Chapter 1

Contents

Chapter 1.1

1.1.1 Definition of the Problem
1.1.2 Scope of the Study
1.1.3 Survey of Existing Literature
1.1.4 Objectives of the Study
1.1.5 Methodology
1.1.6 Plan of Work

Chapter 1.2

1.2.1 Identification of Uniqueness
1.2.2 Identification of the Problems
1.2.3 SWOT Analysis of the Tourism Potentialities of The Sunderbans
1.2.4 Indian Sunderbans at a glance

Endnotes and References
Chapter 1.1

1.1.1 Definition of the Problem

In recent years, there has been an increasing concern and articulation about environmental policies and ecological conservation all over the world. However, this is not because of nature's irresponsibility in any sense; in fact it is human greed and the relentless urge for consumption in mankind that has caused immense damage to the natural environment. The root of all problems in modern times is not with nature but with man; and so, solutions will have to come through human intervention. There are two necessary preconditions for effective intervention. First of all, it is necessary to desist from further misuse of the environment and our natural resources, and simultaneously to minimize the impact of scientific, industrial and technological development on these. Secondly, it is necessary to acknowledge the fact that human well-being is not enhanced in the misuse of natural resources. On the contrary, the need of the hour is to protect our ecosystem.

In this perspective, the relationship between tourism and nature is to be explored. On the platform of natural endowment of a particular region, the tourism is being developed through economic activities and finally being shaped into an industry. In fact, it is the single largest industry in the world (next only to agriculture) in terms of revenue generation, employment creation and capital formation. But, on the other hand, it is the greatest polluter to the nature. Instead of strengthening the platform of natural attributes, in most cases tourism damages and destroys the surrounding natural environment due to its increasing commercial activities. It is important to channel the striking forces of tourism towards poverty eradication, improvement of natural environment and sustainable development of the target region.

Against this backdrop, we consider the Sunderban region (alternatively referred to as The Sunderbans) as one of the most endangered ecosystems on this planet, endowed naturally with its uniqueness of biodiversity. Nature, in her fancy, created The Sunderbans, the world's largest cluster of forest islands at the confluence of the Ganga and Brahmaputra rivers and in fact, the world's largest estuarine forest. It is located in the extreme southern reaches of West Bengal. It covers the two countries of India and Bangladesh occupying an area of 10000 sq. km (of this 6000sq. km is in Bangladesh and the remaining 4000 sq. km is in West Bengal, India). Innumerable
rivers and water channels intersect this deltaic region, all flowing into the Bay of Bengal. Dense forests and vast saline mud flats cover the entire delta belt. The major tourist attractions of The Sunderbans are the wildlife and bird sanctuaries, the crocodile reserves and the tiger reserves, which have the potential to draw a large number of foreign and domestic tourists. However, at present, the tourism potentiality of The Sunderbans is largely unexploited. The primary reasons are lack of adequate facilities and publicity necessary for attracting tourists. On the other hand, the increasing pressure of population, unplanned civilization among the islands, and massive deforestation due to poverty and the need for subsistence among the inhabitants, is challenging the diversified and unique ecology of The Sunderbans. This brings to the fore the significance and imminent need of a systematic plan for eco-tourism development of this region and its effective implementation by governmental and non-governmental interest groups, in concert.

The concept of ecotourism is a relatively new concept, developed during the last two decades of the twentieth century. It has grown as a consequence of the disenchantment with conventional forms of tourism, which have, in a general sense, ignored social and ecological elements of a natural destiny in favour of a more anthropocentric and predominantly profit centered approach to the delivery of tourism products. The major preconditions of eco-tourism are that (i) it should be nature based with low negative environmental impact, and (ii) it should ensure maximum economic benefits to the host country with minimum impact on host culture. In a way, ecotourism is managed tourism. It is increasingly becoming popular in the present decade, probably due to the increasing interest in the deteriorating quality of the natural environment and the corresponding recognition of the importance of conserving nature. Therefore, the present research work focuses upon a specific spatial (the West Bengal Sunderbans) and temporal (present and future) context of appropriate human solutions (namely eco-tourism) to a particular global problem of social inequity and environmental crisis.

