PLANNING FOR TOURISM DEVELOPMENT IN ORISSA STATE, INDIA

A THESIS

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By

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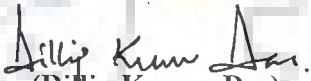
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I hereby certify that the work which is being presented in the thesis entitled **"PLANNING FOR TOURISM DEVELOPMENT IN ORISA STATE, INDIA"** in partial fulfilment of the requirement for the award of the Degree of Doctor of Philosophy and submitted in the Department of Architecture and Planning of the Indian Institute of Technology Roorkee, Roorkee is an authentic record of my own work carried out during a period from January 2004 to April 2006 under the supervision of Dr. V. Devadas.
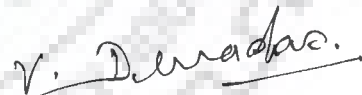
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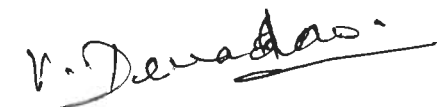
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ABSTRACT

The social-economic benefits of tourism development are unequivocal and it needs more attention. In recent times, it has gained a prominent role in the development process, particularly in the tourism potential regions all over the world. Tourism has become an integral part of a system and its functions influence all the sub systems of the system, such as, physical, social, economic, ecology, environment, infrastructure and institutions. The tourism development plan has thus requires to be prepared by considering all the subsystems of the system, such that it functions as a catalyst in the development process in the tourism resource rich regions. In this present investigation, tourism has been considered as an important function, which influence and also get influenced by the various sub systems of the system.

Having the aforesaid knowledge, the region confined between the coastal and flood plains of a lesser known Orissa State, located in the East coast of India having lot of resources for tourism development is considered in this present investigation for evolving plausible guidelines in order to achieve viable tourism development in the region such that it shall function as a catalyst in the total development of the system.

An extensive field and literature survey were conducted and relevant data pertaining to socio- economic, industrial and tourism conditions of the system were collected and suitable quantitative techniques are employed to understand the socio-economic and tourism conditions of the system. In this regard, a through review of the available literatures and analysis reveals that the conventional methods of analysis have many limitations, and fast becoming inadequate to serve the complexities that require in forecasting the future scenarios. Many Scholars have explored various techniques and methods of analysis for evolving development plans and observed that

application of System Dynamics Theory and Models are one of the most suitable techniques available for understanding the functions of the system, which is essential for planning process. Therefore, System Dynamics models have been developed based on System concept and employed in this present investigation, to understand the functions of various sub systems of the system (study area) by considering the most important control parameters, which influence the functions of the system. Long-range projections are made to understand the demand and supply of the most important infrastructures, which influence tourism development and the system as a whole for the year 2031 A.D. Further, various socio-economic, infrastructural and environmental indicators have been measured, and different scenarios under alternative conditions are generated and tested in the model to understand the system functions. Finally, a set of plausible policy guidelines is prepared by considering phase wise achievements and requirements in alternative conditions and recommendations are made for tourism development along with total development of the system.

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We understand that nothing moves without the wishes of the almighty. As a native resident of Orissa State, my first prayer is to lord Jagannath, whom we all (Orissa People) love, and the native deity of my village, whom we fondly identify as Godmother, whose blessings are my strength.

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(DIILLIP KUMAR DAS)

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GLOSSARY OF TERMS

Applique	Special kind of stitching and patch works on clothes
Dharmasalsla/agarsala/sarais	Charitable Guest houses for short stay of travelers
Gramin	Village related
Gramya	Village
Gram	Village
GRIDCO	Grid Corporation, Orissa (Electricity Distribution Agency in Orissa)
M.T.	Metric Ton
KM/ Km	Kilometer
Maghasaptami	An occasion in the month of February, on which people worship lord Sun
Nata/ Desia/Patua Nach	Kinds of folk dances
N.H.	National Highway
NSDP	Net State Domestic Product
Pattachitra	A kind of Painting
Prakruti Mitra/ Pakirutu Bandhu	Nature Friendly
Ratha Yatra	Car Festival of Lord Jagannath
Rojgar	Employment
Sadak	Road
Sampoorna	Total
Swarnajayanti	Golden Jubilee
Swarojgar	Self employment
Silver Filigree	Intricate design works in silver
Yojna	Plan

Gram Panchayat	Local self Government at Village Level
Panchayat Samiti	Local Bodies at Community Development Block Level
SH	State Highways

INTRODUCTION, LITERATURE REVIEW, OBJECTIVES, SCOPE, CONCEPT, RESEARCH METHODS, LIMITATIONS, JUSTIFICATION OF STUDY AREA

1.0. INTRODUCTION

The development of a country is measured based on its economic strength; which is based on realization of potential and judicious use of the available resources and creation of a conducive environment towards fruitful economic activity. Tourism development contributes much towards the development of the economy along with other activities. Very recent year's, rapid and spectacular growth of business, educational, cultural and sporting activities are emerged throughout the world, which require movement, leisure and recreation; and tourism gains more economic significance. A few Scholars have defined tourism in different terms and different dimensions, which have changed over time. The earliest recorded evidence of tourism could be traced back to the Roman Empire. The Romans visited temples, shrines, festivals and baths for health and for amusements (155). Since then tourism was regarded as a matter of pilgrimage and to a limited extent for business and or official purposes until industrial Revolution. The nineteenth century has brought significance changes in tourism in the sense that it was during this period that tourism as understood in recent times was came into being. The organized tourism was started during this period and the entrepreneurship involved in it made tourism a recognized economic activity. The twentieth century has seen tourism to grow to new heights due to the development of transport industry, and other factors, such as, socio-economic changes, increasing exposure of people to outside world, reduction in international barriers, etc.

Despite the changes occurred over the years, tourism is still defined as the temporary short-term movement of people to destinations outside the places where they normally live and work, their activities during their stay at these destinations, which includes movement for all purposes as well as day visits and excursions, etc., (41) However, the recent developments in tourism make it an activity, which encompasses many sectors of economy as well as social physical and other factors. According to Krippendorf, J. (1987), tourism is a unique activity that involves itself with many different sectors of the economy (146). Properly managed, it confers benefits in terms of social, psychological and, more importantly, economic wellbeing. In addition, Travel and tour enhance quality of human experience in spiritual as well as material way.

In recent times, tourism has become a global phenomenon and accepted widely all over the world and emphasis is given for its development at various levels.

1.1. GLOBAL SCENARIO OF TOURISM

It is observed that, tourism is recognized as an industrial activity in all over the world, and got more importance even in the planning stages of economic development of the countries. A number of countries particularly developing ones have greatly benefited from this sector as a significant contributor to their national income as well as it contributes largely to global economy. In this regard, few studies have established that the global impact of tourism is considerable, is the largest industry contributing significantly to the global economy (268).

It is well understood that tourism is a multi-sectoral and labour intensive service industry with an array of activities comprising many facets of hospitality, travel, transport, marketing, etc. It generates both direct and indirect employment. Also, tourism industry and tourist expenditure on goods and services, create new income earning opportunities, along with employment generation opportunities; and in turn

produce further income and make expenditures on other sectors of the economy, which creates a multiple effect. At present, the shares of tourism and travel economy; and tourism and travel industry; in the world's Gross Domestic Product are 10.70 per cent and 4.20 per cent respectively. The contributions of the above two sectors in world's employment are 8.00 per cent and 3.10 per cent respectively. The shares of tourism sector to export and receipts are also significant as evident from the fact that the total tourism export as percentage of total export is 12.15 per cent, and the total receipt stands at 5.2 per cent in the world. Thus, at present, tourism has emerged as one of the largest industries, contributing significantly to the Gross Domestic Product and higher employment generation opportunities at low investment.

At global level, according to World Tourism Organization (2003), Europe and America are the most important tourist receiving regions, accounting for about 73.30 per cent of the world tourist arrivals in 2002. Individual countries, like, France, Spain, United States of America, Italy, China, U.K, Canada, Mexico, Austria, and Germany are the top most tourist receiving countries in the world. Countries like Malaysia, Turkey, Thailand, Switzerland, Greece, etc., are the most promising countries for tourism development at Global level. India stands at 51st position in the world in this regard.

1.2. INDIAN SCENARIO

Tourism forms an integral part of Indian tradition and culture since time immemorial. In early days, tourism was primarily from pilgrimage as people traveled to participate in fairs and festivals in different parts of the country. The dimensions of tourism changed with the passage of time, with development of trade and commerce, and infrastructure. In addition, from ancient times, rulers built palaces, gardens, temples, forts, tombs, memorials, which become part of India's cultural heritage,

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supplemented by nature's endowments make India a 'tourist paradise'. Realizing that India has a highly diverse and unmatched collection of tourism destinations, and potential to develop as a tourism receiving country, efforts are being made at both Government and Private concerns for tourisms development in the country. The growth of tourism in the modern times, however, continued to be slow until the early 1980s' after which tourism started getting recognized as an industry. Hereafter, tourism started finding a place in the nation's five-year plans. A National Tourism Policy was evolved and made in force in the year 1982, followed by a National Tourism Action Plan was implemented in the year 1992.

It is observed that tourist arrival in India has registered an increasing trend since 1993 (1.80 million tourists) to 2003 (2.80 million tourists). The contributions of both travel and tourism economy; and travel and tourism industry; to Indian economy are observed to be below the world averages, but are still significant with 5.30 per cent and 2.50 per cent to Gross Domestic Product, and 5.60 per cent and 2.90 per cent to employment respectively. In India, tourism is regarded as one of major foreign exchange earner and the third largest exports oriented industry. The share of tourism industry in India in terms of total tourism export to total export is 9.50 per cent, and total receipt is 11.80 per cent, which is even higher than the world average receipts. The tourism receipts are also registering an increasing trend in the aforesaid period. Tourism receipts has increased from 2.10 US$ billion in 1993 to 3.50 US$ billion in 2003. However, it is found that India's share in global tourism arrival is about 0.40 per cent and receipt is about 0.67 per cent, and at present that are even very low. This share of India in world tourism receipts has been varying from 0.64 per cent to 0.67 per cent of the total world receipts over the last decade from the year 1991 to 2003. Tourism also has produced more than 25 million direct jobs alone at a rate of 89 jobs for one

million rupees investment, which is even much higher than the agriculture and manufacturing sector (44.70, and 12.60 jobs per one million rupees investment respectively). Thus, tourism makes itself an important and integral part of the economy at national level providing large-scale opportunities for the growth of the economy, particularly in India. The World Travel and Tourism Council (WTTC, 2000) has identified India as one of the world's foremost tourist growth center and is expected to achieve fastest rate of growth after Turkey in the coming decade.

Considering the importance of socio-economic aspects in tourism, the Governments and the Private Sector Agencies are taking various measures to promote tourism. In various annual plans, the Government of India has made plan outlays and focuses on creation of basic infrastructure, such as, transportation facilities, civic amenities, accommodation facilities, and human resource development, etc., in tourism sector. Marketing and Publicity in overseas and within the country continues to receive a large share of the plan outlay of the Ministry of Tourism. The Government of India also provides financial assistance to the State Governments and the Union of Territories for development of tourism infrastructure in their respective States under various schemes. The Government has developed few organizations, such as, Indian Tourism Development Corporation and State Tourism Development Corporations to look after tourism developments. New fairs and festivals, carnivals and rural craft melas (fairs), such as Konark Dance festival (Orissa State), Craft mela (Surajkund, Haryana State), Desert Festival (Rajstan State), Great Elephant march (Kerala State) etc., are being conducted regularly to woo both the domestic and overseas tourists. In the tenth five year plan, the Government of India has framed strategies to remove the barriers of growth to leverage private sector investment; to enhance the effectiveness of public sector investment through inter-sectoral convergence and prioritization of tourism

related infrastructure programmes in other sectors like special tourist trains, rail and aviation links, rural roads etc; to provide legislative and regulatory support to protect the tourism industry, consumer and the environment. The tenth five-year plan also has the provision to give security to travelers by deploying special tourism police and promote India as a safe destination.

It is also felt that the economic activities related to tourism other than providing services to the tourists, such as, local resource based industries, handicraft, appliqué industries, etc., are other areas, which not only create large scale employment opportunities, revenue generation, foreign exchange earning, etc., but also become prime and attractive features to woo foreign tourists.

The social significance of tourism is equally important. It acts as a potential force by playing positive role in international relations and brings about world peace and understanding through international tourism and at national level, in a country like India with varied cultural, religious and linguistic groups, this leads to much greater mutual understanding through domestic tourism.

1.3. REGIONAL PERSPECTIVES

At regional level, many of the regions of this country (India) are bestowed with tourism-based resources. The study of Market Research Division, Department of Tourism under Ministry of Tourism and Culture, Government of India, reveals that States, such as, Uttar Pradesh, Tamil nadu, Maharastra, West Bengal, Rajasthan are leading domestic tourist receiving States, and Tamil nadu, Maharastra, Delhi, West Bengal and Rajasthan are leading foreign tourist receiving States in India. Under the various States, tourists' circles, such as, Agra circle, Aurangabad circle, Delhi circle, Hyderabad circle, Bhubaneswar circle and Bhopal circle are important tourist receiving destinations. States like Kerala, Orissa, North East States, though have a lot of tourism

potential are not yet achieved much in tourism development, and the activity is being regarded as supplemental activity or at best primary activity for a brief period of the year. The reason being, most of the tourist destinations at regional level of the States are located at small urban centers or in the hinterland of large urban areas. The available basic physical infrastructure, such as, road, rail transport and air transport facilities, boarding and lodging facilities, civic amenities, etc., in terms of both quality and quantity are inadequate to cater the needs of tourism friendly activities in these destinations, thereby not contributing much towards tourism development.

1.4. TOURISM IN ORISSA

Orissa State in general and the coastal region of Orissa State in particular, has tremendous potential for developing tourism industry, due to its rich cultural heritage, availability of important religious places, long and beautiful coastline with natural scenic beaches, wildlife sanctuaries, wild flora and fauna, largest backwater lake, and immigration of beautiful birds and tortoises (Olive riddle) migrate from far corners of the world. Orissa State has adequate resources for craft based products. The high-grade skill is evident from various arts, craft products and heritage structures created over the years. In this regard, the Government of Orissa, despite its economic backwardness is taking various measures to promote tourism in the State. In the year 1995, the Government of Orissa has created a separate department of Tourism and Culture for effective promotion and wholesome development of tourism and cultural activity in the State. Prior to this, Orissa Tourism Development Corporation, a public sector undertaking is functioning since 1979, with the main objective of increasing tourism traffic, extend duration of stay and create an appropriate ambience in the form of creation of infrastructures, transportation facilities, proper publicity, etc., for furthering the tourism activity. Also, keeping in view the economic backwardness of

the State, the tourism and culture department has tied up with a few leading public sector companies operating in the State, like National Aluminum Company Limited (NALCO), Indian Oil Corporations (IOL), Mahanadi Coal Fields Limited (MCL), Eastern Zonal Cultural Centers, etc., in assisting the tourism promotion in the State. Private entrepreneurs are encouraged to participate in tourism promotion in the form of maintenance and operation of the infrastructures created by the Government through tourism management lease programme. Organizations like Indian Archeological Society, State Archeological society, Indian National Trust for Art and Cultural Heritage (INTACH) and other Non-Governmental agencies are operating in the State in their related spheres, such as conservation of archeological sites, conservation of heritage monuments, and conservation of biodiversity and natural resources, etc., thereby contributing to the promotion of tourism in the State. In addition to the above, products based on local handicraft and resources under small scale and cottage industries category are increasingly given priority in industrial development. Various agencies of both Government, such as, Khadi and Village Industry Commission (KVIC), Khadi and Village Industry Board (KVIB), Coir Board, etc. and other private sectors are facilitating such industrial activities.

Tourism is declared as an industry to encourage and facilitate investment in the State. Domestic tourist inflow between 1990-91 to 2004-2005 has gone up from 1.19 million to 4.32 million registering an increase of about 350.00 per cent over 1990-91. Regarding to foreign tourists, the number of tourists visiting Orissa State is very small and its flow is marked by fluctuations too. In 1990-91 as many as 29.43 thousand foreign tourists visited the State. The highest number of such tourists is recorded in the year 1997-98 registering a flow of 35.39 thousand. In the post-cyclone year of 1999-2000, it was declined sharply to 21.43 thousand. In the year 2004-2005, it was further

increased to 30.30 thousand, which is marginally higher than 1990-91. However, in the face of a virtual stagnant tourist inflow, the estimated tourist spending has shown a remarkable increase. The total spending of domestic tourists in the State has increased from Rs.739.6 million in 1990 to Rs.6592.30 million in the year 2004 registering a growth of more than eight times. Such is also the case with foreign tourists whose spending in the State (in spite of their decreasing number) has increased to Rs.341.80 million in the year 2000 from Rs.59.80 million in 1990. The growth shows about six times increase in a decade's time.

Tourism also provides a good number of direct employments (apart from sizeable indirect employment) in the State. While in 1996-97, the total number of persons directly dependent on tourism sector was 26.66 thousand, and it was increased to 46.10 thousand in 2000-2001 (last survey conducted 2000-2001) registering a growth of more than 70.00 per cent over a period of only five years.

1.5. INTEGRATED TOURISM DEVELOPMENT

In today's context, this segment of planning and development comes to the forefront as the greatest single opportunity for providing jobs, generate foreign exchange, boosting the local resource based craft products, help in creating environmental awareness and better understanding among people, and above all raising the living standard of the people of the region. Therefore, evolving an integrated development plan is an inevitable requirement in which tourism is one of the major components.

An integrated tourism development plan aims at bringing total and sustainable development of the region consisting of both urban areas and their rural hinterlands, making the tourism activity function as a catalyst in the development process, which will lead to total development in the system. A study of this nature would necessarily

involve a critical appraisal of the controlling parameters, which decide the functions of the system, potential of the region, past records, supply and demand position (both existing and future), government policies and guidelines, and local practices. The importance of the above is highlighted in the UN report (1976) that "the importance of integrating tourism at the stage of planning and programming for the whole economy, to trace the impacts within a simplified input and output structure and to evaluate its contribution in terms of cost and benefits. It was particularly stressed that in the context of scale economies, demand from tourism - even when relatively marginal could become important for decisions on infrastructures such as transport network, sewage disposal and water supply. These considerations are linked to the environmental aspect of the tourism, the role of which in tourism planning was much stressed" (256).

1.6. PROBLEMS IN TOURISM PLANNING

Numerous problems hamper tourism development at regional level. The most notable problems are listed as below.

- Lack of optimal and feasible policy for integrated development,

- Inadequate investment from Government in the form of less plan outlays and budgetary provisions in tourism,

- Conservative attitude of Private sectors for large investment in tourism,

- Lack of entrepreneurial activity and attitude,

- Non-exploitation of locally available resources and the available skill for high industrial development,

- Inadequate civic, transportation and communication infrastructure availability for tourism development,

- Environmental and ecological problems, such as deforestation, soil erosion, overgrazing, air pollution from industrial effluents and vehicle emissions; water

pollution from raw sewage, tap water is not potable throughout the state; huge and rapidly growing population.

- Low priority of maintenance and conservation of historical and heritage resources,

- Regular occurrences of natural disasters like flood and cyclone,

- Lack of proper publicity and negative impact created due to other vulnerable aspects, such as, social religious blasphemy, crime, terrorism, etc.

1.7. LITERATURE REVIEW

Tourism is primarily regarded as a summation of temporary and short-term movement of people to and their activities at places outside the normal places of living and work (46). The prime motive of tourism has undergone significant changes, and has different meanings depending on the context in which it is used but the meanings are not divergent rather overlapping. The activity is now turned to a safe; pollution free, modern industry connected with business of providing accommodation, communication and other services to the tourists, and earns substantial foreign exchange with minimum investment. Tourism activities now become an established industry with tremendous economic and social potentiality having large income and employment generation opportunities. In addition, it has potential to play important and positive roles in bringing peace and understanding, assimilation of various cultures, etc., at different scales of civilization. Hence, tourism planning needs to encompass several aspects, such as, economic, social, physical, and ecological and environmental issues with optimal utilization of both natural and artificial resources. Thus, the need for an integrated approach of planning and integrating tourism at the planning and programming stage is felt for a sustainable tourism development (256).

The conditions related to tourism development are grouped into the three categories that represent economic, environmental, and social characteristics (42) in many previous studies. Economic conditions include contribution to income and standard of living, increased employment opportunities, improved investment, infrastructure development, increased tax revenues, and increased opportunities for shopping (188; 201, 205, 220, 221, 231, 235, 253). Environmental conditions comprise the state of the natural environment (20, 158, 231), an area's appearance (48), traffic crowding, noise, and litter (32, 50, 205, 221, 244, 260). The natural landscapes are agricultural and pastoral lands, and flora and fauna. The social and cultural indicators are related to changes in value systems, individual behavior, family relations, collective lifestyles, safety levels, moral conduct, creative expressions, traditional ceremonies, community organizations, local resources and facilities, labor structures, and language (3, 47, 90, 137, and 140,141). Tourism being dependent on such parameters, a sustainable development approach with a broad concept of long-term viability and conservation of natural resources, human resource (29,30), and quality of life for host community, visitor satisfaction (124,125, 278) are the essential requirements for integrated tourism development planning for a region.

It is also the need to understand that tourism has potential impact negatively or positively on the socio-economic and physical environment of any destination (168, 208).

The several aspects covering major features of tourism scenario in the global, national and regional level have seen intensive research by various Investigators and shall be broadly classified into various categories. In this present investigation, the relevant literature pertain to this investigation is collected, categorized into eight

important aspects pertaining to tourism development and are presented as below. They are:

1. Integrated Tourism Development;

2. Tourism and Economic Development;

3. Infrastructure and Tourism Development;

4. Social Implications of Tourism Development;

5. Culture, Cultural Heritage and Tourism Development;

6. Environmental Implications of Tourism Development;

7. Peoples/ Stakeholders Participation and Tourism;

8. Application of Tools and Techniques in Tourism Studies.

1.7.1. Integrated Tourism Development

Regional tourism development planning is not a totally independent planning activity (250). It should be prepared within the framework of the national tourism planning development policy. It should also deal with regional tourism policy; regional access and the internal transportation network of facilities and services; the needs of tourist attractions and their locations; quality and quantity of tourist facilities and services; socio-economic, environmental, and cultural impacts of tourism; tourism education and training in the area; marketing strategies and promotion programs and organization, management and implementation of tourism development plan (129, 250). A small country may not need to draw on a plan at regional level, because planning for a small country may be as easy as planning for a region in a large country. On the other hand, such comprehensive tourism planning at sub-national level may not be possible in every country, particularly in developing countries, owing to the fact that most developing countries do not have sufficient experts with appropriate training. Even though much regional planning is structured within the boundaries of

administrative regions, tourism planning at regional level may not belong to only one administrative unit. To deal with geographical entities in the physical environment is the chief peculiarity of regional tourism development planning.

Gunn (1965) developed a more specific model for regional tourism development planning (108,109,110,111,250). As per this model the model, the key elements for regional tourism development planning are as follows: (1) A definable regional boundary, (2) Access from markets and internal circulation corridors, (3) Community attraction complexes, (4) A non-attraction hinterland, and (5) Critical entrances to region. Also, following the discussions held in the context of International Geosphere Biosphere Programme (IGBP) and the approach designed by the World Commission on Environment and Development (1987), agenda 21 of the Rio Declaration on Environment and Development (UNCED 1992), integrated and sustainable development must include ecological integrity, economic efficiency and social equity, a process that allows tourism growth while at the same time preventing degradation of the resources and environment, as this may have important consequences for future quality of life (79).

These key elements guide regional tourism planning to be more specific and feasible. Regional tourism development planning should encompass government, non-profit organizations and the commercial enterprise sector. Moreover, it should be in line with overall goals and objectives of the national plan and other regional and sectoral plans (250).

The need for integrated and regional approach of tourism planning to achieve economic growth, diversification and stabilization through employment generation in both new (tourism related) and existing businesses, trades and crafts; opportunities for income growth through plural activity (91); the creation of new markets for agricultural

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products; and, a broadening of a region's economic base. This also helps in socio-cultural development; maintenance and improvement of public services; revitalization of local crafts, customs and cultural identities; and, increased opportunities for social contact and exchange, as well as protection and improvement of both the natural and built environment and infrastructure (232). Thus, tourism shall be integrated with other forms of social and economic development at the planning stage (200, 245, 246, 247).

1.7.2. Tourism and Economic Development

The decline of many economic activities, restructuring of the agricultural sector, dwindling rural industrialization and out-migration of higher educated youths, has led to the adoption, in many Western nations, of tourism as an alternative development strategy for economic and social regeneration of rural areas (72,116, 135, 206, 269, 272). It is now being looked upon as a viable choice in many developing nations too. Like other emerging sectors in modern economies, tourism is a dynamic, ever changing industry, and results in creating huge impact on the economic activity of a region or country (224). The economic development of a country or a region from tourism activity depends on various factors, such as, income accrued from foreign exchange earnings, earnings from domestic tourism, earnings from exports, creating conducive atmosphere for employment generation, growth of craft industry, creation of optimum required infrastructure and services, etc.

Development of tourism can also be a way to make nature reserves the economically viable and to provide employment and income (74) Tourism is by nature somewhat different from other sectors of the economy. The differences come from the peculiarities of tourism supply and demand. The economies of tourism industry are peculiar. It sells an intangible experience rather than a physical object. The tourism industry is dominantly a service industry. Service is relatively intangible, produced and

consumed in time frame and place. Service production is perishable; this means that services cannot be stored (55,232).

So, there is a need for stronger sectoral coordination and integrated development strategy (126), economic evaluation and focus on complementary and sustainable activities such as, agriculture, small-scale village enterprises, and appropriate industrial development for tourism-oriented products for safer returns and long-term option in economic, socio-cultural, and environmental terms (55,232). In this context of economic growth, diversification and stabilization through employment creation in both new (tourism related) and existing businesses, trades and crafts; opportunities for income growth through pluriactivity and the creation of new markets for agricultural products; and, a broadening of a region's economic base are essential requirements for any integrated tourism planning approach (91, 232).

On the other hand, economic approaches are increasingly seen as insufficient, and a range of other alternative methodologies has been proposed (153). Supporters of these alternative approaches argue that the drivers of success in many industries are ''intangible assets'' such as intellectual capital and customer loyalty, rather than the hard assets shown on the balance sheet. Thus while economic techniques focus on performance against accounting yardsticks, non-economic measures encompass a wider range of factors that may be important in achieving profitability, competitive strength and longer-term strategic goals (131,190).

1.7.3. Infrastructure and Tourism Development

Infrastructure provision functions as the nervous system for effective sustainable development. The success of tourism destinations in world markets is influenced by their relative competitiveness (75). The destination competitiveness extends previous studies that focused on destination image or attractiveness (54,122). Such studies are part of a long tradition of destination image research (92) and, in keeping with that tradition, have concentrated on those attributes that are seen to attract visitors, such as, climate, scenery, accommodation, etc. Whilst tourism services in general are recognized as being important elements of destination image or product the supporting factors or better known as satisfiers and resources (motivators or prime attractions) are factors that provide the foundation for building a successful tourism industry (75, 186). This includes, in particular, the extent and condition of a destination's general infrastructure, a range of facilitating resources, such as, educational establishments, together with factors influencing the destination's accessibility as per the tourism destination competitiveness (TDC) model (66,75), Butler's (1980) destination life cycle model of maturing destination and prevalence of ageing infrastructure (46).

Based on the dimensions and attributes (19), the various types of physical infrastructures that influence tourism development and create an image of the destination are general / basic infrastructure, and tourist infrastructure. The first category, i.e., general infrastructure, which essentially form a part of macro level development that helps in attracting and bringing the tourist to the destinations and other functions. This includes transportation, communication, and health services at broader perspective. The second category of infrastructure, i.e., tourist infrastructure mostly functions at the tourist destination level where the activities take place

comprises of accommodation, food facilities, information and entertainment facilities (19). These two categories of infrastructure are though overlapping to each other, vary with dimensions and scale. However, there is an inter-linkage between the two types of infrastructure.

Of all the accommodation, transportation and communication sector can be classified as business factors contributing income generation and employment creation and the Service quality, which include Tangible, Reliability, Responsiveness, Assurance, and Empathy are key in tourism development (66).

Transportation infrastructure in the form of canals, roads, railroads, turnpikes, and airports was one of the original and major objects of the State activity. The goal is to ease the movement of goods, people, and services both within the State and across the State lines and accessibility of these infrastructure services facilitates economic development (115).

Accommodation is a fundamental element of tourism industry. It is the largest and most ubiquitous sub-sector within the tourism economy (56), accounting for around one-third of total trip expenditure and, forms an essential ingredient of the tourism experience (233). This sector dominates the market and plays a vital role not only in structural terms but also in terms of contribution to Gross Domestic Product and employment. The choice of accommodation reflects, by and large, the needs and expectations of the tourist and, as a result, both the quantitative and qualitative characteristics of the supply of accommodation services directly influence the type of tourism/tourists attracted to destination areas (233).

However, the growth and development of the accommodation sector in particular is also intimately related to overall development and success of tourism

destinations in general. For example, the total supply of bed spaces in relation to a destination's arrivals figures is a powerful influence on occupancy levels, profitability, and employment in the sector, investment and the longer-term ability of accommodation providers to retain control over pricing levels. Similarly, the physical location, density and quality of accommodation, and the extent to which it is balanced with the broader development of infrastructure and tourism-related facilities, is an important element in the overall tone or attraction of tourism destinations. This, in turn, directly influences the ability of destinations to survive in an increasingly competitive international tourism market. In short, the success of tourism industry is largely dependent upon the appropriate development of the accommodation sector. This would suggest, of course, that the development of the accommodation sector should be a fundamental and integral element of the overall destination planning process (233).

Appropriate tourism development policies and, importantly, effective mechanisms for the implementation of such policies, should exist to guide and control the development of the accommodation sector (233).

In the communication sector, the implications of Information communication Technologies (ICTs) on the tourism distribution system has been discussed thoroughly and extensively in many published studies including Buhalis (1998, 2003), O'Connor (1999, 2000),) Sheldon (1997), Inkpen (1998), Cooper et al. (2000), Palmer and McCole (1999), Lang (2000), Standing & Vasudavan (2001), and Xiaoqiu et al.(2003) (37, 39, 56, 128, 147, 162, 191, 192, 195, 234, 236). The most recent developments in e-Tourism applications are at the destination level. By employing Internet, Intranet and Extranet, some destination management organizations (DMOs) have successfully integrated this function in promoting their destination, providing tourists with pre-trip and in-trip information; helping small and medium-sized tourist enterprises (SMTEs) to

promote their products, and expanding internal management within DMOs into destination networking and promotion systems (39, 40). If managed properly, ICTs help tourism companies and destinations to gain competitive advantage by either maintaining their price leadership in the market or by differentiating their product and services (162).

The proliferation of the Internet, from the tourism point of view, as a main stream communication media and as an infrastructure for business transactions has generated a wide range of strategic implications for businesses in general as well as for the travel and airline industries in particular (36). The emergent mobile technologies and mobile commerce are expected to change drastically a number of industries and to force organizations to reconsider their strategic management (36, 225). Thus, the communication sector contributes largely to the tourism industry in the form of information transfer and dissemination.

Boissevain & Theuma (1998), and Bramwell (2003) argue that infrastructure requirements for quality tourism, consume more natural resources like hotels, golf courses and marinas than mass sun, sand, and sea tourism for which the infrastructure was already in place and may create environmental degradation acting as a double edged sword (24, 27).

In this regard, creation of tourist satisfaction and conservation of environment are important dimensions of infrastructure creation for tourism development. Tourism may not sustain its contribution to development without satisfying consumers (tourists). Tourist satisfaction depends largely on the quality of tourism services, facilities and management at the tourist destination. More briefly, "if the visitor does not satisfy the place worth to visit then it will disappear from the tourist map. On the other hand, if

appropriate steps are not taken in time in respect of environment protection, integrated and sustainable development may not be achieved" (250).

1.7.4. Social Implications of Tourism Development

Tourism development planning appears to be evolving beyond an exclusive emphasis on physical land-use planning. This in turn has led to a focus on economic evaluation and more recently to the assessment of the environmental and socio-cultural implications of tourism development (129). A substantial literature exists relating the social impacts of tourism, and social impact concepts are being gradually filtered through to the practice of tourism planning. An example of this is the theory of social exchange and the social exchange process model developed by Ap (1992) (10,143).

Good numbers of Scholars have postulated that tourism may be a positive force able to reduce tension and suspicion by influencing national politics, international relations and world peace (67, 112, 120, 134, 170, 171, 215, 216, 258, 259). However, empirical testing has not always supported this postulation (8, 180, 204). It is interesting to note that a few studies focused on the role that tourism can play in developing relationships between partitioned countries (45, 142, 266, 282, 284).

The social and cultural ramification of tourism warrants careful consideration, as impacts can become either assets or detriments to communities. Influxes of tourists bring diverse values to the community and influence behaviors in the society. Interactions between residents and tourists can impact positively in terms of creating opportunities, bringing societal peace, integration of different cultures and negative manners in the form of associated problems, such as, increase in traffic accidents, increase in crime/robberies/vandalism, increase in alcoholism, prostitution, and sexual permissiveness, increases gambling/illegal games, increase in exploitation of local natives, etc. (107, 144). However, tourism can improve the quality of life in an area by

increasing the number of attractive elements recreational opportunities, and services. Tourism also offers residents' opportunities to meet interesting people, make friendships, learn about the world, and expose themselves into new perspectives.

Another important aspect of social implications of tourism development is the role and importance of the residents, indigenous people or aboriginal as in different cases at local level in the tourism development and planning process. It is increasingly realized that residents or indigenous people form an inseparable and vital component in tourism development and their role is increasingly receiving attention (44, 94,143). In this regard, the various social and cultural indicators that are used in tourism planning are related to changes in value systems, individual behavior, family relations, collective lifestyles, safety levels, moral conduct, creative expressions, traditional ceremonies, community organizations, local resources and facilities, labor structures, and language of the local community or residents (3, 42, 47, 90, 137, 141). It is also found in some studies that the residents having high level of attachment to their communities are more likely to view tourism as being both economically and socially beneficial (107).

Community participation and involvement of residents are of paramount necessity from social point of view of tourism development. A qualitative life for host communities, visitor satisfaction, and conservative use of natural and social resources are highly essential along with long-term viability of good quality natural and human resources are essential   for sustainable tourism development (29, 30, 42, 124,125, 278). Apart from this history, social organization and cultural principles of a society will determine the flexibility or inflexibility in response to or development of the tourist industry. The contours of such responses will be understood better when related to how residents actively construct their identities in relation to global forces, which needs (27,

119, 140), educating both the tourists and community, that can help in development of an attitude that would assist in the planning process (27, 77, 189).

Thus, the social implication of tourism brings the fact to light that a range of other methodologies and alternative approaches other than economic approaches only are of necessity keeping the intangible benefits in view (131,153,190). In this regard, various inputs, such as, social science inputs (socio-cultural assessment), social impact assessment (SIA), and gender analysis, which have grown quite rapidly in the recent past (although possibly still subsidiary to environmental and economic concerns) need to be incorporated into more broadly based tourism planning (143).

1.7.5. Culture, Heritage and Tourism

In the face of continuous challenge of economic development, environmental concerns are an inevitable requirement in the planning process itself of the developing countries (143). Often it has been discussed to understand the possibilities to realize the potential of an area through development of local resources, culture, and heritage (145, 152), and the integration of such alternative sources may help to sustain local economies and to encourage local development (163, 209). The motivation for tourism is moving towards education, curiosity and desire to understand other cultures, all tourism actors directly interested in preserving and enriching the socio-cultural heritage at destinations. Again, this also helps socio-economic benefits when the tourism private sector recognizes the marketing value of cultural and social aspects deriving from the interactions of the tourists with the local community. This will allow not only a real improvement of the quality of life at the destinations, but also creation of a market demand for a more complex system of quality of tourism service.

Even though importance of socio-cultural factors was widely recognized as a major driver of tourism in general, their inclusion criteria in the planning process get

low priority and also mostly omitted from certification or labeling process. It has been argued that these (267) omissions are due to the fact that the social and cultural issues are often location specific, and therefore, they vary in importance from one destination to another (243).

The cultural activities include taking study and/ or cultural tours, traveling to festivals and other cultural events, visiting monuments, and appreciating folklore or arts (7, 283). It exploits both tangible and intangible cultural assets, such as the physical embodiment of cultural values in the form of historic buildings, monuments, archaeological sites, and cultural artifacts; as well as the cultural traditions in the form of folklore, arts and crafts, local ways of life, social customs and cultural celebrations, all of which become the manifestations of heritage (71, 75). In this connection, it has been discussed that the culture and cultural heritage assets (65) must be molded for tourism and tourists, or vice versa as well as highlight cultural features, because they are ideally suited to become attractions, for the unique features of a place that reflect the history, lifestyle, environment and destination's traditions (57,175).

The dwindling interest in host cultures is revived by reawakening cultural heritage as part of tourism development, which increases demand for historical and cultural exhibits. This interest by tourists in local culture and history helps in providing opportunities to support preservation of historical artifacts and architecture.

However, the decision to pursue cultural tourism is often made with incomplete knowledge of potential adverse impacts or of requirements for successful product development (175). The successful transformation of extant cultural and heritage assets into tourism products are constrained by their size, scale, and layout or by legislation restricting modifications to these structures. On the other hand, purpose-built attractions, ranging from theme-parks to museums, face fewer problems and more

popular (65) as attractions than most preserved sites (175). The Tourism Council of Australia (1998) suggests that seven factors must be considered before investing in cultural tourism: the capability of creating enough demand, accessibility to the market place, potential competitive advantages over existing products, life expectancy of the product, the size of the investment required, the target market, and the period for return on investment. It has been observed that developing strategies to manage demand, supply, and yield are important business considerations. It is here to take note that every heritage tourism site undergoes the vicious circle of life cycle based on spatial economic point of view means it goes through four phases of growth and decay (281). In the first phase, expansion of tourism region takes place, followed by higher inflow of visitors in the second phase. The third phase observes priority on central attraction for visits leading to congestion, and the forth stage observes poor return of cultural system and down grading of quality of products, which again leads to expansion of tourism regions with increase in the divergence between area of cost and benefits thus completing the cycle (223).

Cultural heritage has economic importance because its management, state of conservation and access conditions influence human well being and it is increasingly been recognized that the assessment and measurement of economic values provided by Cultural Built Heritage (CBH) as a fundamental part of cultural policy (194, 199). The cultural policy needs a set of sound and theoretically structured and operational tools (techniques), which may be used to achieve integrated cultural economic targets. The culture and cultural heritage need to be envisaged as multi-dimensional, multi-valued and multi-attributed economic resource (173, 226). It is also to understand that the local cultural significance of the asset has less to do with its popularity than the ability of

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tourists to identify with it from their own cultural perspective (175), and accordingly is to be integrated with tourism development.

1.7.6. Ecology, Environment and Tourism

Ecosystem provides essential services to humanity, in the form of supporting life, supplying materials and energy, absorbing waste products, and providing culturally valuable assets (68, 69). Maintaining ecosystem integrity should be a primary human goal for sustainable development and conservation and preservation of the scarce resources (62, 213). This is being increasingly difficult to achieve because little is known about the temporal and spatial scales over which ecosystems should be safeguarded, the limits to replace their functions, or the levels of stress they can endure as complex, interacting, and interdependent systems (59) and continuous and irreversible human intervention. Hence, it is important to understand the contribution of human activities to ecosystem change. Tourism being an activity related to intensive human activity on different spatial scales impact directly and indirectly on ecosystems (101).

Tourism is long been considered as a clean industry without any negative effects on the environment (74). Tourism development is manifested in three core forms, such as, nature-based or eco- tourism, coastal (or beach) tourism, and heritage (or cultural) tourism (160) and is promoted primarily based on natural resources and landscape (78) such as, areas with high-value natural resources, like oceans, lakes, waterfalls, mountains, unique flora and fauna, and great scenic beauty and wild life along with the habitat form the ecosystem, and often times built around sensitive ecosystems (43, 228). This often results into human intervention and interfererance in the ecosystem, strains the relationship between the biodiversity and development resulting into decline of ecosystem as a whole, and degrades the environment.

The human intervention in tourism results into physical and psychological change (101) at the local level in the form deforestation, loss of flora and fauna, pollution, soil erosion and waste generation, etc., there by degrading the environment, consequently add up to global phenomena affecting the ecosystem and global environment in the form of change in land cover, land use, energy use, biotic exchange, extinction of wild species, exchange and dispersion of diseases.

It is well known that environmental degradation arises gradually, and usually it is difficult to retrieve after the degradation has reached serious levels (154), hence need to be preserved, protected, and kept from further ecological decline and environmental degradation.

It is necessary to have Environment Impact Assessment (EIA) and establishment of a set of warning indicators that can quantify change, identify process, and provide a framework for setting targets and monitoring performance (64, 124,125) for ecotourism management (154). In assessing tourism-related disturbance, an indicator of human impact must be chosen for analysis. Often effects upon key parameters, such as, mortality rate and population size are considered to be the ultimate criteria for identifying negative impacts (174, 188,), along with linkages of environmental factors, natural changes in the environment, and the individuality of sites (219, 277). This makes the impact assessment complicated because of issues, such as, the linkage of environmental factors, and natural changes (174).

One of the representative works is indicators for the Sustainable Management of Tourism, which was developed by the World Tourism Organization (WTO) in 1993 (283). In this work, two categories of tourism indicators were developed: derived indices, which included a Destination Attractive Index and Site Stress Index; and individual indicators, which included two long lists of candidate indicators for national

level and local/hot spots, respectively. However, the indicators in the list seemed too long to be understood and used conveniently in a pragmatic context (154). Also, environmental impact studies need to take account of the existing trends as well as the regional impacts of changes in physical development, such as, infrastructure and other services (187). This will require that trade-offs are identified at site, local and regional scales. It is at the latter scale that the benefits probably outweigh the costs (172).

Many of the changes, which took place and continue, are elements of regional change. The weakness of all the Environmental Impact Assessments (EIAs) was that they were site-specific and there was no attempt to look at the issues regionally. Bonnieux, et, al., (1997) have suggested that there has been a strong reluctance to regard environmental assets as having any monetary value (their price is infinite) and environmental constraints have traditionally often been ignored in any economic assessments (6, 25).

The various methods to foster responsible environmental behavior for sustainable development are to create appropriate environmental policies, legislations related to tourism activity, based on the Environmental Impact Assessment (6).

Very few studies have been conducted to model the impacts of environmental policies related to tourism activities. In this regard, many Scholars argue that, this industry does not harm the environment (255), but on the contrary, its components include transportation, accommodation, food services, and retail activities (202), and processes related to them may adversely affect the environment (6,118, 130, 182).

Special legislation can protect the ecosystems. As an example, Indian courts have recognized the right to a wholesome environment as being implicit in the fundamental right to life, guaranteed in Article 21 of the Indian Constitution (135). There are four main statutory acts that regulate environmental impacts of development

activity on the coast: The Water Pollution Act 1974 provides for the prevention and control of water pollution and the maintaining or restoring of the wholesomeness of water. The Air Pollution Act, 1981 is similar to the water act. It is an act to provide for the prevention, control and abatement of air pollution. It lays down air pollution standards and is administered by Central and State Pollution Control Boards. It also empowers the Authorities to close down a unit or to withdraw support services if found violating the law. The Air and Water Acts are then two main legal instruments used by the Central and State Pollution Boards to protect water and air quality. The Forest (Conservation) Act, 1980 prohibits the State Governments from allotting forestland, or any portion thereof for any non-forest purpose without approval from the Central Government.

It has been observed that attempts have been made to estimate the economic effects of tourism on regional or national economies (285) and found that environmental changes in the landscape may significantly impact the level of vegetation, thereby affecting the economy of a region, hence tourism need to be considered as an endogenous activity, which may be responsive to a set of environmental and economic variables (6).

However, planning processes are not always sensitive to articulating environmental meanings or representing a plurality of visions for a community; though there are exceptions to this point (97, 98)). Tourism is regarded as an industry relatively free from regulation today. Adoption of voluntary proactive approaches is consequently, crucial to achievement of environmentally, economically and socially sustainable performance improvements in tourism (243). The use of cleaner technologies impacts positively on maintaining a sustainable tourism industry, the use of cleaner or environmentally friendly technology relates to a conceptualization and

organization of operations that understands the importance of environmentally friendly business operations, however, any environmental management system manuals for any of the properties could not be perused by the Researchers (79).

Ecobelling and development of eco-tax are other methods to curb stress on environment. Environmental certification curbs tourism's negative environmental impacts on the natural resource base of destination areas by encouraging tourism enterprises to attain high environmental standards; educate tourists regarding the impacts of their tourism-related actions and decisions, thereby prompting them to act in favor of 'environmentally benign' tourism enterprises through their purchasing decisions ((254), and develop standards for environmentally friendly tourism products and services (178, 228). Eco-tax or Tourism Development tax, on the other hand while generating revenue at local level discourages unwarranted flow of traffic to the tourist destinations and prevents undesirable development (21, 203).

1.7.7. Peoples/ Stakeholders' Participation and Tourism

Partnership is considered as one of the most important aspects in the field of public policy generally, and local economic development in particular (164). The partnership model is accepted as the preferred method of regional and local development. This is being increasingly applied in a variety of circumstances in order to stimulate resource pooling, joint working, policy development and integrated implementation of agreed priorities at regional level (217, 218). Some regard the idea as a uniquely valuable way of addressing the changing world (217). However, in spite of this pervasiveness (196) has noted that this concept is ambiguous. Presently, partnership in tourism is largely been located at the local and regional levels with much research being focused on the extent of community participative on and administrative Authorities (28, 99,136, 248). However, cooperation and partnership can be maintained

by formulating an inclusive, and integrated tourism strategy, establishing partnership balance, understanding political sensitiveness and participative partnership approach at the local level (105, 106). The various conditions that influence tourism partnership development are contextual issues, which focuses on the background or environment in which partnership operate; stakeholder conditions means equal balance of power, maintenance of determination, commitment and stamina among participants are important parameters for facilitating partnership; decision making conditions that focuses on the relationships and interactions and effective communication channel (127) between organizations and individuals within collaborative arrangements (83); and partnership operation by formulation of clear strategies (26, 103, 104, 169). In addition, the partnership must involve all partners and a wider community, which create equality within the partnership, ownership of policy formulation and implementation and a more effective decision making process (104, 105, 106, 169, 273).

The public participation in participatory planning can be viewed from at least two perspectives: in the decision making process and in the benefits of tourism (176, 263). The concept involves empowerment of local residents to determine their own goals for development and determine their hopes and concerns for tourism; and includes the involvement of other stakeholders and other interest groups in decision-making. Despite the efforts made at different periods and in various countries for participatory approach in tourism planning process, it is observed that there is little involvement of community, residents, private sectors and other interest groups (245, 246,247). The reason for such responses are multifarious, such as, lack of awareness among the stakeholders, lack of financial resources, lack of entrepreneurship skills, inappropriate public administration and legal structure (4) negative attitude of the

residents (167) with increase of tourists and the perception of public authorities that it involves high cost and time in such planning process.

Timothy (1999b) identifies four types of partnerships in the context of tourism planning (246), which may operate among public-private sectors, among government agencies, among levels of administration (such as among nation, state and municipality) and among the same administrative level(s) across territorial political boundaries. Few Researchers have advocated various models for participatory tourism planning such as, framework of issues and phases in partnership development (11, 103), a normative model of participatory tourism planning (245, 246), and guidelines provided for sustainable tourism in protected areas: Planning and management, and community tourism development planning model (211, 212). However, the participatory planning is not functioning well in practice and limited to theoretical exercises, except in a few isolated cases because of various constraints, such as, cultural and political traditions; poor economic conditions of people; lack of expertise; lack of understanding by residents (45, 46); lack of financial resources (159, 210, 249,); lack of coordination (108, 133); lack of proper legal system; lack of information; relatively high cost of community participation (198); and high consumption of time in conflict resolution (279).

1.7.8. Application of Tools and Techniques in Analysis of Tourism

The steady increase in the tourist flow over the last few decades and the uncertainty, nature being perishable (12); the economic consequences (80, 264) attached to it, calls for feasible strategic planning and decision-making, which require accurate estimates in tourism demand forecasting and modeling approaches to arrive at plausible solutions. In this regard, various forecasting methods and modeling solutions have been employed pertaining to tourism studies. The most important among them

collected and are reviewed to find the best possible solutions as per the demand of the situation.

The reliable and accurate forecasting is needed to help the decision makers to plan more effectively and efficiently. Realizing the importance of this factor, various Scholars have done works by employing forecasting techniques since the early 1960s, (100, 274, 275). Following the new developments in macro economic model building and forecasting, tourism-forecasting analysis also experienced considerable changes depending upon various prevailing factors (100).

Four forms of forecasting techniques have been employed in tourism development, such as, Exploratory forecasting, Normative forecasting, Integrative forecasting, and speculative forecasting. Exploratory forecasting extrapolates past trends by using regression and similar techniques and is based on the assumption of relationship of variables. Normative forecasting incorporates discussion of the methods needed to attain a desired future outcome. Integrative forecasting relies on a variety of methods to determine the underlying relationships amongst a variety of forecasts, and integrating these to maximize convergence of results. The speculative forecasting uses techniques like Delphi forecasting or scenario writing and relies on the judgment of experts (49, 207).

As far as forecasting methods are concerned, they are classified into quantitative and qualitative (13, 257). The quantitative method gives more accurate result than judgment forecasts (165). These methods are further divided into causal models and time series approaches. The causal model attempts to identify and measure both econometric and non-econometric variables, while time series approaches identify stochastic (auto regressive and moving average components) in each time series (207).

The various statistical and econometric (230) models available for analysis are regression models such as, linear regression, multiple regressions, cubic polynomial approach (80, 261), exponential smoothing, autoregressive integrated moving average (ARIMA), seasonal autoregressive integrated moving average (SARIMA), multiplicative seasonal autoregressive integrated moving average (MARIMA), Naive model, (100), Artificial Neural Networks (ANN) (261), etc. These methods works in the principle of observed values, past data, etc., and the suitability of the model is based on the minimization of errors in the model (80, 261). These statistical methods are useful and adequate where the time series have regular patterns While, Artificial Neural Networks is useful when the pattern is less obvious (261).

There are various other models being used by different Scholars, which can be grouped under non-time series models, having causal relationships. They are Geographic Information System (GIS) (33, 34, 35) for planning support system, Action Grid Analysis (AGA) (123), Decision Support System (276). Geographic Information System (GIS) is most commonly used for comprehensive planning and zoning, land use inventories, site suitability assessment, socio-demographic and general mapping purposes (33, 35, 265) but past research confirms that the GIS-based tools developed are underutilized and unsuitable for planning. A few Scholars attribute this underutilization of Geographic Information System (GIS)technology to the inadequate capacity and structure of planning institutions, which remain unsuited to the new forms and processes required for effective utilization of planning and decision support systems (33, 34, 35). However, at present, this technique is increasingly employed in planning processes all over the world.

Action Grid Analysis (AGA) is typically called importance performance analysis (IPA). It is a tool with potential for tourism management and is no stranger to

the travel/ tourism literature (70, 76, 96, 114, 185). Unlike importance performance analysis (IPA), Action Grid Analysis (AGA) does not introduce either the term importance or performance and provides a conceptual framework that does not in any way depend on having importance and performance variables. So using them can be a source of problems ((123, 193). Further, though it presents a way of understanding client's needs/ desires and of formulating appropriate reactions to those needs and desires it involves factors that are subject to manipulation ((123,166).

The evolution of newer and sophisticated technologies is increasingly leading to efficient information management and information storage. Marketing Decision Support System (MDSS) is becoming important tool in the decision making process as it support organizations in collecting, storing, processing and disseminating information thereby providing forecasts and decision models (156, 276).

Apart from the aforesaid techniques, another important technique like System Dynamics is also used to understand the functions of the whole system, through which plausible interactive decisions can be arrived.

System Dynamics is a problem evaluation approach based on the premise that the structure of a system, that is the way essential components are connected generates its behavoiur (84, 214, 237, 238 240). It is well suited to analysis of problems whose behaviour is governed by feedback relationships and that have long-term time horizons (237, 262). On the other hand, it is not suited to one-time decisions. The process of creating a simulation model helps clarify the resource management problems and makes the modelers assumptions about the way the system works. Once a model is build, it can be used to simulate the effect of proposed actions on the problem and the system as a whole. It has been observed that the necessity of this kind of tool, because

while people are good at observing the local structure of a system, they are not good at predicting how complex, interdependent systems will behave (229, 237).

A system dynamics analysis proceeds through several steps, such as, defining a problem, describing the system, developing the model, building confidence in the model, use the model for policy analysis and use the model for public out reach (81, 214).

Tourism involves a complex system comprising of socio- economic, cultural, physical and ecological and environmental aspects as its components and needs a decision making concerning the development of a region's tourism promotional activities leading to integrated tourism development of a region (132,197). The dynamic model serves two goals in the context of the modeling literature; first, it illustrates the complex interactions between economic systems that can be modeled in detail and social and environmental systems, which have often, prove difficult to quantify. Second, the model integrates detailed quantitative information about the case study while summarizing the qualitative information (197). The dynamic models are now increasingly in use to illustrate the trends in ecological- economic interactions when long term experimentation is not feasible (58, 61) and also it provides an opportunity of the mix of quantitative and qualitative data, though rare, within the same dynamic model. This is increasingly necessary to address problems of social and environmental importance (138). System Dynamics approach has been attempted to conceptualize the impacts of various tourism development strategies over a period of several decades, while taking into account interactions and feedback loops between ecology, economy, and society to the fullest extent allowed by available data and theory (197).

1.7.9. Summery

1. Tourism is a dynamic, ever changing industry and results in creating huge impact on the economic activity of a region or country. It has gained significant importance from socio-economic and physical development point of view because it has become an established industry with large income, and employment generation opportunities.

2. It enhances socio-cultural development; revitalization of local crafts, customs and cultural identities; increased opportunities for social contact; assimilation of different cultures; and play positive roles in bringing peace and understanding at different scales of civilization.

3. It helps improvement of both the natural and built environment including maintenance and improvement of infrastructure, public services, etc.

4. Regional tourism development planning is not any more a totally independent planning activity and should be prepared within the framework of the national and regional tourism development policy.

5. The need for integrated and regional approach of tourism planning is to achieve economic growth, such as, employment generation; opportunities for income growth through plural activity; the creation of new markets for local agricultural, handicrafts and allied products; and broadening of a region's economic base.

6. Tourism planning at regional level may not belong to only one administrative unit as most regional plans structured, therefore, the key elements for regional tourism development planning comprise of a definable regional boundary, access from markets and internal circulation corridors, community attraction, and critical entrances to the region.

7. The socio-economic, environmental, cultural influences of tourism; tourism education and training; marketing strategies, promotion programs and organization, management and implementation are also major components in the integrated regional tourism development plan.

8. Ecological integrity, economic efficiency and social equity should also be considered at the planning stage.

9. Tourism development planning appears to be evolving beyond an exclusive emphasis on physical land-use planning with shifting the focus on economic evaluation and more recently to the assessment of the environmental and socio-cultural implications.

10. The economic development of a country or region from tourism activity depends on various factors, such as, income from foreign exchange earnings, earnings from domestic tourism, earnings from exports, creating conducive atmosphere for employment generation potential, growth of craft industry, creation of infrastructure and services, etc.

11. Tourism is different from other sectors of the economy and somewhat peculiar as it sells an intangible experience rather than a physical object. The tourism industry is dominantly a service industry, which is intangible.

12. The success of tourism destinations in world markets is influenced by their relative competitiveness; which depends on destination image or attractiveness. The infrastructure provision helps in creating an image of the destination and functions as the nervous system for effective sustainable tourism development as well.

13. There are two types of physical infrastructure relating to tourism industry, such as, general infrastructure, and tourist infrastructure. Transportation,

communication, and health services at broader perspective, which essentially form part of macro level development that help in attracting and bringing the tourist to the destinations and other functions come under general infrastructure, whereas tourist infrastructure mostly functions at destination level comprises of accommodation, food facilities, information, entertainment facilities, etc. These two categories of infrastructure are often overlapping to each other, and vary with dimensions and scale.

14. The service quality of the infrastructures, such as, tangible, reliability, responsiveness, assurance, empathy, etc., has increasingly become key elements in tourism development.

15. Infrastructure development is also followed by the evils, such as, ecological and environmental problems, and may become a dissatisfying factor to the tourists.

16. Various inputs, such as, social science inputs (socio-cultural assessment), social impact assessment (SIA), and gender analysis, which have grown quite rapidly in the recent past, are although possibly still subsidiary to environmental and economic concerns, form important components of broadly based tourism planning.

17. The importance of socio-cultural factors is widely recognized as a major driver of tourism in general, and they vary in importance from one destination to another as they are highly location specific.

18. The motivation for tourism is moving towards education, curiosity and desire to understand other cultures. The preserving and enriching of the socio-cultural heritage at destinations will allow real improvement of the quality of life at the destinations, as well as creation of a market demand for a more complex system of quality of tourism service.

19. The local culture and cultural heritage assets must be molded for tourism and tourists, or vice versa as well as highlight cultural features, because they are ideally suited to become attractions, for the unique features of a place that reflect the history, lifestyle, environment and destination's traditions.

20. Every heritage tourism site undergoes the vicious circle of life cycle based on spatial economic point of view as it goes through four phases of growth and decay in completing the cycle and need to be considered carefully while planning for tourism development.

21. Tourism being an activity related to intensive human activity on different spatial scales impact directly and indirectly on ecosystems, and it is important to understand the contribution of human activities to ecosystem change.

22. Maintaining ecosystem integrity should be a primary human goal for sustainable development, conservation and preservation of the scarce resources. However, it is being increasingly difficult to achieve because little is known about the temporal and spatial scales over which ecosystems should be safeguarded, the limits to replace their functions, or the levels of stress they can endure.

23. The human intervention and interfererance in the ecosystem, and strains the relationship between the biodiversity and development resulting into decline of ecosystem as a whole, and degrades the environment.

24. Environmental degradation arises gradually, and usually is difficult to retrieve after the degradation has reached serious levels, resulting into physical and psychological change at the local level, and consequently affect the global phenomena.

25. The various methods to foster responsible environmental behavior for sustainable development are to create appropriate environmental policies,

legislations related to tourism activity, based on the Environmental Impact Assessment supported by effective community participation, implementation of environmental quality standards agreed by relevant international organizations for tourism projects, allocation of tourism revenues to prevent degradation of the destination resources and to meet the needs to supply tourism services in future.

26. Partnership and peoples participation are most important aspects in the field of public policy generally, and a preferred method of local and regional economic development in particular. This is employed in order to stimulate resource pooling, joint working, policy development and integrated implementation of agreed priorities at the regional level.

27. Various conditions that influence tourism partnership development are contextual issues focusing on the background or environment in which partnership operate. They are equal balance of power, maintenance of determination, commitment and stamina among participants, relationships and interactions and effective communication channel between organizations and individuals within collaborative arrangements, and partnership operation by formulation of clear strategies.

28. Community participation and involvement of residents are of paramount necessity from social point of view of tourism development. The level of attachment of residents and communities also play an important role as the communities, which are having high level of attachment are more likely to view tourism both economically and socially beneficial.

29. The implemental strategic planning and decision-making require accurate and reliable estimates in tourism demand forecasting and modeling approaches to arrive at plausible solutions.

30. There are four forms of forecasting techniques have been employed in tourism development, such as, exploratory forecasting, normative forecasting, integrative forecasting, and speculative forecasting and it is observed that the quantitative methods give more accurate result than judgment method of forecasting.

31. The various statistical and econometric models available for analysis, which work in the principle of observed values, past data, are regression models, such as, linear regression, multiple regressions, cubic polynomial approach exponential smoothing, (ARIMA), average (SARIMA), Multiplicative seasonal autoregressive integrated moving (MARIMA), Naive model, Artificial Neural Networks (ANN), etc. These statistical methods are useful and adequate where the time series data have regular patterns, while Artificial Neural Networks is useful when the pattern is less obvious.

32. There are various other models being used, which can be grouped under non-time series models, having causal relationships. They are Geo Informatics System (GIS), Action Grid Analysis (AGA), Decision Support System, etc. Apart from the aforesaid techniques, another important technique like System Dynamics is also used to understand the functions of the whole system, through which plausible interactive decisions can be arrived.

33. It has been observed that the System Dynamics model is the most suitable technique amongst the aforesaid techniques to understand the complex tourism system comprising of physical, social, economic, ecological and environmental,

infrastructural, institutional aspects as its components, and needs a decision-making concerning the development of a region's tourism promotional activities leading to integrated tourism development of a region. Such a tool is highly appropriate in understanding and simulating future scenarios while taking into account of interactions and feedback loops between ecology, economy, and society to the fullest extent allowed by available data and theory.

The review of relevant literature reveals the various important aspects to be considered in tourism planning as mentioned frequently in the literature. Tourism is no more an independent activity. There is a need of an obvious shift of tourism planning from unitary approach, considering this as an independent entity to an integrated approach, encompassing several aspects, such as, economic, social, physical, and ecological and environmental issues. The study led to understand the various important parameters to be considered, such as, socio-economic implications, infrastructure development, culture and heritage, ecology and environmental implications, Peoples/ stakeholders' participation, and application of appropriate tools and techniques in analysis in tourism planning; and need of an integrated approach encompassing all the aforesaid aspects at the planning and programming stage, such that, tourism activity can function as a catalyst in the development process.

1.8. STATEMENT OF THE PROBLEM

The Investigator has studied problems of tourism development at the regional level thoroughly and understood that various important parameters, such as, socio-economic implications, infrastructure development, culture and heritage, ecology and environmental implications, Peoples/ stakeholders' participation, and application of appropriate tools and techniques in analysis are very much essential in tourism planning. Further, this needs an integrated approach combining all these above aspects

together such that tourism can become a catalyst for the development of the system. The Investigator observed that very less attention has been given in this regard in India, particularly. At present, the Indian National Government, as well as various State Governments have laid emphasis on tourism development in tourism resource rich areas, and accordingly various steps are being taken at different levels. However, it has been observed that the sectoral planning approach considered has lead to the failure or partial success of the steps that are taken in this direction with wastage of wealth and non-utilization of the available resources. In addition, it is understood that in spite of the availability of natural and mineral resources, the potential rich regions suffer from poor socio - economic development, pitiable social conditions and inadequate physical development.

