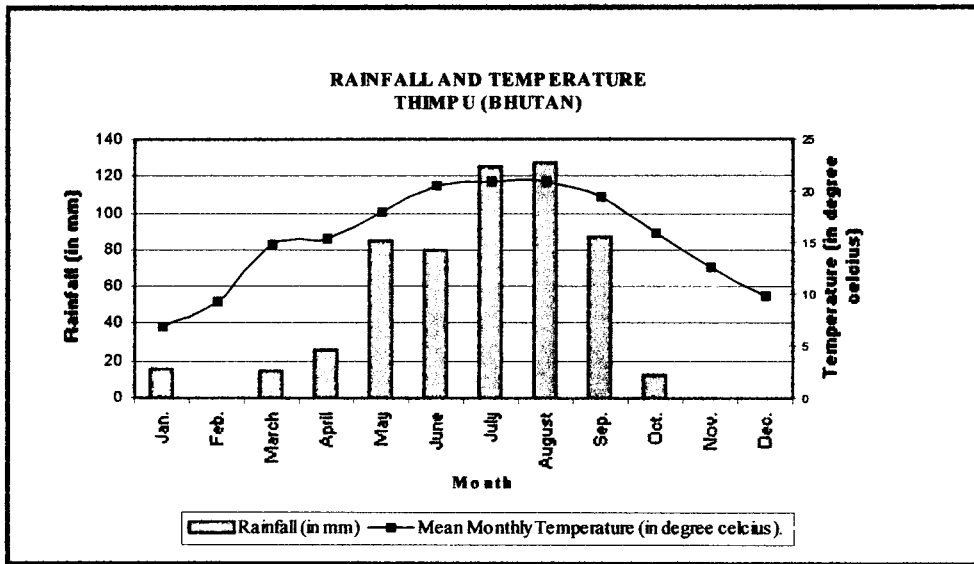
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5. Karan, Pradyumna P. (1967), *Bhutan –A Cultural Geography*, Lexington: University of Kentucky Press. p. 25.
 6. *Encyclopedia of the Third World* (1982), London: Monsel Publishing Limited.
 7. Coelho, Vincent H. (1970), *Sikkim and Bhutan*, New Delhi: Services of India. p.56.

approximately 15⁰C to 26⁰C during the monsoon season of the June to September but drop to between - 4⁰C and 16⁰c in January. Most of the central portion of the country experiences a cool and temperate climate year round. In the south, a hot, humid climate helps in maintaining a fairly even temperature range of between 15⁰C and 30⁰C round year, although temperature sometimes reach 40⁰C in the valleys during the summer.

Bhutan's dry spring season normally starts in early March and lasts until mid-April. Summer weather commences in mid-April with sporadic showers and continues through the early monsoon rains of late June. The summer monsoon lasts from late June through late September with heavy rains from the southwest monsoon. The monsoon weather, blocked from its northward progress by the Himalayas, brings heavy rains, high humidity, flash floods and landslides, and numerous misty, overcast days. Autumn, from late September or early October to late November, follows the rainy season. It is characterized by bright, sunny days and some early snowfalls at higher elevations. From late November until March, winter sets in, with frost throughout most of the country and snowfall is common above elevation of 3000 meters. The winter northeast monsoon brings gale force winds down through high mountain passes. Apart from that, a major feature of the climate is the frequency of violent thunderstorms from which Bhutan gets its name. In the native language Bhutan means, "Land of the Thunder Dragon". For meteorological purposes, four stations Thimphu, Samdrup, Lhuntse and Samtse have been selected which represent the Northwest, Southeast and Northeast And South West region of the Bhutan. Climatic graph of these stations show the trend of rainfall and temperature round the year.

In Thimphu maximum rainfall occurs in the month of July and the August by the southwest monsoon. February, November and December are the dry months. However, Temperature is also high in the month of July and August.

Figure: 1.1: Rainfall and Temperature at Thimphu (Bhutan)



The station Samdrup Jongkhar, which represents South East region gets maximum rainfall, occurs in the month of July. That is rainfall corresponds to summer season and very less rainfall occurs in the winter season. Temperature is also very high in the month of June, July, August, and September.

Figure: 1.2: Rainfall and Temperature at Samdrup (Bhutan)

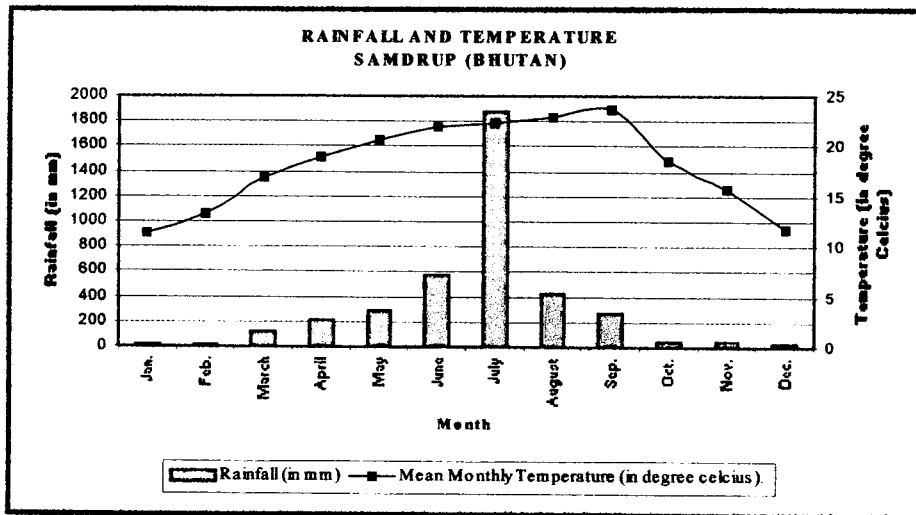


Figure 1.3 represents climatic condition of Lhuntse, which is located in the northeast region of Bhutan.

Figure: 1.3: Rainfall and Temperature at Lhuntse (Bhutan)

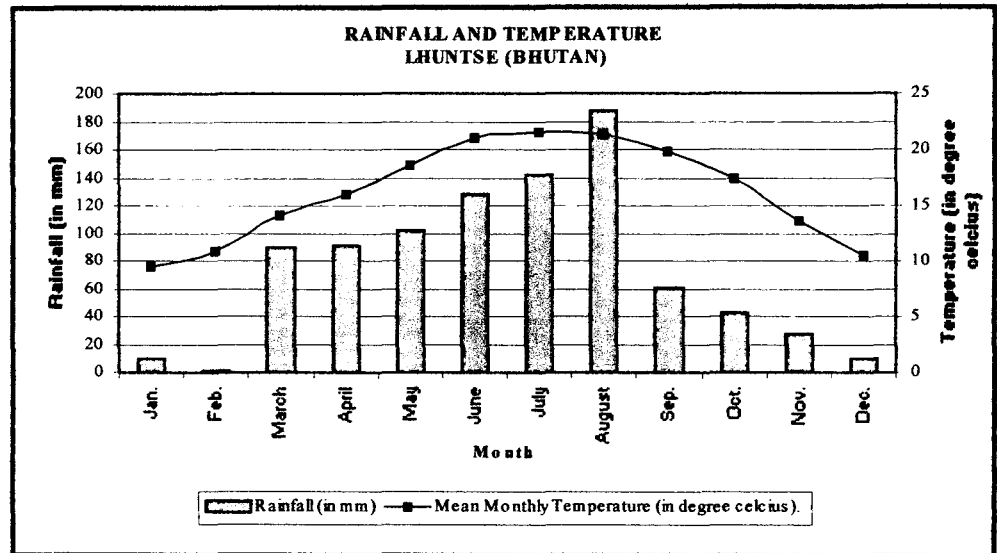
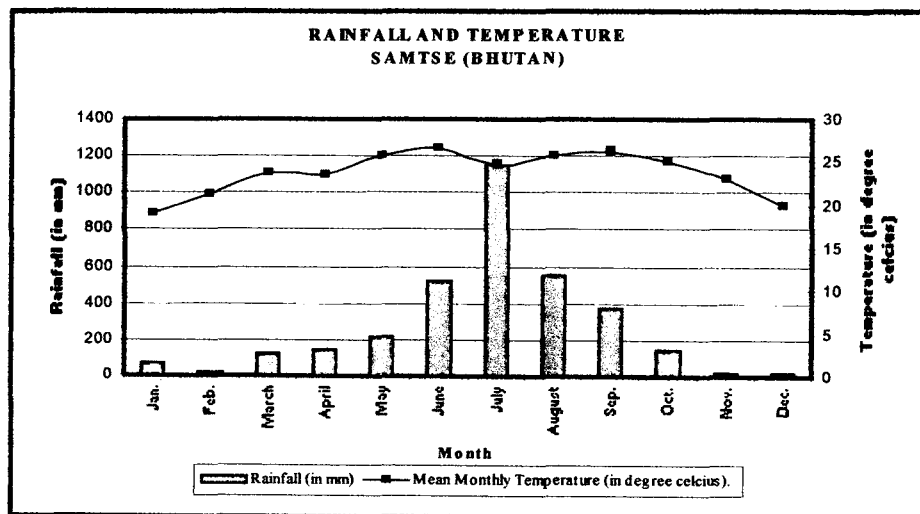


Figure 1.4 represents the climatic condition of Samtse, which is located in the South West region of Bhutan

Figure: 1.4: Rainfall and Temperature at Samtse (Bhutan)



1.2.3 Drainage System

Bhutan is drained by a series of parallel rivers flowing south through narrow valleys and gorges into the Brahmaputra from west to east. These are the Amo Chhu, Raidak (with its tributaries the Paro Chhu, Wang Chhu and the Ha

Chhu), Sankosh, Ai, Tongsa, Bumtang, Kuru and the Dangma. None of these rivers is navigable. By and large, we can divide Bhutan into four major river systems. The Drangme Chhu, the Puna Tsang Chhu, also called the Sunkosh, the Wong Chhu and the Amo Chhu. Each flows out of the Himalayas, southerly through the Duars to join the Brahmaputra River in India. The largest river system, the Drangme Chhu, flow southwesterly from India's state of Arunachal Pradesh and has three major branches: The Drangme Chhu, Mangde Chhu and Bumthang Chhu. These branches emerge from the Drangme Chhu boon basin, which spreads over most of eastern Bhutan and drains the Tongsa and Bhumthang valleys. In the Duars where eight tributaries join it, the Drangme Chhu is called the Manas Chhu. The 320 Kilometer long Puna Tsang Chhu rises in northwestern Bhutan on the Mo Chhu and Pho Chhu, which are fed by the snows from the Great Himalayas Range. They flow southerly and at the Punakha they join to form the Puna Tsang Chhu which flows southerly into Indian state of West Bengal. The tributary of the 370 kms long Wang Chhu rises in Tibet. The Wang Chhu itself flows southeasterly through west Central Bhutan, drains the Ha, Paro, and Thimphu Valleys and continues into the Divas, where it enters into West Bengal as the Raisye Chhu. The smallest river system, the Tira Chhu, known as the Amo Chhu in its northern reaches also flow out of Tibet into the Chumbi Valley and swiftly through western Bhutan before broadening near Phuntsholing and then fazing into India⁸.

1.2.3 Glaciers

Glaciers are mainly located in northern Bhutan, which cover about 10 per cent of the total surface area⁹. These glaciers are fed by fresh snow in each winter and slow melting takes place in summer. The Glacial melt added to the monsoon fed rivers; creating the flooding and the consequent disaster.

1.2.4 Flora and Fauna

The century of isolationism, a small population, and topographical extremes has led Bhutan to maintain one of the intact ecosystems in the world. Over 7500 varieties of plant life exist that includes around 300 medicinal plants. Over 165 species of mammals are known to exist,

8. *Encyclopedia of the Third World* (1982), London: Monsel publishing Limited.

including many rare and endangered species like the red panda, snow leopard and golden langur and 700 species of birds. Bhutan's forests are internationally significant for their rich biodiversities and Bhutan has been accepted as one of the "10th hot spot" in the world (RGoB, 2003).

The forest resources in Bhutan is only one of its kind in the Himalayan range due to its enormous variety, changing with altitude over a relatively short distance from subtropical forest through temperate broad-leaved and coniferous woodland to high alpine meadow and scrubs. There is a pronounced difference in the vegetation cover in three different zones of the country and it is mostly due to the prevalence of varied climatic conditions across the kingdom. The southern foothills are mostly covered by the dense and thick deciduous trees while the inner regions are dotted by an infinite variety of plants, flowers and trees including birch, pine, chestnut, oak, apples, peaches and plums are also grown in the fertile valleys. The northern part with the tundra type of climate allow the growth of coniferous trees and other alpiners growth like magnolia rhododendrons, birth fir, spruce etc.

According to remote sensing data 64 per cent of the land area in Bhutan is covered by trees and 6.6 per cent by alpine pasture/ meadows and shrubs.

1.3 Economy

1.3.1 Land use

In the mid-1980s, about 70 per cent of Bhutan was covered with forests; 10 per cent area was covered round the year with snow and glaciers; nearly 6 per cent was permanently cultivated or used for human habitation and another 3 per cent was used for shifting cultivation (*tsheri*), a practice banned by the government, and 5 per cent was used as meadows and pastures. The rest of the land was either barren rocky even or scrub land.

Remote sensing data indicate that as much 64 per cent of Bhutan's land areas are forested with 6.6 per cent Alpine pasture; snow and glacier 10.0 per cent; cultivated land 8.8 per cent; 94.4 per cent of the land under forest is well stocked; 0.5 per cent is covered by plantation and only 5.5 per cent is degraded. Most of the degraded forest is located in the southern region.

1.3.2 Agriculture

In 2001, Agriculture contributed 36.7 per cent of share to the total economy as measured in terms of Gross Domestic Product (GDP). It is also the single largest sector that provides livelihood to 79 per cent of the population. The agricultural practice has changed tremendously over the years. The farm production is supplemented by keeping different kinds of domestic animal such as cattle for draught and milking propose, chicken for eggs and pigs for meat, due to the improved communication facilities in the country. There is an increasing tendency to go for cash crops like apples in the temperate north, oranges, areca nut and cardamom in the subtropical south.

1.3.2.1 Farming System

Bhutan can be classified into three sub-systems: Pastoral transhumance system, subsistence level crop and animal husbandry, and early commercial farming. The present cropping calendar in valley cultivation proceeds according to traditional beliefs and experiences, and has remained relatively unchanged over the past 20 years.

1.3.2.2 Cultivation System

There are three types of cultivation among Bhutan's subsistence farmers: namely valley cultivation, terrace cultivation and shifting cultivation (Negi, 1983). Valley cultivation covers less than 30 per cent slopes. This type of land represents 18 per cent of the total cultivated land and is normally used to grow paddy rice in 75 per cent of the cropped area. Terraced cultivation is done in the rain fed land (also referred to us dry land or *Kamshing*) with more than 30 per cent slope. Almost 50 per cent of the cultivated land in the country is under terraced cultivation. Maize is the major summer crop followed by buckwheat in areas not suited for maize due to cold. The third type is shifting cultivation (*tsheri*). This is practiced on 32 per cent of the cultivated land. It is practiced to hedge the risk of crop failure and to compensate for food deficit, and almost all farmers practicing it can be regarded as subsistence farmer, Maize constitutes 68 per cent of crops produced in this land.

1.3.3 Mining Energy and Commerce

1.3.3.1 Industries

In Bhutan, the industrial sector has until recently played a relatively small role in the economy of the Kingdom. Industrial production and construction represented only 14.2 per cent of GDP projected for 1991. Handicrafts, cement, food processing, wood milling and distilling were the major industries. There are about 400 small-scale cottage and industrial units. Cottage industry plays a prominent role with its good timber resources and favourable agricultural conditions. There is a lot of scope for expansion of the manufacturing sector particularly in these areas.

1.3.3.2 Mining

The mining industry in Bhutan is as yet relatively undeveloped. The kingdom has significant deposits of a number of mineral resources, including limestone, coal, graphite, gypsum, slate and dolomite. Most mining activities are limited to relatively small operations, mainly involved in the mining of dolomite, gypsum, limestone, slate, coal, marbles quartzite and talc.

The mining and quarrying industry was projected to produce 1.5 per cent of GDP in 1991. Limestone used in cement production and clay is among the major minerals being extracted. Mineral production also has included marble, dolomite, graphite and slate.

1.3.3.3 Energy

Electricity and gas production was expected by the government to account for 10.7 per cent of GDP in 1991. Hydroelectric power has long been a very important aspect of Bhutan's economic development as a low cost energy source supporting more capital intensive industries, such as forestry, mining, cement and calcium carbide production. Bhutan's steep mountains, deep gorges and fast flowing rivers create abundant hydro electric potential which the Government began to develop in the early 1960s with India's assistance.

1.3.3.4 Commerce

Commercial services were projected to generate 7.4 per cent of GDP in 1991. Much of Bhutan's commerce revolves around tourist-oriented hotels, restaurants, wholesale and retail trade.

1.4 Infrastructure Development

An efficient road system for a landlocked country assumes paramount importance as it plays a crucial role in supplying all development activities and in stimulating domestic and international trade. In the last 25 years, tremendous achievements were made in establishing 4007 kms of roads and several motorable bridges. In the difficult areas where the construction of motorable road has not yet begun, suspension bridges provide the vital transport links. As per the 2002 record, there are four thousand seven kilometers of highways out of which only twenty-four kilometers is paved and rest thirty nine hundred twenty three kilometer is unpaved. As far as, airlines are concerned Druk air is the national airline. Bhutan established its international air links with Kolkata and today it flies to six destinations in the region. The Paro international airport was inaugurated on 10 April 1999 and has taken the air transport sector further ahead in providing the reliable, safe and comfortable travel services. As per the 2004 record, there are only two airports. In the last two and half decades, telecommunication network has changed from physical wire network to a national digital network. Telecommunication has been accorded high priority in Bhutan's development plans.

1.5 Literature Survey

Because of the infancy of ecotourism research, there are many 'unknowns' that may be partially addressed by the general tourism literature, and literature from other disciplines. Literature is an important parametric issue, which carries research forward. There is a vast body of literature on eco-tourism. It includes different types of tourism, planning, its impact and areas of tourism interest.

Douglas Pearce (1988)¹⁰ in his book 'Tourist Development' took origin-linkage-distinction framework, which underlines the structure of the whole book

10. Pearce, Douglas (1989), *Tourist Development*, Harlow (England): Long man Group Ltd.

and analyses agents and elements of development, impact and planning highlights the spatial interaction arising out of the movement from origin to destination. In his study we envisages relationship between geography and tourism. Apart from this, he also identifies patterns and trends and at last provides a model on the basis of which whole tourism can be developed.

Mill and Marion (1985)¹¹ describe tourism system in terms of demand and supply. They identify four major parts of the tourism system. These are 1. Market (tourists), 2. Travel (transportation) and 3. Destination (attraction, facilities and services) and 4. Marketing (information and promotion).

Gunn (1985)¹² identifies the "population" with an interest in and ability to travel. Besides he also specifies the influencing factors on the functioning of tourism system such as natural resources, cultural resources community, government policies and organization leadership etc.

De Kadt (1979)¹³ says that policies and practices for tourism will follow the overall policies and practices of the nation as a whole. This is reflected in the relative roles of government and private enterprise.

Cohen (1978)¹⁴ deals with the problems of AIDS in tourism areas and envisages that the best policy for the government to adopt is openness about the problem, giving attention to protecting public health. This approach informs the tourists and residents about the situation so that they can take precautions and provide a basis for taking measures to mitigate the problem.

The academicians representing different fields of knowledge have initiated number of attempts for understanding tourism.

According to Lee (1989)¹⁵, researchers have made attempts to understand the phenomenon of tourism authority. Their approaches can broadly be identified into two major streams: i. Political economy approach and ii. Functional approach.

11. Mill, R.C and A.N. Harrison (1985), *The Tourism System: An Introductory Text*, Englewood cliffs: N.J. Prentice Hall Inc.

12. Gunn C.A. (1988), *Tourism Planning*, New York: Talow and Francis.

13. De Kadi, Emanuel (1979), *Tourism: Passport to Development*, New York: Oxford University Press.

14. Cohen, Eric (1978), "Impact of Tourism on the Physical Environment", *Annals of Taliban Research* (5 92): 215-237.

15. Lee J. (1989), *Tourism Development in the Third World*, New York: Routledge Publication.

Political economy approach emphasizes the structural relationship between origin and destination. According to this approach the structure of industry is determined or governed by political and economic determinant. Functional approach mainly deals with classifying tourism in terms of their functional aspects, without any political considerations.

Mitchell and Murphy (1991)¹⁶ explain environment in the totality of tourism activity incorporating natural elements and society's modification of the landscape and resources.

Singh (ed.) (1989)¹⁷ discuss the negative and positive impact of mountain tourism on documented by various scholars for presenting an integrated model of mountain development. Currently, the studies highlighting sustainable approach and development of eco-friendly tourism are becoming the area of interest of many tourism researchers.

Jina (1994)¹⁸ has dealt with the evolutionary aspect of tourism development, which covers a part of his work '*Tourism in Ladakh Himalayas*'. He has identified four stages in the process of tourism development and had correlated it with the economic development of the host region.

Holdern (2000)¹⁹ in his book '*Tourism and Environment*' took a holistic approach in trying to understand the complexity of both tourism and the environment, and the relationship that exists between them. In his book he also envisages that how the pace of development has placed a tremendous strain upon the natural resources of the earth, and the functioning of the environmental systems that we as human rely upon for our survival.

Fennell (1999)²⁰ in his book '*Eco-tourism*' attempted to address what might be considered 'inconsistencies' in the philosophical basis of eco-tourism, and the development and implementation of ecotourism

16. Mitchell and Murphy (1991), "Geography and Tourism", *Annals of Tourism Research* Vol. 18: 57-70.

17. Singh, S.L. (ed.), (1989), *Impact of Tourism on Maintain Environment*, Meerut: Research India Publication.

18. Jina, P. Singh (1994), *Tourism in Ladakh Himalayan*, New Delhi: India's Publication.

19. Andrew Holden (2001), *op.cit.*, New York: Routledge.

20. Fennell, A. David (1999), *op.cit.*, New York: Routledge.

products in a wide variety of destinations. Apart from this he also highlighted the key issues related to the field of ecotourism.

Chandra (2002)²¹ in his book '*Global Ecotourism Codes, Protocols and Charters*' highlights the global codes, protocol and charters which will not only help to develop environmentally responsible travel and visitation, but would also promote participation. He emphasised how these serves as guidelines to protected areas managers, tour operators, travel agencies, local people and tourists while undertaking eco-tourism, particularly in ecologically fragile areas.

Philippe (1994)²² in his book '*Principles of International Environmental Laws, Volume 1, Framework, Standards and Implementation*' present a comprehensive overview of those roles of public international law which have their objective for the protection of the environment. He also highlighted that international environmental efforts will remain marginal unless they are addressed in an integrated manner.

Anastasia and Stephens (2004)²³ provide a qualitative insight of duality of ecotourism (tourism and environment) and in their conclusion they said very few images being positioned at the middle of the continuum and the two social practices does not function in a complementary way leading to a dualism rather than a duality of ecotourism.

Smit Kar (2002)²⁴ in his article "Scope for Harnessing Ecotourism", he highlighted the potential and contribution of ecotourism in world GDP. Export-Import foreign exchange earning employment and other related field. He also monitored certain pre-requisites of ecotourism.

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21. Chandra, Prabha (2003), *Global Eco-tourism Codes, Protocols and Charters*, New Delhi: Kaniskha Publishers and Distributors.
 22. Philippe, S. (1994), *Principles of International Environmental Law Framework, Standards and Implementation, volume 1*., Manchester and New York: Manchester University Press.
 23. Anartisia, G. S. and P. Stephamos (2004), "Images of Nature by Tourism and Environmentalist Discourses", in visitors' books *A Critical Discourse Analysis of Ecotourism, Discourses society* Vol. 15, No.1.
 24. Smit Kar (2002), "Tourism Industry: Scope for Harnessing Eco-tourism", *Mainstream*, Vol. 40, July-December 29-30.