1.1.2 Scope of the Study

The Sunderbans is ecologically rich but economically poor. In order to overcome poverty certain economic objectives like wealth creation, income generation, equitable distribution of resources etc. are to be fulfilled. But these objectives are pursued at the cost of exploitation and destruction of its natural endowment. The
problems of The Sunderbans are, thus complex in nature. In order to maintain a balance between attaining economic goals and fulfilling social objectives subject to ecological limits, sustainable all round strategies are to be formulated. The scope of development is also multidimensional. It is not possible for a particular agency or department to solve the entire problem single-handedly. It requires a comprehensive and integrated plan to be followed by all interested parties through a continuous monitoring system. In this perspective, this study is confined to a segmental approach towards the development of The Sunderbans (West Bengal part only) based on the concept of eco-tourism. This is a relatively new concept and strategically effective to develop tourism sustainably in a particular region without hampering the existing ecosystem. It approaches towards the maintenance as well as possible improvement of the biodiversity of an area and searches for tourism prospect involving the local inhabitants. It is quite likely that human beings, for the sake of future development and material benefits, will continue to use and even misuse natural resources. It is equally unrealistic to suggest that the settlers and local inhabitants of the area should be evicted in order to restore the natural balance in The Sunderbans, and to replenish the denuded forests. One can hardly expect the local common to refrain from using natural resources to meet their material needs. In this situation, the effective implementation of eco-tourism concept may be a good solution to the problem. This may create consciousness amongst the local people to conserve mangrove ecosystem for their own benefits and to derive income out of them.

This study explores the possibilities of introducing other types of tourism like cultural tourism, historical tourism etc. in this region. It is important to diversify conventional tourism of a region to other modes. Finally, this study tries to suggest a sustainable eco-tourism plan, which may be considered as a sustainable mechanism for all round development of the region. The study is restricted to the time-frame considering the information, data, policies adopted and actions taken till the financial year 2005-06.

1.1.3 Survey of Existing Literature

A rich stock of literature is found based on The Sunderbans and related topics. Different authors, organizations, committees, professional bodies, governments, NGOs have undertaken various surveys and investigations on the history, topography, ecology, biosphere, economic conditions and tourism prospects of The Sunderbans area. These varied literary works can be classified into two broad categories:
A. Conceptual Framework on ecotourism, sustainable development and tourism, tourism marketing and other concepts.

B. Wide spectrum of data and information on The Sunderbans.

Selected survey under these two categories is being presented in table 1:

### Table 1: Survey of Existing Literature

<table>
<thead>
<tr>
<th>Author/Editor</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Information about The Sunderbans</strong></td>
<td></td>
</tr>
<tr>
<td>De, R (1990)</td>
<td>Detailed list of flora and fauna including mangrove species of The Sunderbans.</td>
</tr>
<tr>
<td>Paul D (2005)</td>
<td>Medicinal and herbal plants found in The Sunderbans.</td>
</tr>
<tr>
<td><strong>B. Conceptual Framework</strong></td>
<td></td>
</tr>
<tr>
<td>Fennell, D (1999)</td>
<td>Concept of ecotourism and different dimensions of its application.</td>
</tr>
</tbody>
</table>

This survey enables us to draw baseline information for the current research.
1.1.4 Objectives of the Study
The primary objective of the study is to explore the tourism potential while maintaining the ecological balance in The Sunderbans region within West Bengal, and to recommend effective promotional strategies in order to position The Sunderbans as a significant tourist destination.

The study includes the following support objectives:

- Compilation of detailed background and baseline ecological information on The Sunderbans region. (Chapter 1 and 2)
- Study of socio-economic conditions of the people of the area. (Chapter 2)
- Assessment of the existing and future tourism potential in the region. (Chapter 3 and 4)
- Effective environmental management of eco-tourism of The Sunderbans with the support of environmental impact assessment. (Chapter 5)
- Formulating effective marketing and promotional strategies for highlighting The Sunderbans as world tourist spot and to develop eco-tourism industry in the region. (Chapter 6 and 7)

1.1.5 Methodology
This study is essentially exploratory in nature. In attempting to the perspective and scope of eco-tourism development of The Sunderbans, a detailed analysis of the current scenario in the domain of tourism and environment is carried out. Besides, data required for the purpose of this study are collected from publications of related government departments and agencies.