It has also been observed based on through analysis of the existing literature that so far no attempt has been made to understand the functions of the system by considering tourism as a catalyst in total development.

Having the above knowledge in mind, the Investigator has chosen this particular field of learning for conducting the present investigation, and also to evolve a set plausible guidelines and necessary recommendations where tourism functions as a catalyst leading to integrated development of the system and growth of tourism as well. The region comprising of coastal and natural flood plains of Orissa State, India, is chosen to conduct this present investigation. Accordingly, a set of objectives is framed to conduct this present investigation.

1.9. OBJECTIVES

The following objectives are framed in this present investigation. They are:

- To assess the existing socio-economic, physical, ecological, and environmental conditions of the study area (system).

- To assess the current status of tourism and it's related activities in the system.

- To identify the control parameters, which decide the functions of the system and assess the functions of the system.

- To forecast the demand and supply of infrastructure, pertaining to tourism industry and their impact on the system for 2031 A.D.

- To evolve a set of plausible policy guidelines, for the development of tourism and for integrated development of the system by considering tourism as the catalyst for development.

1.10. HYPOTHESIS

A plausible hypothesis is framed based on analytical work and is tested in this present investigation, i.e., an integrated tourism development brings about sustainable development in the system. In this development process, tourism activity functions as a catalyst, where considerable amount of potential is available for tourism industry development thereby helping the over all development of the system while experiencing growth in itself.

1.11. SCOPE

The present investigation aims at evolving an integrated development plan for the development of the study area by exploiting the available resources by keeping tourism as the catalyst for the development of the system. The Investigator hopes that if the recommendations of the present investigation are implemented as per the proposed guidelines, integrated and steady development would be anticipated in the system.

1.12. CONCEPT

In this present investigation, system concept is employed. A system functions as a whole with the interaction of several sub systems. All the sub-systems of the system are interlinked and interdependent to each other, and function as a whole with dynamic characteristics. If one of the sub-systems functions with advancement or defunct or partly function, its effects can be observed in the whole system.

In this present investigation, the study area under investigation is considered as a system, which has the following sub-systems, such as, physical, social, economic, ecological, environmental, infrastructure and institution conditions, are functioning as a whole. All these subsystems are interlinked and interdependent to each other. Tourism industry can be considered as a catalyst for the development of the system since it has enormous potential. Hence, the Investigator gives more stress on tourism-integrated development in the system by considering all the sub-systems of the system together.

Therefore, system concept is employed in this present investigation to assess the functions of the system in different situations to prepare a feasible integrated development plan and to evolve a set of plausible policy guidelines in this regard.

1.13. RESEARCH DESIGN

1. Survey research methods have been employed in this present investigation.

2. The methodology which have been followed to conduct this investigation is presented in the Fig. No. 1.1.

1.13.1. Methodology

This investigation follows a systematic and step wise methodology as shown in the Fig-1.1. The various steps followed in the investigation are Identification of problems and formulation of objectives followed by collection of data, analysis and identification of control parameters, which decide the functions of the system, development of model, validating the model, forecasting, simulation, drawing of

inferences, policy analysis, and evolving a set of policy guideline and recommendations.
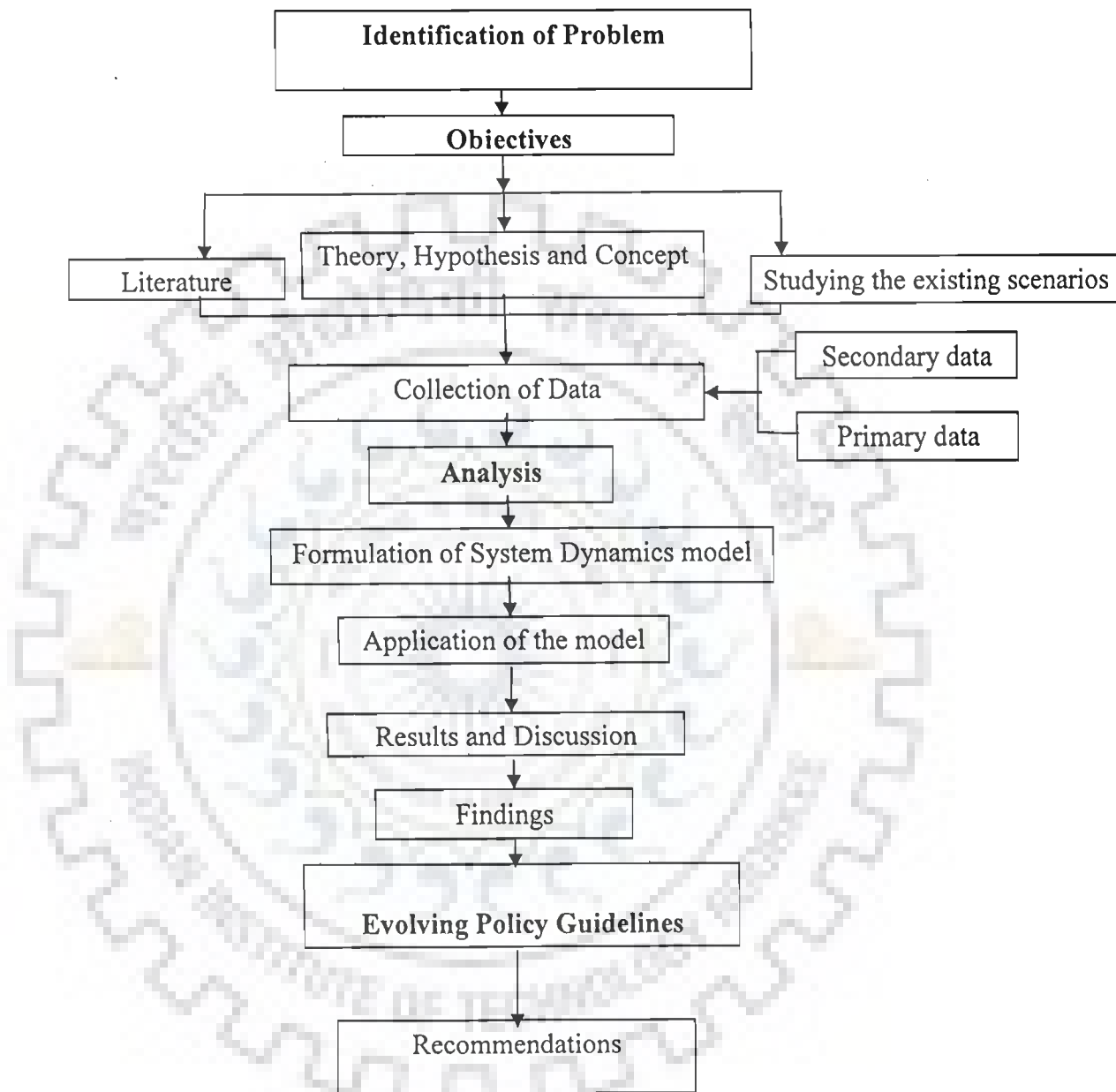
Fig. No. 1.1: Methodology Chart

1.13.2. Data

Two types of data, such as, secondary and primary sources of data have been collected pertaining to this present investigation and employed in this investigation. The details of data collected are presented in the Table No.1.1

Table No. 1.1: Details of Data Collected

Sl. No.	Levels	Sources of Information/persons concerned	Types of information
1	State	Department Ministry, Directorates of Departments, State level Officers	Secondary and Primary
2	Study Area and District level	District level Offices, District Level officers	Secondary and Primary
3	Household	Household persons	Primary
4	Industrial Units	Industrial Units in the Study Area	Primary
5	Tourist Destination	Tourists	Primary

Secondary Sources of Data: Required data from the published and unpublished literatures, documents from various sources are collected pertaining to this investigation.

Primary Sources of Data: Sample survey at household level, individual tourist level and industrial units' level are conducted for obtaining requisite data at the grassroots level and firsthand information.

1.13.3. Significance of the Primary Survey

Most of the secondary data were available to the Investigator at the time of investigation (2004) for the Study area and Orissa State from Census-2001, periodically compiled, documented and published data by different Government agencies. The secondary source of data have a set of data, which are commonly available, whereas certain data have more bearing at micro level are not available in any form of secondary data. Data pertaining to the demographic, socio-economic conditions of the households, such as, income, occupation, employment, expenditures, savings, infrastructural facilities, households' priorities, future interests, etc.; tourists related data, such as, category of tourists, requirement of tourism infrastructure, tourists aspirations, interests, priorities, number of days of staying at destinations, tourists opinions, environmental problems, etc., are not available in any form of documentation at any level. Similarly, data pertaining to individual industrial units, which influence the functions of the system, such as, types of industry, installation capacity, production position, investment, employment, infrastructural requirements, general problems in industrial units, opinion on future prospects are not available in any form of the secondary data. These variables have more influence in the system. Therefore, an extensive primary survey was attempted considering household aspect, tourism related and industrial aspects separately by using pre-tested schedules for investigation. The primary survey was conducted in the year 2004.

1.13.4. Need for the Primary Survey

Integrated tourism plan aims at total development of the system with tourism functioning as a catalyst for development in the system. This requires an in-depth understanding of various activities that prevail in the system, quantification of available resources ad their potentialities, issues, problems, etc. For the above said purpose, the

study area is divided into three sub-regions based on the locations proximity to each other having similar socio-economic and physical characteristics and concentration of tourism related resources. The first sub-region comprises of Balasore, Bhadrak and and Jajpur districts in the North Eastern part of the study area, the second sub region comprises of Cuttack, Puri, Khurda, Kendarpara and Jagatsinghpur districts in the central part of the study area and the third sub region consists of Ganjam, and Nayagarh districts in the South west of the study area (Fig. No.1.2). All these sub-regions have distinct characteristics features in the form of landform, natural and spatial resources, population density, socio-economic and cultural activity, infrastructural facilities etc. In addition to the above, they have different types of tourism resources such as, architectural and religious places, archeological places, seacoasts and sea beaches, waterfalls, etc., located in different sub-regions.

The development of tourism and the entire system depend on the changes in spatial, socio-economic and public policy factors. The aspirations, perception, and participation of people also play major role in developing the system. These aforesaid factors forced the Investigator to collect detailed information for the investigation in three different aspects, such as, socio-economic conditions of the system, industrial scenario and tourism scenario prevalent in the system. The information regarding socio-economic conditions are collected through surveys conducted at the household level, the information regarding industrial scenario was collected from industrial survey conducted at industrial units level and tourism related information was collected by the survey conducted at tourists level at the destinations. All these surveys brought a lot of first hand information and insight to understand the system, the factors that influence the functions of the system pertaining to the availability, utilization of natural and artificial resources, ecology, environment, etc.

50

West Bengal

Mayurbhanj

Keonjhar

Baleswar

Bhadrak

Anugul

Dhenkanal

Jajpur

Boudh

Kendrapada

Cuttack

Nayagarh

Jagatsinghpu

Phulbani

Khurda

Puri

Ganjam

Gajapati

Bay of Bengal

N

LEGEND

▬▬▬	State Boundary
	District
	Sub Region 1
	Sub Region 2
	Sub Region 3

50   0   50   100   200   350 KMS
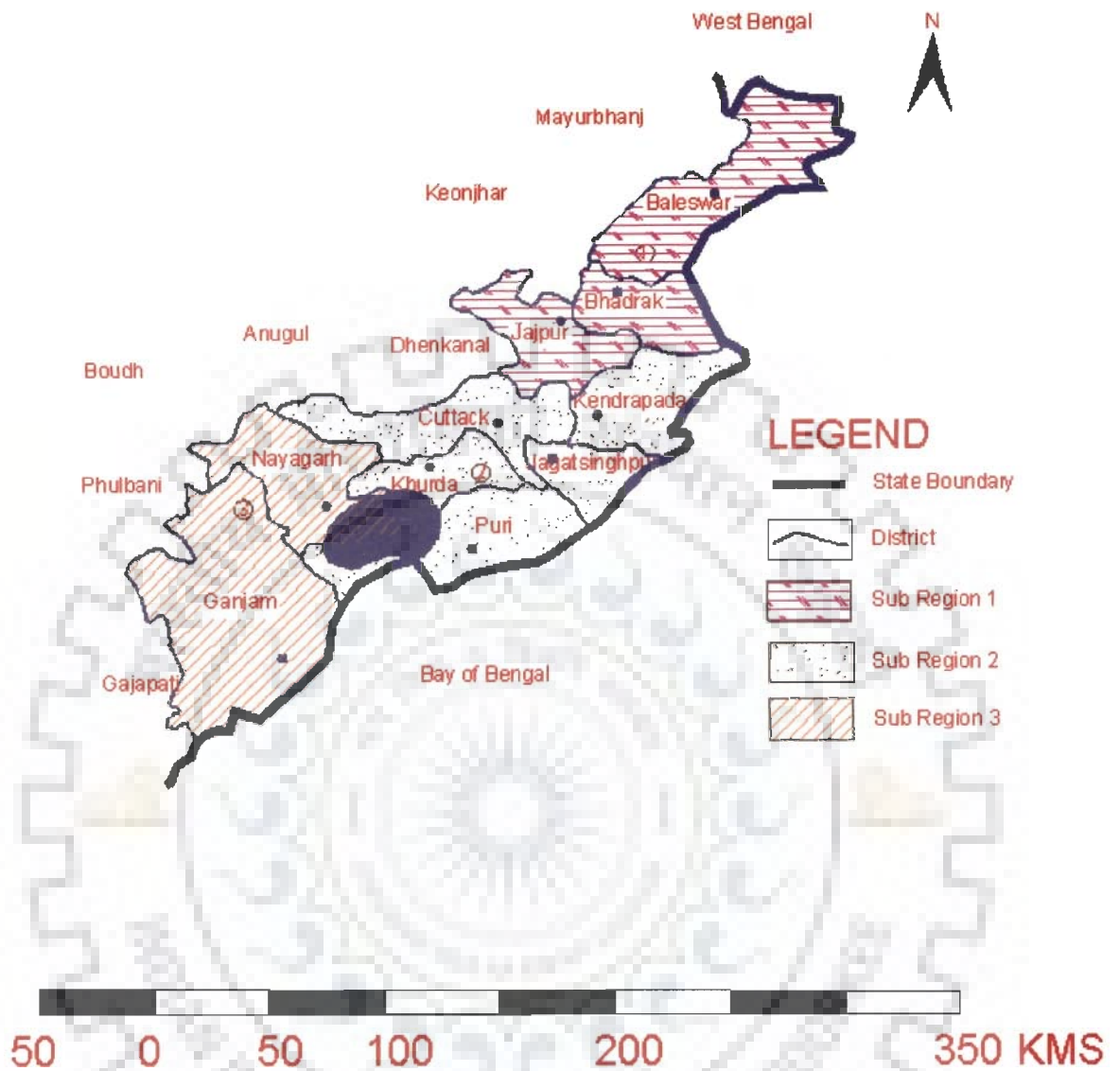
Fig. No. 1.2: Sub-regions in the study area of Orissa State

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1.13.5. Selection of Sites for Primary Survey

The study area comprising of ten administrative districts of the coastal and floodplains of Orissa State and located close to Bay of Bengal is chosen for this present investigation. As described earlier, the total region is divided into three sub regions, and one urban and one rural area were selected from each sub regions which are located in close proximity to tourism related resources for household survey. For this purpose, Balasore town and Baliapal Community Development Block, in sub region 1, Bhubaneswar city and Balipatna Community Development Block in sub-region 2; and Chhatrapur town and Berhampur Sadar Community Development Block have been selected for conducting household survey (Fig. Nos.1.3 A, 1.3 B and 1.3 C). For conducting household survey one Urban local body and few villages from each urban and rural area respectively of the respective sub regions have been selected and sample households are decided as described in the next section.

Tourism survey was conducted in three important tourist destinations, such as, Puri, Konark and Nandankanan of Bhubaneswar (Fig. No. 1.-4). Industrial survey was conducted in the industrial locations of Bhubaneswar and Khurda region, Cuttack and Balasore region (Fig. No. 1.5).

1.13.6. Selection of Sample Households, Sample Tourists and Sample Industries

For household survey, the Investigator collected a list of households by administrative region. In the urban areas, the Urban Local Bodies and in the rural areas, Community Development Blocks are chosen for this purpose. A total number of 247 households were selected based on the availability of households, and number of households varying from 35 to 50 in each area selected for survey by using systematic stratified random sampling method. The sample size was chosen by having the formula k=N/n, where N and n represent the total number of households and the sample size,

respectively. The households selected by area wise are shown in Table No.1.2 and Fig. No. 1. 6.

Fig. No. 1.3 A **Fig. No. 1.3 B** **Fig. No. 1.3 C**
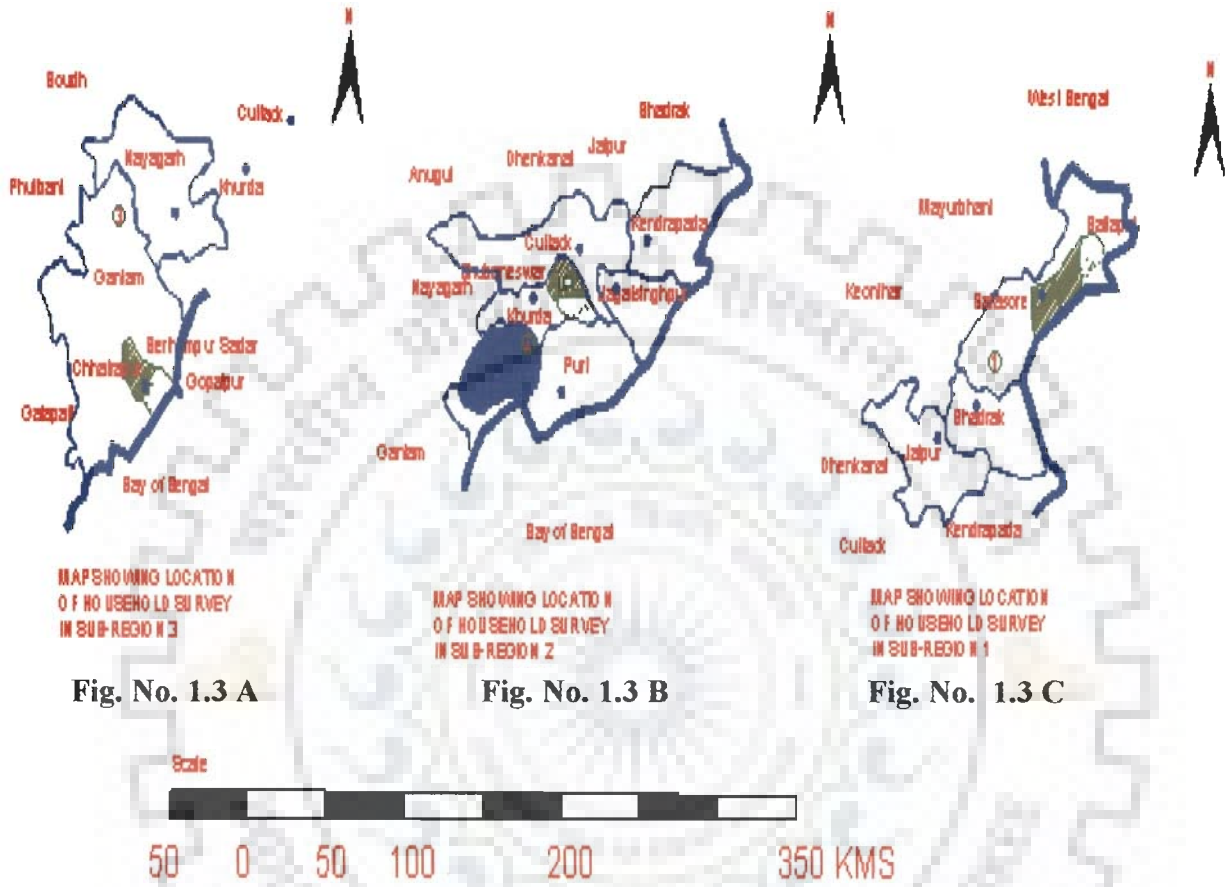
Fig. No. 1.3: Locations for household survey in different sub-regions
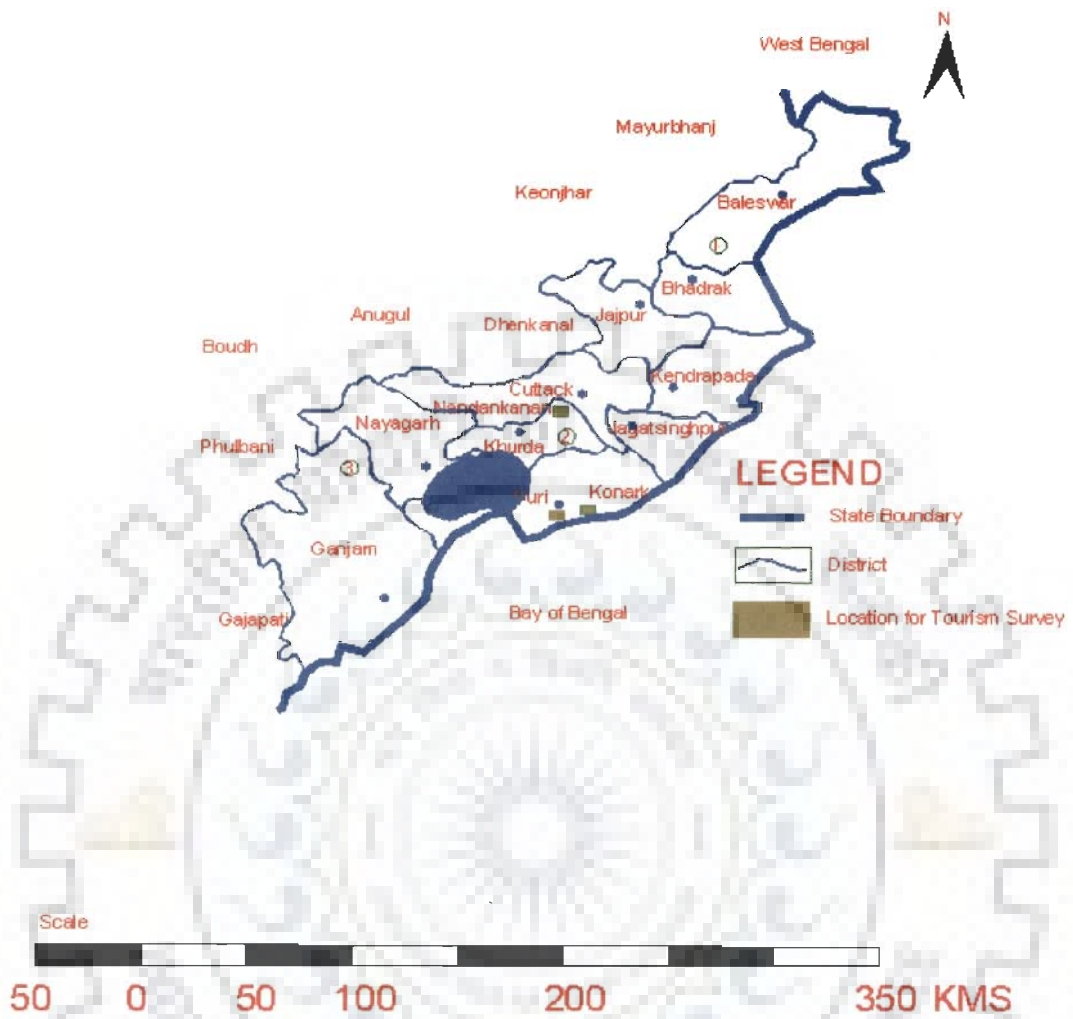
Fig. No. 1.4: Locations for tourism survey in different sub-regions
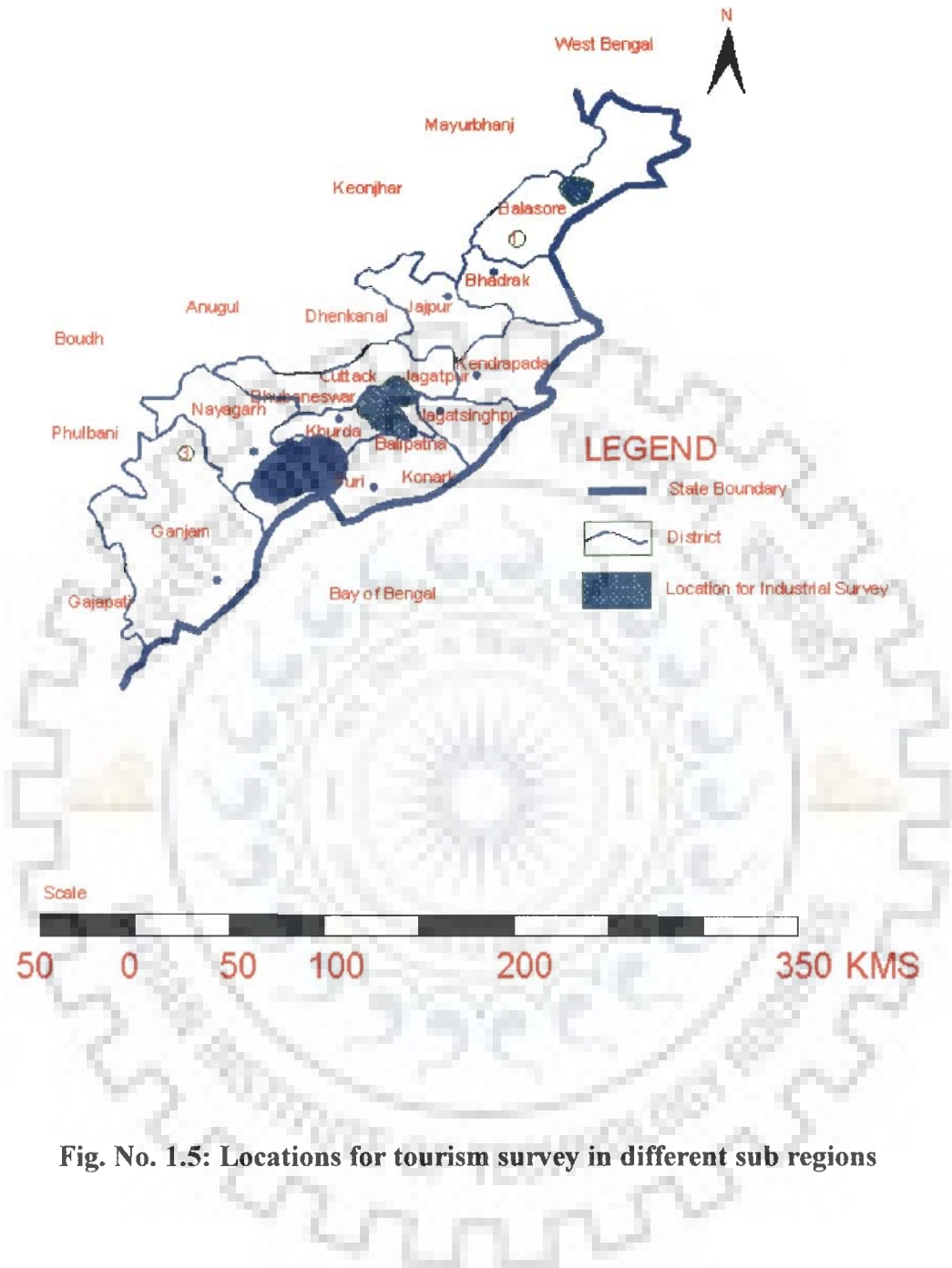
Fig. No. 1.5: Locations for tourism survey in different sub regions

Study area

3 sub regions

10 districts

Selected urban local bodies and Community development blocks

Selected sites for conducting household survey

Households and Respondents
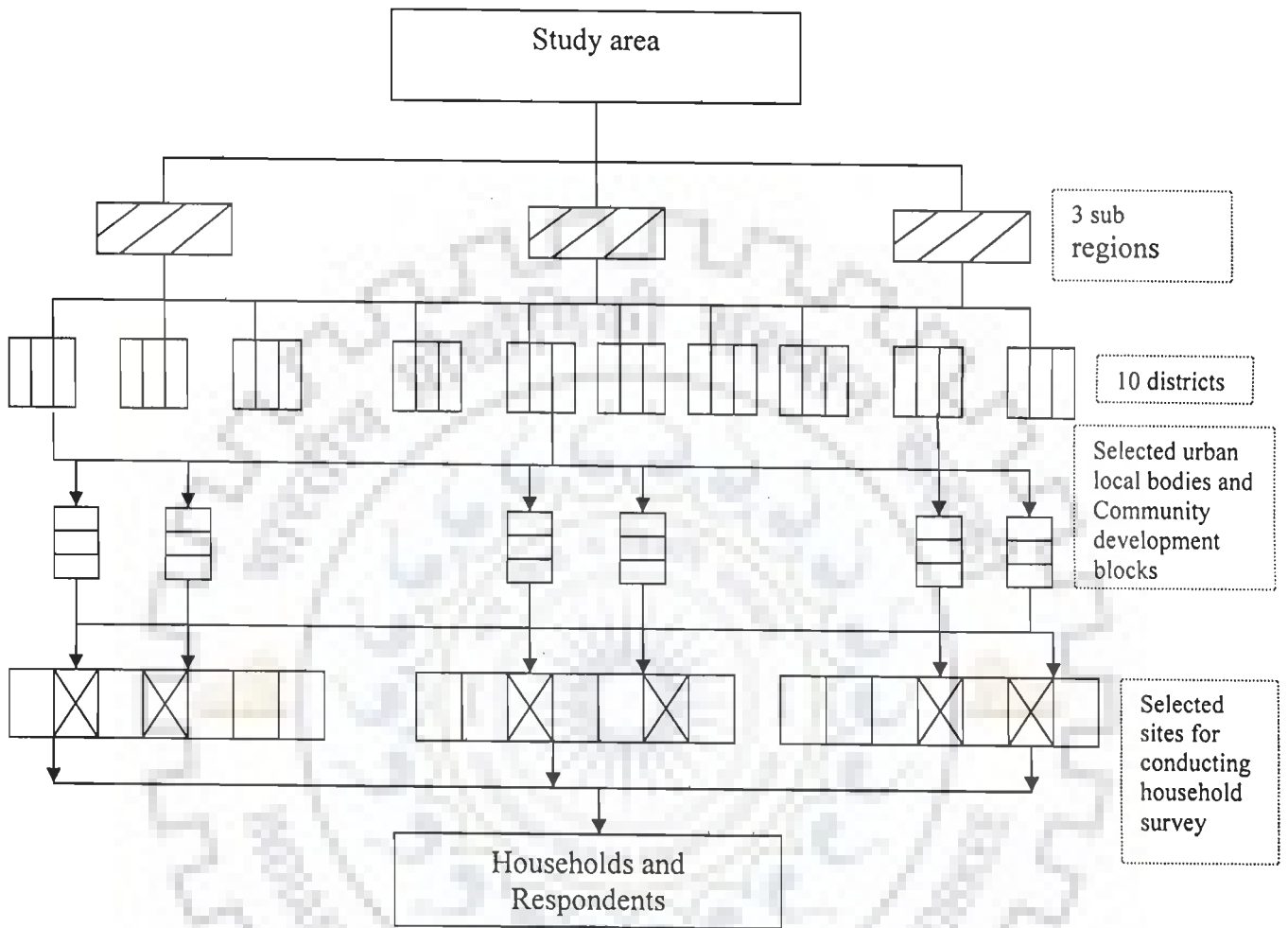
Fig No 1.6: Sampling Method

For conducting tourism survey, three most important tourist locations such as Puri, Konark and Nandankanan were selected and about individual tourist were approached randomly for participating in the survey. The survey was conducted among the tourists who were willing to participate in the survey. A sample size varying between 30 and 40 number of tourists were selected in each location for conducting the survey.

The industrial survey was conducted in the locations where there is large concentration of industries. Industrial units on such locations were approached randomly to participate in the survey and survey was conducted among the willing industrial entrepreneurs. About a sample size varying between 10 and 25 numbers of industries were selected in each location of survey based on the availability and concentration of industries.

1.14. SURVEY TOOLS

Appropriate survey tools, such as, pre-tested schedules, questionnaires, etc., are employed in this present investigation. They are discussed below.

1.14.1. Schedules

Three different schedules, such as, household schedule, industrial survey schedule and tourism survey schedules were prepared; pre tested in the study area and then employed in this investigation for conducting the survey and are presented as follows. They are:

Table No. 1.2: Details of Selected Samples

Sl No.	Districts	Type of Schedule	Selected Area	Types of Area	No of selected samples after
1	Ganjam	Household	Chhatrapur	Urban	40
2	Ganjam	Household	Berhampur sadar	Rural	40
3	Khurda	Household	Bhubaneswar	Urban	50
4	Khurda	Household	Balipatna	Rural	42
5	Balasore	Household	Balsore	Urban	40
6	Balsore	Household	Baliapal	Rural	35
7	Total	Household			247
8	Khurda	Industry	Bhubaneswar and Balipatna	Rural and Urban	25
9	Cuttack	Industry	Jagatpur	Rural and Urban	15
10	Balasore	Industry	Balsore	Urban	11
11	Total	Industry			51
12	Puri	Tourism	Puri	Urban	40
13	Puri	Tourism	Konark	Urban	30
14	Khurda	Tourism	Nadan Kanan	Urban	30
15	Total	Tourism			100

1.14.1.1. Household schedule

Household schedule is the most important one, which is used for conducting survey at the grassroots level. The schedule has several variables related to socio-economic, physical and environmental quality of the households in the system. Details such as, household income from different sources, family size, education, employment, occupation, parameters related to agriculture such as landholdings, cropping pattern, crop intensity, major crops, irrigation intensity, horticulture activity, animal husbandry, fishery activity, industrial parameters such as, skill availability, local industrial resources availability, trade and commerce related parameters such as, wholesale trade and retail trade activity etc., infrastructural conditions such as roads, railways, water supply, sanitation and waste disposal parameters, housing positions etc., and

expenditure pattern etc., were included in this schedule. The household schedule used for this investigation is presented in Appendix-1. (A).

1.14.1.2. Industrial Schedule

Industrial schedule is important to understand the present state of the industries available in the system. Parameters related to individual industrial units, which influence the functions of the system such as, types of industry, installation capacity and production position, employment, investment, infrastructural requirements, general problems in industrial units, opinion on future prospects were included in this schedule. The industrial schedule used for this investigation is presented in Appendix-1. (B).

1.14.1.3. Tourism schedule

Tourism schedule is important to understand the tourist requirement problems, and the aspiration of tourists and the native residents of the system. Parameters, such as, category of tourists, requirement of tourism infrastructure, tourists aspirations, interests, priorities of tourist activity, preference of various tourism activity, number of days staying at destinations, period of visits, tourists opinions, environmental problems, etc., were included in this schedule. The tourism schedule used for this investigation is presented in Appendix-1. (C)

1.14.2. Methods of Administering the Surveys

The household survey, industrial survey and tourism survey were conducted in the year 2004. To conduct the surveys, the Investigator contacted the State level and the District level officers at the apex level and middle level too. At the grassroots level, the Community Development Block level officials in the rural areas and the Municipal level officials in the urban areas were contacted and detailed discussions were held, which gave valuable insight in organizing the schedules. Subsequently, the Investigator conducted a pre testing surveys in some of identified households for household survey,

industrial units for industrial survey and tourists visiting tourism destinations for tourism survey, with the help of the local level officials. The collected data by using the pre-tested schedules were analyzed thoroughly to develop the final schedules.

To conduct the household survey the Investigator approached the households directly, and has a detailed discussion with the members of the households, after obtaining prior appointments from the respondents for conducting the final survey at the household level.

In case of industrial survey, local industrial promotion officers were contacted and with their help, appointments were fixed with industrial units. The Investigator has made detailed discussion with the industrial unit management personnels and relevant data were collected.

In tourism survey, the Investigator, visited the destination and made interviews personally with the willing respondents at the selected locations. In addition, the Investigator has made discussions with the people in the destinations, such as, businesspersons, native residents, and service providers to have an insight to various problems of the destinations.

These three schedules have given more insight to understand the functions of the system to the Investigator during data collection stage itself. Further, since the Investigator himself conducted the surveys, he gained a lot of insight about the overall functioning of the system, and was able to draw some conclusions based on observations.

1.15. ANALYSIS

After compilation, the data were checked for completeness and correctness, and errors or bias in the returns was eliminated by crosschecking, and subsequently, care

fully transferred into code sheets and further to a computer for analysis. The analysis is done by employing various tools and techniques as described below.

1.16. ANALYTICAL TOOLS AND TECHNIQUES

1.16.1. Analytical Tools

Relevant analytical tools, such as code sheets, softwares (SPSS, EXCELL, POWERSIM, etc.) were used for data processing, analysis and modeling.

1.16.2. Analytical Techniques

Relevant statistical techniques, such as, tabulation, correlation, multiple regression, and system dynamic models, etc., were employed based on the requirement of the present investigation.

1.17. APPLICATION OF THEORY

System Dynamics theory (Forester's W.J 1969) based on systems concept has been employed in this present investigation. In this present investigation, the study area has been considered as a system and achieving integrated development is considered as the major objective. The theoretical frameworks developed by various Scholars (61,88,132,197) are followed to establish the functions of the system for tourism and integrated development of the system since tourism activities function as a catalyst for development.

1.18. MODELING

System Dynamic models are developed and employed to understand the dynamic functions of the system for evolving a suitable planning model. POWERSIM software is employed to develop the System Dynamics model.

1.19. VALIDATION OF MODEL

The evolved system Dynamic model is validated to understand the reliability of the model for further investigation.

1.20. FORECASTING

The evolved and validated System Dynamics model is employed to project the various control parameters, such as, population, infrastructural facilities, resources, tourism potential, etc., and were incorporated in the model for developing the projected year model.

1.21. APPLICATION OF THE MODEL

Alternate plausible scenarios have been developed based on historical development, trend analysis, assumptions, etc., and the same have been tested in the projected year model for arriving at different feasible decisions.

1.22. RESULTS AND DISCUSSION

Results of all types of analysis, such as, literature review, primary household survey, industrial and tourism surveys, model results, and simulation results have been discussed in detail to arrive at plausible findings.

1.23. INFERENCES

The plausible inferences were drawn for evolving a set of feasible policies.

1.24. STRATEGIES AND RECOMMENDATIONS

A set of policy guidelines is prepared and recommended based on the results, discussions and inferences of this investigation for tourism and total development of the study area.

1.25. JUSTIFICATION OF THE STUDY AREA

The Study area considered for this investigation is bounded by the coastal region and flood plains of Orissa State. It is delineated for investigation based on its homogeneous physical and demographic characteristics; evenly spreading of tourist destinations, location of the settlements (districts) in one axis, and the reasonable communicable distance by road and railway from one end of the study area to the other end (about 350 KMs). It comprises of ten administrative districts such as, Balasore, Bhadrak, Cuttack, Ganjam, Jagatsinghpur, Jajpur, Kendrapara, Khurda, Nayagarh and Puri.

This study area contains most of the tourist related resources of the State and is thickly populated. It has tremendous potential for developing tourism industry due to its rich cultural heritage, availability of religious places, archeological sites, long and beautiful coastline with natural scenic beaches, wildlife sanctuaries, wild flora and fauna, largest backwater lake (Chilka), immigration of beautiful birds and tortoises (Olive riddle) from far corners of the world, hot springs, water falls, etc. It has also adequate resources and high-grade skill for craft based products. The region has fertile land, advantages of irrigation facilities for agriculture and horticulture development. Yet, this region is still economically, socially and physically backward, and need for careful attention. Under this situation, evolving an integrated development plan considering all aspects, such as, physical, social, economic, ecological and environment along with tourism development is inevitable requirement for the development of the study area, where tourism can play the role of a catalyst for comprehensive development of the area and contribute to the economy of the State. Having the above knowledge, the Investigator has chosen this particular region and this field of learning

for investigation. The existing condition of the Study area is presented in the Study area profile in the second chapter.

1.26. LIMITATIONS

The Investigator could conduct the survey of 247 household respondents, 51 industrial units and 100 tourist respondents only, which may be the miniatures of the total households, industrial units and tourists in the study area. The limited number of respondents was conducted due to several reasons, such as:

- Time Limit (Ph.D Research is time based)
- Limited availability of manpower for conducting the survey (the Investigator himself conducted the investigation, at the grass roots level which yields more advantages).
- The survey was conducted during the daytime only.
- The availability of secondary data before the year 1992 was limited due to the division of districts in the State and non-availability of proper documents at district level.

1.27. CHAPTER SCHEME

The thesis is organized in different chapters as follows:

Chapter One: Chapter one consists of Introduction, review of literature, Statement of Problem, Objectives, Scope, Concept, Research Methods, Limitations, Conclusion.

Chapter Two: Chapter two deals with the Study Area profile.

Chapter Three: Chapter three depicts the tourism scenario in the Orissa state and in the study area.

Chapter Four: Chapter four illustrates the analysis of Socio-economic, Physical, Environmental conditions of the System (study area).

Chapter Five: Chapter five deals with the Control Parameters, which decide the functions of the System and their functions pertaining to tourism Industry, Application of theory, development of functional models, and its application under various alternative conditions, Forecasting the demand and supply of infrastructure facilities in 2031 A.D., and the functions of the system in 2031 A.D., under alternative conditions.

Chapter Six: Chapter six deals result and discussions with Inferences, and Summery.

Chapter Seven: Chapter Seven concentrates on evolving a set of policy guidelines, recommendations and conclusion.
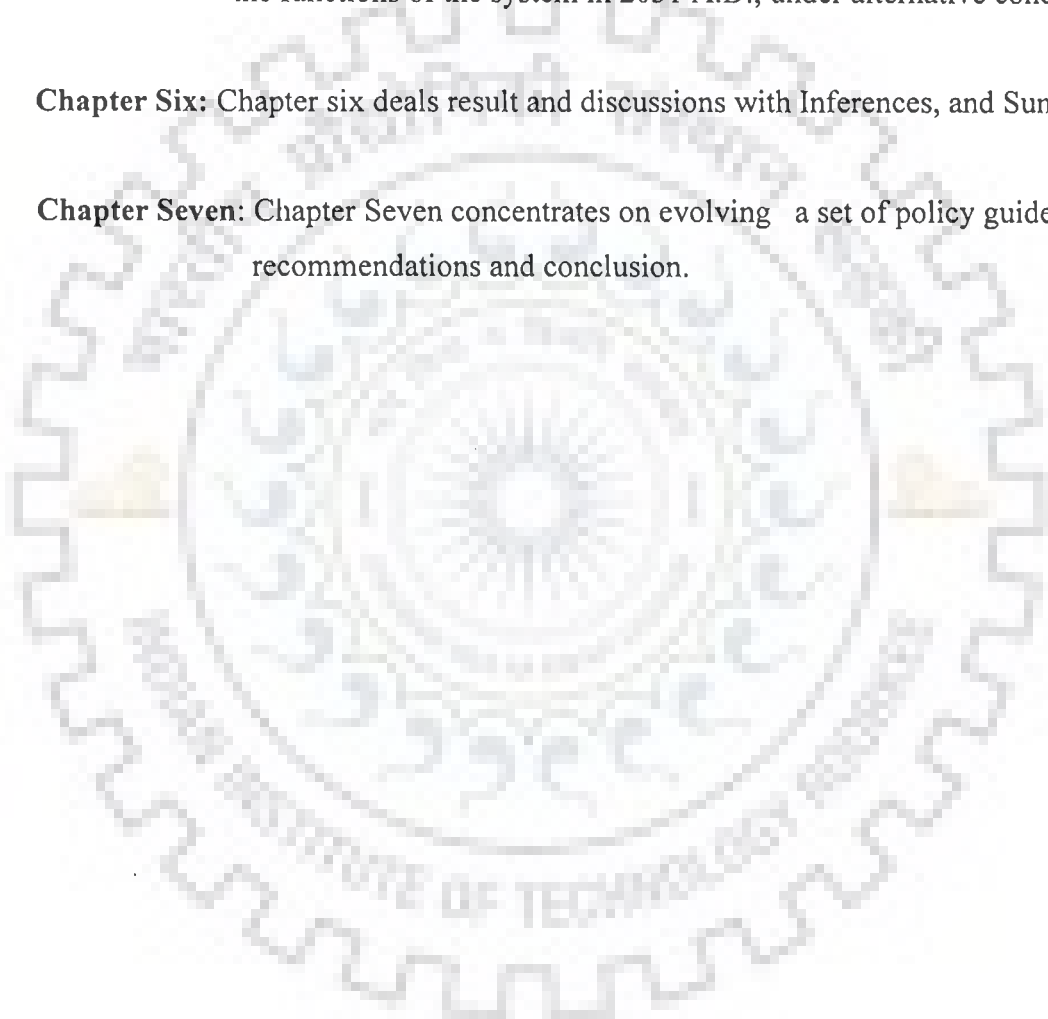
STUDY AREA PROFILE

2.0. INTRODUCTION

Investigation of the study area is very much essential for understanding the characteristics, prospects and problems of the system for successful planning. The study area chosen in this investigation is an important part of Orissa State, which is one of the 30 provinces of the democratic republic of India (Fig. No. 2.1)

The study area chosen for this investigation comprises of two geomorphologic regions of Orissa State, such as, the coastal plains, a portion of the river valleys and flood plains (Fig. Nos.2.2 and 2.3). It encompasses ten administrative districts of Orissa State namely, Balasore, Bhadrak, Cuttack, Ganjam, Jajpur, Jagatsinghpur, Kendrapara, Khurda, Nayagarh, and Puri. The major urban centers located in various districts of the Study area are Berhampur, Puri, Cuttack, Kendrapada, Balasore, Paradeep and the capital city Bhubaneswar (Fig. Nos.2.4 and 2.5).

In this Chapter, an attempt was made to investigate and understand the various parameters that influence the system, such as, demographic profile, socio-economic profile, which include various resources like agricultural, horticultural, aquaculture, industrial, mineral, tourism resources, etc.; social and physical infrastructure; ecology and environment; and various problems faced in the study area. The study area being an important part of the State and many parameters are having similar functions both in the State and in the study area, the investigation has been carried out in this regard taking the State and the study area together

Map of Orissa State

Legend

- ● District Headquarter
- ● State Capital
- ▭ State Boundry
- ▭ District

Map of India
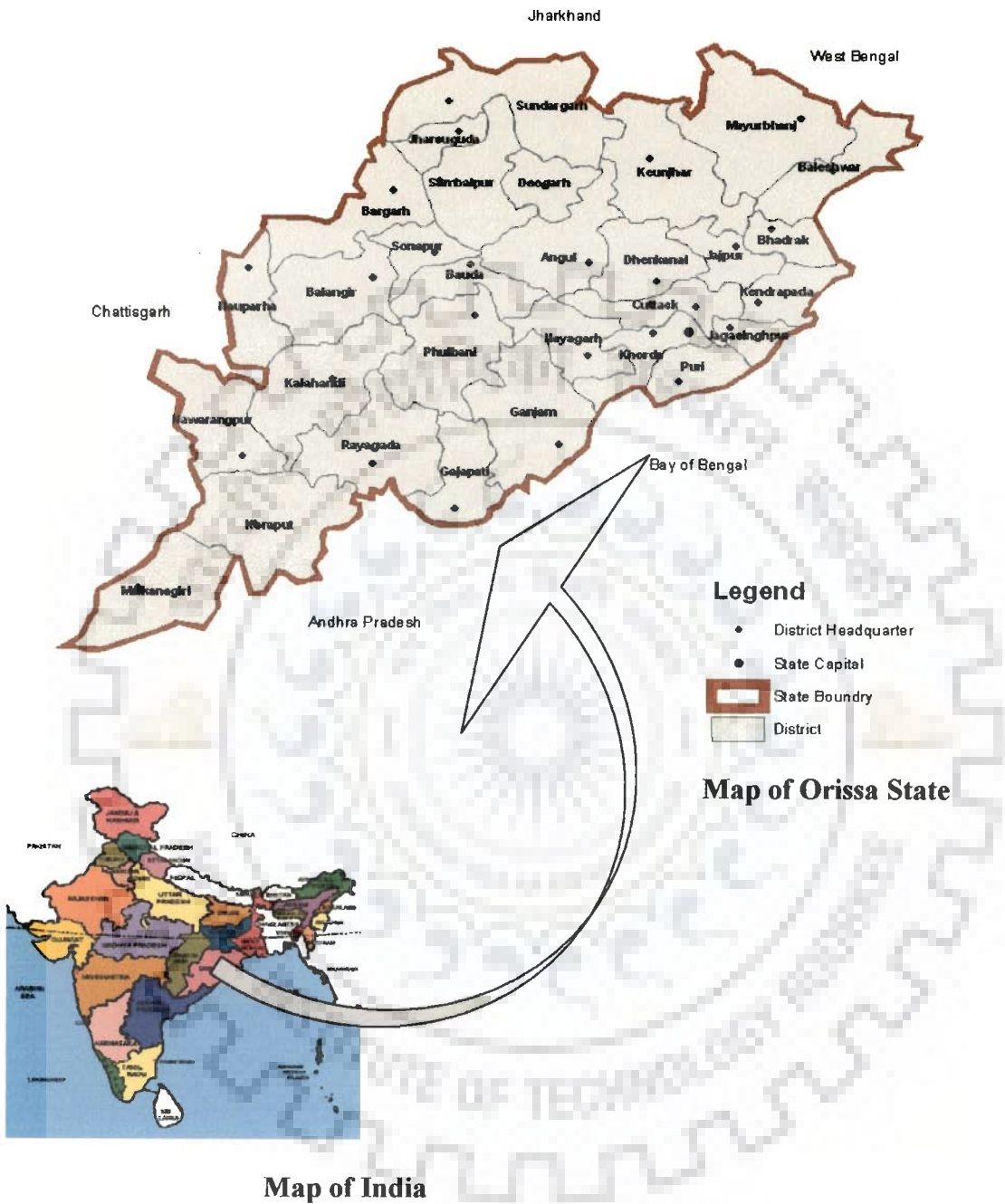
Fig. No.2.1: Location and Administrative Map of Orissa State
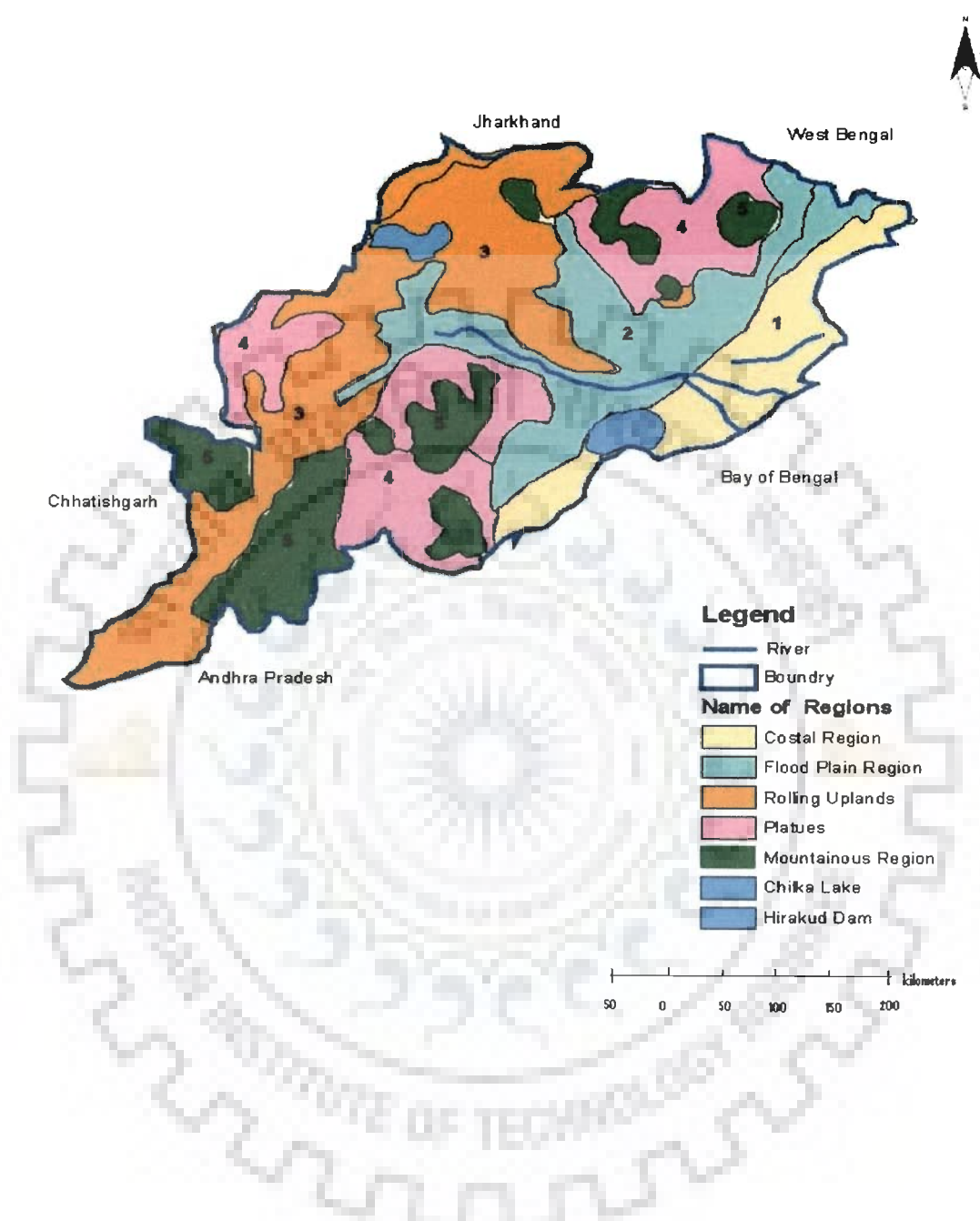
Fig. No. 2.2: Physiographic Regions of the Orissa State, India
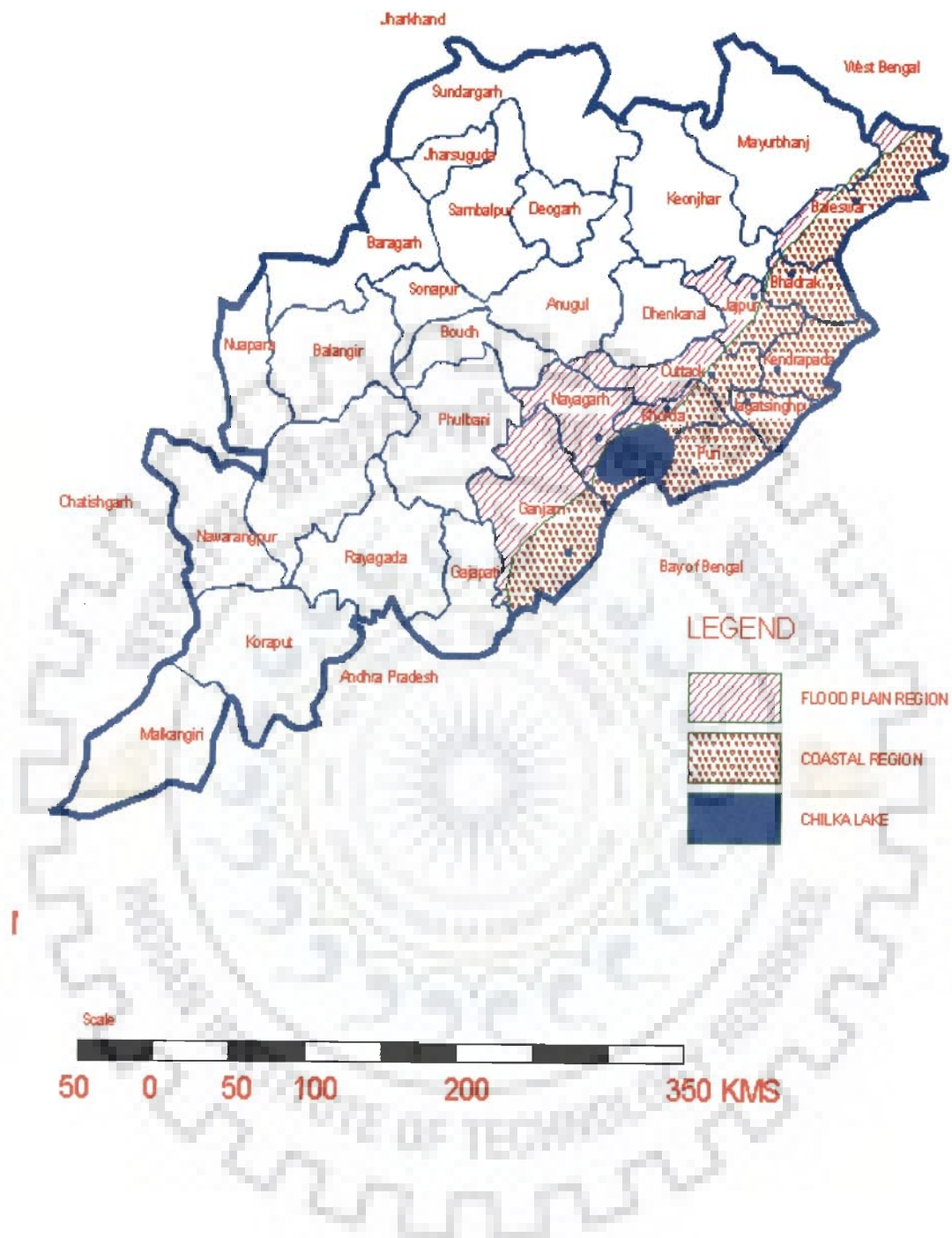
Fig. No. 2.3 Physiographic regions of the study area
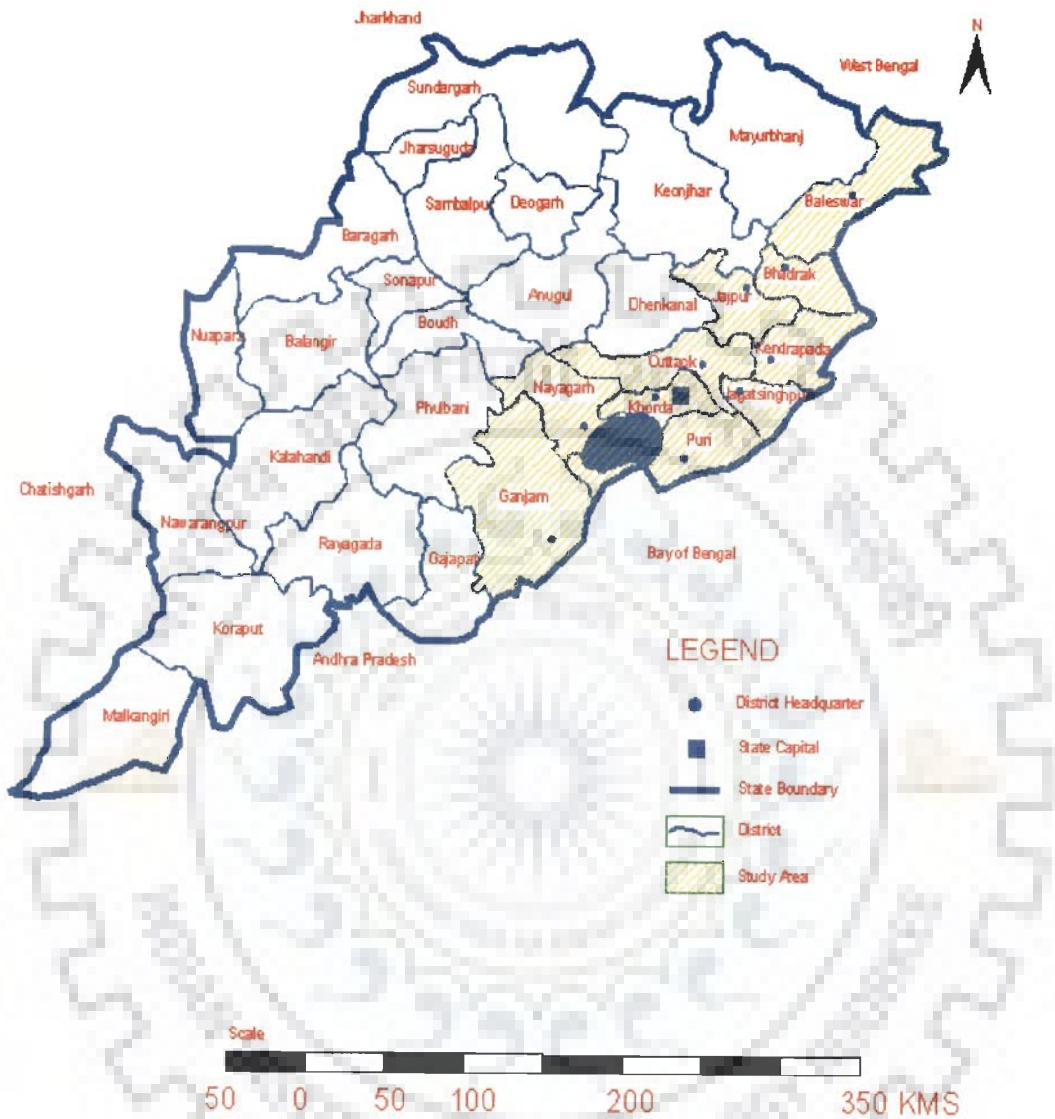
Fig. No. 2.4: The study area in Orissa State

West Bengal

Mayurbhanj

Keonjhar

Baleswar

Bhadrak

Anugul Dhenkanal Jajpur

Boudh

Kendrapada

Cuttack

Phulbani Nayagarh

Khurda Jagatsinghpur

Puri

Ganjam

Gajapati

Bay of Bengal

LEGEND

State Boundary

District

Sub Region 1

Sub Region 2

Sub Region 3

Scale

50   0   50   100   200   350 KMS
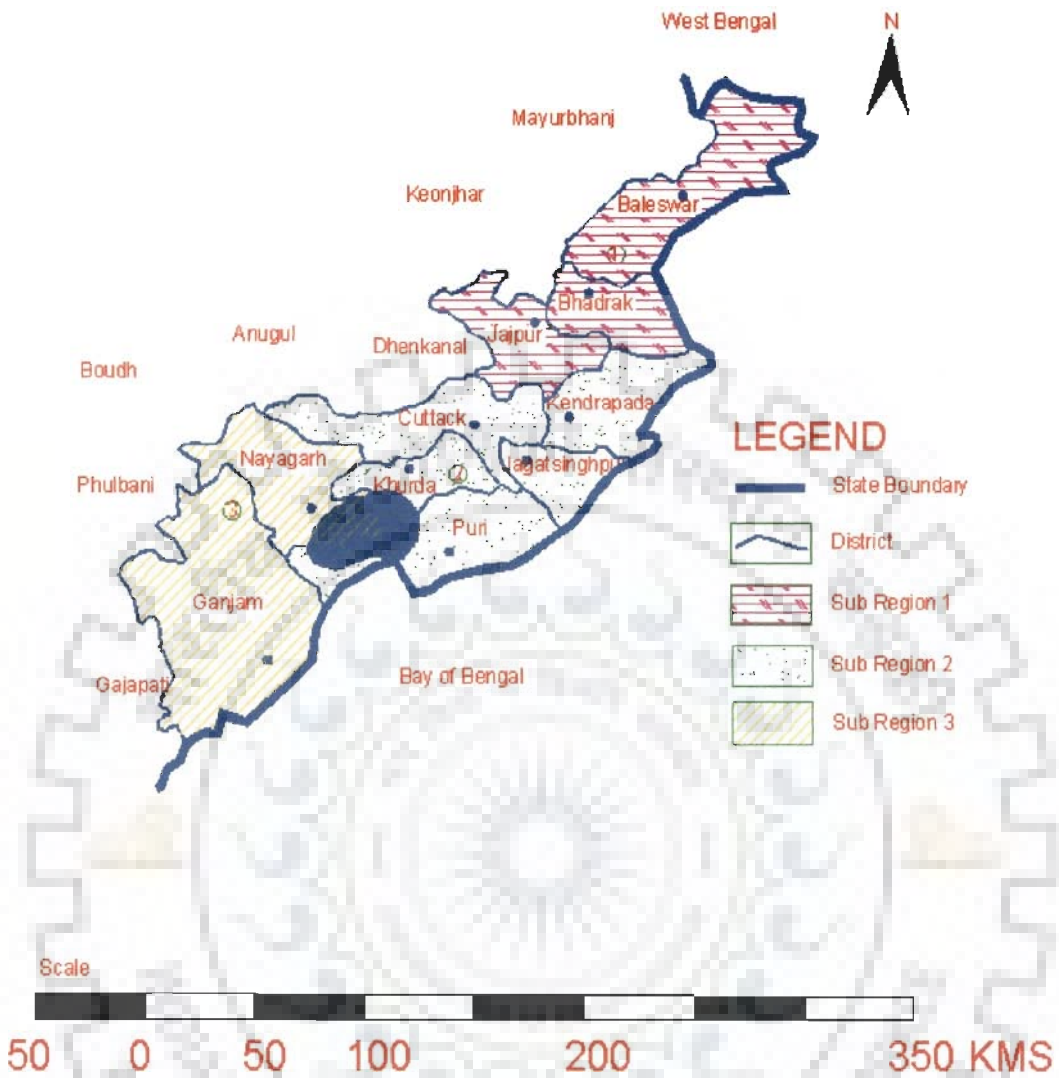
Fig. No. 2.5: Various sub-regions in the study area

2.1. BRIEF HISTORY OF ORISSA STATE AND THE STUDY AREA

The history of Orissa State dates back to the prehistoric period, as its most famous names Kalinga, Utkal and Odra. The political boundary of the Kalinga, Utkal or Odra had been different and sometimes far extended beyond the present one, over different periods of history. By the time of Mahabharata, Kalinga, Utkal and Odra had entered into the Aryan polity as powerful kingdoms, which is evident from the frequent reference of Kalinga and infrequent references of Utkal and Odra in the Mahabharat, one of the greatest epochs in Indian mythological era. The Kalinga- Utkal region on the entire East coast of India has acquired recognition and fame by the time of Mahavir and Buddha.