Robyn (2001)²⁵ in his article emphasise upon ecotourism in Bhutan villages. He introduced with the pastoral yak herding religious festival, music, crafts etc. of Bhutan village and show a growing concern over the impact of tourism and emphasises that how can the village benefit from the beauty of such places without destroying them in the process. Above all, how is the benefit returned to the source to the villages is a matter of concern.

Martin Li (2004)²⁶ in his article "*Travel in Bhutan: The Land of the Thunder Dragon*", highlighted the measures and a responsible attitude toward tourism which are helping successfully to preserve the last untouched Himalayan culture.

Martha Honey (1999)²⁷ in his book '*Ecotourism and Sustainable Development*' presents an overview of the ecotourism industry and a first hand account of ecotourism project around the world. His case studies highlight the economic and cultural impact of tourism development on indigenous population as well as on ecosystem Honey also surveys current thinking and policies of various environmental group.

Gregory, Zbigniew, and Anthony (1999)²⁸ in their book '*Decision Support Systems for Sustainable Development*'. A resource book of methods and applications highlights about the role of information technology (IT) in achieving sustainable development by providing well-designed and useful tools for decision maker. This book explores the area of Decision Support System (DSS) in the context of sustainable development.

Barry Dalal, and Stephen (2003)²⁹ in their book '*Sustainable Development Strategies*', provide a cornerstone resource for a wide range of organization and individuals concerned with sustainable development

25 Rohyn, R. (2001), "Eco-tourism in a Bhutan Villages", *Transition Abroad*, Jan-February.

26 Martin Li (2004), "Travel in Bhutan: The Land of Thunder Dragon", *Transition Abroad*, November –December.

27 Martha Honey (1999), *Eco-tourism and Sustainable Development*, Washington D.C: Island Press.

28 Gregory, E. K., M. Zbqgnw, and G. Y. Anthony (1999), *Decision Support Systems for Sustainable Development*, Massachusetts, USA: Publisher Springer.

29 Barry Dalal, C. and B. Stephen (2003), *Sustainable Development Strategies*, USA: Earth Scan Publication Ltd.

at national and local levels as well as for international organizations concerned with supporting such development. This book focuses on integrated strategy for sustainable development; the approaches and methods covered are equally relevant to poverty reduction, environmental and sectoral development.

Martin and Alan (2004)³⁰ in their book *Explaining Sustainable Development: Geographical Perspective*, offer fresh insights into sustainable development by looking at it from a range of geographical perspectives. It demonstrates geography's unique contribution to the study of human – environment relationships and examines sustainability at the full range of spatial scales from global to the local

Jennifer A Ellzott (1999)³¹ in his book *An Introduction to Sustainable Development*, envisages that how world's existing patterns and processes of development and their environmental impact confirms the need for sustainable development.

Jane, Silberstain (2000)³² in the book *Land Use Planning for Sustainable Development*, believes that there is a need to connect current problems with contemporary practices and why they exist and emphasis that potential remedies are based on principle of sustainable design and at last he suggests the alternative methods for guiding, directing and controlling the ways in which we modify our land scape.

Natalia Mirovitsksya, William Ascher (2002)³³ in their study “Guide to Sustainable Development and Environmental policy”, attempt a comprehensive presentation of definition, philosophies, policies, models and analysis of global environmental and developmental issue with a view of comparative, multidisciplinary, and geographically varied perspectives on environmental governance,

30 Martin Purvis, Grainge Alam (ed.) (2004), *Exploring Sustainable Development: A Geographical perspective*, USA: Earth Scan Publication Ltd.

31 Jennifer A. Elliott (1999), *An Introduction to Sustainable Development*, London: Routledge.

32 Jane Silberstain (2000), *Land Use Planning for Sustainable Development*, CRC Press.

33 Natalia Mirovitskaya, William Asher (2002), *edited Guide to Sustainable Development and Environmental Policy*, Durham: Duke University Press.

Russell B carpenter (2002)³⁴ in “The Blessing of Bhutan” presents a splendid account of Bhutan. The blessing of Bhutan is based on the account of extensive travels and interviews. Author also highlights distinctiveness of Bhutan from its social structures to its development philosophy of Gross National Happiness.

B.S. Das (1995)³⁵ in “Mission to Bhutan: A Nation in Transition” highlights the process of Bhutanese efforts to deal with the changing situation as the country strive to project itself as a modern nation. In part II of this book author envisages Bhutan’s problems in the coming years.

Habibur Rahman Khan (1997)³⁶ in his article, “Challenges of Economic Liberalization and Environment in Small States of South Asia: Bhutan and Maldives”, envisages on the development processes of both the countries which have been accelerated for the benefits of the people and simultaneously faced many obstacles with regard to development associated with demographic changes and environmental degradation. He emphasized upon how to adopt an eclectic approach to maintain the sustainable development.

Jacqueline M. Hamilton, David. Maddison, Richard, S.J. Toi (2005)³⁷ in their article, “Climate Change and International Tourism: A Simulation Study of the Current Pattern of International Tourist Flows”, has been modeled using 1995 data on departure and arrivals for 207 countries. Using this basic model, the impact on arrivals and departures through changes in population, per capita income and climate change have been analyzed. He found that in the medium to long term tourism would grow, however the change from climate is smaller than from population and income change.

34 Russell. B. Carpenter , Blyth Carpenter (2002), *The Blessing of Bhutan*, USA: University of Hawaii Press.

35 Das, B.S. (1995), *Mission to Bhutan : A Nation in Transition*, New Delhi: Vikas Publishing House.

36 Khan, Habibeu Rahman (1997), “Challenges of economic Liberalization and Environment in small states of South Asia: Bhutan and Maldives”, in *BIJS Journal*, Vol. 18, No. 4: 470-496.

37 Jacqueline M. Hamilton, David J. Maddison and Richard J. Toi (2005), *Global Environmental change*, Vol. 15: 253-266. ()

Thierry Mathov (2001)³⁸ in his article, “Bhutan in 2001: At the Crossroad”, analysed the major challenging issues of economy, domestic politics, ULFA and Bodo-insurgency, foreign relations, immigration negotiation with Nepal. He also highlighted that the private sectors as the engine of employment and national growth have not made headway yet in Bhutan.

Nagendra Singh (1978)³⁹ in his book, ‘*Bhutan: A Kingdom in the Himalayas*’ presents a comprehensive study of the land, its people and their government. He took a historical perspective in presenting detailed account.

1.6 Objectives

1. To find out the evolving trends, patterns and directions of tourist arrival in different seasons, months and years in Bhutan.
2. To analyse how ecotourism offers new opportunities and hope for future development.
3. To monitor and evaluate the environmental and cultural impact of ecotourism and identify the problems that affect the future sustainability of Bhutan’s ecotourism or challenges of regulating ecotourism in Bhutan.
4. What are the measures that can be taken to reduce any adverse impact and issues that need to be addressed urgently to ensure ecotourism in Bhutan to remain sustainable.
5. Role of government, international organizations, tourist organizations and local communities in maintaining long term sustainability of ecotourism in Bhutan.

1.7 Data Base

Data for the study were collected from the following sources:

1. Statistical Year Book of Bhutan: 2003. National Statistical Bureau, Royal Government of Bhutan, Thimphu Catalogue No.101, March 2004.

38 Thierry Mathov (2001), “Bhutan in 2001: At the Crossroad”, in *Asian Survey*, Vol. XLL, No.1: 192-97.

39 Singh, Nagendra (1978), *Bhutan: A Kingdom in the Himalayas*, New Delhi: Thomson Press (India) Ltd Publication Division.

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2. Statistical Year Book of Bhutan 2004, National Statistical Bureau, Royal Government of Bhutan, Thimphu, March 2005.
3. Department of Tourism, MTT, Royal Government of Bhutan, Thimphu, 2002.
4. Ministry of Communications, Royal Government of Bhutan, Thimphu Thimphu, 2001.
5. Ministry of Agriculture, Royal Government of Bhutan, Thimphu, 1995.

1.8 Methodology

The data collected from the various secondary sources have been compiled and analyzed according to the need of the study. The data computation ranges from computation of simple per centage values of the absolute figures to construction of various indices. The use of statistical diagrams, cartographic techniques like GIS mapping has also been made. The following indices have been constructed for a better representation of the significant features of ecotourism.



1.8.1 Seasonality Index (SI)

This index has been constructed to measure the seasonal fluctuations of tourist arrival. For this purpose, the year is divided into four seasons based on the homogeneity in distribution of temperature and rainfall.

Winter	December, January, and February
Summer	March, April, May
Monsoon	June, July, August
Autumn	September, October, and November.

Seasonality index for each season is obtained by computing the per centage share of tourists coming during each season out of annual tourist flow

The index is as follows:

$$\begin{aligned}
 \text{S.I.} &= \frac{\text{Tourists arriving in the } X^{\text{th}} \text{ Season}}{\text{Total tourist arrival in } Y^{\text{th}} \text{ year}} \times 100 \\
 &= \frac{t(x)}{t(y)} \times 100
 \end{aligned}$$

Higher is the value of index, the higher would be the share of tourists in that season.

DISS
338.4791
D537 Ec
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DE MARTONNE'S ARIDITY INDEX

De Mortonne defined aridity index as follows

$$I = \frac{\text{Mean Annual Precipitation in mm}}{\text{Mean Annual Temperature in } ^\circ\text{C} + 10}$$

Based on this, the above mentioned index is used in this study to represent the composite impact of precipitation in mm and temperature in $^\circ\text{C}$ on the monthly tourist flow. It is found that higher is the value of index, lower is the aridity and vice versa.

It is computed for different states for the purpose of regionalisation.

1.8.2 Road Density

This index has been constructed to measure the accessibility. This is a ratio between length of road in kilometers of the n^{th} district and the area (in square kilometers) of the n^{th} district. Higher value of index indicates greater accessibility. The index has been calculated as under

$$\text{Road density (RD)} = \frac{\text{Road length in km } n^{\text{th}} \text{ district}}{\text{Area in km}^2 \text{ of } n^{\text{th}} \text{ district}}$$

CHAPTER 2

EVOLVING TRENDS AND DIRECTIONS OF ECOTOURISM IN BHUTAN

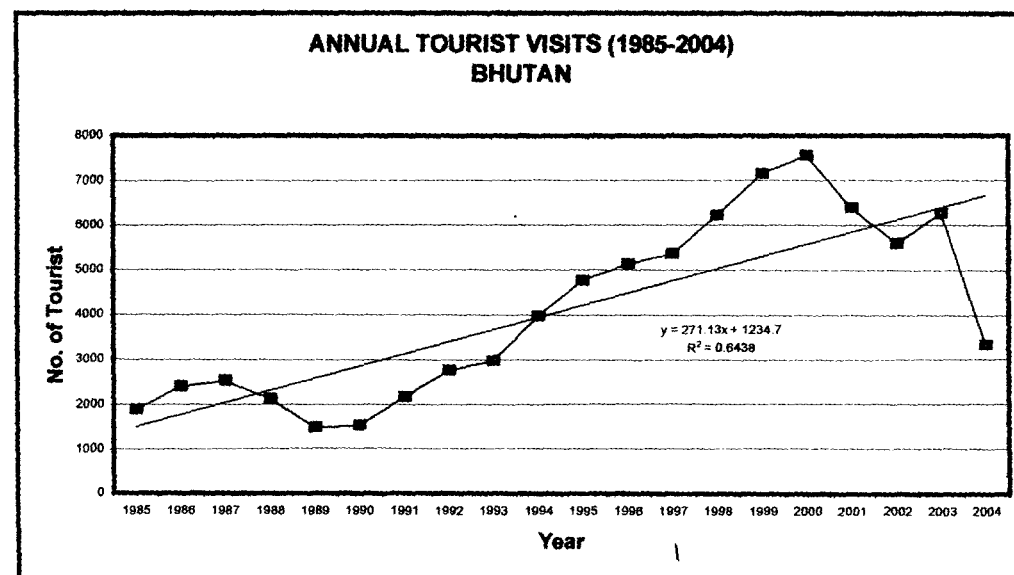
2.1 Bhutan's Tourism: The Present Trends

Bhutan's tourism industry began in 1974, it was introduced with the primary objective of generating revenue, especially the foreign exchange, publishing the country's unique culture and traditions to the outside world, and to contribute to the country's socio-economic development.¹ Initially, the government was totally operating this industry, but in response to changing operational requirements, it was first corporatized in 1983 and finally with the privatization initiative of the government, it got privatized towards the end of 1991.

2.2 Present Trends- by Arrival of the Tourists

The tourism industry in Bhutan is relatively young. Since its beginning, the number of tourists visiting Bhutan has increased gradually from just 287 in 1974 to over 7559 in 2000. However in 2002 there was a comparative decrease in tourist arrivals. In the year 2001 and 2002 the number of tourist reduced to 6393 and 5599, respectively. This indicates the government policy of "High Value – Low Volume" tourism.

Figure 2.1: Annual tourist visits (1985-2004) in Bhutan.



Source: Statistical Year Book, Bhutan, 2004.

But number of tourist arrival in the year 2004 drastically reduce to the half of the level of the year 2000. It is partly due to political instability, Bodo insurgency and

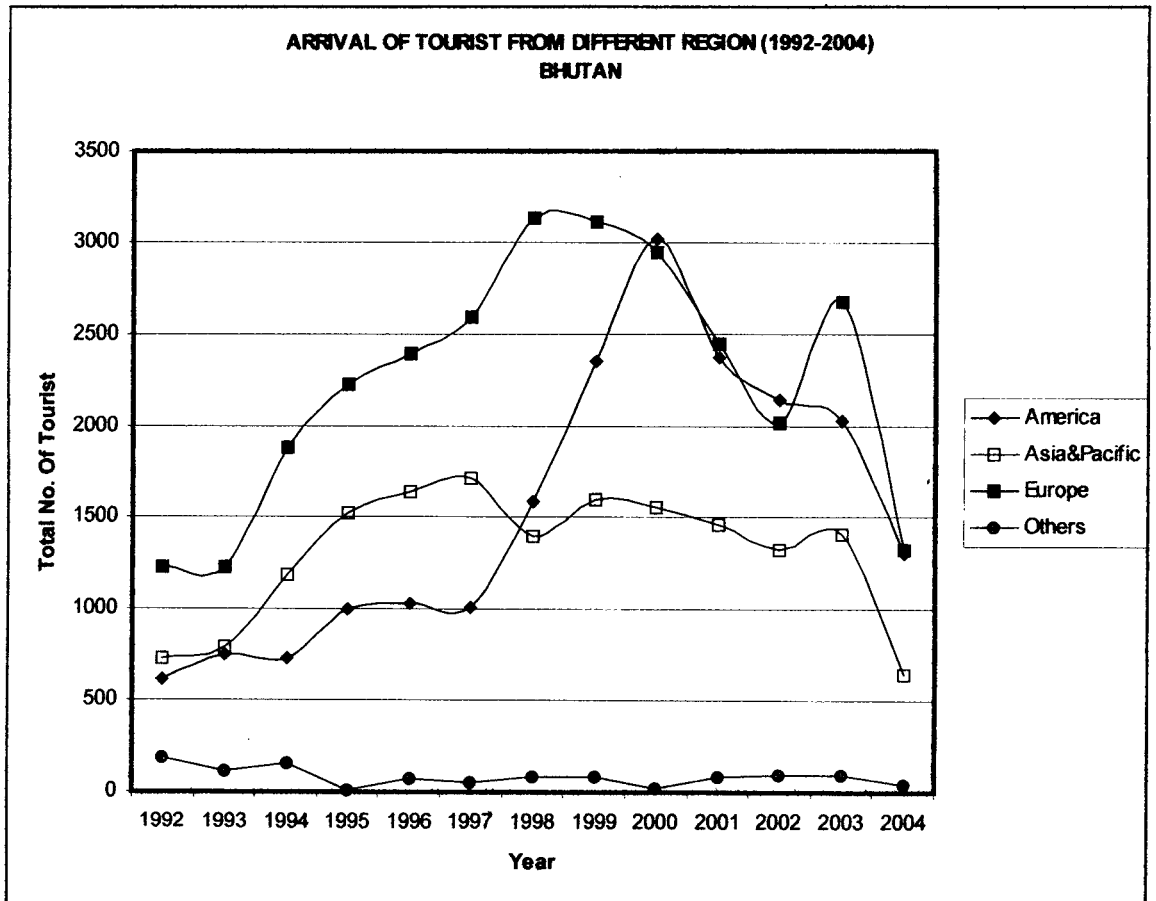
¹ Edward, Inskipo (1992), "Sustainable Tourism Development in the Maldives and Bhutan", *UNEP Industry and Environment*, Vol 15 (3-4) p. 34

peace keeping operation i.e. “operation all clear”.It is an important indicator, which tells that stability, peace and security are prerequisite for ecotourism development.

2.3 Direction of Ecotourism in Bhutan

Presently most of the tourists coming to Bhutan are from Europe followed by America and Asia pacific. Tourist from these regions showing increasing trends till the year 2000 but after that they started declining while the tourists from other regions show fluctuating trends.

Figure 2.2: Arrival of Tourist from Different Region (1992-2004) in Bhutan.



Source: Statistical Year Book, Bhutan, 2004.

In the early period tourist from the Asia – pacific accounted for larger percentage of total arrivals in comparison to America till 1997 and ranked second after Europe but there after its place has replaced by tourist coming from America. Presently the America and the Europe are the most important regions from where tourists are coming to Bhutan. It is followed by Asia pacific. Very few numbers of tourists come to

Bhutan from South Africa, South America and the Middle East.

Further more, on the basis of nationality, tourists of USA constitute the largest number of all tourists which count 1913 is followed by Japan 892 and United Kingdom 892 and 519 respectively in the year 2002. In the Asia Pacific region, Japan ranked first followed by Australia. From America largest number of tourists come from USA followed by Canada, which is very low in comparison to USA. While from Europe the largest number of tourists come from United Kingdom followed by Germany, Netherlands, and France. Very few numbers of tourists come to Bhutan from South Africa, South America and Middle East.

2.4 Present Trends of Tourist Arrival by Purpose

Tourist visits Bhutan for different purposes. In the early years, the pleasure tour, holiday, and recreation, trekking and mountaineering were not differentiated. Later on the purpose of tourist arrivals divided into two categories first belongs to those who come for tours, holidays and recreation and other who come for trekking and mountaineering. From the graph it is clear that the percentage share of tourist coming for tours, holidays and recreation have been more or less increasing. It constitute 93.6 per cent of total tourist in the year 2002 while those who come for trekking and mountaineering show fluctuating but declining trends and its share reduced to 21.7 percent in the year 1998 to 6.4 percent in the year 2002. Presently in the year 2004 percentage of tourists coming for the purpose of tour, holidays and recreation constitute 95.9 percent, and tourists coming for trekking and mountaineering constitute only 4.1 percent. It has shown declining trends due to increasing environmental concern regarding conservation of natural resources, fragile forest, and biodiversity. Government regulated control has resulted into decreasing the number of tourists coming for trekking and mountaineering purpose.

Table: 2.1. Some trekking routes in Bhutan

Trek No.	Trek (Open)	Duration (in days)	Length (in km)
1	Gangtey Winter Trek	4 Days	37.338
2	Laya/Gasa Trek	15 Days	127.795
3	Bumthang Cultural Trek	3 Days	74.200
4	Wild East Rodungla Trek	10 Days	30.360
5	Punakha Winter Trek	12 Days	27.146
6	Samtengang Winter Trek	4 Days	15.422
7	Druk Path	5 Days	29.261
8	Dagala Thousand Lake Trek	7 Days	42.777
9	Chilila Nature Trek	4 Days	30.090
10	Chomolhari Trek#1	8 days	60.760
11	Chomolhari Trek#2	9 Days	106.781
12	Lunana Snowmen Trek	22 Days	198.887
13	Dur Hot Spring Trek	7 Days	40.220

Source: Window on Bhutan: 2002

Map No. 2.1

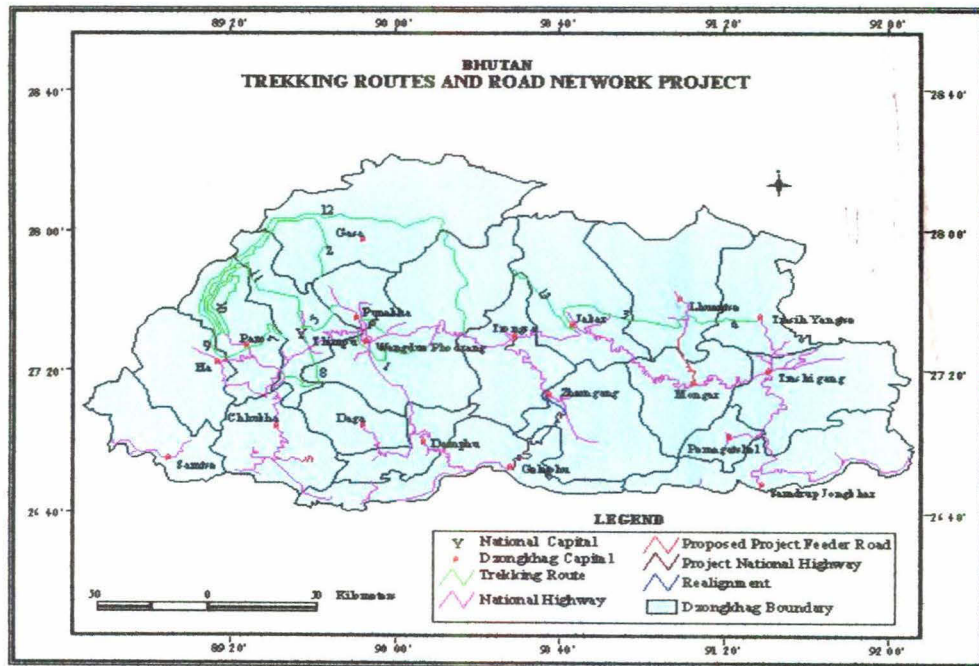


Table 2.2 Trekking Seasons

Name of trek	Jan	Feb	Mar	Apr	May	June	July	Augu	Sept	Oct	Nov	Dec
Bumthang	X	X	S	S	S	M	M	M	S	S	S	X
Gangtey	S	S	S	S	S	M	M	M	S	S	S	S
Samteygang	S	S	S	S	S	M	M	M	M	S	S	S
Lingshi	X	X	S	M	S	S	S	S	M	X	X	X
Gasahot spring	S	S	S	S	S	M	M	M	M	S	S	S
Jumolhari	X	X	S	S	S	S	M	M	S	S	S	X
Druk Path	X	X	S	S	S	S	M	M	S	S	S	X
Dagala	X	X	S	S	S	S	M	M	S	S	X	X

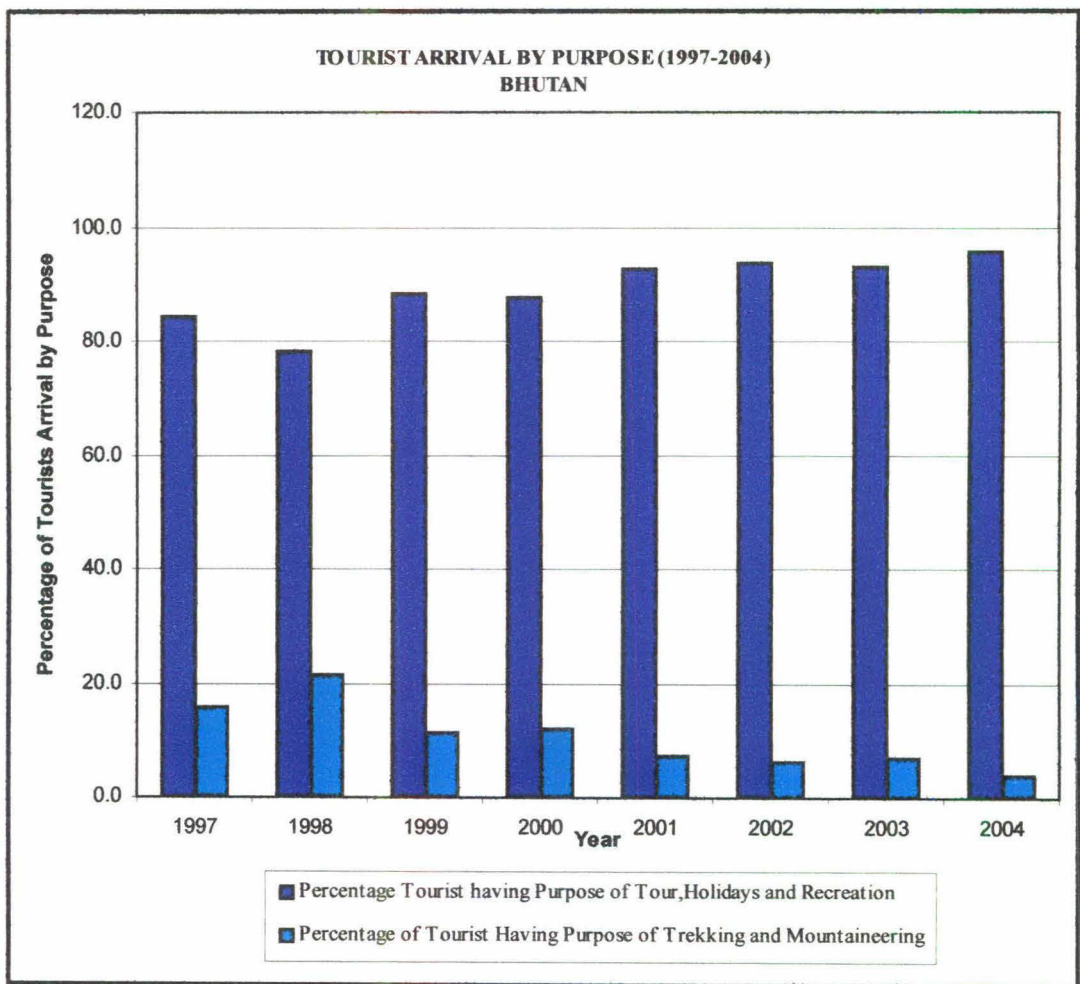
‘S’ Refers to good season for trekking. ‘M’ Refers to moderate season there are chances of rain

‘X’ Refers to month when trekking routes are closed because of landslides

Source: Window on Bhutan, 2002.