In the main, the methodologies may be classified under two broad heads:

- Analysis of secondary data available from journals, books, conference reports and district gazetteers;
- Primary data collection through administration of questionnaire (shown in Annexure 11), interviews and meetings with government officials, local inhabitants, the hospitality industries in the private sector, and tourists both domestic and foreign.

This has helped collect and validate information from different sources and also helped in our understanding of the problems and prospects of eco-tourism in The Sunderbans.
The data collected are analysed through appropriate tools and techniques (e.g., matrix display, comparative analysis, flow charts and graphical analysis) to identify the development requirements of the tourism sector in the region.

1.1.6 Plan of Work

The study consists of the following seven chapters:

**Chapter 1**

1.1 Definition of the problem, scope of the study, survey of existing literature, objectives, methodology, plan of work.

1.2 Uniqueness of The Sunderbans, identification of the problems, SWOT analysis, The Sunderbans at a glance.

**Chapter 2**

An account of the physical resources and socio-economic and cultural features of the region. In this chapter, a brief account of physical attributes of The Sunderbans along with its socio-economic and cultural features is presented.

**Chapter 3**

Evaluation of the existing tourism profile of the region.

This chapter describes the existing tourist spots and facilities situated within Indian Sunderbans. Area-wise distribution of the region is also given.

**Chapter 4**

Environmental management issues related to ecotourism development

Exploring the possibilities of diversification of the conventional tourism in The Sunderbans to other forms of tourism:

4.1 Historical Tourism focuses upon the historical significance of the region and the possibilities of developing historical tourism there.

4.2 Religious Tourism focuses upon the impact of religious tourism in the Sagar Island on the development of the region and the scope of expansion and diversification of tourism circuits in an eco friendly and integrated manner.
4.3 Cultural Tourism focuses upon the unique cultural practices followed in this region and explores the scope of developing cultural tourism circuits in The Sunderbans.

4.4 Health Tourism highlights the concept of health tourism and the prospects of its implementation in The Sunderbans.

Chapter 5

5.1 Ecotourism concept and its applicability in The Sunderbans.
Here the various aspects of the Ecotourism concept with respect to The Sunderbans region are discussed.

5.2 Environmental impact assessment on development of the ecotourism projects in The Sunderbans.
This part explains the relevance of environmental impact assessment on tourism development and projects a baseline EIA on Sunderban’s ecotourism proposals.

Chapter 6

6.1 Analysis of various tourism plans prepared at different times.
Here four important tourism development plans for The Sunderbans are discussed.

6.2 Probable solutions-Effective marketing and promotional strategies for the ecotourism industry in The Sunderbans.
Here, an optimum solution to sustainability in tourism of the Sunderbans is explored, and implementation through a strategic private-public partnership model is proposed.

Chapter 7

Summary of findings, limitations of the study, avenues for further research and conclusions.

Bibliography
Chapter 1.2

1.2.1 Identification of Uniqueness

The geographical uniqueness of the Sunderbans can be found out from the following characteristic features of this region:

1. Sunderbans of Bangladesh and India is the single largest mangrove ecosystem of the globe. The Indian part of Sunderbans is located between 21°32' and 22°40' N latitude and 88°0'N and 89°00'E longitude.\(^1\)

2. It is the largest deltaic region of the world. It extends through India to Bangladesh, covering an area about 26,000 square kilometers.