The political history of Orissa State openedup with the rule of Nanda, Emperor of Magadha as evident from Hathigumpha inscription of emperor Kharavela at Udaygiri, which refers to the Nanda king twice. When Chandragupta Mourya succeeded to the throne of Nanda, Kalinga was not a part of his empire. Later, in 261 B.C. emporer Asoka, the Magadha king invaded Kalinga, which had far reaching consequences. A battle was fought and it was described by Asoka himself in his thirteenth rock edicts, which records one hundred and fifty thousand men were carried away as captives from the kingdom, and as many as one hundred thousand were killed there in action and many times of that number perished. It is also said that Kalinga was conquered but the conquest had changed the heart of the emperor, and consequently changed the course of religion and cultural history of not only of India but also of the whole of the Asian continent.

Another great epoch of Orissa history was the period of Kharavela who ruled in the first half of the second century B.C. During this period, he had extended his empire by defeating the Satkarni in the West, the Musikas on the bank of river Krishna, the

Rasthrikas, the Bhojakas, the rulers of Rajagriha and Magadha. In the thirteenth year of his rule, he retired in Khandahiri near Bhubaneswar (now it is an integral part of Bhubaneswar city), which falls in the study area, and started to propagate Jainism.

The history of Orissa for several centuries after Kharavela is obscure. The Chinese traveler Hiuen Tsang's account reveals that Harsha Siladitya's political sway was extended to Orissa for sometime. According to Ptolemy, a Greek Geographer of second century A.D, flourishing trade marts were functioning in the Orissa coast. In the 8th century A. D., Orissa's overseas activities were at the peak when the Sailendra Empire in the present day Malayasia was established.

The Bhauma –Kara dynasty ruled over Utkal (the then name of Orissa) from the 8th to 10th centuries A.D. Oriya language began to take shape during this period. The Bhauma- Karas were followed by Somas and the Kesharis later to this period. The famous Lingaraj temple of Bhubaneswar was built by Yajati Keshari and completed by his successors during this period.

Anantavarma Chodagangadeva (1078-1191A.D.) of Ganga dynasty ruled over this region extending from Ganga (Northern region) to the Godavari (Southern region), which are two of the largest river systems of the country, by the end of 12th century A.D. He had shifted his capital from Kalinganagar (located in the present Gajapati district and part of undivided Ganjam district) to Cuttack (presently, the second largest city of the State).During this period Vaishnavism religion received royal patronage and Vaishnavite temples were built at Mukhingm, Shrikurmam, Simanchalam and the famous Puri Jagannath temple was completed.

In the 13th century, when Hindu architecture in the North faced its worst days of ravage and destruction, Orissan architecture reached its zenith and glory with the

construction of the famous Sun Temple at Konark by Narasimhadeva-1 (A.D. 1238-1264), which is regarded as the crowning glory of Hindu Architecture. Followed by, the first Surya King, Gajapati Kapilendradeva (1435-1466 A.D.) defeated the Muslim ruler of Bengal, the Hindu ruler of Vijayanagar, Kanchi, and the Bahamani Sultan and established Surya dynasty. Kapilendradeva had advanced to Bidar, the capital of Bahamani empire. During this period, the empire extended from the catchments of river Ganga in the North to the catchments of river Kaveri in the South. The Surya dynasty declined after the death of Prataprudradeva, the grandson of Kapilendradeva. The last independent king of Orissa Mukundadeva belonged to Surya dynasty was killed in 1568, while fighting the Afghans of Bengal. The death of Mukundadeva, made Orissa lost its independence and become the last Hindu Kingdom of India to fall to the Muslims.

The State was under the Moghul rule for a little over a century, and the Moghul empire declined after the death of Aurangzeb. The State then was passed under the rule of the independent Nawabs of Bengal.

In 1741, the Bhonsala king of Nagpur invaded Orissa under the leadership of Bhaskar Ram and the nawab (ruler) of Bengal Alivardi Khan was compelled to code the State to the Marathas, whose rule lasted until the British conquered in 1803.

On the other hand, within the two decades of Vasco-da-Gama's discovery of the sea route to India, the Portuguese had established a flourishing trade mart in Pipli, at the mouth of river Subarnarekha. The English had established trade settlements in Hariharapur and Balasore by 1633 A.D. In subsequent years, the Dutch, the Danes and the French appeared at Balasore and established their footholds. In 1757 A.D., after the battle of Plassey the legal title of Nawab of Bengal, Bihar and Orissa passed on to the English. In 1765 A.D., Shah Alam granted the East India Company the Dewani

(administration) of Bengal, Bihar and Orissa. Orissa was a small territory to the North of river Subrnarekha then. Lord Wellesley (1798-1805 A.D.) asked the Bhonsala king of Nagpur to enter into "Subsidiary Alliance" and the King refused. The Anglo-Maratha war resulted in the British conquest of Orissa in 1803.

The misrule of British administration in later years resulted in Paika (the warrior class) rebellion in Khurda region in 1817, and duly crushed by the British rule. The State remained under British rule as a part of Bihar and Bengal until 1936 A.D.

In the first April 1936, the Orissa State came into existence after being separated from the then Bihar State. After the attainment of independence of India, the princely states merged with the major unit in 1948 and the new Orissa State was formed with thirteen administrative districts. Again, in 1993, the earlier thirteen districts have been reorganized to make thirty districts for the easy and better administration. Before independence of the country under British Rule, Cuttack city was the State capital until the new capital Bhubaneswar was set up in 1951. In the ancient times, Cuttack city and Bhubaneswar city were the capital cities of different dynasties in different period.

However, despite the unstable and torrid administrative set up throughout the historic period, the State has carved a niche of it's own for its exquisite art, craft, culture, heritage and maritime, which is evident from the presence of archeological, sculptural and religious heritages in the State.

In this present investigation, the study area chosen for investigation, is comprised of old four coastal districts such as Cuttack, Puri, Ganjam and Balasore, which are further divided into ten districts in 1992-93. The study area being an integral

part of the State throughout, the history of the study area is no different from the Orissa State.

2.2. PHYSICAL ASPECTS

The Orissa State of India is located between the parallels of 17^0 $49'$ N and 22^0 $34'$ N latitudes and meridian of $81^0 27'$ E and $87^0 29'$ E longitudes. It is situated in the Eastern parts of India and is surrounded by the West Bengal State on the North East, the Jharkhand State on the North, the Chhatisgarh State on the West, the Andhra Pradesh State on the South and the Bay of Bengal on the East (Fig. No.2.1). The State has geographically and morphologically distinct and varied forms ranging from hilly girt region on one part to large flood plains; and long coastal belt on the other.

Based on homogeneity, continuity and physiographical characteristics Orissa State is divided into five natural regions, such as, the coastal plains, the river valleys and flood plains, the rolling uplands, the plateaus and hills and mountains (Fig. No.2.2). The coastal plains (up to 75 m in elevation) are formed by the alluvial deposits of six major rivers and their tributaries and distributaries flowing in the State. This region has a long stretch of plain land adjoining to 480 KM of coastline that covers ten districts of the State. The plains are narrow in the North, wide in the middle, narrowest in the Chilka lake coast, and again broad in the South. It constitutes a perennially green belt of fertile land watered by the rivers and canals. The river valleys and flood plains (75 m to 150 m elevation) are also the creations of the major rivers. The valleys and plains of the region are not continuous and scattered along the courses of the rivers. The rolling uplands are of undulating topography with the elevation varying between 100 m and 300 m. This region is situated in the sub mountainous zones having bedrock of hard soil and patches of forest to cover them partially. The plateaus including the subdued ones are the old Peninsular tablelands located in the hilly region, with elevation varying

between 305 m and 610 m. The topography is flat and interrupted by river valleys. The mountainous portions mostly are a part of the Eastern Ghats varying in elevation from 300 m to more than 1200 m and are densely forested.

The present investigation covers the coastal region and major flood plains regions since these two regions have more potential for tourism development (Fig. Nos. 2.3, 2.4 and 2.5).

2.3. CLIMATE

The study area has tropical climate, and is influenced by the South-West monsoon. Though the climate is characterized by high temperature from March to May, the region enjoys a very good and soothing climate during the other seasons of the year and suitable for traveling and tourism. Temperature varies from a minimum of about 15 degree Celsius in the month of December and January to maximum of about 45 degree Celsius in the month of April and May. The average annual rainfall is about 1500 mm. The maximum rainfall occurs between the months of June and August.

2.4. ADMINISTRATION AND SETTLEMENT COMPOSITION OF THE STUDY AREA

These ten revenue (administrative) districts of total thirty revenue districts of Orissa State, which constitute the study area, are divided into Subdivisions, Tehesils, and Villages for revenue administration. In addition, Community Development Blocks are created under subdivisions for facilitation of development activities. Again, after the adoption of Panchayati raj system, Orissa State adopted the three-tier system of local administration, such as, Zilla parisad at district level, Panchayat Samiti at Block level and Gram Panchayats at village level that look after the local administration and developmental activities. Apart from this, Municipal Corporations, Municipalities and

Notified Area Councils (NAC) form integral part of urban administration and involved in urban development activities.

The Table No. 2.1 illustrates the administration and settlement composition of Orissa State.

Table No. 2.1: Settlement composition

Sl. No.	Administrative districts	Area in Square Kilometers	Number of Sub divisions	Number of Tehesils	Number of Blocks	Number of Villages	Number of Municipalities	Number of NACs
		Settlement Composition						
1	Balsore	3806	2	19	12	1922	1	3
2	Bhadrak	2505	1	6	7	1307	1	1
3	Cuttack	3932	3	10	14	1967	2	2
4	Ganjam	8206	3	12	22	3171	1	17
5	Jagatsinghpur	1668	1	4	8	1391	1	1
6	Jajpur	2899	1	6	10	1781	2	0
7	Kendrapara	2644	1	6	9	1532	1	1
8	Khurda	2813	2	3	10	1567	3	2
9	Nayagarh	3890	1	4	8	1694	0	2
10	Puri	3479	1	5	11	1714	1	3
11	Study Area	35842	16	75	111	18046	13	32
12	Orissa State	155707	58	171	314	51057	35	68

Source: Statistical Abstract, Government of Orissa, 2002

Thus, the study area comprises of 10 Districts, 16 Subdivisions, 75 Tehesils, 111 Community Development Blocks, 18046 Villages and 45 Urban centers. The share of rural areas and urban areas in the study area to the Orissa State are 35.30 percentage and 43.70 percentage respectively. Bhubaneswar city, the state capital is located in this study area.

2.5. DEMOGRAPHIC CHARACTERISTICS

According to the Census of India 2001, the total population of the Orissa State is 36706920, which spread over the area of 155707 square kilometer. The population density of the State is 236 persons per square kilometer, which is much lesser than that of National population density, that is 324 persons per square kilometer. The study

area is having a population of 17051151 spread over the area of 35804 square kilometer bearing a density of 476 persons per square kilometer. The study area, having an area of 23.00 per cent of total area of Orissa State, accommodates about 46.40 per cent of population of the State. The density of population in the study area is almost two times that of the State. The birth rate and the death rate in the State are 23.10 per cent and 0.90 per cent respectively (Economic Survey, Orissa 2001-2002). The details of the population of the country, State and the study area are presented in Table No. 2.2.

Table No. 2.2: Demographic Characteristics 2001

Sl No	State	Demographic characteristics 2001				
		Population (Numbers)	Decadal growth rate (percentage)	Density of population	Sex ratio	Literacy (percentage)
1	India	1027015247	21.34	324	819	65.38
2	Orissa State	36706920	15.94	236	972	63.61
3	Study Area	17051151	16.63	476	962	69.41

Source: Census of India-2001

The table illustrate that India has a population growth of 21.34 per cent in the last decade (1991-2001). The State and the study area experienced the population growth of 15.94 per cent and 16.63 per cent respectively, which are lower than that of national growth. It is interesting to note that the population growth in the study area is almost same as that of the entire State in the last decade.

2.5.1. DECADAL GROWTH OF POPULATION IN ORISSA STATE AND IN THE STUDY AREA

The decadal growth of population in the State and in the study area is presented in Table No. 2.3 and Fig-2.3. Orissa State has experienced almost a steady growth, which is around 20.00 per cent since 1951 to 1991, and there is a decrease in growth rate from 20.05 per cent to 15.94 percent from 1991 to 2001. On the other hand, it is

observed that the growth rate in the Study area has experienced fluctuation. It has obtained a higher growth rate of 25.23 per cent from 1961 to 1971 and 31.83 per cent from 1981 to 1991, where as it is around 20.00 per cent in 1951 to 1961 and 1971 to 1981. However, this growth rate has drastically reduced to 16.63 per cent from 1991 to 2001, which is almost same as the growth rate experienced in the whole State. It is also observed that the population growth in the Study area is higher than Orissa State over the last six decades.

Table No. 2.3: Decadal Population growth in the State and in the Study area

Sl No.	Year	Orissa	Percentage change over last decade	Study Area	Percentage change over last decade
1	1951	14645946	-	6044980	-
2	1961	17548846	19.82	7282968	20.48
3	1971	21944615	20.02	9120434	25.23
4	1981	26370271	20.16	11089146	21.58
5	1991	31659736	20.05	14619158	31.83
6	2001	36706920	15.94	17051151	16.63

Source: Census 2001, India
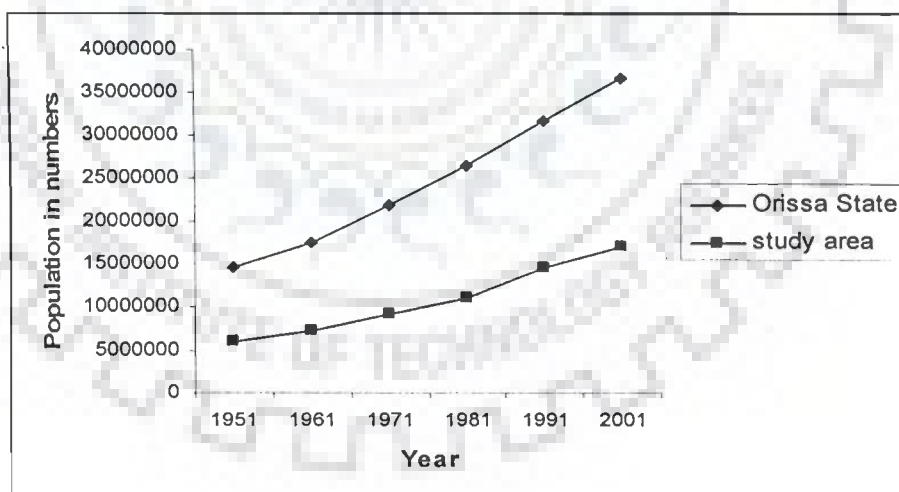
Source: Census 2001, India

Fig. No. 2.6: Decadal Growth of Population in Orissa State and in the study area

2.5.2. Detailed Demographic Characteristics of the Study Area 2001

A detailed account of the demographic features of the various settlements (districts) of the study area is presented in the Table No. 2.4.

It is found that the decadal growth in the certain districts such as, Balasore (19.24 per cent), Bhadrak (20.47per cent), Khurda (24.79 per cent) and Jajpur (17.08 per cent), have experienced higher rate of growth than the State and the study area as a whole. The districts like Nayagarh (10.39 per cent), Jagatsingh pur (13.15 per cent), Kendrapara (13.25 per cent) and Cuttack have experienced lesser growth rate in the last decade.

Table No. 2.4: Detailed Demographic Characteristics of the Study Area 2001

SI No	Districts	Area in sq. km.	Detailed Demographic Characteristics of the study area 2001					
			Population in nos.		Decadal growth (per cent)	Density (persons/ sq.km)	Sex ratio	literacy rate (per cent)
			1991	2001				
1	Balasore	3806	1696583	2023056	19.24	532	949	70.94
2	Bhadrak	2505	1105834	1332249	20.47	532	973	74.64
3	Cuttack	3932	2053192	2340686	14.00	595	938	76.13
4	Ganjam	8206	2704056	3136937	16.01	382	1000	62.94
5	Jagatsinghpur	1668	933789	1056556	13.15	633	962	79.61
6	Jajpur	2899	1386177	1622868	17.08	560	973	72.19
7	Kendrapara	2644	1149501	1301856	13.25	492	1014	77.33
8	Khurda	2813	1502014	1874405	24.79	666	901	80.19
9	Nayagarh	3852	782647	863934	10.39	222	939	71.02
10	Puri	3479	1305365	1498604	15.27	116	968	78.4
11	Study Area	35804	14619158	17051151	16.63	476	962	69.41
12	Orissa State	155707	31659736	36706920	15.94	236	972	63.61

Source: Census of India-2001

2.5.2.1. Population density

The overall population density of the study area is 476 persons per square kilometer, which is found to be two times of that of the Orissa State as a whole, and well above the national population density. This population density also varies among various districts of the study area. It ranges from 116 persons per square kilometers to 666 persons per square kilometer. Puri district and Nayagarh districts have the lowest

81

density of 116 and 222 persons per kilometer respectively, where as Khurda district has the highest density of 666 persons per square kilometer, followed by jagatsighpur district with 633 persons per square kilometer.

2.5.2.2. Literacy

The literacy rate is considered as one of the major indicators of quality of life and is responsible for urbanization process. The literacy rate in Orissa State is 63.61 per cent which is little lower than the national literacy rate (65.38 per cent), where as the study area possesses a little higher literacy rate, i.e., 69.41 per cent. The Khurda district has the highest literacy rate of 80.19 per cent, and the Ganjam district has the lowest literacy rate of 62.94 per cent. The literacy rate in other regions ranges from 70.94 per cent to 79.61 per cent. The detailed literacy rate of the study area is presented in Table No. 2.5.

Table No. 2.5: Literacy Rates (district wise)

Sl No	Districts	Area in sq. km.	Population 2001	literacy rate		
				Male	Female	Total
				Per cent	Per cent	Per cent
1	Balasore	3806	2023056	81.75	59.57	70.94
2	Bhadrak	2505	1332249	85.44	63.62	74.64
3	Cuttack	3932	2340686	85.46	66.19	76.13
4	Ganjam	8206	3136937	78.39	47.7	62.94
5	Jagatsinghpur	1668	1056556	88.96	69.94	79.61
6	Jajpur	2899	1622868	82.69	61.45	72.19
7	Kendrapara	2644	1301856	87.62	67.29	77.33
8	Khurda	2813	1874405	88.38	71.06	80.19
9	Nayagarh	3852	863934	83.23	58.1	71.02
10	Puri	3479	1498604	88.73	67.8	78.4
11	**Study Area**	35804	17051151	85.06	63.27	69.41
12	Orissa	155707	36706920	75.95	50.97	63.61

Source: Census of India-2001

The table illustrates that the male literacy rate in the State (75.95 per cent) and in the study area (85.06) are well above the female literacy rates of Orissa State (50.97

82

percent) and the study area (63.27 per cent) respectively. It is observed that there is less variation in both male literacy rate and female literacy rate among the districts of the study area.

2.5.2.3. Sex ratio

The sex ratio in the study area (962) is little lower than the Orissa State (972) and are well above the national sex ratio (819). It is observed that the sex ratio in Khurda district is the lowest (901) and in the Kendrapara district it is the highest (1014). This is due to male migration to the capital city of Bhubaneswar, which is a part of Khurda district. In other regions of the study area, the sex ratio varies marginally.

2.5.2.4. Religion

Hinduism is the predominantly practiced religion in the State. The concentration of Hindus is about 92.00 per cent, followed by Christians (1.70 per cent), Muslims (1.50 per cent) and Buddhists (0.04 per cent). However, it is a land of religious tolerance and harmony.

2.6. URBAN RURAL COMPOSITION

Orissa State is predominantly rural in its character. As per the Census of India 2001, the level of urbanization in the State is about 14.97 per cent, and in the study area it is 16.64 per cent, which are much lower than that of national urbanization level (27.79 per cent). It is observed that in the study area the urbanization varies considerably. The district wise analysis shows that the Khurda district is highly urbanized (42.93 per cent), followed by the Cuttack district (27.4 percent), the Ganjam district (17.15 per cent) and the Puri district (13.59 per cent). The high level of urbanization in the Khurda and Cuttack districts is due to the presence of State capital

Bhubaneswar and Cuttack city respectively. Other districts of the study area are highly rural with the urbanization level varying between 4.28 per cent and 10.88 per cent. The details of urban and rural composition in terms of population and settlements are presented in Table No. 2.6 and in Table No. 2.7 respectively.

Table No 2.6: Urban Rural Composition (population in numbers)

Sl No	Districts	Area in sq. km.	Population				
			Nos.			Per cent	
			Urban	Rural	Total	Urban	Rural
1	Balasore	3806	220194	1802862	2023056	10.88	89.02
2	Bhadrak	2505	140950	1191299	1332249	10.57	89.43
3	Cuttack	3932	641577	1699109	2340686	27.40	72.6
4	Ganjam	8206	538191	2598746	3136937	17.15	82.85
5	Jagatsinghpur	1668	104321	952235	1056556	9.87	91.13
6	Jajpur	2899	72945	1549923	1622868	4.49	95.51
7	Kendrapara	2644	74128	1227728	1301856	5.69	94.31
8	Khurda	2813	804775	1069630	1874405	42.93	57.03
9	Nayagarh	3852	37052	826882	863934	4.28	95.72
10	Puri	3479	203802	1294802	1498604	13.59	86.41
11	**Study Area**	**35804**	**2837935**	**14213216**	**17051151**	**16.64**	**83.36**
12	Orissa State	155707	5496318	31210602	36706920	14.97	85.03

Source: Statistical Abstract, Orissa, 2002

Table No. 2.7: Rural Urban Composition (Settlements)

Sl .No	Administrative districts	Area in Square Kilometers	Number of Villages	Number of Municipalities	Number of NACs	Total urban areas
1	Balsore	3806	1922	1	3	4
2	Bhadrak	2505	1307	1	1	2
3	Cuttack	3932	1967	2	2	4
4	Ganjam	8206	3171	1	17	18
5	Jagatsinghpur	1668	1391	1	1	2
6	Jajpur	2899	1781	2	0	2
7	Kendrapara	2644	1532	1	1	2
8	Khurda	2813	1567	3	2	5
9	Nayagarh	3890	1694	0	2	2
10	Puri	3479	1714	1	3	4
11	**Study Area**	**35804**	**18046**	**13**	**32**	**45**
12	Orissa State	155707	51057	35	68	103

Source: Statistical Abstract, Orissa, 2002

The study area possesses 45 numbers of urban centers of the total 103 numbers (43.7 per cent) of urban centers in the State. The two of the largest urban centers Bhubaneswar and Cuttack are confined in the study area. It is observed that the urbanization level in study area a little higher than the State urbanization level, however it is highly rural in nature and most of the major urban centers lie in this study area.

2.7.   ECONOMY

Orissa State comprises of 4.74 per cent of India's land mass and 36.70 million people (Census India, 2001) and accounts for 3.57 per cent of the country. About 85.00 per cent of the population live in the rural areas and depend on primary sector, i.e., mostly on agriculture in the State. The Study area encompasses 23.00 per cent of the land area, which inhibit about 46.50 per cent of total population of the State. About 83.00 per cent of the population of the Study area live in rural areas and depend on primary sector as the major occupation. Thus, the primary sector dominates the State and in the study area as a whole. However, efforts are being taken to enhance the secondary sector since the early nineteen eighties in the form of industrial activities. It is also observed that the tertiary sector dominates in the urban areas of the State. The primary sector, i.e., agriculture and its allied activities contributes 28.13 per cent of the Net State Domestic Product of the State (Orissa Economic Surveys, 2003-2004). In the secondary sector the share of manufacturing sector is 7.88 per cent and shows an erratic trend over the years (Orissa Economic Surveys, 2003-2004). Mining is another activity that dominates the State and contributes largely to the State income but this activity is negligible in the study area except the Jajpur district.

2.7.1. The State Income

The Gross State Domestic Product (GSDP) at constant prices of Orissa State increased from Rs.18,5366.60 millions in 1993-94 to Rs.255390.10 millions (quick estimate) in 2002-03 at 1993-94 prices, showing a compound annual growth rate of 3.62 per cent over the period. The Net State Domestic Product (NSDP) commonly known as State income increased from Rs.161848.80 million in 1993-94 to Rs.218619.10 million (quick estimate) in 2002-03 at 1993-94 prices. The per capita income at constant prices (1993-94 prices) has been estimated at Rs.5836.00 in 2002-03 against Rs.4896.00 in 1993-94. The increase in Net State Domestic Products (NSDP) is mainly attributable to the increase in State Domestic Product (SDP) of tertiary sector. It is noted that the per capita income in the State is the second lowest in the country.

The Land use and various economic activities practice in the State and in the study area are described as below:

2.7.2. Land Use

Characteristic features of the land are important parameters in a regional setting. In the regional perspective, the land uses indicate the productivity of the various land uses for different purposes, such as, agricultural and non-agricultural, forest, etc. The land uses pattern in the study area and in the State is presented in Table No. 2.8.

Table No. 2.8: Land use pattern (Area in '000ha)

Sl No	Land use Pattern	Land use area		Share of study area to Orissa state in per cent
		study area	Orissa state	
1	Forest	748.00 (21.21)	5606.00 (36.00)	13.34
2	Trees and Grooves	112.00 (3.17)	774.00 (4.97)	14.47
3	Permanent Pastures	102.00 (2.89)	534.00 (3.42)	19.1
4	Culturable waste	109.00 (3.09)	445.00 (2.85)	24.49
5	Land put to non agricultural use	388.00 (11.00)	838.00 (5.35)	46.3
6	Barren and Unculturable	92.00 (2.60)	618.00 (3.96)	14.88
7	Current fellow	113.00 (3.20)	345.00 (2.21)	32.75
8	other fellow	73.00 (2.07)	336.00 (2.15)	21.72
9	Net area sown	1788.00 (50.70)	6075.00 (39.01)	29.43
10	Total Area	3525.00 (100.00)	15571.00 (100.00)	22.63

Source: Statistical Abstract, Orissa, 2002
Note: The numbers in the parentheses indicate the percentages of area of respective land uses to the total area.

It is observed that the share of land area of the study area is 22.63 per cent to that of the State. The net shown area in the study area is 29.43 per cent of the State, and the net shown area in the study area and in the State are 50.70 per cent and 39.01 per cent of total land area respectively. The area under forest is low (21.21 percent) in the study area compared to that of State forestland area (36.00 per cent). It is also observed that the land area under nonagricultural use, barren, current fallow and other fallow constitute about 46.30 per cent and 14.88, 32.75 percent, 21.72 per cent respectively to that of State, which is quite significant for availability of land for other non agricultural development activities in the Study area.

2.7.3. Agriculture

The contribution of agriculture to economic development lies in providing more food to rapidly expanding population, increasing the demand for industrial products and thus necessitating the demands for secondary and tertiary sectors of the economy, providing additional foreign exchange for the import of capital goods for development through increased agricultural exports, increasing rural incomes to be mobilized by the

State, providing productive employment and improving the welfare of the rural people. In addition, the increased agricultural surplus is a great stimulus for industrial development. Thus, agriculture largely influences the functions of a system.

Agriculture and its allied activities particularly animal husbandry sector continue to be the mainstay of the Orissa State's economy with a contribution of 28.13 per cent to Net State Domestic Products and is the most important component of Orissa State's economy. In order to understand the functioning of this sector in the State and in the study area, it is discussed here under various categories, such as, operational land holding, operational land area, area under production, total crop production, etc.

2.7.3.1. Operational land holdings

The operational holding position in the State and in the study area is presented in Table No. 2.9

Table No. 2.9: Operational Land Holdings (in '000 numbers)

Sl No..	Districts	Operational Land holdings					
		Marginal <1.0 ha	Small 1.0-2.0 ha	Semi medium2.0-4.0 ha	Medium 4.0 - 10.0 ha	Large >10.0 ha	Total
1	Balasore	125.80	53.30	24.00	6.50	0.40	210.00
2	Bhadrak	85.80	34.20	20.90	5.50	0.30	146.70
3	Cuttack	73.10	39.90	15.90	2.90	0.20	132.00
4	Ganjam	228.80	64.50	29.70	7.60	0.60	331.20
5	Jagatsinghpur	60.50	36.20	13.60	2.20	0.10	112.60
6	Jajpur	52.70	35.20	18.90	4.80	0.20	111.80
7	Kendrapara	60.80	37.30	18.80	4.30	0.20	121.40
8	Khurda	82.70	27.90	10.00	1.90	0.10	122.60
9	Nayagarh	74.40	35.40	8.60	4.30	0.10	110.80
10	Puri	96.30	25.80	12.80	4.80	0.20	144.80
11	**Study area**	**940.90**	**389.70**	**173.20**	**44.80**	**2.40**	**1543.90 (38.92%)**
12	Orissa State	2145.20	1106.30	543.80	155.90	15.20	3966.40
13	Share of different landholdings in the study area (Per cent)	60.90	25.24	11.20	2.90	0.02	100.00
14	Share of different landholdings in Orissa State (Per cent)	53.60	27.89	13.71	3.93	0.38	100.00

Source: Economic survey, 2003-2004, Orissa

According to the Agricultural census of Government of Orissa State, 1995-96, the State has 3.996 million operational landholdings, of which small and marginal holdings accounted for 81.97 per cent while the remaining 18.03 per cent is confined under semi-medium, medium and large holdings. The study area accounts for about 38.92 per cent of the total operational land holdings. The marginal and small holdings comprise of about 86.14 per cent and remaining 13.86 per cent is confined under semi-medium, medium and large landholdings.

2.7.3.2 Operational land area

The operational land area in the State and in the study area is presented in Table No. 2.10

Table No. 2.10: Operational Land Area

Sl.No.	Districts	Operational Land Area					
		Marginal <1.0 ha	Small 1.0-2.0 ha	Semi medium2.0-4.0 ha	Medium 4.0 - 10.0 ha	Large >10.0 ha	Total
1	Balasore	562.00	751.00	660.00	376.00	75.00	2424.00
2	Bhadrak	389.00	477.00	556.00	301.00	35.00	1758.00
3	Cuttack	362.00	544.00	422.00	154.00	40.00	1522.00
4	Ganjam	1024.00	885.00	775.00	416.00	151.00	3251.00
5	Jagatsinghpur	319.00	515.00	371.00	117.00	16.00	1338.00
6	Jajpur	283.00	500.00	500.00	256.00	41.00	1580.00
7	Kendrapara	310.00	518.00	494.00	230.00	46.00	1598.00
8	Khurda	380.00	380.00	262.00	99.00	15.00	1136.00
9	Nayagarh	334.00	466.00	231.00	228.00	15.00	1016.00
10	Puri	438.00	360.00	326.00	281.00	35.00	1448.00
11	Study area	4401.00	5396.00	4597.00	2458.00	469.00	17321.00 (33.67%)
12	Orissa	10641.00	15217.00	14513.00	8643.00	2425.00	51439.00
13	Share of land area in different landholdings in the study area (Per cent)	25.40	31.16	26.55	14.19	2.70	100.00
14	Share of land area indifferent landholdings in Orissa State (Per cent)	20.68	29.58	28.22	16.80	4.72	100.00

Source: Economic survey, 2003-2004, Orissa

It is observed from the table that the study area has about 33.67 per cent of the total land area of the State. About 50.26 per cent of the total operated area is owned by the small and marginal farmers and the remaining 49.74 per cent is owned by the semi-medium, medium and large farmers in the State. About 56.56 per cent of the total operated area in the study area comes under the ownership of small and marginal farmers and remaining area of 53.44 per cent are confined under semi-medium, medium and large farmers. This reveals that majority of the farmers of the study area belongs to low landholding and have low operational land area.

2.7.3.3. Agricultural production

Agricultural production including food grains have fluctuated over the years in the State. The prime reason behind this fluctuation is the occurrences of natural disasters like drought, flood and cyclone situation in the State, which are experienced almost alternately in every year. However, the area under agriculture has remained constant over the years. The share of various crops in the study area and in the State are presented in Table No. 2.11.

Table No. 2.11: Area under Crops in the Study area and in Orissa State
(In ' 000 ha)

Sl. No.	Crop	Area		Percentage share of Study area to State
		Study area	Orissa State	
1	Paddy	1584.00 (79.26)	4434.00 (72.57)	35.72
2	Total cereals	1597.59 (79.96)	4638.81 (76.70)	34.43
3	Total pulses	189.76 (9.49)	554.69 (9.07)	34.21
4	Total food grains	1787.35 (89.45)	5193.5 (84.96)	34.41
5	total oilseeds	42.83 (2.14)	338.75 (5.54)	12.64
6	Total vegetables	113.44 (5.67)	356.19 (5.82)	33.48
7	Sugarcane	7.87 (0.39)	16.78 (0.27)	46.9
8	Total spices	32.92 (1.64)	129.39 (2.11)	25.44
9	Total Fibers	13.97 (0.69)	78.1 (1.27)	17.88
10	Total	1998.00 (100.00)	6112.71 (100.00)	32.69

Source: Statistical Abstract, Orissa, 2002
Note: The figures in parentheses are the percentages of the respective crop areas with respect to total crop area

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It is observed from the table that the shares of study area under different crop areas in the State, such as, total cereals, total pulses total food grains, total oilseeds, vegetables, sugarcane, spices, and fiber crops account to 34.43 per cent, 34.21 per cent, 34.41 per cent, 12.64 per cent, 33.48 percent, 46.9 per cent, 25.44 per cent, and 17.88 per cent respectively. It is found that cultivation of food grains dominates the State (84.96 per cent) and in the study area (89.45 per cent). It is also observed that the paddy crop (79.26 per cent, 72.57 per cent) is the major crop followed by pulses (9.45 per cent, 9.07 per cent) and vegetables (5.67 per cent, 5 82 per cent) both in study area and in the State respectively. In the cereal category paddy is the dominating crop, which accounts to 1584.00 ha (99.14 per cent) and 4434.00 ha (95.58 per cent) in the study area and the State respectively.

An investigation regarding the Production of various crops were attempted to find the most important crops in the study area. For the said purpose, the annual production of crops as per the available data for the year 2002 has been considered and presented in Table No. 2.12.

Table No. 2.12: Production of Crops in the Study area and in Orissa State
(All crop production in '000M.T.)
(Fiber crop in '000 bales)

Sl. No.	Crop	Production of crops		Percentage share of Study area to State
		study area	Orissa State	
1	Paddy	2009.00	4614.00	43.54
2	Total cereals	2019.80	4767.78	42.63
3	Total pulses	55.13	208.11	26.49
4	Total food grains	2074.90	4975.89	41.69
5	Total oilseeds	31.50	125.68	25.06
6	Total vegetables	1153.30	3337.27	35.55
7	Sugarcane	458.19	963.92	47.53
8	Total spices	43.75	178.25	24.54
9	Total Fibers	68.10	246.52	27.62

Source: Statistical Abstract, Orissa, 2002

The study area produces about 42.63 per cent of total cereals, 43.54 per cent of paddy, 26.49 per cent of pulses, and 41.69 per cent of total food grains of the total production of such crops of the State. The share of production of oilseeds, vegetables, sugarcane, spices and fiber crops are 25.06 per cent, 35.55 per cent, 47.53 per cent, 24.54 per cent and 27.62 per cent respectively. Paddy is the major constituents of the total cereal production both in the study area and in the State and accounts to 96.86 per cent and 92.72 per cent respectively. Thus, paddy, pulses and vegetables are most cultivated crop in the study area. The contribution of sugarcane production in the study area (47.53 per cent) to the State sugarcane production is also significant.

2.7.4. Horticulture

The different agro climatic zones help Orissa State and the study area favourably for horticulture development. The major thrust areas identified by the State are cultivation of commercial fruits crops, use of hybrid vegetable seeds, propagation of off-season vegetable cultivation, establishment of bio-centers of production of quality planting materials, installation of drip irrigation system, etc. The mango, coconut, citrus, banana, papaya, pine apple are the major crops in the State. The total area under the horticulture crops in the State is 289.66 thousand hectares, of which mango (113.11 thousand ha) and coconut (53.33 thousand ha) constitutes 39.06 per cent, and 18.41 per cent respectively. The production of mango, banana, citrus, pineapple, papaya and coconut are 402.91 M.T, 234.63 M.T., 189.99 M.T., 10.76 M.T., 219.54 M.T and 205.50 million nuts per year. Most of the banana and coconut are produced in the study area.

2.7.5. Irrigation

Irrigation is of paramount importance for agricultural activities. In Orissa State and in the study area, the absence of irrigation facilities results in the over dependency

of agricultural activities on monsoon. The erratic nature of monsoon makes the agricultural production fluctuate widely from year to year. However, appreciable steps are being taken by the Government of Orissa in creating adequate irrigation facilities in the State. In the Orissa State, sources of irrigation are categorized into major and medium irrigation, minor flow irrigation and minor lift irrigation potential. The irrigation potentials developed up to the year 2002 are presented in Table No. 2.13.

Table No. 2.13: Source wise Irrigated Area (Area in '000 ha)

| SI .No | Region | source wise irrigated area | | | |
		major and medium	minor flow	minor lift	total
1	Study Area	899.00 [65.38] (53.60)	181.00 [13.16] (34.80)	295.00 [21.45] (54.83)	1375.00 [100.00] (50.29)
2	Orissa State	1676.00 [61.30]	520.00 [19.01]	538.00 [19.67]	2734.00 [100.00]

Note: 1.The numbers in the square bracket indicate share of different
2. Sources of irrigation to the total irrigation area in the respective areas. The numbers in the parenthesis indicate the share of study area under different sources of irrigation to that of the State
Source: Statistical Abstract Orissa, 2002

In the year 2001-02, the net irrigation potential created from all sources in the State is 2734.0 thousand hectares and in the study area is 1375.00 thousand hectares, which are about 44.73 per cent and 68.81 per cent of total crop area respectively. The irrigation potential in the study area is about 50.29 per cent of the State potential. It is also observed that the major and medium irrigation potential (65.38 per cent) are the prime sources, followed by the minor lift irrigation (21.45 per cent) and the minor flow irrigation (13.16 per cent) in the study area.

2.7.6. Animal Resources

Animal husbandry plays an important role in providing and supplementing income in rural households. The populations and animal husbandry production are two important parameters considered to understand the status of animal resources in the

study area. The populations of various livestock in the State and in the study area are presented in Table No. 2.14.

Table No. 2.14: Position of Animal Resources (in numbers)

Sl No.	Types	Study area	Total State	Share of study area to State
1	Indigenous cattle	4838321 (90.69)	12898275 (93.36)	37.51
2	Cross breed cattle	466806 (8.75)	865615 (6.26)	53.92
3	Exotic Cattle	29942 (0.56)	42549 (0.38)	70.38
4	Total Cattle	5334554 (100.00)	13810439 (100.00)	38.63
5	Indigenous buffalo	308478 (94.47)	1356765 (97.74)	22.73
6	Improved Buffalo	17637 (5.53)	31259 (2.26)	56.41
7	Total Buffalo	326095 (100.00)	1388024 (100.00)	23.48
8	Sheep	525832	1779367	29.55
9	Goat	1837202	5879723	31.24
10	Pig	67100	601917	11.11
11	Poultry	6311068	18437782	34.23

Note: the figures in parentheses show the per cent of different animal resources to total animal resources
Source: Live Stock census 2001, Government of India.

It is found that the study area has 38.63 per cent of total cattle population, 23.48 per cent of total buffalo population, 29.55 per cent of sheep population, 31.24 per cent of goat population, 11.11 per cent of pig population and 34.23 per cent of poultry population of the State. It is observed that in the study area, the shares of improved variety of cattle, such as, cross breed cattle and exotic cattle are 8.75 per cent and 0.56 per cent as against 6.26 per cent and 0.38 per cent of the State. Similarly, the improved variety of buffalo in the study area is 5.53 per cent of the total buffalo population compared to 2.26 per cent of the State.

The production of animal husbandry products are presented in Table No. 2.15.

Table No. 2.15: Production Animal husbandry products

Sl No.	Products	Study area	Orissa State	Share of Study area to State in Per cent
1	Milk (in '000 M.T.)	449.88	875.33	51.39
2	Egg (Millions nos.)	332.65	730.29	45.54
3	Meat ('000 M.T)	16049	38386	41.8

Source: Statistical Abstract Orissa, 2002, Government of Orissa

The milk production in the study area is 449.88 thousand M.T., meat production is 16049 thousand M.T., and egg 332.65 million numbers. The share of milk, egg and meat are significant compared to the Orissa State, and accounts to 51.39 per cent, 45.54 per cent and 41.80 per cent respectively.

2.7.7. Fisheries

Fish resources and potentialities of the study area and in the State can be profitably harnessed and can help to earn substantial foreign exchange. This sector is also gradually drawing attention as an important field of employment and income generation. The position of annual production of fish is presented in Table No. 2.16.

Table No. 2.16: Production of Fish (in '000 M.T.)

Sl No.	Category of Fish	Study area	Orissa State	Share of the study area to region in per cent
1	Fresh water	56.12 (29.45)	125.11 (48.20)	44.85
2	Marine	121.08 (63.54)	121.08 (46.65)	100.00
3	Brackish water	13.34 (7.01)	13.34 (5.15)	100.00
4	Total	190.54 (100.00)	259.53 (100.00)	73.41

Source: Statistical Abstract, Orissa, 2002

The State has 666.00 thousand ha of fresh water area, 418 thousand ha. of brackish water area, 480 kms of coast line and 24000 KMs. of continental self area, which provides excellent scope for fish production. The largest natural Indian brackish water lagoon 'Chilka lake' measuring an area of 79000 ha. is located in this State ,

which is also part of the study area. The study area accounts to 100 per cent of the marine water and brackish water area of the State.

About 44.85 per cent of the fresh water fish and 100 per cent of marine fish and brackish water fish of the State are produced in the study area. In the study area, marine fish production accounts for about two third (63.54 per cent) of the total fish production, followed by fresh water (29.45 per cent) and brackish water (7.01 per cent). It has been observed that about 82000 M.T. (in 2001-2002) of fish is transported to other States and also exported to other countries from the State. Thus, fishery has the potential to become an important economic activity in the study area and in the State.

2.7.8. Mineral Resources

Mineral resources form the backbone of any State's industrial development. Orissa State is bestowed with vast quantities of varieties of mineral deposits and occupies an important place in India's mineral map. According to the All India Mineral Resources estimates 2002, reserves of major minerals like chromite, nickel, bauxite, iron ore, and coal in the State are 98.40 per cent, 95.11 per cent, 70.40 per cent, 26.50 per cent, 24.37 per cent respectively of the total deposits of India. Other important mineral deposits that are available in the State are china clay, fireclay, limestone, quartz, precious and semi precious stones, copper, manganese, titanium, vanadium. Most of the important minerals deposits are located in the regions other than the study area. The minerals, such as, Chromites, Iron ore, Quartz and Quartzite are found in Jajpur district and Fire clay is found in Cuttack district in the study area. This reveals that the study area is not rich in mineral resources though most of the exports are done through the Paradeep port, which is located in the study area.

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2.7.9. Trade and Commerce

The contribution of trade and commercial activities at national level is very meager in export activities. At the grassroots level (in the study area), considerable amount of service based trade and commercial activities are functioning, and it occupies a major place in its social and economic function. The major centers of the study area are bestowed with very good connectivity, which is a major requirement for better trade and commercial activities. All the urban areas and administrative headquarters are engaged in various kinds of trade and commerce activities, such as consumer goods, agriculture products, food, textile products, and other industrial and manufacturing products. In the few particular centers, such, as Pipili, Raghurajpur, etc., selling of craft based products are the major trade and commerce activity. The Cuttack city and Bhubaneswar city are the two major commercial centers in the study area, dealing with multifarious products. Cuttack city is regarded as the commercial capital of Orissa State, and is known for wholesale trade activities.

The study area is also blessed with products with high export value. Marine products, such as, Frozen Shrimps and Prawns, Prawn seeds; Dried fish; Handicraft products, such as, Stone works, Appliqué works, Coir products, Wood works, etc.; Handloom products, such as, Silk, Cotton; Gems and jewelry, Agricultural and Horticultural products, such as, Non Basamati rice, Cashew nuts, Betel leaves, Coconut, etc., are transported from the study area to the other parts of the country and also exported to other countries. The Paradeep port is involved in exporting mineral and industrial products to foreign countries. Apart from this, Bhubaneswar airport is declared as custom airport, which helps in export and import activities for the study area.

2.7.10. Industry

Industrial activities are highly essential for the development of any economy. The availability of vast mineral resources, abundance raw materials, comfortable power situation and sufficient skilled manpower make the State a potential destination for industrial development.

In Orissa State, various industries are categorized into Food & Allied, Chemical &Allied, Electrical & Electronics, Engineering & Metal based, Forest &wood Products, Glass & Ceramic, livestock and leather products, Paper & Paper products, Rubber & Plastic, Textiles, Miscellaneous Manufacturing and repairing Services. Apart from the above, handicraft industries are also observed in the State.

The industries are categorized according investment, such as, Large Scale, Medium Scale, Small Scale, and Cottage and Tiny industries.

Large number of public sector industries like Rourkela Steel plant, National Aluminum Company (NALCO), Indian Charge Chrome Ltd, Paradeep Phosphates, and coal-based power plants in Talcher, Kanhia, under Public sector have been set up in the State. In the private sector also a number of large scale industries such as, Metal and Ferro Alloys, Iron & Steel Chemicals, Oil, Energy sectors, etc., are also being set up. The study area does not possess any mineral-based Large Scale industries but the corporate offices are located in the Capital city of Bhubaneswar, which is an important part of the study area. At present, the State has 358 large and medium industries with an investment of Rs. 35847.10 million and employment potential of 85777 persons. However, small-scale, village and cottage industries form important components of industrial development in the State and in the study area.

The position of number of small-scale industries, employment and investment is presented in Table No. 2.17.

Table No. 2.17 Position of Small Scale industries

Sl.No	Items	Orissa State	Study area	Share of Study area in Per cent
1	No of Industries	74133.00	34031.00	45.90
2	Employment ('000Nos.)	468.00	218.08	46.60
3	Investment (Million Rupees)	18695.70	9815.24	52.50

Source: The Industrial compendium, Directorate of Industries, Orissa, 2002

There are 74133 number of small scale industries with an investment of 18695.70 million rupees and employment potential of 468.00 thousand numbers located in the State out of which about 45.9 per cent of industries are located in the Study area. The share in investment and employment potential of study area to the State are 52.50 per cent and 46.0 per cent respectively.

2.10.1.1. Handicraft and cottage industries

Handicrafts are a part of Orissa State's rich cultural heritage. These are mainly works of art, skill and beauty, designed and shaped by hand with creative imagination of Crafts persons. Orissa State endowed with varieties of crafts based on superb skill and art. In the State, there are as many as 49 crafts are practiced providing employment opportunities to about more than 100 thousand artisans. These artisans produce handicrafts goods valued over 70000.00 million rupees annually. In the study area, of the 49 crafts practiced in the State, Applique works, Silver filigree, Golden grass works, Art textile, Stone Carving, Sea shell works, Coir crafts, Brass and Bell metal works, Cane and Bamboo works,, Pattachitra, Terracotta, Carpet, Wood carving, etc., are being practiced.

In the cottage industry sector, there are about 158.40 million cottage industries have been set up in the State by the year 2002, with an investment of Rupees 7200.00 million and total employment provision of 275.10 million.

Thus, handicrafts and cottage industries form an important component of industrial economy of the State and study area as well.

2.7.11. Employment

The increase in population and consequent addition to the labour force result the supply of labour outstrip the demand and emphasizes the problems of unemployment and under employment. Thus, employment is an important factor in the economy of the study area. The employment positioning the State and in the study area is presented in Table No. 2.18.

Table No. 2.18: Employment Position

Sl No.	Area	Total workers		Cultivators		Agricultural labourers		Workers in household industry		Other workers	
		No	per cent of population	No.	per cent of total workers	No.	per cent of total workers	No.	per cent of total workers	No	per cent of total workers
1	Study area	5579582 (39.09)	32.71	1549194 (36.55)	27.76	1628199 (32.55)	29.18	200655 (29.11)	3.59	2231534 (51.35)	39.99
2	Orissa State	14272764	38.89	4238347	29.69	5001075	35.04	689173	4.83	4344169	30.44

Note: The values in the parenthesis indicate the share of the study area to the State.
Source: Economic Survey, Orissa 2003-04,

In Orissa State, the occupational classification as per census 2001 shows that the total workers in the State account to 14272764 numbers constituting 38.89 per cent of total population. The workers comprise of cultivators (29.69 per cent), agricultural labourers (35.04 per cent), household industries workers (4.83 per cent) and other workers (30.44 per cent). The proportions of male workers to male population, and female workers to female population in 2001, stand at 52.75 per cent and 24.72 per cent respectively.

The study area has 5579582 numbers of total workers, which account to 32.71 per cent of the total population and 39.09 per cent of the total workers of the State. The workers include cultivators (36.55 per cent), agricultural labourers (32.55 per cent), workers in household industries (3.59 per cent) and other workers (39.99 per cent). It is observed that the employment in non-agricultural sectors in the study area is quite significant as compared to the State as a whole.

Growing unemployment particularly the phenomenon of educated unemployment is one of the burning problems of the State. It is estimated that, the backlog of unemployment at the beginning of the tenth five-year plan is 3686500.00 thousand-man days. It is predicted that with addition of 34054500.00 thousand man days to the labour force and employment generation of 354050000.00 man days during the tenth plan , the unemployment in the State may come down to 35551000.00 thousand m at the end of tenth plan (Economic Survey 2003-04).

The Government of Orissa State has accorded high priority for generation of employment opportunities through self-employment ventures in addition to employment in organized sector. Several new self-employment ventures have been launched in the State apart from the ongoing schemes in a bid to enlarge the scope of self-employment particularly for the educated youths. In this regard, activities like Tourism, Horticulture, Floriculture, Herbal plantation, Information technology, Cottage and handicrafts industries, etc., are considered having potential to support employment generation through self-employment.

2.8.   SOCIAL CHARACTERISTICS

2.8.1. Education

Education is an indispensable requirement for the development of human resources. It's a major factor, which decides the functions of the System. It is used as a tool to measure the social development of a nation. In the State and in the study area in particular, education plays a major role in its development.

The overall literacy rate in the state in 1951 was 15.80 per cent, and it was only 4.50 per cent among females. The overall literacy rate in the State has increased to 63.60 per cent and that of males to 75.9 per cent and for females 50.97 per cent, while the overall, male and female literacy rate in the Study area are 69.41 per cent, 85.06 per cent and 63.27 per cent respectively' as per census 2001. The high drop out rate in the primary school level especially in the tribal and inaccessible areas is a major factor for low educational level among females and persons belonging to scheduled tribes and scheduled castes.

Orissa State administration has taken a number of steps for advancement of education in the State at various levels. Obliging the constitution of India, the State provides free and compulsory education to all children up to the age of 14 years. Among other programs, UNICEF assisted Early Childhood Education, Universalisation of Elementary Education, for development of elementary education in the State. Similar programs such as, District Primary Education Programme (DPEP), is being implemented in the State for universalisation of primary education. Under Sarvasikhya Abhijan (SAA), attempts are made for community participation and monitoring of school system, while trying to universalize elementary education. Education Guarantee

Scheme and Mass Education are other schemes, which are functioning in the State for the above said purposes.

The secondary education and higher education have also been accorded equal priority in the State. In addition to the above, steps are taken to enhance vocational education at higher secondary level and technical education for creation of eligible and skilled human resources in the State.

The details of education infrastructure in the study area and in the State are presented in Table No. 2.19.

It is observed that the student teacher ratio in all levels of education in the study area are higher than the State. This reveals that the number of students enrolment in the study area is higher than the State. It is observed the share of schools and number of teachers in the secondary level (50.68, 54.18 per cent) and in higher education (47.03, 49.72 per cent) to that of State are significant, which manifests better educational infrastructural facilities in the study area. It is also observed that the per capita expenditure on general education is Rs.495.56 (Economic Surveys 2003-04), which is much lesser than the national average. However, the per capita expenditure in education is increasing steadily over the years from Rs.332.24 since 1997-98.

Apart from this, there are eight Universities available in the State, which includes one technological university and one Agriculture & technology university. They are:

- Utkal University, Bhubaneswar
- Sri Jagannath Sanskrit University, Puri, Orissa.
- Orissa university of Agriculture & technology, Orissa.

- Biju Patnaik University of Technology, Orissa.

- Fakir Mohan university, Balasore , Orissa.

- Utkal university, Bhubaneswar , Orissa.

- North Orissa university, Takatpur, Orissa.

- Berhampur university, Berhampur , Orissa.

- Sambalpur university, Sambalpur , Orissa.

Under technical education, there are 37 Engineering and Technology colleges, 10 technical schools, 15 management institutions, and 4 medical colleges available in the State imparting technical and medical education to more than 20000 students of the State as against only 4 Engineering colleges, 4 technical schools and 3 medical colleges in 1990s. This shows that the State is very much conscious about creation of skilled and better human resources in the State. It is also worthwhile to mention that most of these higher technological, medical and management institutions are located in the study area, thus putting the study area in an advantageous position from educational point of view.

2.8.2. Health Services

The National Health Policy aims at providing universal health care and access to medical services, covering preventive and curative aspects to all sections of the community to have a healthy and prosperous society. In the State, there are 180 hospitals, 158 community health centers, 184 primary health centers, 1166 new primary health centers and 13 mobile health units in the Government sector providing curative health services. There are also 5 ayurvedic hospitals, 519 ayurvedic dispensaries, 9 unani dispensaries, 6 homeopathic hospitals and 460 homeopathic dispensaries available in the State. In the study area, there are 78 hospitals, 57 community health

centers, 61 primary health centers, 519 new primary health centers engaged in health services in Government sector. In addition, there are four ayurvedic hospitals, 191 ayurvedic dispensaries, 2 homeopathic hospitals and 196 homeopathic dispensaries available in the study area. Apart from these, there are several hospitals and health clinics promoted by the private sector.

The family welfare program is being implemented by the State Government with the objective of population control, universal immunization and health care.

Table No. 2.19: Details of Educational Institutions, Teachers, Students and Teacher Student Ratio.

Sl. No.	Area	Primary Education				Secondary Education				Higher Education			
		No of Institutions	No of Teachers	Students	Teacher Student ratio	No of Institutions	No of Teachers	Students	Teacher Student ratio	No of Institutions	No of Teachers	Students	Teacher Student ratio
1	Orissa State	42104	114791	4710000	41.03	6165	51570	1100000	21.33	1367	18125	555000	30.62
2	Study Area	15812 (37.55)	38408 (33.45)	2198000 (46.67)	57.22	3125 (50.68)	26223 (50.84)	596000 (54.18)	22.78	643 (47.03)	8618 (47.54)	276000 (49.72)	32.02

2.8.3. Poverty Alleviation

The Planning commission, Government of India, estimates that about 48.01 per cent of rural population and 42.83 per cent of urban population live below poverty line in the State. This makes the State as one of the poorest States in the country. In order to overcome this problem of poverty, several antipoverty and wage employment programmes are being implemented in the State since 1980-81, to create income generating assets and employment on daily wage basis for identified target groups and enable them to cross the poverty line and also to improve the standard of living. The various poverty alleviation programmes that are in operation in the State in different periods are: Integrated Rural Development Programmes (IRDP), Development of women and Children in Rural Areas (DWCRA), Training of Rural Youth for Self Employment (TRYSEM), Supply of Improved Toolkits to Rural Artisans (SITRA), Ganga Kalyan Yojna (GKY), Million Well Scheme (MWS), etc. At present, all these schemes have been merged into a single new scheme known as "Swarnajayanti Gram Swarozgar yojna (SGSY)" since 1999. Another two employment generating Schemes, such as, Employment Assurance Scheme (EAS), and Jawahar Gramya Sadak Yojna (JGSY), were in operation in the State until 2001. The above two schemes now are merged into one scheme called as " Sampoorna Gramin Rojgar Yojna (SGRY)" with an objective to provide additional wage employment in rural areas, ensure food security, create durable and community assets, and develop infrastructure.

2.8.4. Development of Women

Women form an important element of the society. Conservative social attitudes in the State have not helped the State in women development for a long time. Understanding the

contribution of women highly necessary for socio-economic development, several welfare prgrammes are being implemented in the State. The various programmes include, setting up of women's training centers, provision of short stay homes for women, rehabilitative services for women in distress, provision of old age pension, etc. Apart from these above, provision of reservation of one third of the vacancies in public services of Orissa State Government Departments have been made to increase the number of women in public services. The erstwhile Development of Women and Children in Rural Areas (DWCRA) scheme has been merged with the new scheme "Swarnajayanti Gram Swarojgar Yojana (SGSY)" and also provisions have been made to benefit the women in getting employment under "Sampoorna Gramin Rojgar Yojna (SGRY)".

2.8.5. Welfare of Schedule Tribes and Schedule Castes

Scheduled castes (SCs) and Scheduled tribes (STs) together constitute about 38.41 per cent (22. 21 per cent STs and 16.20 per cent SCs) of the total population of the State. This segment of the society has remained socially and economically backward for a long time. Therefore, concerted efforts have been made under different plans in order to bring them into mainstream of development. Various special programmes and welfare measures have been launched for the benefit of this segment, which include legal aid, housing facilities, rehabilitation of victimized SCs and STs, establishment special employment exchanges, reservation in employment and special recruitment drive programmes.

The special approaches, such as, Tribal sub-plan approach and Special Component Plan for Scheduled Castes are also considered in different plans and allocations are earmarked for

such programmes of the total plan programmes of the State commensurate to the proportion of the Scheduled Tribe and Scheduled Caste population to the total population of the State.

2.9. INFRASTRUCTURE

Infrastructure is one of the most important parameters, which decides the functions of the system and also help for the development of the system. The quality and quantity of infrastructure available in the study area clearly establish the level of development of the system.