Despite lacking any peaks over 8000 meters many of Bhutan summits are eyed longingly by climbers. Jomolhari (7314 meters), Bhutan's most sacred summit was famous landmark on early Everest expeditions. Bhutanese are resisting the lure of the lucrative climbing gravy train. At 7541 meters, Gangkhar puensum remains the world's highest unclimbed summit.

Figure 2.3: Arrival of Tourist by Purpose (1997-2004) in Bhutan.



Source: Statistical Year Book Bhutan, 2004.

Trekking in Bhutan is permitted but only around a dozen recognized tracks. Given the rugged terrain, walking is the best and often the only way to reach isolated settlements and experiencing the real soul of this little explored land. Bhutanese treks have a unique feel quite different from those in other parts of the Himalayas. At high,

altitude, horses and yaks are used instead of porters to carry the loads.

Table: 2.3 Purpose of Tourist Arrival, Bhutan, (1997-2004)

Years	Tour, Holidays and Recreation	Percentage Tourist having Purpose of Tour, Holidays and Recreation	Trekking and Mountaineering	Percentage of Tourist Having Purpose of Trekking and Mountaineering	Total Tourist
1997	4517	84.2	846	15.8	5363
1998	4860	78.3	1343	21.7	6203
1999	6328	88.4	830	11.6	7158
2000	6633	87.7	926	12.3	7559
2001	5925	92.7	468	7.3	6393
2002	5242	93.6	357	6.4	5599
2003	5823	93.0	438	7.0	6261
2004	3207	95.9	136	4.1	3343

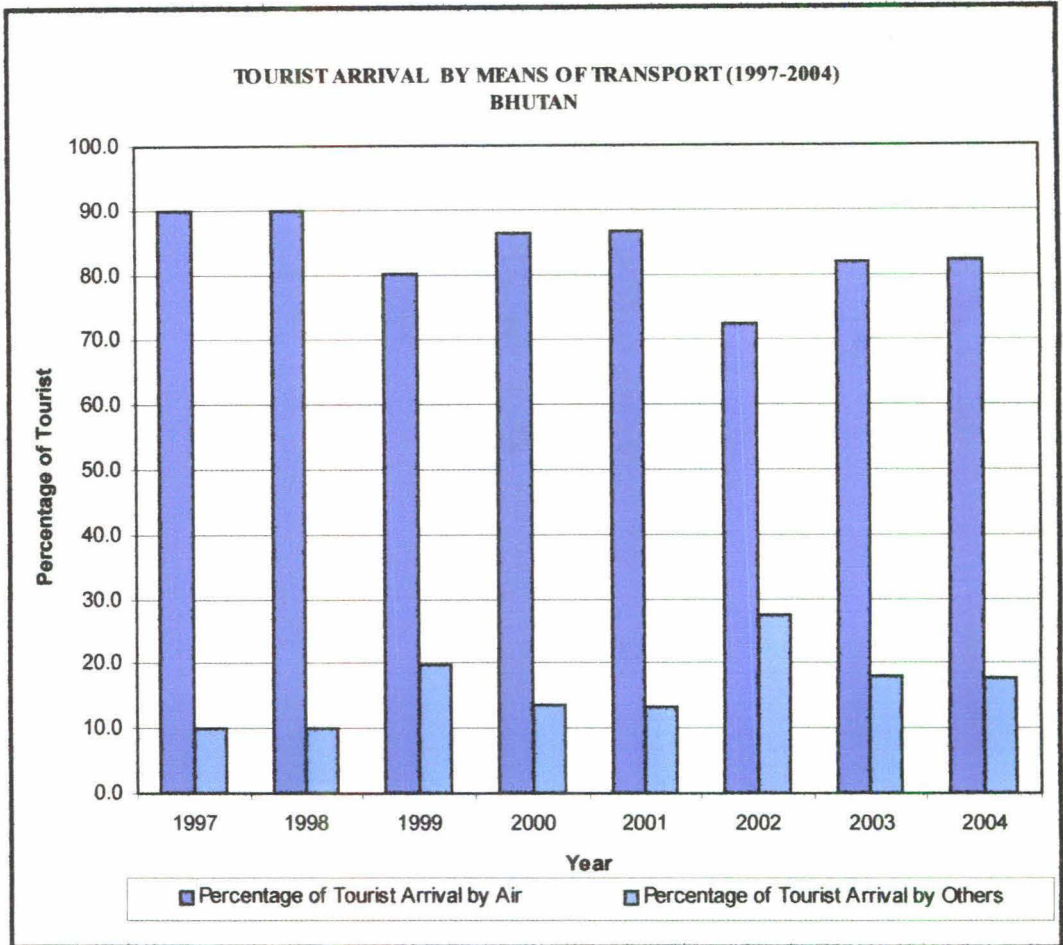
Source: Calculated from Statistical Year Book of Bhutan, 2004.

2.5 Present Trends of Tourist Arrival by Means of Transportation

Road entry to Bhutan is through Phuentsholing in the south or by air to Paro. Druk Air, the national airline, is linked to five cities in four countries. “There are five flights a week from Bangkok, four flights from Kolkata, two flight a week from New Delhi and Kathmandu and once a month from Dhaka. During the festival season, Druk air arranges for additional flights accordingly.”²

2 Tshering Lyonpo Dago (2002), “*Window on Bhutan*,” New Delhi, Roots Advertising Services Pvt Lt..

Figure 2.4: Arrival of Tourist by Means of Transportation (1997-2004) in Bhutan.



Source: Statistical Year Book, Bhutan, 2004.

Percentage of tourist arrival in Bhutan constitute 90 percent by Air and only 10 percent by other means of transport communication but the percentage share of tourist arrivals by air is showing a declining trend and in the year 2002 it constituted only 72.5 per cent while other modes of transport communications showing an increasing trend and now it constitutes 27.5 percent of total tourist arrivals. The minimum tariff set by the department of Tourist is US \$ 200 per night.”³ In the year 2004 the percentage of tourists arrival by air is 82.2 per cent while percentage of tourists arrival by other modes of transport communication constitute 17.8

per cent strengthen the forward and backward linkages for Ecotourism industry.

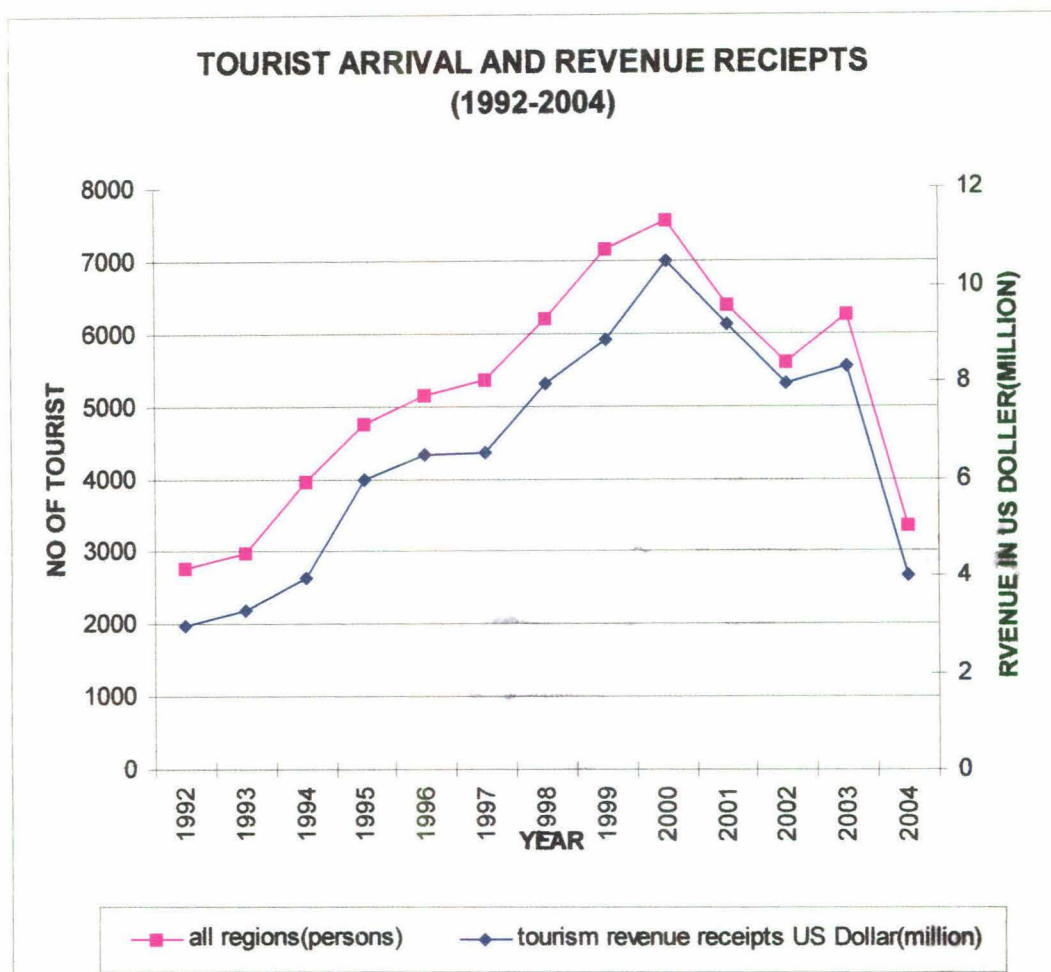
2.6 Present Trends of Tourists Arrival by Revenue Receipt

The tourism industry has been an important source of hard currency to Bhutan. The potential as far as foreign exchange earnings are concerned are very high, though the government has followed a strategy regulating the number of tourists coming into Bhutan. By the late 1980s tourism contributed over US \$ 2 million revenues to the government. In the year 1989, the Royal Government raised the tourist tariff that year only 1480 tourists visited Bhutan but the government still earned US \$ 1.95 million through tourism. By 1993, tourists' revenues contributed as much as US \$ 3.3 million. It continues to show increasing trends of revenue receipt till the year 2000 when it contributes the US \$ 10.5. While its share marginally decline due to decrease in number of tourist arrival in 2001 and 2002 when it contributed US \$ 9.2 and \$ 7.98 million in the respective year. In the year 2004, revenue receipt decline drastically to US\$ 4 million, it is mainly due to rapid decline of tourists coming into the Bhutan in the year 2004 due to political instability and Bodo insurgency and the operation all clear, which was being run by the RGoB.

From the graph it is clear that the number of tourists arrival and revenue receipts go in the same direction and government can generate revenue by allowing entry to larger number of tourists in Bhutan but "it has always been aware that an unrestricted flow of tourists can have negative impacts on Bhutan's pristine environment and its rich and unique culture."⁴

4 Dorji Tandi (1999), "Sustainability of Tourism in Bhutan", *Journal of Bhutan Studies*, Vol (4) p 84-103.

Figure 2.5: Arrival of Tourist by Revenue Receipts (1992-2004) in Bhutan.



Source: Statistical Year Book Bhutan, 2004.

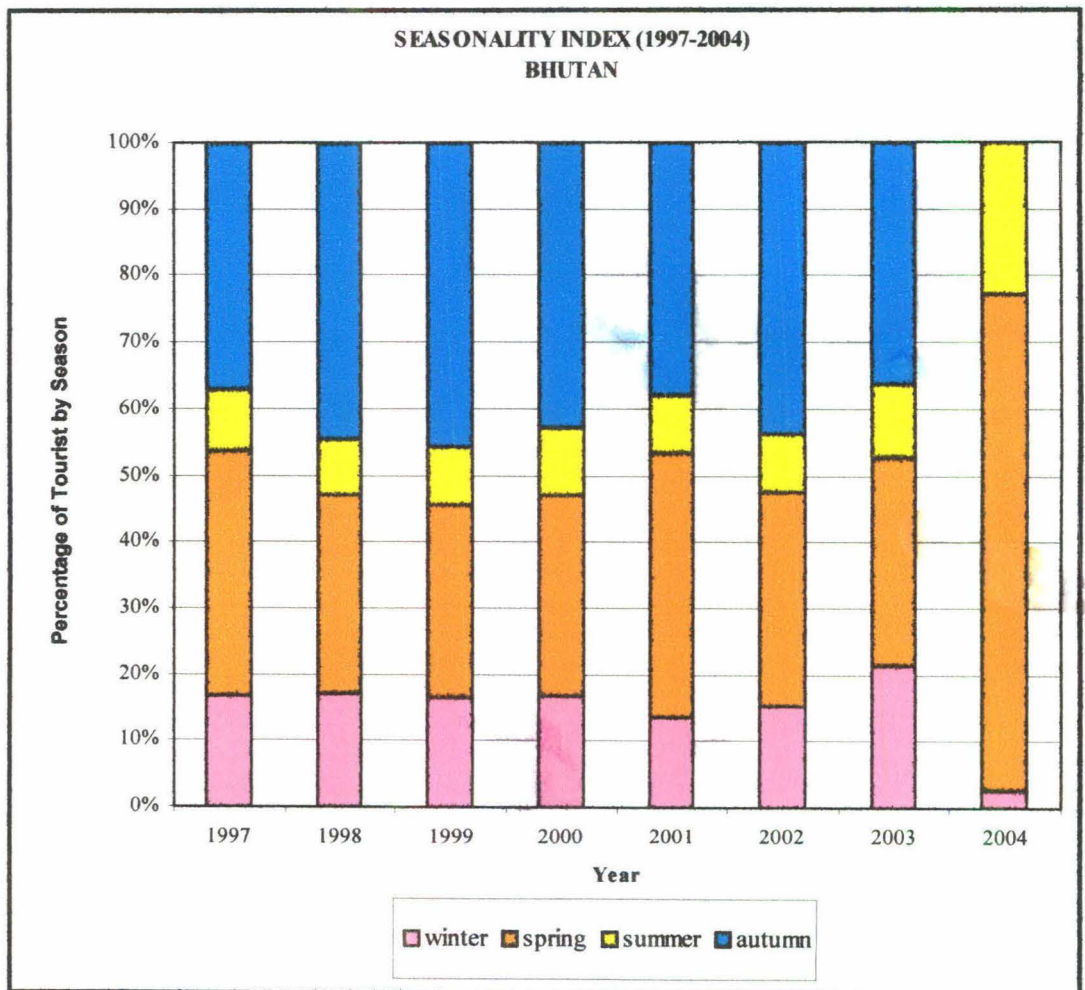
The number of tourists visiting Bhutan is regulated to a manageable level because of the lack of infrastructure.

2.7 Present Trends of Tourist Arrival by Seasons

The pattern of tourists' arrival is somewhat seasonal. Year has been divided into four seasons namely Winter season (November to January) Spring season (February to April), Summer season (May to July), Autumn season (August to October), Tourist arrivals become peak during the Autumn season followed by Spring season, Winter and Summer while in month the highest number of tourists are coming in

month of October in the year 2002 is 1474. From the graph it is clear that the tourist arrivals in Bhutan are subject to pronounced seasonality. March / April and September, October and November are the top months in which weather is ideal for trekking and the religious and the cultural festivals are taking place all over the country.

Figure 2.6: Arrival of Tourist by Seasons (1997-2004) in Bhutan



Source: Statistical Year Book Bhutan, 2004.

December, January and June, July are the months with the lowest activity as the weather is too cold or rainy for trekking and there are hardly any significant cultural events taking place. Tourists of different region have seasonal bias, with a relatively lower preference during summer rainy season. The seasonal₃₃ nature of tourism leads to a highly

inequitable distribution of visitors throughout the year adding pressure on the limited infrastructure during the peak seasons.

Table: 2.4. Trends of Tourist Arrival by Seasons Values of Seasonality Index (1997-2004), Bhutan

Seasons	1997	1998	1999	2000	2001	2002	2003	2004
Winter	16.8	16.9	16.5	16.9	13.7	15.2	21.5	2.7
Spring	36.9	30.0	28.9	30.2	39.7	32.4	31.4	74.6
Summer	9.1	8.3	8.9	10.1	8.6	8.7	10.9	22.8
Autumn	37.2	44.8	45.7	42.8	38.0	43.7	36.2	0.0

Source: Calculated from Statistical Year Book Of Bhutan, 2004

Ecotourism in Bhutan is characterized by marked seasonality. Temperature and Rainfall are two most important climatic factors which guide the temporal and spatial variation of tourists flow in the country. These two indicators together best reflected by aridity index in which higher value represent low aridity and low value represent very high aridity. This index can be best utilized for recognition purpose and this can be used as a tool for redirecting the tourists flow from one region to another climatically suited regions. This can also help in preventing concentration of tourists in fewer destinations and center of tourist attraction. Because the concentration of tourists in a particular region can have negative impact on fragile environment and limited basic infrastructure. Southern region of the country comprising Samtse, Chhuka, Dagana, Haa, Sarpany Zhenging, Penia ciyatshel, Samdrup Jongkhar and Transhigang are characterized by low aridity.

While, Punakha, Thimpu, and Wangdue Phudrang are Characterised by high aridity and rest of the Dzongkhajs come under moderate aridity. It would be helpful for spatial ecotoursim planning keeping in mind the seasonality pattern of tourists flow throughout the year. This can also be used as an important indicator for conservation protection and development of ecotourist sites, their flora and fauna.

Map No. 2.2

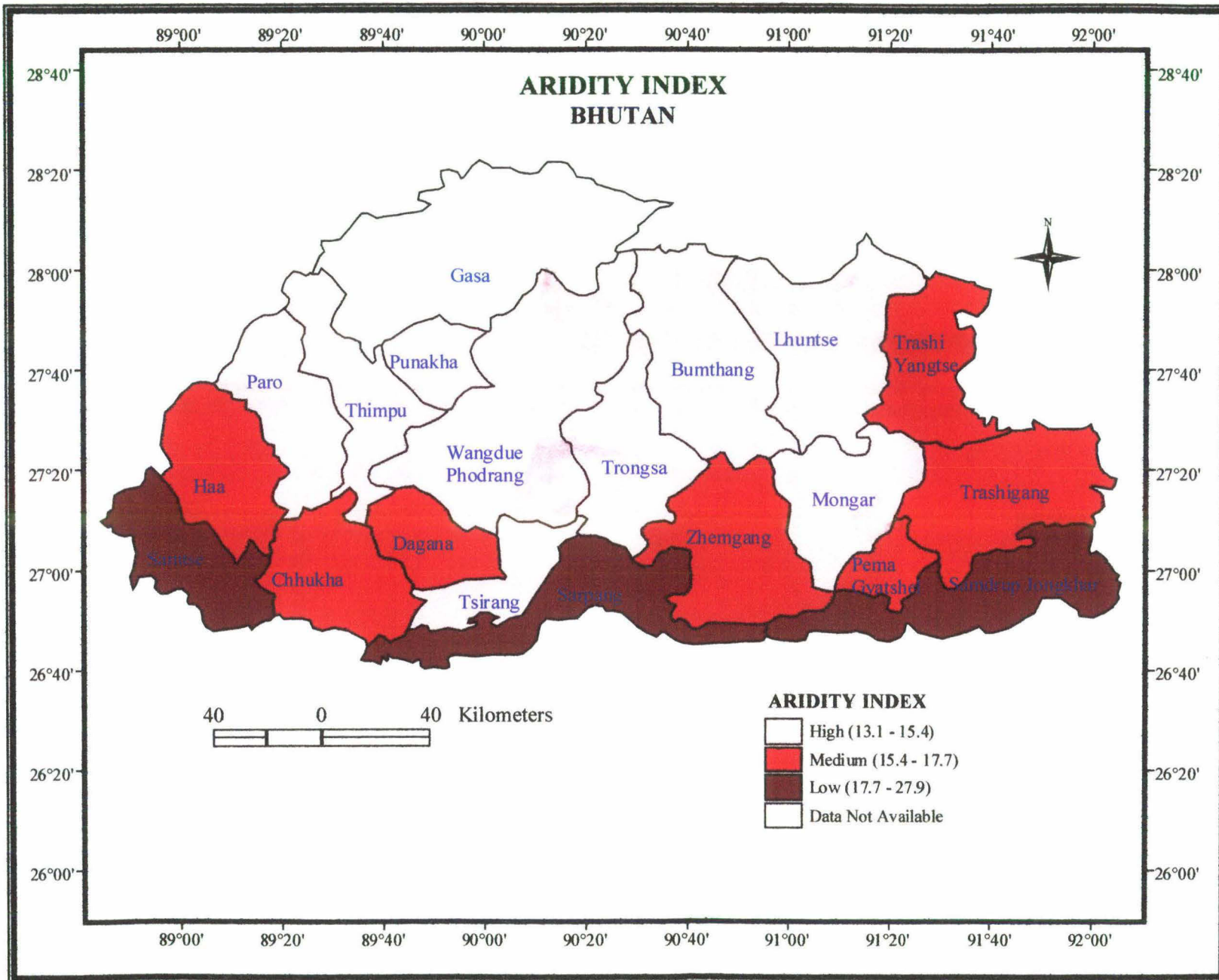


Table 2.5: Values of Aridity Index

Stations	Aridity index
Thimphu	13.1
Paro	14.7
Haa	17.2
Samtse	21.8
Chhuka	16.7
Dagana	17.5
Punakha	13.7
Wangdue phodrang	13.7
Tsirang	14.8
Trongsa	15.4
Bumthang	15.1
Zhemgang	16.7
Sarpang	24.5
Lhuntse	14.6
Mongar	14.4
Pemagytshel	17.7
Trashiyangtse	16.1
Trashgang	17.0
Samdrup Jongkhar	27.9

Source: Calculated from Statistical Year Book of Bhutan, 2004.