3. This mangrove zone is the habitat of highest biodiversity, unique interesting flora and fauna.

4. It is the only marshy tiger land of the world.

5. Tidal amplitude and fluctuations of the Sunderbans is very high.

6. Floral successions in the Sunderbans are unique with highest\(^2\) number of species diversity.

7. It supports coastal fisheries throughout the east coast of Bay of Bengal.

8. The Sunderbans act as the sink for mega metropolitan pollutants.

9. It is the home of several endangered, threatened and endemic floral and faunal species.

10. The mangrove forest provides protection to inland habitations against the fury of cyclones.

For all the reasons cited above, Sunderbans was included in the list of world heritage sites, and declared as world heritage site by UNESCO in 1984. The National Park status was awarded by the Central Government in the same year. The Ministry of Environment and Forests, Government of India adopted the National Man and Biosphere programme (MAB) accepted in the general conference of the UNESCO in 1970 and declared the entire 9630sq.km of Sunderbans as the Sunderbans Biosphere Reserve in 1989 through a notification to establish a formal mechanism for coordinating and integrating diverse activities of conservation, research and training for creating a better situation of harmony between man and environment. The Sunderbans Biosphere Reserve has also been included as the second Biosphere reserve from India, other than Nilgiri Biosphere Reserve, in the global network of
Biosphere Reserves during 2001-02\(^2\). The process of declaring Sunderbans a ‘Ramsar Site’ for being an outstanding wetland is in an advanced stage.\(^4\)

1.2.2 Identification of the Problems

The mangrove ecosystem of Sunderbans is world famous with its unique adapted mangrove plant species along with different groups of fauna both in estuarine aquatic system and silted up deltaic lands. This system is, at present threatened due to heavy biotic pressure and abiotic stresses. It has attracted attention from all walks of life particularly the researchers, scientists, administrators, policymakers, foresters, nature-lovers and tourists. The glamour of Sunderbans is world-renowned and has attracted several world organisations particularly the environmentalists and thousands of dollars are proposed to be spent towards effective conservation and management of the fragile but interesting ecosystem. What is badly needed is to identify the problems and prospects of the Sunderbans specifically. This unparalleled mangrove forest in Sunderbans has been reduced to less than half of what it was 200 years before and gradually losing its past glamour, possibilities, potentialities and prospects. Under the above circumstances, some of the problems are highlighted for future perspectives:

1. Uncontrolled population growth

During post-independence period, this region witnessed sudden increase of population mainly due to migration. The displaced persons forcibly occupied vested lands, cleared forests for habitations and developed colonies in different islands of Sunderbans which in course of time, being converted into cities. Therefore, population has increased from 1.2 million (1951 census) to 4.1 million (2001 census).

2. Large-scale destruction of forestland, deforestation of mangroves for human settlements and rapid growing needs

The first detailed survey and stock mapping of Sunderban forest was done by Mr. Curtis, a British Forester, between 1924-29. The next updating of stock maps including realignment of changed block/compartments took place in 1999-2000, using the latest technology of GIS and Remote Sensing. Analysis of satellite data and old maps of 1924-29 shows that there has been a loss of nearly 220 square kilometres of land area within the reserved forest, due to erosion, over a period of 70 years.\(^5\) Apart from this, due to reclamation in 24 parganas district, during the last 90 years or so an
area of about 750 square kilometres of forestland had been released for agricultural purpose.  

3. Management problem: protection vs. acute loss of biodiversity in the Sunderbans

The threats to the mangrove ecosystem are partly biotic pressure from the environment and partly due to human intervention. Some of these problems can be outlined as below-

a) **Reduced flow of sweet water into Sunderbans mangrove system**

Due to shift in the fresh water flow from the *Hooghly* river system into *Padma* river, major fresh water rivers like *Matla* and *Bidyadhari* had been detached from its fresh water sources. As a result, less of fresh water flushing of the mangroves takes place during low tides which increases the salinity level in the forest of Sunderbans. This induces adverse changes in the vegetation pattern inside the islands.

b) **Construction of embankments to protect human settlements**

It affects the drainage system and cuts off the sweet water flow into adjoining areas, resulting in increased salinity in these areas. Moreover, due to embankments, the silt deposition along the inner banks and river beds from the tidal waves have raised the levels of river beds higher than the level of human settlements.

c) **Extension of non forestry land use into mangrove forest**

The increased pressure on land for expansion of activities like aqua-culture, prawn farming, drying of sea-fish etc are decreasing and degrading the existing mangrove forests, specially in non tiger-project reserved forest land.

d) **Uncontrolled collection of prawn seedlings**

Self engagement of vast rural people in the large scale netting out of shrimp seeds posing exploitation and damage of other fish, prawn, crab species and damage on river dykes and mangrove forest areas have created lot of problems on degradation of aquatic fauna. Large-scale operation of fine mesh nylon nets and exploitation of estuarine fish juveniles indiscriminately, create problems towards loss of aquatic species diversity. Moreover, unscientific fishing practices including non-usage of TED by the trawlers causes great damage to fishery stock and sea turtle population.
e) Long international border along the eastern boundary of the Indian Sunderban