The infrastructure facilities that influence the social and economic condition of any system include transportation and communication, power, water supply, drainage system, sewerage system, waste disposal systems, infrastructures for education, health services, recreation, security and safety systems, etc.

The Investigator analyzed the available infrastructure services in the study area and in the State and presented as follows:

2.9.1. Transportation

Transportation is one of the most important parameters, which decides the functions of the system. Efficient transportation facilities function as a catalyst for the development of the system in achieving rapid economic development. The Orissa State and the study area are connected to the other parts of the country with all modes of transportation, such as, air, rail, road, and sea routes. The various parts of the State and in the study are mostly connected by rail and road transportation system.

2.9.1.1. Air transport

The State has one domestic airport for domestic traffic and is located at Bhubaneswar city, which is an integral part of the Study area. There are 13 airstrips in the State at present at different locations, such as, Rourkela, Sunabeda, Saraga, Chowdwar etc., and 16 helipads in addition to the air strips.. The Bhubaneswar airport has already been declared as a Customs Airport and proposed to be upgraded as International airport. All the commercial flights to and from the State are being operated from this airport, thus providing additional transportation advantages to the Study area. The Government of Orissa has provided 27.30 hectares of land free of cost for development and modernization of the airport. A few domestic airlines of the country including airlines in private sector ply daily flights connecting important cities of the country, such as, New Delhi, Mumbai, Kolkata, Chennai, Hyderabad, etc., with the State.

2.9.1.2. Rail transport

Railway is the cheapest mode of transportation in the State particularly in the study area is an important means of transportation for tourism development. The railway network in the State area is under the East coast railway zone of the country. The headquarter of this railway zone is located in Bhubaneswar city. At present, it is found that there are about 45 numbers of express & super fast express trains and several multiple diesel units are plying through the State and are involved in passenger movement inside and outside the study area and the State connecting State capitals and important cities of the country. In addition to the passenger movement, the goods movement is also managed through railway which include- transportation of petroleum products, natural gas, minerals, such as, coal, iron, industrial products like aluminum, steel, cement, etc., and food grains.

The railway route length in the State is about 2401 KMs (2328 KMs are under broad gauge), which has increased by 9.53 per cent from 1997-98. The total route length in the study area is 674 kms, which is about 28.07 per cent of total rail route length of the State. Most of the route lengths are under broad gauge. Further, a careful study of the trains plying through the State reveals that many of the important tourist destinations of the country and cities are not connected by direct railway link. It is also observed that many of areas and tourist destinations of the State are also not connected by railway network in the State. The available railway net work in the State is presented in Fig. No.2.7 and route length is presented in the Table No. 2.20.

Table No. 2.20: Road and railway route length in the State
(In KMs)

Sl.No.	Year	length of roads	Railway route length
1	1997	225939	2192
2	1998	226022	2192
3	1999	226266	2317
4	2000	226597	2317
5	2001	226846	2384
6	2002	230743	2384
7	2003	231034	2401
8	2004	231034	2401

Source: East Coast Raiway Zone, Bhubaneswar and
Directorate of Staistics and Economics , Bbubaneswar

The railway route length density in the study area per thousand square kilometer is only 18.82 Kms as compared to the State rail route density of 15.40 Kms. per thousand square Kms, which is also quite low. About 38.03 per cent of the railway stations of the State are located in the Study area. The track electrification in the state is under progress and till now, only 552 Kms in the State and 318 kms in the study area are electrified. The lower level of track electrification and the low railway route length density signify the backwardness of the State in railway transportation. The details are presented in the Table No. 2.21.

Table No. 2.21: Railway Network position in the Study area

Sl.No.	Items	Orissa State	Study area	Share of study area to State (Per cent)
1	Route length (Kms)	2401.00	647.00	28.07
2	Stations (No)	281.00	108.00	38.43
3	Track Electrification (Kms)	318.00	552.00	57.6
4	Density per '000 sq Kms	18.82	15.40	

Source: East coast Railway Division, Bhubaneswar, Orissa, 2001

Fig. No.2.7: Railway net work in Orissa State and in the study area

2.9.1..3. Road transport

The inadequacy of rail linkages in the State in general and in the study area in particular make the roads as the major means of transportation. The roads are classified into different categories in the State and are, National Highways, State Highways, Major District Roads, Other District Roads, Classified Village Roads, Village Roads, Panchyat Samiti Roads, Grampanchayat Roads, Forest Roads, and Municipal Roads (Urban roads). A detailed account of road lengths under various categories available in the State since the year 1997 is presented in Table No. 2.22 and Fig. Nos. 2.8 and 2.9.

The investigation of the road lengths over the years between 1997 and 2004 reveals that there is a considerable increase in National Highways and marginal increase in State highways, where as there is decline in Major District road and other district roads. This occurs due to the upgradation of such roads to higher level. In addition, it is observed that there is an increase in all types of rural roads, and they are very meager. Thus, there is only marginal increase observed in road lengths in the State over last few years.

In order to find the road length situation in the study area in the year 2004, an investigation pertain to road length under various road categories have been attempted and the result is presented in Table No. 2.23.

At present, there are 12 numbers of National Highways in the State covering a total length of 3193.00 kms passing through 25 districts of the State. In the study area, a number of National highways such as, NH-5 joining Mumbai and Kolkata, NH-42 joining Cuttack and Sambalpur, NH-60 joining Balasore- Laxmannath, NH-203A are passing through the area covering 681.00 kms. It is found that the study area and the State have only about 9.00 per cent

and 7.50 per cent of the total roads respectively under higher category, such as, National Highways, State Highways and Major District Roads, Other District Roads.
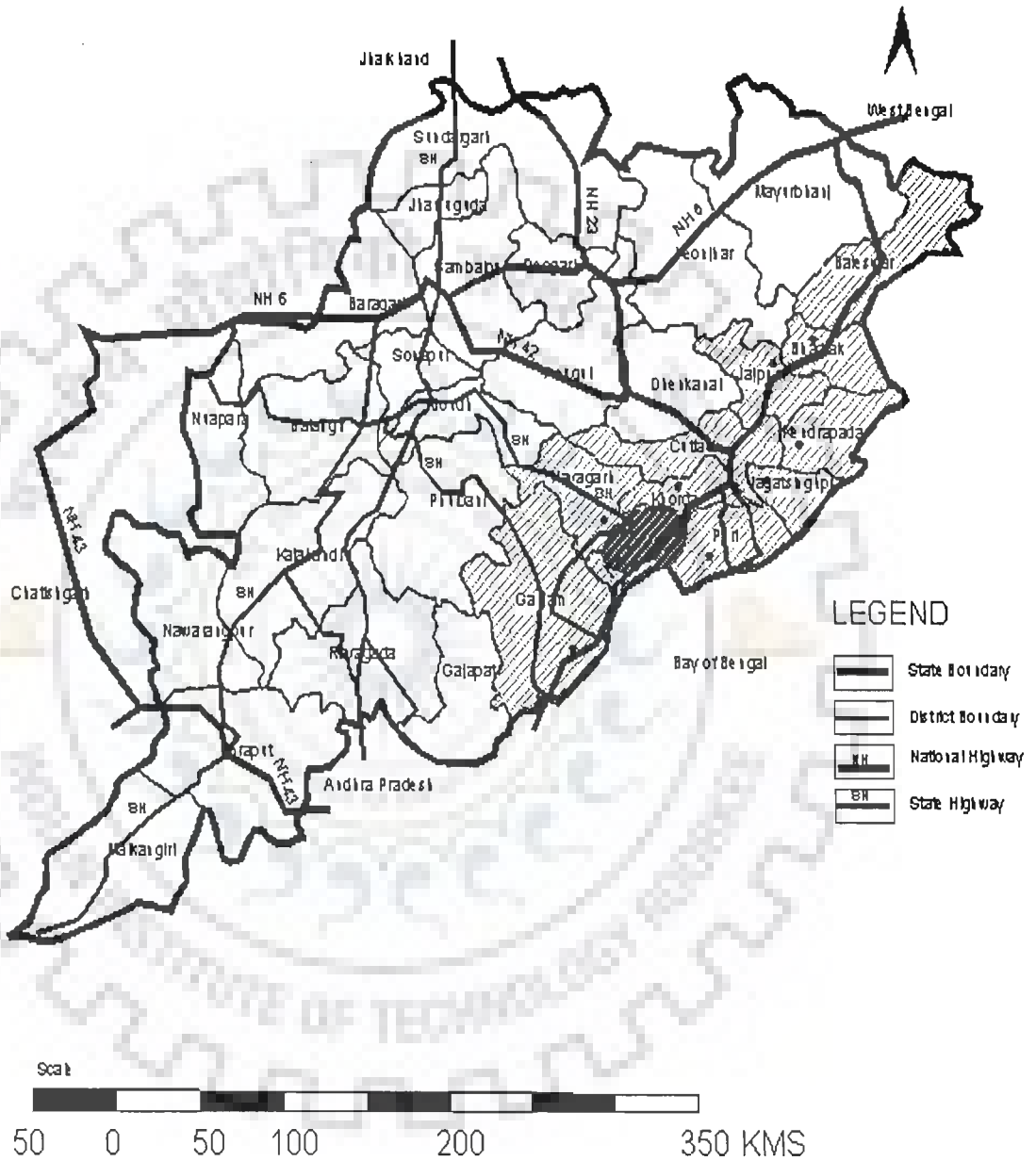
Fig. No.2.8: Major Road Networks in the study area and in Orissa State

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The major portion of road length belongs to other lower order roads of which Gram panchayat roads have the major share. This reveals that the lower qualitative development of road transportation system prevails in the study area as well as in the State.

It is also found that total road length in the State and in the study area are 231034.00 Kms and 71076.00 (30.68 per cent of the total road length of the State) Kms respectively. However, it is also observed that the density of road length in the study is higher (1983.00 km/ 1000 sq. Kms) than that of the State (1487.65 Kms/ 1000 sq. Kms). There are also attempts for quality improvement of roads in the State and study area as it is evident from up-gradation of certain stretches of National highways in the State. The NH stretch from, Sambalpur to Sundargarh on NH-6, Bhubaneswar to Cuttack on NH-5 have already been widened to four lanes system and the widening process of the stretch from Cuttack to Balsore is under progress.

Table No. 2.22: Length of different roads in Orissa (in KMs.)

Sl No.	Year	National Highways	State Highways	Major District Roads	Other District Roads	Classified Village Roads	Village Roads	Forest Roads	P.S. Roads	Grampnchayat Roads	Municipal Roads	Total
1	1997	1625	4406	4735	4750	4670	24552	7030	20426	139968	13777	225939
2	1998	1682	4564	4577	4755	4670	24552	7030	20427	139988	13777	226022
3	1999	1677	4564	4577	4767	4670	24572	7294	20380	139988	13777	226266
4	2000	2752	4638	3875	4666	4670	24572	7294	20380	139973	13777	226597
5	2001	2752	4970	3727	4445	4670	24843	7317	20372	139973	13777	226846
6	2002	2752	4970	3727	4445	4670	24970	7317	20393	140019	17480	230743
7	2003	2752	4970	3727	4445	4670	25183	7317	20417	140073	17480	231034
8	2004	3193	5014	3281	6138	3338	25027	7242	20324	139942	18132	231034

Source: Government of Orissa Department of Public works,Department of Rural Development, Department of Panchayati Raj and Department of Forest, (2004)
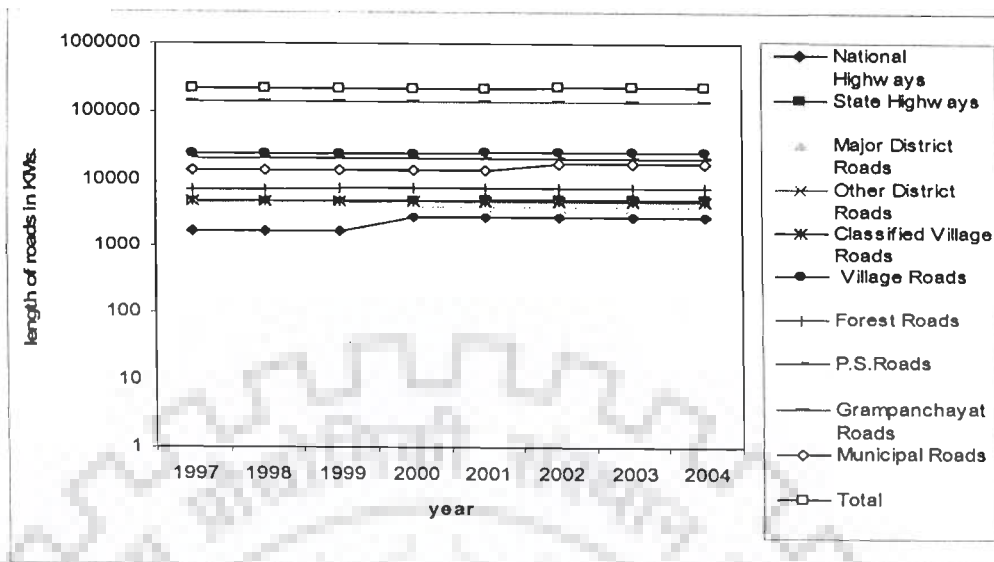
Note: Logarithmic Scale has been used

Fig. No.2.9: lengths of various roads in Orissa State

Table No. 2.23: Different types of roads in year 2004 (length in Kms.)

Sl.No.	Category of roads	Road Length		Share of study area to State
		Orissa State	Study area	Per cent
1	National Highway	3193.00 (1.38)	681.00 (0.95)	21.32
2	State highways	5014.00 (2.16)	1422.00 (2.00)	28.36
3	Major district roads	3288.00 (1.41)	1685.00 (2.37)	51.24
4	other District roads	6138.00 (2.64)	2587.00 (3.64)	42.14
5	Classified village roads	3338.00 (1.44)	1112.00 (1.56)	33.31
6	Village roads	25027.00 (10.80)	9585.00 (13.48)	38.29
7	Forest roads	7242.00 (3.12)	1408.00 (1.98)	19.44
8	P.S road	20324.00 (8.77)	6668.00 (9.38)	32.80
9	G.P road	139942.00 (60.18)	36792.00 (51.76)	26.29
10	Municipal roads	18132.00 (7.82)	9136.00 (12.85)	50.38
11	Total	231034.00 (100.00)	71076.00 (100.00)	30.76
12	Density (per '000sq.kms.)	1487.65	1983.03	

Note: Density in Kms/'000 sq. kms.
Number in the parentheses indicate the percentages of each category with respect to total in each area.
Source: Government of Orissa Dept. of Public Works, Dept. Rural Development, Dept. of Panchayati Raj,2004

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2.9.1.4. Vehicles

The number of motor vehicle on road of all categories in the State is 1121070 numbers in 2001 with a growth rate of 10.63 per cent over 1991. The numbers of vehicles in the State per square km were 2.00 and per thousand populations were 9.80, which have been increased to 7.20 and 29.90 respectively during 2001. It is also found that the largest number of vehicles registered is in Bhubaneswar (231242 numbers) region followed by Cuttack (143954). The vehicle registration positions in the State and in the study area are presented i Table No. 2.24. It is found that the passenger buses are very meager in both State (0.32 per cent) and in the study area (0.38 per cent) compared to other category of vehicles. The share of two wheelers occupy more than three fourth of total vehicles available in the State and in the study area. The availability of light motor vehicles in the State and in the study area is 8.60 per cent and 9.45 per cent respectively, which are quite significant. The availability of three wheelers are very low, i.e., 1.28 per cent in the State and 1.72 per cent in the study area of the total vehicles available in respective areas. It is also observed that the study area possess significant share of two wheelers (54.24 per cent), Light Motor Vehicles (59.82 per cent), Three wheelers (73.56 per cent)), Heavy Motor Vehicles (50.46 per cent), and Buses (63.86 per cent) of that of total availability of vehicles in the State. In overall calculation the study area possess about 54.45 per cent of total number of vehicles of the State.

Table No. 2.24: Number of Vehicles

Sl. No.	Types of vehicles	Study area	Orissa State	Share of Study area to State
1	Two Wheeler	462726 (78.18)	853084 (78.49)	54.24
2	Light motor vehicles	55927 (9.45)	93486 (8.60)	59.82
3	Three wheeler	10208 (1.72)	13876 (1.28)	73.56
4	Heavy Motor Vehicles	32785 (5.54)	64963 (5.98)	50.46
5	Buses	2248 (0.38)	3520 (0.32)	63.86
6	Others	27978 (4.73)	57962 (5.33)	48.26
7	Total	591872 (100.00)	1086891 (100.00)	54.45

Source: Statistical Abstract, Orissa, 2002
Note: The figures in parentheses indicate the percentages of the vehicle in different categories
to the total available vehicles

The vehicle availability and road density shows that the study area is little more developed than the other regions of the State. The availability of high percentage of two wheelers imply that most of the people in the State and in the study area live in low-middle income and middle income group, because generally low-middle and middle income group people used to have two wheeler for their mobility.

2.9.1.5. Seaports

Orissa has a long coastline, with Paradeep as the major all weather port. In addition, there are a number of small ports in the State, which offers tremendous opportunities for international trade. There is a proposal to set up an all weather port at Gopalpur that will enhance the export opportunities to State.

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2.9.1.6. Water transport

There are inland water transport services in the study area through motorized launches in different inaccessible areas being provided by Government of Orissa. There are eight such water routes in three sectors such as, Chandabali sector, Balugaon Sector and Astaranga sector.

2.9.2. Power

Power is one of the prime movers of any developed economy. Adequate and reliable power is indispensable for sustained growth of the economy. Consumption of power depicts the growth and development of any system. There is a strong correlation between per capita energy consumption and gross domestic product in various countries. This clearly indicates that power is one of the most important factors that decides the development of the system.

The State has installed capacity of 4621 MW and generates 1423 MW of power of which 12712 MW is generated from the State Sector, 97 MW from central sector and 55 MW is purchased from Captive Power Plants of different industries. It is observed that the generation is only 30.74 per cent of total installed capacity. The power generation in the State is from both the sources such as, Hydro and Thermal power projects. The installation capacity in the State in hydropower sector is 1918.0 MW and in Thermal power sector is 2633.0 MW and power generation in the above two sectors are 375 MW (26.38 per cent) and 1046.0 MW (73.62 per cent) respectively. It is observed that the State mostly depends on the thermal power generation. The demand of power in the State is increasing steadily due to growing industrialization, urbanization and rural electrification. The year wise demand and availability of power and consumption is presented in Table No. 2.25.

Table No. 2.25: Power position in Orissa State

Sl.No	Year	Installed capacity (MW)	Power generation or availability (MW)	Demand (MW)	Consumption (Million Units)
1	1997-98	4052	1162	NA	NA
2	1998-99	3905	1207	1234	5431
3	1999-2000	4020	1271	1270	5603
4	2000-01	4540	1405	1376	6090
5	2001-02	4621	1423	1367	5759

Source: GRIDCO, Orissa, 2001-2002

The per capita power consumption is 156.89 KWh as against the national average consumption of 360 KWh, which indicates the poorly developed environment in the State. However, it is found that the power generation is more than the power demand in the State and the installed capacity is much higher indicating the potential of the State in power sector.

Orissa is the first State and has been a pioneer among States in India in embarking on a comprehensive reform of the power generation industry of the State. The aim of the reform is to address the fundamental issues underlying poor performance of the Orissa State Electricity Board and restructure the power sector. The objective to make power supply more efficient, meet the needs of a growing economy and develop an economically viable power industry which will enable Orissa to attract private capital while safeguarding the interests of the consumers.

Orissa State is also making efforts in generating renewable energy and about 21.00 per cent (Rupees 6717.00 million) of the total plan outlay is being kept for investment in this sector. This signifies the priority given by the State in developing power sector.

The State also has accorded high priority to private sector investment in power generation. Accordingly, two more thermal power projects, which have installation capacity of

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total 5320 MW and another project by National Thermal power Corporation of installed capacity 2000MW have been planned and are expected to generate power during the tenth five year plan itself (2002-2007).

The State has also achieved electrification coverage of 80.01 per cent of inhabited villages (37597 villages electrified out of 46989 villages) through conventional and non-conventional energy source. The study area as such does not have much power problems except complains of qualitative service in terms of voltage fluctuation, load shedding and maintenance.

2.9.3. Communication

The telecommunication service network has gone major expansion in the State since nineteen nineties. At present, the long distance transmissions networks within Orissa State comprise are mostly fiber optic and digital microwave systems. The 12 long distance charging centers and 120 short distance-charging centers of Orissa State have been provided with reliable media, mostly optical fiber cable.

Total reliable media route kilometer in Orissa is about 12,500 km in 2001. Total number of exchanges with reliable media is 945 out 990 Switching.

All 800 Exchanges are Digital Electronics Exchanges with 0.4 million lines capacity & 0.37 working lines. Major cities have new tech switch with CCS-7 signaling & ISDN. TAX (Trunk Auto Exchange) at Cuttack is of OCB (Alcatel) type & ESWD (Siemens) types at Cuttack..

The number of telephone exchanges in the State is 1104 number, which are operated fully electronically with total consumers including cell phones, are 804,831 numbers. The telephone

connections at present are 21.9 per thousand persons as against National average of 9.0 per thousand persons.

Internet is available throughout the State from central ISP node at Bhubaneswar. All Secondary Switching Area headquarters, which are having co-terminus with 30 revenue districts with separate ISP nodes.

The State also encourages on line and e- transaction by way of creating public kiosks at important centers of the State.

The postal service is supplemented with additional courier services by private operators. At present, there are 8159 post offices in the State out of which 7556 post offices are located in rural areas, providing good postal connectivity in the State. The number of post offices per 100 square kilometer in the State is 5.2 and average number of post offices available in the State per million populations is 222. All the qualitative and premium postal services such as, Speed post, Express Parcel post, Mass mailing Service, Corporate money order service and Satellite mail service are available in the State.

2.9.4. Water Supply

Water supply and quality of drinking water supply are also considered as important points to measure the development of any system. In the State as well as in the study area, efforts are being made to provide drinking water supply through urban water supply schemes and rural water supply schemes in respective areas. Under rural water supply programme, out of 46989 inhabitant villages in the State and 18046 villages in the study area are covered through tube wells, sanitary well and spring based water supply schemes. In areas, which are not suitable for provision of drinking water through tube wells, such as, saline belts are provided with drinking

water through pipe water supply. However, most of the rural areas of the State and in the study area experience shortage of water supply during the summer season.

The water supply system in the urban areas is looked after by Public Health engineering department of the State and the urban local bodies. All the urban local bodies of the State and in the study area are supplied with piped drinking water supply system and, at present, 660 million liters of water are being supplied every day through piped water supply system benefiting about 79 per cent of total urban population of the State. This piped water supply system is supplemented by hand pump, and tube well at different urban areas, and this is a key feature in the coastal urban areas of the study area.

2.9.5. Sanitation

Rapid urbanization and growth of slums in urban areas give rise to problems of water logging, congestion in discharge of drainage water, accumulation of garbage, etc., leading to public health and aesthetic problems. This calls for proper sanitation in both urban and rural areas. Understanding this problem, under the urban sanitation scheme, underground sewerage clearance facilities have been provided partly in the developed areas in five cities of the State such as, Bhubaneswar, cuttack, Puri, Sunabeda, and Rourkela, of which Bhubanewasr, Cuttack, and Puri are confined in the study area. The State also made pioneering efforts in treating wastewater through evaporation in Puri city and expected to start in other urban areas too.

Sulabha International Social Services Organisation (SISSO) has been associated with implementation of sanitation programmes in both rural and urban areas. Under this programme, Sulabha International Social Services Organisation (SISSO) is entrusted with construction of public toilets, water sealed latrines, conversion of dry latrines to water sealed latrines, etc.

Drainage is another important factor, which is essential for smooth functioning of life particularly in the urban areas, and hence influences the functioning of the system. In absence of adequate data, the Investigator observes that there is not much of proper drainage system in the rural areas except the natural drainage. It is also observed that open drainage system has been provided in few segments of the large urban areas.

Organized solid waste disposal and garbage disposal is done in a few urban areas of the State and in the study area by the urban local bodies. It is observed by the Investigator that Solid waste disposal system is almost absent in the rural areas except in a few places where the programme is taken by the local bodies on voluntary and sporadic ways.

In addition to the above infrastructures, the Investigator considers the following social infrastructures, such as, education, health, recreation, safety and security organizations and tourism for analysis since they play a major role in the system.

The education profile and health services have already been discussed and presented in sections 2.8.1 and 2.8.2 respectively.

2.9. 6. Recreation

The State has given priority in providing various outdoor and indoor recreational facilities to the inhabitants and tourists to the State. The State encourages out door sports facilities and has made sports as mandatory in school and colleges for participation along with creating stadiums at district level and selected subdivision and block levels. The same trend is marked in the study areas. It may be mentioned that two national level sports stadiums are located in the study area such as, at Bhubaneswar city and Cuttack city. Additionally open playgrounds, recreational parks and open spaces are created in almost all urban centers by the

local bodies. Apart from these, entertainment infrastructures in the forms of theatres, festival arenas and organizations for cultural recreations such as, dances, folklores are integral part of the study area and the State as well. In this regard, places for festivals like Konark dance festival, Beach festival at Puri, Boat Sailing festival at Chandrabhaga are the important ones.

2.9.7. Safety and Security

Police, judiciary and fire protection organizations are the most important social safety and security infrastructure in any system. In Orissa State, there are high courts at the State level and district, session, and chief judicial courts, at district level followed by sub judge courts, sub divisional judicial magistrate and munsif courts present at subdivision level to look after the crime and civil judicial matters.

The State has 451 police Stations and 603 police outposts, of which 164 police stations and 256 police outposts are located in the study area to look after the security system in the State. The total number of armed and unarmed personnel in the police force in the State and in the study area are 10139 and 12355 respectively, of which the study area has 4046 numbers (39.90 per cent) and 6266 numbers (50.71 per cent) personnel in the above two category of police force responsible for safety and security of the system.

Fire protection is another safety measure, which influence social security in the system. In the State, there are 142 numbers fire stations, of which, 60 numbers (42.25 per cent) functioning providing fire protection in the study area.

2.9.8. Financial Institutions

Well-developed financial infrastructure plays major role in stimulating and sustaining economic growth in a system. A network of financial institutions helps in investment and deployment of its savings more efficiently in the system. Orissa State is no exception in this regard.

There are 33 scheduled Commercial banks with 2212 branches, 9 Regional Rural Banks (RRBs) with 829 branches and 24 public sector banks with 1370 branches in the State. Besides, there are 316 branches of Orissa State Co-operative Banks and 5 branches of OSCARD banks are available in the State. The study area has 361 Branches of Regional Rural Banks, 725 branches of Public Sector banks and 1099 branches of Scheduled commercial branches. The details about various bank performances are presented in Table No. 2.26.

Table No. 2.26: Details of Banking Services in the State and Study area in 2003-04

Sl No.	Items	Orissa state				Study area			
		RRBs	Public Sector Banks	Scheduled Commercial Banks	Total	RRBs	Public Sector Banks	Scheduled Commercial Banks	Total
1	No of offices	829	1370	2212	4411	361	725	1099	2185 (49.53)
2	Deposits (Rs. in Millions)	18381.90	129434.30	151108.70	298924.90	9303.90	92683.50	95283.90	197271.30 (65.99)
3	Credit (Rs. in Millions)	9310.10	52895.30	62649.80	124855.20	4359.70	33650.30	38454.00	76464.00 (61.24)
4	Credit Ratio	50.60	40.86	41.46	41.76	46.85	36.30	40.35	38.76
5	Population per branch (thousands)	44.27	26.79	16.59	8.32	47.23	23.51	15.51	7.80

Source: Economic Survey 2003-2004, Orissa State

It is observed in all totals that the study area has one branch of banks for 7.80 thousand population as against 8.32 thousand population in the State. The credit deposit ratio in the study

area is lower (38.76) than the State (41.76). The table shows that 65.99 per cent of total deposits of the State occur in the study area, and 61.24 per cent of total credits of State are made in the study area, yet the credit ratio is low. It signifies that even there are high deposits in the study area; they are not fully utilized for investment in the system.

Apart from the above, there are nine commercial banks with 12 branches operating in the State. In addition, Orissa State has a three-tier co-operative credit structure in rural areas for extending short and medium term loans with Orissa State Co-operative Bank at apex level, Central Co-operative Banks at district level and Primary Agricultural Co-operative Societies at the grassroots level. There is also a two tier Co-operative Agricultural Rural Development Banks such as, Orissa State Co-operative Agricultural Rural Development Bank (OSCARD) at State level and Co-operative Agricultural Rural Development Banks (CARD) at grassroots level to provide long-term loans to farmers for agricultural purposes rural areas. In urban areas, there are 15 urban co-operative banks, and 687 Employees Credit Co-operative Societies are operating to provide loan facilities to traders, wage and salary earners.

Under non-banking financial companies, Orissa State Financial Corporation (OSFC) and Private Non-Banking Financial Companies are functioning in the State. Orissa State Financial Corporation (OSFC) provides assistance in setting up of small and medium scale industries, construction of hotels, nursing homes, and acquisition of transport vehicles. It also provides financial assistance for modernization, expansion and rehabilitation of sick units. The private non-banking financial companies play in facilitating higher resource flow to the economy by mobilizing household savings in the State.

2.9.9. Accommodation Facilities

The accommodation facilities available in the study area are dealt separately in the subsequent chapter (Chapter- 3) under tourism infrastructure.

2.10. ECOLOGY AND ENVIRONMENT

The environment includes various ecological systems. As per the Government of Orissa classification, the ecological systems in Orissa State can be divided into four major categories, such as, forest ecosystems including reserved forests, coastal ecosystems harbouring the mangrove vegetation, habitat ecosystem and many inland sectors having mining activities or mining ecosystems.

The various geographical terrains in the State contain tremendous bio-diversity including forest, agriculture, marine and plant resources. Orissa State has about one third of its area under the forest cover and largely influence the environment of the State. The forest cover includes reserve forests, a number of National Parks and Sanctuaries for Wildlife Conservation and social forests. The coastal ecosystem comprises of marine areas including sea beaches, mangrove forests, backwater areas and river deltas. All the seven major rivers of the State meet the sea in the coastal areas of the State. The largest backwater lake of the country, Chilka is providing wintertime shelter to migratory birds. Gahirmatha beach, and sand bars of Gahirmatha surrounded by mangrove forests, is one of the largest rookeries of Olive Ridley sea turtles in the world. Satapada, is very congenial environment to dolphins where as Bhitarkanika offers a home for Crocodiles.

On the other hand, the mangrove vegetation is very important in controlling natural calamities like floods and cyclones and plays a pivotal role in the coastal environment.

Mangrove vegetation embraces plants belonging to several unrelated families and exhibit different degrees of salt tolerance. It also offers a good breeding ground and nursery for edible fish and prawns. The forest meadows and swampy habitats of this area support a large number of residents, as well as migratory birds. The mongroove forests on the coastal tracks of Orissa play an important role in the above regards though they are under threat due to continuous human intervention

The mining areas of central and western Orissa have an ecosystem, which is highly different from the coastal ecosystem with it mining and related activities.

The environment and ecological balance of the State are under tremendous pressure due to the human intervention in the said ecosystems. It is indicated from the ecological irregularities, such as, depletion of mangrove forests, decrease in visit of migratory birds to the State, and change in climate in the system. Besides, it is observed that the State has witnessed rapid urbanization and industrialisation in the last few years. The rapid urbanisation and large scale industrialisation, along with a combination of other factors, such as, deforestation, extensive construction activities, thermal based power plants, uncontrolled mining, elimination of water bodies, and extensive carbon consumption, etc., are influencing the climate, in form of temperature variation; change in rainfall duration, quantity, and timing; and moderating the winter in the State. These factors also have brought environmental pollution of air, water and soil to some extent in the industrial areas and urban areas of the State. Environmental pollution is experienced in the large cities like Bhubaneswar, Cuttack, Berhampur, Puri, etc., in the study area, though the rural areas remain mostly less polluted. The air and water pollution

characteristics in the study area are presented in Table No. 2.27 and in Table No. 2.28 respectively.

Table No. 2.27: Air Pollution in the State (Annual Mean Concentration ($\mu g/m^3$))

Sl No	Air Pollutants	Industrial Area		Residential Area	
		2001	2003	2001	2003
1	Suspended particulate Matters	179.00	154.00	187.00	164.00
2	SO_2	5.60	9.70	11.00	6.00
3	NO_2	30.00	21.90	26.00	12.80

Source: Central pollution Control board, India, 2003

Table No. 2.28: Water Quality in major rivers

Sl No	Rivers	Temperature range (^0C)	pH range	D.O (mg/l) range	B.OD range(mg/l)	Colliform (MPN/100ml)
1	Mahanadi	20-34	7.00-8.50	6.60-10.60	0.80-2.50	13000
2	Bramhani	25-35	7.10-8.30	6.70-7.70	0.60-2.60	9200
3	Baitarani	23-34	7.00-7.50	7.50-11.30	0.70-2.80	7900

Source: Central pollution Control board, India, 2003

It is observed that the Annual Mean Concentration of air pollutants State and Study area in both residential areas and industrial area of the State and in the study area are within the low range, such as, SPM (0-180 $\mu g/m^3$), SO_2 and NO_2 (0-40 $\mu g/m^3$). The pollutant concentration is also decreasing from 2001 to 2003. The water qualities in the major rivers such as Mahanadi, Bramhani and Baitarani at lower reaches, which flow through the study area, reveal that except colliform all other parameters are within the tolerable ranges. The colliform are much higher than the accepted limit of 50 MPN/100ml for using without disinfection and 5000 MPN/100ml with disinfection. The reason of the presence high concentrations of colliform in the river is due the disposal of industrial sewage into the river without treatment.

It is also observed that, for more than a decade now, Orissa has been experiencing contrasting extreme weather conditions. It has suffered several heat waves, cyclones, droughts and floods at frequent intervals. The State meteorological department observed that, summers are getting prolonged in Orissa, indicating that the State's climate is changing drastically.

In order to protect the environment and ecosystem, the State is taking a number of measures which include, legislative and legal provisions, creation of Pollution Control Board to monitor and enforce pollution control activities, Environmental Societies, Environment conservation groups, awareness activities and law enforcing agencies, etc. In this regard, the various legal provisions in operation in the State are, The Wildlife (Protection) Act, 1972 (Amended, 1991), The Wildlife (Protection) (Orissa) Rules, 1974, The Central Water Pollution Act, 1974, The Central Water Pollution (Amendment) Act, 1978, The Environmental (Protection) Act, 1986, Coastal Regulation Zones (CRZ I, II & III), The Orissa Marine Fishing Regulation Act, 1982, The Orissa Marine Fishing Regulation Rules, 1983, and Coastal Zone Illumination (Prevention & Control) Act and Rules (Proposed).

The other provisions to abate environmental degradation and maintenance of ecological balance in the system, the following steps are being taken in the State. District Environment Societies have been constituted in each district. Awards such as, 'Prakruti Mitra, and 'Prakruti Bandhu' (both means Nature's Friend) have been instituted and are being given to voluntary organizations/ villages/ institutions and individuals.

The Ministry of Environment & Forests, Government of India, has introduced National Green Corps programme. Under this programme, 150 Eco-clubs have been constituted in schools in each of the 30 districts of the State. The Eco-clubs are pioneer teams creating environmental awareness among the local inhabitants.

National Environment Awareness Campaign (NEAC) is an important environmental awareness programme that is taken up by the Environment Department through the Center For Environmental Studies (CES), which has been declared as the Regional Resource Agency (RRA) under the NEAC Programme by the Ministry of Environment & Forests, Government of India. Small NGOs are funded for environmental awareness activities.

For sustainable use, development and protection of coastal and marine area resources, a proposal for preparation of an Integrated Coastal Zone Management Plan for identified stretches of Orissa coast viz. Konark, Puri and Bhitarkanika in association with the Institute for Ocean Management, Anna University, Chennai, has been submitted to the Government of India.

A Task Force has been constituted for promotion of Ecotourism in Orissa with interactions with stakeholders and has decided that it would be initially restricted its functions to Chandaka, Chilika, Bhitarkanika and Similipal, of which the first three areas belong to the Study area.

2.11. TOURISM

Tourism is considered as one of the major economic activities of the State and in the study area in recent years that influence the functions of the system. Orissa State, particularly the Study area is endowed with a treasure of tourists' attraction, which is varied catering to every facet of tourism, which includes religious, cultural, heritage, leisure or eco-tourism. The hospitability industry has grown enormously over the last one decade. For example, the 'Golden Triangle' of Bhubaneswar-Puri-Konark is the biggest tourist attraction. The 'Tri-Ratna Triangle' comprising Laleet Giri, Udaya Giri and Ratna Giri is yet another attraction for the Budhists from Eastern countries. The rich tourist spots have all the potential to become a money-spinning

industry providing gainful employment to thousands of people directly and indirectly and substantial revenue to the State.

Tourism in the study area and in the State is discussed in detail separately in Chapter three of this thesis.

2.12. OBSTACLES IN THE GROWTH OF ECONOMY OF THE STATE

The above discussion pertains that the Orissa State has enormous potential for agricultural and industrial development as well as in service sector too, contributing at large to the over all socio-economic development of the state. Yet, the State is economically, socially and physically backward due to various problems and obstacles faced by it in the path of development. In this context, it is highly necessary to discuss various problems, to understand the over all scenario of the state the economy. The major problems are enumerated as below:

2.12.1. Population Growth

The decennial growth of population is 15.94 per cent in the state during the period 1991-2001, which is lower than the national average of 21.34 per cent and experienced decline as compared to the previous decade's growth rate of 20.06 per cent. However, this rate is still higher than some other states like Tamil Nadu, Assam and Kerala. The population growth rate is a major barrier to the development process in the study area and in the State as well.

2.12.2. Incessant Poverty

As per the latest estimates of the Planning Commission, Government of India, percentages of population below poverty line is 48.01 in rural areas and 42.83 in urban area of the State (Tenth Five year Plan Report, 2002). This is far above the national averages of 27.09 per cent and 23.62 per cent in rural and urban areas respectively. This situation of poverty

continues since long time over the years with marginal variation only. The population growth coupled with poverty, lead to low or non-possibility of investment in the State by the people of Orissa, thus, there is a higher degree of dependency on the primary sector of the economy, creating under employment, unemployment and disguised employment situation in the State and in the study area.

2.12.3. Low Capital Formation and Fiscal Deficit

There is low capital formation in the State and there by low investment is observed due to the vicious circle of poverty. The Gross state Domestic Product and Net State Domestic Product are at present registering increase in annual growth rate 4.33 per cent and 4.25 per cent respectively. These are far less than the national averages and are too low. The per capita income (Rs. 6105.00) in the State is much lesser than the national level per capita income (Rs. 10754.00) which is it-self very low.

The State has been experiencing serious fiscal stress for several years and is currently facing a serious fiscal crisis. It has increased from 7.80 per cent of the State Gross Domestic Product in 1995-96 to 27.30 per cent in 2001-2002. This arises out of large non-plan expenditure, substantial increase of salary and pensions, widening gap between non-plan revenue expenditure and receipts resulting higher borrowings and higher debt servicing liabilities.

The credit deposit ratio in the State was 41.76 and in the study area it was 38.76 during 2001-2002 as against national average of 62.31, which also lead to low capital formation. This credit deposit ratio observed in the State is low compared to States like Maharastra (107.09), Tamil Nadu (84.29), Karnataka (59.75), and Andhra Pradesh (61.60).

2.12.4. High Dependence on Agriculture and Primary Sector

The State is highly dependent on the primary sector, which constitutes about 40.00 per cent of NSDP, of which the share of agriculture is 28.13 per cent. Though the State is in the process of creating extensive irrigation facilities, still agriculture in the State is mostly rain-fed and dependent on behavior of monsoon. The erratic behavior of monsoon causes fluctuations in agricultural production in absence of adequate irrigation facilities. Owing to the large contribution of agricultural sector to NSDP and its linkages with other sectors of the economy, these fluctuations influence the overall growth of the State's economy.

2.12.5. Under-Utilization of Natural and Mineral Resources

Orissa State is blessed with abundance of mineral and other natural resources like forestry and wild life. The rate of exploitation, when compared to the total reserves, is quite low for most of the minerals. During 2001-2002, except for chromites, manganese and graphite, the rate of exploitation of most minerals remain as low as below 1.00 per cent. In case of some important minerals such as, iron ore, bauxite, and coal the rate of exploitation were only 0.47 per cent, 0.21 per cent, and 0.09 per cent respectively of the total reserves. Apart from this, in the absence of large-scale investment and industrial development in the State the minerals are transported as raw materials to industrially developed States within the country and exported to the other countries too. Thus, these resources are not efficiently utilized.

The other natural resources such as forestry and wildlife are not judiciously utilized over the years for economic development of the State. The forest products, though contributes largely to the economy of the State, lack of proper planning, care and involvement of people in

conservation activities, the forest resources and wildlife are degraded and denuded thus making them scarce for contributing substantially to the development of the State.

2.12.6. Lack of Adequate Infrastructure

Infrastructure in the form of availability of road sector, railway transportation system, inland water transportation system, air transportation facilities, developed land and work sheds for industrial development and power position form the base of any developed economy. However, Orissa State though has huge potential for the development of all these infrastructures does not possess adequately, thus creating barriers for economic development.

2.12.7. Lack of Entrepreneurial Activity and Attitude

It is observed that Orissa State does not possess much of entrepreneurial activity, and the attitude towards development such activity is not encouraging. Whatever such activities are being created, that are of first generation only. This is being influenced by small size of market, too much of competition from neighboring markets and producers, lack of capital for investment, absence of substantial private capital for investment, improper attitude of lending agencies, critical bureaucratic procedure and absence of managerial skill coupled with non receptive social attitude and lack of risk taking ability. Similar characteristics are observed in this regard in the study area.

2.12.8. Technological Backwardness

Until recently, a few years from now the State did not have adequate technical experts and was continuing with the outdated methods of production in all sectors of economy such as agriculture, industry, mining and other activities. This leads to high production cost despite low

labour wages, and high labour-output and capital out-put ratio. The economic activities are not always cost effective in the State as a whole and in the Study area.

2.12.9. Visit of Natural Calamity to the State

The State and the study area are often prone to multiple hazards and has been experiencing since long years of history. One calamity or the other hits the State almost every year fully or partially. Even in recent years, before recovering the trauma of the super cyclone in 1999, which had created havoc particularly in the study area, the State was hit by a severe drought in the year 2000-2001 followed by unprecedented floods during the rainy season of 2001. Again, drought hit in the State in 2002, followed by flood in 2003. This story of natural calamity in the State is only a repetition of past long history. Though the State is taking regular preventive measures, yet they are proved inadequate repeatedly. Such circumstances only provide high unpredictability to the State's economic growth.

2.12.10. Lack of Integrated Policy

Creating a favourable climate for overall economic growth, sustaining high growth of output and employment opportunities, investment possibility need an integrated policy without confusions and hindrances in the path of development. Even though, the Government of Orissa, has formulated a number of policy resolutions such as Industrial Policy Resolution, 2001; Agricultural policy, 1996; Tourism policy, 1996; Orissa Fisheries Policy, etc., keeping in view the recent trend in market oriented economy and globalization, the necessity of an integrated planned approach and policy is felt.

2.13. SUMMERY

1. The study area is an integral part of the State throughout and its history is not different from the State. It has been invaded time and again, governed by various dynasties and has a torrid administrative set up throughout the historic period. The State came into existence in its present form since the year1936.

2. Orissa State is divided into five natural regions, such as, the coastal plains, the river valleys and flood plains, the rolling uplands, the plateaus and hills and mountains based on homogeneity, continuity and physiographical characteristics and the study area is confined between the coastal plains and river valleys and flood plains.

3. The study area has tropical climate, and is influenced by the South-West monsoon.

4. The study area has a population of 17051151 spread over the area of 35804 square kilometer bearing a density of 476 persons per square kilometer. The study area, having an area of 23.00 per cent of total area of Orissa State, accommodates about 46.40 per cent of population of the State. The population growth rate in the last decade is 16.63 per cent, which is marginally higher than the population growth rate in the State.

5. The study area has a literacy rate of more than 65.00 per cent and sex ratio of 962, which are little higher than the State literacy rate and sex ratio respectively. Male literacy rate is higher than the female literacy rate in the study area.

6. The study area is predominantly rural though most of the major urban centers of the State are confined in it.

7. Primary sector predominate in the study area and contributes about one third to the State Gross Domestic Product. The per capita income in the State is the second lowest in the country.

8. About half of the total area in the study area is under agriculture and one fifth of the area is confined under forestland. About one tenth of the land area is used for non agricultural purposes i.e., confined under habitation area.

9. Majority of the farmers of the study area belongs to low landholding and have low operational land area.

10. Cultivation of food grains dominates the study area. It is also observed that the paddy under cereals crop is the major crop followed by pulses and vegetables both in the study area and in the State. Coconut is the major horticultural crop in the study area.

11. More than half of he irrigation potential of the State is confined in the study area.

12. Fishery is another important economic activity in the study area and marine fish production accounts for about two third (63.54 per cent) of the total fish production, followed by fresh water (29.45 per cent) and brackish water (7.01 per cent) fish production.

13. Most of the important minerals deposits are located in the regions other than the study area and the study area is not rich in mineral resources.

14. The study area is also blessed with many products with high export value, such as, Marine products, like, Frozen Shrimps and Prawns, Prawn seeds; Dried fish; Handicraft products, like, Stone works, Appliqué works, Coir products, Wood works, etc.; Handloom products, like, Silk, Cotton; Gems and jewelry, Agricultural and Horticultural products, such as, Non Basamati rice, Cashew nuts, Betel leaves, Coconut, etc.

15. About half of the industries of the State are located in the study area though it does not possess any mineral-based large-scale industries. Small scale industries and cottage industries form important components of the industrial development in the study area.

16. Handicraft industry is an important component of the industrial development in the study area. Applique works, Silver filigree, Golden grass works, Art textile, Stone Carving, Sea shell works, Coir crafts, Brass and Bell metal works, Cane and Bamboo works,, Pattachitra, Terracotta, Carpet, Wood carving, etc., are major handicraft activities being practiced in the study area. Handicraft products are highly location specific in the study area.

17. Total workers in the study area accounts about one third of the total population in the study area. Majority of the workers belong to agriculture sector.

18. There are comparatively better educational facilities available in the study area than the State though the per capita expenditure on education is very low, signifying educational backwardness of the study area.

19. There are reasonable health services available in the study area in the form of various types of medical facilities mostly provided Government.

20. The study area connected to the other parts of the country with all modes of transportation, such as, air, rail, road, and sea routes. The various parts of the State and in the study area are mostly connected by rail and road transportation system.

21. The State has one domestic airport for domestic traffic and is located at Bhubaneswar city, which is confined in the study area. A few domestic airlines of the country including airlines in private sector ply daily flights connecting important cities of the country, such as, New Delhi, Mumbai, Kolkata, Chennai, Hyderabad, etc., with the State.

22. The rail route length and rail route length density in the State and in the study area is very low. Many of areas and tourist destinations of the State are also not connected by railway network in the State.

23. The available road lengths density in the study area and in the State are low compared to other developed areas of the country. Majority of the road lengths belong to lower order roads showing qualitative backwardness in road system in the study area and in the State.

24. Paradeep is the major all weather sea port located in the study area. In addition, there are a number of small ports in the State.

25. There are eight water routes in three sectors such as, Chandabali sector, Balugaon Sector and Astaranga sector located in the study area; however, their operation is confined to limited areas only.

26. Power generation is more than the power demand in the State and the installed capacity is much higher indicating the potential of the State in power sector. However, the per capita power consumption is 156.89 KWh as against the national average consumption of 360 KWh, indicating poorly developed environment in the State.

27. Communication network is reasonably developed in the study area and in the State.

28. In the State as well as in the study area, efforts are being made to provide drinking water supply through urban water supply schemes and rural water supply schemes in respective areas. However, most of the rural areas of the State and in the study area experience shortage of water supply during summer season.

29. Sewerage, drainage and solid waste disposal systems are mostly confined to a few urban areas of the study area only.

30. Stadiums, open playgrounds, recreational parks and open spaces are created in almost all urban centers by the local bodies. Entertainment infrastructures in the form of theatres, festival arenas and organizations for cultural recreations, such as, dances, folklores are integral part of the study area and the State as well.

31. A good numbers of banking and financial institutions are available in the State and in the study area. About two third of the deposits of the State occurs in the study area, but the credit ratio is very low signifying low investment in the system.

32. There are four ecosystems in the State and in the study area, such as, forest ecosystems including reserved forests, coastal ecosystems harbouring the mangrove vegetation, habitat ecosystem and many inland sectors having mining activities or mining ecosystems. The environment and ecological balance of the State are under tremendous pressure due to the human intervention in the said ecosystems. Environmental pollution is experienced in the large and industrial cities like Bhubaneswar, Cuttack, Berhampur, Puri, etc., in the study area, and the rural areas mostly remain free from it.

33. Population growth, incessant poverty, lack of capital formation, fiscal deficit, high dependence on agriculture, underutilisation of natural and mineral resources, lack of adequate infrastructure, lack of entrepreneurial activity and attitude, technological backwardness, regular occurrences of natural disasters and lack of integrated policy are the few obstacles in growth of the economy in the State and in the study area.

2.14. CONCLUSION

Understanding the Characteristics of the study area is of paramount importance while planning for any system. In this chapter, the profile of the study area is presented with facts and figures. The most important control parameters, which decide the functions of the system, are identified and their characteristics features are analyzed in detail and presented in the subsequent chapters.

TOURISM AT A GLANCE IN ORISSA STATE AND IN THE STUDY AREA

3.0.   INTODUCTION

Tourists' attractions in Orissa State cater to every facet of tourism. The tourist treasure varies from historic monuments to places of worship, from colourful tribal culture to beautiful handloom and handicrafts, from wildlife to well orchestrated festivals, from sandy sea beaches to geo-thermal health sites, and unique depository of flora and fauna to rich sources of marine species. Thus, Orissa State is a unique reservoir of beautiful elements that God and human hands created over the ages. Above all, the people of Orissa, in spite of their poverty, are also distinguished for their hospitality.

In Orissa State, the study area is considered as one of the most important and potential regions for tourism development. Very recently, tourism development has been given priority in the State especially in the regions bounded by the study area. It has become an important and integral part of the economy in the study area, providing large-scale opportunities for the growth of the economy. Harnessing the tourism potential regions also holds the key in contributing significantly to the State's economy. In this chapter, an attempt has been made to critically assess the available tourism resources in the study area and Orissa State as a whole. Further, the measures adopted by the State in accordance with the State tourism policy, 1997; tourism related infrastructure, tourism organizational structure in the State and problems for tourism development in the study area and in the State etc., are discussed to have a thorough insight pertain to development of tourism and its associated activities in the study area.

3.1.   PROSPECTS OF TOURISM DEVELOPMENT IN THE STUDY AREA

The department of tourism, Government of Orissa has identified 292 numbers of major tourist destinations in the State. Of which, about half (131numbers) of the tourist destinations of the State are confined in the study area in different categories. Of which, include religious places, architectural and historical monument sites, wildlife areas, scenic spots, sea beaches, etc. The districts wise and category wise tourist spots in the study area are presented in Table No. 3.1 and Table No. 3.2 and the major locations are presented in Fig. Nos. 3.1 and 3.2.

Table No. 3.1: District wise number of identified tourist centers / destinations in the study area

Sl.No.	Name of the District	Number of Tourist Centers
1	Balasore	20
2	Bhadrak	8
3	Cuttack	17
4	Ganjam	18
5	Jagatsinghpur	5
6	Jajpur	13
7	Kendrapara	4
8	Khurda	16
9	Nayagarh	10
10	Puri	20
11	Total	131

Source: Department of Tourism and Culture, Government of Orissa, 2004

Table No. 3.2: Category wise Tourist centers in Orissa State and in the study area

Sl. No.	Category	Number of destinations	
		State	Study area
1	Religious centers	112	48
2	Architectural / Historical sites	28	18
3	Scenic Spots including water falls	78	22
4	Sea Beach	13	13
5	Wild life places	12	4
6	Others	49	26
7	Total	292	131

Source: Department of Tourism and Culture, Government of Orissa, 2004
Note: Others include strategic points, district headquarters, lakes, memorials, and industrial areas
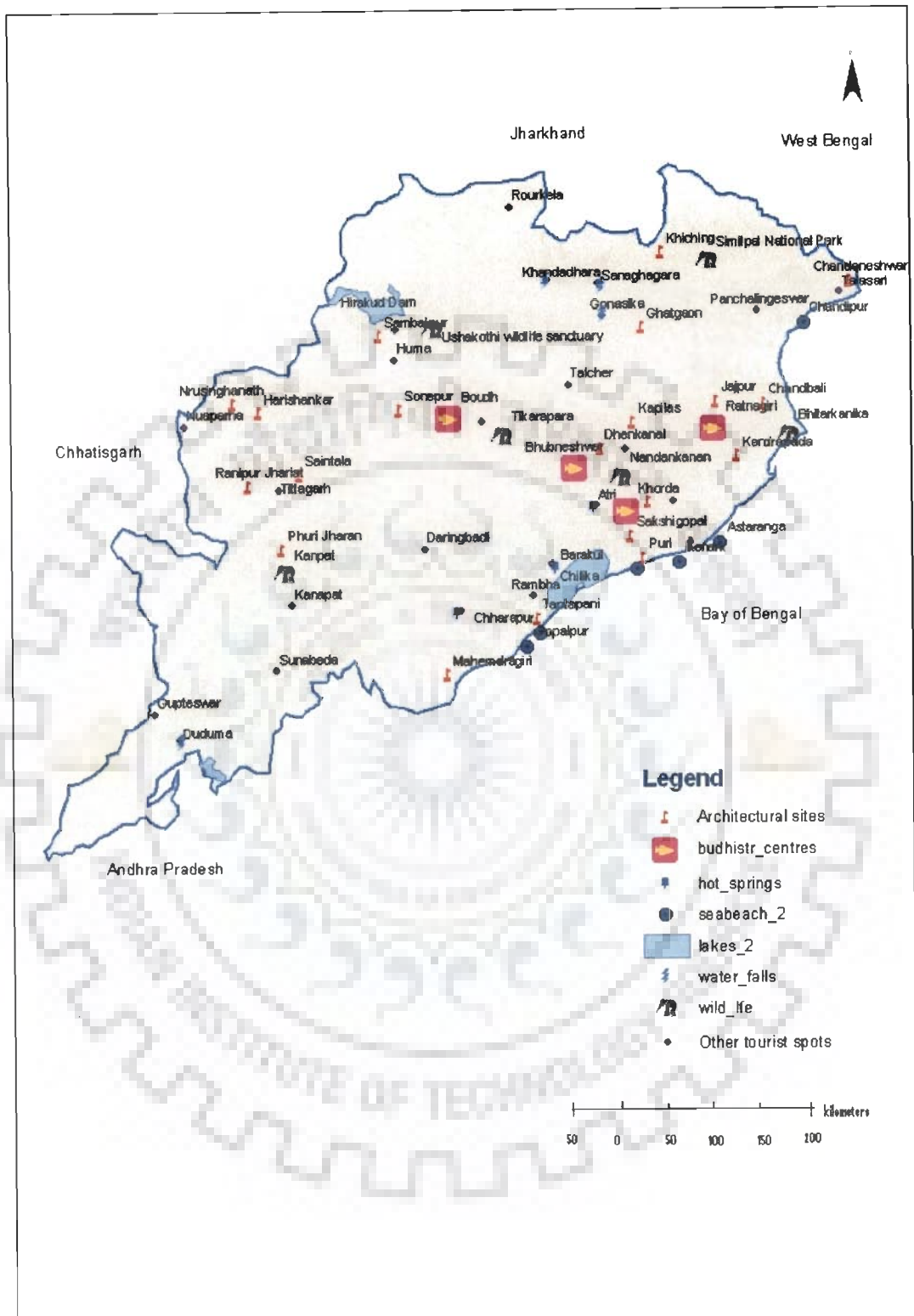
Source: Department of Tourism and Culture, Government of Orissa, India

Fig. No. 3.1: Important Tourist Spots of Orissa State, India
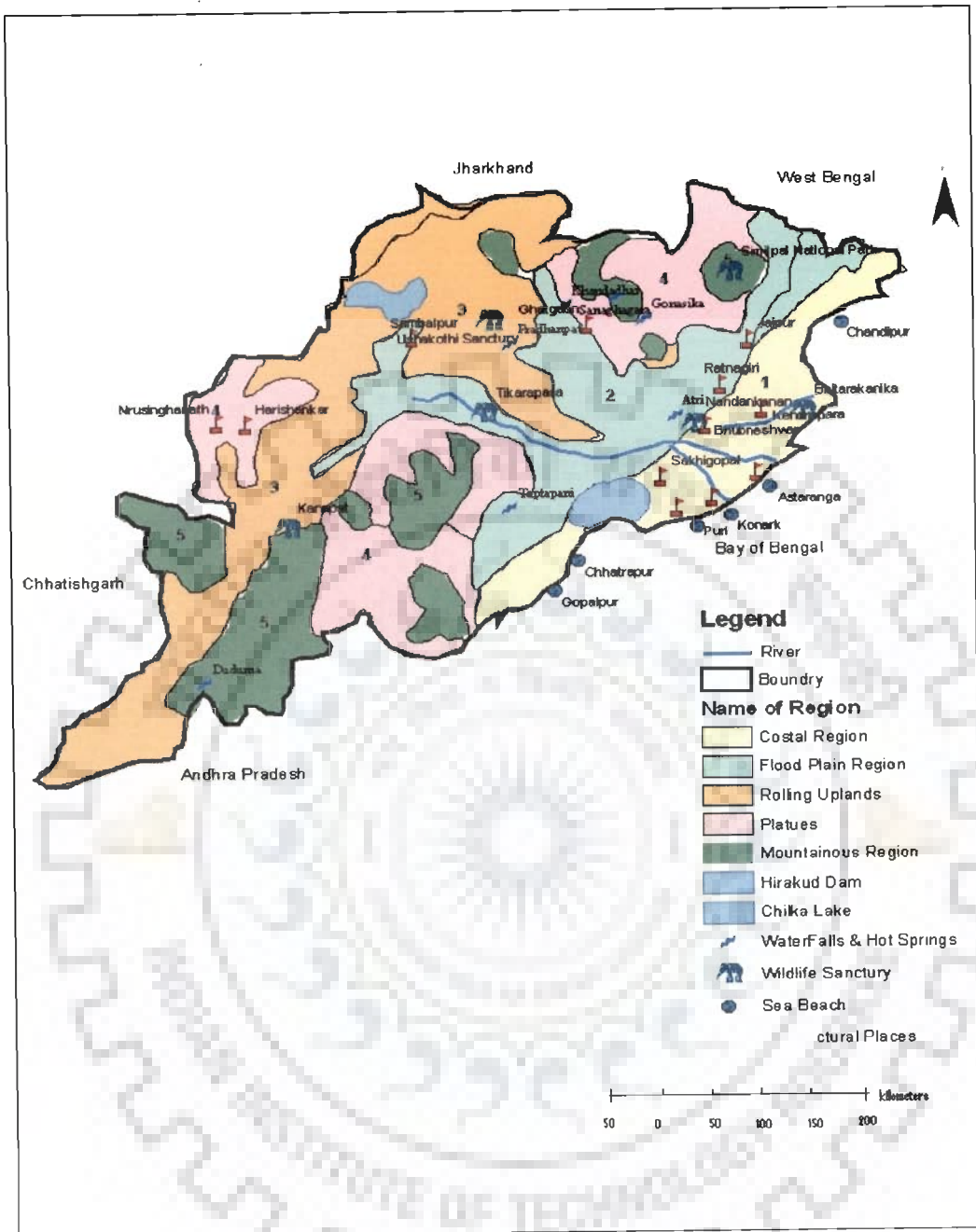
Source: Department of Tourism and Culture, Government of Orissa, India

Fig. No. 3.2: Region Wise Important Tourist Locations in Orissa State, India

The various features, which contribute to tourism development in the State and in the study area, can be classified under various categories, such as, Natural and Scenic beauty; Architecture, Sculpture and Paintings; Culture and Heritage; Economic resources, and are discussed below. They are:

3.1.1. Natural Scenic and beauty

The study area in Orissa State has eye-catching beauty having diversified topography consisting of hills, valleys, dense evergreen forests, shrub jungles, estuaries, deltas, coastlines and flood plains. The natural scenic beauty regions having tourism potential in the study area comprises of coastlines, sea beaches, estuaries, lakes, hot springs, and mangrove forests, jungles and wildlife.

3.1.1.1. Forest and wildlife

The study area though has very less forest areas, the diversified ecological riches and environmental situations provide an excellent habitat for rich fauna. Wildlife is very rich and in most of the cases exciting and are sources of great attraction to not only the domestic tourists but also tourists from accross the globe. Chilika lake (the backwater lake), the mangrove forests at Bhitarkanika, and Gahirmatha, wildlife sanctuaries located in the coastal region, such as, crocodile sanctuaries of Gahiramatha, Dolphin areas of Satapada (Fig. No. 3.2), are already in the world map. The Nandan Kanan Park (Fig. No. 3.2), which is a combination of zoological park, botanical garden and a beautiful lake spread over a large expense of undulating topography along with wildlife safaris in the park itself and adjacent Chandaka forest adds to pristine beauty and diversity of nature and wildlife, and contribute heavily to the tourism prospects of the study area.

3.1.1.2. River deltas

The Orissa State is bestowed with major rivers, which flows from North to South, creating beautiful river valleys, deltas, and reservoirs. The river valleys make the entire topography of the State diversified. All the rivers passing through the study area join the Bay of Bengal creating a number of deltas and confluences at the river mouths before reaching the Bay of Bengal. The important deltas of tourist attraction are the deltas created by the river Mahanadi and the river Bramhani near Paradeep.

3.1.1.3. Beaches, lakes, waterfalls and hot springs

The availability of numerous other natural elements, such as, beaches, lakes, waterfalls and hot springs are main attractive features in the tourist map of the study area and provide large prospect for tourism development in the study area and in Orissa State as well.