CHAPTER 3

PLACES OF TOURIST ATTRACTION, PROTECTED AREAS, AND ECOTOURISM IN BHUTAN

3.1 Places of Primary Attraction

Potential of ecotourism in an area is indeed the result of interaction of tourist demand and supply of tourist resources. "Tourist demand of an area can be assessed through the preference or choice of tourists towards various components of its resource base. The supply or local availability component of attraction in an area has to be considered so as to analyze how well the resources are able to satisfy the interest of tourists".¹ Bhutan has a vast supply side potential. It is said that "Bhutan is one of the few countries in the world still untouched, paradise for tourist, interested in Buddhist culture and philosophy, flora and fauna, trekking and mountaineering. Trip to Bhutan is considered as an experience once in a life time".²

3.2 Determining Factors of Primary Attraction

Some destinations may have similar type of attraction, but one may be comparatively well equipped and capable of offering better facilities and services to tourist. Hence the importance of a destination may be estimated not only on the basis of the resources available but also the ways in which they are being managed. The factors that influenced the tourist place attractions are reputation, accessibility and seasonality.

Reputation is an asset of a destination. The tourist generally prefers to go such places that are preferred by most others. In course of time a positive image of the destination is built which adds to the popularity of the place. Accessibility in terms of importance and physical access to all tourist resources is always emphasized. A more accessible destination has greater advantage than a less accessible one. Apart from this seasonality has an important role to play in the pattern of use of the tourist resources. A considerably long tourist season is generally treated as an asset, which allows tourism activity to continue for a long time.

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- 1 Ferrario. F.F. (1982), "Method Approach for Evaluating Tourist Resources – Care of South Africa Studies" in Singh T.V. Et al (eds.) *tourism wildlife Parks conservation*, New Delhi: Metropolitan, pp 135-140.
 - 2 Pandey V.C. (2004), *Environment security and tourism development in South Asia*, Delhi: ISHA Books.

A tourist destination may have all the above important elements but may be inherently fragile and unable to sustain more pressure from tourists. Such destinations may lose their original, natural and cultural characteristics in course of time. So, an understanding of the fragile nature of resources is a prerequisite for sound ecotourism practice.

Many different attractions may induce a tourists to visit particular areas or spend their holiday in specific regions. These have been classified in a variety of way.

A first distinction is usually made between natural features such as land forms, flora and fauna and man-made objects, historic or modern, in the form of monuments, historic building or amusement parks. A third general category embraces man and his culture as expressed through language, music, folklore, dances and so forth³.

Details of some of the most important tourist sites are given below:

3.3 Characteristics of Places of Tourist Attraction

3.3.1 Thimphu: At an altitude of 7,710ft in the fertile valley of the Wang Chu River, the capital Thimphu is an interesting blend of the old and the new. A unique law, which retains the forms and motifs of Bhutan's traditional architecture even in new buildings give Thimphu a delightful structural harmony.

Bhutan's National Library, National textile Museum, Folk Heritage Museum, Institute of Zong Chosum, National Memorial Chorten, Simtokha Dzong, Changangkha Lhakhang and National institute of Traditional Medicine and Zongtopelri are other places of interest in Thimphu.

3.3.2 Phajoding: To the west of Thimphu the Phajoding monastery overlooks the town from 10000 feet and presents a splendid view of the whole area. Visitors may also go to Dontsho a pass for an impressive vista of snow peaks, lakes, streams and alpine flowers and to Dochu la, another scenic mountain pass, where the panorama of vivid rhododendrons and azaleas against the backdrop of the great Himalayas is breathtaking.

3.3.3 Paro: With patchwork fields, willow glades, murmuring trout filled streams and scattered hamlets, Paro is the most attractive of Bhutan's valleys, and the air exudes a sense of profound peace. At 7382 ft, Paro is the only airport site of Bhutan. Besides the colourful spring, tsechu, Paro has a number of sights and

3 Douglas, Pearce (1981), "*Tourist Development*", Great Britain.:Layman Publishers

monuments to enthral the visitors. The pastoral beauty of Paro valleys magnificent view of Mount Jhomolhari, the incredible monastery of Tasktsang which clings to a sheer rock cliff, the ruins of Druk gyel, dzong fortress of the victorious drupas and the National museum housed in an ancient watchtower, are a few of the attraction that make Paro one of the high – points of any tourist destination in Bhutan.

3.3.4 Vhunzom or Confluence

In an area called Vhungan or Confluence the meeting place of the Parachu and Wangchu rivers branch roads lead off to Paro and Ha valleys. This was an important station in Bhutan once enjoying thriving trade with Tibet, beyond it lies the chumby valley.

3.3.5 Taktsang (The Tigers Nest) and Kyichu

Beyond the Paro, the road runs along the river valley to the Tibetan border. The name Taktsang means “The Tigers Nest” for the legend Padma Sambhava, the bringer of Buddhism, flew here from Tibet on the back of a tiger Today pilgrims and other visitors reach the tiger nest by crossing a bridge and mounting a steep winding track on horseback.

3.3.6 Punakha: The Old capital

A three hour drive to the east of Thimphu takes one to the old capital of Bhutan – Punakha. A superb example of Bhutanese architecture, the Punakha Dzong majestically stand on the bank of the river Punakha, with abundance of trouts, the Punakha River is considered an angler’s paradise.

3.3.7 Bumthang

Bumthang is the general name given to the complex of four valleys Churmey, Choekhor, Tang and Ura with altitudes varying from 2600 metres to 4000 metres. The Dzong at Jakar and other holy shrines are major tourist attractions. Bumthang is also the traditional home to the greatest Buddhist teacher Pema Lingpa.

3.3.8 Wangdue Phodrang

Wangdue Phodrang in the last town on the highways before entering central Bhutan. The Wangdue Dzong is perched on a spur at the confluence of two rivers. The position of the dzong completely covers the spur and commands an impressive view over both the north – south and east – west roads.

3.4 Ecotourism in Protected Areas

Ecotourism is the most suitable form of tourism for protected areas and is also a significant part of the greater concept of sustainable tourism. Ecotourism is an acceptable alternative way of gaining income from the natural areas. The development of ecotourism activities in protected areas can produce benefits both for the tourism sector and the protected areas. Ecotourism needs protected areas since they are a profitable visitor attraction and at the same time local people and managers of protected areas need the income that is generated by eco tourism. Moreover, the opportunity given to the visitors to see, live close to and “touch” the natural environment can turn them into active supporters of the conservation of protected areas of nature.

Ecotourism activities in protected areas should be based on a widespread but controlled implementation of the principle “small is beautiful”. This concept leads to the planning of many activities in a large part of the protected area, but with a strictly controlled number of participants each time. Tourism in protected areas, and particularly ecotourism should be based on a series of principles:

- The primary goal of the management of protected areas is their protection and their conservation.
- Tourism is an economic activity and consequently the tourism services suppliers aim mainly at a profit.

The profit making can be compatible with the management of protected areas as long as profit makers respect the primary goal of protection and conservation of the areas.

The planning of tourism activities in protected areas requires the participation of all the interested parties. For ecotourism in protected areas to be a case of mutual benefits (a win-win scenario), mutual respect is necessary among the interested parties and also the use of methods of participatory planning in the management of the natural environment. The significance of the participation of the social groups, as a basis for ecotourism development, is widely recognised at the national and international level. This implies that the responsibility to develop ecotourism and to manage the protected areas should be shared among public services, research institutes, users of natural resources, environmental organisations and the business sector.

The participatory planning of ecotourism in protected areas should be based on a well-designed procedure with the following steps:

1. The management objectives are clarified and documented
2. The level of environmental consciousness and the expectations of the local communities are identified
3. Ecotourism actions are designed so that they are within environmental limits, should be compatible with the management objectives and expectations of the local people

In more details ecotourism should be compatible with the following: -

- *Nature*: protection of the landscape, the water resources, the soil, the flora and fauna.
- *Health*: health of people and animals, and also organic (ecological) food production.
- *Social features*: harmony with the local tradition and culture, the local social structure and the hierarchy of the social formal and informal institutions.
- *Economical features*: economic benefits for the local area, fair allocation of the benefits, financial assistance for small and medium enterprises, development of tourism diversity.
- *Infrastructure*: ability of the infrastructure to absorb the gradual tourism development according to the local organisational capability and the local infrastructure needs.

At the operational level, for a successful sustainable tourism development it is necessary that the attitudes of both locals and visitors will change.

The owners of the areas and the tourist facilities, and the local governments have to apply certain measures:

- Information and training concerning the environment
- Responsible visitor management in sensitive areas
- Reduction of water and energy consumption
- Reduction of waste and increase of recycling
- Reduction of traffic
- Sign-posting in protected areas
- The visitors have to accept some requirements of sustainable development:
- Respect the sensitivity of protected areas

- Participate in the protection of the environment
- Consume local products which add value to the area
- Show willingness to understand local problems.
- Interest in and respect towards the local tradition, culture and way of life
- Adopt energy saving practices

Ecotourism has the potential to contribute to a better quality of life and can make the visitor a real ally to the protection of nature. Ecotourism can be a vehicle for the nature conservation provided that ecotourism activities will be planned and implemented in a sustainable manner. Ecotourism development must be an integral part of a broader sustainable development strategy. Such a strategy must take into account the requirements of all economic sectors and at the same time must guarantee that tourism development will increase according to the other needs of local communities, and to the available natural resources, especially water, land and energy.

3.5 Discription of Protected Areas:

Bhutan's System of National Parks, Reserves and Sanctuaries

The Protected Area system of Bhutan which covers a total area of 10,878.33 sq. km are as follows:

Toorsa Strict Nature Reserve (650.74 sq. km)

This reserve protects the westernmost temperate forest of the country from broadleaf forests to alpine parks including the small lakes of Sinchulungpa. The area has no human habitation and is a security area near the Chinese border.

Jigme Dorji National Park (4,349 sq. km.)

This park represents the largest protected area in Bhutan. It is an important natural conservatory of glaciers, alpine meadow and scrublands, sub-alpine and temperate conifer forests, warm and cool temperate broadleaf forests, major rivers and streams, and the flora and fauna that inhabit these ecosystems. The park harbours some charismatic' species of wildlife, many of which are endangered or extinct elsewhere in the world. These include the, snow leopard, blue sheep, musk deer, Himalayan black bear, marmol, red panda, tiger and several species of pheasants.

The trek ventures to Jigme Dorji National Park, the largest protected area in Bhutan, with an altitude range of 1,400 to above 7,000 m. The park is vital

watershed covering almost half of the northern Bhutan, and is an important natural conservatory of glaciers, alpine meadows and scrublands, sub-alpine and temperate conifer forests, warm and cool temperate broadleaf forests, major rivers and streams, and flora and fauna that inhabit these ecosystem. Jigme Dorji harbors numerous species of wildlife, many of which are endangered or extinct elsewhere in the world. These include the tiger, snow leopard, takin, blue sheep, musk deer, Himalayan black bear, marmot, red panda and several species of Pheasant.

This park is also famous for its flora and more than 300 species of plants found here are used in indigenous medicine. The trek goes through a small part of the park passing few of the Yak herder's settlement and the remotest region of Lingshi that are some of the wildest regions of Bhutan. One should be reasonably physically fit to enjoy the majestic mountain views, endure thin air, serenity & the wildness of the landscape while on the trek.

c) Royal Manas National Park (1,022.84 sq. km)

This park is the conservation showpiece of Bhutan. Its location is strategic in that, to the north, it is adjacent to Jigme Singye Wangchuk National Park (formerly Black Mountains National Park) and to the south it forms a trans-frontier reserve with India's Manas, which is under UNESCO's World Heritage Programme. Thus, RMNP forms an integral part of a Protected Area complex, which includes a range of habitats, from lowland tropical systems all the way up to permanent ice field. It is also the only Park in Bhutan where rhinoceros are found. This park contains more significant species than any other in Bhutan and already 362 species of birds have been confirmed in the park area.

d) Jigme Singye Wangchuck National Park (1,400 sq km)

This is the former Black Mountains National Park, renamed recently as Jigme Singye Wangchuck National Park (JSWNP) on the recommendation of Her Majesty the Queen Ashi Darji Wangmo Wangchuck during her visit to the park in the early 2002. It covers a wide range of habitat types from permanent ice on the peak of Dorshingla 4,925 m, alpine lakes and pasture, conifer and broadleaf forests. The reserve will constitute the largest and richest temperate forest nature reserve in the entire Himalayas. Surveys have already revealed 449 species of birds in this combined area of JSWNP and RMNP more than any other reserve in Asia. The only major use currently made of this area is the grazing of yaks in summer on the northern alpine areas of the park.

e) Thrumshingla National park (768 sq. km)

This is the second major temperate park in Bhutan and contains some spectacular scenic views; beautiful forests from alpine to sub-tropical broadleaf. It also contains some protected examples of chir pine forests. The soil of this area is particularly fragile rendering it quite unsuitable for logging or other development but it has excellent tourism potential with a good wildlife trail from the Ura Valley right down to the Bumthang Valley.

f) Bombdiling Wildlife Sanctuary (1,486 sq. km)

This sanctuary contains a rich diversity of flora and fauna. The natural ecosystems range from sub-tropical forests in the lower elevation to alpine meadows in the higher elevation. It also contains some of Bhutan's most scenic alpine lakes. Bombdiling valley, located within the sanctuary, is also one of Bhutan's main wintering spots for the rare black-necked crane. In addition to the wide spectrum of ecosystems, the sanctuary houses several cultural and religious sites of international significance, including the Singye Dzong and Khempa Jong, sites held sacred by Buddhists throughout the region (BFT, 1995).

g) Sakteng Wildlife Sanctuary (650 sq. km)

The area is designed to protect the easternmost example of the temperate ecosystems of Bhutan where some endemic species are found such as the eastern blue pine, black-rumped magpie and many other species found only in the east of the country.

h) Khaling-Neoli Wildlife Sanctuary (273 sq. km.)

This reserve will consist of the existing reserves of Khaling and Neoli. It is planned to combine the two areas and revise the boundaries retaining the same size. The reserve is important for elephant, gaur, and other tropical wildlife and may be the only locality in Bhutan where pygmy hog and hispid hare occur. Both are known from the Khaling Reserve on the Assam side of the border with which this reserve will form a transfrontier reserve.

i) Phibsoo Wildlife Sanctuary (278 sq. km)

This sanctuary in South-central Bhutan is known for its diverse flora and fauna and important biogeographic position in the country. Tropical fauna such as elephant, gaur, and golden langur are found here. It is the only reserve in Bhutan to have chital deer. In addition, it is the only remaining natural Sal forest in Bhutan (FSD, 1950).

Table 3.1. Protected Areas in Bhutan

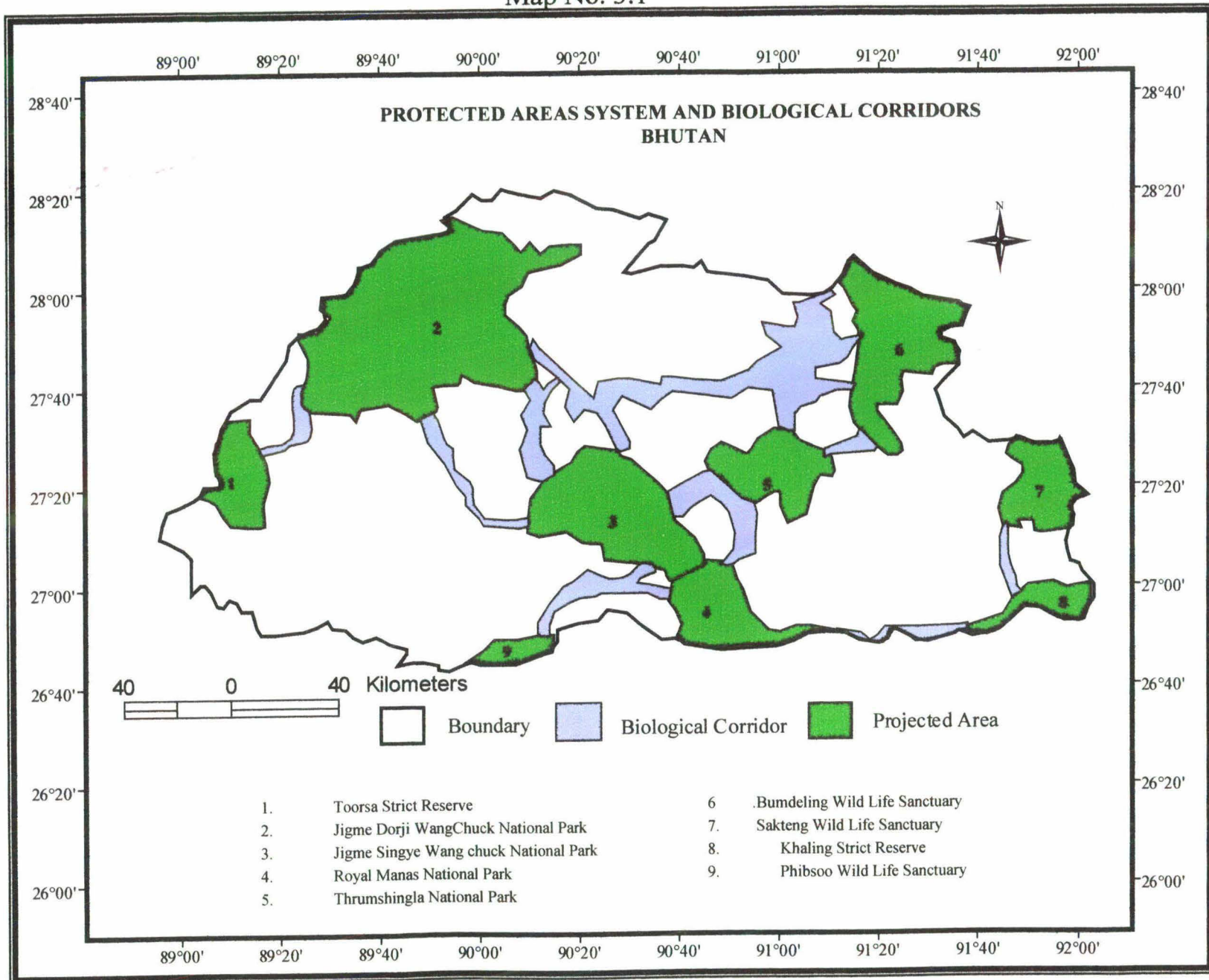
Royal Manas National park	Size (Sq. Km)	Dzongkhags	Status	Donor
Royal Manas National Park	1,022.84	Zehmgang Sarpang	Operational since 1995 1995-2002	WWF Bhutan Programme
Jigme Singye Wangchuck National Park	1,4	Zhemgang Trongsa Sarpang Wangduephodrang Tsirang	Operational since 1995	Government of the Netherlands 1998-2002
Jigme Dorji National Park	4,349	Gasa Thimphu Paro Punakha	Operational since 1995	UNDP/GEE 1997-2002
Bombdiling Wildlife Sanctuary	1,486.75	Mongar Lhuentse Trashiyangtse	Operational since 1998	DANIDA 1998-2003
Thrumshingla National Park	768	Bumthang Mongar Lhuentse Zhemgang	Operational since 1998	WWF Bhutan Programme 1998-2002
Phibsoo Wildlife Sanctuary	278	Sarpang	2002	Bhutan Trust Fund WWF Bhutan Programme
Sakteng Wildlife Sanctuary	650	Trashing	2002	None
Khalin/Neoli Wildlife Sanctuary	273	Samdrup Jongkhar	To be operationalized during 9 th FYP	None
Toorsa Strict Nature Reserve	650.74	Ha Samtse	To be operationalized during 9 th FYP	None

Source: Biodiversity Action Plan for Bhutan, 2002

3.6 The Land Use within the Protected Areas

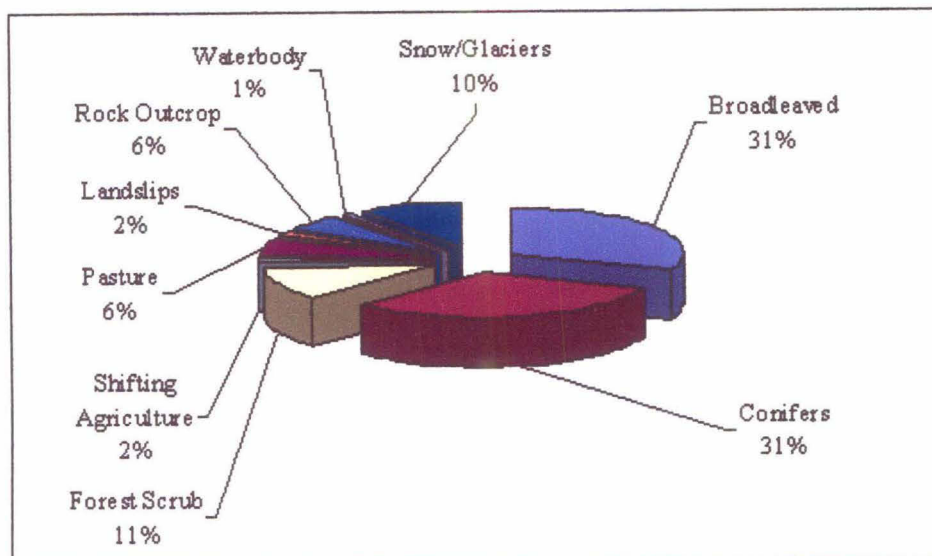
Figure 3.1 presents the picture of the combined land use in the network of the nine protected areas. It provides similar information on land use for each of the

Map No. 3.1



nine protected areas. Although all the protected areas are rich in biodiversity and have more than 70 percent forest cover, the presence of farming and shifting cultivation in each of them raises some concerns about their sustainability.

Figure 3.1: Land use in the protected areas (Bhutan)



3.7 Management of Protected Areas

Park management has evolved significantly over time. One of the finest examples of this evolution is the development of the eco-system management philosophy, which has blossomed as a consequence of the realization that in order to safeguard an environment one must scientifically understand the relationships and processes that exist within such a setting. “The biodiversity crises, new ecological theories, and dissatisfaction with policies measures also contributed to the birth of this mode of thinking.”

“Ecosystem management involves internal ecosystem structure and function, plus inputs and outputs, to achieve socially desirable conditions.” Identification of issues through research, public involvement, goal setting, plan development, monitoring and evaluation is often a key element of successful ecosystem management in protected areas.

Management of protected areas follows an integrated program approach that combines conservation and development efforts. Two of the national parks (Royal Manas National Park and Jigme Dorji National Park) have well developed

integrated management plans. The current emphasis is on protection of endangered species from poaching and understanding their habitats and population dynamics. The present policy is not to resettle people residing within the national parks unless they want to move or it is absolutely necessary to do so. The management allows current habitants to harvest of wood, collect minor products and graze their animals. The protected areas, which comprise about 26.3 percent of the country.

3.8 The Zoning System of National Parks in Bhutan

The zoning system of national parks in Bhutan differs slightly from one park to another, as do rules within each zone. However the overall concept is consistent. Generally, national parks in Bhutan comprise the following zones:

- (i) **Core zone.** An area of healthy ecosystem fully and strictly protected and maintained free of human disruption. This zone is closed to all human-related activities except regulated research, monitoring programs, and staff monitoring.
- (ii) **Administrative zone.** This comprises park headquarters, warden and guard posts, and other infrastructure related to management.
- (iii) **Multiple-use zone.** This area is for facilitating sustainable harvesting of timber and other forest products, regulated tourism and recreation, limited grazing, research, reforestation and habitat management. It includes areas for settlements, agriculture, visitors, forest utilization, and grazing, and is aimed at encouraging the socioeconomic development of the local people.
- (iv) **Enclave zone.** In some park management plans, this zone is included as part of the multiple use zone. This area defines boundaries of settlements, agricultural lands, communal forests, orchards, and pastures within the park.
- (v) **Buffer zone.** This includes surrounding areas within a distance of about 3.5 km from the park boundary it is designed to provide an added layer of protection, where restricted and/or regulated use of natural resources is permitted. The buffer zone does not come under the purview of the park management, but it is patrolled by park staff who controls human activities that may have adverse impacts on the park. Any developments within the buffer zone will be subject to screening by the park management and environmental impact assessments.