Poaching, smuggling, illegal immigration and other unauthorized activities take place along the border, which is difficult to control for various reasons.

f) Chemical pollution

Oil leakage of mechanized country boats, motor launch and vessels, inflow of toxic waste materials from Kolkata and suburbs through river system, using chemical pesticide in agriculture etc. occasionally cause pollution in this virgin ecosystem or estuarine water.

g) Organisational inadequacies

Shortage of field staff, funds, equipments, vessels etc. poses severe problem towards effective management.

4. Transport

Transport facilities are inadequate, underdeveloped, only the country boats are common means of transport. It affects socio-economic conditions and health services.

5. Agriculture

Agriculture is not much developed in these areas due to lack of irrigation facilities, though these zones are very much potential. Reduction of per capita operational holding due to overcrowding of population causes disguised unemployment. Breaching of embankment causes intrusion of saline water and loss of good agricultural land.

6. Drinking water and sanitation

Non-availability of drinking water in close proximity and poor sanitary conditions are the key factors for frequent outbreak of water-borne diseases.

7. Education

The literacy level of Sunderbans area is more than 60 % (as per 2001 population census) with few exceptions but the percentage of female literacy is much lower. The percentage of student’s dropout even at primary level is alarmingly high. Poor economic condition, poor connectivity and absence of schools etc. are the main reasons of lack of education.
8. Socio-political conflicts

Sunderban is situated in one of the most inaccessible regions of the state. The local government is not very effectively operational here. Developmental efforts are sometimes hindered by petty local politics and organized crimes occasionally spoil the security of the forest, wildlife and the bio-diversity of Sunderban as a whole.

Last but most common problem is that the Sunderbans is the frequent and severe cyclone prone area. In an estimate [page 33] it is seen that during the last four centuries more than ninety severe cyclones, sea surges, earthquakes were responsible for partially or fully destroying the coastal zones of Sunderbans. These cyclones and natural calamities are inevitable and this region can be completely destroyed any day due to this disaster. In a recent development it has been apprehended that Sunderbans may be submerged within fifty years due to the global warming effect. This is surely a threat to the existence of this unique ecosystem.

Taking into account the features, uniqueness of the region, prospects and problems-a SWOT Analysis has been made in order to better understanding of the Sunderbans.

1.2.3 SWOT Analysis of Tourism Potentialities of The Sunderbans

This is a management technique of analyzing an organization’s competitive situation in a business environment. Here this technique is applied to understand the problems and prospects of The Sunderbans in terms of tourism perspective.
## Figure 1.1

### SWOT Analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Unique ecosystem</td>
<td>• Due to communication difficulties, effective distance from Kolkata is greater than actual distance.</td>
</tr>
<tr>
<td>• Largest estuarine delta of the world</td>
<td>• Lack of infrastructure facilities required for international tourism.</td>
</tr>
<tr>
<td>• A haven of biodiversity</td>
<td>• None of the rivers have fresh water source; drinking water needs to be carried to tourist spots</td>
</tr>
<tr>
<td>• Highest concentration of mangrove species.</td>
<td>• High frequency of natural calamities like cyclonic storm</td>
</tr>
<tr>
<td>• Wide range of birds, fishes and animals</td>
<td>• Tourism season is restricted to a maximum of six months due to extreme weather and river conditions.</td>
</tr>
<tr>
<td>• Distinct ecotourism zone</td>
<td></td>
</tr>
<tr>
<td>• Declared as a world heritage site and a global biosphere reserve.</td>
<td></td>
</tr>
</tbody>
</table>

### Opportunities

- It is possible to position Sunderbans as an international ecotourism site if effective strategy formulation is made.
- Cross-border tourism with Bangladesh is possible after scientific coordination between two countries.
- Development of Medical tourism, Historical tourism etc.
- It is possible to take climate change reduction initiatives through scientific research and planning.
- Scope of adopting Private-Public-Partnership model for sustainable development of the region.