Beaches: All the beaches of Orissa State are located in the study area. They are considered as among the best in the world with their soft white sands fringed by surging seawater that constantly changes colours, and a sky with breath taking sunsets. They are places for enjoying the sun and the sea, and are foremost-preferred places for both domestic and foreign tourists. The various beaches present in the coastal tracts are Puri beach, Konark beach, Gopalpur beach, Chandipur beach, Talasari beach, and Pati-Sonapur beach, etc., which are having distinct features from one to another (Fig. No. 3.2).

Lakes: Orissa State has a number of sparkling natural and artificial lakes. The natural lakes are Clilka (Fig. No. 3.2), Sar and Samang (Coastal area) with salt water and Ansupa (Cuttack district) and Kanjia (Nandan Kanan) with fresh water that are confined in the study area.. The above lakes are of uncommon scenic charm and full of

aquatic fauna, and become the abode for migratory birds from across the globe during the winter. These lakes are also famous for water sports, such as, boating, fishing and picnicking, which attract all segments of tourists.

Hot Springs: There are three hot springs gushing mineral waters with a high percentage of sulphur located in the study area. The foremost among them are Atri, Taraboi (Fig. No. 3.2 and Taptapani, which are also places of religious importance. While Atri and Taraboi are located in the coastal region, and Taptapani is located in the mountainous region of the State (Fig No. 3.2). The above hot springs are considered among the prime tourist attractions of the study area.

3.1.2. Architecture, Sculpture and Paintings

Orissa State and the study area in particular are bestowed with archeological treasures dating from the pre historic period to the end of Muslim rule in the middle of the sixteenth century. Among important architectural heritages and sculptures, which are evident from the Buddhist Stupas and Vihara of Dhauligiri (Fig. No.3.3.9), Lalitgiri, Ratnagiri (Fig. No. 3.3.10 and 3.3.12), the Jain caves of Udaygiri and Khandagiri (Fig.No. 3.3.11). The study area is also famous for its temples. The designs of the temples are extremely beautiful and artistic. The architecture is distinct and having its own style, better known as Orissan Architecture. They have the power to behold the visitor to his heart's content only by their sheer magnificent beauty and splendor. The various important temples of Orissa located in the study area are the Sun Temple-Konark (Fig. No. 3.3.17 to 3.3.20) , Jaganath temple- Puri (Fig. No. 3.3.14), Lingaraj temple-Bhubaneswar (Fig. No.3.3.13), Rajarani temple (Fig. No. 3.3.15), Mukteswar temple, Kedar Gouri temple, Bramheswar temple at Bhubaneswar from a long list of numerous temples of Orissa.

The Sun temple –Konark at Konark, the Jaganath temple at Puri, Lingaraj temple at Bhubaneswar and other numerous temples provide images of high skilled art, architecture and sculptures are prime tourist attractions of the study area. Besides, there are several important religious places available, such as, Biraja in Jajpur, Charchika in Banki, Kakatpur, Kendrapara, Nilamadhab at Kantilo, Bhattarika, etc., are also confined in the study area. All these temples are mostly regarded as pilgrimage centers and religious places. Each of these destinations are having specific festivals and attract huge domestic tourists from religious point of view , thus are the major prospects of tourist attraction.

The paintings of walls are a tradition that remains as fresh as centuries ago in Orissa. The most important Orissan style of paintings is mostly located in the temples. Besides, the paintings depicting the tribal culture and rock shelter paintings have the capacity to attract the tourists towards them. Important tourists' locations in the study area have been presented in Fig. Nos. 3.3.1 to 3.3.20.

3.1.3. Culture and Heritage

Through centuries, Orissa State has retained its cultural identity within the mainstream, of Pan-Indian culture. It has rich and diverse art and culture that are the products of a long historical process in which, the spiritual, philosophical and human dimensions have merged. This makes culture and heritage as the biggest strengths of Orissa State. The most popular and important cultural elements which are having tourists attraction potential include the Jagannath cult, tribal culture of Orissa, and various dance, music and folk plays.

Fig.No.-3.3.2 Kanigia Lake, Nandankanan near Bhubaneswar

Fig.No.-3.3.4 Tourist Cottage at Bhitarakanika

Fig. No.-3.3.1 Olive Riddle Tortoise at Gahiramatha

Fig.No.-3.3.3 Mongroove Forest, Bhitarakanika

Fig.No.-3.3.6 Sea Beach, Puri

Fig.No.-3.3.8 Sea Beach, Chandipur

Fig.No.-3.3.5 Chilka Lake
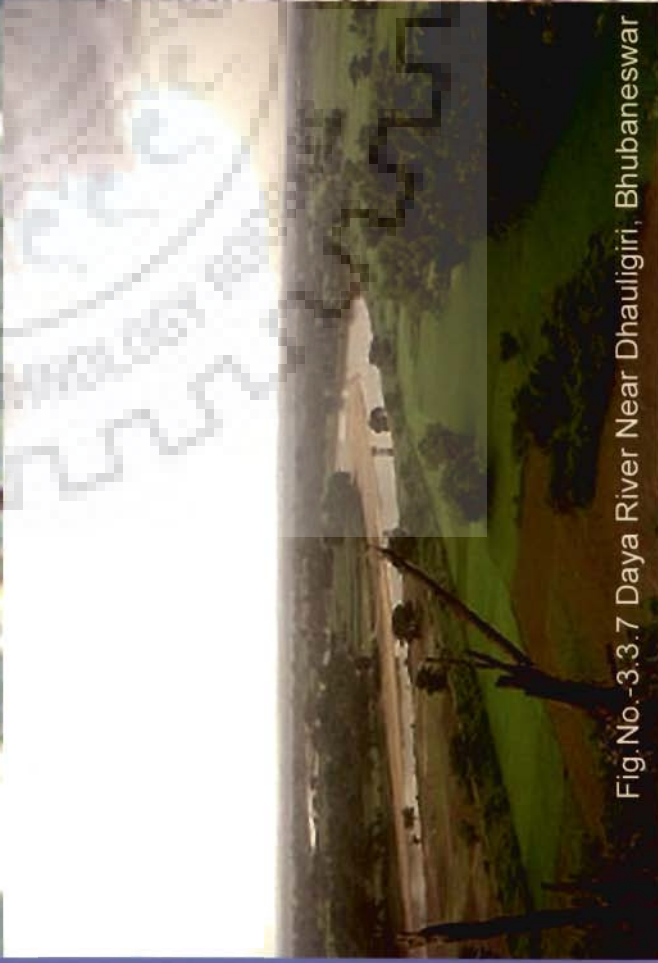
Fig.No.-3.3.7 Daya River Near Dhauligiri, Bhubaneswar

Fig.No.-3.3.10 Budhist Monuments at Ratnagiri

Fig.No.-3.3.12 Budhist Monuments at Ratnagiri
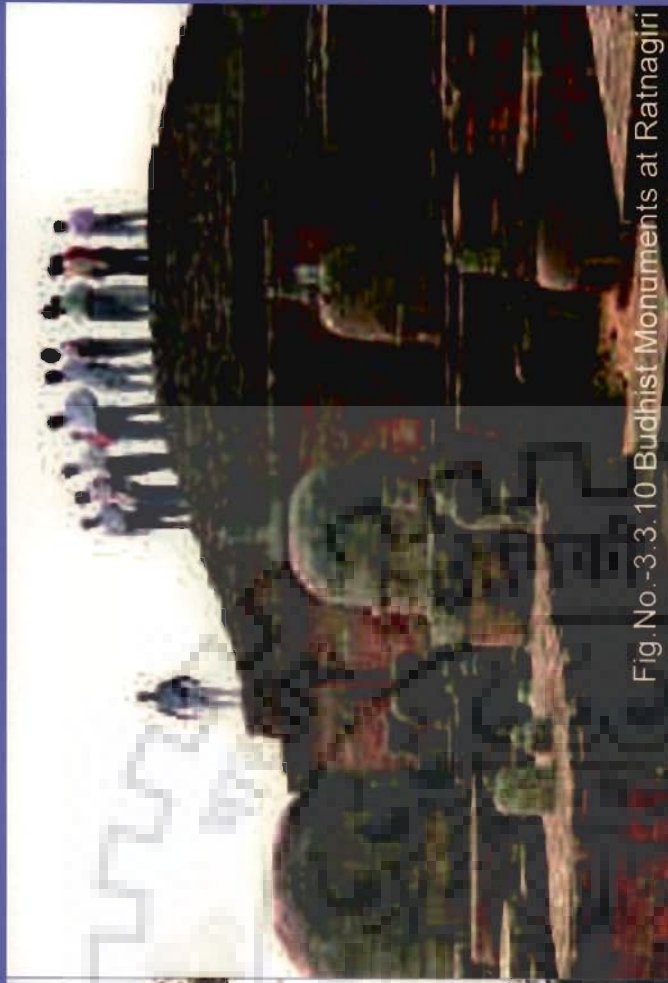
Fig.No.-3.3.9 Budhist Stupa at Dhauli

Fig.No.-3.3.11 Jain Caves at Khandagiri, Bhubaneswar

Fig.No.-3.3.13 Lingaraj Temple, Bhubaneswar

Fig.No.-3.3.14 Jagannath Temple, Puri

Fig.No.-3.3.15 Rajarani Temple, Bhubaneswar

Fig No.-3.3.16 Car Festival (Lord Jagannath), Puri

Fig.No.-3.3.18 Sun Temple, Konark (Panoromic view)

Fig.No.-3.3.17 Sun Temple, Konark

Fig.No.-3.3.20 Horses in Sun Temple, Konark

Fig.No.-3.3.19 Elephants in Sun Temple, Konark

3.1.3.1. The Jagannath cult

Orissa State is better known as the land of Lord Jagannath, where, the culture exhibits a unique experiment in religion. The culture of Orissa means the culture of Jagannath. The culture of Jagannath is a synthesis of varied religions. The great spectacular temple built on the charming seashore of Puri attracts one and all and is one of the most important tourist destinations in the study area. The Car festival better known as the Ratha yatra, is another famous and attractive features of Orissa tourism that occur in the study area every year.

3.1.3.2. Tribal culture

The mountainous regions of the State inhabit the tribals of Orissa. Orissa has the largest number tribes in India and constitutes about 24 per cent of State's total population. The study area does not posses much of the tribal population, but their presence and culture are felt in every cultural happening in the study area, and thus making it an integral part of the study area. They have their distinct culture, language, handicraft and way of life, which woo many foreign tourists.

3.1.3.3. Dance, music, and folk plays

The Orissa State has contributed two distinct schools of dance to the rich mosaic of Indian culture. They are Odissi and Chhau. Odissi is one of the six acknowledged classical dance forms in India with its origin lies in the temples of Orissa. The dance has created ripples all over the world and has become an integral part of Orissa as a tourism attraction. Similarly, Chhau is known for its vigour, vitality and folk in nature. This was performed by the Soldiers to keep them fit. This dance is practiced in the Mayurbhanj district of Orissa and parts of Eastern India and provides impetus for tourists to travel those areas. Similarly, the Sambalpuri dance, an integral part of Western Orissa has its own niche in the realm of dance and music. Apart from

these two, there are numerous folk dances, such as, *Nata, Desia, Patua nach, Laudikhela* to name a few that have the capacity to attract the tourists. The music of Orissa is having its own identity, and the important music, such as; Odissi and Sambalpuri have their own style.

Traditional Orissa is also rich with in folk plays, which defines the wisdom of the people that regulates their life style. They have the capacity to woo the foreign travelers to visit Orissa.

3.1.3.4. Fairs and festivals

Orissa is not only an ideal choice for monuments, beaches, waterfalls, and scenic beauties but also for her colourful fairs and festivals. The festivals are numerous as the days in a year, each with a difference having an individuality of its own. The fairs and festivals include the Grand Car festival (*Rath yatra*) of Puri, Maghasaptami at Chandrabhaga, Konark dance festival, etc.

These culture, heritage, dance, music, fairs and festivals of Orissa State are prevalent all over the State and also are commonly practices in large way in the study area.

3.1.4. Economic Resources

Handicrafts and other economic activities, such as, floriculture, horticulture, marine activities, etc., provide vast potential for tourism development in the State and in the study area.

3.1.4.1. Handicrafts

The study area possesses a very high-grade skill, which is evident from various arts and artifacts. The handicrafts practices in the study area are second to none in the world for their exquisite, fine and intricate works. The handicraft works of clay, cloth,

horn, silver filigree work, bell metal, stone works, applique works, etc., form the essential part of rich cultural heritage and craftsmanship of both in the study area and in the Orissa State. Among the most important ones, the silver filigree works of Cuttack, the applique art perfected by the artisans of Pipili, and the handloom sarees of Cuttack and Khurda always provide impetus to the tourists to visit the places for handicraft marketing. The stone works of Khurda, Bhubaneswar and Puri, bell metal works at Balakati have also gained important place in the handicraft sector. The handicrafts not only contribute significantly to the economic base of the study area and the State, but also are major attractions for foreign tourists and domestic tourists from outside the State (The Industrial Compendium 1999-2000; Industry Orissa 2002-2003; Handicrafts and Cottage Industries of Orissa 2003). The handicraft locations in this study area are presented in the Fig. No. 3.4.

3.1.4.2. Other economic resources

Horticulture and Floriculture are the activities, which have vast potential for development specifically in the State, which may help in attracting farm tourists. The long coastline, Backwater Lake and deltas of rivers of the State provide many opportunities for aquaculture development, which also can be a part of the tourist attraction in the study area.

Thus, the rich cultural heritage, presence of grand artifacts, availability of religious places, long and beautiful coastline with natural scenic beaches, wildlife sanctuaries, largest backwater lake (Chilika), and immigration of beautiful birds and tortoises (Olive riddles) from far corners of the world, the presence of dolphins, etc., make the study area the major potential for tourism development. The study area also possesses adequate resources for craft based products. The presence of high-grade skill

available in the study area and in the State as a whole, which is evident from various arts, craft products and heritage structures created over the years, also form important parameters in tourism development in the study area.
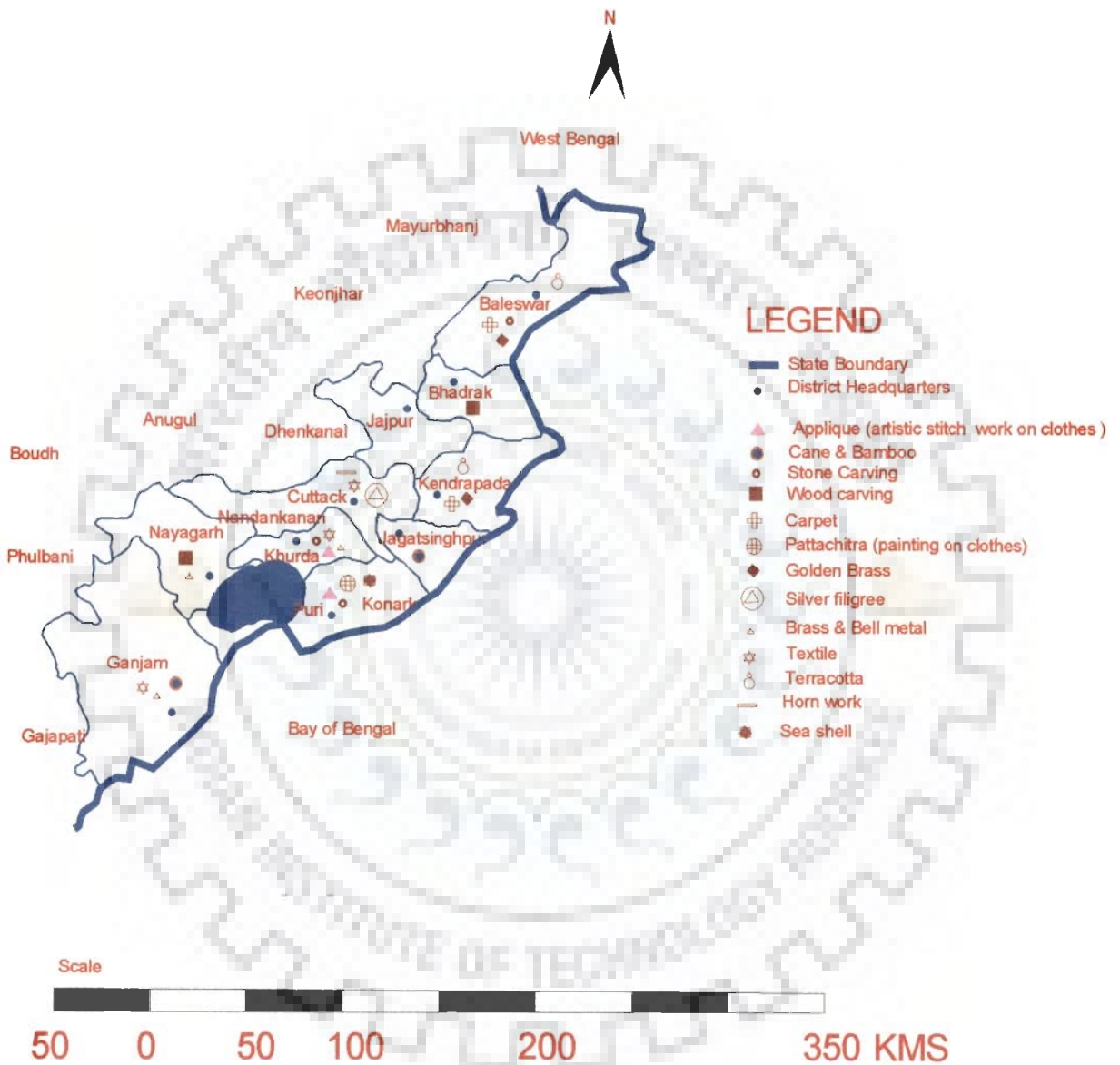
Fig. No. 3.4: location of handicrafts in the study area

3.2. TRENDS OF TOURISM IN ORISSA STATE AND IN THE STUDY AREA

The trend of the tourism and various important related parameters in the study area vis-à-vis the State were analyzed based on extensive literature survey to assess the present status; and discussed below. They are:

3.2.1. Foreign and Domestic Tourists of the Country Visiting the State

The share of tourist arrival of Orissa State to that of the country has been analyzed in order to find the relative importance of the State in the country from tourism development point of view and priority attached by the tourists to the State as a tourist destination and the results are presented in Table No. 3.3.

Table No. 3.3: Tourist arrival in Orissa vis-à-vis India from the year 2000 to 2004
(in '000s)

Sl.No.	Year	Domestic tourists		Share of Orissa in per cent	Foreign tourists		Share of Orissa in per cent
		India	Orissa		India	Orissa	
1	2000	220106.94	2981.23	1.35	2649.37	25.56	0.97
2	2001	234781.25	3162.53	1.34	2537.28	21.97	0.86
3	2002	271328.18	3429.02	1.26	2384.36	23.48	0.98
4	2003	NA	3805.96	-	2726.21	25.55	0.93
5	2004	NA	4326.02	-	3367.98	30.30	0.89

Source: Complied from Statistical Bulletin2000 to 2004, Department of Tourism and Culture, Government of Orissa and Statistical Abstract 2002, Government of Orissa.

It is observed from the table that the share of domestic tourist inflow to the State varies between 1.26 to 1.35 per cent and that of foreign tourist varies between 0.86 to 0.98 per cent to that of tourist arrival in the country in the last five years between 2000 and 2004. In both the cases, the share of Orissa to national level is abysmally low. This result infers that Orissa State is yet to become a prime tourism destination in the country in spite of having rich potential pertaining to tourism industrial development.

3.2.2. State/Region Wise Domestic Tourist and Country/ Region Wise Foreign Inflow to Orissa State

The State wise /region wise domestic tourist flow, and country / region wise foreign tourist inflow to Orissa State is analyzed for the year 2004 in order to understand the major tourist contributing regions in the country and world and the results are presented in the Table Nos. 3.4 and 3.5 and Fig. Nos. 3.5 and 3.6.

Table No. 3.4: State/Region wise Domestic Tourist inflow to Orissa State in 2004
(Tourist flow in '000s)

Sl.No.	State/Region	Tourists inflow in Numbers	Per cent of total
1	West Bengal	865.21	20.11
2	Andhra Pradesh	197.34	4.59
3	Bihar and Jharkhand	185.23	4.31
4	Madhya Pradesh and Chhatisgarh	175.46	4.08
5	Northern States	169.10	3.93
6	New Delhi	8.62	0.20
7	Western States	149.64	3.48
8	Other southern States	113.39	2.64
9	Other States/ Union Territories	281.64	6.55
10	Orissa	2156.98	50.13
11	Total	4326.02	100.00

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa and Statistical Abstract 2002, Government of Orissa
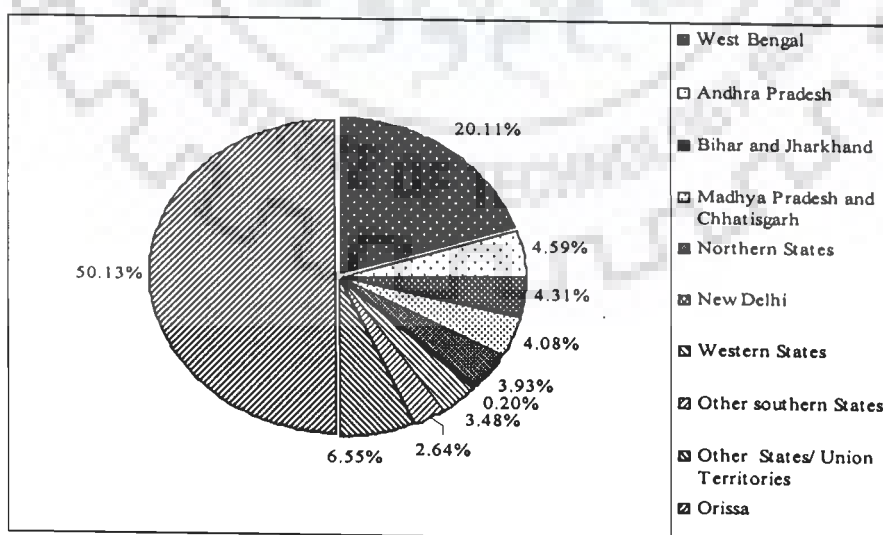
Fig. No. 3.5: Region wise domestic tourist flow to Orissa State

Table No. 3.5: Country/ Region wise Foreign Tourists visiting Orissa State in 2004
(Tourists in '000s)

Sl.No	Region	Tourists inflow in numbers	Per cent of total
1	North America	3.74	12.34
2	Central and South America	0.24	0.79
3	Australia	1.67	5.51
4	Western Europe	16.75	55.28
5	Eastern Europe	0.56	1.84
6	West Asia	0.44	1.45
7	South Asia	0.97	3.20
8	South-East Asia	0.69	2.27
9	East Asia	3.33	10.99
10	Africa	0.44	1.45
11	Others	1.47	4.85
11	Total	30.30	100.00

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa and Statistical Abstract 2002, Government of Orissa
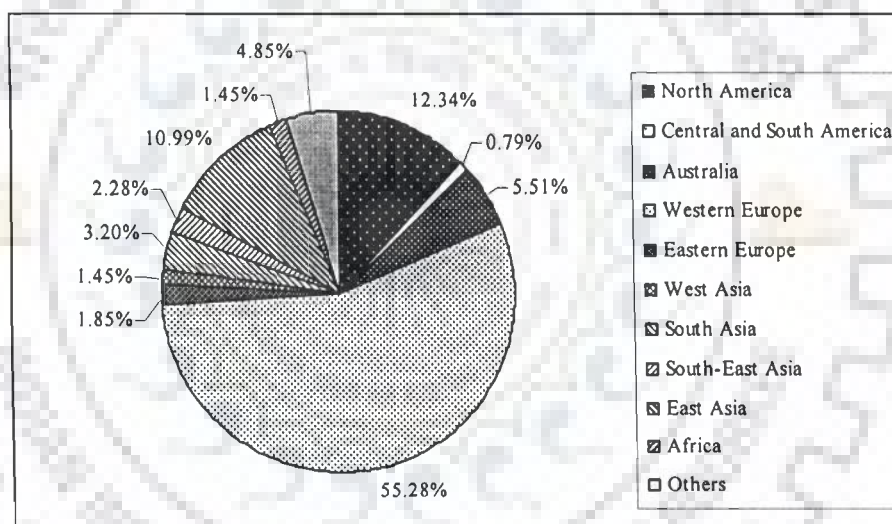
Fig. No. 3.6: Country/ Region wise foreign visiting Orissa State in 2004

It is observed from the table and figure that the majority of domestic tourists visit are from neighboring States/regions, such as, West Bengal State (20.11 per cent), followed by Andhra Pradesh State, Bihar and Jharkhand Region, Madhya Pradesh and Chhatisgarh Region of the country. About half of the total domestic tourists belong to the State itself. This clearly shows that the tourism has not made much influence in many regions of the country.

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In the foreign tourist category, majority tourist inflow is observed from Western Europe (55.28 per cent). North America (12.34 per cent), East Asia (10.99 per cent) and Australia (5.51 per cent) are the other important foreign tourist contributing regions to Orissa State.

Thus, it is observed that there are many countries across the globe and regions of the county are at present away from the influence of tourism in Orissa State in spite of its rich potential.

3.2.3. Year Wise Tourist Arrival in the State and in the Study Area

The inflow of tourists to the State and the study area have been investigated based on the data available since the year 1980 to year 2004, in order to find the general trend and the possible shift in tourist flow in both domestic and foreign categories, in the changing scenario, with open market economy (adopted in early 1990s'), and flexible policy adopted by the Government of India and the Orissa State and presented in Table No. 3.6.

Table No. 3.6: Tourist arrival in Orissa State since 1980 (Tourists in '000s)

Sl. No	Year	Total number of Tourist visited					
		Domestic	Percentage change	Foreign	Percentage change	Total	Percentage change
1	1980	190.29	-	23.94	-	214.23	-
2	1985	670.90	252.50	26.23	9.50	697.13	225.41
3	1990	1212.26	80.69	32.19	22.72	1244.45	78.51
4	1992	2471.34	103.86	35.39	9.94	2506.73	101.43
5	1995	2740.15	10.88	30.21	-14.63	2770.36	10.51
6	2000	2981.23	8.79	25.56	-15.39	3006.79	8.53
7	2004	4326.02	45.10	30.30	18.54	4356.32	44.88

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa and Statistical Abstract 2002, Government of Orissa.

It is observed from the table that there is a large increase in total tourist inflow (about 20 times) since 1980 to 2004, which is mostly due to increase in inflow of large domestic tourists. The increase in both domestic and total tourist arrival to the Orissa

State is about 13 times that of in 1980. On the other hand, it is also observed that the foreign tourist inflow since 1980 to 2004 is almost stagnant (increase of 26.56 per cent), and even shown negative trend between the period 1992 and 2000. Thus, open market economy and policy initiatives have not influenced the foreign tourist arrival in the State.

3.2.4. Year Wise Tourist Visit to Orissa State and in the Study Area Since 1992

The year wise tourist arrival in the State and in the study area was investigated to explore the general trend of tourist arrival and share of the study area to the total tourist arrival in the State in the post market economy era. The results are presented in the Table No. 3.7 and Fig. No. 3.7.

Table No. 3.7: Year wise tourist visit to Orissa State and in the study area since 1992

(in '000s)

Sl. No	Year	Domestic tourist			Foreign tourist			Total tourist		
		Orissa State	Study Area	share of Study Area to Orissa State (Per cent)	Orissa State	Study Area	share of Study Area to Orissa State (Per cent)	Orissa State	Study Area	share of Study Area to Orissa State (Per cent)
1	1992	2471.34	1910.34	77.30	26.34	11.74	44.60	2497.69	1922.08	76.95
2	1993	2538.87	1948.58	76.75	24.85	11.26	45.35	2563.73	1959.84	76.44
3	1994	2594.99	2009.30	77.43	26.02	11.24	43.20	2621.01	2020.54	77.09
4	1995	2740.15	2127.33	77.63	30.21	13.73	45.44	2770.36	2140.54	77.26
5	1996	2776.06	2145.67	77.29	35.31	13.23	37.46	2811.38	2148.80	76.43
6	1997	2835.27	2166.92	76.42	35.39	13.02	36.79	2870.66	2179.94	75.93
7	1998	2883.08	1887.75	65.47	31.62	10.22	32.32	2914.70	1897.97	65.11
8	1999	2608.19	1905.65	73.06	21.43	8.45	39.43	2629.63	1914.10	72.78
9	2000	2981.23	1950.52	65.40	25.56	9.69	37.79	3006.79	1960.21	65.19
10	2001	3162.53	2805.20	88.70	21.97	9.74	44.33	3184.52	2814.74	88.38
11	2002	3429.02	3084.45	89.95	23.48	9.43	40.12	3452.51	3093.88	89.61
12	2003	3805.96	3739.89	98.26	25.55	10.95	42.85	3831.52	3750.64	97.88
13	2004	4326.02	4150.10	95.93	30.30	13.22	43.63	4356.52	4163.22	95.56

Source: Complied from Statistical Bulletin 2004, Department of Tourism and Culture, Government of Orissa and Statistical Abstract 2002, Government of Orissa.
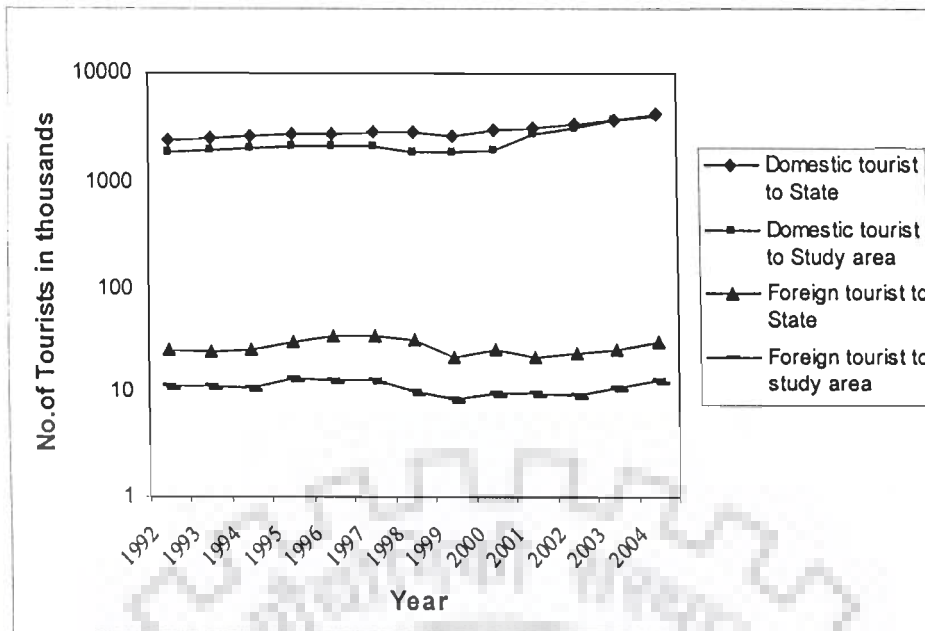
Note: Logarithmic Scale is used.

Source: Complied from Statistical Bulletin 2004, Department of Tourism and Culture, Government of Orissa and Statistical Abstract 2002, Government of Orissa.

Fig. No. 3.7: Year wise Growth of Domestic and Foreign tourists to Orissa State and in the study area

It is observed from the table and from the figure that the domestic tourist inflow in the State and in the study area has increased steadily over the years and the foreign tourist inflow is almost stagnant showing negative trends 1997 to 2003. There is about 175.00 per cent and 217.00 per cent increase in domestic tourist inflow to the State and in the study area since 1992 to 2004, which contributes about more than 99.30 per cent of total tourist arrival in the State, and in the study area.

The share of domestic tourist varies from 62.45 per cent to 77.75 per cent from the year 1992 to 2001, after which the share has increased to about 98.00 per cent in 2003 and about 95.00 per cent in 2004. On the other hand, the share of the study area in foreign tourist arrival varies from 32.00 per cent to 45.00 per cent. Thus, it is understood that most of domestic tourists to the State visits the study area in recent times; where as other areas of the State attracts the foreign tourists considerably.

It is also observed that there is a steady growth in domestic tourists to both in the study area and in the State where as there is fluctuations in growth in foreign tourist category. However, in the year 2004, the study area has experienced a growth rate of 10.95 per cent and 20.70 per cent in domestic and foreign tourist categories respectively as compared the growth rate in the State in the above two categories are 13.69 per cent and 20.80 per cent respectively.

3.2.5. Destination Wise Tourist Visit to the Study Area

A destination wise tourist flow in both domestic and foreign tourists categories have been conducted in order to explore the prime tourists destination and their importance in the study area. The investigation was made based on the secondary data available for important destinations. In this investigation, the most important destinations of the study area were considered and the results are presented in Table No. 3.8.

Table No. 3.8: Destination wise Tourist visit to Study area (in the year 2004)

(Tourists in '000s)

Sl No	Name of the Districts	Important destinations	Domestic tourists	Foreign tourists	Total Tourists	Share of foreign tourists to the destinations to the foreign tourists visits to the study area	Share of domestic tourists to the destinations to the domestic tourist visit to the Study area	Share of total tourist visit to the study area (Per cent)
1		Chandipur	335.10	0.11	335.21	0.8	8.07	8.05
2		Remuna	307.00	0.00	307.00	0	7.39	7.37
3		Chandaneswar	486.60	0.00	486.00	0	11.71	11.67
4	Balasore	Panchalingeswar	246.30	0.00	246.30	0	5.93	5.91
5		Balaramgadi	335.10	0.11	335.21	0.8	8.07	8.05
6		Talasari	96.40	0.00	96.40	0	2.32	2.31
7		Balasore	97.04	0.17	97.21	1.2	2.33	2.33
8	Bhadrak	Aradi	658.00	0.00	658.00	0	15.85	15.84
9		Dhamnagar	131.00	0.00	131.00	0	3.15	3.14
10		Chandbali	145.40	0.08	145.48	0.6	3.5	3.49

11		Aharpada	84.30	0.00	84.30	0	2.03	2.02
12		Cuttack	339.55	0.25	339.80	1.89	8.18	8.16
13		Lalitgiri	84.80	0.54	85.34	4.08	2.04	2.04
14		Ansupa	43.20	0.00	43.20	0	1.04	1.02
15	Cuttack	Banki	132.25	0.00	132.25	0	3.18	3.17
16		Bhatarika	6.68	0.00	6.68	0	0.16	0.16
17		Choudwar	68.09	0.00	68.09	0	1.64	1.63
18		Dhabaleswar	198.23	0.00	198.23	0	4.77	4.76
19		Nemala	101.49	0.00	101.49	0	2.44	2.43
20		Gopalpur	247.50	0.93	248.43	7.03	5.96	5.96
21		Taptapani	88.05	0.20	88.25	1.51	2.12	2.11
22		Narayani	102.80	0.00	102.80	0	2.47	2.46
23		Taratarini	316.50	0.00	316.50	0	7.62	7.60
24	Ganjam	Berhampur	222.90	0.15	223.05	1.13	5.37	5.35
25		Mahurkalia	83.20	0.00	83.20	0	2	1.99
26		Manitridi	111.50	0.00	111.50	0	2.68	2.67
27	Jagatsingh pur	Paradeep	170.07	0.48	170.55	3.63	4.09	4.09
28		Jhankad	220.54	0.00	220.54	0	5.31	5.29
29		Jajpur	156.55	0.00	156.55	0	3.77	3.76
30		Ratnagiri and Udaygiri	108.02	0.54	108.56	4.08	2.6	2.60
31	Jajpur	Mahavinayak	93.80	0.00	93.80	0	2.26	2.25
32		Chandikhol	89.80	0.00	89.80	0	2.16	2.15
33		Chhatia	90.50	0.00	90.50	0	2.18	2.17
34		Baruneswarpitha	73.67	0.00	73.67	0	1.77	1.73
35		Kendrapara	204.14	0.00	204.14	0	4.91	4.90
36	Kendrapara	Bhitarakanika	33.54	0.13	33.67	0.98	0.8	0.80
37		Ali	88.24	0.00	88.24	0	2.12	2.11
38		Bhubaneswar	555.90	9.72	565.62	73.52	13.39	13.58
39		Dhauli	688.70	7.92	696.62	59.49	16.59	16.73
40	Khurda	Khandagiri and Udaygiri	733.50	7.52	741.02	56.88	17.67	17.79
41		Nandankanan	1352.68	1.13	1353.81	8.54	32.59	32.51
42		Artri	121.02	0.02	121.04	0.15	2.91	2.90
43		Chilka	322.65	0.69	323.24	5.21	7.77	7.76
44		Kantilo	78.55	0.00	78.55	0	1.89	1.88
45		Odagoan	197.20	0.00	197.20	0	4.75	4.73
46	Nayagarh	Sarankul	78.10	0.00	78.10	0	1.88	1.80
47		Nayagarh	89.30	0.00	89.30	0	2.15	2.11
48		Jamupatna	118.75	0.00	118.75	0	2.86	2.85
49	Puri	Puri	4150.10	13.22	4163.32	100	99.9	99.90
50		Konark	1993.51	7.95	2001.49	60.13	48.03	48.07
51		Kakatpur	160.87	0.00	160.87	0	3.87	3.86

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52		Satyabadi	409.02	0.42	409.44	3.17	9.85	9.83
53		Baliharichandi	75.30	0.01	75.31	0.07	1.81	1.80
54		Brahmagiri	141.09	0.00	141.09	0	3.39	3.38
55		Raghurajpur	31.19	1.52	32.71	11.47	0.75	0.78
56		Pipli	276.56	4.28	280.84	32.37	6.66	6.72
57		Ramchandi	138.79	2.90	141.69	21.93	3.34	3.41
58		Satapara	70.52	0.60	71.12	4.53	1.68	1.70

Source: Complied from Statistical Bulletin 2004, Department of Tourism and Culture,
Government of Orissa and Statistical Abstract 2002, Government of Orissa.

It is observed from the table that in the domestic category Puri is the highest receiver of total tourists' inflow (about 99.90 per cent), followed by Konark (48.07per cent), Nandan Kanan (32.51 per cent) in Bhubaneswar, Khandagiri and Udaygiri (17.79 per cent), and Dhauli (16.73 per cent) at Bhubaneswar. The other important destinations, which attract large number of domestic tourists, are Chilka, Pipli, Satyabadi, Chandipur, Remuna, Chandaneswar, Aradi, Gopalpur and Taratareni. The tourist arrival in these destinations varies from about 5.00 per cent to 15.00 per cent of total tourist arrival in the study area. It is also observed that a number of destinations despite having tourist attraction features, such as, Lalit giri and Ratna giri (Archeological sites), Bhitarkanika and Satapara (wildlife such as, Crocodile sanctuary, Dolphine sights etc.), Chandikhol, (summer resort), etc., do not attract many tourists. In the foreign tourist category, it is observed that, most of the tourists inflow are concentrated in Puri (100.00 per cent), Konark (60.13 per cent), Bhubaneswar (73.52 per cent), Dhauli (59.49 per cent), Khandagiri and Udaygiri (56.88 per cent), Pipli (32.37 per cent), Raghuraj pur (11.47 per cent), Chilka (5.21 per cent) and Nandan Kanan (8.54 per cent). Other destinations do not attract much of the foreign tourists.

Therefore, it is revealed that there are large variations in tourists flow to various destinations. Most of the tourist flow in domestic category is due to religious reasons, followed by archeological and architectural sites. Sea beaches and organized wildlife

also attract good number of domestic tourists. However, it is also found that the most of the domestic tourist flow are to the well-publicized destinations and a number of important destinations despite their attractive features do not attract many tourists for other reasons such as, lack of transportation facilities, accommodation and proper promotion and publicity.

The foreign tourists concentrate in the most publicized destinations, which are located in and around Bhubaneswar and Puri. The architectural and archeological artifacts mostly attract foreign tourists. Similarly, it is also observed that places like Pipli and Raghurajpur, which are exclusively known for their handicrafts, have higher share of foreign tourists visit than domestic tourists. Thus, organized handicrafts destinations attract foreign tourists.

3.2.6. Month Wise Tourist Visit to Orissa State

The month wise tourist inflow to the State was investigated in order to find out the appropriate period of the year based on the data available for the year 2004 and presented in Table No.3.9 and Fig. No. 3.8.

Table No. 3.9: Month wise Tourist Visit to Orissa State (in '000s)

Sl.No.	Month	Number of Tourists			Proportion of total in per cent	
		Domestic	Foreign	Total	Domestic	Foreign
1	January	358.19	4.00	362.19	8.28	13.22
2	February	315.79	3.89	319.68	7.30	12.84
3	March	297.19	2.77	299.96	6.87	9.13
4	April	274.26	2.30	276.56	6.34	7.62
5	May	320.55	0.94	321.49	7.41	3.13
6	June	317.96	0.99	318.95	7.35	3.28
7	July	324.88	0.96	325.84	7.51	3.20
8	August	290.70	1.23	291.93	6.72	4.07
9	September	292.87	1.24	294.11	6.77	4.11
10	October	462.01	3.37	465.38	10.68	11.14
11	November	464.61	3.42	468.03	10.74	11.32
12	December	606.93	5.19	612.12	14.03	16.94
13	Total	4326.00	30.30	4356.30	100.00	100.00
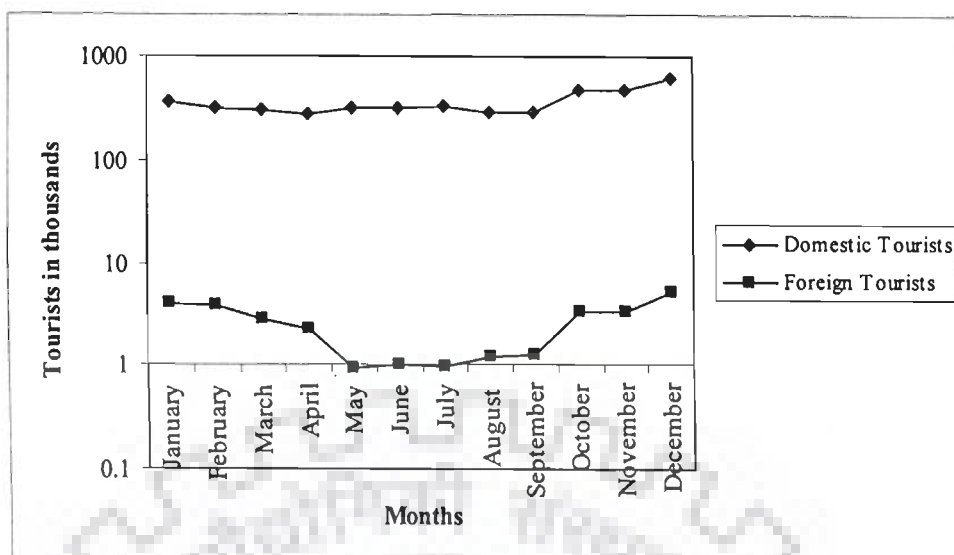
Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture

Fig. No. 3.8: Month wise variation of tourist flow to the State

It is observed from the table and from the figure that the maximum domestic tourist flow to the State occurs in the months of October, November, December and January with the peak flow in December. In other period of the year, the tourist inflow is almost constant. In case of foreign category, majority of tourist inflow occurs in the period of October, November, December, January, February March and it is peak in the months of December and January. Thus, the winter and early spring are the best seasons for tourist flow to the State. In the absence of precise data about the month wise tourist flow to the study area and the study area being the prime receiver of the tourists (about 95.00 per cent of domestic and 45.00 per cent of foreign tourists) similar trend is assumed for the study area. In this regard, a verification of the month wise trend is attempted through primary survey and presented in the section 4.3.7 of Chapter-4.

3.2.7. Inflow of Money through Tourist Expenditure

The inflow of money to the State has been investigated from the tourist expenditure in the State based on the secondary data available from the year 1998 to 2004 in order to find out the contribution of tourism to the economy of the State. The investigation was done based on the share of foreign exchange earning of the State to that of the country from tourist expenditure and total inflow of money to the State from tourist expenditure and are presented in Table No. 3.10 and Table No. 3.11.

Table No. 3.10: Foreign Exchange earning in India and Orissa State from tourist Expenditure

(in Million Rupees)

Sl No.	Year	Inflow of Foreign Exchange money in Million Rupees		
		India	Orissa State	Share of Orissa State to India in per cent
1	1998	121500.00	382.60	0.31
2	1999	129510.00	305.50	0.23
3	2000	142380.00	281.40	0.20
4	2001	143440.00	271.10	0.19
5	2002	141950.00	273.20	0.19
6	2003	164290.00	296.80	0.18
7	2004	218280.00	341.80	0.16

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture

Table No. 3.11: Inflow money through Tourist Expenditure from 1998 to 2004

(in Million Rupees)

Sl No.	Year	Inflow of money in Million Rupees			Share of money inflow (in per cent)		
		Domestic tourist	Foreign tourist	Total	Foreign	Domestic	Total
1	1998	9583.50	382.60	9976.10	3.83	96.13	100.00
2	1999	9014.40	305.50	9319.90	3.07	96.93	100.00
3	2000	9672.60	281.40	9954.00	2.82	97.18	100.00
4	2001	10382.30	271.10	10653.40	2.54	97.46	100.00
5	2002	11430.60	273.20	11703.80	2.33	97.67	100.00
6	2003	12394.70	296.80	12691.50	2.33	97.67	100.00
7	2004	13815.60	341.80	14157.40	2.41	97.59	100.00

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture

It is observed from the above tables that the share of foreign exchange inflow to the State is on decline, and that it is abysmally low (about 0.16 per cent of the total country's receipt from tourism in the year 2004). It is also observed that most of the inflow of money from tourist expenditure in the State comes from domestic tourists, which varies from 96.00 per cent to 98.00 per cent in the years 1998 to 2004. The inflow of money from domestic tourist expenditure is on increasing trend, and the inflow from foreign tourist expenditure is experiencing fluctuation in the last five years.

Thus, domestic tourists form the most important component of the total tourist arrival and earning from tourist expenditure. The status of foreign tourist arrival and expenditure is highly negligible.

3.3. PROXIMITY OF IMPORTANT TOURIST CENTERS IN THE STUDY AREA

The distances of various important tourist destinations keeping Bhubaneswar as the base destination have been investigated in order to explore the proximity of the destinations for destination networking and circuit development. The distances of the destinations have been presented in Table No. 3.12. and in Fig. No. 3.9. Bhubaneswar is considered as the base destination because of its central location in the study area and importance as capital city with higher level of communication and accommodation facilities.

It is observed that a majority of the notable destinations are within the range of 150 KMs on either directions of North-East and South-West from Bhubaneswar city. A number of destinations are confined within 200 KMs range, and a few are located just above two hundred kilometers away from Bhubaneswar.
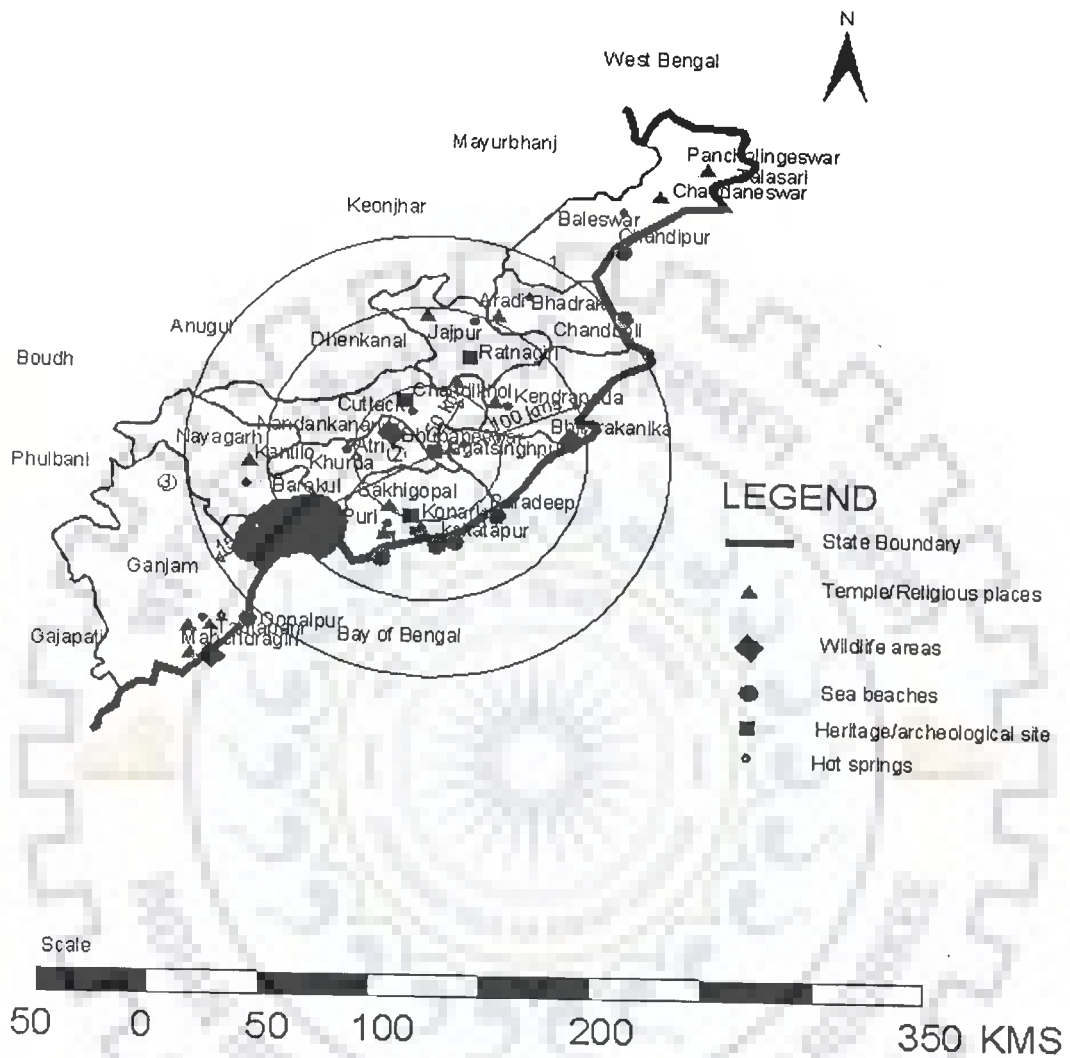
Fig No–3.9: Distance of important tourist destinations in the study area from Bhubaneswar city

3.4.   EMPLOYMENT GENERATION

Employment opportunity is one of the most notable benefits that tourism provides. Tourism activities provide employment generation opportunities in both organized and informal sector. The tourism and its associated activities, which generate employment opportunities, are accommodation, restaurant, transportation, guide

services, shopping, etc. It is found that tourism sector generates employment for about 46103 and 32475 numbers in different sectors of tourism in the State and in the study area respectively. The sector wise employment generation is presented in the Table No.3.13.

Table No. 3.13: Employment generation in Tourism Sector in 2004

Sl.No	Sectors	Employment in the State	Share of different sectors to total employment in tourism in per cent	Employment in the study area	Share of different sectors to total employment in tourism in per cent
1	Accommodation	7855	17.04	6543	20.15
2	Restaurant	14902	32.32	10147	32.24
3	Transportation	11673	25.32	8615	26.53
4	Guides	217	0.48	169	0.52
5	Shopping	7325	15.88	5293	16.32
6	Others	4131	8.96	1376	4.24
7	Total	46103	100.00	32475	100.00

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture and District Statistical Hand Books

It is found from the above table hat restaurant and accommodation sectors together constitute more than half of the total employment generation in tourism sector. The transportation activity generates more than one fourth (25.32 per cent in the State, and 26.53 per cent in the study area) of the total employment opportunities in tourism sector in the State and in the study area both. Shopping is also a major employment-generating sector, which has a share of more than one seventh of the total employment generation opportunities. However, the share of employment as guides is very low (0.48 per cent in the State and 0.52 per cent in the study area), compared to the total employment generation in tourism.

3.5. TOURISM INFRASTRUCTURE

Tourist infrastructure includes basic or general infrastructure, such as, transportation facilities in the form of roads, railways, airways, civic amenities and pertinent exclusive tourism infrastructure, such as, accommodation facilities, travel agencies, guide services and entertainment facilities. In the absence of detailed data, an attempt was made to investigate the availability of infrastructure facilities in the organized sector in the study area and in the State, such as, railways, roads, hotels in the accommodation sectors, and the travel agencies.

3.5.1. Road Network

The road network in the State are classified under various categories, such as, National Highways, State Highways, Major district roads, Other district roads, Classified village roads, Village roads, Forest roads, Panchayat Samiti (Local Bodies at Block Level), Grampanchayat (Local bodies at Village level) roads, and Municipal roads. A detailed account of roads available in the State is already presented in the table nos. 2.22 & 2.23 and shown in the Fig. No.2.9 in the section 2.9.1.3 of Chapter-2. There are about 231034.00 KMs of road length available in the State. Of which, 3193.00KMs of National Highways 5014.00 KMs of State Highways and 3288.00 KMs of Major districts roads available in the State. Six numbers of National Highways are passing through the State joining important cities and State capitals of the country. The roads up to the level of other district roads are mostly paved or black topped. The density of roads in the State is about 1.48KMs Per Square Kilometer, which is very low, compared to the other developed regions of the country.

Table No. 3.12: Distances of Tourist Destinations from Bhubaneswar

Distances of important tourist destinations from Bhubaneswar in KMs									
< 50		51 -100		101-150		151-200		>200	
North East	South west	North East	South west	North East	South west	North East	South west	North East	South west
Bhubaneswar, Dhauli Khandagiri and Udaygiri Nandankanan Satyabadi, Sakhigopal Cuttack Choudwar	Khurda Traboi	Lalitgiri, Ansupa Dhabaleswar Nemala Mahavinayak Chandikhol Chhatia Baruneswarpitha Artri Puri Konark Kakatpur Baliharichandi Brahmagiri Raghurajpur Ramchandi Satapara	Kantilo Odagoan Sarankul Nayagarh Jamupatna	Aradi Dhamnagar Chandbali Aharpada Bhadrakali Banki Bhatarika Paradeep Jhankad Biraja Jajpur Kendrapara Bhitarakanika Ali Satabhaya Gahirmatha Aul	Banapur Satokosia	Chandipur Balasore	Berhampur Gopalpur Chilka	Remuna Chandaneswar Panchalingeswar Balaramgadi Talasari Dhamra Baliapal	Bomkhai Belguntha Kulad Mahurkalia Manitridi Nrayani Patisonpur Taptapani Taratareni

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa

An investigation of the road lengths over the years between 1997 to 2004 reveals that there is a considerable increase in the National Highways and marginal increase in the State Highways, where as there is a decline in Major District roads and other district roads. This occurs due to the up-gradation of such roads to higher level. Although, it is observed that there is increase in all types of rural roads, they are very marginal, and thus there is only marginal increase in road lengths in the State over the last few years.

There are only 681.00 KMs of National Highways, 1422.00 KMs of State Highways and 1688.00 KMs of Major District roads, which belong to the higher-grade category in the study area (c.r.t. 2.9, Chapter-2). This constitutes a meager about 5.00 per cent of total road lengths in the study area. The density of road lengths in the study area is about 198.30 KMs per 100.00 Square kilometers. Thus, it is imperative that there is both quantitative and qualitative inadequacy of roads in the study area and in the State as well from tourism point of view.

3.5.2. Railways

Railway is an important means of transportation for tourism development. At present, as it is mentioned earlier in Chapter-2, that there are about 45 numbers of express and super fast express trains plying through the State joining important cities and destinations of the country. In addition to this, a number of Diesel Multiple Units connecting a few cities of the State and neighbouring States are also running. A careful study of the trains plying through the State reveals that except a few major pilgrimage centers, many of the important tourist destinations of the country and cities are not connected by direct railway link, there by denying inter-tourist destination connectivity. It is also observed that many of areas and tourist destinations of the State are not connected by railway network in the State. Apart from this, the rate of growth of

railway routes in the State and in the study area is very slow. Thus, the inadequacy of railway network in the State and in the study area is a major deterrent in the tourism development of the study area. The available railway network is presented in the Fig. No.2.7 and route length is presented in the Table No. 2.20 and 2.21 of chapter-2.

3.5.3. Airways

The State has only one airport having quality services and located in the State capital Bhubaneswar. There are also a number of airstrips located in other destinations such as, Rourkela, Chowdwar, Jaypore, and Saranga, but are not used for commercial purposes. Bhubaneswar is connected to major cities of India, such as, New Delhi, Mumbai, Channai, Kolkata, Hyderabad, Nagpur, etc. However, the frequency and number of flights to the State are low compared to other locations of the country, and at present, only two domestic air service providers operate their flights to the State.

3.5.4. Travel Agencies

Travel agencies play important roles in providing tourist facilities and services to the tourists. The study area has about 71 and the State as a whole has 85 recognized travel agencies that provide various services and facilities in the State including package tours. Majority of the travel agencies are located in Bhubaneswar, Cuttack and Puri. However, there are only four nationally recognized tour operators and travel agencies operate in the State. A discussion with various travel agencies reveals that most of them except Orissa Tourism Development Corporation do not provide service tour packages in the study area. Orissa Tourism Development Corporation plies a very few bus and taxi services to a very few tourist destination on sporadic basis. Thus, the study area does not have organized service tour packages connecting a number of destinations to facilitate tourists visit in the study area and in the State as well.

3.5.5. Accommodation

Accommodation is another important aspect, which strengthen tourism industrial development. Various accommodation facilities in the State and in the study area are Hotels, Panthanivases (Guesthouses with all modern and hospitality facilities run by Tourism Department), Dharmasalas (Charitable Guest Houses), tourist bungalows, etc. In the absence or organized data regarding the tourist bungalows and charitable guesthouses; an investigation has been attempted pertaining to availability of hotel positions, year wise growth of hotels and number of hotel beds and available occupancy ratio in the State and in the study area.

3.5.5.1. Accommodation (hotel) facilities in the study area and in the state (2004)

The availability of hotel facilities in the year 2004 in the study area and in the State is presented in Table No. 3.14.

Table No. 3.14: Accommodation (Hotel) facilities in the study area and State (2004)

Sl.No.	Districts	No of Hotels	No. of Rooms	No. of Beds
1	Balsore	44	789	1604
2	Bhadrak	15	188	311
3	Cuttack	52	1369	2425
4	Ganjam	80	1605	2903
5	jagatsinghpur	7	168	345
6	Jajpur	21	284	529
7	kendrapara	8	77	133
8	Khurda	116	2868	5624
9	Nayagarh	9	111	186
10	Puri	223	4549	9899
11	Study area	575 (63.53)	12008 (64.76)	23959 (67.84)
12	Orissa State	905	18541	35314

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa

It is observed that there are 575 hotels in all categories having 12008 rooms and 23949 beds available in the Study area in the year 2004. The availability of hotels, rooms and beds nearly constitute more than 60.00 per cent of the total availability in the

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State. It is observed that majority of the hotels are concentrated in Puri and Khurda districts, followed by Ganjam and Cuttack districts.

3.5.5.2. Year wise position of hotels in the study area and in the State

The year wise hotel positions in the study area and in the State are presented in Table No. 3.15., and the table reveals that the average year wise growth rate of hotels in the study area and in the State are 4.65 per cent and 4.33 per cent respectively in the last eight years, which shows that there is slow but steady progress in construction with availability of hotels in the study area and in the State.

Table No. 3.15: Year wise hotel position in the Study area and in the State
(in Numbers)

Sl.No.	Area	Year wise hotel position							
		1997	1998	1999	2000	2001	2002	2003	2004
1	Balsore	35	36	36	40	38	39	42	44
2	Bhadrak	10	12	12	16	15	14	14	15
3	Cuttack	47	48	48	49	49	47	48	52
4	Ganjam	58	59	67	67	68	70	71	80
5	Jagatsinghpur	4	4	4	4	4	4	4	7
6	Jajpur	8	10	10	11	11	13	17	21
7	Kendrapara	5	5	6	6	6	7	8	8
8	Khurda	81	87	88	100	113	113	114	116
9	Nayagarh	5	5	5	6	6	6	8	9
10	Puri	166	168	174	178	209	212	215	223
11	Study area	419	434	450	477	519	525	541	575
12	Orissa State	672	694	733	769	817	829	860	905

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa

3.5.5.3. Category of hotels

Affordability of stay is an important parameter in deciding the tourist visit and stay in any destination. Therefore, an attempt was also made to explore the availability of hotels under various average room tariff conditions The hotels are broadly classified into three categories, such as, Low Spending (Average Room tariff having less than Rs. 300.00), Medium Spending (Average Room tariff between Rs. 300.00 to Rs. 699.00), and High Spending (Average Room tariff more than Rs.700.00) for the

aforesaid purposes, and analyzed. The results are presented in Table No. 3.16, and the table reveals that in the study area and in the Orissa State, about 90.00 per cent of the hotels belong to low spending and medium spending groups, thus most of the hotels are available under affordable range of the tourists, which is the positive sign for tourism development.

Table No. 3.16: Category of hotels in the study area and in the State

Sl No	Category of hotels	Study area		Orissa State	
		No.	Per cent	No.	Per cent
1	Low Spending	376	65.39	646	71.38
2	Medium Spending	136	23.65	183	20.22
3	High Spending	63	10.96	76	8.40
4	Total	575	100.00	905	100.00

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa

3.5.5.4. Ratio of hotel and hotel beds to tourist occupancy

The ratio of availability of hotels and hotel beds occupancy is analyzed thoroughly and the results are presented in Table No. 3.17.

Table No. 3.17: Ratio of beds to tourist occupancy

Sl. No.	Parameters	Ratio	
		Study area	Orissa State
1	Total tourist: Total no. of hotels	7240.00:1	4318.25:1
2	Total tourist: Total no. of beds	173.75:1	123.35:1
3	Night occupancy: total no. of hotels	2544.85:1	1684.50:1
4	Night occupancy: Total no. of beds	104.82:1	43.17:1

Source: Complied from Statistical Bulletin 1996 to 2004, Department of Tourism and Culture, Government of Orissa

Note: 35.15 percent of total tourists are considered to stay in hotels based on the first hand informations collected from the occupancy rates of hotels in the study area.