3.9 Conservation and Related Issues in Protected Areas

High livestock population has led to overgrazing in many instances. Overgrazing, mainly in broadleaf forests, may lead to attrition or loss of species, reduction of land productivity and soil erosion. Forest regeneration is also hampered where overgrazing is rampant. Apart from this, excessive wood consumption is another issue because traditional rural house construction entails extensive use of wood. Almost all housing structure, floor, roof, staircase, windows and doors, and beams and pillars are made of wood. Fuel wood consumption is also very high although collection of dry fuel wood in the form of fallen twigs and driftwood is common. Bulk of the fuel wood needs is met from natural forest. Besides timber and fuel wood, there is a long list of biodiversity resources that the rural Bhutanese use. These include medicinal and aromatic plants, forest food such as mushrooms, ferns and wild greens, bamboo and cane for local handicrafts, Daphne barks, for traditional paper making, wood for agricultural and household implements, animal fodder, and leaf litter for farmyard manure. There are several examples from across the country of biodiversity resources becoming scarce due to unsustainable harvesting.

Poaching and wildlife trade is another core issue. The country has several species of wild animals and plants of great commercial value in the international market. A porous international border both in the north and south, inadequate law enforcement personnel, and general lack of knowledge of the legal consequences of poaching have made control a difficult job. The main species targeted for poaching are musk deer and Chinese caterpillar fungus, musk pods. Poaching of other species such as tiger and bear is limited.

Poverty is also a major threat to conservation of protected areas. "Some of the country's poorest communities live in the protected areas and biological corridors. For these communities, long-term conservation benefits mean little when their daily subsistence is at stake and therefore, they will be less prepared to participate in conservation and even resentful when conservation adversely impacts their subsistence." Clearly, there is a need to integrate poverty alleviation in the management of protected areas and biological corridors.

Limited institutional capacity need to be enlarged for biodiversity conservation, it is far from adequate. Protected areas are still inadequate in terms of

trained personnel, information on key aspects of conservation such as distribution of species and demographic patterns in protected areas and biological corridors, and conservation infrastructure remains rudimentary.

There is a lack of transboundary cooperation of the nine protected areas in the country; seven have boundaries with other countries. In the south, the Royal Manas National Park share its southern boundary with India's Manas Tiger Reserve while in the east the Khaling Wildlife Sanctuary shares its eastern boundary with Eagle Nest Wildlife Sanctuary in India. In addition, a few protected areas in Bhutan such as Buxa Tiger Reserve and Barnadi are located on the border with Bhutan. There is a need for trans-boundary cooperation between protected areas personnel for two reasons: the movement of wildlife transcends international boundaries and it is therefore important that they are sufficiently protected when they cross into the other side of the border and much of the poaching occurs along borders as a consequence of porous borders and ready market for wildlife parts and products.

CHAPTER-4

POTENTIAL BENEFITS, THREATS AND INFRASTRUCTURE BASE OF ECOTOURISM IN BHUTAN

4.1 Introduction

Bhutan's hilly area by their matchless natural exposition provides varied scope for ecotourism development. Their terrain, climatic condition, flora, fauna and colorful ways of life of the people attract the tourists. They also offer possibilities for various kinds of adventure-based experience.

“In general spatial inaccessibility protects such ecospheres and keeps the rare natural and cultural resources at a relatively less disturbed state”¹. Ecotourism development in the hilly country like Bhutan is basically undertaken for economic reasons. It increases monetary inflow and makes the economy of the area vibrant and dynamic, which otherwise may remain economically backward.

It is one class of tourism that attempts to minimize the negative effects of traditional tourism is ecotourism. While Ecotourism planning is in its infancy, Ecotourism projects have the potential to be tools for sustainable development. Bhutan with its beautiful and largely unspoiled Himalayan settings, its rich flora and fauna and its vibrant Buddhist culture has become an increasingly popular destination for eco tourism².

4.2 Potential Benefits of Ecotourism

It is essential to have a clear vision on what is desired from ecotourism simply stating that growth in this industry is desired is meaningless if there are no clear cut strategies to achieve it. In Bhutan, this industry is regulated by adopting a policy of “High value- low volume” tourism. So far the royal government's overall objective of maximizing foreign exchanges while minimizing undesirable cultural and environmental impacts of tourism seems to have paid off. The tourism industry has made significant contributions to the socio-economic development of the country, especially after the privatization of the industry in 1991. A high level of profits is available to tour operators and an increasing number of Bhutan entrepreneurs are investing in the tourism sector. Bhutanese have also found employment as guide, cooks, transport operators and hotel and restaurant owners. Tourism contributes significantly to rural incomes through earning from tourist transport and

1 Bhattachaya, Prasanta and Abani Kumar Bhajabati, “Potentiality of Tourism Development in Hill district of Assam”, *Geographical Review of India* 62(2) 145-161 (2005).

2 National Environment Commission (1998), RGoB *the Middle Path National Environment Strategy for Bhutan* p (51-53)

portage. Tourism has also provided the impetus for the development of the service sector, which include hotels, restaurants transportation and communication. Another visible impact of tourism has been the promotion of the indigenous cottage industry and setting up of handicraft shops in Thimphu and other commonly visited areas.

The travel and tourism industry claims that it is well placed to contribute to sustainable development on the following ground:

- It has less impact on the environment than many other industries.
- This industry is based on an enjoyment of the natural and cultural environment and so is motivated to protect them.
- It can play a positive role in awareness raising and consumer education through its vast distribution channels and
- Hence provides an economic incentive to protect habitat that might otherwise be converted to less environmentally friendly landuses

The above points can be made equally in relation to ecotourim's potential contribution to biodiversity conservation, because biodiversity is a critical component of the natural environment that tourist enjoy.

The nations tourism potential is recognized as being considerable and this potential must be explored in the future. Bhutan possesses potential and comparative advantages in a sufficient number of areas to ensure the maintenance of economic growth and economic growth and economic diversification³.

Further there is a question about the capacity of eco tourism to generate enough jobs in the next decades. However, it is well-accepted fact that more jobs could be easily created through the development of the eco tourism. It also raises broader questions concerning the longer-term development of the nations economic structure and the quality of the transformation that is envisage, environmentally 'clean' products, such as spring water, organically produced agricultural products, vegetable dyes, aromatic substances, essential oils, herbal medicines and handicrafts that make use of natural products as well as traditional skills. Most of there

3 Planning commission (1999), Royal Government of Bhutan, '*Bhutan 2020 A vision for peace, Prosperity and Happiness*, Keen Publishing (Thailand) Co. Ltd. P, (58-59).

products would be high value / low bulk products that would be marketed for tourist coming from different regions of the world.

So ecotourism and adventure / sports tourism such as rafting, canoeing, climbing, that are similarly based upon the nations natural beauty, biodiversity and unique and distinctive culture most be pursued. Ecotourism in Bhutan, represent a great opportunity in several ways. Eco tourism provides direct benefits in the form of substitute income, business and job opportunities, as well as indirect benefits, such as development of infrastructure, health and education services for communities living close to ecotourism sites.

Apart from this, ecotourism provides viable organizational and economic tools for the conservation of protected and other natural areas in Bhutan. It may also contribute to regional development to a certain extent because it has capacity to generate multiplier effect in the regional economy. The future development of eco tourism should now involve a process of refinement whereby attempts are made by the industry itself to mitigate any negative environmental and cultural impacts; explore and develop the numerous niche markets such as ecotourism, that offer significant growth potential and are consistent with the other development objectives of the royal government, and increase the participation of local communities in ecotourism activities.

Ecotourism is considered as the fastest growing market in the tourism industry today and with Bhutan's enviable resources and hence it should explore ways of developing this market.

It is an extension or outgrowth of alternative tourism, Ecotourism has grown as a consequence of the dissatisfaction with conventional forms of tourism which have, in a general sense ignored social and ecological elements of foreign regions in favour of a more anthropocentric and strictly profit centred approach to the delivery of tourism products⁴.

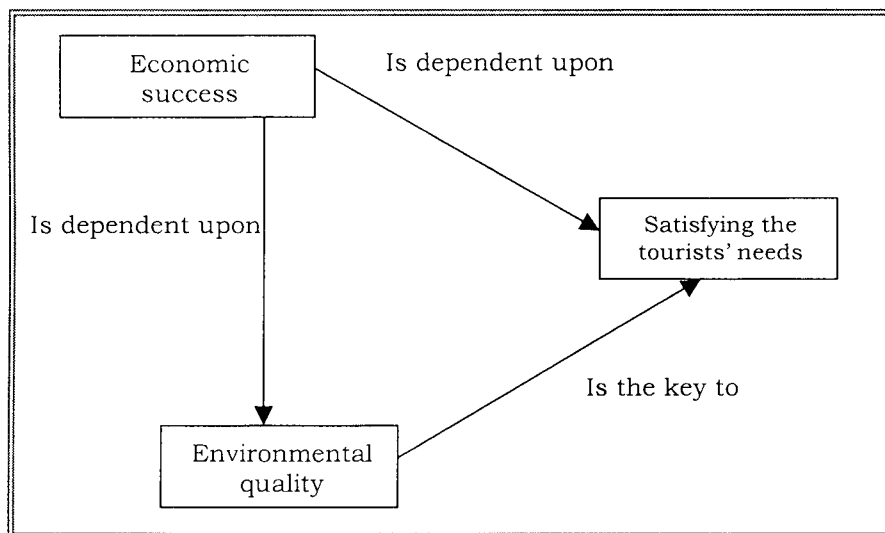
Ecotourism is low impact nature tourism which contributes to the maintenance of species and habitats either directly contributing to conservation or indirectly by providing

4 Fennell A David (1999), *Eco tourism: An Introduction*, London: Routledge.

revenue to the local people to value, and therefore protect, their wildlife heritage area as a source of income⁵.

Bhutan has varied and rich natural cultural attractions that present great potentials for eco tourism development, but at the same time are extremely fragile systems, whose future development needs to be focused on sustainable and integrated options capable of reconciling the economy, human development and environmental conservation. Ecotourism constitutes an opportunity to diversify the limited economic activities that currently exist, to generate employment and preserve the natural environment, “The very existence of eco tourism is unthinkable without a healthy and enjoyable environment, with well preserved landscapes and harmony between people and nature”.⁶

Figure 4.1 Relationship between Economic Success of Tourism, Environment and Tourist.



4.3 Relationship between Natural Environment, Local Economy and Tourism

Ecotourism must do more, than create a series of activities to attract visitors, offering than an opportunity to interact with nature in such a way as to make it possible to preserve or enhance the special

5 Goodwin, H. (1996), 'In Pursuit of Ecotourism' *Biodiversity and Conservation*, 5 (3): p. 288.

6 Andrew, Holden (2003), '*Environment and Tourism*'. London and New york: Routledge.

qualities of site and its flora and fauna, while allowing local inhabitants and future visitors to continue to enjoy these qualities. Destroying the environment on which the success of the industry is based is like killing the goose that lays the golden eggs. Ecotourism can and sometime does make significant contribution to the protected areas system through conservation. Direct benefits from ecotourism to conservation can be grouped in five areas:

- A source of financing for biodiversity conservation, especially in legally protected areas.
- Economic justification for protected areas.
- Economic alternatives for protected areas.
- Economic alternatives for local people to reduce overexploitation of wildlife natural resources in protected areas.
- Constituency building which promotes biodiversity conservation and
- An impetus for private biodiversity conservation efforts.

Successful ecotourism venture generally result in the formation of parks or natural protected areas within the host community. “First it aids in the environmental protection of the area, it generates financial revenue through entrance fees, donations, and government support it provides valuable jobs that add to the social and economic structure of the host community.”⁷

Though these jobs are relatively few, they are an important economic contributor to the community.

Local people have become employed as national park tour guides, campground operators and craft and food providers and through these initiative have provided successful community projects such as clinics, schools and water sources⁸.

Another positive impact of ecotourism is the opportunity for community empowerment. “There are four levels of empowerment that may be achieved through successful community based tourism ventures, like psychological, Social, Political and Economic”⁹

7 Bhattachaya , Prasanta and Abani Kumar Bhajabati, *op.cit.*, 145-161.

8 Williams, B. (1997) *News article on United Nations Conference on Climate Change*. Reuters, December 1997.

9 Schevens, R. (1999) “Ecotourism and the Empowerment of Local Communities”, *Tourism management*, 20, 245-249.

Table 4.1 briefly, describes these fair levels. In essence and level of empowerment in meant to be long lasting, not seasonal and is designed to support a community's well –being and the future mental and physical health.

Table 4.1: Four levels of community empowerment, which may be achieved with successful community, based ecotourism (adapted from scheyvens, 1999).

Psychological	Social
Enhance self esteem of residents Member seek further education Increase status of women, youth	Improved community cohesion Tourism profit used for community development Enhances community's equilibrium
POLITICAL	Economic
Political structure represents needs of all community members Special interest groups (women, youth etc.) have a voice	Lasting economic gains Profits shared equally Visible gains of improvement in community due to profits

4.4 Potential Threats of Ecotourism in Bhutan

Although tourism in Bhutan is referred as a model for other fragile mountain areas where there is much concern over the society's traditional heritage, there has emerged a number of pressing tourism – related environmental and cultural problems in the last few years, among the problems currently encountered are following¹⁰.

The destruction of vegetation through the cutting of slow growing trees for firewood. This is particularly more pronounced in Bhutan's high alpine regions through which most of the trekking routes are located. The local people in these areas rely on wood for fuel and tourism adds more pressure on the forests.

Erosion of fragile vegetation is another visible problem associated with eco tourism in Bhutan. Although eco tourism activities are not solely responsible for erosion in the high mountain areas, the use of horses and

10 National Environmental Commission (1998), Royal Government of Bhutan: *The Middle Path - National Environmental Strategy for Bhutan*. Tourism and its effects on the culture and the environment " p. 52.

yaks during treks have a significant impact. “Also local residents tend to increase the size of their domestic herds for transport contract with the eco tourism industry, which in turn adds to the limited carrying capacity of fragile mountain eco system”.¹¹

High domestic herds population has led to overgrazing in many instances. Over grazing, mainly in broadleaf forests, may lead to attrition or loss of species and soil erosion. Forest regeneration is also hampered. Increasing number of tourist produce stress on limited eco resources of the country. Because construction of homes, hotels, restaurants entails extensive use of wood. Almost all housing structure floor, roof, staircase, windows and doors and beams and pillars are made of wood.

A report of the forest resource development division (FRDD) mention that the annual total consumption of timber at 190000m³ in the recent year exceeded the total annual allowable cut of about 149000m³ from all forest management units¹².

Fuel wood consumption is even higher. Although collection of dry fuel wood in the form of fallen twigs driftwood is common bulk of the fuel wood need is met from natural forests. Tourism can also lead to the indiscriminate clearance of native vegetation for the development of new facilities. Ecologically fragile areas such as rainforests, wetlands are also threatened by intensive or irresponsible tourist activity. The creation of garbage trails from the indiscriminate disposal of non-biodegradable waste is another visible environmental problem associated with the tourism industry. “It has been pointed out that tourism is promoting changes from sustainable farming and cropping pattern to other more profitable and less sustainable livelihoods, to meet the needs of affluent tourists”.¹³

As in other sectors of tourism, lack of planning and foresight even in well meanings eco tourism projects can cause serious negative impacts. It may lead to exploitation, and destruction of ecologically fragile areas where tourist might not have been allowed if not for eco tourism.

11 Dorji Tandi (1999), “Sustainability of Tourism in Bhutan”, *Journal of Bhutan studies*. vol (4) p. 38.

12 Nature Conservation Division, Dept of Forestry services, MOA, with support from wwf Bhutan Program (2004) *Bhutan Biological conservation Complex*, Thimpu, Bhutan. p 25-26.

13 Dorji Tandi (1999), *op.cit.*,p.38.

Ecological impacts of eco tourism began to emerge in the early 1980s, from Krippendorf (1982) who recognized that “The ecological resource base acted on the raw material of eco tourism, which through improper one and over use loses its value”.¹⁴

Natural resources depletion and environmental degradation associated with ecotourism activities are sometime serious problems in tourism rich regions. The management of natural resources to reverse this trend is thus one of the most difficult challenges for governments at different levels. The fact that most tourists chose to maintain their relatively high patterns of consumption and waste generation, it can be a serious problems for developing countries like Bhutan without the appropriate means of protecting their natural resources and local ecosystems from the pressure of the tourism.

Without careful land-use planning, for instance, rapid tourism development can intensify competition for land resources with other uses and lead to rising land prices and increased pressure on agriculture land. Intensive tourism development can also threaten natural landscapes, notably through deforestation, loss of wetlands and soil erosion. Besides the consumption of large amounts of natural and other local resources the tourism industry also generates considerable waste and pollution in Bhutan. Improper disposal of liquid and solid waste generated by tourism industry has become a particular problem for Bhutan that lacks the capacity to treat these waste materials properly.

Apart from the contamination of fresh water from pollution by untreated sewage, tourist activities can also lead to land contamination from solid waste and intensive tourism activity in national areas can interfere with fragile vegetation and wildlife which cause irreversible damage to ecosystems, particularly if the infrastructure in those areas is not adequately prepared to absorb to tourists. Uncontrolled tourism activities can lead to the severe disturbance of wildlife habitats and increased pressure on endangered species. It is another important core issue, which is threaten by ecotourism. The common understanding of the term” biodiversity” is all the living things on earth and the ecological process associated with them.

14 Krippendorf, J. (1987), “Ecological Approach to Tourism Marketing”, *Tourism Management* , 8(2) p. 174-176.

Biodiversity is essential to human development because of the goods and services it provides. Components of biodiversity may be used directly as food, medicine, building materials and so on. Biodiversity provides more indirect benefits, in the form of environmental regulation, soil conservation and pollution control. It also has what economists refer to as “non-use values” for example, the simple enjoyment or “existence value” of some aspects of biodiversity and the option to use biological resources in the future.

Bhutan having great concentration of plant and animal species, it is extremely important that these areas receive very special conservation attention, along with research and monitoring to prevent further extinctions. It might be expected that ecotourism development should go hand in hand with biodiversity conservation and improvements in rural livelihoods. In many instances, tourism has been instrumental in delivering scarce funds for conservation and providing local people with an economic incentive to protect biodiversity from other potentially more damaging forms of development such as mining, logging or consumptive one of wildlife.

Maintaining an attractive resource continued to attract more tourists and support a healthy ecotourism industry, thus generating more Funds for conservation.

4.5 Problems that Affect the Future Sustainability of Bhutan’s Ecotourism

There are other problem associated with ecotourism in Bhutan that might affect the sustainability of the industry in the long run if they are not addressed now these are seasonality, weak infrastructure base, less involvement of the local community, lack of substantive tourism research base, worsening in Pricing integrity and Regional imbalance.

Tourist arrivals in Bhutan are subject to pronounced seasonality March/ April and October / November are the top months in which the weather is ideal for trekking and most of the religious and cultural festivals take place in these months. Insufficient diversification of tourism is another problem that may affect future sustainability of the Bhutan’s tourism. In the year 2002, out of the total of 5599 tourists 5242 were cultural tourists and 357 trekkers. Although Bhutan has vast

potential for other forms of tourism such as sports tourism, adventure tourism and nature tourism and the process of diversification is just beginning.

Involvement of local communities is relatively low and it is argue that local communities need to be more involved in the business and should receive more benefits from tourism. Local community involvement is currently limited to providing tourism and portage. Apart from this weak institutional base and lack of substantive tourism research base are another limitation, which may affect the future sustainability of tourism in Bhutan. The department of tourism lack both manpower and finance to manage and monitor the tourism industry effectively. There is a lack of qualified manpower, particularly at the management and entrepreneurial levels. There are no formal hotel and tourism training institutes in the country. Lack of proper research surveys, feedback, statistics, data collection and processing and research related to tourism development are needed for making sound policy decisions in the future. Lack of coordination, cooperation and management between government and tourism operators affect the efficiency of policy of ecotourism. Government's policy allows a high margin of profitability to tourism operators, operators are resisting to discounts and rebates to foreign operators in order to snatch business away from competitors. This has led to a break down in pricing integrity.

Regional imbalance is another most important problem that might a affect the sustainability of tourism and today it is mostly limited to a Himalayan zone for mountaineering and high altitude trekking and central zone for cultural tours. As such tourism is mostly limited to the western valleys of Paro, Thimphu, Paunakha, Wangdue Phodrang and the central valleys of Trongsa and Bumthang.

Apart from this one type of tourism for which Bhutan has become renowned is trekking arrival of over 400 to 600 trekkers and mountaineer per annum has put extra pressure upon the natural resources of the area, unplanned development has led to the construction of lodger in which trekker can stay forest area have been removed to provide timber for construction and fuel to heat food for tourists and provide them with hot water for showers. Deforestation of the mountains has resulted in tremendous landslide. Waste disposal problem are also an issue.

In adequate sanitation facilities results in pollution of water supplies, and non-biodegradable litter is thrown into streams and piled in rubbish heaps on the edge of settlements, again leading to pollution and hygiene problems¹⁵.

Moreover, it is increasingly recognized that the rapid expansion of nature tourism or ecotourism may also pose a threat to ecologically fragile areas, including natural heritage sites, if not properly managed and monitored.