### Threats

- Gradual decay of forest land and destruction of mangrove species increase the possibilities of environmental disaster.
- Indiscriminate and unplanned growth of population causes tremendous pressure on the ecosystem of the region.
- Food chain of Sunderbans ecology is threatened.
- Man-animal conflict continues to increase as schemes for alternative economy are not formulated properly.
- United Nation's change of weather committee Report apprehended that due to global warming Sunderbans may be submerged to sea within next 50 years.
From the above analysis it can be stated that a comprehensive project should be taken to study the socio-economic-cultural-environmental aspects of the Sunderbans and to bring all research work on The Sunderbans under one umbrella for better management of tourism research aimed at sustainable development.

1.2.4 Indian Sunderbans at a glance

1. Area: 9630 square kilometres

2. Location
   - In the east—rivers Ichamati, Kalindi
   - In the west—rivers Bhagirathi, Hoogly
   - In the north—Dampier Hodges line
   - In the south—Bay of Bengal

3. Administrative information
   - The area is covered by parts of two districts. Total number of blocks is 19.
   - Police stations: 16; Villages: 1064; Subdivisions: 05; Gram panchayat: 190

4. Population (2001) 37,55,924
   - Female: 18,25,004; Male: 19,30,920
   - Number of female per 1000 male: 945
   - Population density per square kilometer: 930

5. Islands
   - Total number of islands—102
   - Inhabited islands—54

6. Sanctuaries
   - Sajnekhali sanctuary—362 square kilometers
   - Lothian island sanctuary—38 square kilometers
   - Haliday island sanctuary—06 square kilometers
   - Sunderbans Tiger Reserve—2600 square kilometers
   - Sunderbans National Park—1330 square kilometers

7. Roads
   - Total-8559.52 kilometers
8. **Embankments**: 3500 kilometers

9. **Agricultural information**
   - Total agricultural land—304834 Hectare
   - Number of farmers-10,49,899
   - Marginal farmers-3,20,364
   - Landless labourers-3,08,583

10. **Banks**
    - Nationalised banks-95
    - Rural banks—45

11. **Hospital services**
    - Village hospitals-11
    - Primary health centers- 57
    - Family healthcare centers-217

12. **Educational institutions**
    - Primary schools-2117
    - Secondary schools-239
    - Higher Secondary schools—79
    - Colleges-09

**Source**: Sreekhanda Sunderban pg 596-598

**Endnotes and References**

1 A Handbook on Sunderban Biosphere Reserve pg 2
3 Raha, A. k(2003) *A Wonder That is Sunderban* Computronics pp. 18
5 A Handbook on Sunderban Biosphere Reserve
6 Ibid
7 United Nation’s change of weather committee Report-Anandabazar Patrika-03.02.2007
Chapter 2

An Account of the Physical Resources and Socio-Economic and Cultural Features of The Sunderbans

Contents

2.1 Origins
2.2 Geographical and Physical Location
  2.2.1 Boundary of The Sunderbans
  2.2.2 Demographics
2.3 Physical Attributes
  2.3.1 Terrain
  2.3.2 Climate
  2.3.3 Soil
  2.3.4 The River Systems
  2.3.5 Significance of the name ‘Sunderban’
2.4 Flora and Fauna
  2.4.1 Flora
  2.4.2 Fauna
2.5 Ecosystem of The Sunderbans
2.6 Socio-economic Conditions
  2.6.1 Introduction
  2.6.2 Economic Attributes
  2.6.3 Agriculture
  2.6.4 Fishing
  2.6.5 Forest Related Activities
  2.6.6 Other Industries
  2.6.7 Analysis of the Present Economic Activities of The Sunderbans
2.7 Social Infrastructure
  2.7.1 Education
  2.7.2 Medical Facilities
  2.7.3 Communication Facilities
  2.7.4 Drinking Water
  2.7.5 Unique Socio-Cultural Features
  2.7.6 Conclusion

Endnotes and References

Annexure 1 Map of The Sunderbans prepared by GIS cell Sunderbans Biosphere Reserve
Annexure 2 Demographic Pattern 1772-2001
Annexure 3 Subdivision, Police Station and Block-wise Population Details