The above table illustrates that the ratio of total tourists and availability of hotels and beds are 7240.00:1, 173.75:1 in the study area, and 4318.25: and 123.35:1 in the State. Similarly, the ratio of night occupancy of availability of hotels and beds are 2544.85:1, 104.82:1 in the study area, and 1684.50:1, and 43.17: 1 in the State. Thus, the availability of hotels particularly in the study area is low at the present position of tourist flow.

3.5.6. Other Tourist Infrastructure and Civic Amenities

The various other tourist infrastructures, such as, places for entertainment, food locations and restaurants, clubs, excursion and camping facilities at destination level, temporary resting facilities, civic amenities, such as, water supply, sanitation, waste disposal facilities, tourist information centers and network are available at destination levels, for which organize data are not available. Therefore, primary survey has been attempted in order to understand the status of these infrastructures and are presented in the subsequent Chapter-4.

3.6. TOURISM INVESTMENT

Investment is one of the most important factors, which strengthens tourism industrial development. Tourism investment occurs under various heads, such as, tourist center development, accommodation, promotion and publicity, transportation, etc. In the State, tourism investment occurs in plan outlays under five year plans. The total plan outlays in the Ninth (1997-98) and Tenth Five Year plan (2002-03) are 195.00 and 219.50 Million Rupees, which accounts about 0.10 per cent of the total plan outlay of the State. A detailed annual plan outlay/ and expenditure is presented in Table No. 3.18.

Table No. 3.18: Plan outlay (expenditure) in the State for tourism development

Sl. No.	Year	Tourist Center develop-pment	Accomm-odation	Adminis tration	Promotion and publicity	Investment in public sector undertaking	Tourist Transport	Others with assistance From central gover-ment	Total
		Plan out lay /Expenditure in Million Rupees							
1	1997	2.70	13.27	2.14	13.30	1.50	3.47	0.00	36.68
2	1998	13.20	9.85	1.80	16.60	1.50	0.00	0.00	43.00
3	1999	2.34	6.20	0.90	14.50	0.00	0.00	0.00	24.01
4	2000	1.31	9.94	1.14	15.10	1.00	0.00	0.00	28.49
5	2001	1.02	5.08	0.82	16.06	0.00	0.00	0.00	22.98
6	2002	0.25	9.54	0.00	11.70	0.00	0.00	0.00	21.49
7	2003	0.25	25.36	0.00	16.63	0.00	0.00	0.00	42.24
8	2004	0.30	53.60	0.00	24.00	0.00	0.00	30.00	107.60

Source: Complied from Statistical Bulletin 2004, Department of Tourism and Culture, Government of Orissa

The above table explains that the annual plan outlay and subsequent expenditure in tourism sector varies from 21.49 million rupees to 42.24 million rupees in 1997 to 2003 and only in the year 2004, the plan outlay is little higher, i.e., 107.60 million rupees. It is observed most of the investments are in accommodation, promotion, and publicity. In contrast it is found that there is very low investment in tourist center development, and transportation.

Additionally, the annual budgets of Orissa State of the year 2002-2003 and 2003-04 have been analyzed to observe the financial planning and the priority attached to tourism development in the State as an example.

The analysis manifested that tourism does not find any distinct place in the annual budget allocation of the State. However, there are allocations in infrastructural developments, such as, transport, energy, water supply and sanitation, rural development, sports and culture, which indirectly support tourism development. The total budget allocation on the above heads found to be about 8.00 per cent of total budget of the State, which is very meager.

3.7. CONSERVATION

Conservation of Cultural heritage structures and tourist attraction elements are important factors for tourism development. It is observed that a number of organizations in both private and public sector are involved in conservation of art, culture and cultural heritage and biodiversity of the State. Organizations like Indian Archeological Society, State Archeological Society, Indian National Trust for Art and Cultural Heritage (INTACH) and other Non-Governmental Organisations are operating in the State in their related spheres, such as conservation of archeological sites, conservation of heritage monuments, and conservation of biodiversity and natural resources, etc., thereby contributing to the promotion of tourism in the State. However, it is also understood that despite efforts are made at various levels, paucity of fund make it difficult for proper attention and conservation of the heritages and bio diversity to retain their attractive features for tourism development.

3.8. GOVERNMENT POLICIES AND INITIATIVES

In the recent changing scenario, understanding the potential of tourism, the Government of Orissa and the Government of India have taken a number of initiatives in the form of organizational support, investment in the priority areas, such as, creation of adequate infrastructure and civic amenities, conservation of heritage monuments and wildlife, supporting in the fairs and festivals, marketing and publicity. The State also encourages Private Sectors and Public Sectors to participate in tourism development process, through various incentives. Apart from this, Orissa State in India is the first State to declare hotel as an industry. Above all, Tourism Policy of Orissa State in 1997 has been drawn to harness the potential offered by the State, and the State Tourism Policy is discussed as below:

The Orissa State accords a very high priority for development of tourism in the State in general with the objectives of optimum harnessing of the resources to attract the maximum number of domestic and foreign tourists with increased average duration of their stay in the State. Further, development of tourism-related industries, promotion of rich handicrafts and handlooms, promotion of the natural grandeur and cultural heritage, promotion of cross-cultural interaction, socio-cultural amity and economic development through tourism, and involvement of the private sector, autonomous bodies, local authorities and the people at large in promotion of tourism, are the other key areas of concern in which priorities have been attached by the State.

The tourism policy manifests that the State shall encourage and facilitate activities, which will promote tourism consistent with the tradition and culture of the State. The State envisages to act as a promoter and catalyst to create an environment for planned and sustained tourism development. In this regard, the focus is laid on prioritization of identified travel circuits, planning broad strategies for tourism development, reparation of Tourism Master Plans and Land-use Plans, earmarking of land for creation of tourism-related activities, operation of tourist information services, development of human resources for tourism industry (guide services, hotel and tourism management, etc.), provision for effective regulatory and supervisory mechanism to protect the interest of tourists, production of informative and attractive tourist literature and audio-visual aids, creation of tourism awareness through fairs, festivals, campaigns, publicity, promotion and marketing of the tourist attractions of the State.

As per the policy, the State shall encourage the Non-Government Sector (including private organizations, local bodies, autonomous organizations and corporate agencies) to participate in tourism development to the maximum extent possible. It also

sought the support and collaboration of the local bodies, the Public Sector Undertakings and autonomous bodies, such as, academic institutions and Universities to strengthen tourism infrastructure and services.

The policy also gives thrust on development of the Special Tourism Area identified near Puri extending towards Chilka and other areas declared by the Orissa State Government. Locations identified, as tourist centers shall be reviewed for short listing of viable ones for supporting them for tourism related infrastructural development, publicity and promotional efforts according to importance.

Government land for tourism-related activities declared as industrial activities under the State Industrial Policy- 1996 will be allotted, at concession rates prescribed under the industrial policy of the State.

The State will place high priority in planning new roads; maintenance and improvement of existing roads; which provide linkage to thrust areas and other, identified destinations of tourist importance as well as steps to be taken to provide adequate transport services for various categories of tourists.

It is thus, understood from the above policy guidelines that a number of the essential and pre-requisites for tourism development have been taken care of at the macro level.

3.9. ORGANIZATIONAL SET UP AND PROCEDURAL REFORMS

One administrative constraint found in many developing countries is that power may be highly centralized in National Government, with little remaining with local or State Governments. In India, confusion persists as tourism as a separate subject does not find a place in the seventh schedule of the constitution of India although a number of its components are either in the Union list, State list or in the Concurrent list. In addition, there are often complex bureaucratic procedures and related envy within

Government in developing countries that fragment the planning process and obstruct coordinated policymaking. However, within the constraints, the Government of Orissa has taken various steps in its organizational set up and procedural reforms for enhancing tourism development in the State.

The Government of Orissa has created a separate department known as Department of Tourism and Culture that has come into existence in its present form in the year1995 to facilitate tourism development in the State. The tourism wing of the department has a composite structure. The directorate of tourism officiated by the Director Tourism and Additional Secretary to Government is the linking pin between the Government at top and organizations at field level. The organizational structure of the Department of Tourism has been presented in Fig. No. 3.10. It is observed that a number of State level officers are functioning at middle level management under the top management, responsible for specific activities relating to tourism development in the State. Further, district level offices in the erstwhile thirteen districts of the State and destination level offices at important destinations, such as, Bhubaneswar, Konark and Barakul are functioning. In addition, three tourist offices outside the State are functioning in three most important cities (Delhi, Kolkata and Chennai) of India. A public sector undertaking, known as Orissa State Tourism Development Corporation Limited, is also functioning under the administrative control of Department of Tourism since the year 1979, facilitating tourism development in the areas of travel, accommodation and tourist guidance.

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                    ┌─────────────────────────┐
                    │    Minister of Tourism   │
                    └─────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │    Commissioner cum      │
                    │       Secretary          │
                    └─────────────────────────┘
                                 │
                                 ▼
                ┌───────────────────────────────────┐
                │ Director of Tourism and Additional │
                │   Secretary to Government.         │
                └───────────────────────────────────┘
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| Deputy Director of Tourism cum Deputy Secretary to govt. | Joint Director of Tourism cum Deputy Secretary to govt | Deputy Director of Tourism (Finance) | Deputy Director of Tourism (Research) | Deputy Director of Tourism (Statistics) |

| Assistant Director of Tourism cum Under Secretary | Assistant Director of Tourism -II | Assistant Director of Tourism (Production) |

| Horticulturist and Tourist Officer | Four Sections with supporting staff headed by Section Officers |

| Thirteen District Level offices one each in erstwhile mother districts of the State | Three Destination Level Tourist offices at Bhubaneswar, Konark and Barkul | Three Turist offices outside the State one each at New Delhi, Kolkata, and Chennai |

Source: Report on the activities of the Tourism and Culture (Tourism) Department for the year, Govt. of Orissa, 2002-2003.

Fig. No. 3.10: Organizational Set up of Department of Tourism and Culture (Tourism Wing) of Orissa State

3.10. MAJOR PROBLEMS IN TOURISM DEVELOPMENT IN THE STUDY AREA

In spite of the vast potential available for tourism development, the study area stands very lowly in the tourism map of India. Hence, it is indeed the need of the hour to understand and find the reasons for ailing tourism industry in the State in general and in the study area in particular. A few of the prime problems, such as, occurrence of natural disasters, lack of adequate infrastructure, poor maintenance and conservation of historical and heritage structures, negative image of the State and poor publicity, and environmental problems faced are the reasons for the same and are discussed below:

3.10.1. Natural Disasters

The study area is often prone to multiple hazards and has been experiencing since long years of its history. One calamity or the other hits almost every year fully or partially. Even in recent years, before recovering the trauma of super cyclone in 1999, the study area was hit by severe drought in the year 2000-2001, followed by unprecedented floods during the rainy season of 2001. Again, it was hit by drought in 2002 followed by flood in 2003. This incidence of natural calamity in the State and in the study area is only a repetition of past long history. It is understood that the study area being a coastal area and comprise of flood plains, occurrence of cyclones and floods are regular features making havoc in the study area. Though the State keeps on taking regular preventive measures, yet they are proved inadequate time and again. Such circumstances only provide high unpredictability and impart negative impacts on the over all economic growth, in general and tourism development in particular.

3.10.2. Poor Publicity

The tourism industry in the State and in the study area is a casualty of the negative image that the State has acquired due to the jolts inflicted on it by nature

repeatedly in the form of heat wave during the summer season and the resultant death due to sunstroke. The havoc created because of the large-scale poverty, deaths due to hunger in Kalahandi district, the state of rampant corruption, etc.; also do not make any good to the sagging image of the State, there by forcing the travelers for a second thought to visit the State.

Very recently, the importance of proper marketing and publicity is understood, and State has initiated steps in these directions. Yet these activities need to be invigorated in a continuous and professional manner to yield fruitful results.

3.10.3. Lack of Adequate Infrastructure

3.10.3.1. Poor transportation and communication system

Very recently, the State is taking measures to upgrade the transportation and communication system in the State and provide an efficient network system, yet the effort and investment is inadequate and limited to major urban areas only. The States most important tourism potential lies in the hinterland and in the rural areas, which are deprived of the development in this sector creating connectivity problems. The quality of road surfaces is also poor in many parts of the State and study area except a few major roads.

Further, though a number of trains are plying through the State connecting various important locations of the country like New Delhi, Mumbai, Kolkata, Channai in addition to other important cities, the number of trains and frequency are low causing the inadequacy in railway service. Railway service inside the State and in the study area is also highly inadequate and most of the tourist locations of the State and study area are away from rail linkage except locations, such as, Puri and Bhubaneswar. The poor facility of air service in the State also plays a deterrent role in attracting domestic tourists from other States of the country as well as foreign tourists because of the low

frequency, connectivity to limited number of cities and lack of air service operators. Apart from this, lack of adequate organized transport operators, tour operators, travel agents in the approved category and unorganized local transport systems in almost all the destinations also act as deterrents for tourism industrial development in the study area.

3.10.3.2. Inadequate civic infrastructure

The tourist destinations do not posses much of the civic amenities, such as, drinking water supply, adequate power supply, efficient drainage and sanitary facilities, which fall under the local bodies. Again, whatever civic amenities available in the study area are mostly confined in the major urban areas. This situation is not improving due to the paucity of funds in the local bodies, which hinder the tourism industrial development considerably.

3.10.3.3. Inadequate Boarding and Lodging Facilities

The State has taken one important step to declare hotel as an industry, which has resulted in establishment of number of hotels in the State, but most of them are concentrated in a few major urban destinations, such as, Bhubaneswar, Cuttack, Puri, and Khurda only. They are also not properly distributed to cater to all categories of travelers. Hence, the smaller destinations are deprived of the facilities, which affect the tourism development to the larger extent.

3.10.4. Inadequate Measures for Restraining Environmental Degradation

A number of environmental and ecological problems, such as, deforestation, soil erosion, overgrazing, air pollution from industrial effluents and vehicle emissions; water pollution from raw sewage, non potable tap water throughout the State; are plaguing the State. To site a few examples, the ecological system of various lakes, such as, Chilika, Hirakud, Ansupa, wildlife areas of Gahirmartha, and Satapada are under

tremendous pressure due to large-scale human intervention, there by the congenial environment for immigrant birds, animals, etc., is degrading day by day.

3.10.5. Poor Maintenance and Conservation of Historical and Heritage Resources

The State particularly the study area has huge number of historical monuments, which are ageing over the years and are being denuded by the vagaries of climate, sea wave and weather. They are in urgent need of conservation. There are a few organizations, such as, Archeological Society of India, State Archeological Society, Indian National Trust for Art and Cultural Heritage and a few Non-Governmental Organizations involved in conservation activities, but lack of adequate financial support and technological facilities make their efforts minimal resulting poor conservation and maintenance of such structures.

3.10.6. Lack of Entrepreneurial Activity and Attitude

It is observed that Orissa State does not possess much of entrepreneurial activity, and the attitude towards the development of such activity is not that encouraging. Whatever such activities are being created are of first generation only. This is being influenced by small size of market, too much of competition from neighboring markets and producers, lack of capital for investment, absence of substantial private capital for investment, improper attitude of lending agencies, critical bureaucratic procedure and absence of managerial skills and are coupled with social attitude and lack of risk taking ability, etc. Thus, tourism is a casualty of such phenomena, improper attitude and lack of awareness, for which, an activity that has the ability to produce sizeable amount of revenue, and generate large-scale employment opportunity and other social benefits is simply not happening.

3.10.7. Lack of Stakeholders and Peoples Participation

No public activity grows and strengthened in absence of people's positive contribution, and participation of stakeholders, and tourism is no exception. In Orissa State, the people's participation is very limited to local level only. Tourism is a labour oriented industry, hence need larger amount of local peoples participation. The lack of awareness, training, education, low-income level and financial capability do not create an atmosphere for proper participation of the various stakeholders and people as well in the tourism development planning process, decision making and implementation. Consequently, the planning process is almost a top down approach and the benefits are limited to a few only.

3.11. CONCLUSION

The analysis of the tourism related parameters, such as, prospects of tourism development, trends in tourism development, infrastructure, tourism investment, tourism policy, organization structure for tourism development and management and above all problems in the tourism development in the State and in the study area gives an insight to the tourism sector in the study area. The study area is bestowed with tremendous potential for tourism development on one hand and on the other is faced with multifarious problems, which hinder tourism development in the study area. The growth of tourist flow to study area is though shows positive trend in recent years is not appreciable compared to the potential it offers. It is, thus understood that the study area is an important region for tourism development in the State and needs proper attention. However, a detail and very close investigation is very much essential pertaining to all aspects of development of the region (study area), such as, socio-economic, industrial development and tourism development for evolving strategies for an integrated development of the region, where tourism can play a catalytic role. Therefore, detailed investigations were attempted about the socio-economic and tourism aspects of the study area and are presented in the subsequent (fourth) chapter.

SOCIO-ECONOMIC, PHYSICAL, ENVIRONMENTAL CONDITIONS OF THE SYSTEM

4.0. INTRODUCTION

An attempt is made to study the, socio-economic, physical and environmental conditions and status of tourism prevalent in the system at the grassroots level and presented in this chapter. To understand the functions of the system at the grassroots level, survey research methods have been employed, and the detailed methodology is presented in sections 1.13.3. to 1.14.2 of chapter-1. This chapter constitutes three parts containing three types of analysis such as, Socio-economic conditions, Industrial conditions and tourism status of the study area.

The Investigator conducted a detailed investigation to understand the functions of the system by considering a number of major variables. They are: Income, household size, Population, Age, Employment, Occupation, Economic activity, Landholding, Agriculture, Infrastructure, Expenditures, Savings, Type and category of industries, Installation capacity, Production, Sources of capital, Raw materials, Employment, Markets, Industrial infrastructure, Advantages and problems for industrial set up etc. under socio-economic conditions;. Similarly, Category of tourists, Frequency of visit, Stay in the study area, Period of visit, Purpose of visit, Tourism activity, Preferred destinations, Tourist related infrastructure, Condition of tourism elements, Tourism related problems, Knowledge about tourism in the study area, tourism satisfaction, etc., functions were considered in the analysis.

The Investigator himself conducted the survey by using the pre-tested schedules at the grassroots level by employing survey research methodology, which is presented in the Chapter-1. Once the data were collected, the Investigator vetted all the schedules,

cross checked, corrected the discrepancies, and subsequently transferred the data into code sheets to avoid errors. Thereafter, the Investigator fed the data into the computer and used EXCELL software for analysis.

4.1. SOCIO-ECONOMIC CONDITIONS OF THE STUDY ARAEA

The socio-economic conditions of the study area are analyzed based on the survey results. The analysis of the relevant data are done by considering the household income, and the same has been considered as the dependent variable and other variables as independent variables, and the results are presented in the sequel. They are:

4.1.1 Income

Income is the most important parameter, which decides the functions of the system. The family's status in the society is increased along with increase in income. Moreover, income decides the purchasing and spending power of the family in particular, and the system in general. The increase in income in any system leads to multiple effects in the system, such as, it leads to increase in standard of living, increase in using infrastructure services, increase in investment, which further leads to increase in production, trade and commerce activities, etc. Consequent upon this increase in saving, increase in capital formation, and increase in investment occur in the system, which further helps in increasing the income. In this process, a dynamic function takes place in the system, which is very much essential for development of any system.

In order to analyze the data, the colleted data have been classified into income groups. The grouping is done after preliminary examination of the income of individual households and income range variation among the total households and they are clubbed to the nearest income groups. Care has been taken to keep the income class interval uniform for easy and error free unambiguous analysis. Accordingly, the entire households surveyed have been classified into six annual income groups. They are

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having annual income below Rs. 36000.00; Rs.36001.00- Rs.72000.00; Rs.72001.00-108000.00; Rs.108001.00-144000.00; Rs.144001.00-180000.00 and above Rs.180000.00 in ascending order of income. The number of families in various income groups is presented in Table No. 4.1 and in Fig. No. 4.1, and the table and figure enumerate that highest number (28.74 per cent) of the households are having annual income between Rs. 36000.00 and Rs. 72000.00, 15.79 per cent in the income range below Rs.36000.00; followed by 19.84 per cent, 16.60 per cent, 11.74 per cent, and 7.29 per cent in the income ranges between Rs 72001.00 to Rs 108000.00, Rs 108001.00 to Rs 144000.00, Rs 144001.00 to Rs 180000.00, and above Rs.180000.00, respectively. It is observed that about 44.53 per cent of households are confined in the two lowest income groups and the remaining households follow a decreasing trend with increase in income. The number of households in the highest income range above 180000.00 is the lowest with a size of only 7.29 per cent of total households.

Table No. 4.1: Classification of households by Income Group (Income in Rupees)

Sl. No.	Annual Income (Rs.)	Households			
		Households		Household size	Average household size
		No.	Percent		
1	< 36000	39	15.79	5.36	
2	36001 - 72000	71	28.74	5.17	
3	72001 - 108000	49	19.84	4.94	
4	108001 - 144000	41	16.60	4.68	5.07
5	144001 - 180000	29	11.74	5.03	
6	180001 and above	18	7.29	5.44	
7	Total	247	100.00		

Source: Primary Household Survey-2004
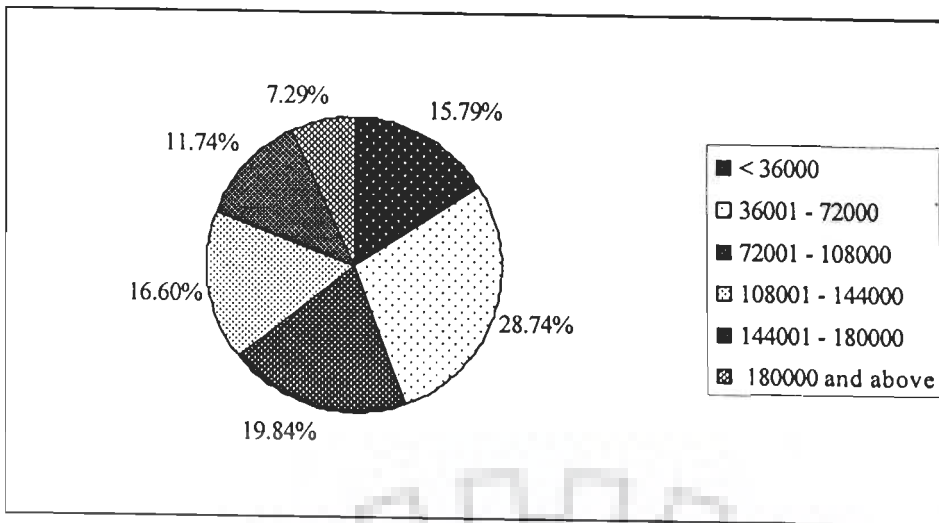
Source: Primary Household Survey-2004

Fig. No. 4.1: Classification of households by Income Group

4.1.2. Population and Household Size

Population is one of the most important parameters, which decides the functions of the system. India with its large population and higher population growth is characterized by low per capita availability of land, low per capita Gross Domestic Product, low per capita income, low per capita consumption on infrastructural services. These above factors also lead to several socio-economic problems. Moreover, understanding the trend of population growth in different income groups is also highly essential to decide the function of the system.

Number of households in different income groups and the household size are important indicators to analyze the household and their income structure of a system. If a household has a higher size of population, and the annual income is very less, the household suffers socially, and economically definitely. On the other hand, if the household has a small size of population and earn reasonable amount of income, it prospers and can have better standard of living compared to the others. Having the above in mind, the available number of population in all categories of income groups

by gender, household size, in all six different categories are analyzed and presented in Table No. 4.2 and in Fig. No. 4.2 and the above table and figure explains that there are 1254 population available in all 247 households and the average household size is 5.07. Of the total population, more than half the population is males (53.70 per cent) and the rest are females (46.30 per cent). It is observed that the number of male and female population are decreasing along with the increases in income except in the lowest income group, which is because of the availability of less number of households in that group than the second category of income group (Rs.36001.00-72000.00). The share of male and female population in each category is more or less uniform.

Table No. 4.2: Population, No. of males, females and household size

Sl. No.	Annual Income (Rs.)	Number of House holds	Population						Average Household size
			Males		Females		Total		
			No	Percent	No	Percent	No	Percent	
1	< 36000	39	115	55.00	94	45.00	209	16.70	5.36
2	36001 - 72000	71	196	53.40	171	46.60	367	29.30	5.17
3	72001 - 108000	49	131	54.10	111	45.90	242	19.30	4.94
4	108001 - 144000	41	101	52.60	91	47.80	192	15.30	4.68
5	144001 - 180000	29	78	53.40	68	46.60	146	11.60	5.03
6	>180001	18	57	58.20	41	41.80	98	7.80	5.44
7	Total	247	678	53.70	576	46.30	1254	100.00	5.07
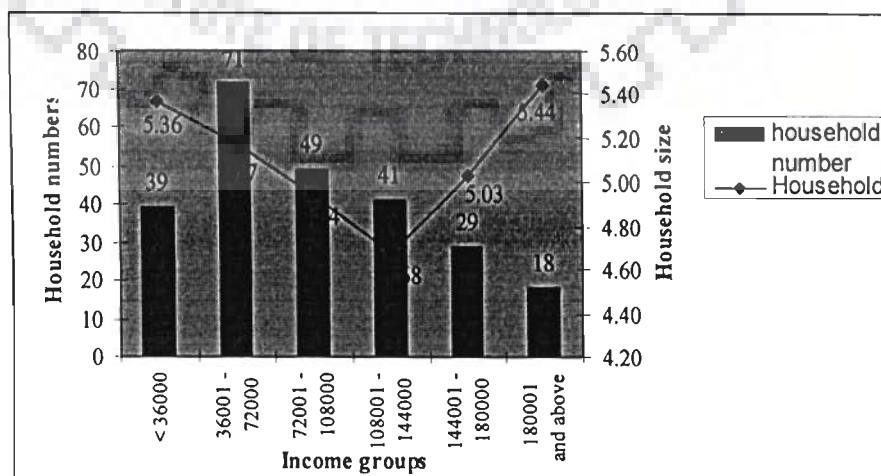
Source: Primary Household Survey-2004

Fig. No. 4.2: Number of households and Household Size

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It is found that the size of household decreases with increase in income from the lowest income group (5.36) to income group of Rs. 108001.00-14400000 (4.68) and again increases with the income level and touch the peak (5.44) in the highest income group of Rs.180000.00 and above. The lower most two income groups (household size 5.36, 5.17) and the highest income group (household size 5.44) have household size higher than the average household size and the remaining groups have lower household size than the average of 5.07. The decrease in household size with increase in income in the middle-income level is due to awareness in family planning system and the higher household size in higher income groups are due pertaining to joint family system in some of the households families and also having better affordability.

4.1.3. Age

The age of the population, in any system determines the activeness and availability of the employable people in the system. It also directly affects the occupation structure, income, education, marital status and responsibility of the members to the family and towards the society. Having this knowledge in the mind the investigation was done to understand, the age group of the family members of the households and presented in Table No.4.3 and inFig. No. 4.3 and it is observed that about 70.50 per cent of population in the system belong to employable group of age group of 15 to 60 years. Of which, 41.79 per cent belongs to young age group of 25 to 35 years. It is also found that the child population (0-14 years) is about one fourth of the total population and rest 5.42 per cent population is considered as retired personnel. About one third (30.10 per cent) of the child population is confined in the bottom most income group and rest of them are almost uniformly distributed among all other income groups. In the age group of 15-35 years, it is found that the share of population goes on decreasing along with increase in income, which is reverse in case of age group of 36-

60 years where, population increases with income range up to Rs.144001.00- Rs.180000.00 and again decreases in the highest income group. This clearly indicates that income increases as the age and experience increases.

Table No. 4.3: Persons in the Family (Age)

(Age in Years)

Sl. No.	Annual Income (Rs.)	Persons (age in years)									
		0 - 14		15 - 35		36 - 60		>60		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	< 36000	63	30.10	87	41.60	49	23.50	10	4.80	209	100.00
2	36001 - 72000	85	23.20	165	44.90	96	26.20	21	5.70	367	100.00
3	72001 - 108000	54	22.40	104	42.90	73	30.20	11	4.50	242	100.00
4	108001 - 144000	46	23.90	78	40.10	62	32.90	6	3.10	192	100.00
5	144001 - 180000	31	21.20	56	38.40	51	34.90	8	5.50	146	100.00
6	>180001	23	23.50	34	34.70	29	29.60	12	12.20	98	100.00
7	Total	302	24.08	524	41.79	360	28.71	68	5.42	1254	100.00

Source: Primary household survey, 2004
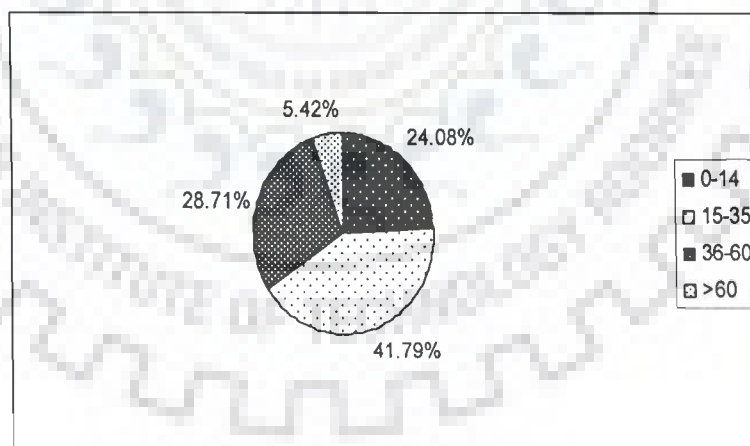
Source: Primary Household Survey- 2004

Fig. No. 4.3: Persons in the Households (Age wise in years)

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From societal point of view, it is observed that the system is a young society with about 55.87 per cent of population is below 35 years of age, which clearly shows that the bottom most income group does not practice family planning measures much and it is not a healthy sign for development.

4.1.4. Education

Education is an indispensable requirement for development of human resources. It is a major factor, which decides the functions of the system. It is used as a tool to measure the social and economic development of a nation. In the Study area in particular education plays major role for its development. In this investigation, it is tried to explore the academic development of the people in the system. To understand the status of education in the system among the households, the population is classified into people into qualified up to Higher Secondary and above Higher Secondary. Subsequently, the persons above Higher Secondary are classified further into higher secondary, undergraduate, postgraduate and technical qualifications and analysed thoroughly, and the results are presented in the Table No. 4.4.

Table No. 4.4: Academic Qualification

Sl. No.	Annual Income	Higher Secondary		Undergraduate		Post graduate		Technical		Total Population above HSC Qualification	Total Population	Per cent educated above HSC Per cent	Percent educated below HSC Per cent
		No.	Per cent	No.	Percent	No.	Percent	No.	Per cent				
1	< 36000	41	19.60	28	13.50	6	2.90	4	1.90	79	209	37.80	62.20
2	36001 - 72000	87	23.70	57	15.50	21	5.70	19	5.10	184	367	50.10	49.90
3	72001 - 108000	51	21.10	33	13.60	17	7.00	14	5.80	115	242	47.50	52.50
4	108001 - 144000	27	14.10	36	18.80	22	11.50	13	6.70	98	192	51.10	48.90
5	144001 - 180000	22	15.10	33	22.60	15	10.30	12	8.20	82	146	56.20	43.80
6	>180001	14	14.30	15	15.30	12	12.20	11	11.30	52	98	53.10	56.90
7	Total	242	19.30	202	16.10	93	7.40	73	5.80	610	1254	48.60	51.40

Source: Primary household survey, 2004

It is observed that of total 1254 persons among the surveyed households, 610 (48.60 per cent) are qualified with higher secondary or above degree. It has been observed that in almost all income groups, half of the population have good education, i.e., above higher secondary education except the lowest income group. It may be due to more number of people belong to child population in that category and also poverty do not allow them to continue their education at the higher level. Only 5.80 per cent people in the system are technically qualified, followed by 7.40 per cent of population are having a postgraduate qualification. Availability of postgraduate and technically qualified persons are higher in size in higher income groups. This analysis shows that households having good amount of income are better educated in the system. The high percentages (above 50.00 per cent) of persons having education level below higher secondary and low percentage of persons having technical education or postgraduate qualification clearly signify that the system is educationally backward.

4.1.5. Economic Activity

Economic activities are the most influential functions of any system, and contribute largely to the development of the other sub system functions of the system. This parameter decides the mobility of the system towards a socially and economically developed society. The economic activity is classified into Primary sector, secondary sector, and the tertiary sector. In the present investigation, agriculture, horticulture, animal husbandry and Pisiculture are the activities considered under primary sector. The industrial activities are included under secondary sector. All types of trade and commerce and service activities are considered under the tertiary activities. The predominant economic activities in the study area as revealed from household survey are presented in Table No. 4.5.

Table No. 4.5: Predominant Economic activity

Sl No.	Annual Income (Rs)	Economic activity (Number/ per cent)												
		Agriculture		Industrial		Trade and commerce		Service		Other		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	19	48.80	0	0	5	12.80	10	25.60	5	12.80	39	100.00
2	36001- 72000	25	35.0	2	2.80	15	21.20	27	380	2	2.80	71	100.00
3	72001 - 108000	12	24.40	3	6.10	14	28.60	18	36.80	2	4.10	49	100.00
4	108001 - 144000	8	19.50	4	9.80	11	26.80	17	41.50	1	2.40	41	100.00
5	144001 - 180000	3	10.30	2	6.90	10	34.50	12	41.40	2	6.90	29	100.00
6	>180001	2	11.10	3	16.70	5	27.80	8	44.40	0	0	18	100.00
7	Total	69	27.90	14	5.70	60	24.30	92	37.20	12	4.90	247	100.00

Source: Primary Household Survey-2004

This table explains that tertiary sector such as, trade and commerce and service activity are predominant in the system. The agricultural activity is the second predominant activity and secondary sector or industrial activity is very meagerly functioning in the system. It is observed that agriculture is mostly a predominant activity among the lower income groups and its function decreases with increase in income. On the other hand, industrial activity increases with increase in income. The tertiary sector is almost uniformly distributed over various income groups, but is lowest in the bottom most income group. In the tertiary sector, Service activity has higher presence than the trade and commerce activity. Agriculture is the single major activity after service activity alone, trade and commerce stands in the third place followed by industrial activity.

4.1.6. Employment

Employment is considered, as the backbone of the economy in this system and all types of activities such as, primary sector, secondary sector and tertiary sectors are present in the system. The shares of employment to total population, income group wise, and age group wise are presented in Table No. 4.6 and 4.7.

Table No. 4.6: Share of employment in the System (income group wise)

Sl. No.	Annual Income (Rs.)	Share of employment			
		Number employed	Total population	Percentage of employment of total employed	Percentage of employment of total population
1	< 36000	59	209	14.46	28.20
2	36001 - 72000	110	367	26.96	29.97
3	72001 - 108000	79	242	19.36	32.60
4	108001 - 144000	67	192	16.42	34.90
5	144001 - 180000	58	146	14.21	39.70
6	>180001	35	98	8.57	35.70
7	Total	408	1254	100.00	32.50

Source: Primary Household Survey-2004

Table No. 4.7: Persons employed (Age wise)

Sl. No.	Annual Income (Rs.)	Persons employed in different age groups (Years)									
		0 - 14		15 - 35		36 - 60		>60		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	< 36000	0	0	34	57.60	25	42.40	0	0	59	100.00
2	36001 - 72000	0	0	57	51.80	53	48.20	0	0	110	100.00
3	72001 - 108000	0	0	43	54.40	36	45.60	0	0	79	100.00
4	108001 - 144000	0	0	33	49.30	31	46.20	3	4.50	67	100.00
5	144001 - 180000	0	0	29	500	27	46.50	2	3.50	58	100.00
6	>180001	0	0	15	42.80	17	48.60	3	8.60	35	100.00
7	Total	0	0	211	51.70	189	46.40	8	1.90	408	100.00

Source: Primary Household Survey-2004

These tables reveal that there are 408 employed persons available in the surveyed households, which accounts for 32.50 per cent of the total population. Of the total employed 14. 46 per cent belong to lowest income group, followed by 26.96 per cent in the second lowest income group and then employment percentage shows a decreasing trend and it s lowest in the highest income group. It is also revealed that the shares of employed persons to that of total persons are higher in higher income categories, i.e., 39.70 per cent in Rs.144001.00-Rs.180000.00 and 35.70 per cent in the highest income group. The lowest income group has the lowest share of employed persons (28.20 per cent) to the total population in said income group (Table No. 4.6)

Of the total employed persons it is observed that just more than half of the population (51.70 per cent) belong to age group of 15-35 years and about another half (46.40 per cent) of them belong to the age group of 36 to 60 years to 98.10 per cent. Only 1.90 per cent employed persons are above 60 years of age. There is no child employment observed in this system. The share of employed persons in the age group of 15-35 years and 36-60 years are uniformly distributed over different categories.

However, a significant share of population employed (8.60 per cent) in the age group beyond 60 years belong to the highest income group of Rs.180000.00 and above (Table No. 4.7).

It shows that more people are employed at lower employable age group and share of employment decreases with increase in income.

4.1.7. Occupation

The occupational structure of an area is an important indicator to understand the status of development of the region and more or less influences the households, income, standard of living, etc. This results in influencing the overall development of the system. Keeping in mind, an attempt is made to understand occupational structure of the system. The occupational structure of the households in the system has been classified into two categories such as, Primary occupation and Secondary occupation. Primary occupation means the sector, in which the person sped more time in his occupation. The secondary occupation serves as a means of additional income to the family. The detailed occupation structure of the households and persons employed among the surveyed households are presented in Table No. 4.8 and the table illustrates that about half (48.10 per cent) of the households are involved in more than one occupation. Service occupation is the major occupation with more than half of the households (53.80 per cent) are involved in this sector, followed by agricultural activities (39.90 per cent). Trade and commerce is also a significant contributor in the system with about one third of the households some way or other involved in this occupation. Industrial activity with own industry has a very feeble presence in the system. Activities like animal husbandry and horticulture also contribute considerable amount in the system. The occupation structure is presented in Fig. No. 4.4.
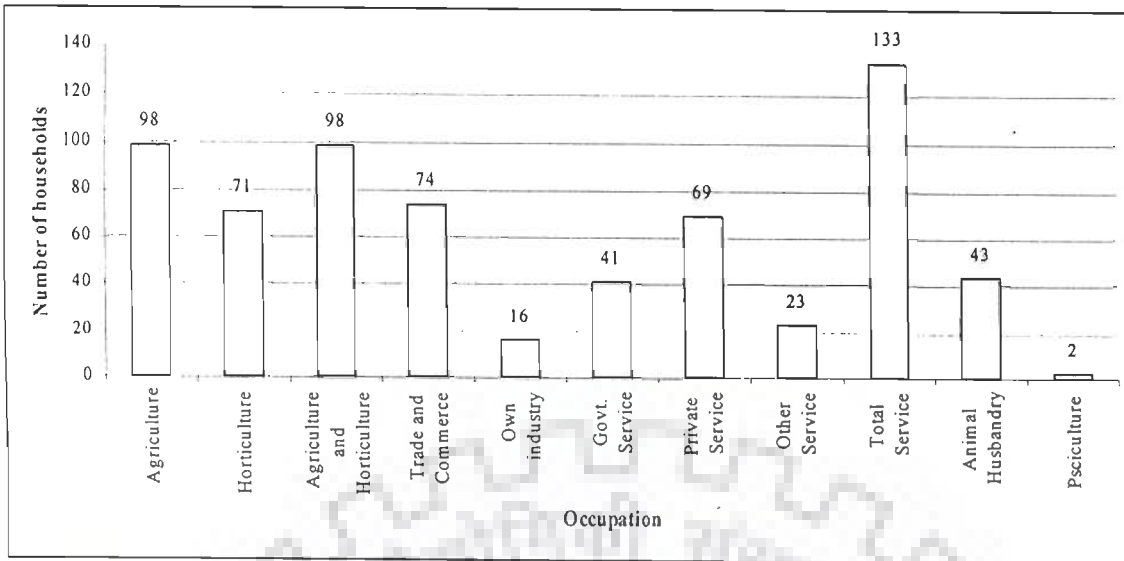
Source: Primary Household Survey-2004

Fig No. 4.4: Occupation Structure in the System

Table No. 4.8: Households engaged in different economic activities

Sl. No.	Annual Income (Rs.)	Occupation (Number/ per cent)																		
		Agriculture		Horticulture		Agriculture and horticulture		Trade and commerce		Industry		Service		Animal Husbandry		Psciculture		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No	Per cent
1	< 36000	19	48.70	10	25.60	19	48.70	8	20.50	0	0	19	48.70	17	43.60	0	0	63 (39)	100.00
2	36001 - 72000	29	40.80	17	23.90	29	40.80	21	2.60	0	0	34	47.90	9	12.60	2	2.8	95 (71)	100.00
3	72001 - 108000	14	28.60	14	28.60	14	28.60	17	34.70	0	0	32	65.30	4	8.20	0	0	67 (49)	100.00
4	108001 - 144000	19	46.30	14	34.10	19	46.30	6	14.60	0	0	31	75.60	6	14.60	0	0	62 (41)	100.00
5	144001 - 180000	12	41.30	11	37.90	12	41.30	11	37.90	9	31.10	12	41.30	4	13.80	0	0	48 (29)	100.00
6	>180001	5	27.70	5	27.70	5	27.70	11	61.10	7	38.80	5	27.70	3	16.70	0	0	31 (18)	100.00
7	Total	98	39.70	71	28.70	98	39.70	74	29.90	16	6.50	133	53.80	43	17.40	2	0.8	366 (247)	100.00

Source: Primary household survey, 2004

Note: 119 Families have more than one occupation (366-247), which accounts to 48.70 per cent of households

Parentheses in the table shows the total number of households in the category surveyed.

It is also found that agriculture, horticulture and animal husbandry occupations are mostly practiced among the lower income group households, where as service activity is concentrated among the middle income groups. Trade and commerce does not follow any pattern and has its presence in all the categories of income groups. Industry activity with own industry occupation is only confined among the two highest income groups.

4.1.7.1. Primary occupation (Household wise and employment wise)

In order to understand the predominant economic activity in the system, an attempt was made to study both the primary occupation of households and individual persons employed in the system and presented in Table Nos. 4.9 and 4.10. It is observed that about 44.10 per cent of households are involved in service activity, 26.50 per cent of households in trade and commerce and 21.50 per cent household in agriculture as their primary occupation. Industrial activity with own industry has a low presence. It is revealed that service activity is predominant among the middle-income groups, agriculture in lower and middle-income groups and trade and commerce has an overall presence. It is also observed that agriculture and horticulture are practiced together as primary occupation in many households that practicing agriculture. The analysis of primary occupation employment wise reveals that service is the major occupation followed by agriculture and trade and commerce. Animal husbandry is not fully considered as a primary occupation. Similar kind of trend are observed in primary occupation household wise and employment wise analysis of primary occupation with very less variations.

4.1.7.2. Secondary occupation

Secondary occupation gives additional income to the households. An attempt was made to find out the involvement of households and people in this occupation, which, strengthen the income level of households and economy of the system. The details of this occupation structure are presented in Table Nos. 4.11 and 4.12.

The table reveals that about half (48.10 per cent) of the households are engaged in different secondary occupational activities in the system. The Table No. 4.11 shows that 38.60 per cent of households involved in secondary occupation are engaged in agriculture. Animal Husbandry is also a preferred secondary occupation in addition to agriculture and horticulture. Service is also a significant secondary occupation (21.10 per cent) in which private service occupation is predominant.

The analysis of persons employed in secondary occupation reveals that more people are engaged in service (38.10 per cent) of which private service is predominant, followed by agriculture and horticulture (29.80 per cent). Secondary employment in Animal husbandry has a significant presence in the system. It is noted here that animal husbandry as secondary occupation, and horticulture as primary and secondary occupation are performed by the same persons involved in agriculture.

It is concluded that despite the system is a combination of both urban and rural areas, tertiary sector including service and trade and commerce are the prime occupational activities in the system followed by agriculture and horticulture. Animal husbandry has also significance influence. Industrial activity has a poor presence in the system.

Table No. 4.9: Occupation Employment wise (Primary)

Sl. No.	Annual Income (Rs.)	Occupation (In terms of employment Number/ per cent)														
		Agriculture		Horticulture		Agriculture and horticulture		Trade and commerce		Industry		Total service		Animal Husbandry		Total	
		No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent
1	< 36000	21	43.70	6	12.50	21	43.70	8	15.60	0	0.00	14	29.20	5	10.40	48	100.00
2	36001 - 72000	25	31.60	7	8.90	25	31.60	20	25.30	0	0.00	31	39.20	3	3.80	79	100.00
3	72001 - 108000	8	19.50	8	19.50	8	19.50	16	32.60	0	0.00	24	48.80	1	2.40	49	100.00
4	108001 - 144000	9	22.00	6	14.60	9	22.00	6	14.60	0	0.00	26	63.40	0	0.00	41	100.00
5	144001 - 180000	6	16.20	6	16.20	6	16.20	10	27.00	12	32.40	9	24.30	0	0.00	37	100.00
6	>180001	3	13.30	3	13.30	3	13.30	8	34.80	7	30.40	5	21.70	0	0.00	23	100.00
7	Total	72	26.80	36	13.40	72	26.80	68	23.80	19	7.10	109	39.30	9	3.30	277	100.00

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Table No. 4.10: Occupation Household wise (Primary)

Sl. No.	Annual Income (Rs.)	Primary Occupation (Number/ per cent															
		Agriculture		Horticulture		Agriculture and horticulture		Trade and commerce		Industry		Total service		Animal Husbandry		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	14	35.80	14	35.80	14	35.80	8	20.50	0	0.00	14	35.80	3	7.60	39	100.00
2	36001 - 72000	18	25.30	18	25.30	18	25.30	20	28.20	0	0.00	31	43.70	2	2.80	71	100.00
3	72001 - 108000	9	18.40	9	18.40	8	16.30	16	32.60	0	0.00	24	48.90	1	2.10	49	100.00
4	108001 - 144000	8	19.50	5	19.50	9	21.90	6	14.60	0	0.00	26	63.40	0	0.00	41	100.00
5	144001 - 180000	2	6.90	2	6.90	2	13.80	9	31.00	9	31.00	9	31.00	0	0.00	29	100.00
6	>180001	1	5.60	1	5.60	1	5.60	6	33.30	6	33.30	5	27.70	0	0.00	18	100.00
7	Total	52	21.50	52	21.50	52	21.50	65	26.30	15	6.10	109	44.10	6	2.40	247	100.00

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Sl. No.	Annual Income (Rs.)	Agriculture		Horticulture		Agriculture and horticulture		Trade and commerce		Industry		Total service		Animal Husbandry		Psciculture		Total	
		No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
1	< 36000	5	20.80	2	8.30	5	20.80	0	0.00	0	0.00	5	20.80	14	58.30	0	0.00	24	100.00
2	36001 - 72000	11	45.80	4	16.70	11	45.80	1	4.20	0	0.00	3	12.50	7	29.10	2	8.30	24	100.00
3	72001 - 108000	5	31.50	3	31.50	5	31.50	1	6.30	0	0.00	7	43.70	3	31.50	0	0.00	16	100.00
4	108001 - 144000	11	47.80	5	21.70	11	47.80	0	0.00	0	0.00	6	26.10	6	26.10	0	0.00	23	100.00
5	144001 - 180000	10	52.60	3	15.80	10	52.60	2	10.50	0	0.00	3	15.80	4	21.10	0	0.00	19	100.00
6	>180001	4	30.70	2	15.30	4	30.70	5	38.50	1	7.70	0	0.00	3	23.70	0	7.00	13	100.00
7	Total	46	38.60	19	15.90	46	38.60	9	7.60	1	0.80	24	21.10	37	31.10	2	1.70	119	100.00

Table No. 4.12: Occupation in terms of employment (Secondary)

Sl. No.	Annual Income (Rs.)	Secondary Occupation (Number/ Percent)																
		Agriculture		Horticulture		Agriculture and horticulture		Trade and commerce		industry		Total service		Animal Husbandry		Psciculture		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	< 36000	7	28.00	4	16.00	7	28.00	0	0.00	0	0	6	0.24	12	0.48	0	0.00	25	100.00
2	36001 to 72000	11	25.00	10	22.70	11	25.00	5	11.40	0	0	20	45.40	6	13.60	2	4.50	44	100.00
3	72001 to 108000	15	38.40	7	17.90	15	38.40	6	15.40	0	0	16	41.00	2	5.20	0	0.00	39	100.00
4	108001 to 144000	10	29.40	8	23.50	10	29.40	0	0.00	0	0	16	47.20	8	23.50	0	0.00	34	100.00
5	144001 to 180000	9	31.00	5	17.20	9	31.00	5	17.50	0	0	15	37.90	4	13.80	0	0.00	33	100.00
6	>180001	4	30.70	2	15.40	4	30.70	6	46.10	0	0	0	0.00	3	23.10	0	0.00	13	100.00
7	Total	56	29.80	36	19.10	56	29.80	22	11.70	0	0	73	38.80	35	18.60	2	1.10	188	100.00

- *the employment in animal husbandry as secondary occupation are done by the same persons involved in agriculture
- * the employment in horticulture as primary and secondary occupations are done by the same persons involved in agriculture

4.1.7.3. Future interest in occupation

An attempt was made to understand the future occupational interests of the persons among the surveyed households, which gives an indication of the direction in which the system functions in future. The details of this analysis are presented in Table No. 4.13 and the table illustrates that about half (47.80 per cent) of the persons are interested in trade and commerce, followed by service activity. Agriculture including horticulture and animal husbandry are the least preferred occupations. The higher income group people prefer to have industrial activity through their own industry. It is also observed that irrespective of the income range the preference for trade and commerce and service occupation as preferred occupation in future are uniformly distributed. It is interesting to note that the two higher most income groups (Rs.144001.00-Rs.180000.00, and Rs. 180000.00 and above) are least interested in service activity and given highest priority to trade and commerce activity followed by the industrial activity.

It is concluded that given the opportunity, the system shall move in the direction of tertiary sector economy. It also indicates that primary sector activities, such as, agriculture, horticulture and animal husbandry shall loose priority in the system dislodging the economic balance of the system.

Table No. 4.13: Future Interest in Occupation

Sl. No.	Annual Income (Rs.)	Agriculture and horticulture		Trade and commerce		Industry		Total service		Animal Husbandry		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	3	6.40	27	57.40	0	0	15	31.90	2	4.30	47	100.00
2	36001 - 72000	3	3.30	57	60.50	1	1.10	31	33.00	2	2.10	94	100.00
3	72001 - 108000	4	5.30	32	42.10	4	5.30	33	43.40	3	3.90	76	100.00
4	108001 - 144000	9	13.10	22	31.90	13	18.80	24	34.80	1	1.40	69	100.00
5	144001 - 180000	5	11.90	17	40.50	13	30.90	6	14.30	1	2.40	42	100.00
6	>180001	2	8.70	13	56.60	7	30.40	1	4.30	0	0	23	100.00
7	Total	26	7.50	168	47.80	38	10.80	110	31.30	9	2.60	351	100.00

Source: Primary Household Survey-2004

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4.1.8. Agriculture

Agriculture is the prime source of sustenance in any regional economy in a developing country and in a country like India; it is the major activity in the rural areas. No system can develop without proper integration of agriculture with other activities where this sector of economy plays relatively important role. Orissa State mostly being rural in its character, agriculture plays an important role in development of the economy, and it is observed in the study area that agriculture and its allied activities are the major occupations that are being carried out by the people.

In the study area, of 247 households, about two fifth (39.90 per cent) of households are involved in agriculture activities. The numbers of households engaged under different groups of income are presented in Fig. No. 4.5. Most of the households engaged in agriculture belong to lower income and middle-income categories.
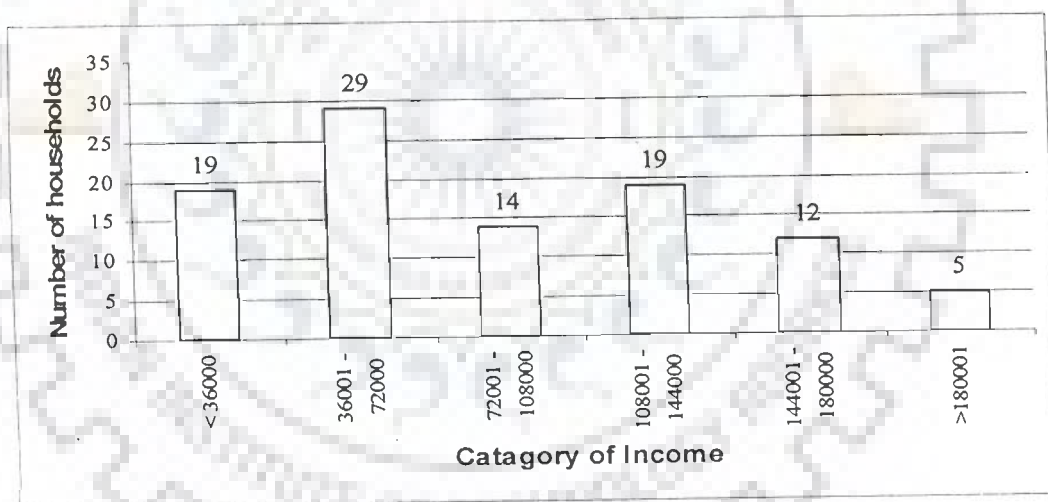
Source: Primary Household Survey- 2004

Fig. No.4.5: Income Category wise Number of households involved in Agriculture

Keeping these above factors in mind, the agriculture and allied activities in the system are analyzed thoroughly and presented subsequently in this chapter. The important variables that are considered in analysis of agriculture and allied functions

are Landholding, Cropping pattern, Crop coverage, Crop intensity, Agricultural input, Agricultural output, Irrigation coverage and irrigation intensity.

4.1.8.1. Agricultural land holding

Agricultural land holding is an important parameter, which manifests the extent, and intensity of agriculture functions of an agrarian system. The more the landholding size the more the possibility of enhanced agricultural activities and higher production of crops. The landholding size in the system is analyzed and presented in Table No. 4.14 and in Fig. No. 4.6.

Table No. 4.14: Agriculture Land holding

Sl. No.	Annual Income (Rs.)	Agricultural Land holding in hectares									
		<1.0		1.0 - 2.0		2.0-4.0		4.0 -10.0		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	8	42.10	11	57.90	0	0.00	0	0.00	19	100.00
2	36001 - 72000	15	51.70	8	27.60	6	20.70	0	0.00	29	100.00
3	72001 - 108000	2	14.30	11	78.60	1	7.10	0	0.00	14	100.00
4	108001 - 144000	5	26.30	10	52.60	3	15.80	1	5.30	19	100.00
5	144001 - 180000	0	0.00	5	41.70	7	58.30	0	0.00	12	100.00
6	>180001	0	0.00	0	0.00	2	40.00	3	60.00	5	100.00
7	Total	30	30.61	45	45.92	19	19.39	4	4.08	98	100.00

Source: Primary Suvey-2004
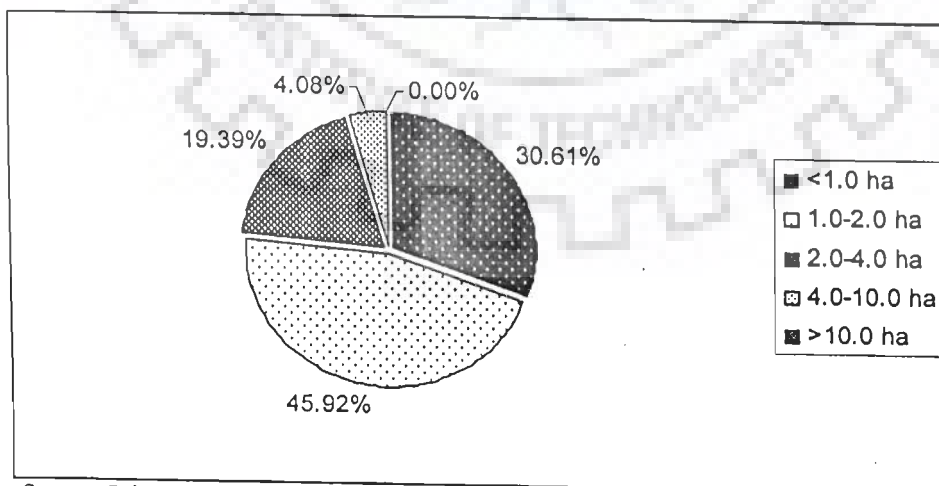
Source: Primary Suvey-2004

Fig. No.4.6: Share of Landholding in the system

The land holding sizes of the households are classified under different income categories as per the Government guidelines. The various categories of landholding are marginal (below 1.0 hectare), small (1.0-2.0 hectares), small-medium (2.0-4.0 hectare), medium (4.0-10.0 hectare) and large holdings (above 10.0 hectares). It is observed that 45.92 per cent households have small landholding and 30.61 per cent households have marginal landholdings, followed by 19.39 per cent small-medium and 4.08 per cent medium landholdings. The system has no large landholding size at all. It is also observed that the landholding size increases along with increase in income. Higher percentage marginal and small landholding belong to lower income groups (below Rs.36000.00 and Rs.36001.00-Rs. 72000.00) and higher percentage small-medium and medium landholding belong to households of higher income groups (Rs.140001.00-Rs.180000.00 and above Rs.180000.00). It clearly shows that the agriculture system mostly comprises of marginal and small farmers that hinders the agricultural growth in the system.

4.1.8.2. Cropping pattern

Cropping pattern in any agriculture system is an important parameter, which indicates the development of agriculture and its contribution to the economy of the system. The cropping pattern shows the various crops that are cultivated, and major crops that are prevalent in the system. This also presents the nature of agricultural practice in the system. Keeping this knowledge in mind, the Investigator has attempted to analyze the cropping pattern of the system and presented in Table No. 4.15.

Table No. 4.15: Cropping pattern

Sl No.	Annual Income (Rs)	Cropping Pattern (Households)								Total Households involved in agriculture
		Paddy		Pulses		Vegetables		others		
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	
1	< 36000	19	100.00	9	47.40	10	52.60	3	15.80	19
2	36001 - 72000	29	100.00	17	58.60	11	37.90	4	13.80	29
3	72001 - 108000	14	100.00	9	64.30	5	35.70	1	7.10	14
4	108001 - 144000	19	100.00	17	89.50	2	10.50	1	5.20	19
5	144001 - 180000	11	91.70	11	91.70	5	41.70	2	16.70	12
6	>180001	5	100.00	5	100.00	3	60.00	1	20.00	5
7	Total	97	98.90	68	69.40	36	36.70	12	12.20	98

Source: Primary household survey, 2004

The table indicates that Paddy crop is the major crop, followed by Pulses and vegetables. Paddy crop is cultivated by most of the households in the system. Pulses cultivation shows an increasing trend with increase in income and vegetable cultivation is distributed over all the income ranges except in the income group of Rs.108001.00-144000.00, where highest percentage (75.60) of households involved in service activity. The other crops have a meager presence in the system which are mostly cultivated by the lower income groups (15.80 percent in <Rs. 36000.00 income group and 13.80 per cent in Rs. 36001.00-Rs.72000.00 income group) and higher income group (16.70 per cent in Rs. 144001.00-Rs. 180000.00 income group, and 20.00 per cent in Rs.180001.00 and above income group). The secondary data presented in Table No. 2.11 of chapter-2 reveals that a number of crops are cultivated in the system, but the primary survey presents that paddy (cereals), pulses and vegetables are the most

cultivated crops. This manifests that the system is subsistence in nature and the cash crop has not possess major role in the system.

4.1.8.3. Crop coverage and crop intensity

Crop coverage and crop intensity are other major parameters, which influence the agriculture sector in the system. These factors manifest the richness and efficiency of the agriculture sector of the system. In this regard, the Investigator has made an attempt to understand this aspect through analysis of crop coverage (household wise, season wise, area wise) and Crop intensity (Household wise and area wise) and are presented in Table Nos. 4.16, 4.17, 4.18 and 4.19.

The crop intensity levels in different income groups and in total show that almost all the households concentrated in the crop intensity range of 101-150 per cent, closely followed by 151-200 per cent. Households, which are cultivating crops with crop intensity higher than 200 per cent, are negligible (only two households out of total 98 households). It is also observed that the average crop intensity in the system is 151.80 per cent.

The crop coverage and crop intensity pattern in the system reveals that Khariff crops are the prime crops in the system followed by Rabi crops. Paddy is the most cultivated crop, followed by Pulses. Under cash crops, vegetable crop has a significant presence. The cropping intensity in the system is fairly high as more than one crop is practiced in the system. Crop coverage and crop intensity increases with increase in income level in the system.