4.6 Infrastructure Base and Ecotourism Development in Bhutan

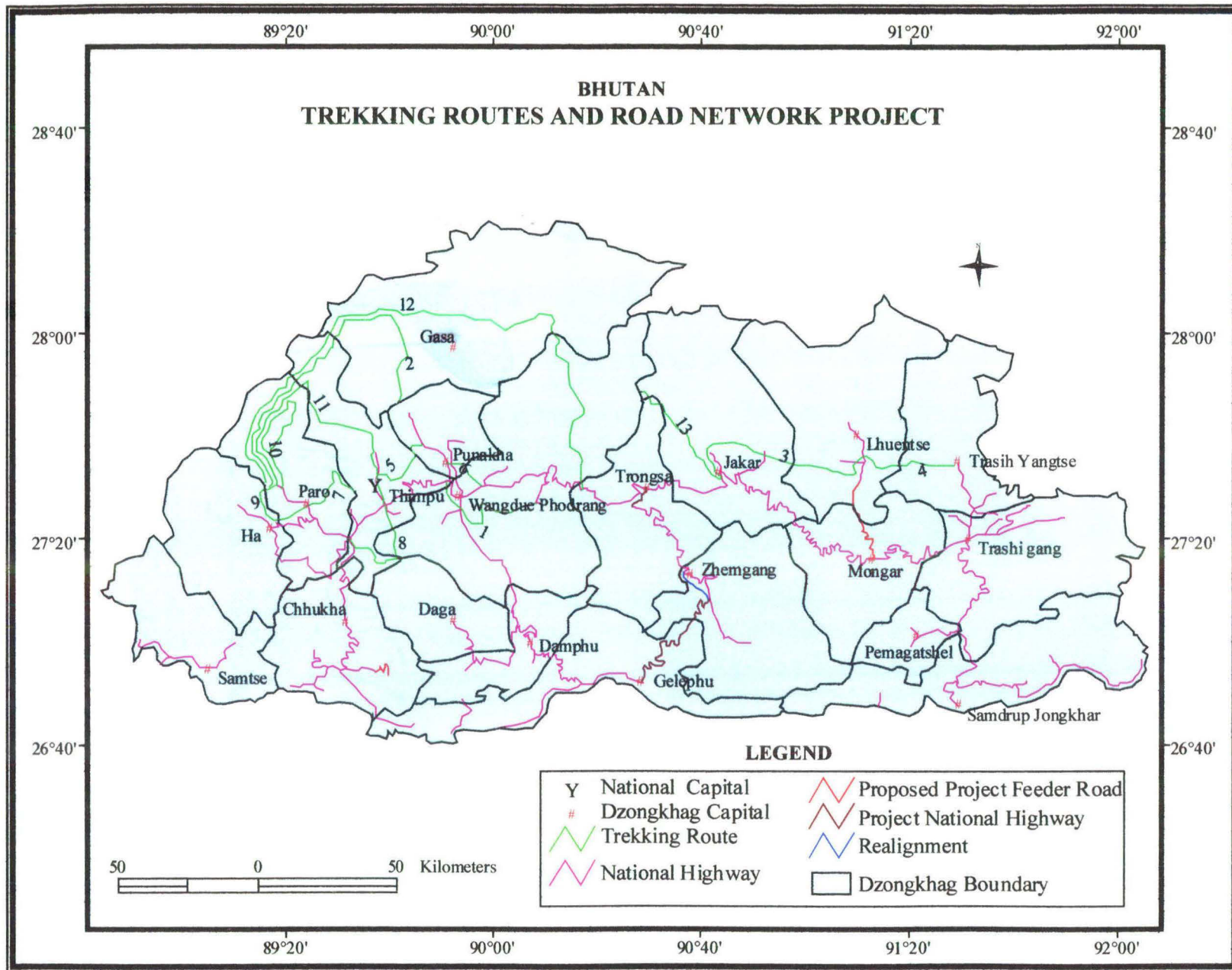
The development of well-organized transport network reflects the development of economy. It not only ensures the movement of tourists but also the movement of ideas and skills from one region to the other. Today Bhutan's most vital need is to knit the far-flung inaccessible regions together to strengthen the ecotourism industry. And road transport network is very much suitable for a hilly country like Bhutan. Main characteristic of road transport in Bhutan is flexibility, reliability and speed. It is quite flexible in handling the tourists. Vehicle on the road may be stopped anywhere for looking up picturesque beauty of the nature.

Road transport is most important, mode of communication within the domestic boundary. It links different region. It is also an important indicator, which shows degree of accessibility for different Dzongkhags. But road network and its density show unequal development due to its hilly terrain and other physical, environmental and economical barriers.

Road network and road density, which show accessibility also facilitate movement of tourist along line of communication. Lack of road infrastructure also restricts tourist flow in different Dzongkhags. So there is a direct correlation between level of development of road infrastructure and tourist arrival in that particular Dzongkhags. Hence most of the tourist coming Bhutan have purpose of tour, holidays and recreation and their percentage comprise more than Eighty Five percent of total tourist arrival and they generally prefer road communication for visit different centers of attraction of different Dzongkhags. Percentage of tourist having purpose of trekking and mountaineering comprise less than fifteen percent while in 2002 it was only 6.4 percent of total tourist arrival.

15 Andrew, Holden (2003), *Op.cit.*

Map No. 4.1



As far as the road density of Bhutan in 2001 is concerned, it is clear that there is a regional imbalance in level of road infrastructures development and in turn accessibility of different region. Most accessible Dzongkhags are Thimphu and Chhuka where road density is very high. Percentage of road length to total road is also very high it is 12.16 percent and 9.45 percent respectively. While Paro, Tsirang, Mongar, Pema Gyalshel have high road density and in turn show high accessibility to centers of attraction in these Dzongkhags. Punakha, Sarpang, Trangsa Zhemgang, Samdrup Jongkhar, Trashigan Dzongkhags are moderately accessible. Most of them are situated in Southern region. Low accessible Dzongkhags Haa and Samtse in Southwest.

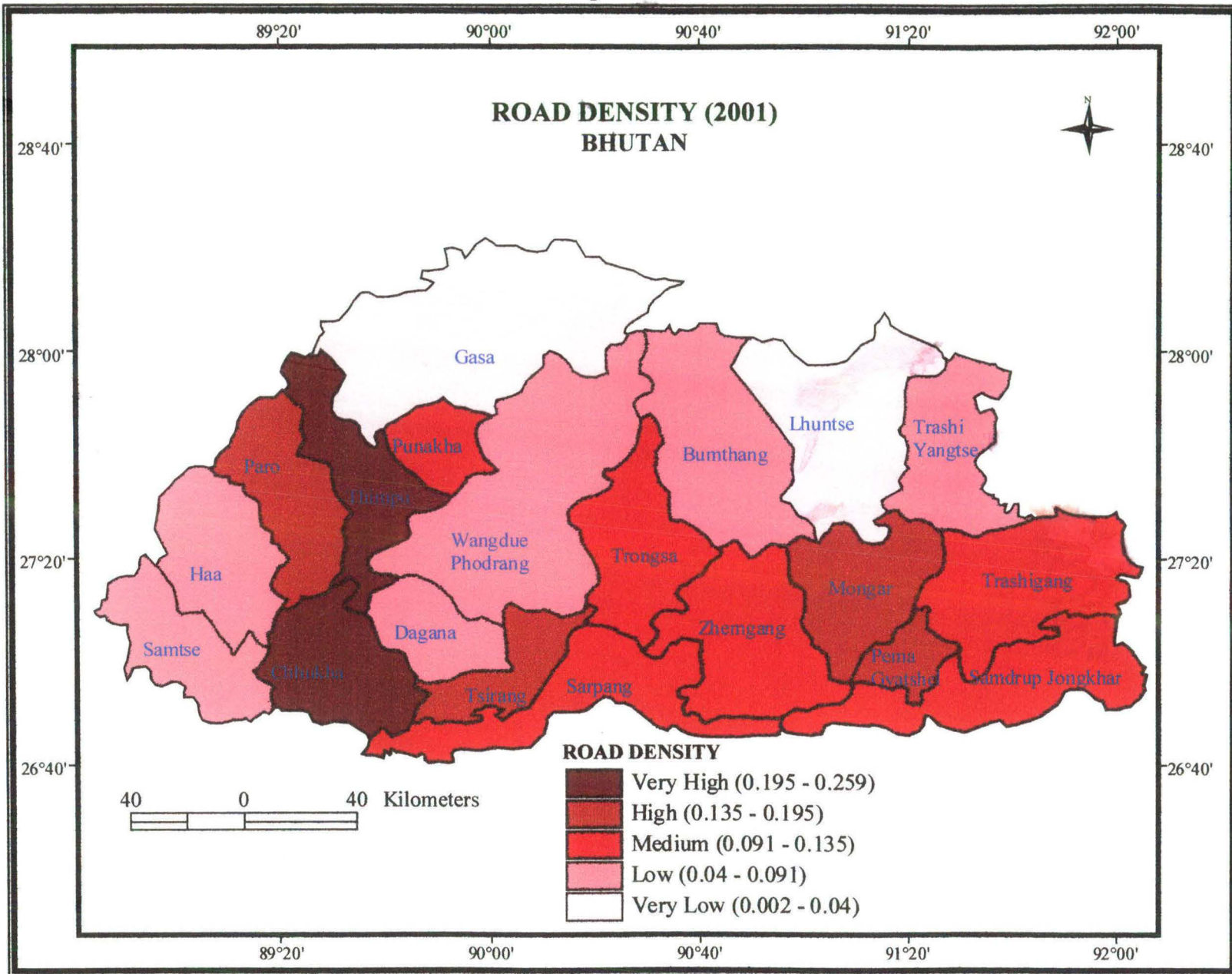
Wangdue Phodrang, Dagana, Bumthang and Trashigang in North east while very low accessible Dzongkhags are Gasa & Lhunse North west and North east respectively. These are generally high relief area and rugged terrain. In Gasa, road length is only 7.3 km and has least road density. Road networks improved access to national Parks and increased potential for ecotourism.

In short, practically all development activities in the country and particularly ecotourism are in some way dependent upon the extent and condition of Bhutan's transportation network. Ensuring that all developments on this network are made as environmentally benign as possible, is no easy task. The alarming degradation currently taking place elsewhere in the Himalayas could easily be replicated in Bhutan if appropriate soil conservation techniques are not implemented.

However, once completed roads can actually have positive environmental effects. Improving roads can facilitate the implementation of natural resource management programmes and techniques. In the last 25 years tremendous achievements were made in establishing 3746 Kilometers of motorable roads and several motorable bridges. In the difficult areas, where the construction of motorable bridges provide the vital transport links. We should also keep in mind that the road construction has great potential to disturb the often delicate balance of existing land formations. Therefore, it requires promotion of mechanized and environmentally friendly road construction.

Improvements in site selection also can help minimize environmental damage. Ideally, the alignment should be as direct as possible to economise construction, maintenance and vehicle operating costs.

Map No. 4.2



This requires a high degree of site. Specific investigation and involves skilled, multi-disciplinary consultants.

Environmental Impact Assessment is another viable option to minimize ill effect of road construction. Almost all predicted adverse significant impacts of the proposed road network project will occur during the construction phase. The characteristics of the impacts are significant, but short term and reversible. They are manageable and almost all of them can be minimized through engineering solutions easily incorporated into the project design. Continuous monitoring will be needed to examine whether remedial action is required to respond to unexpected impact.

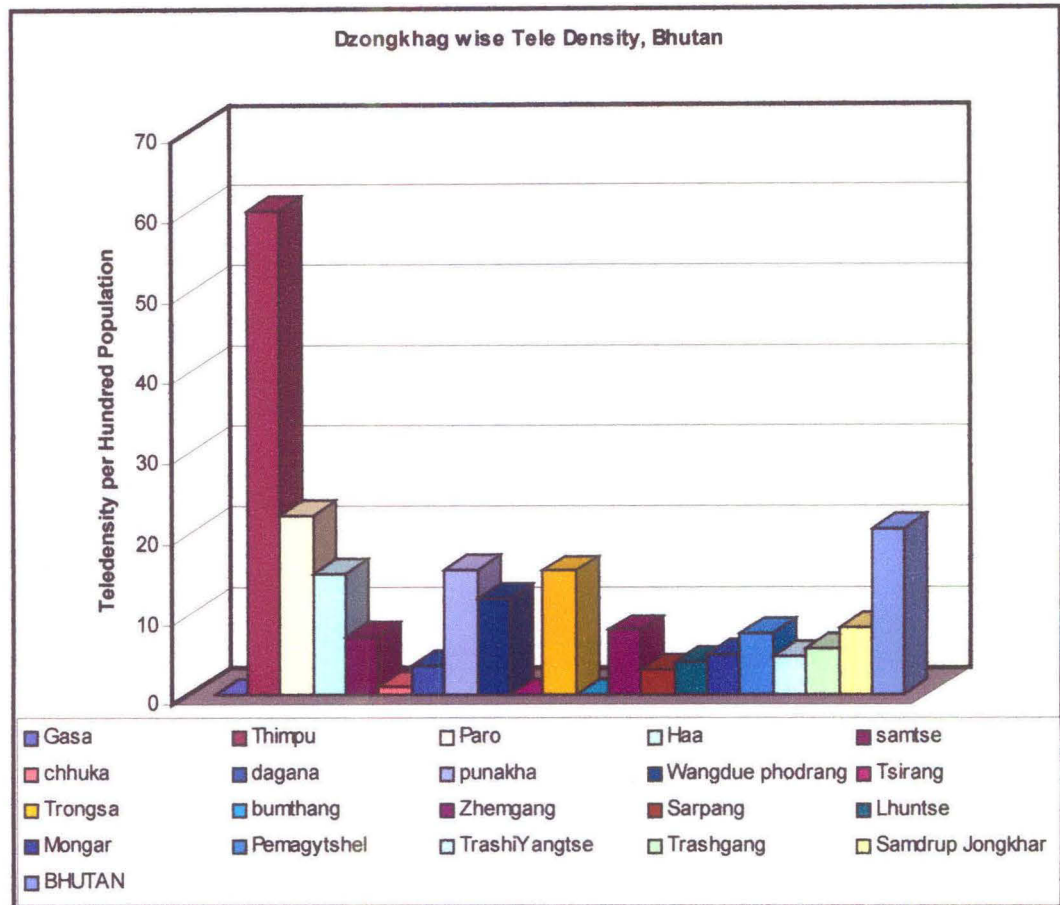
Apart from this conventional system other innovative, environmentally benign transport systems should be adopted so as to ensure a healthy environment for ecotourism sustainable development.

Alternatives to automobile especially for Thimphu like electric powered vehicles and use of bicycles in urban areas held much promise in reducing vehicular pollution. The construction of Tunnels can prevent road building on steep slopes. Boats are viable means of transport in the southern areas of the country and have relatively few adverse impacts on the environment.

Other types of transportation, such as Bhutan's national airline carrier, Druk-Air, ropeways also are significant. Ropeways also can provide short distance transport, and their use can be considerably expanded. Domestic or charter airplanes are not available in Bhutan. In rural and remote areas walking or riding mules or horses are mode of transport. Improving the road conditions as the most available option.

Another communication services that have facilitated ecotourism in the region are telecommunication like, telephone, Internet, cell phone, etc. Within the last two and half decades, telecommunication network has changed from physical wire network to a national digital network. Highest no. of tele density is found in Thimphu 60.1 it is followed by Paro, Punakha Trongsa and Haa where it is 22.1, 15.4, 15.3 and 14.9 respectively.

Figure 4.2: Dzongkhag wise Tele Density of Bhutan



Source: Statistical Year Book, Bhutan 2003.

Bhutan’s first satellite international link was established in 1990. In March 1999 all the 20 Dzongkhas headquarters had access to telecommunication services with the period 1992-1999 the number of telephones per 100 people increased from 0.08 to 1.12 and as of Dec. 2004, there were, 30,285 telephone connections.

Yet another breakthrough was the launch of cellular mobile services in the kingdom in 2003, the Bhutan Telecom Authority has connected the three regions. Thimphu, Paro and Phuntsholing, in its first phase. The four new regions covered are Wangdue Phodrang, Pinakha, Gelephu and Samdrup Jangkhar.

Besides, there are now 110 postal services where on average, one post office caters around 6,843 Bhutanese people.

In 1999, the country established the first television network and started the internet service. Since then, the information and communication technology such as internet provides access to global information and play an important role in the

every day affairs and access to information for tourists of the different region of the world. As in Dec. 2004 there were 3,036 Internet.

By and large Bhutan lack in basic infrastructure support system and for promoting ecotourism it is necessary to develop appropriate infrastructure base. Although this type of tourism traditionally needs fewer infrastructures than other form of tourism but for maintaining sustainability, it is indispensable that there must be a sufficient infrastructure base.

CHAPTER 5

PRINCIPLES, GUIDELINES, POLICY MEASURES **AND THE ROLE OF DIFFERENT AGENCIES**

5.1 Principles and Guidelines for Development and Management of Ecotourism in Bhutan

To ensure maximizing benefits from ecotourism and minimizing negative impacts on natural environments and surrounding communities, all stakeholders must entrust themselves to follow some principles and guidelines in their operations, in a concerned effort. World Tourism Organization has identified the following principles and guidelines for ecotourism development and management that need to be adapted to suit the special conditions of each country.

- Ecotourism must contribute to the conservation and improvement of natural areas and to the sustainable development of adjacent areas and communities.
- Ecotourism requires specific policies, strategies and programmes for each particular region; it cannot be sustainably developed by simply copying what has been done elsewhere.
- Ecotourism needs practical and effective systems of coordination between all the players involved, including governments, private enterprises and the local community.
- The physical planning and design of eco-tourist facilities - especially hotels and other means of accommodation, restaurants, information centers in national parks and the like - should be carried out in a manner to avoid or minimize any negative impact that may have upon the natural and cultural environment. Building materials, architectural styles, furniture and décor should ideally be local, while low pollution energy sources should be used.
- Similarly, the means of transport and communications to access ecotourism areas should be low contaminating. Sports involving noisy or highly polluting means of transport should definitely be prohibited in these areas.
- The practice of ecotourism in national parks and protected areas should strictly comply with the management rules governing such areas.
- Reciprocally, these management plans should take into account the fact that they will be used by tourists, and make suitable provisions for a sustainable use.

- The carrying capacity of ecosystems in relation to tourism is all-important, and integrated long-term strategies and plans must take into account these carrying capacities.
- Appropriate legal and institutional mechanisms should be established to facilitate and make effective the orderly participation of the local community in the entire ecotourism process, including policy definition, planning, and management and monitoring. Awareness raising and capacity building are essential ingredients for this.
- In line with this, institutional, financial, fiscal or other mechanisms should also be established to ensure that a significant proportion of the income generated from ecotourism should remain with the local community or serve conservation purposes.
- It is however important to ensure that ecotourism is a good, economically sustainable business and the profits that are generated from it. If there are no prospects for profit, then the private entrepreneurs will not invest and there will be no benefits to distribute for the local communities or conservation purposes.
- All those concerned with the ecotourism business must be aware of the costs of mitigating any possible negative impacts, and such costs must be incorporated in the pre-investment cost-benefit analysis of any ecotourism project.
- Compliance with general tourism regulations and codes should be stricter in the case of ecotourism in Bhutan combining supervision and monitoring, with awareness raising campaigns among business people and tourists, training of service suppliers, and eventually sanctions against those who do not comply. Self-regulation and voluntary initiatives related to the environmental and socio-cultural sustainability of ecotourism should be encouraged but duly checked.
- Consideration should be given to the prospects of establishing the obligation of certification systems for ecotourism facilities and operations, to guarantee that their quality is consistent with the principles of sustainability.

- Education and training are prerequisites for sustainable ecotourism development and management. Company managers and employees, as well as the local population need training on general and specific aspects of ecotourism, tailored to the needs of each. In particular, ecotourism needs highly qualified guides, who should ideally be natives from the region.
- Eco-tourist need detailed and specialized information about ecotourism both before and during the trip. The provision of complete information is precisely one of the elements that differentiate the ecotourism experience from traditional tourism, and it can take various forms, such as brochures, guide books, leaflets, maps, interpretation centers, eco-museums, signposted nature trails, and, of course the guides themselves.
- Promotional material for ecotourism should contain substantial information on the experience to which potential tourists are invited, including details on flora, fauna, geology and in general on the ecosystem to be visited. It should also include truthful information about the accommodation and catering services, as well as recommendations on what may and may not be done at the destination. All this information before the purchase will help the potential clients to discriminate between genuine ecotourism operators and others that only seek to take advantage of a fashion.
- Both the marketing channels and the promotional means for ecotourism products should be consistent with the type of tourism the consumer is being offered and with the typology of ecotourists.

Wallace and Pierce suggest,

“Tourism may be said to be true eco tourism if it addresses six principles:

- It entails a type of one that minimizes negative impacts to the environment and to local people.
- It increases the awareness and understands of an area’s natural and cultural systems and the subsequent involvement of visitors in issues affecting those systems.
- It contributes to the conservation and management of legally protected and other natural areas.
- It maximizes the early and long term participation of local people in the decision making process that determines the kind and amount of tourism that should occur.
- It directs economic and other benefits to local people that complement rather than overwhelms or replaces traditional practices (Farming, fishing, social system etc.).
- It provides special opportunities for local people and nature tourism employees to utilize and visit natural areas,

learn more about the wonders of the nature that other visitors come to see.¹

Monitoring the flow of tourists is paramount in preserving the pristine nature of Bhutan's higher elevations. Because of the highly fragile nature of mountain eco-systems, damage takes much longer to undo. Maintaining the integrity of these ecosystems thus require additional measures of diligence and prevention. "If the alpine meadows, streams and forests that western tourists are willing to pay substantially more to see are to be preserved a wide variety of action will need to be taken to ensure that human impacts are kept well below maximum levels of acceptability".²

To reduce the adverse impacts, some guidelines for environmentally friendly tourism have been drawn up by the Ministry of Trade and Industry (MTI) of Bhutan.

Among the more significant of the remedies being advocated are the substitution of kerosene and liquid petroleum gasoline (LPG) for fuelwood; the construction of permanent composites, rest houses and toilet facilities along established trekking routes; the full removal of all non-biodegradable waste; and strict limitations on the amount of washing and other activities that pollute the environment. There are plans to levy an environmental fee on all visitors to Bhutan. Revenues from this fee would be used to underwrite the costs of providing ecologically benign facilities and general maintenance and cleaning services.

In Bhutan ecotourism must be undertaken very carefully so that it could become a positive force for conservation and environmental protection that also provides a unique opportunity for raising awareness and enhancing support for conservation. There fore, if Bhutan has to explore its ecotourism potential the following measures will have to be implemented.

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1. Wallace, G.N. and Pierce, S.M. (1996), "An Evaluation of Eco tourism", *Annals of tourism Research*, 23 (4): p 843-873.
 2. National Environment Commission (1998), Royal Government of Bhutan, *The Middle Path: National Environment Strategy*, for Bhutan. P 52.

The royal government and the tourism industry must undertake a marketing survey to better understand the potential for ecotourism in Bhutan and to identify specific areas where Bhutan has a comparative advantage.

A weakness in Bhutan's present ecotourism is the lack of well trained and knowledgeable guides, especially for specialist tours like bird watching, photography and flora tourism. Ecotourism requires trained guides who have knowledge of specific parks and other sites and who are able to identify the biodiversity of the region.

Apart from this there is a dearth of imperative materials that can be used by interested visitors to Bhutan and school children, particularly field guides and biodiversity tour guides. Other most important point which need consideration is infrastructure, although ecotourism requires fewer infrastructure than other forms of tourism, many countries have built elaborate facilities within protected areas. Such developments have given ecotourism a bad name what protestors calling it "eco-terrorism" it is recommended that the development of infrastructure for ecotourism in protected areas should undergo an environment impact assessment to ensure the suitability of the project and to prevent environment degradation.

Moreover numerous policy documents of the Royal government, including Bhutan 2020,³ and the middle path Bhutan's Natural environment strategy⁴ have also recognized the need to promote eco tourism as a way to achieve sustainable tourism development in the country. EIA is one of the most appropriate and advanced way to promote ecotourism and it must be applied to a wide range of eco tourism projects, especially physical infrastructure projects, in order to evaluate their likely impacts on the environment. EIA ensure that development projects are environmentally and economically sound in the longer terms: It can help

3. Planning Commission Secretarial (1999), Royal Government of Bhutan: *Bhutan 2020: A vision for Place, prosperity, Happiness*. P. 36.

4. National Environment Commission (1998), Royal Government of Bhutan, *The middle path – natural environmental strategy for Bhutan*. "Tourism and its effect on the culture and the Environment", p. 53.

in minimizing adverse impacts of environmental, economic, cultural and social development projects. Apart from this environmental impacts on ecologically fragile system should receive prior evaluation.

Besides EIA, effective management of watersheds must be considered key components of our efforts to place the nation's ecotourism on a sustainable path. Watershed management is a key tool for maintaining biodiversity and soil fertility, The biological productivity of natural systems and for combating erosion and other forms of environmental degradation.

5.2 Role of Government in Ecotourism Development (Bhutan)

The role of the government is indispensable to ensure ecotourism development and in minimizing its ill effects. Governmental controls regulate the private sector to make all ecotourism practices environmentally sustainable. There must be some strategy and policy that aim to co-ordinate government and private efforts in order to achieve positive impacts of ecotourism because “ecological value of the sites diminishes if visitation is not managed properly. Limitation on visitors must be imposed in order to maintain the ecological and cultural integrity of a ecotourism site”⁵.

Government of Bhutan has drafted the Bhutan National ecotourism strategy with financial assistance from WWF Bhutan Programme. The strategy generally reaffirms Bhutan's overall tourism policies.