Table No. 4.16: Crop coverage and crop intensity (Area wise)

Sl No.	Annual Income (Rs)	Crop coverage and cop intensity								Total crop coverage in ha	Total Land holding in ha	Crop Intensity
		Rice		Pulses		Vegetables		others				
		Quantity of land in ha	Per cent	Quantity of land in ha	Per cent	Quantity of land in ha	Per cent	Quantity of land in ha	Per cent			
1	< 36000	28.80	70.10	8.10	19.70	1.70	4.10	2.50	6.10	41.10	29.60	138.80
2	36001 - 72000	55.10	72.20	12.40	16.30	5.30	6.90	3.50	4.60	76.30	50.00	152.60
3	72001- 108000	29.00	70.30	8.50	20.70	1.70	4.10	2.00	4.90	41.20	26.50	155.40
4	108001- 144000	32.40	64.30	12.40	24.60	3.20	6.30	2.40	4.80	50.40	32.40	155.50
5	144001- 180000	29.00	60.90	7.10	14.90	8.00	16.80	3.50	7.40	47.60	31.50	151.10
6	>180001	26.00	63.40	9.00	21.90	4.00	9.80	2.00	4.90	41.00	26.00	157.60
7	Total	200.30	67.40	57.50	19.30	23.90	8.00	15.90	5.30	297.60	196.00	151.80

Source: Primary household survey, 2004

Table No. 4.17: Crop Intensity (Household wise)

Sl No.	Annual Income (Rs)	Crop Intensity								Total	
		<100 percent		101-150 percent		151-200 percent		>200 percent			
		No. of house holds	Per cent	No. of house Holds	Per cent	No. of house holds	Per cent	No. of house holds	Per cent	No. of house holds	Per cent
1	< 36000	4	21.10	5	26.30	10	52.60	0	0.00	19	100.00
2	36001 - 72000	5	17.20	13	44.80	10	34.50	1	3.50	29	100.00
3	72001 - 108000	0	0.00	7	50.00	6	42.90	1	7.10	14	100.00
4	108001 - 144000	2	10.50	12	63.20	5	26.30	0	0.00	19	100.00
5	144001 - 180000	1	8.30	5	41.70	6	50.00	0	0.00	12	100.00
6	>180001	0	0.00	2	40.00	3	60.00	0	0.00	5	100.00
7	Total	12	12.20	44	44.90	40	40.80	2	2.10	98	100.00

Source: Primary household survey, 2004

Table No. 4.18: Total crop coverage (Area wise) season wise

Sl No.	Annual Income (Rs)	Total crop coverage season wise							
		Khariff		Rabi		Summer		Total	
		Quantity of land in ha	Per cent	Quantity of land in ha	Per cent	Quantity of land in ha	Per cent	Quantity of land in ha	Per cent
1	< 36000	32.10	78.10	8.10	19.70	0.90	2.20	41.10	100.00
2	36001 - 72000	55.10	72.20	16.50	21.60	4.70	6.20	76.30	100.00
3	72001 - 108000	26.00	63.10	10.50	25.50	4.70	11.40	41.20	100.00
4	108001- 144000	32..00	66.30	15.80	31.30	2.20	4.40	50.40	100.00
5	144001 - 180000	32.00	67.20	9.60	20.20	6.00	12.60	47.60	100.00
6	>180001	25.00	60.90	11.00	26.80	5.00	12.10	41.00	100.00
7	Total	202.60	68.10	71.50	24.10	23.50	7.80	297.60	100.00

Source: Primary household survey, 2004

Table No. 4.19: Total Crop coverage season wise (households)

Sl No.	Annual Income (Rs)	Total crop coverage season wise (households)							
		Khariff		Rabi		Summer		Total	
		No. of house holds	Per cent	No. of house holds	Per cent	No. of house holds	Per cent	No. of house holds	Per cent
1	< 36000	19	100.00	12	63.20	3	15.80	19	100.00
2	36001 - 72000	29	100.00	21	72.40	6	20.70	29	100.00
3	72001 - 108000	14	100.00	13	92.80	6	42.90	14	100.00
4	108001 - 144000	19	100.00	18	94.70	3	15.80	19	100.00
5	144001- 180000	12	100.00	10	83.30	7	58.30	12	100.00
6	>180001	5	100.00	5	100.00	4	80.00	5	100.00
7	Total	98	100.00	79	80.6	29	29.60	98	100.00

Source: Primary household survey, 2004

4.1.8.4. Input to agriculture

Agricultural production largely depends on the agricultural inputs in terms of seeds, fertilizer, pesticides, labour and utilization mechanical appliances. More agricultural input leads to more output in the system. It indicates the advancement of agricultural practices in the system. The Investigator attempted to study the trend of

agricultural input, which is used in the agricultural system and the annual agricultural input is presented in Table No. 4.20.

Table No. 4.20: Annual Input to Agriculture

SI No.	Annual Income (Rs)	Annual input to Agriculture (Rs. / Annum)											
		<5000		5001 to 10000		10001 to 15000		15001 to 20000		>20001		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	8	42.10	11	57.90	0	0	0	0	0	0	19	100.00
2	36001-72000	4	13.80	22	75.90	3	10.30	0	0	0	0	29	100.00
3	72001-108000	0	0	11	78.60	3	21.40	0	0	0	0	14	100.00
4	108001-144000	0	0	16	84.20	1	5.30	2	10.50	0	0	19	100.00
5	144001-180000	0	0	3	25.00	4	33.33	3	25.00	2	16.67	12	100.00
6	>180001	0	0	0	0	0	0	1	20.00	4	80.00	5	100.00
7	Total	12	12.20	63	64.40	11	11.20	6	6.10	6	6.10	98	100.00

It is observed that 64.40 per cent of households make agricultural inputs between Rs 5001.00-Rs. 10000.00 annually. Only a little above 12.00 per cent of households spend more than Rs. 15001.00 and above in agriculture annually. It is also observed that the higher percentage of households belonging to lower income and middle-income groups (<Rs.36000.00 to Rs.108001.00-Rs.144000.00) make lower inputs to agriculture and higher income groups make higher inputs. The lower income and middle income groups spend below Rs. 15000.00 and most of the higher income groups make agricultural inputs more than Rs. 15000.00 and above. Thus, most households make lower agricultural inputs in the system, which means the agricultural practices are not much advanced in nature. This again reiterates the subsistence nature of agriculture in the system.

4.1.8.4.1. Input to agriculture through fertilizer and pesticides

The consumption of fertilizer and pesticides signify the advanced agricultural practices in the system. In order to corroborate the nature of agriculture that is prevalent in the system, the Investigator attempted to study the annual input in consumption of fertilizer and pesticides in agriculture in the system. The consumption of fertilizer and pesticides has been transferred in monetary terms to have knowledge of the same with respect to total agricultural input. This is presented in Table No. 4.21.

It is observed that more than 70.00 per cent of households engaged in agriculture have annual fertilizer and pesticides inputs of less than Rs. 2000.00, and only a little above 16.00 per cent households spent more than Rs. 3000.00 annually in fertilizer and pesticides. Households in higher income groups have higher percentage in high inputs in fertilizer and pesticides and lower income groups have higher percentage in low inputs in fertilizer and pesticides. This information confirms the low per hectare fertilizer and pesticides consumption in the study area (40.84 kg per hectare) with respect to national average (90.12 kg per hectare).

Table No. 4.21: Annual input to Agriculture in Fertilizer and Pesticides

Sl No.	Annual (Rs)	Seasonal input to Agriculture in Fertilizer and Pesticides (Rs. / season)										Total	
		<1000		1001 - 2000		2001 - 3000		3001 - 4000		>4001			
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	13	68.20	6	31.80	0	0	0	0	0	0	19	100.00
2	36001-72000	10	34.50	17	58.60	2	6.90	0	0	0	0	29	100.00
3	72001-108000	3	21.40	5	35.80	4	28.60	1	7.10	1	7.10	14	100.00
4	108001- 144000	4	21.20	10	52.60	2	10.50	2	10.50	1	5.20	19	100.00
5	144001-180000	0	0	4	33.30	2	16.70	3	25.00	3	25.00	12	100.00
6	>180001	0	0	0	0	0	0	0	0	5	100.00	5	100.00
7	Total	30	30.60	42	42.90	10	10.20	6	6.10	10	10.20	98	100.00

Source: Primary household survey, 2004

4.1.8.5. Annual agricultural output

Agricultural output is the most important parameter in any agriculture system, which decides the functions of the system. It manifests the capability of the agriculture practices and its contribution to the economy of the system. More output means a better economy and higher contribution of agriculture to other sectors of economy such as, trade and commerce activities of agricultural produces, input to agriculture and food processing and other rural based industries, self-sufficiency or surplus in food production etc., and higher investment in this sector for advancement of the agriculture system. Keeping this knowledge in mind, the Investigators attempted to explore the annual agricultural outputs of households in terms of shares of households in production defined in monetary terms, total yields, and average yield of major crops in the system, and the results are presented in the Table Nos. 22(a) and 22 (b).

Table No. 4.22 (a) explains that about 75.00 per cent of total households have agricultural output between Rs. 10000.00 to Rs.30000.00 (54.10 per cent having output Rs.10001.00-20000.00, and 20.40 per cent having output Rs.20001.00-Rs. 30000.00). Only 12.20 per cent households are having agricultural output more than Rs 40000.00. It is also observed that agricultural output is higher in higher income groups, and lower and middle-income households have lower outputs. It is also observed that most of the lower middle and middle-income groups (Rs.36001.00-Rs.72000.00, Rs.72001.00-Rs.108000.00, Rs.108001.00-Rs.144000.00) have annual agricultural output range from Rs. 10001.00 to Rs.30000.00.

Table No. 4.22 (a): Agricultural output (Amount in Rupees)

Sl No.	Annual Income (Rs)	Annual output from Agriculture (Rs. / annum)											
		<10000		10001-20000		20001-30000		30001-40000		>40001		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	2	10.5	7	36.8	8	42.2	2	10.5	0	0	19	100
2	36001 -72000	3	10.3	19	65.6	4	13.8	2	6.9	1	3.4	29	100
3	72001 -108000	1	7.1	8	57.1	4	28.6	1	7.1	1	7.1	14	100
4	108001 - 144000	0	0	16	84.2	2	10.5	1	5.3	0	0	19	100
5	144001 -180000	0	0	3	25	2	16.7	2	16.7	5	41.6	12	100
6	>180001	0	0	0	0	0	0	0	0	5	100	5	100
7	Total	6	6.1	53	54.1	20	20.4	8	8.2	12	12.2	98	100

Source: Primary household survey, 2004

Table No. 4.22(b): Annual output from Agriculture (Major crops)

SI No.	Annual Income (Rs)	Annual output from Agriculture (Rs. / annum)					
		Paddy			Pulses		
		Area (Ha)	Output (tones)	Average yield per Ha (tones)	Area (Ha)	Output (tones)	Average yield per Ha (tones)
1	< 36000	28.80	40.70	1.41	8.10	1.71	0.21
2	36001 - 72000	55.10	74.50	1.35	12.40	3.16	0.25
3	72001 - 108000	29.00	41.70	1.43	8.50	2.10	0.24
4	108001 - 144000	32.40	47.10	1.45	12.40	3.10	0.25
5	144001 - 180000	29.00	46.10	1.59	8.60	2.30	0.27
6	>180001	26	39.00	1.50	8.50	2.40	0.28
7	Total	200.30	289.1	1.44	58.50	14.77	0.25

Source: Primary household survey, 2004

Table No. 4.22 (b) explains that Paddy and pulses are the two major crops in the system. The average yield of paddy and pulses in the system are 1.44 tones per hectare and 0.25 tones per hectare, which are on the very lower side of the average yield compared to the national average. It is observed that the average yield of both Paddy and pulses increases with increase in income level in this particular system. This means that higher agricultural output can be achieved with higher agricultural inputs. The agricultural practices in the study area therefore, require to be upgraded with advanced practices of mechanization, application of fertilizer, high yielding variety (HYV) of seeds etc., for higher production.

4.1.8.6. Irrigation coverage and irrigation intensity

Water is one of the most important parameters, which decide agricultural operation in any system. Normally monsoon is the major source of irrigation to various crops in Khariff season in this part of the country. The erratic behavior of monsoon creates havoc in cultivation practices and the production fluctuates widely from year to year. Irrigation mitigates such problems and helps in

advanced practices of cultivation, as well as increasing the cropping intensity, there by enhancing the productivity. Having this knowledge in mind, the Investigator attempted to find the household wise irrigation coverage, area wise irrigation coverage and irrigation intensity in the study area through the household survey and the results are presented in the Table Nos. 23(a), 23(b) and 23(c).

Table No. 4.23 (a) Irrigation coverage household wise

| Sl No. | Annual Income (Rs) | Irrigation coverage season wise (household wise) | | | | | | | |
| | | Khariff | | Rabi | | Summer | | Total | |
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	19	100.00	11	57.80	3	15.80	19	100.00
2	36001 - 72000	29	100.00	20	68.90	4	13.80	29	100.00
3	72001 - 108000	14	100.00	12	85.70	6	42.90	14	100.00
4	108001 - 144000	18	94.70	15	78.90	3	15.80	19	100.00
5	144001 - 180000	12	100.00	11	91.70	6	50.00	12	100.00
6	>180001	5	100.00	5	100.00	4	80.00	5	100.00
7	Total	97	98.90	74	75.50	26	26.5	98	100.00

Source: Primary household survey, 2004

Table 23 (a) reveals that 98.90 per cent of the households surveyed having agriculture as one of the occupations are covered under irrigation during Khariff season, followed by 75.50 per cent in Rabi season and only 26.50 per cent in Summer season. It is also observed that except the income category of Rs. 108001.00-Rs.144000.00, all the households in other income categories are covered fully under irrigation in Khariff season. In Rabi season, the coverage of households under irrigation increases with increase in income category, so also in the summer season except the same income category of Rs.108001.00-Rs.144000.00, where the coverage is lower than the preceding income category. The two higher most income categories have the higher irrigation coverage.

Table No.423 (b): Irrigation coverage (Area wise) and Irrigation Intensity

Sl No.	Annual Income (Rs)	Irrigation coverage season wise								Total land holding in Ha	Irrigation Intensity
		Khariff		Rabi		Summer		Total crop coverage			
		Quantity of land in ha	Per cent	Quantity of land in ha	Per cent	Quantity of land in ha	Per cent	Quantity of land in ha	Per cent		
1	< 36000	26.20	75.50	7.40	21.30	1.10	2.80	34.70	100.00	29.60	117.20
2	36001 - 72000	49.10	72.50	15.50	22.90	3.10	4.60	67.70	100.00	50.00	135.40
3	72001 - 108000	19.00	55.90	10.50	30.90	4.50	13.20	34.00	100.00	26.50	128.30
4	108001 -144000	30.40	66.20	13.30	28.90	2.20	4.90	45.90	100.00	32.40	141.60
5	144001 - 80000	26.00	62.50	9.60	23.10	6.00	14.40	41.60	100.00	31.50	132.10
6	>180001	21.00	56.70	11.00	29.80	5.00	13.50	37.00	100.00	26.00	142.30
7	Total	171.70	65.80	67.30	25.80	21.90	9.40	260.90	100.00	196.00	133.10

Source: Primary household survey, 2004

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Table No.4·23 (c): Irrigation Intensity

SI No.	Income per annum (Rs)	Irrigation Intensity											
		<50 per cent		51-100 per cent		101-150 per cent		151-200 per cent		>200 per cent		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	0	0	9	47.40	7	36.80	3	15.80	0	0.00	19	100.00
2	36001- 72000	1	3.40	10	34.50	10	34.50	7	24.20	1	3.40	29	100.00
3	72001 -108000	0	0	2	14.30	9	64.30	2	14.30	1	7.10	14	100.00
4	108001-144000	0	0	3	15.80	7	36.80	9	47.40	0	0.00	19	100.00
5	144001 -180000	0	0	2	16.70	7	58.30	3	25.00	0	0.00	12	100.00
6	>180001	0	0	0	0.00	4	80.00	1	20.00	0	0.00	5	100.00
7	Total	1	1.00	26	26.50	44	44.90	25	25.50	2	2.10	98	100.00

Source: Primary household survey, 2004

It is also observed from Table No. 23 (b) area wise irrigation coverage under various crops that 65.80 per cent of total irrigated crop area comes under Khariff Crop, followed by Rabi Crop (25.80 per cent) and summer crop (9.40 per cent). The area wise coverage under various seasons in different categories are distributed and lower income groups have higher share of irrigation coverage in Khariff season compared to other income groups. In the higher most income groups, irrigation coverage in summer season is higher than the lower in come groups. This confirms that Khariff season has higher coverage under irrigation followed by Rabi season and summer season. Thus, it is inferred that Khariff season is the most important crop season in the system.

The analysis of area wise irrigation intensity and household wise irrigation intensity are presented in Table No. 23 (b) and in Table No. 23 (c). It is found that the average irrigation intensity in the system is 133.10 per cent and is increasing with increase in income group, except the income group of Rs.144001.00-Rs.180000.00. The Table No. 23 (c) reveals that about 44.90 per cent of the households have the advantage of 101-150 per cent irrigation intensity, followed by 26.50 per cent with irrigation intensity of 51-100 per cent and 25.50 per cent with irrigation intensity of 151-200 per cent. It is noteworthy to mention that the number of households having irrigation intensity below 50.00 per cent and more than 200.00 per cent are very marginal. Thus, it is inferred that the system practices mostly single or double crops in the year. The possibility of more than two crops cultivation is totally negligible in the system.

4.1.9. Fishery Activity

Fishery is an important activity, which is confined particularly in the coastal regions. The study area has vast potential for development of fishery related activities due to the presence of long coastline, continental self, inland water resources and

backwater. An attempt was made by the Investigator to find the extent of fishery and its allied activities in the system. It is observed that the involvement of households surveyed in this activity as an occupation is negligible. However, an opinion survey was conducted regarding the sources of fish and aqua products and location of markets of these products among the households. Of total 247 household surveyed, 191 households have given their opinion, regarding sources and 175 households have knowledge about the market locations of aqua products. The analysis of the opinion surveys are presented in Table Nos. 24 (a) and 24 (b).

According to opinions collected from the household survey, inland fish farming is the major activity and it represents about half (49.20 per cent) of the fish related activity, followed by marine source, which accounts to a little more than two fifths (40.30 per cent) and backwater sources (10.50 per cent) in the system. Thus, all the sources of aquaculture activity are prominent in the system and the activity is confined to particular groups only. About 46.30 per cent of the population opined that locations other than the local area where fishes are produced are having major markets. Export of aqua products to different countries and transportation to other States of the country are also significant.

Table No.424 (a) No-Sources of Fish/ aqua products

Sl No.	Annual Income (Rs)	Sources of aqua products							
		Inland water		Marine		Back water		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	13	41.90	14	45.20	4	12.90	31	100.00
2	36001 - 72000	28	56.00	18	36.00	4	8.00	50	100.00
3	72001 - 108000	18	45.00	17	42.50	5	12.50	40	100.00
4	108001 - 144000	17	51.50	13	39.40	3	9.10	33	100.00
5	144001 - 180000	12	52.20	9	39.10	2	8.70	23	100.00
6	>180001	6	42.90	6	42.90	2	14.20	14	100.00
7	Total	94	49.20	77	40.30	20	10.50	191	100.00

Source: Primary survey, 2004

Table No.424 (b): Marketing places of Fish/ Aqua Products

Sl No.	Income per month (Rs)	Local market		Other locations in the State		Export		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	16	51.60	13	41.90	2	6.50	31	100.00
2	36001 - 72000	14	35.00	18	45.00	5	200	37	100.00
3	72001 - 108000	15	40.50	17	42.50	5	13.50	37	100.00
4	108001 - 144000	12	35.30	16	47.10	6	17.60	34	100.00
5	144001 - 180000	8	34.80	12	52.20	3	13.00	23	100.00
6	>180001	3	23.20	5	38.40	5	38.40	13	100.00
7	Total	68	38.80	81	46.30	26	14.90	175	100.00

Source: Primary household survey, 2004

4.1.10. Trade and Commerce

The contribution of trade and commerce activity forms an integral part of the economy in the system. It is far more important in urban systems. The Investigator has attempted to study the functions of this activity in order to understand the behaviour of the system towards this activity, and its share in the economic development of the system.

The analysis of predominant economic activities (c.r.t 4.5 capter-4) in the system reveals that trade and commerce is one of the major activities along with agriculture and service activities. The survey of occupation structure shows that the trade and commerce is practiced in about 29.90 per cent (c.r.t. 4.8, chapter-4) of total households and employs about 23.80 per cent (c.r.t.-4.9, chapter-4) of persons as primary occupation, which are quite significant, thus making trade and commerce as a major function of the system.

The Investigator attempted to find out the approach and type of activity that is prevailing in the system towards trade and commerce. For this, an opinion-oriented survey was conducted in the households regarding the preferences in dealing with

various products in wholesale and retail trade. The details of this survey are presented in Table Nos. 4.25 (a) and 4.25 (b).

It is observed that consumer products (37.00 per cent) are having the highest preferred wholesale trade and commerce activity, followed by agricultural and horticultural products (18.20 per cent). The preference of textile products and traditional skill based products are also significant. In the retail trade survey, it is revealed that consumer goods trading are most preferred ones (42.00 per cent). Followed by textile based products and traditional skill base products are other significant trading products for retail trade in the system. As against the wholesale trade, agricultural products get the lower preference. Thus, it is inferred that higher capital-intensive trade and commerce activities are not preferred in the system due to lack of investment capability. The local resource based products such as agriculture and skill based products also found favour in wholesale trading , where as this trend is not same in retail trade. In both the cases it can be inferred that traditional skill based products have demand to certain extent.

Table No. 25 (a): Preferred Retail Trade

Sl No.	Annual Income (Rs)	Traditional skill based		Consumer products		Agriculture and Horticulture products		Industrial products		Textile products		Others		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	3	12.50	8	33.30	4	16.70	3	12.50	4	16.70	2	8.30	24	100.00
2	36001 - 72000	10	16.10	28	45.20	8	12.90	5	8.10	9	14.50	2	3.20	62	100.00
3	72001 - 108000	7	16.70	18	42.80	5	11.90	2	4.80	7	16.70	3	7.10	42	100.00
4	108001 - 144000	5	15.20	16	48.50	4	12.10	3	9.10	4	12.10	1	3.0	33	100.00
5	144001 - 180000	3	13.00	10	43.50	4	17.40	2	8.70	4	17.40	0	0	23	100.00
6	>180001	2	12.5	4	25.00	1	6.25	3	18.75	5	31.25	1	6.25	16	100.00
7	Total	30	15.00	84	42.00	26	13.00	18	9.0	33	16.50	9	4.50	200	100.00

Source: Primary household survey, 2004

Table No. 4.25 (b): Preferred Wholesale Trade

SI No.	Annual Income (Rs)	Preferred Wholesale Trade														
		Traditional skill based		Consumer products		Agriculture and Horticulture products		Industrial products		Textile products		Others		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	1	4.80	4	19.00	6	28.60	2	9.50	3	14.30	5	23.80	21	100.00
2	36001 - 72000	8	14.80	17	31.50	14	25.90	4	7.40	7	13.00	4	7.40	54	100.00
3	72001 - 108000	5	12.50	18	45.00	5	12.50	4	10.00	6	15.00	2	5.00	40	100.00
4	108001 - 144000	4	13.80	12	41.40	4	13.80	3	10.30	4	13.80	2	6.90	29	100.00
5	144001 - 180000	2	8.70	10	43.60	3	13.00	3	13.00	4	17.40	1	4.30	23	100.00
6	>180001	2	14.30	6	42.90	1	7.10	2	14.30	2	14.30	1	7.10	14	100.00
7	Total	22	12.20	67	37.00	33	18.20	18	9.90	26	14.40	15	8.30	181	100.00

Source: Primary household survey, 2004

4.1.11. Service

Service is another activity, which have significant influence in the system. Service activity includes employment in government, public sector, private organizations or professional activity and providing service in different forms, such as, transportation, accommodation, food, tourism, religious activity, entertainment activity, etc. The details of service activity are given in the household occupation and primary and secondary occupation analysis (c.r.t. 4.8, 4.9, 4.10, 4.11, and 4.12., chapter- 4). It is observed that service occupation is the most employable activity in the system. Of the total households surveyed, more than half (53.80 per cent) of households are engaged in service activity in some way or other, where private sector employment (27.90 per cent) is the major service providers followed by government service (16.60 per cent). The all other services constitute about 9.30 per cent of total occupation. Under this condition, the Investigator attempted to find out the preference of households in the service activity other than government and private sectors. This is presented in Table No. 4.26. It is observed that about 37.50 per cent of the surveyed households prefer transportation activity, tourism related activity stands second with 16.00 per cent, followed by providing food services (15.00 per cent), accommodation activity (14.10 per cent) and entertainment activity (12.10 per cent). The religious activity is the least preferred activity with 5.30 per cent. The lower and middle-income groups mostly prefer the transportation and religious activity; where as, accommodation and entertainment activities are preferred by the higher income group. The share of food activity and tourism is mostly distributed over various income groups.

It can be inferred that except religious activity all other activity has a reasonable potential for growth in the service sector.

Table No. 4.26: Preference in Service occupation

Sl No.	Annual Income (Rs)	Transportation		Accommodation		Food		Tourism		Religious activity		Entertainment		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	< 36000	9	30	4	13.3	5	16.7	6	20	2	6.7	4	13.3	30	100
2	36001 - 72000	31	50	8	12.9	8	12.9	7	11.3	3	4.8	5	8.1	62	100
3	72001 - 108000	18	42.9	6	14.3	4	9.5	7	16.7	3	7.1	4	9.5	42	100
4	108001 - 144000	11	33.3	4	12.1	6	18.2	5	15.2	2	6	5	15.2	33	100
5	144001 - 180000	4	17.4	3	13	6	26.1	6	26.1	0	0	4	17.4	23	100
6	>180001	4	25	4	25	2	12.5	2	12.5	1	6.3	3	18.7	16	100
7	Total	77	37.5	29	14.1	31	15	33	16	11	5.3	25	12.1	206	100

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4.1.12. Housing

Housing is another important parameters, which influences the functions of the system. House is a place where one can rest, finds shelter from natural and artificial hazards. A good house is essential for decent living, provides convenience in performing daily responsibilities and activities for comfortable living, and has great significance in promoting social wellbeing and neighborliness. On the other hand, housing situation in the system gives an indication of development of the system. Having this in the mind, the housing condition of the sample households in the system is analyzed based on three criteria, such as, ownership of houses, types of houses and physical condition of houses.

4.1.12.1. Ownership of houses

Ownership of houses is an indicator of the stability of the system, and relative movement of people in the system. People having own houses have less movement and more or less stable than the people having no houses located in the system. The details of ownership of houses are given in Table No. 4.27.

Table No. 4.27: Ownership of houses

SI No	Annual Income (Rs.)	Ownership of houses					
		Own House		Rented house		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	<36000	38	97.43	1	2.57	39	100.00
2	36001-72000	53	74.64	18	25.36	71	100.00
3	72001-10800	32	65.30	17	34.70	49	100.00
4	108001-144000	19	46.34	22	53.66	41	100.00
5	144001-180000	18	62.06	11	37.94	29	100.00
6	180001and above	16	88.88	2	11.12	18	100.00
7	Total	176	71.25	71	28.75	247	100.00

Source: Primary household survey, 2004

It is observed from the table that about three fourth (71.25 per cent) of the surveyed households have own hoses and rest of them (28.75 per cent) stay in rented houses in the system. The lower income groups (Rs.36000.00 and Rs.36001.00-Rs.72000.00) and the highest income groups (Rs180001.00 and above) have higher percentage of ownership houses, where as a sizable amount of households in middle income groups stay in rented houses in the system. This shows that more people in the middle-income groups have more mobility and stay away from their native places.

4.1.12.2. Types and physical condition of houses

Types of houses and physical condition of houses provide information regarding the living standard and family status in the system. Types of houses, such as, detached houses, semi detached houses and flats denote the joint family and single-family situation in the system. Physical condition of houses is analyzed under the conditions of RCC roofed houses, Pucca (well constructed) without RCC roofed houses and Kutcha (temporary or made up of local materials) and presented in Table Nos. 4.28 and 4.29.

Table No. 4.28: Types of Houses

Sl No	Annual Income (Rs.)	Types of houses							
		Detached		Semi Detached		Flat		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	<36000	28	71.79	8	20.51	3	7.70	39	100.00
2	36001-72000	47	66.19	16	22.53	8	11.28	71	100.00
3	72001-10800	30	61.22	10	20.40	9	18.38	49	100.00
4	108001-144000	22	53.65	11	26.82	8	19.53	41	100.00
5	144001-180000	14	48.27	7	24.13	8	27.60	29	100.00
6	180001and above	14	77.77	2	11.11	2	11.11	18	100.00
7	Total	155	62.57	54	21.86	38	15.38	247	100.00

Source: Primary household survey, 2004

Table No. 4.29: Physical condition of houses

Sl No	Annual Income (Rs.)	RCC Roofed		Pucca without RCC Roofed		Kutcha		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	<36000	7	17.94	11	28.20	21	53.40	39	100.00
2	36001-72000	17	23.94	28	39.43	26	36.63	71	100.00
3	72001-10800	20	40.81	21	42.85	8	16.32	49	100.00
4	108001-144000	19	46.34	15	36.59	7	17.07	41	100.00
5	144001-180000	20	68.96	9	31.04	0	0.00	29	100.00
6	180001and above	17	94.44	1	5.56	0	0.00	18	100.00
7	Total	100	40.48	85	34.41	62	25.11	247	100.00

Source: Primary household survey, 2004

It is observed from the Table No.4.28 that about two third (62.57 per cent) households have detached houses, and just above one-fifth (21.86 per cent) stay in semi detached houses and the rest (15.38 per cent) of households stay in flats. It also reveals that the share of detached houses decreases with increase in income and again majority of highest income group households have detached houses. The percentage of flat houses among the sample households increases with increase in income except in the highest income category. The semi-detached houses are mostly distributed across the different income groups. It means most of the households are single-family households or divided joint family households. The increase in income helps in having own detached houses or flats, and on the other hand the lower income people have detached houses of their own standards.

The Table No. 4.29 analysis reveals that just above two fifths (40.48 per cent)of the surveyed households are having RCC roofed, just above one third (34.41 per cent) of houses are Pucca without RCC roofed, and one fourth (25.11 per cent) of them are of Kutcha condition in the system. The share RCC roofed houses increases with increase

in income, and share of Kutcha houses decreases along with increase in income. Most of the middle-income group households have higher share of Pucca houses without RCC roofed.

This inferred that mixed types of houses with mixed housing conditions are prevalent in the system. The type and condition of houses depend on the income of the household. It is found that higher income of households leads to better housing situation in the system.

4.1.12.3. House construction finance

In the wake of priority being given by the Government of India in housing finance through different financial institutions, the Investigator attempted to find the adoptability of the system towards better living. In order to have this knowledge, house construction finance situation was explored in the household survey and the results presented in Table No. 4.30.

Table No. 4.30: House construction Finance

Sl. No.	Annual Income (Rs.)	Houses financed for construction by financial institutions		Total House holds	
		No	Percent	No	Percent
1	< 36000	0	0.00	39	100.00
2	36001 - 72000	4	5.70	71	100.00
3	72001 - 108000	5	10.20	49	100.00
4	108001 - 144000	7	17.10	41	100.00
5	144001 - 180000	6	20.70	29	100.00
6	>180001	4	22.20	18	100.00
7	Total	26	10.50	247	100.00

Source: Primary household survey, 2004

It is observed that only 10.50 per cent of the households have utilized the facility of housing finance for construction of their houses. The utilization of housing finance facility increases with increase in income, i.e. the higher income groups availed the facility better than the lower income groups. This shows that the higher income groups have more access with finance lending agencies.

4.1.12.4. Temporary accommodation in market places

An attempt was made to explore the availability of temporary accommodation in market places for the short-term stay of seasonal or mobile businesspersons in the system. This information is an indicator of the attitude of the people in the system to accept seasonal businesspersons and provide accommodation to them particularly during the time of fairs and festivals. Having the importance of this variable in mind pertaining to tourism and economic point of view, the Investigator has done a detailed analysis about this particular variable and the results are presented in Table No. 4.30a

Table No. 4.30a Availability of Accommodation in market Places

| Sl. No. | Annual Income (Rs.) | Availability of Temporary Accommodation in Market places | | | | | |
| | | Yes | | No | | Total | |
		No.	Percent	No.	Percent	No.	Percent
1	< 36000	12	30.80	27	69.20	39	100.00
2	36001 - 72000	27	38.10	44	61.90	71	100.00
3	72001 - 108000	21	42.90	28	57.10	49	100.00
4	108001 - 144000	13	31.70	28	39.30	41	100.00
5	144001 - 180000	16	55.10	13	44.90	29	100.00
6	>180001	10	55.60	8	44.40	18	100.00
7	Total	99	40.10	148	59.90	247	100.00

Source: Primary household survey, 2004

This table illustrates that about three-fifth (59.90 per cent) of households do not agree that adequate accommodation facility is available in the market locations in the system, where as rest of them (40.10 per cent) agree that temporary accommodation is available. It is interesting to note that the agreement towards availability of accommodation increases with increase in income and disagreement is observed in reverse trend. This above analysis reflects that higher income group people have positive attitudes towards providing temporary accommodation facilities.

4.1.13. Transportation

Transportation is also one of the important parameters, which decides the functions of the system. Efficient transportation system leads to more dynamic functions of the system. In the study area, attempts were made to analyze the public transport system in terms of types of transportation facilities being availed, availability of quality of roads, maintenance of roads, modes of transportation system, frequency of passenger buses and trains in the system.

4.1.13.1. Types of transportation facility

The types of transportation system provide an information regarding modes of movement in the system. The types of transportation system were categorized into three types such as, only roads, use of both roads and railways, and waterways. During the course of investigation, it is observed that waterway transportation has a very meager presence and hence is not considered in the analysis. The results of such analysis are presented in Table No. 4.31 and the table reveals that about two third (64.80 per cent) of the households use roads as their major transportation facility, and the rest use both roads and railways together as transportation means in the system. Again, it is observed that the majority of middle-income group households use roads as the major means of transportation than the lower and higher income group households. A significant

segment of lower and higher income group people use both roads and railways together for their transportation. However, majority of these households too use road as the most important means of transportation. This analysis reflects that road sector is the major means of transportation in the system followed by railways.

Table No. 4.31: Types of Transportation facilities in the system

| Sl. No. | Annual Income (Rs.) | Transportation Facility | | | | | |
| | | Roads | | Both Railway and Roads | | Total | |
		No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	22	56.40	17	43.60	39	100.00
2	36001 - 72000	41	57.70	30	42.30	71	100.00
3	72001 - 108000	40	81.60	9	18.40	49	100.00
4	108001 - 144000	28	68.30	13	31.70	41	100.00
5	144001 - 180000	19	65.50	10	34.50	29	100.00
6	>180001	10	55.50	8	44.50	18	100.00
7	Total	160	64.80	87	35.20	247	100.00

Source: Primary household survey, 2004

4.1.13.2. Availability of quality of roads

Availability of quality of roads reflects the efficiency and effectiveness of the transportation system in any system in terms of facilities for all weather communication without much problems. This also gives an idea about the priority given to this sector of development. Therefore, an attempt was made to analyze the quality of road available in the system, and the results are presented in Table No. 4.32 and it indicates that about half (46.90 per cent) of households have access to paved roads, just above two fifth (42.50 per cent) have access to all weather roads without paved condition and the rest (10.60 per cent) of them do not have access to paved or all weather roads and have to depend on fair weather roads. It is also revealed that the access to better quality paved or bituminous roads increases with increase in income. However, the access to all weather roads is uniformly distributed across the income groups. It shows that though

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priority is given for the development of this sector in the system, still there is a huge need of qualitative improvement of roads in the system.

Table No-4.32: Availability of quality of roads

Sl. No.	Annual Income (Rs.)	Availability of quality of roads							
		Bituminous or concrete paved		All weather		Fair weather		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	18	46.20	16	41.00	5	12.80	39	100.00
2	36001 - 72000	31	43.70	32	45.10	8	11.20	71	100.00
3	72001 - 108000	21	42.90	22	44.90	6	12.20	49	100.00
4	108001 - 144000	20	48.80	18	43.90	3	7.30	41	100.00
5	144001 - 180000	14	48.30	13	44.80	2	6.90	29	100.00
6	>180001	12	66.70	4	22.20	2	11.10	18	100.00
7	Total	116	46.90	105	42.50	26	10.60	247	100.00

Source: Primary household survey-2004

4.1.13.3. Maintenance of roads

Maintenance of roads also reflects the efficiency ineffectiveness of the road transportation system. Maintenance allows the roads to remain in proper condition and shape and helps in influencing positively the time distance and fuel consumption relation. The quality of road works as an impetus for travel, and other development along with its social essentiality. Having this knowledge, an attempt was made to analyze the maintenance condition of roads in the system and presented in Table No. 4.33 and the table illustrates that about one third (31.60 per cent) of households have access to well maintained roads, and the rest (68.40 per cent) do not have proper access with poorly maintained roads. It means that in majority of the areas, roads are not well maintained. Thus, the road maintenance situation is not healthy that leads to inefficient transportation system in the study area.

Table No. 4.33: Maintenance of roads

Sl. No.	Annual Income (Rs.)	Maintenance of roads					
		Well maintained		Poorly maintained		Total	
		No.	Percent	No.	Percent	No.	Percent
1	< 36000	14	35.90	25	64.10	39	100.00
2	36001 - 72000	22	30.90	49	69.10	71	100.00
3	72001 - 108000	12	24.50	37	75.50	49	100.00
4	108001 - 144000	15	36.50	26	63.50	41	100.00
5	144001 - 180000	8	27.60	21	72.40	29	100.00
6	>180001	7	38.90	11	61.10	18	100.00
7	Total	78	31.60	169	68.40	247	100.00

Source: Primary household survey-2004

4.1.13.4. Modes of road transportation

Modes of transportation indicate the availability of different vehicular movement for travel in the system. This also illustrates the living standards and advancement in terms of time distance relationship, comfort, etc., of the society and achievement in the physical and social infrastructure direction. Having this mind, the Investigator has done a detailed analysis about various modes of transportation available in the system and the results are presented in Table No. 4.34. This table explains that the passenger buses are the most preferred modes of road transport (30.80 per cent) followed by combined modes of transport (23.50 per cent). Two wheelers have a significant presence in the system (16. 20 per cent). About 11.30 per cent people use three wheelers and only 6.10 per cent people use four wheelers. It is also noteworthy to observe that about 12.10 per cent of households use bicycles. The use of bus as modes of transport mostly distributed across all the segments of the society, though it has a lower use in lowest income group and among the highest income group households. Use of two wheelers increases along with increase in income and use of three wheelers are evenly distributed among the lower and middle-income groups and it is not preferred by the two higher most income group households. Four-wheeler has a

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significant presence in two higher income group households (Rs.144001.00-Rs180000.00, and Rs.180000.00 and above) and increases with income. The use of bicycles are mostly confined to lower and lower middle class families (<Rs.36000.00, Rs.36001.00-Rs.72000.00 and Rs.72001.00-Rs.108000.00) and do not have any presence in the higher income group households at all. Combined modes are evenly distributed across all segments of income groups in the system.

This analysis reflects that public transportation modes, such as, bus, has a significant presence, and that influence the system to the larger extent. The households who have more income strength own four wheelers and two wheelers, where as three wheelers are the preferred modes among the lower and middle class people. The lower income people prefer bi-cycle in addition to buses and three wheelers for their movement.

4.1.13.5. Frequency of passenger buses

The analysis of modes of transport reveals that buses are important modes of transportation in the study area. In order to determine the efficiency of the bus transport system in the study area, the frequency of passenger buses are analyzed. It is noted that buses by both Government sector under State Transport department and private sectors ply in the system. The status of frequency of passenger buses are analyzed thoroughly and the results are presented in the Table No. 4.35 and the table reflects that about two-fifth (38.10 per cent) of households have access to bus communication within every 30 minutes, followed by about one third (29.70 per cent) have access to buses in a frequency of 30 minutes to one hour, just above one fifth (about 22.20 per cent) of the households get buses at an interval of one to two hours, and the rest (10.10 per cent) of them have access to buses beyond once in two hours. The access to buses at various frequencies is distributed in the system irrespective of income groups. This means the bus transport system is reasonably fair in providing movement in the study area (system).

Table No. 4.34: Mode of Transportation

Sl. No.	Annual Income (Rs.)	Mode of Transportation (Number/ per Cent)													
		Trains		Bus		Four wheelers		Three wheelers		Two wheelers		Bicycles		Combined modes		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	0	0	6	15.40	0	0	6	15.40	0	0	16	41.00	11	28.20	39	100.00
2	3600-72000	0	0	29	40.90	0	0	10	14.10	4	5.60	12	16.90	16	22.50	71	100.00
3	72001-108000	6	12.30	13	26.50	1	2	6	12.30	8	16.30	2	4.10	13	26.50	49	100.00
4	108001 - 144000	4	9.80	14	34.10	2	4..90	6	14.60	8	19.50	0	0	7	17.10	41	100.00
5	144001-180000	1	3.40	10	34.50	6	20.70	0	0	4	13.80	0	0	8	27.60	29	100.00
6	>180001	0	0	4	21.10	6	33.30	0	0	5	27.80	0	0	3	16.70	18	100.00
7	Total	11	4.50	76	30.80	15	6.10	28	11.30	29	11.70	30	12.10	58	23.50	247	100.00

Source: Primary household survey, 2004

Table No. 4.35: Frequency of Passenger Buses

Sl. No.	Annual Income (Rs.)	Frequency of Passenger Buses											
		<30 minutes		30 to 60 minutes		60 to 90 minutes		90 to 120 minutes		>120 minutes		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No	Per cent	No.	Per cent
1	< 36000	16	41.10	8	20.50	8	20.50	4	10.30	3	7.60	39	100.00
2	36001 - 72000	18	25.30	30	42.20	7	9.90	7	9.90	9	12.70	71	100.00
3	72001 - 108000	21	42.80	14	28.60	5	10.30	3	6.10	6	12.20	49	100.00
4	108001 - 144000	22	53.60	10	24.40	3	7.30	4	9.80	2	4.90	41	100.00
5	144001 - 180000	8	27.60	6	20.70	4	13.80	6	20.70	5	17.20	29	100.00
6	>180001	9	50.00	5	27.70	3	16.70	1	5.60	0	0.00	18	100.00
7	Total	94	38.10	73	29.60	30	12.10	25	10.10	25	10.10	247	100.00

Source: Primary household survey, 2004

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4.1.13.6. Frequency of passenger trains

The frequencies of passenger trains give an idea about the efficiency of rail transport system for intra regional and inter regional transport. Passenger trains carry more number of people at a time, and higher frequency of passenger trains serve more number of peoples movement within shorter duration, and its role in transportation system is phenomenal. The available frequency of passenger trains in the transportation system in the study area is analyzed thoroughly and results are presented in Table No. 4.36.

Table No. 4.36: Frequency of Passenger Trains

Sl. No.	Annual Income (Rs.)	Frequency of Passenger Trains							
		60 to 90 minutes		90 to 120 minutes		>120 minutes		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	3	27.30	2	18.20	6	54.60	11	100.00
2	36001 - 72000	6	33.30	0	0.00	12	66.70	18	100.00
3	72001 - 108000	0	0.00	0	0.00	10	100.00	10	100.00
4	108001 - 144000	6	40.00	3	20.00	6	40.00	15	100.00
5	144001 - 180000	3	33.30	0	0.00	6	66.70	9	100.00
6	>180001	3	37.50	0	0.00	5	62.50	8	100.00
7	Total	21	29.60	5	7.10	45	63.30	71	100.00

Source: Primary household survey-2004

Note: 71 households out of 247 households surveyed have responded to this question.

It is observed from the table that about two third (63.30 per cent) of the households have access to passenger trains at a higher interval of time (more than two hours) and about one third (29.60 per cent) have access from one to one and half hour duration, where as the rest (7.10 per cent) get trains from one and half hour to two hour duration in the system. This shows that rail transport system is not a regular mode for travel within the system.

4.1.14. Power

Power is another most important parameter that decides the functions of the system. Power in the system may be categorized into electricity and from other sources, such as, solar cells, generators, oils, battery cells, etc. Electricity is the most important source of power in the system. Availability of electricity, supply of electricity and energy as a whole in a system play an important role in setting up of industries and influence other service activities. Having this knowledge in mind, an attempt was made to analyze the availability of electricity, quality of electricity service and availability other sources of energy in the system. The availability of the electricity at household level is studied carefully, and the results are presented in Table No. 4.37.

Table No. 4.37: Availability of Electricity at household level

Sl. No.	Annual Income (Rs.)	Availability of Electricity					
		Available		Not available		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	31	79.50	8	20.50	39	100.00
2	36001 -72000	65	91.50	6	8.50	71	100.00
3	72001 -108000	44	89.90	5	10.10	49	100.00
4	108001 -144000	41	100.00	0	0.00	41	100.00
5	144001 -180000	29	100.00	0	0.00	29	100.00
6	>180001	18	100.00	0	0.00	18	100.00
7	Total	228	92.30	19	7.70	247	100.00

Source: Primary household survey-2004

It is observed from the table that more than nine-tenth (92.30 per cent) of households have electricity and the rest (7.70 percent) of households still do not have access to electricity. The availability of electricity increases with increase in income. The non-availability of electricity is more pronounced among the lowest income groups. It is noted that despite better power generation situation and priority in rural electrification, there are houses in this system still with no electricity.

The service quality of electricity is another major parameter that influences the various activities in the system. The socio-economic functions of a system are increasingly becoming highly dependent on the service quality of electricity. Therefore, service quality of electricity available in the system is analyzed and presented in Table No. 4.38.

Table No. 4.38: Quality of Electricity service

| Sl. No. | Annual Income (Rs.) | Quality of Electricity Service | | | | | | | |
| | | load shedding condition | | Voltage fluctuation | | good service | | Total | |
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	14	45.15	14	45.15	3	9.70	31	100.00
2	36001 -72000	28	43.10	31	47.70	6	9.20	65	100.00
3	72001 -108000	23	52.30	11	25.00	10	22.70	44	100.00
4	108001 -144000	17	41.50	21	51.20	3	7.30	41	100.00
5	144001 -180000	13	44.80	11	37.90	5	17.30	29	100.00
6	>180001	8	44.40	5	27.80	5	27.00	18	100.00
7	Total	103	45.17	93	40.78	32	14.05	228	100.00

Source: Primary household survey-2004

It is observed from the table that according to the opinions of the people who are using electricity, load shedding and voltage fluctuations are two major problems that engulfed the system. It has been observed that more number of people are fed up with the poor quality of power supply system in the study area and about five-sixth (85.95 per cent) of the total population are not at all satisfied about the present power supply system, and the rest (14.05 per cent) feel satisfactory. This condition is almost uniformly distributed among all the income groups. It presents an indication that though electricity is available in the system, the quality of service is very poor.

4.1.14.1. Other sources of energy

The other sources of energy apart from grid based electricity supply in this system are oil (diesel, and petrol) powered generators; solar cells and battery cells are also used for generating electricity. This sources acts as the supplementary sources of energy in addition to electricity, and therefore plays an important role at the time of electricity failure. Apart from these, kerosene is used for lighting and cooking. An attempt was made to analyze the use of the other sources in the system and the results are presented in Table No. 4.39. The table results that about two third (62.34 per cent) of households of the total households use various other sources of energy. Of the total users of such energy about three-fourth (74.67 per cent) use kerosene oil, where as just above one-tenth (11.68 per cent) use generators and the rest (13.63 per cent) use solar cells.

The use of generators and solar cells or battery increases with increase in income level and use of kerosene is observed in other ways, i.e., it decreases along with increase in income. It is also understood that use of generators and solar cells for additional source of energy is not much prevalent in the system.

Table No. 4.39: Other additional of sources Energy

Sl. No.	Annual Income (Rs.)	Other additional sources of Energy								Total house holds	Percentage of other energy users
		Generators		Solar cells and Battery		Kerosene		Total other sources of energy user			
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	< 36000	0	0.00	0	0.00	34	100.00	34	100.00	39	87.17
2	36001 -72000	1	2.10	6	13.04	39	87.78	46	100.00	71	64.71
3	72001 -108000	3	12.50	4	16.67	17	70.83	24	100.00	49	48.97
4	108001-144000	2	10.00	3	15.00	15	75.00	20	100.00	41	48.78
5	144001 -180000	5	29.41	4	23.52	8	47.05	17	100.00	29	58.62
6	>180001	7	53.84	4	30.76	2	15.38	13	100.00	18	72.22
7	Total	18	11.68	21	13.63	115	74.67	154	100.00	247	62.34

Source: Primary household survey-2004

4.1.15. Drinking Water Supply

The availability of water in any system is an important requisite for its sustainability. Water supply is essential for domestic uses as well as for irrigation and industrial requirements. The Orissa State is bestowed with both surface and ground water, through presence of five major rivers and ground water is taped through open wells and tube wells. Irrigation was discussed in the chapter-2, and in this chapter, an attempt was made to investigate the drinking water supply system, which influences the socio-economic conditions in the system and the results are presented in Table No. 4.40, and the table explains that about half (44.90 per cent) of people depend on public water supply, and about one third (30.40 per cent) have their own sources of water supply and the rest (24.70 per cent) of the households have both sources of water supply. The dependence of public water supply decreases with increase in income level. The middle-income group people do not follow any pattern. This may be because most of the middle-income group people live in urban areas and depends on public water supply. It is concluded that public water supply system has not reached full coverage in the system.

Table No. 4.40: Water supply system

Sl. No.	Annual Income (Rs.)	Water Supply System							
		Public supply system		Own source		Both		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	< 36000	26	66.70	11	28.20	2	5.10	39	100.00
2	36001 -72000	33	46.50	18	25.40	20	28.10	71	100.00
3	72001-108000	16	32.70	17	34.60	16	32.70	49	100.00
4	108001 -144000	24	58.50	13	31.70	4	9.70	41	100.00
5	144001 -180000	8	27.60	11	37.90	10	34.50	29	100.00
6	>180001	4	22.20	5	27.80	9	50.00	18	100.00
7	Total	111	44.90	75	30.40	61	24.70	247	100.00

Source: Primary household survey-2004

4.1.16. Sanitation

Good sanitation leads to good health, better quality of life and better environment. Sanitation is used as one of the parameters, to measure the quality of life index in the system and there by influence the functions of the system. In this regard, investigation is made on the availability of sanitation facility and drainage facility in the system, and the results are presented in Table Nos-4.41 (a) and 4.41 (b)

Table No. 4.41(a) Availability of Sanitation System

Sl. No.	Annual Income (Rs.)	Sanitation System								Total	
		Public sewerage		Own arrangement		Both		No sanitation system			
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	4	10.30	25	64.10	0	0.00	10	25.60	39	100.00
2	36001 - 72000	11	15.40	46	64.80	1	1.40	13	18.40	71	100.00
3	72001- 10800	8	16.30	26	53.10	9	18.40	6	12.20	49	100.00
4	108001 - 144000	4	9.80	34	82.90	0	0.00	3	7.30	41	100.00
5	144001 - 180000	8	27.60	17	58.60	4	13.80	0	0.00	29	100.00
6	> 180000	4	22.20	3	16.70	11	61.10	0	0.00	18	100.00
7	Total	39	15.80	151	61.10	25	10.10	32	13.00	247	100.00

Source: Primary household survey-2004

The table 4.41 (a) explains that public sewerage system of sanitation has a low presence (15.80 per cent) and most households (61.10 per cent) depend on own arrangements. It is also found that about one eighth (13.00 per cent) households do not have any sanitation system, while one tenth (10.10 per cent) have both public sewerage and own arrangement. Public sewerage system is distributed over all sections of households irrespective of income levels, where as both system are mostly available to the highest income groups. Own arrangement of sanitation facility is concentrated among the lower and middle income households. It is also observed that a sizable number of households in lower income category (<Rs. 36000.00 and Rs36001.00-Rs.

72000.00) have no sanitation facility. The Investigator observed while conducting the household survey that lack of sanitation system in households is prevalent in villages. In addition to this, the Government of Orissa is taking measures to provide sanitation facilities in the public places through various sanitation programmes in both rural and urban systems.

Drainage system means the artificial drainage facility available in the settlements of the system for rainwater flow and dry water flow from households. An attempt was done to understand the available drainage facility in the system because it has more bearings in the system pertain to health, social development, etc., and the results are presented in Table No. 4.41 (b).

Table No. 4.41 (b): Drainage System

| Sl. No. | Annual Income (Rs.) | Drainage System | | | | | | | |
| | | Open drains | | Covered drains | | No drains | | Total | |
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	< 36000	12	30.80	4	10.30	23	58.90	39	100.00
2	36001-72000	24	33.80	6	8.50	41	57.70	71	100.00
3	72001-10800	17	34.70	4	8.20	28	57.10	49	100.00
4	108001-144000	10	24.40	8	19.50	23	56.10	41	100.00
5	144001-180000	17	58.60	6	20.70	6	20.70	29	100.00
6	> 180000	12	66.60	3	16.70	3	16.70	18	100.00
7	Total	92	37.20	31	12.60	124	50.20	247	100.00

Source: Primary household survey-2004

It observed from the Table No. 4.41 (b), that about half (50.20 per cent) of the households surveyed in the system do not have drainage facility at all, and more than one-third (37.20 per cent) have open drainage facility. The availability of covered drains in the system is very meager. The availability of any kind of drainage system among various household categories increases with increase in income and lack of

drainage is more visible in low income and middle-income categories. It can be concluded that the system has a very poor artificial drainage system.

4.1.17. Waste Disposal System

Waste disposal system helps in providing a better living environment in the system. It increases the aestheticism of the settlements, and creates a better image of the settlements and also influences the sanitation condition of the system. This parameter is analyzed on the basis of availability of waste disposal facility, frequency of waste disposal and means of waste disposal in the system, and the results are presented in Table No. 4.42 and Fig. No. 4.7 (a) Fig. No. 4.7 (b).

Table No. 4.42: Availability of waste disposal system

Sl. No.	Annual Income (Rs.)	Availability of waste disposal system					
		Available		Not available		Total	
		No.	Percent	No.	Percent	No.	Percent
1	< 36000	10	25.60	29	74.40	39	100.00
2	36001 -72000	21	30.60	50	70.40	71	100.00
3	72001-10800	14	28.60	35	71.40	49	100.00
4	108001-144000	15	36.60	26	63.40	41	100.00
5	14400-180000	14	48.30	15	51.70	29	100.00
6	> 180000	8	44.40	10	55.60	18	100.00
7	Total	82	33.20	165	66.80	247	100.00

Source: Primary household survey-2004

The Table No.4.42 reflects that about one third (33.20 per cent) of the households are covered under waste disposal facilities in the system and the rest (66.80 per cent) are deprived of systematic waste disposal system. It is also observed that availability of waste disposal facility increases along with increase in income level.
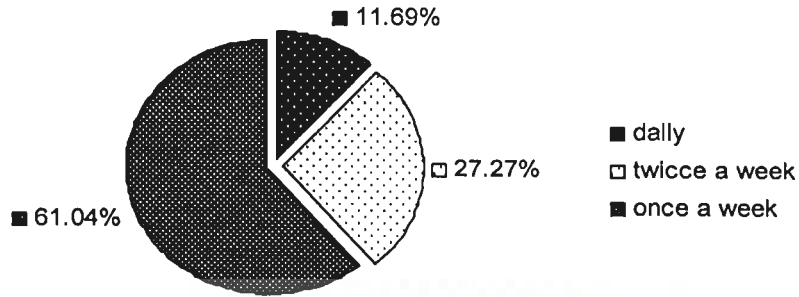
Fig. No. 4.7 (a): Frequency of Waste disposal in the system

The Fig. No. 4.7 (a) describes the frequency of waste disposal in the system. It is observed that about two third (61.04 per cent) of households under waste disposal system are having waste disposal frequency once in a week, followed by just above one fourth (27.27 per cent) have a frequency of twice in a week and just above one tenth of the surveyed households (11.69 per cent) have daily waste disposal facility.
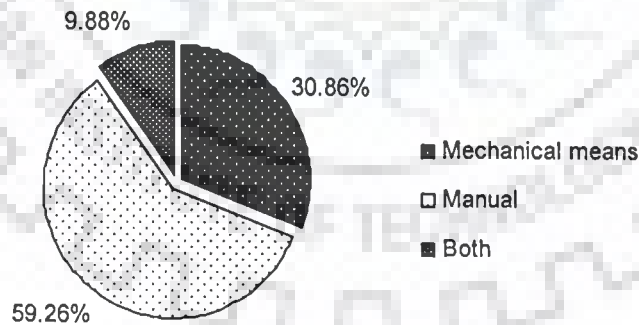
Fig. No.   4.7 (b) Means of Waste disposal in the system

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The Fig. No. 4.7 (b) presents the means of waste disposal in the system. It is observed that manual means of waste disposal is predominant (59.26 per cent), followed by 30.86 per cent by mechanical means, and about one tenth (9.88 per cent) of households covered under waste disposal facility are having both means of waste disposal system. This concludes that the situation of waste disposal in the system is not of high order and has a meager presence in terms of availability and efficiency.

4.1.18. Annual Income and Expenditure

Income is the one of the most important factors, which control the functions of the system and decides each, and every activity of the household. The expenditure is directly proportional to the amount of income generated in the households. The expenditure depends on the life style of people. The total income and expenditure of households is a major factor in determining the savings or amount available for investment for any economic activities that inturn generates more income. On the other hand, income also is a factor of prioritization of socio- economic activities of the households in the system. Thus expenditure and income are major parameters those control various functions of any system.

Having this knowledge, the Investigator analyzed the average income and expenditure of the households within the study area and the results are presented in Table No. 4.43 and the table explains that more than three fourth (77.02 per cent) of the average annual income is spent by the households. The balance amount (22.97 per cent) of the total income is available for investment, expenditure for other social activity purposes and savings. About half (46.07 per cent) of total income is spent for the basic activities, such as, food, clothing, heaths, education and water supply. The expenditure on transportation and energy are 6.69 per cent, and 7.62 per cent respectively. The expenditure on recreational activities alone is as low as 3.74 per cent.

It is also observed that the share of basic expenditure and total expenditure decreases with increase in income and balance amount or savings increases with increase in income. The lower and lower middle income groups (<36000, 36001-72000, 72001-108000) have very high expenditure and low savings as compared to higher income groups. It is revealed that lowest income group spends almost the entire income, of which about two-third amounts is spent on food only.

It shows that expenditure in the system is in consonance with the income and higher income groups are having higher savings. It can also be concluded from this analysis that the saving or balance amount available for investment after expenditure in the system is low. Again, since the basic expenditure is high among the lower income groups, the expenditures on optional activities, such as, recreation may get low priority in the household functions.

4.1.19. Total Household Expenditure

The expenditure directly proportional on the income of households and depends on the life style of people. The total annual expenditure incurred by households are divided into six categories for analysis and presented in the Table No. 4.44.

It is observed that 87.20 per cent of lowest income group, 91.60 per cent of income group between 36001.00-72000.00, 98.00 per cent of income group between 72001.00-108000.00, 91.70 per cent of income group between 108001.00-144000.00, and 93.10 per cent of 144001.00-180000.00 income groups has expenditure within their income level. The highest income group (>180000.00) have expenditure beyond 180000.00.

Table No. 4.43: Income Expenditure status in the system

Sl.No	Annual Income (Rs.)	Average Income (Rs.)	Expenditure on Basic needs		Expenditure on Transportation needs		Expenditure on Energy needs		Expenditure on Recreation needs		Total Expenditure		Balance/ Savings	
			Amount (Rs.)	Per cent	Amount (Rs.)	Per cent	Amount (Rs.)	Per cent	Amount (Rs.)	Per cent	Amount (Rs.)	Per cent	Amount (Rs.)	Per cent
1	< 36000	33015.38	21830.77	66.10	1876.8	5.68	4738.44	14.35	46.08	0.13	31369.23	95.10	1646.15	4.90
2	36001 - 72000	62230.99	37198.31	59.80	3430.9	5.51	6019.32	9.62	2088.96	3.35	54981.13	88.30	7249.86	11.70
3	72001 - 108000	92963.27	48857.14	52.60	6306.12	6.78	7532.8	8.10	4004.04	4.30	77254.29	83.10	15708.99	16.90
4	108001- 144000	130331.71	56341.46	43.20	8477.72	6.50	9102.36	6.98	5209.68	3.99	105175.61	80.60	25156.1	19.40
5	144001- 180000	162827.59	59606.9	36.60	11926.68	7.32	11275.8	6.92	7055.16	4.33	112344.83	68.90	50482.76	31.10
6	>180001	270666.67	93566.67	34.56	20866.68	7.79	13299.96	4.91	10033.32	3.37	162566.67	60.10	108100	38.90
7	Total	102019.43	47001.13	46.07	6833.16	6.69	7776.6	7.62	3823.2	3.74	78578.62	77.02	23440.81	22.98

Source: Primary household survey-2004

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However, analysis of income and expenditure of individual households show that the expenditure in this group is also within their income generation. It also reveals that the highest proportion of households (36.80 per cent) is having annual expenditure range of 36001.00-72000.00, followed by 27.90 per cent spend within 72001.00-108000.00 and 14.60 per cent spend below Rs. 36000.00 and 14.20 per cent within 108001.00-144000.00. Only 4.90 per cent and 1.60 per cent have expenditure within 144001.00-180000.00 and above 180000.00 respectively. Therefore, it is concluded that there are a few households where expenditure is higher than the income. Most of the households are confined in the lower and middle-income group categories. Thus, expenditure has a direct high correlation with income of the households.

4.1.20. .Expenditure on Loan Repayment

Loan repayment is a parameter, which indicates the investment and credit facility in the system as well as the income of the households. It also explains people's capability and entrepreneurial attitude towards higher income and better living by utilizing credit facilities. An analysis has been attempted in this regard from among the sample households and are presented in Table No. 4.45.

Table No. 4.44: Total Household Expenditure

Sl. No.	Annual Income (Rs.)	Total Household Expenditure (in Rs.)													
		< 36000		36001 to 72000		72001-108000		108001-14400		144001-180000		>180001		Total	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	< 36000	34	87.20	5	1.80	0	0.00	0	0.00	0	0.00	0	0.00	39	100.00
2	36001-72000	2	2.80	65	91.60	4	5.60	0	0.00	0	0.00	0	0.00	71	100.00
3	72001-108000	0	0.00	21	42.90	27	55.10	1	2.00	0	0.00	0	0.00	49	100.00
4	108001- 144000	0	0.00	0	0.00	25	61.00	13	31.70	3	7.30	0	0.00	41	100.00
5	144001- 180000	0	0.00	0	0.00	13	44.80	14	48.30	2	6.90	0	0.00	29	100.00
6	>180001	0	0.00	0	0.00	0	0	7	38.90	7	38.90	4	22.20	18	100.00
7	Total	36	14.60	91	36.80	69	27.90	35	14.20	12	4.90	4	1.60	247	100.00

Source: Primary household survey-2004

It is observed from the analysis that more than four fifth (83.40 per cent) of the surveyed households have not availed any kind of loan at all and the rest (16.60 per cent) have availed the credit facility. It is also observed that majority of the lower income and middle-income groups do not spend anything since they never availed any loan. On the other hand, about one-third (30.00 per cent) of the households in the higher income groups have utilized loan facilities. While most of the highest income group who have availed loan spend more than Rs 48000.00 and above on loan repayment, 46.20 per cent of households (who have availed loans) in the income group between Rs.108001.00-144000.00, spend between Rs. 24001.00-36000.00 and 38.50 per cent of same group spend between Rs 12001.00 to Rs. 24000.00. About 70.00 per cent of the households taken loan in the income category of Rs. 144001.00-180000.00 spend between Rs 12001.00-24000.00. On the over all account, out of the total sample households availed loan facilities, about two-third (60.00 per cent) spend below Rs 24000.00 and just above one fifth (22.00 per cent) spend between Rs. 24000.00 -36000.00, and about one tenth (9.80 per cent) spend more than Rs 48000.00.