RGOB in the Biodiversity Action plan for Bhutan advocates that to control visitors number “government will continue to actively intervene in quality, pricing and payments. A new slogan “high value, low impact”, has been adopted to more clearly explain Bhutan's determinedly cautious “product-led and values-led” approach to tourism development”.

In keeping with this approach, a set of ecotourism related principles is established to guide the future development of the tourism sector. Government can also redirect the visitor to other parts of the country or to other seasons of the year

⁵ National Environment Commission (1998), Royal Government of Bhutan, *The middle path – natural environmental strategy for Bhutan*. “Tourism and its effect on the culture and the Environment”, p. 53.

through either regional quotas. Government can also restrict the limits of hotel, restaurants, lodges in the more busy regions of the country.

Bhutan economy is driven by the tourism industry and thus it is becoming increasingly concerned with the environmental, as well as the socio-cultural problems associated with unsustainable tourism. As a result, there is now increasing agreement on the need to promote sustainable ecotourism development to minimize its environmental impacts and to ensure more sustainable management of natural resources. The concept of sustainable tourism developed in the United Nations Sustainable Development Process, refers to tourist activities, leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological process, biological diversity and life support system. These sustainability concerns are therefore, beginning to be addressed by government at national regional and local levels.

Generally speaking, the main priority for national and regional governments is to incorporate ecotourism planning and development effectively into overall sustainable development strategies. Regional development strategies for areas containing water resources that are potentially attractive to ecotourism, should carefully consider the availability of those resources in an integral manner that considers all potential water users. Government policies to promote the domestic ecotourism industry and to attract foreign direct investment should also ensure that ecotourism is properly planned and managed so that it would minimize adverse environmental impacts and uses of natural resources. Since the environmental impacts of eco tourism development are primarily felt at the local and regional levels, national governments need to promote decentralization of public environment management to the regional and municipal levels.

Central government should also support capacity building programmes at lower levels modern to enable local and regional authorities to better respond to the challenges of sustainable ecotourism development in the areas under their jurisdiction. National and local government also need to develop clear strategies to monitor progress towards sustainable ecotourism.

Last but far from least, government at all levels can greatly benefit from working in partnership with all major stakeholders including local communities, to ensure their active participation in ecotourism planning, development and

management as well as in the sharing of benefits. Participation of local communities in decision making and sharing of benefits also helps to generate better awareness of the environmental costs of ecotourism and thus provides strong motivation to conserve natural resources and protect local environmental assets.

Government, together with the tourism industry and other stakeholders, should also promote or support various efforts to raise public awareness about the impact of tourists on destinations to promote respect for local communities and their cultures and to protect the environment. Such public awareness campaigns not only succeed in promoting positive behavioral changes in tourists, but also in tourism workers and host communities as a whole.

Sustainable ecotourism can also be promoted by a careful mix of government policies comprising both direct regulation and market based instruments, although financial incentives that encourage environmentally damaging activities, should be reduced or removed. The major challenge for governments is therefore to formulate and effectively apply an appropriate mix of regulatory and economic instruments for both sustainable natural resources management and environmental protection. The most direct tool for promoting sustainable ecotourism involves the use of regulatory mechanism, such as integrated landuse planning.

5.2.1 Tourism Policy in Protected Areas

The RGOB recognizes the negative impact of unregulated or excessive tourism that can have on a nation's culture and biodiversity. Experience in neighbouring countries has emphasized this key point. Consequently, the RGOB has limited the total number of tourists by a relatively high fee for all tourists other than Indians.

With respect to biodiversity in the Protected Areas, especially in JDNP, which has a number of tourists trekking the park, the tourism policies are as follows:

- Tourism an visitation will be allowed within the park, but will be secondary in priority to nature conservation and the needs to protect the ecosystem and the need to prevent adverse effects on the social, cultural and traditional integrity of the local communities.

- Tourism practices will be based on the principle of sustainability, they must be environmentally and ecologically friendly, and socially and culturally acceptable.
- Tourism and tourists will be confined to designated visitor zones; and
- Tour operators will be held accountable for violation of park rules by visitors and guides, and will be fined and/or their licenses revoked under the regulations of the Department of Tourism. A park-entry fee will be charged from foreign visitors, which will be used for local development and park management.

The manager of Sigme Dorji National park saw benefits in increasing nature tourism experiences, such as trekking through the parks as it would allow people in the remote areas of the park to benefit financially by providing accommodation, food and related services to tourists. One of the major problems facing the park was the illegitimate harvesting of rare and sometimes endangered plants used for traditional medicine. The park manager felt village people in the park would be less tempted to poach if they could be assured of a consistent income from ecotourism.

Extensive research, survey and management Programmes are required on many species in Bhutan including Tigers, Black-necked crane, Himalayan Takin, Himalayan musk deer, Golden langur, and one horned Rhinoceros in order to insure their survive in the long term. Even within the Buddhist society, well managed nature based tourism could provide direct and indirect environmental benefits in Bhutan's protected area systems as long as carrying capacities are regulated to prevent long term problems. If there is pressure to expand, habituation of local animals at camp sites, the introduction of exotics vegetation and the siting of fixed accommodation, waste disposal facilities and the like may interfere with migration and breeding habitats (weaver 1998)⁶.

5.2.2 National Ecotourism Strategy

The Department of Tourism has drafted the Bhutan National Ecotourism strategy with financial assistance from WWF Bhutan Programme. The process of developing the Strategy has involved wide participation by the tourism industry,

6. Weaver, D. (1998), *Ecotourism in the Less Development world*. New York: CAB International

including two major stakeholder and industry workshops in April and September 2001.

The term “ecotourism” is now widely used in both conservation and tourism circles, although definitions vary widely. Taking a broad definition, all of Bhutan’s tourism can be said to be ecotourism. Therefore, rather than plan for ecotourism in a separate way, the Strategy addresses the whole of the tourism sector and seeks to incorporate the principles of ecotourism where appropriate. Furthermore, the Strategy uses the language of ecotourism as means to explain, in a positive way, Bhutan’s unique approach to tourism.

The Strategy generally reaffirms Bhutan’s overall tourism policies: RGOB will continue to actively intervene in quality, pricing and payments. A new slogan, “High value, low impact”, has been adopted to more clearly explain Bhutan’s determinedly cautious “product-led” and “values-led” approach to tourism development. Ecotourism, defined the Bhutanese way, will be an ideal towards which the whole tourism industry will strive. In keeping with this approach, a set of ecotourism related principles is established to guide the future development of the tourism sector.

5.2.3 Analysis of Ecotourism Policy of Bhutan

As stated previously, Bhutan has the potential to be one of the most desirable specialist natural tourism destinations in the world. It also has infrastructure barriers [transport, accommodation, communication, sewage, water, energy] to rapid ecotourism development. “A deliberate government policy (government mandated minimum price per day) has been implemented to ensure slow tourism growth in the hope of preventing excessive socio-cultural and environmental impact. In 2003 approximately 6261 foreign tourist visited Bhutan which provides US \$ 8.32 million although not large provides significant foreign exchange earnings for a small developing country”⁷

The present policy consists (effectively) of a fixed price set by government, with quality, of service and visitor experience maintained by ‘market share’

7. Planning Commission, Royal Government of Bhutan (1999), *Bhutan 2020: A vision of peace, prosperity and happiness*: Thailand: Keen Publishing.

competition between tour operators , and government regulation licensing of tour operations, guides, hotels.

Establishing a minimum price is an effective and efficient mechanism to regulate number for maximum yield: that is, maximum return for minimum impact.

Tourism is increasingly being seen by RGoB as the major option for economic diversification. Any review of ecotourism policy must consider a complex array of economic, cultural, social and environmental issues. To achieve desired outcome would require action on many fronts.

The consequences of policy changes can be very complex and sometimes unexpected. It is vital that up-to-date, relevant and strategic information and research informs any policy review and subsequent changes. Although the situation is changing, the Bhutanese acknowledge that lack of pertinent data often thwarts the implementation of effective policies to prevent undesirable environmental and cultural change (p.c. 1999).⁸ Bhutan's Biodiversity, Action plan (FSD 1998)⁹ demonstrates an awareness of problems and potential problems related to ecotourism. Bhutan will need to develop practical strategies to manage the environmental impact of ecotourism if it is to encourage increased use of its natural assets.

Bhutan has devised a solution to the one problem of waste disposal with the recent banning by the king on all plastic bags. Other areas that require monitoring include building, roads and tracks within fragile environments, the impacts of human on willdlife and so on (NEC, 1998)¹⁰.

A core component of Bhutan's ecotourism policy is to ensure a sustainable, cultural and environmental carrying capacity, a challenging task, as it is very difficult to determine carrying capacity for natural and cultural sites.

5.3 Role of Local Communities in Ecotourism Development

Local involvement and input are essential for the long-term economic and environmental sustainability of ecotourism in Bhutan. If

8. Planning Commission, Royal Government of Bhutan (1999), *Bhutan 2020: A Vision Of Peace, Prosperity And Happiness*, Thailand: Keen Publishing.

9. Forestry Service Division, Royal Government of Bhutan (1998), *Draft Biodiversity Action Plan*. Thimphu: FSD.

10. National Environmental Commission, Royal Government of Bhutan (1998), *The Middle Path: National Environmental Strategy For Bhutan*, Thailand: Keen publishing

local communities are involved and have participation in ecotourism activities, it will be in their interest to ensure that ecotourism is sustainable. Local people can help to achieve set goal. They can also help in increasing project effectiveness. Key local leaders and community's commitment help in identification and assessment of the projects. The role of women can also play a very significant role in ecotourism development provide they have taken vocational training, skill oriented literacy course and informal adult education.

Participation of local community can be increased by the ecotourism team explain the goals and objectives of the project, how the project will affect the community, the values of the areas, any history of threats, and the benefits of the project.

Collective decision-making is another way to ensure greater participation of community in ecotourism development. The ecotourism project team presents the findings of their research to the community, together with an action plan. Community members are asked to react to the plan with the possible and result being a forum through which the team and local people negotiate to reach final consensus based on the impacts of the project.

Local community can take variety of position in ecotourism development, research position, park management positions, gift shops, guides etc. Community participation is vital to any successful ecotourism project and this very active participation ensure that local residents are a part of the plan, having the final say in what their community needs and wants. Without active participation and equal distribution of profit, a project is destined to fail because the residents will not care enough or know enough about it. Wood also examines the occurrence of community based ecotourism and states that “this relatively new variety of ecotourism has been quite successful, running either totally from within a community or with one – outside partner often utilizing other community initiative such as cooperatives”¹¹.

11. Wood, M. (2002), *Ecotourism: Principles, Practices and Policies for Sustainability*, UNEP Publication in collaboration with the international Ecotourism society.

5.4 Role of NGOs in Ecotourism Development in Bhutan

The Royal Society for the Protection of Nature (RSPN), an NGO, has been the most active organisation with regard to improving public consciousness and education. In the last nine years, the RSPN has established a network of school nature clubs, and several research projects including some on fuelwood consumption, water quality, and ecotourism as well as workshops on environmental issues for village leader men and representatives of the National Assembly. It also addresses a wide variety of conservation issues, using a variety of educational methods such as public meetings, magazines, debates, seminars and workshops.

The Royal Society for the protection of Nature, since its establishment in 1987, has Environment Education and Awareness as a major component of the organization's programme activities. With the assistance of WWF Bhutan Programme, RSPN has implemented conservation education and awareness activities in schools. With 78 established nature clubs serve as the target group as well as the medium for dissemination of conservation to others.

5.5 Biodiversity Cooperation with International NGOs

WWF Bhutan Programme is the principal international NGO that has assisted Bhutan with biodiversity for many years. It has provided important support for biodiversity conservation since 1972, including training programmes and other efforts to expand staff capabilities, surveys and inventories of biodiversity, assistance to national park development, and institutional support to the NCD and RSPN. For the future, WWF Bhutan Programme has adopted a programme approach and shall focus on the following programme.

- Support on-going improvement in policy development and implementation to conserve forest and freshwater ecosystems;
- Promote alternative, environmentally sustainable rural livelihoods to reduce pressure on natural resources;
- Promote environmental education and awareness;

- Conserve species of special concern including plants and birds.

Currently the major activities of WWF Bhutan Programme include Thrumshingla National Park, Royal Manas National Park, Biological Corridors, Bhutan Integrated Biodiversity Information System, Tiger Conservation Programme anti-poaching, taxidermy, survey and GIS, medicinal and aromatic plants, environmental education, PICO hydel, electric cookers at the Institute of Language and Cultural Studies and Royal Bhutan Police messes, ecotourism, and institutional support to NCD and RSPN. Most of these activities will be continued for the next five years.

Other international NGOs have had a much more limited involvement with biodiversity in Bhutan. The World Resources Institute (WRI) of Washington D.C. has provided personnel to assist with development of Bhutan's National Environmental Strategy with a study of biodiversity policy options (Reid, 1996). The Snow Leopard Trust has assisted WWF Bhutan Programme with training in field survey techniques. The World Foundation for Environmental and Development (WFED) of Washington D.C. is assisting the NBC to develop a Bioprospecting Action Plan for Bhutan and facilitating a programme of workshops and training in aspects of bio prospecting management.

The RGoB recognizes the importance of co-operating with nations of the international level to bring about biodiversity conservation and sustainable use. In keeping with this policy, Bhutan signed the Convention on Biological Diversity at the United Nations Conference on Environment and Development, Earth Summit.

By signing the Convention on Biological Diversity in Rio de Janeiro in 1992 and the ratification of this convention by the national assembly at the 73rd assembly. Bhutan has accepted its global commitment to preserve the country's wealth of biodiversity. Bhutan also recognizes the importance of the part of the convention that assigns sovereign countries rights to genetic resources. Bhutan has also signed the framework Convention on Climate Change at the Earth Summit, and the National Assembly ratified the convention in 1995.

Bhutan is also part of the cooperation agreement under this Sustainable Development Agreement (SDA) with Benin, Costa Rica and the Netherlands,

based on the principles of equality, reciprocity and participation. One of the priority areas of cooperation identified between the countries is the conservation and sustainable use of biodiversity.

5.6 Multilateral and Bilateral Cooperation on Biodiversity

Biodiversity is an important area for developing co-operation between Bhutan and both multilateral and bilateral donors. A few of the projects focused on or relating closely to biodiversity are:

- Biodiversity Strategy and Action Plan, BAP I and II (UNDP/GEF).
- A series of environmentally related projects of the UNDP;
- Sustainable Development Co-operation between the Netherlands and Bhutan, where biodiversity has been considered one of the priority areas for co-operation.
- Assistance to NEC with the EIA process (ADB).
- Integrated Forest Management Projects with Austria, Germany, FAO, the World Bank, Switzerland-Helvetas and others;
- Biodiversity conservation in Jigme Singye Wangchuk National Park with the Netherlands-SNV;
- Forest Resources Management and Institutional Development Project (UNDP).
- Assistance in the Integrated Horticulture Master Plan (UNDP).
- Punakha-Wangdi Valley Development Project (UNDP).
- Tourism Development (Austria).
- Development of a National Re-afforestation Strategy (FAO & Japanese Government).
- Manufacture of energy efficient wood stoves (Switzerland-Helvetas).
- Assistance to the National Herbarium and the Flora of Bhutan (DANIDA).

5.7 The Bhutan Trust Fund for Environmental Conservation

Bhutan Trust Fund was established in 1991 as the world's first environmental trust fund, and legally incorporated in Bhutan under the Royal Charter in 1996. It is an independent grant-making organisation created to sustain finance Bhutan's conservation programmes. Donors to the trust fund endowment include the Global Environmental Facility, WWF and the governments of Bhutan,

Denmark Finland, Netherlands, Norway and Switzerland. Today, the trust fund is governed by a high-level board composed of Bhutanese representatives from the government's agriculture, environment, education and finance sectors, the private sector and civil society.

By and large the RGoB recognises that ecotourism is a world-wide phenomenon and an important means of achieving socio-economic development particularly for a developing country like Bhutan. It also recognises that tourism is an opportunity to travel, can help in promoting understanding among people and building closer ties of friendship based on appreciation and respect for different culture and lifestyles.

CHAPTER-6

CONCLUSION

Conclusion

It is obvious that Bhutan does not merely want to create the illusion of safeguarding the environment, rather wants to ensure the environmental integrity of this small pristine country for the benefit of succeeding generations. This can only be realized if each and every individual is made to understand that they are part and parcel of the environment in which they live, not its master.

Tourism industry in Bhutan is relatively young and since its beginning the number has gradually increased. It shows overall an increasing trend. So far the government's policy of 'high- value and low volume' tourism has been successful in regulating the control growth of the industry and maintaining the number of visitors at an acceptable level. However, after the year of 2000, tourists visit to Bhutan decreased marginally and in the year 2004 it reduced drastically to half of the level of the year 2000. It is partially due to environmental concern and conservation policy of government. But decrease in number of tourists in the year 2004 is more due to problem of insurgency and the "all clear operation" which is being operated by the government of Bhutan. From this it is obvious that political stability, peace and security are prerequisite for ecotourism development and maintaining development and sustainability with the environment. It creates a sense of security and peace in the minds of tourists.

Although Bhutan has been able to attract tourists from all direction but the degree of access to Bhutan varies across the region over the passage of time. Presently America and Europe are the most important region of tourist origination to the tourist destination of Bhutan followed by Asia Pacific and other regions. Very few number of tourists come to Bhutan from the South Africa, South America and Middle East. Leading countries from America, Europe and Asia Pacific are USA, UK and Japan respectively.

Tourists visit Bhutan for different purposes. Tourist coming for tour, holidays and recreation constitute most significant proportion and contributed more than 95 percent in the year 2004 to the growth of this sector. While tourist coming for trekking and mountaineering contribute very less proportion and showing decreasing trends. They mainly come to Bhutan by Air Transport which is 90 percent and only 10 percent come by other means of transport communication.

Another concluding remarks of pattern of tourist arrivals in Bhutan is that it is somewhat seasonal, tourist arrivals peak during the Autumn season followed by Spring, Winter and Summer. Tourists of different regions have season bias, with a relatively lower preference during the Summer. Marked Seasonality of ecotourism in Bhutan leads to a highly inequitable distribution of visitors throughout the year adding pressure on the limited infrastructure base during the peak season. Temperature and rainfall are two most important climatic factors which guide the temporal and spatial variation of tourist flow in the country. These two indicators together are best reflected by aridity index. This index can be best utilized for recognition purpose and can be used as a tool for redirecting the tourist flow from one region to another climatically suited region. This can also help in preventing concentration of tourists in few destinations and this concentration of tourist in particular region can have negative impacts on the fragile environment and limited basic infrastructure. It would be helpful for spatial ecotourism planning keeping in mind the seasonality pattern of tourists flow throughout the year. This can be used as an important indicator for conservation, protection and development of eco-tourist sites, their flora and fauna.

Bhutan's wild areas by their unique natural exposition provide diverse scope for ecotourism development. Although ecotourism planning is in its infancy, ecotourism projects have the potential to be tools for sustainable development. Bhutan has clear vision on what is desired from ecotourism and it is regulated by adopting a policy of high value low volume tourism. The eco tourism has made significant contributions to the socio-economic development of the country. Bhutanese people have found employment through ecotourism and it has contributes significantly to rural incomes and provided the impetus. Ecotourism acts as catalyst for the development of the service sector and cottage industries. Apart from this ecotourism provides a viable organisational and economic tools for the conservation of protected and other natural areas in Bhutan. It also contributed to regional development to a certain extent because it has capacity to generate multiplier effect in the regional economy.

Ecotourism also makes it possible to preserve or enhance the special activities at sites and its flora and fauna, while allowing local inhabitants and future visitors to continue to enjoy these qualities. So destroying the environment on which the success of industry is based, is like killing the goose that lays the

golden eggs. Although ecotourism in Bhutan is referred to as a model for other fragile mountain areas, a number of environmental and cultural problems emerged in the last few years. Among the problems currently encountered are, destruction of vegetation, erosion of soil, overgrazing, extensive use of wood, depletion of biodiversity, poaching, garbage trails, pressure on basic infrastructure and maintaining delicate balance between nature, tourist and local community by the government.

There are some problems which affect the sustainability of the industry in the long run if they are not addressed immediately are weak infrastructure base, less involvement of local community, lack of substantive tourism research base, deterioration in pricing integrity and regional imbalance.

Today Bhutan's most vital need is to knit the far-flung inaccessible regions together to strengthen the ecotourism industry through various modes of transport and communication and development of infrastructure base while ensuring that all developments should be made as environmentally benign as possible.

Tourists are very selective in nature, some destinations are similar in nature, but are comparatively well equipped and capable of offering better facilities and services to tourists. Hence importance of destination is based not only on the basis of the resources available but also the ways in which they are being managed. Reputation, accessibility, seasonality, and scenic beauty are some of the factors which guide the tourists' preference of different centers of attraction.

Ecotourism in protected areas is another issue of core concern. Ecotourism is the most suitable form of tourism for protected areas and also is significant part of the greater concept of sustainable tourism. Participation of local community of protected areas ensure sound and healthy practice of eco-tourism. Some of the country's poorest communities live in protected areas and biological corridors for these communities, long term conservation benefits meaning little when their daily subsistence is at stake and therefore, they will be less prepared to participate in conservation and even resentful when conservation adversely impact their subsistence.

Although all the protected areas are rich in bio-diversity and have more than 70 percent forest cover, the presence of farming and shifting cultivation in each of them raises some concern about their sustainability. So to ensure maximizing benefits from ecotourism and minimizing negative impacts on natural environments certain principles, guidelines and policies measures should be

adopted. Ecotourism must contribute to the conservation and improvement of natural area and to the sustainable development of adjacent areas and communities. It requires specific policies, strategies and programmes for each particular regions. It needs practical and effective systems of coordination between all the players involved, including government, private enterprises, local communities, NGOs, and international organizations. The role of the government is to ensure ecotourism practices environmentally sustainable and to coordinate all the players to bring about desired result.

A core component of Bhutan's ecotourism policy is to ensure a sustainable, cultural and environmental carrying capacity. But to determine carrying capacity for natural and cultural sites is a challenging and very difficult task. Local community involvement and input are essential for the long-term economic and environmental sustainability of ecotourism in Bhutan. NGOs can play supplementary role in spreading awareness among local communities and tourists about the fragile natural system and their flora and fauna. RSPN has been spreading environmental education and awareness since 1987 with assistance of WWF Bhutan Programme; RSPN has also implemented conservation education and awareness activities in schools.

WWF Bhutan Programmes is the principal international NGO which has assisted Bhutan with regard to bio-diversity programmes for many years. Other international NGOs, have had a much more limited involvement with bio-diversity in Bhutan. The RGoB recognizes the importance of co-operating with nations at the international level to bring about bio-diversity conservation and sustainable development of ecotourism development in Bhutan.

The long-term Objective of ecotourism development should be based on the principles of sustainability, ecological soundness, and cultural acceptability.

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APPENDICES

Table: 1. Annual tourist visits (1985-2004), Bhutan

Year	Annual Tourist
1985	1896
1986	2405
1987	2524
1988	2129
1989	1480
1990	1538
1991	2160
1992	2763
1993	2984
1994	3971
1995	4765
1996	5138
1997	5363
1998	6203
1999	7158
2000	7559
2001	6393
2002	5599
2003	6261
2004	3343

Source: Statistical Year Book Of Bhutan, 2004

Table: 2. Arrival of tourist from different region (1992-2004), Bhutan

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
America	616	751	734	1003	1039	1010	1591	2346	3024	2367	2142	2025	1301
Asia&Pacific	728	791	1193	1529	1639	1712	1401	1599	1556	1462	1332	1411	652
Europe	1229	1229	1884	2227	2391	2590	3132	3118	2948	2450	2015	2671	1329
Others	190	119	160	6	69	51	79	83	24	87	93	93	43
All regions(persons)	2763	2984	3971	4765	5138	5363	6203	7158	7559	6393	5599	6261	3343
Tourism revenue receipts (million\$)	2.99	3.3	3.97	6	6.51	6.55	7.98	8.88	10.5	9.2	7.98	8.32	4

Source: Statistical Year Book of Bhutan, 2004

Table: 3. Purpose of tourist arrival, Bhutan, (1997-2004)

Years	Tour, Holidays and Recreation	Percentage Tourist having Purpose of Tour, Holidays and Recreation	Trekking and Mountaineering	Percentage of Tourist Having Purpose of Trekking and Mountaineering	Total Tourist
1997	4517	84.2	846	15.8	5363
1998	4860	78.3	1343	21.7	6203
1999	6328	88.4	830	11.6	7158
2000	6633	87.7	926	12.3	7559
2001	5925	92.7	468	7.3	6393
2002	5242	93.6	357	6.4	5599
2003	5823	93.0	438	7.0	6261
2004	3207	95.9	136	4.1	3343

Source: Calculated from Statistical Year Book of Bhutan, 2004

Table: 4. Tourist arrival by means of transport (1997-2004), Bhutan

Year	Air	Percentage of Tourist Arrival by Air	others	Percentage of Tourist Arrival by Others	Total tourists
1997	4826	90.0	537	10.0	5363
1998	5583	90.0	620	10.0	6203
1999	5745	80.3	1413	19.7	7158
2000	6522	86.3	1037	13.7	7559
2001	5544	86.7	849	13.3	6393
2002	4062	72.5	1537	27.5	5599
2003	5134	82.0	1127	18.0	6261
2004	2749	82.2	594	17.8	3343

Source: Calculated from Statistical Year Book Of Bhutan, 2004

Table: 5. Tourist arrival and Revenue receipts (1992-2004), Bhutan

Year	Annual Tourist Visits	Tourism Revenue Receipts US Dollar(million)
1992	2763	2.99
1993	2984	3.3
1994	3971	3.97
1995	4765	6
1996	5138	6.51
1997	5363	6.55
1998	6203	7.98
1999	7158	8.88
2000	7559	10.5
2001	6393	9.2
2002	5599	7.98
2003	6261	8.32
2004	3343	4

Source: Statistical Year Book Of Bhutan, 2004

**Table: 6. Trends of tourist arrival by seasons
Values of seasonality index (1997-2004), Bhutan**

Seasons	1997	1998	1999	2000	2001	2002	2003	2004
winter	16.8	16.9	16.5	16.9	13.7	15.2	21.5	2.7
spring	36.9	30.0	28.9	30.2	39.7	32.4	31.4	74.6
summer	9.1	8.3	8.9	10.1	8.6	8.7	10.9	22.8
autumn	37.2	44.8	45.7	42.8	38.0	43.7	36.2	0.0

Source: Calculated from Statistical Year Book Of Bhutan, 2004

Table: 7. Some trekking routes in, Bhutan

Trek No.	Trek (Open)	Duration (in days)	Length (in km)
1	Gangtey Winter Trek	4 Days	37.338
2	Laya/Gasa Trek	15 Days	127.795
3	Bumthang Cultural Trek	3 Days	74.200
4	Wild EastRodungla Trek	10 Days	30.360
5	Punakha Winter Trek	12 Days	27.146
6	Samtengang Winter Trek	4 Days	15.422
7	Druk Path	5 Days	29.261
8	Dagala Thousand Lake Trek	7 Days	42.777
9	Chilila Nature Trek	4 Days	30.090
10	Chomolhari Trek#1	8 days	60.760
11	Chomolhari Trek#2	9 Days	106.781
12	Lunana Snowmen Trek	22 Days	198.887
13	Dur Hot Spring Trek	7 Days	40.220

Source: Window on Bhutan: 2002

Table: 8. Area of Dzongkhags as percentage of total area of Bhutan

DZONGKHAG	Altitude	0-600	600-1200	1200-1800	1800-2400	2400-3000	3000-3600	3600-4200	4200-4800	4800-5400	5400-6000	6000-6600	>6600
Gasa	3659	0	0	0.1	0.9	2.5	4.8	11.2	21.9	28.6	21.1	7.4	1.4
Thimpu	2320	0	0	1	5	16.3	18.8	18.6	27.3	10.9	1.4	0.5	0.1
Paro	2280	0	0	0	6.3	25.3	24.8	18.6	21.3	3.5	0.1	0	0
Haa	2712	0	0.8	3.6	7.3	16.1	24	27.9	17.6	2.6	0.1	0	0
samtse	390	17	25.5	24.3	18.8	11	2.5	0.7	0	0	0.1	0	0
chhuka	2220	7.7	17.2	20.8	20.4	18.7	11.8	3.1	0.1	0	0.1	0	0
dagana	1520	4	15.7	22	24.3	20.7	8.7	3.7	1	0	0	0	0
punakha	1220	0	0	17.8	26.5	21.8	15.5	12.6	5.7	0.1	0	0	0
Wangdue phodrang	1260	0.1	3	9	13.5	17.8	19.2	12.7	12.5	11.1	1.1	0	0
Tsirang	1620	7.3	31.4	30.1	19.8	7.6	3.2	0.5	0	0	0	0	0
Trongsa	2180	0	2.9	10.4	19.5	28.8	21.2	12.4	4.7	0.1	0	0	0
bumthang	2690	0	0	0	0.4	10.6	26.2	25.7	18.4	16.3	2.2	0.2	0
Zhemgang	1916	9.5	27.1	28	17.9	9.7	5.1	2.1	0.5	0	0	0	0
Sarpang	210	31.1	29.4	21.1	14.6	2.9	0.7	0.2	0	0	0	0	0
Lhuntse	1460	0	0.9	6.8	14.3	19.6	17.3	15.7	16.7	8.4	0.5	0	0
Mongar	1620	3.1	17.9	27.1	23.3	16	11.2	1.5	0	0	0	0	0
Pemagytshel	1200	7.9	39	39.7	13.2	0.2	0	0	0	0	0	0	0
Trashiyangtse	1830	0	2.3	6.7	16.5	23.4	18.8	15.5	13.4	3.2	0.2	0	0
Trashgang	1040	0.2	4.9	15.8	22.2	20.6	18	16	2.3	0	0	0	0
Samdrup Jongkhar	160	25.6	27.6	23.1	14.4	6.5	2.4	0.3	0	0	0	0	0
%BHUTAN		5.3	9.8	12.6	13.4	14.3	13.2	10.9	9.9	6.8	2.7	0.9	0.2

Source: Statistical Year Book of Bhutan, 2004

Table: 9. Temperature and rainfall of some selected station, Bhutan

Month	Thimpu		Samtse		Samdrup Jongkhar		Lhuntse	
	1	2	1	2	1	2	1	2
Jan.	6.85	15.5	19.05	70	11.35	7.8	9.4	9.2
Feb.	9.3	0	21.2	20.2	13.25	15	10.85	1
March	14.8	14.2	23.8	123.7	16.95	122.6	14.15	89.1
April	15.45	25.5	23.6	148.4	18.85	219.2	16.1	91.4
May	17.9	84.8	25.65	216.6	20.7	289	18.6	101.7
June	20.5	80.3	26.7	519.8	22	574.2	21	128.2
July	20.95	125.1	24.6	1148.6	22.3	1877.4	21.6	142.4
August	20.85	127.2	25.8	551	22.85	418.2	21.35	188
Sep.	19.45	87.5	26.3	373.6	23.65	278.4	19.9	60.9
Oct.	15.85	12.4	25.05	142.8	18.5	47	17.35	43
Nov.	12.55	0	23	16.2	15.65	44.4	13.7	27.4
Dec.	9.9	0	20	24.8	11.8	25	10.45	10.3

1. Temperature (in °C) and 2.Rainfall (in mm)

Source: Statistical Year Book of Bhutan

Table: 10. Dzongkhagwise monthly temperature and rainfall, Bhutan

Station	Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual	Mean Annual
Bumthang	Max.	11.1	14.2	15.7	17.9	19.4	20.9	20.6	21.7	20.9	17.6	14.4	11		
	Min.	-6.6	-1.4	1.9	5.1	9.2	14.1	16.3	16.3	14.8	7.4	2.3	-2.8		
	Total	4.5	12.8	17.6	23	28.6	35	36.9	38	35.7	25	16.7	8.2		
	Mean monthly	2.25	6.4	8.8	11.5	14.3	17.5	18.45	19	17.85	12.5	8.35	4.1	141	11.8
	Rainfall (in mm)	0.4	0.3	29.8	40.1	100.4	108.6	158.4	178.4	56.7	31.6	18.5	0	723.2	60.3
Zhemgang	Max.	20	23.2	26.2	30.2	32.8	33.2	32.6	32.2	32.8	30.1	27.9	24.2		
	Min.	8.9	10.5	12.6	16.1	18.7	21.2	22.1	21.3	20	16.1	12.3	9.8		
	Total	28.9	33.7	38.8	46.3	51.5	54.4	54.7	53.5	52.8	46.2	40.2	34		
	Mean monthly	14.45	16.85	19.4	23.15	25.75	27.2	27.35	26.75	26.4	23.1	20.1	17	267.5	22.3
	Rainfall (in mm)	44	12	153.7	113.4	105.2	330.8	576.8	246.4	185	9.8	2	11	1790.1	149.2
Sarpang	Max.	20.9	26.7	29.2	29.6	31.7	31.2	30.5	31.9	32.2	29.6	28.6	22.6		
	Min.	12.3	15.3	17.2	18.6	20.3	22.6	23.2	22.5	21.6	20.1	18.6	13.8		
	Total	33.2	42	46.4	48.2	52	53.8	53.7	54.4	53.8	49.7	47.2	36.4		
	Mean monthly	16.6	21	23.2	24.1	26	26.9	26.85	27.2	26.9	24.85	23.6	18.2	285.4	23.8
	Rainfall (in mm)	9	0	60.6	263.9	384.6	845.4	1438.8	616.4	467	55.6	0	0	4141.3	345.1
Lhuntse	Max.	14.1	16.4	18.6	22	24.3	26.6	26.5	26.7	25.4	23.2	21.1	17		
	Min.	4.7	5.3	9.7	10.2	12.9	15.4	16.7	16	14.4	11.5	6.3	3.9		
	Total	18.8	21.7	28.3	32.2	37.2	42	43.2	42.7	39.8	34.7	27.4	20.9		
	Mean monthly	9.4	10.85	14.15	16.1	18.6	21	21.6	21.35	19.9	17.35	13.7	10.45	194.45	16.2
	Rainfall (in mm)	9.2	1	89.1	91.4	101.7	128.2	142.4	188	60.9	43	27.4	10.3	892.6	74.4
Mongar	Max.	16.7	19.8	21.2	23.6	25.6	25.7	26.8	26.3	26.4	23.4	21	18.2		
	Min.	7.8	10.8	11.1	14.1	19.3	21.1	21.4	22	19	14.4	11.1	8.3		
	Total	24.5	10.8	32.3	37.7	44.9	46.8	48.2	48.3	45.4	37.8	32.1	26.5		
	Mean monthly	12.25	5.4	16.15	18.85	22.45	23.4	24.1	24.15	22.7	18.9	16.05	13.25	217.65	18.1
	Rainfall (in mm)	0	0	14.6	133.8	76.8	157.2	258.6	218.8	87.4	9	1	4	961.2	80.1
Pemagytshel	Max.	20.7	21.6	22.8	24.4	26.9	27.4	25.4	26.6	26	22.8	20.5	18		
	Min.	5.6	8.1	12.4	12.1	15.9	16.5	16.4	14.9	13	11	10.2	8.8		
	Total	26.3	29.7	35.2	36.5	42.8	43.9	41.8	41.5	39	33.8	30.7	26.8		
	Mean monthly	13.15	14.85	17.6	18.25	21.4	21.95	20.9	20.75	19.5	16.9	15.35	13.4	214	17.8
	Rainfall (in mm)	0	8.8	62.9	129	71.8	352.2	611.5	161.5	183.4	24.2	20.2	13.1	1638.6	136.6
Trashiyangtse	Max.	7.3	10.4	12.7	15.1	22.2	22.7	21	22.1	20.3	17.6	14.5	8.7		
	Min.	5.4	7.9	9.4	11.4	14.1	16.7	18.1	17.5	15.8	12.3	8.6	5.7		
	Total	12.7	18.3	22.1	26.5	36.3	39.4	39.1	39.6	36.1	29.9	23.1	14.4		
	Mean monthly	6.35	9.15	11.05	13.25	18.15	19.7	19.55	19.8	18.05	14.95	11.55	7.2	168.75	14.1
	Rainfall (in mm)	3.8	0	55.4	130.2	170.4	92.1	186.5	234.5	147.2	13	0	0	1033.1	86.1
Trashgang	Max.	14.1	13.1	14.4	18.2	23.8	26.3	26.5	25.9	24.1	22.9	19.6	13.4		
	Min.	5.9	6.6	7.2	8.7	11.9	13.9	15.7	15.5	15.5	13	7.6	4.7		
	Total	20	19.7	21.6	26.9	35.7	40.2	42.2	41.4	39.6	35.9	27.2	18.1		
	Mean monthly	10	9.85	10.8	13.45	17.85	20.1	21.1	20.7	19.8	17.95	13.6	9.05	184.25	15.4
	Rainfall (in mm)	2	4	43.2	127.4	93.6	181.8	487.9	178.6	142.8	12.2	24.2	0	1297.7	108.1
Samdrup Jongkhar	Max.	15	16.6	20	20.9	23.1	24.5	24.1	25.4	27	22.4	19.9	15.2		
	Min.	7.7	9.9	13.9	16.8	18.3	19.5	20.5	20.3	20.3	14.6	11.4	8.4		
	Total	22.7	26.5	33.9	37.7	41.4	44	44.6	45.7	47.3	37	31.3	23.6		
	Mean monthly	11.35	13.25	16.95	18.85	20.7	22	22.3	22.85	23.65	18.5	15.65	11.8	217.85	18.2
	Rainfall (in mm)	7.8	15	122.6	219.2	289	574.2	1877.4	418.2	278.4	47	44.4	25	3918.2	326.5

Table continue in next page.....

Station	Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual	Mean Annual	Aridity index
Thimpu	Max.	16.4	18.2	21.1	23.8	25.4	26.7	25.9	26.6	25.9	24.2	22.7	20.3			
	Min.	-2.7	0.4	8.5	7.1	10.4	14.3	16	15.1	13	7.5	2.4	-0.5			
	Total	13.7	18.6	29.6	30.9	35.8	41	41.9	41.7	38.9	31.7	25.1	19.8			
	Mean Monthly Temp.	6.85	9.3	14.8	15.5	17.9	20.5	21	20.85	19.5	15.9	12.6	9.9	184.35	15.4	13.10
	Rainfall (in mm)	15.5	0	14.2	25.5	84.8	80.3	125	127.2	87.5	12.4	0	0	572.5	47.7	
Paro	Max.	14.6	14.5	17.7	19.1	23.3	24	25.3	24.6	21.9	26.7	15.9	12.4			
	Min.	-5.2	-1.9	3.1	5.5	10.2	15.4	14.9	13.9	12.7	6.5	-0.4	-3.5			
	Total	9.4	12.6	20.8	24.6	33.5	39.4	40.2	38.5	34.6	33.2	15.5	8.9			
	Mean Monthly	4.7	6.3	10.4	12.3	16.8	19.7	20.1	19.25	17.3	16.6	7.75	4.45	155.6	13.0	14.7
	Rainfall (in mm)	0	0	0	0	47.1	123	229	206.2	114	16	0	0	735.3	61.3	
Haa	Max.	9.7	11.6	12.9	14.9	18.1	19.1	20.1	20.1	18.8	16	15	13.6			
	Min.	-5.6	-2.1	3.7	5.1	7.5	10.8	13.8	12.1	12.4	6.5	-0.5	-4.5			
	Total	4.1	9.5	16.6	20	25.6	29.9	33.9	32.2	31.2	22.5	14.5	9.1			
	Mean monthly	2.05	4.75	8.3	10	12.8	15	17	16.1	15.6	11.3	7.25	4.55	124.55	10.4	17.2
	Rainfall (in mm)	27.4	5	31.9	57.7	71.7	113	216	197.6	147	28.4	0	0	895.7	74.6	
Samtse	Max.	23.3	25.2	27.7	27.6	29.6	29.3	27.9	29.5	30.1	29.4	27.6	23.5			
	Min.	14.8	17.2	19.9	19.6	21.7	24.1	21.3	22.1	22.5	20.7	18.4	16.5			
	Total	38.1	42.4	47.6	47.2	51.3	53.4	49.2	51.6	52.6	50.1	46	40			
	Mean monthly	19.05	21.2	23.8	23.6	25.7	26.7	24.6	25.8	26.3	25.1	23	20	284.75	23.7	21.8
	Rainfall (in mm)	70	20.2	123.7	148	217	520	1149	551	374	143	16.2	24.8	3355.7	279.6	
Chhuka	Max.	11.7	14.6	16.6	19.4	22.6	22.2	21.6	23.6	20.1	18.9	16.1	12.3			
	Min.	8.3	11.7	12.7	14.7	18.2	17.6	16.2	17.7	15.5	12.5	4.8	3.2			
	Total	20	26.3	29.3	34.1	40.8	39.8	37.8	41.3	35.6	31.4	20.9	15.5			
	Mean monthly	10	13.2	14.65	17.1	20.4	19.9	18.9	20.65	17.8	15.7	10.5	7.75	186.4	15.5	16.7
	Rainfall (in mm)	29.8	2	77.1	167	118	122	369	169	126	50.4	6.4	0.4	1237.1	103.1	
Dagana	Max.	17.1	19.7	21.3	23.5	27.9	28	28.7	27.8	26.1	24.6	21.5	17.4			
	Min.	8.5	10.5	11.8	14.5	16.2	20.5	21.2	18.7	18.9	16.7	12.6	10.4			
	Total	25.6	30.2	33.1	38	44.1	48.5	49.9	46.5	45	41.3	34.1	27.8			
	Mean monthly	12.8	15.1	16.55	19	22.1	24.3	25	23.25	22.5	20.7	17.1	13.9	232.05	19.3	17.5
	Rainfall (in mm)	8	0	23	123	165	299	682	275	150	10.6	3.8	4.5	1742.3	145.2	
Punakha	Max.	16.4	19.7	19.7	22.1	27.1	27.9	27	27.9	25.3	25.2	18.1	15.9			
	Min.	5.8	9.4	11.9	14.4	16.3	17.2	17.1	17.3	16.6	14.7	11	5.6			
	Total	22.2	29.1	31.6	36.5	43.4	45.1	44.1	45.2	41.9	39.9	29.1	21.5			
	Mean monthly	11.1	14.6	15.8	18.3	21.7	22.6	22.1	22.6	21	20	14.6	10.8	214.8	17.9	13.7
	Rainfall (in mm)	15.4	0	3.2	46.5	56	73.8	84.6	291.4	158	42.1	2.8	14.5	788.4	65.7	
Wangdue phodrang	Max.	12.9	20.4	24.5	26.3	27.6	29	28.9	28.9	28.2	26.2	21.9	16.4			
	Min.	8	10.6	13.1	14.1	17.6	19	18.7	17	18.5	15.5	12.5	8.6			
	Total	20.9	31	37.6	40.4	45.2	48	47.6	45.9	46.7	41.7	34.4	25			

	Mean monthly	10.45	15.5	18.8	20.2	22.6	24	23.8	22.95	23.4	20.9	17.2	12.5	232.2	19.4	13.7
	Rainfall (in mm)	6	0	15.1	58.9	41.4	140	271	250.4	64.3	9.2	1.4	0	857.3	71.4	
Tsirang	Max.	21.6	25.8	28.4	30	30.1	30.4	29.9	30.8	31	28.1	28.2	24.4			
	Min.	9.1	10.9	15	18.1	19.2	23	22.9	21.3	20.4	16.6	13.1	11.1			
	Total	30.7	36.7	43.4	48.1	49.3	53.4	52.8	52.1	51.4	44.7	41.3	35.5			
	Mean monthly	15.35	18.4	21.7	24.1	24.7	26.7	26.4	26.05	25.7	22.4	20.7	17.8	269.7	22.5	14.8
	Rainfall (in mm)	6.5	0	11.8	46.4	5.3	218	487	280.4	149	86.7	7.6	5.1	1303.7	108.6	
Gasa	Max.	13.3	16.3	18	19.4	21.9	23.8	24.7	24.1	23.4	21.8	19	15.1			
	Min.	1.1	5.2	8.4	10.5	12.8	16.7	18	16.6	14.9	11.5	6.3	3.3			
	Total	14.4	21.5	26.4	29.9	34.7	40.5	42.7	40.7	38.3	33.3	25.3	18.4			
	Mean monthly	7.2	10.8	13.2	15	17.4	20.3	21.4	20.35	19.2	16.7	12.7	9.2	183.05	15.3	15.4
	Rainfall (in mm)	5.5	3.5	45.8	64.1	129	166	195	233.9	78.6	53	13.8	5.3	993.9	82.8	

Source: Derived from Statistical year book, 2004

Table: 11. Some trekking routes in, Bhutan

Trek No.	Trek (Open)	Duration (in days)	Length (in km)
1	Gangtey Winter Trek	4 Days	37.338
2	Laya/Gasa Trek	15 Days	127.795
3	Bumthang Cultural Trek	3 Days	74.200
4	Wild East Rodungla Trek	10 Days	30.360
5	Punakha Winter Trek	12 Days	27.146
6	Samtengang Winter Trek	4 Days	15.422
7	Druk Path	5 Days	29.261
8	Dagala Thousand Lake Trek	7 Days	42.777
9	Chilila Nature Trek	4 Days	30.090
10	Chomolhari Trek#1	8 days	60.760
11	Chomolhari Trek#2	9 Days	106.781
12	Lunana Snowmen Trek	22 Days	198.887
13	Dur Hot Spring Trek	7 Days	40.220

Source: Window on Bhutan: 2002

Table: 12. Dzongkhagwise infrastructure base, (2004) Bhutan

Dzongkhag	Population	Telephone Connection	Tele Density	Suspension Bridge	Sanitary Latrine	Smokeless Stove	Road Length	Hospital	Grabage Pit	Education Facility
Gasa	3116	0	0.0	4	89	10	7.3	0	82	6
Thimpu	98676	5926	60.1	8	92	67	359.38	4	53	59
Paro	36433	806	22.1	17	81	59	236.22	1	55	36
Haa	11648	174	14.9	14	94	77	101.3	1	42	19
Samtse	60100	418	7.0	13	82	19	127.4	3	52	33
Chhuka	74387	63	0.8	14	76	42	447.1	3	39	43
Dagana	18222	63	3.5	12	79	4	118.36	0	56	35
Punakha	17715	273	15.4	9	85	39	100.97	1	68	20
Wangdue phodrang	31135	366	11.8	12	95	19	267.26	1	85	36
Tsirang	18667		0.0	14	80	27	107.68	1	45	21
Trongsa	13419	205	15.3	18	87	27	202.73	1	64	41
Bumthang	16116		0.0	17	94	94	235.02	1	86	39
Zhemgang	18636	147	7.9	16	79	9	243.26	1	55	46
Sarpang	41549	120	2.9	23	82	26	256.19	2	58	36
Lhuntse	15395	60	3.9	17	88	6	60.95	1	45	42
Mongar	37069	182	4.9	24	87	7	289.11	1	51	61
Pemagytshel	13864	105	7.6	17	81	0	67.4	1	36	34
Trashiyangtse	17740	83	4.7	19	90	2	55.1	1	44	46
Trashgang	51134	286	5.6	19	90	8	264.75	3	43	100
Samdrup Jongkhar	39961	331	8.3	11	89	14	202.32	2	51	38
Bhutan	634982	13031	20.5	358	1720	556	3749.8	29	1110	791

Source: statistical Year Book of Bhutan, 2004