Thus, it is seen that most of the lower income groups do not avail loan facilities and higher income groups spend higher amount on loan repayment, whose proportion is very low. The lowest and lower income groups may not have accessibility in the financial agencies, where credit facilities are available, since they do not have much voice in the system in spite of number nationalized banks and other credit agencies are functioning in the system. Therefore, it can be concluded that the system is not highly advanced on the account of credit utilization and investment.

Table No. 4.45: Annual Expenditure on Loan Repayment

Sl. No.	Annual Income (Rs.)	Households does spend on loan repayment		Expenditure on Loan Repayment (Rs.)												
				Households make Loan Repayment												
				<12000		12001-24000		24001-36000		36001-48000		48001and above		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	< 36000	39	100.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
2	36001 – 72000	62	87.30	9	100.00	0	0.00	0	0.00	0	0.00	0	0.00	9	100.00
3	72001 - 108000	44	89.80	2	40.00	3	60.00	0	0.00	0	0.00	0	0.00	5	100.00
4	108001-144000	28	68.30	1	7.70	5	38.50	6	46.20	1	7.70	0	0.00	13	100.00
5	144001- 180000	19	65.50	1	10.00	7	70.00	2	20.00	0	0.00	0	0.00	10	100.00
6	>180001	14	77.70	0	0	0	0.00	0	0.00	0	0.00	4	100.00	4	100.00
7	Total	206	83.40	13	31.70	14	34.10	9	22.00	1	2.40	4	9.80	41	100.00

Source: Primary household survey-2004

4.2. INDUSTRAL SCENARIO IN THE STUDY AREA

Industrialization is the process of manufacturing of consumer goods and capital goods and of creating social overhead in order to provide goods and services to both individuals and businesses. As such, industrialization plays an important role in the economic development of a system.

The history of advance countries shows that industrialization is a prerequisite for economic developments. The share of the industrial sector should rise in national income and that of agricultural sector should decline for development. This is only possible through feasible policies of deliberate industrialization. As a result, the benefits of industrialization will trickle down to other sectors of economy in form of the development of agricultural and its allied activities, development of service sectors, etc, leading to the rise in employment, output, reinvestment, income, etc.

Again, industrialization is necessary in order to provide employment to the underemployed and unemployed in the agricultural sector. In an agrarian system a larger size of people are unemployed or disguised employed whose marginal product is zero or negligible. They can be transferred from agriculture to industry with a little or no loss in agricultural output. Since marginal productivity of labour is higher in industry than agriculture, transferring such workers to the industrial sector will raise aggregate output.

Industrialization provides a wide and expanding range of consumer goods, which encourages the agriculturist to increase farm produce; this in turn tends to raise their incomes to enable them to buy consumer goods. Agriculture and industrialization are interrelated making one sector influence the growth of the other and should have a harmonious development.

These attributes of industrialization lead to an emphasis on creation of a process for development of industrial sector in developing countries like India in the late 1950s'. Orissa State is not an exceptional one in this direction, and was a pioneering State for creating an ambient environment of industrial development. In this regard, Orissa State is one of the first States of the country to formulate an industrial friendly policy, providing infrastructure, allowing financial incentives, etc., to the entrepreneurs. The State has gone a step ahead of other States of the country by declaring hotel and entertainment activity such as, Cinema houses, and tourism activity as industry since as early as in 1980s' to give a boost to the overall industrial sector in general, and these activities in particular.

It is, thus, expected that there will be significant contribution of industrial sector to the overall economic scenario of the State and people's income. Therefore, an attempt has been made to understand the overall scenario of the industrial sector in the study area and its impact on the system.

In this regard, the Investigator has conducted an industrial survey of various industries located in the study area. A total of 51 numbers of industries belonging of different categories, nature and types have been surveyed. The survey methods adopted are discussed in the sections 1.13.3 to 1.14.2, of chapter- 1.

The various parameters considered for this investigation are installation capacity, annual production, sources of capital, employment situation, sources of raw material, physical infrastructure, markets of products, major problems face by industries and major advantages for industrial development in the system.

4.2.1. General Scenario of Industries Surveyed

The available 51 numbers of industries in the study area are classified based on category of industries, types of organization, and nature of industries and types of products, as adopted by Government of Orissa and the results are presented in Table No. 4.46 and the table results that more than three-fourth (76.50 per cent) of the total industries are established between the years 1991 and 2000. Of which more than half (56.90 per cent) them are established between years 1996 and 2000, followed by about one fifth (19.60 per cent) between 1991 and 1995. The industries established between the years 2001 and 2004 are very less, as only about one tenth (9.80 per cent) of them are installed during this period. It is important to note that there was scarcely any industrialization prior to 1980s' (only 3.90 per cent) and the situation was also not better during the period 1981 and 1985 (5.90 per cent) and from the year 1986 to 1990 (3.90 per cent). It is, thus, revealed that industrialization started only after liberalization initiatives of economy taken by the Government of India, and subsequently followed by the State since the years of early nineteen nineties.

Table No. 4.46: Year wise establishment of industries in the study area

Sl. No.	Year of Establishment	No. of Units	Per cent
1	Before 1980	2	3.90
2	1981-1985	3	5.90
3	1986-1990	2	3.90
4	1991-1995	10	19.60
5	1996-2000	29	56.90
6	2001-2004	5	9.80
7	Total	51	100.00

Source: Primary industrial survey, 2004

4.2.2. Category of Industries

As per the Government of India, industries are categorized into Large-scale industries, Medium scale industries, Small-scale industries, and Tiny and Cottage industries based on investment in fixed assets such as, Plant and Machinery. Any industry with investment more than 10 million rupees is regarded as Large scale industries, 3.5 million to 10.00 million rupees is known as medium scale industries and industries having investment less than 3.5 million rupees in plant and machinery and other fixed assets are classified as small scale industries. Under the small-scale industries, the units having investment less than 1.00 million is considered as Tiny industries irrespective of location. Cottage industries are tiny industries based on their locations (Ref. The Industrial Compendium, 1999-2000, 2000-2001, Government of Orissa). However, this definition varies as per the Government of India guidelines, and present definition is adhered to in this investigation.

In this investigation, an attempt has been made to find the available industries under different categories and the result is presented in Table No. 4.47, and the explains that almost all (95.00 per cent) industries surveyed are confined under small-scale industries, of which 20.00 per cent belong to tiny and cottage industries. Very few industries among the surveyed industries are found as large and medium scale industries and their representation are 2.00 per cent 3.00 per cent respectively in the study area.

Table No. 4.47: Category of Industries

Sl No.	Category of Industries	No. of Units	Per cent
1	Large Scale	1	1.96
2	Medium Scale	2	3.90
3	Small Scale	37	72.60
4	Tiny	4	7.80
5	Cottage	7	13.74
6	Total	51	100.00

Source: Primary industrial survey, 2004

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4.2.3. Types of Industrial Organization

Industrial organizations are classified into Public sector, private sector companies, joint ventures, partnerships, proprietorship and cooperative organizations based on the ownership of industries. Ownership of industries are studied carefully and the results are presented in Table No. 4.48 and the table reveals that of the total industries surveyed, majority of them (62.80 per cent) belong to private sector undertakings, proprietorship has a share of about one fifth (19.60 per cent)of the sample industries. The shares of cooperative industries, partnerships and public sector are 7.80 per cent, 5.90 per cent and 3.90 per cent respectively, and it is thus found that most of industrial development takes place in private sector and the public sector contribution is very negligible.

Table No. 4.48: Types of Industrial Organization

Sl No.	Type of Organization	No. of Units	Per centage
1	Public Sector	2	3.9
2	Private Sector	32	62.8
3	Partnership	3	5.9
4	Proprietorship	10	19.6
5	Cooperatives	4	7.8
6	Total	51	100

Source: Primary industrial survey, 2004

4.2.4. Nature of Industries (Based On Products)

The Government of India has classified the industries into various types based on types of products such as, Engineering and Metal industries, Electrical and Electronics, Handicrafts, Building Materials, Rubber, Plastic and Chemical industries, Agro and Food based, Service industries, etc. An attempt has been made to find the presence of various types of such industries available among the sample industries surveyed in the study area and the results are presented in Table No. 4.49 and the table illustrates that all the types of industries are evenly distributed in their presence except

the building material industry, which has a very low share. However, the Engineering and metal industries have the largest share (25.50 per cent) followed by Agro and food based industries. Electrical and Electronics industries, Rubber, plastic and chemical industries, and Service industries are almost equally distributed each having a share of more than 10.00 per cent in the system.

Table No. 4.49: Nature of Industries

Sl No.	Nature of Industries	No. of Units	Per cent
1	Engineering and Metal	13	25.50
2	Electrical and Electronics	7	13.70
3	Handicrafts	6	11.80
4	Building Materials	3	5.90
5	Rubber, Plastic and Chemicals	7	13.70
6	Agro and Food based	9	17.60
7	Services	6	11.80
8	Total	51	100.00

Source: Primary industrial survey, 2004

It is concluded that there is no particular preference of industrial set up based on products in the system. However, handicraft industries have a low share despite the presence of high-grade skill available in the State.

4.2.5. Installation Capacity

Installation capacity of any industrial unit at the time of inception and at a certain period provides an indication of progress of the industry over the years. In order to find the progress of industries in the study area, an attempt has been made to explore the enhancement in the installation capacity of various categories of sample industries and presented in Table No .4.50.

Table No. 4.50: Installed capacity

Sl. No	Type of Industry	No of Units	Annual installed capacity inception (Rs. in Millions)	No. of Units with enhance installed capacity	Annual installed capacity at Present (Rs. in Million)	Increase in installed capacity (Rs. in Million)	Percentage Change
1	Engineering and Metal	13	509.80	1	518.10	8.30	1.62
2	Electrical and Electronics	7	65.52	0	65.52	0	0
3	Handicrafts	6	11.95	0	11.95	0	0
4	Building Materials	3	140.70	0	140.70	0	0
5	Rubber, Plastic and Chemicals	7	10.96	1	11.68	0.72	6.56
6	Agro and Food based	9	1183.50	1	1277.90	94.40	7.97
7	Services	6	20.15	1	20.20	0.05	0.25
8	Total	51	1942.48	4	2046.05	103.57	5.33

Source: Primary industrial survey, 2004

It is observed that there is only 5.33 per cent increase in the annual installation capacity among all categories of industries. Agro and Food product based (7.97 per cent), and Rubber, Plastic and Chemical industries (6.56 per cent) show some increase in installation capacity and other categories of industries do not experience any enhancement. This concludes that the progress of existing industrial units area almost stagnant.

4.2.6. Annual Production

Annual productions of the industries surveyed are investigated to understand the variation in production between the production level at the time of inception and at present situation. This gives an indication of the efficiency of industries as well as the demand of such industrial development. The results of such analysis are presented in Table No. 4.51 and the table illustrates that over all production shows an increase of of more than one-fourth (26.70 per cent) over initial production level, in which Service industries (49.30 per cent), and Engineering and Metal industries (39.64 per cent) show appreciable increase in production. On the other hand, Building material, Agro and

Food based, Rubber, Plastic and Chemical based and Electrical and Electronics industries show average enhancement in production capacity. The Handicraft industries have experienced a very meager enhancement in its production. Therefore, it is concluded that agro and food based; and engineering and metal-based industries in the system perform efficiently having greater demand. The handicraft industries do not function in efficient manner and less organized. It is also observed from the above two tables of annual production and installation capacity that the production level at the time of inception and at present condition is lower than the installation capacity, means there is underutilization of industrial installation in the system.

Table No. 4.51: Annual Production

Sl. No	Type of Industry	No of Units	Annual production at inception (Rs. in Millions)	No. of Units with enhanced Production	Annual installed capacity at Present (Rs. in Million)	Increase in production (Rs. in Million)	Per cent Change
1	Engineering and Metal	13	342.80	9	478.70	135.90	39.64
2	Electrical and Electronics	7	37.71	5	43.64	5.93	15.70
3	Handicrafts	6	7.04	2	9.85	2.81	3.99
4	Building Materials	3	97.36	0	121.2	23.84	24.70
5	Rubber, Plastic and Chemicals	7	7.06	6	8.16	1.10	15.60
6	Agro and Food based	9	968.9	9	1187.70	218.80	22.60
7	Services	6	9.35	6	13.96	4.61	49.30
8	Total	51	1470.22	37	1863.21	392.99	26.70

Source: Primary industrial survey, 2004

4.2.7. Employment

Employment generation is an integral part of industrial development and increase in employment position along with increased production indicates the growth of the industries. In order to understand the growth of industrial sector in different category of industries, an attempt has been made to investigate the employment position at the time of inception and employment position at present and the results are

presented in Table No. 4.52 and the table analysis illustrates that there is more than one-fourth (25.60 per cent) overall increase in employment in all categories of industries. Employment opportunities increased in Agro and food based industries (44.90 per cent) considerably, followed by Engineering and Metal based industries (39.20 per cent), and Electrical and Electronics industries (36.60 per cent). On the other hand, few segments have shown marginal growth in employment generation i.e., Handicraft industries (9.10 per cent), Service industries (6.00 per cent) and Rubber, Plastic and Chemical industries (2.30 per cent). The Building material industries do not experience any increase in employment at all.

Table No. 4.52: Employment

Sl. No	Type of Industry	No of Units	Total No of employees at inception	No. of Units with enhanced employment	Total No of employees at Present	Increase in employment	Percentage Change in employment
1	Engineering and Metal	13	442	9	615	173	39.20
2	Electrical and Electronics	7	224	5	306	82	36.60
3	Handicrafts	6	307	2	335	28	9.10
4	Building Materials	3	189	0	189	0	0.00
5	Rubber, Plastic and Chemicals	7	128	1	131	3	2.30
6	Agro and Food based	9	312	3	452	140	44.90
7	Services	6	83	1	88	5	6.00
8	Total	51	1685	21	2116	431	25.60

Source: Primary industrial survey, 2004

It is, thus, concluded from the above three types of analysis such as installation capacity, annual production and employment generation; the overall industrial growth in the study area is not highly significant. However, Engineering and Metal industries, Agro and Food-based industries perform efficiently. On the other hand, Handicrafts based industries are not performing well and it needs much attention.

4.2.8. Sources of Capital

Capital is the most important prerequisite for industrial development, and hence sources of capital largely influence the industrial development. An attempt has been made to investigate the various sources of capital and investment facilities that are being utilized by the industries surveyed in the study area and the results are presented in the Table No. 4.53.

Table No-4.53: Sources of Capital

Sl No.	Sources	No. of Units	Per cent
1	Nationalized Bank	38	74.50
2	Cooperatives	5	9.80
3	Self	3	5.90
4	Other (Boards/Corporations)	5	9.80
5	Total	51	100.00

Source: Primary industrial survey, 2004

The results of the above analysis show that the various sources of capital and lending agencies in the study area are nationalized banks, private banks, cooperative banks, boards/ corporations and self financed individuals or groups. It is observed that about three-fourth (74.50 per cent) of the industries are financed by the nationalized banks and thus is most important sources of capital. Cooperative banks (9.80 per cent), Boards/corporations (9.80 per cent) contribute about one tenths of the total finance respectively and self-financers contribute very meager amount (5.90 per cent) as sources of capital. It is also noteworthy to realize that despite the establishment of private banks in the study area, they do not contribute anything in the form of industrial investment in the study area.

4.2.9. Availability of Raw Materials

Generally, industrial development occurs based on the following aspects, such as, resource based, need based or demand based. In this present investigation, an attempt is made to understand the industrial development based on the above aspects. At the out set the Investigator had a close look at the resource based industrial development in the study area by looking at the raw materials available for industrial development. Raw materials are the backbone of any industrial development. Availability of raw material influences the location of industrial set up. Therefore, an attempt has been made to investigate the availability of raw materials for various categories of industries surveyed in the study area and the results are presented in Table No. 4.54 and the table reveals that about three-fifth (58.80 per cent) of the industries obtain their raw materials from the local area and the rest (41.20 per cent) depends on outside sources. In the individual category of industries, all the Agro and Food based, Building material industries, and more than four fifth (83.00 per cent) of Handicrafts industries obtain their raw materials from the local area. Also, two third of the Service industries (66.70 per cent), and more than half (57.00 per cent) of Electrical and Electronics industries depend on local area for their raw material. On the other hand, a higher percentage of Engineering and Metal industries and Rubber, Plastic and Chemical industries depend on outside sources for raw materials.

Table No. 4.54: Availability of Raw Materials

Sl. No	Type of Industry	Depends on Locally available raw material		Depends on outside source of raw material		Total	
		No of Units	Per cent	No of Units	Per cent	No of Units	Per cent
1	Engineering and Metal	6	46.20	7	53.80	13	100.00
2	Electrical and Electronics	4	57.10	3	42.90	7	100.00
3	Handicrafts	5	83.30	1	16.70	6	100.00
4	Building Materials	3	100.00	0	0.00	3	100.00
5	Rubber, Plastic and Chemicals	2	28.60	5	71.40	7	100.00
6	Agro and Food based	9	100.00	0	0.00	9	100.00
7	Services	4	66.70	2	33.30	6	100.00
8	Total	33	58.80	18	41.20	51	100.00

Source: Primary industrial survey, 2004

Thus, it is concluded that the study area is blessed with abundant raw materials for Agro and Food based; building materials and handicrafts based industrial development.

4.2.10. Infrastructure

Infrastructure is highly essential for location of setting up of industries. Basic physical infrastructure, such as, roads and rail connectivity for better accessibility are the two most important infrastructures apart from availability of power for setting up industries in any location. The availability of infrastructures, such as, higher order roads and railway link decides the location of industries, transportation medium of raw materials, finished products, etc. Therefore, in this investigation, an attempt has been made to understand the present condition of infrastructures particularly the accessibility condition because transportation medium of raw materials and finished products, location of industries from nearest Railway station and location of industries from nearest National Highways are the three parameters basically influence setting up the industries in the study area.

4.2.10.1. Transportation medium of raw materials and finished products

The various transportation medium of raw materials and finished products are road, railway and other mediums, such as air and waterways. An attempt has been made to find the transportation medium for industrial raw materials and finished products and the results are presented in Table No. 4.55.

Table No. 4.55: Transportation Medium for Raw Materials

Sl. No	Type of Industry	Road		Railway		Other		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	6	46.20	7	53.80	0	0	13	100.00
2	Electrical and Electronics	4	57.10	3	42.90	0	0	7	100.00
3	Handicrafts	5	83.30	1	16.70	0	0	6	100.00
4	Building Materials	3	100.00	0	0.00	0	0	3	100.00
5	Rubber, Plastic and Chemicals	2	28.60	4	57.10	1	14.30	7	100.00
6	Agro and Food based	9	100.00	0	0.00	0	0	9	100.00
7	Services	4	66.70	2	33.30	0	0	6	100.00
8	Total	33	64.70	17	33.30	1	2.00	51	100.00

Source: Primary industrial survey, 2004

The table results that all the Agro and Food based industries (100.00 per cent), Building Material industries (100.00) and most of the Handicraft based industries (83.30 per cent) depend on roads. A majority of Engineering and Metal industries, Electrical and Electronics, Service industries depends on both road and railway sectors almost equally, and Rubber, Plastic and Chemical industries depend on all sectors of transportation modes without any particular preference. It is observed that in overall two third (64.70 per cent) of the industries depends on road sector and one-third (33.30per cent) of industries depends on both road and railway sectors together.

4.2.10.2. Location of industries from nearest railway station

The importance of railways for industrial development is investigated for the sample industries and presented in Table No. 4.56.

It is observed that more than four fifth (85.00 per cent) of Electrical and Electronics industries, two-third (67.00 per cent) of building material industries, four fifth (80.00 per cent) of Service industries and more than half (57.00 per cent) of Rubber, Plastic and Chemical industries are located within five kilometers fro the railway station. On the other hand, a majority of other category of industries, such as, Engineering and Metal industries (more than 53.00 per cent), handicrafts (83.30 per cent), and agro and food based industries (more than 55.00 per cent) are located within 5.00 to 10.00 kms distances or beyond from the railway station.

4.2.10.3. Location of industrial units from National Highway

In order to find the importance of National Highways and other roads on the industrial set up in the study area, an attempt has been made to investigate the location of sample industries from the National Highways and the results presented in Table No. 4.57.

It is observed that more than four-fifth (85.00 per cent) of Engineering and Metal industries, about two-third (60.00 per cent) of Electrical and Electronics industries, all the (100.00 per cent) of Building Material industries, more than two-third (70.00 per cent) of Rubber, Plastic and Chemical industries, more than four-fifth (88.00 per cent) of Agro and Food based, and Service (83.00 per cent) industries are located within 5.00 kms from the National Highways and rest of the industries are located within 10.00 kms from the National Highways except Handicraft industries. Most of the Handicraft industries (83.30 per cent) are located beyond 10.00 kms from the National Highways. In all totals, about three-fourth (74.00 per cent) of industries are located within 5.00 kms from the National Highways.

Table No. 4.56: Location of Industrial Units (From nearest Railway Station)

Sl No	Type of Industry	Distance from Railway Station in KMs.								Total	
		<2.0		2.0 to 5.0		5.0 to 10.0		> 10.0			
		No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
1	Engineering and Metal	2	15.40	4	30.80	4	30.80	3	23.00	13	100.00
2	Electrical and Electronics	3	42.90	3	42.90	1	14.20	0	0.00	7	100.00
3	Handicrafts	1	16.79	0	0.00	0	0.00	5	83.30	6	100.00
4	Building Materials	1	33.30	1	33.30	0	0.00	1	33.30	3	100.00
5	Rubber, Plastic and Chemicals	3	42.90	1	14.20	3	42.90	0	0.00	7	100.00
6	Agro and Food based	4	44.40	0	0.00	3	33.30	2	22.30	9	100.00
7	Service industries	2	33.30	3	50.00	0	0.00	1	16.70	6	100.00
8	Total	16	31.40	12	23.50	11	21.60	12	23.50	51	100.00

Source: Primary industrial survey, 2004

Table No. 4.57: Location of Industrial Units (From National Highway)

Sl No	Type of Industry	Distance from National Highway in KMs.									
		<2.0		2.0 to 5.0		5.0 to 10.0		> 10.0		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	9	69.20	2	15.40	1	7.70	1	7.70	13	100.00
2	Electrical and Electronics	2	28.60	3	42.80	2	28.60	0	0.00	7	100.00
3	Handicrafts	1	16.70	0	0.00	0	0.00	5	83.30	6	100.00
4	Building Materials	3	100.00	0	0.00	0	0.00	0	0.00	3	100.00
5	Rubber, Plastic and Chemicals	3	42.80	2	28.60	2	28.60	0	0.00	7	100.00
6	Agro and Food based	6	66.70	2	22.20	1	11.10	0	0.00	9	100.00
7	Service industries	3	50.00	2	33.30	1	16.70	0	0.00	6	100.00
8	Total	27	52.90	11	21.60	7	13.70	6	11.80	51	100.00

Source: Primary industrial survey, 2004

Thus, it is concluded that higher order roads are the most important infrastructure and influence the location of industries followed by railways in the study area. The case of Handicraft industries is an exception as they are mostly cottage industries and located relatively in the inner areas of the study area.

4.2.11. Markets for Industrial Products

Demand of industrial products and availability of adequate markets are the factors that make industries grow and sustain in the long run. The Investigator has attempted to investigate the available markets for the products of sample industries and the results are presented in Table No. 4.58, and the table reveals that the Orissa State provides markets to about three-fourth (71.40 per cent) of Electrical and Electronics industries, 100.00 per cent of Service industries, half (50.00 per cent) of Handicrafts industries, two-third (66.70 per cent) of Agro and Food based industries and more than half (53.80 per cent) of Engineering and Metal industries, which include local consumption of the products. About one-fourth (23.10 per cent) of Engineering and Metal industries, Just above one-fourth (28.60 per cent) of Electrical and Electronic industries, more than half (57.10 per cent) of Rubber, Plastic and Chemical industries, just above one-tenth (11.10 per cent) of Agro and Food industries, and more than one-seventh (16.70 per cent) of Handicraft industries have markets for their products at national level. It is also important to note that 100.00 of Building material industries, one-third (33.30 per cent) of Handicraft industries, about one-fourth (23.10 per cent) of Engineering and Metal industries and Agro and food-based (22.20 per cent) industries are export oriented industries.

Table No. 4.58: Market of the products

Sl No.	Type of Industry	Total no of units	Local		Inside the State		National level		Export	
			No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	13	2	15.40	5	38.40	3	23.10	3	23.10
2	Electrical and Electronics	7	0	0.00	5	71.40	2	28.60	0	0.00
3	Handicrafts	6	0	0.00	3	50.00	1	16.70	2	33.30
4	Building Materials	3	0	0.00	0	0.00	0	0.00	3	100.00
5	Rubber, Plastic and Chemicals	7	0	0.00	3	42.90	4	57.10	0	0.00
6	Agro and Food based	9	2	22.20	4	44.50	1	11.10	2	22.20
7	Service industries	6	2	33.30	4	66.70	0	0.00	0	0.00
8	Total	51	6	11.80	24	47.00	11	21.60	10	19.60

Source: Primary industrial survey, 2004

Thus, it is concluded that Orissa State is the major market for all types of products except Building material, and Rubber, Plastic and Chemical industries. Most of the industrial products of the study area have a very meager presence in the National market. Most of the Building material industries, some of the handicraft industries, Engineering and Metal industries and Agriculture and Food based industries have demand in foreign countries.

4.2.12. Proposed Future Expansion of Industries

Proposal for future expansion of industrial units gives an indication of the progress and well run of industrial units. Therefore, the Investigator has attempted to find the proposal for future expansion of industrial units in terms of establishment of additional units, space and employment and the results are presented in Table No. 4.59.

It is observed that only about one-sixteenth (7.70 per cent) of Engineering and Metal industries, have proposal for expansion in terms all three categories. About one seventh (14.30 per cent) of Electrical and Electronics industries and just above one-tenth (11.10 per cent) of Agriculture and Food industries have proposal for expansion in terms of space and employment. All other industries do not have any proposal for future expansion. It is, therefore, concluded that the progress in all categories of industries are grim.

Table No. 4.59: Proposed of future expansion

Sl No.	Type of Industry	Total no of units	In terms of additional units		In terms of space		In terms of employment		Total expansion	
			No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	13	1	7.70	1	7.70	1	7.70	1	7.70
2	Electrical and Electronics	7	0	0.00	1	14.30	1	14.30	1	14.30
3	Handicrafts	6	0	0.00	0	0.00	0	0.00	0	0.00
4	Building Materials	3	0	0.00	0	0.00	0	0.00	0	0.00
5	Rubber, Plastic and Chemicals	7	0	0.00	0	0.00	0	0.00	0	0.00
6	Agro and Food based	9	1	11.10	0	0.00	1	11.10	1	11.10
7	Service industries	6	0	0.00	0	0.00	0	0.00	0	0.00
8	Total	51	2	3.90	2	3.90	3	5.90	3	5.90

(Future Expansion spans the columns: In terms of additional units, In terms of space, In terms of employment, Total expansion)

Source: Primary industrial survey, 2004

4.2.13. Major Advantages in the Study Area for Industrial Set Up

An attempt has been made to investigate various important advantages in the study area that facilitate the setting up of industries or invite entrepreneurs for setting up of new industries as per the opinion of the personnel involved in industrial units. The various parameters assesses in this investigation are accessibility, cost of land, availability of land, skill availability, availability of power, water, assured market, assured raw materials, Government incentives and policies etc., analyzed thoroughly and the results are presented in Table No. 4.60.

The table results that availability of land and accessibility are the two most important advantages for all most all categories of industries. Availability of skill and Government incentives and policies are important advantages for Handicraft industries. In addition, Government incentives and policies are also important advantages for Agriculture and Food based, and Building material industries.

4.2.14. Major Problems in the Study Area for Industrial Development

An attempt has been made to investigate the major problems, which hinder the set up, and running of industries in the study area based on the opinion of persons involved in the industrial units. The parameters considered are availability raw materials, capital, power, market of products, transportation, water, environmental condition, technology, labour and Government policies, and are analyzed thoroughly and the results are presented in Table No. 4.61.

It is revealed from the table analysis that two-third of the industries (66.70 per cent) of industries feel power is a major problem followed by more than half (56.90 per cent) feel that capital as a major problem. Environmental conditions are major hindrances for Building material (100.00 per cent) industries.

Based on the analysis of advantages and problems for industrial development it is concluded that while availability of land, accessibility are the major advantages; inadequate availability of power and capital are the major problems. Availability of skilled labour, availability of raw material, availability of water, technology, availability of market, environmental conditions, Government policies, etc., are though not major advantages, do not pose hindrances in industrial development in the study area.

4.2.15. Future Prospects of Industry in the Study Area

The Investigator has attempted to find the future prospects of the industries in the study area based on the analysis of the opinion of the persons involved in industries in the sample industries and the result is presented in Table No. 4.62.

The table result manifests that a most of the industry people, i.e., about nine-tenth (88.30 per cent) feels that the future prospects of industries in the study area are either good or promising and only just above one-tenth (11.70 per cent) feels that the future prospect is bad or grim in all categories of industries. It is noteworthy to observe that according to the opinion of almost everyone future prospect of Handicrafts industries and Building material industries are good or promising. Therefore, according to the opinion of the industry people it is concluded that the future prospects of industrial development promise to be good in the study area.

Table No. 4.60: Major advantages for industrial development in the study area

SI No.	Type of Industry	Total no of units	Accessibility		Cost of land		Availability of land		Skill availability		power		Water		Assured raw material		Assured market		Govt. incentives	
			No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	13	13	100.00	3	23.10	12	92.30	7	53.80	4	30.80	5	38.50	5	38.50	5	38.50	3	23.10
2	Electrical and Electronics	7	3	42.60	0	0.00	7	100.00	4	57.10	3	42.90	3	42.90	5	71.40	3	42.90	3	42.90
3	Handicrafts	6	3	50.00	0	0.00	6	100.00	6	100.00	1	16.70	2	33.30	3	50.00	4	66.70	5	83.30
4	Building Materials	3	3	100.00	0	0.00	2	66.70	1	33.30	1	33.30	1	33.30	3	100.00	2	66.70	2	66.70
5	Rubber, Plastic and Chemicals	7	5	71.40	1	14.30	6	85.70	3	42.90	3	42.90	2	28.60	3	42.90	3	42.90	2	28.60
6	Agro and Food based	9	9	100.00	2	22.20	7	77.80	5	55.60	5	55.60	4	44.40	4	44.40	4	44.40	6	66.70
7	Services	6	6	100.00	2	33.30	5	83.30	3	50.00	2	33.30	5	83.30	2	33.30	2	33.30	3	50.00
8	Total	51	42	82.40	8	15.70	45	88.20	29	56.90	19	37.30	22	43.10	25	49.00	23	45.10	24	47.10

Source: Primary industrial survey, 2004

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Table No. 4.61: Major Problems for industrial development in the study area

Sl No.	Type of Industry	Total no of units	Raw materials		Capital		Energy		Market		Transportation		Water		Environmental		Labour		Govt Policies	
			No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	13	2	15.40	7	53.80	8	61.50	6	46.20	1	7.70	0	0.00	1	7.70	3	23.10	2	15.40
2	Electrical and Electronics	7	0	0.00	2	28.60	7	100.00	2	28.60	1	14.30	0	0.00	0	0.00	3	42.90	0	0.00
3	Handicrafts	6	0	0.00	5	83.30	3	50.00	2	33.30	1	16.70	0	0.00	0	0.00	0	0.00	0	0.00
4	Building Materials	3	0	0.00	0	0.00	2	66.70	0	0.00	0	0.00	1	33.30	3	100.00	1	33.30	0	0.00
5	Rubber, Plastic and Chemicals	7	0	0.00	5	71.40	5	71.40	0	0.00	0	0.00	2	28.60	2	28.60	2	28.60	1	14.30
6	Agro and Food based	9	0	0.00	7	77.80	7	77.80	2	22.20	0	0.00	3	33.30	3	33.30	2	22.20	1	11.10
7	Services	6	0	0.00	3	50.00	2	33.30	2	33.30	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
8	Total	51	2	3.90	29	56.90	34	66.70	14	27.50	3	5.90	6	11.80	9	17.60	11	21.60	4	7.80

Source: Primary industrial survey, 2004

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4.3. STATUS OF TOUSISM IN THE STUDY AREA

In order to gather first hand knowledge about the status of tourism in the study area, the Investigator attempted a through and detailed analysis of various parameters related to tourism industry development in this investigation. The investigation pertain to tourism development is done based on data collected from the primary tourist survey carried out in the study area. The details of the survey methodology adopted are discussed in chapter- I. The various parameters considered for this investigation are category of tourists, frequency of visit, duration of stay, purpose of stay, period of visit, priority of tourism activities, preferred destinations, preference of other tourist destinations in the State, infrastructural facilities pertaining to tourism, preference of tourist related products and handicrafts, condition of tourist attraction elements, problems relating to tourism, means of acquiring knowledge about the study area, etc. The above parameters are analyzed thoroughly with adequate attention and the results are presented as below:

4.3.1. Category of Tourists Visits

The tourists visiting Orissa State and the study area were categorized into two categories, such as, foreign tourists and domestic tourists depending upon their native place. A foreign tourist is a person visiting India on a foreign passport, for the purpose of leisure (recreation, holiday, health, study, religion, sport, etc.) and stays at least twenty-four hours in the country. A domestic tourist is a person who travels within the country to a place other than his usual place of residence, or work and stays at hotels or other accommodation establishments run on commercial basis or in charitable guest houses (dharmasalas / sarais / musafirkhans / agra-sals), inns, choultries, etc., for a duration of not less than twenty four hours or one night and not more than six months at a time for the purposes of pleasure(holiday, leisure, sports, etc.), pilgrimage, religious

and social functions, business conferences and meetings or study, health, etc. It is highly essential to understand the share of these two categories of tourists and the areas of their origin for creating suitable tourism development plan since their needs, aspirations, etc., are absolutely different.

An attempt was made to find the category of tourists and potential regions from where tourists visit to the study area, and the results are presented in Table No. 4.63 and table explains that of the total 100 tourists surveyed, 18 persons belong to foreign tourists' category and 82 persons to domestic tourists' category. Of the foreign tourists, tourists from U.S.A, U.K, and Western Europe, Australia are the major contributors to foreign tourists' arrival to the study area. It is also observed that about two fifth (37.80 per cent) of the total domestic tourists visit to the study are belong to the Orissa State. West Bengal State contributes about one-seventh (14.60 per cent). Andhra Pradesh and other Southern States contribute about one seventh (13.40 per cent), Madhya Pradesh and Chhatishgarh region contribute just above one-tenth (11.00) of the total domestic tourist to the Study area. Bihar and Jharkhand States are also the major contributors (8.50 per cent) of domestic tourists to the study area. Northern regions of the country including Uttar Pradesh, Rajasthan, Delhi, and Western regions such as Maharastra, Gujarat States are also significant contributors of domestic tourists to the Study area. It is understood from the above table that while Europe and U.S.A are the important nations from where foreign tourist arrives to the study area, while the neighboring State are the major contributors of domestic tourists to the study area.

Table No. 4.63: Category of tourists Visiting Orissa State

Sl. No.	Category of tourists						Total No. of Tourists
	Foreign tourists			Domestic tourists			
	Country/ Region	No.	Per cent	State/ Region	No.	Per cent	
1	USA	6	33.30	Orissa	31	37.80	
2	UK	5	27.80	West Bengal	12	14.60	
3	Western Europe	5	27.80	Andhra Pradesh and other southern States	11	13.40	
4	Australia	2	11.10	Madhya Pradesh and Chhatisgarh State	9	11.00	
5	Nepal	0	0	Bihar and Jharkhand State	7	8.50	
6	Sri Lanka	0	0	Western Region	4	4.90	
7	Others	0	0	Northern Region	8	9.80	
8	Total	18	100.00	Total	82	100 .00	100.00

Source: Primary tourist survey, 2004

4.3.2. Age Wise Tourists Visiting the Study Area

Age is a parameter, which influences largely the mobility of the persons. From tourism point of view, age factors decide various tourism functions and infrastructure requirements to be considered on priority basis in the tourist destinations. Having this knowledge, the Investigators has attempted to analyze the age wise tourists visits to the study area and results are presented in Table-4.64 and the table reveals that the highest proportion of visitors to the study area both in foreign (about 89.00 per cent) and domestic (80.00 per cent) category belongs to the age group of 26 years to 60 years. The age group of 41 years to 60 years is dominant in both categories of tourists (55.56 per cent in foreign and 45.12 per cent in domestic category). Among the foreign tourist category, arrivals of children and in the young age group of 15-25 years to the study area are very much negligible. The share of tourists in senior age group (above 61 years) is negligible in both groups, i.e., 5.56 per cent in foreign tourist category, and it is 6.10 per cent in the domestic category. It is, thus, observed that most of the tourists in

both foreign and domestic category belong to age group of 41-60 years followed by age group of 26-40 years.

Table No. 4.64: Age wise tourist visits to the study area

Sl. No	Age in Years	Age wise tourist visits to the study area					
		Foreign		Domestic		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	<14	0	0	4	4.88	4	4.00
2	15 to 25	1	5.56	8	9.76	9	9.00
3	26 to 40	6	33.33	28	34.15	34	34.00
4	41 to 60	10	55.56	37	45.12	47	47.00
5	> 61	1	5.56	5	6.10	6	6.00
6	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourist survey, 2004

4.3.3. Frequency of Visits

An attempt has been made to explore the frequency of visits by different categories of tourists to the study area. This is done to find the present status of repeat visits of tourists, which manifests the importance and potential of the study area as attractive tourist destination. The results of the analysis is presented in Table No. 4.65 and the table reveals that about three-fourth (77.80 per cent) of foreign tourists are on their first visit to the study area and the rest (22.20 per cent) are on their second or more visits, which is quite significant. In the domestic category, about a little less than three-fourth (71.90 per cent) have visited the study area twice or more and the rest (28.10 per cent) of them were on first visit. Over all, about two-third (63.00 per cent) of total tourists have visited the study area more than twice. Therefore, it can be concluded that the study area has potential and attractions for repeat visits to both foreign and domestic tourists.

Table No. 4.65: Frequency of Visit

Sl. No	Visits	Foreign Tourist		Domestic Tourist		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	First Visit	14	77.80	23	28.10	37	37.00
2	Second Visit	3	16.70	34	41.50	37	37.00
3	More than twice	1	5.50	25	30.40	26	26.00
4	Total	18	100.00	82	100.00	100	100 00

Source: Primary tourist survey, 2004

4.3.4. Number of Days Stay in the Study Area

The number of days staying in the study area is a measure of the tourists spending. More the number of days stay means more spending by the tourists and more income and more employment generation. Having this knowledge in mind, the Investigator, has attempted to find the number of days tourists stay in the study area, and the results are presented in Table No. 4.66 and the table explains that more number of tourists stay about 3 days to 5 days in the study area while, it is distributed in case of foreign tourists, which varies from 3 days to 14 days. Domestic tourists spend 3.96 days; foreign tourists stay about 8.30 days on an average leading to over all average of 5.01 days for all categories of tourists. The higher average stays of foreign tourists lead to higher tourist spending and higher income in the study area from tourist expenditure. The average stay of domestic tourists seems to be low, means less individual tourist spending.

Table No. 4.66: Average number of Days of stay in Orissa State

Sl. No	Type of Tourist	Number of Tourists/ Number of days														Total Number of Tourist	Average number of stay
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1	Foreign	0	0	1	3	1	1	2	2	0	3	1	1	2	1	18	8.3
2	Domestic	0	3	19	18	12	2	1	1	0	0	0	0	0		56	3.96
3	Total	0	3	20	21	13	3	3	3	0	3	1	1	2	1	74	5.01

Source: Primary tourist survey, 2004

4.3.5. Purpose of Visit

An attempt has been made to explore the purpose of visit of different categories of tourists. This helps in identifying the priorities in creating activities and supporting infrastructure that motivate the tourists for visit and stay for higher number of days in the study area and the results of this analysis are presented in Table No. 4.67 and the table illustrates that in the foreign tourist category, travel (75.00 per cent) is the most preferred purpose followed by pilgrimage (11.00 per cent), and business activity (5.5 per cent) is very negligible. The purpose of tourists for a combination of different activities is also significant in this category. In the domestic tourist category recreation (30.50 per cent), pilgrimage (19.50 per cent), business (17.10 per cent) and travel (15.80 per cent) are the various purposes of visit of tourists on priority basis. Thus, it can be concluded that travel, recreation, pilgrimage, are the major purposes of tourism in the study area.

Table No. 4.67: Purpose of Visit

Sl. No.	Purpose	Purpose of Visit					
		Foreign Tourists		Domestic Tourists		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	Travel	12	75.00	13	15.80	26	26.00
2	Pilgrimage	2	11.00	16	19.50	18	18.00
3	Recreation	0	0	25	30.50	25	25.00
4	Official	0	0	3	3.70	3	3.00
5	Business	1	5.50	14	17.10	14	14.00
6	Combination of any	2	11.00	11	13.40	13	13.00
7	Any other	1	5.50	0	0	1	1.00
8	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourist survey, 2004

4.3.6. Prioritized Tourism Activity in the Study Area

An attempt has been made to find the preference of various tourism activities in the study area among different category of tourists, which helps in enhancing micro-

Table No-4.62: Future prospects of industry in the study area

Sl No.	Type of Industry	Total no of units	Good		Promising		Bad		Total	
			No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Engineering and Metal	13	9	69.20	2	15.40	2	15.40	13	100.00
2	Electrical and Electronics	7	4	57.10	2	28.60	1	14.30	7	100.00
3	Handicrafts	6	4	66.70	2	33.20	0	0.00	6	100.00
4	Building Materials	3	2	66.70	1	33.30	0	0.00	3	100.00
5	Rubber, Plastic and Chemicals	7	4	57.10	2	28.60	1	14.30	7	100.00
6	Agro and Food based	9	3	33.30	5	55.60	1	11.10	9	100.00
7	Service industries	6	3	50.00	2	33.30	1	16.70	6	100.00
8	Total	51	29	56.90	16	31.40	6	11.70	51	100.00

Source: Primary industrial survey, 2004

level facilities in the destinations as well as facilitating those activities. The results of this analysis are presented in Table No. 4.68 (a), and 4.68 (b) and these tables reveal that recreation and travel is the top ranked activity (44.40 per cent ranked it as number one) among the foreign tourists, followed by seeing sculptures (22.20 per cent) and visiting religious shrines and heritage and archeological sites. Activities like wildlife watching, bird watching are the second prioritized activities. Marketing of handicrafts and sight seeing are the next preferred tourism activities among the foreign tourist.

Table No. 4.68 (a): Ranking of Tourism activity in Orissa State (Foreign Tourist)

Sl No.	Activities	Tourism activity in Orissa State (Foreign Tourist)									
		Rank 1		Rank 2		Rank 3		Rank 4		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	Recreation and Travel	8	44.40	1	5.60	0	0	1	5.60	10	55.60
2	Sight Seeing	0	0	0	0	0	0	1	5.60	1	5.60
3	Adventure Sports	0	0	0	0	0	0	0	0	0	0
4	Boating	0	0	0	0	0	0	0	0	0	0
5	Bird Watching	0	0	3	16.70	3	16.70	5	27.70	11	61.10
6	Visiting Religious Shrines	3	16.70	1	5.60	1	5.60	1	5.60	6	33.30
7	Seeing Sculptures	4	22.20	9	50.00	2	11.10	2	11.10	17	94.40
8	Visiting Heritage and Archeological Sites	2	11.10	4	22.20	9	50.00	2	11.10	17	94.40
9	Marketing of traditional Handicrafts	0	0	0	0	1	5.60	2	11.10	3	16.70
10	Cultural Programmes	0	0	0	0	0	0	0	0	0	0
11	Wild life watching	1	5.60	0	0	2	0	4	22.20	7	28.90
12	Any other	0	0	0	0	0	0	0	0	0	0
13	Total	18	100.00	18	100.00	18	100.00	18	100.00		

Source: Primary tourism survey, 2004

Table No. 4.68 (b): Ranking of Tourism activity in Orissa State (Domestic Tourist)

Sl No.	Activities	Tourism activity in Orissa State (Domestic Tourist)									
		Rank 1		Rank 2		Rank 3		Rank 4		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Recreation and Travel	43	52.50	6	7.30	4	4.90	2	2.40	55	67.10
2	Sight Seeing	1	1.20	10	12.20	2	2.40	4	4.90	17	20.70
3	Adventure Sports	0	0	0	0	0	0	0	0	0	0
4	Boating	0	0	1	1.20	1	1.20	1	1.20	3	3.60
5	Bird Watching	0	0	1	1.20	6	7.30	7	8.50	14	17.10
6	Visiting Religious Shrines	32	39.10	27	32.90	6	7.30	4	4.90	69	84.10
7	Seeing Sculptures	2	2.40	17	20.80	16	19.60	19	23.20	54	65.90
8	Visiting Heritage and Archeological Sites	3	3.60	14	17.10	36	43.90	10	12.20	63	76.80
9	Marketing of traditional Handicrafts	0	0	0	0	2	2.40	14	17.10	16	19.50
10	Cultural Programmes	0	0	0	0	0	0	7	8.50	7	8.50
11	Wild life watching	1	1.20	6	7.30	9	11.00	14	17.10	30	36.60
12	Any other	0	0	0	0	0	0	0	0	0	0
13	Total	82	100.00	82	100.00	82	100.00	82	100.00		

Source: Primary tourism survey, 2004

In case of domestic tourists' too recreation and travel (52.50 per cent), and visiting religious shrines (39.10 per cent) are the top ranked tourism activities in the

study area being preferred by the tourists. Seeing sculptures, visiting heritage sites, wildlife watching and bird watching are the next prioritized activities.

It is also observed that activities such as, adventure sports, boating, affinity towards cultural programmes are the least preferred tourism activities in the study area.

Thus, it can be concluded that recreation and travel, religious activity and pilgrimage, visiting heritage and archeological sights, seeing of sculptures, etc., are the most important tourism activities in the study area.

4.3.7. Period of Visit to the Study Area

Successful tourism to a destination depends on its climatic factors too. A pleasant and soothing climate enhances the possibility of higher tourist flow and increasing tourism activity. Therefore, an attempt has been made to understand the better periods of visit to the study area and the results of this analysis are presented in Table No. 4.69.

Table No. 4.69: Period of Visit to the study area

Sl No.	Period	Foreign Tourist		Domestic Tourist		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	Summer (April-June)	0	0	4	4.90	4	4.00
2	Winter (September to January)	6	33.33	28	34.11	34	34.00
3	Spring (February to March)	8	44.50	23	28.00	32	32.00
4	Other period	0	0	0	0	0	0
5	Through out the year	3	16.70	21	25.60	24	24.00
6	Festival Time	1	5.5	6	7.4	6	6.0
7	Total	18	100	82	100	100	100

Source: Primary tourism survey, 2004

It is observed from the above analysis that foreign tourist flow in spring season i.e., months of February and March is the highest (44.50 per cent), followed by winter season i.e., months of September to January (33.33 per cent). In addition, 16.70 per

cent of foreign tourists prefer to visit the study area through out the year. In summer season (April to June), there was no foreign tourist visit observed in the study area. In case of domestic tourists, winter season is the most preferred period to visit (34.11 per cent), followed by spring season (28.00 per cent) and more than one fourth (25.60 per cent) prefer to visit the study area through out the year. It is noteworthy to mention that about 5.50 per cent of foreign tourist and 7.40 per cent of domestic tourists visit the study area during the festival seasons other than the preferred periods of visit. It can be concluded that the months of September to March, and festival season, like month of July are the most suitable period of visit to the study area. The summer months of April, May and June are least preferred months for both domestic and foreign tourists to visit the study area.

4.3.8. Preferred Destinations in the Study Area

The Investigator or has made an attempt to explore the preferred destinations in the study area in order to get an insight to the tourist preference and potential of tourism activity in various destinations in the study area. For this, an opinion survey has been conducted among the both foreign and domestic categories of tourists visiting the study area and the results of the analysis are presented in Table Nos. 4.70 (a) and 4.70 (b).

It is observed from Table No. 4.70 (a) that Puri, the abode of lord Jagannath is ranked first among the foreign tourists, followed by Konark and Bhubaneswar. However, it is also observed that Puri, Konark and Bhubaneswar together as popularly known as Golden triangle of Orissa, ranked high in the priority list of destinations of foreign tourists. The largest backwater lake in Asia, Chilka, which is an abode of migratory birds ranked next to the above three destinations and followed by wildlife sanctuaries. The smaller destinations are ranked low in the study area. In the domestic category, golden triangle ranked first among all the destinations. In the individual

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category, Puri is the most preferred destination by the largest domestic tourists followed by Konark and Bhubaneswar. Chilka Lake, sea beaches and wildlife sanctuaries are the second ranked preferred destinations in the study area. Smaller destinations in the study area do not find much preference among the domestic tourists. Thus, it can be concluded that the established destinations are most preferred ones and the smaller destinations such as religious places, archeological sites, historical sites, and sea beaches, wildlife sanctuaries are lagging behind in attracting the tourists.

4.3.9. Interest in Visiting Other Tourist Destinations in the State

An attempt has been made to understand the interest of the tourists to visit other destinations of the State, as this would give an indication for interlinking the various tourism destinations of the State with the study area for tourism development in both study area and the State. The results of the analysis is presented in Table No. 4.71 and the table explains that about three-fourth (72.20 per cent) of foreign tourists prefer to visit the other tourist destinations of the State and in contrast, only a little more than one third (34.10 per cent) of domestic tourists keep interests in visiting other tourists' destinations of the state. In all totals, just above two-fifths (41.00 per cent) of total tourists have interest in visiting those destinations. Therefore, it is concluded that foreign tourists are more interested in visiting other areas in addition to the study area in comparison with domestic tourists.

Table No. 4.70 (a): Priority of Destinations in the Orissa State (Foreign Tourists)

Sl.No.	Destinations	Rank 1		Rank 2		Rank 3		Rank 4		Lesser ranks		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Puri	6	33.30	4	22.20	0	0	4	22.20	4	22.20	18	100.00
2	Konark	4	22.20	6	33.30	3	16.70	4	22.20	1	5.6	18	100.00
3	Bhubaneswar	2	11.10	2	11.10	7	38.90	0	0	0	0	11	61.10
4	Golden triangle	6	33.30	0	0	0	0	0	0	0	0	6	33.30
5	Chilika	0	0	6	33.30	2	11.10	9	50.00	1	5.60	18	100.00
6	Smaller destinations near by	0	0	0	0	0	0	0	0	2	11.10	2	11.10
7	Sea Beaches	0	0	0	0	0	0	0	0	3	16.70	3	16.70
8	Wildlife Sanctuary	0	0	0	0	6	33.30	1	5.60	3	16.70	3	16.70
9	Towards east coast	0	0	0	0	0	0	0	0	0	0	0	0
10	Towards west Coast	0	0	0	0	0	0	0	0	0	0	0	0
11	Other regions of the state	0	0	0	0	0	0	0	0	4	22.20	4	22.40
12	Total	18	100.00	18	100.00	18	100.00	18	100.00	18	100.0		

Source: Primary tourism survey, 2004

Table No. 70 (b): Priority of Destinations in the Orissa State (Domestic Tourists)

Sl.No.	Destinations	Priority of destinations in the Orissa State (Domestic Tourists)											
		Rank 1		Rank 2		Rank3		Rank4		Lesser rank		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Puri	18	22.00	20	24.40	10	12.20	13	15.90	10	12.20	71	86.60
2	Konark	17	20.70	15	18.30	16	19.50	15	18.40	12	14.60	73	89.00
3	Bhubaneswar	14	17.10	9	11.00	15	18.30	3	3.60	0	0	41	50.00
4	Golden triangle	33	40.20	6	7.30	0	0	0	0	11	13.40	50	61.00
5	Chilika	0	0	25	30.50	13	15.90	35	42.70	1	5.50	72	87.80
6	Smaller destinations near by	0	0	0	0	0	0	0	0	7	8.50	7	8.50
7	Sea Beaches	0	0	4	4.90	5	6.10	3	3.60	8	9.70	20	24.40
8	Wildlife Sanctuary	0	0	3	3.60	23	28.00	11	13.40	23	28.00	66	8.00
9	Towards East Coast	0	0	0	0	0	0	2	2.40	4	14.30	6	7.30
10	Towards West Coast	0	0	0	0	0	0	0	0	4	4.90	4	4.90
11	Other regions of the State	0	0	0	0	0	0	0	0	2	2.40	5	6.10
12	Total	82	100.00	82	100.00	82	100.00	82	100.00	82	100.00		

Source: Primary tourism survey, 2004

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Table No 4.71:-Interest in visiting other Tourist Destinations of the Orissa State

Sl. No.	Type of tourists	Interest in visiting other destinations of the State					
		Yes		No		Total	
		No.	Per cent	No.	Per cent	No.	Per cent
1	Foreign	13	72.20	5	27.80	18	100.00
2	Domestic	28	34.10	54	65.90	82	100.00
3	Total	41	41.00	59	59.00	100	100.00

Source: Primary tourism survey, 2004

4.3.10. Priority of Other Tourist Regions in the State

The priority of other regions as tourist destinations shall lead to inter-linkage of different regions with the study area. This shall also facilitate in movement of tourists from one region to the other and in the process help growth of tourism each region and over all tourism development in the State. In this regard an attempt has been made to find priority of the different regions other than the study area in the State and the results are presented in the Table Nos. 4.72 (a) and 4.72 (b), and these tables reveal that more than nine-tenth (92.30 per cent) of the foreign tourists and more than half (53.60 per cent) of the domestic tourist ranked tribal areas as the top ranked tourist regions in the State, which are away from the study area. Western Orissa stands at second with 7.70 per cent of foreign tourists and 32.10 per cent of domestic tourists ranked it first rank; and 61.50 per cent of foreign tourist and 46.40 per cent domestic tourists ranked it second. Central Orissa ranked third as tourist regions of the State. Thus, it is concluded that important locations in the tribal area and Western Orissa shall influence the tourism development of the study area and vice versa.

Table No. 4.72(a): Priority of Other Tourist Regions in the Orissa State.
(Foreign Tourist)

Sl.No.	Destinations	Priority of other destinations							
		Rank 1		Rank 2		Rank3		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	Central Orissa	0	0	4	30.80	9	69.20	13	100.00
2	Tribal Area	12	92.30	1	7.70	0	0	13	100.00
3	Western Orissa	1	7.70	8	61.50	4	30.80	13	100.00
4	Total	13	100.00	13	100.00	13	100.00		

Source: Primary tourism survey, 2004

Table No. 4.72 (b): Priority of Other tourist regions in the Orissa State.
(Domestic Tourist)

Sl.No.	Destinations	Priority of other destinations							
		Rank 1		Rank 2		Rank3		Total	
		No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	Central Orissa	4	14.30	6	21.40	18	64.30	28	100.00
2	Tribal Area	15	53.60	9	32.20	4	14.30	28	100.00
3	Western Orissa	9	32.10	13	46.40	6	21.40	28	100.00
4	Total	28	100.00	28	100.00	28	100.00		

Source: Primary tourism survey, 2004

4.3.11. Infrastructure Facilities for Tourism in the Study Area

Infrastructure functions as a vehicle, which essentially drives tourist inflow to destinations. The availability of certain infrastructure facilities and their quality forms major factors that influence the tourist decision to visit and stay in a destination, and thus form most important components of any area for tourism development. In this regard, an investigation has been made to understand the availability and the tourist's perception of the availability of various infrastructures and facilities. The factors, which are analyzed based on the primary tourist survey are quality of infrastructure services, such as, road condition, accommodation, sanitation, parking, market, creation of

organized market areas, mode of travel preferred by tourists, preference of accommodation, preference of food locations, preference of shopping locations, etc. In this section, each of the above factors has been analyzed and presented below.

4.3.11.1. Quality of infrastructure

Quality of infrastructure functions as a catalyst in tourists mind to visit the destination and stay there for a longer duration. It also becomes a factor for tourist's decision to revisit the destination and recommend other tourists to travel to such places having quality of infrastructure.

An attempt was made by the Investigator to explore the tourists opinion (both foreign and domestic tourists separately) on the quality of infrastructure and facilities available in the study area, analyzed the opinion and the results are presented in Table Nos. 4.73 (a), 4.73 (b), 4.73 (c) and 4.73(d). The tables 4.73 (a) and 4.73 (b) illustrate that half (50.00 per cent) of the foreign tourists and a little above half (51.20 per cent) of domestic tourists opinioned that road condition is satisfactory and others feel that roads condition in the study area is bad. More than half of foreign tourists (55.60 per cent) and domestic tourists (52.40 per cent) visit to the study area, opinioned that accommodation facilities are satisfactory and others feel the condition needs improvement. Similarly, about two-third (61.10 per cent) of the foreign tourists and about three-fourth (72.00 per cent) of the domestic tourists feels sanitation condition is unsatisfactory and needs improvement.

The Table No.4.73 (c) and Table No.4.73 (d) explain that majority of the foreign tourists (83.30per cent) and domestic tourists (79.30 per cent) feel that the parking facilities are unorganized and needs improvement. Similarly, two-third of the foreign tourists, and three-fourth of domestic tourist feel that markets for shopping in the tourist destinations in the study area are unorganized. Thus, it is observed that the

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quality of infrastructure and facilities in the study area are not of high-grade to attract tourists and needs considerable improvement.

Table No. 4.73 (a): Quality of Infrastructure (Opinion of Foreign Tourist)

Sl.No.	Infrastructure	Quality of Infrastructure					
		Satisfactory		Bad/ Needs improvement		Total	
		No	Percent	No	Percent	No	Percent
1	Road condition	9	50.00	9	50.00	18	100.00
2	Accommodation	10	55.60	8	44.40	18	100.00
3	Sanitation	7	38.90	11	61.10	18	100.00

Source: Primary tourism survey, 2004

Table No. 17 (b): Quality of Infrastructure (Opinion of Domestic Tourist)

Sl.No.	Infrastructure	Quality of Infrastructure					
		Satisfactory		Bad/Needs improvement		Total	
		No	Percent	No	Percent	No	Percent
1	Road condition	42	51.20	40	48.80	82	100.00
2	Accommodation	43	52.40	39	47.60	82	100.00
3	Sanitation	23	28.00	59	72.00	82	100.00

Source: Primary tourism survey, 2004

Table No. 4.73 (c): Availability of Services (Opinion of Foreign Tourist)

Sl.No.	Service	Availability of Services							
		organized		Needs improvement		Un-organized		Total	
		No	Percent	No	Percent	No	Percent	No	Percent
1	Parking	3	16.70	0	0	15	83.30	18	100.00
2	Market	6	33.30	0	0	12	66.70	18	100.00

Source: Primary tourism survey, 2004

Table No. 4.73 (d): Availability of Services (Domestic Tourist)

Sl.No.	Service	Availability of Services							
		Organized		Needs improvement		Un-organized		Total	
		No	Percent	No	Percent	No	Percent	No	Percent
1	Parking	17	20.70	0	0	65	79.30	82	100.00
2	Market	20	24.40	0	0	62	75.60	82	100.00

Source: Primary tourism survey, 2004

4.3.11.2. Modes of travel

Modes of travel in a system provides an indication of development of level of transportation infrastructure. In this investigation, an attempt was made to find the various modes of travel adopted by the tourists in both categories at three different levels such as, at national level, regional level and local level are analyzed and the results are presented in Table Nos. 4.74 (a), 4.74 (b) and 4.74 (c).

Table No. 4.74 (a): Mode of Travel at National Level

Sl. No.	Mode of Travel	Foreign Tourist		Domestic Tourist		Total	
		No	Per cent	No	Per cent	No	Per cent
1	Air	14	77.80	4	4.90	18	18.00
2	Rail	4	22.20	63	76.80	67	67.00
3	Road	0	0	15	18.30	15	15.00
4	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

Table No. 4.74 (b): Mode of Travel at Regional Level

Sl. No.	Mode of Travel	Domestic Tourist		Foreign Tourist		Total	
		No	Per cent	No	Per cent	No	Per cent
1	Air	0	0	0	0	0	0.00
2	Rail	4	22.20	9	11.00	13	13.00
3	Road	14	77.80	73	89.00	87	87.00
4	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

Table No. 4.74 (c): Mode of Travel at Local Level

Sl. No.	Mode of Travel	Foreign Tourist		Domestic Tourist		Total	
		No	Per cent	No	Per cent	No	Per cent
1	Tourist Bus	0	0	6	7.30	6	6.00
2	Other Bus	1	5.50	15	18.30	16	16.00
3	Taxi/ Own Vehicle	11	61.20	21	25.60	32	32.00
4	Auto Rickshaw	4	22.20	29	35.400	33	33.00
5	Other slow moving Vehicle	2	11.10	11	13.00	13	13.00
6	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

It is observed from the Table No.4.74 (a) that about three-fourth (77.80 per cent) of foreign tourist prefer air travel mode compared to only 4.90 per cent of domestic tourists using the same mode for national level travel. In contrast to the above, majority of domestic tourists (76.80 per cent) prefer rail transport, followed by about one-fifth (18.30 per cent) travel by road for national level transportation. It is also observed that only few foreign tourists (22.20 per cent) prefer rail and no foreign tourists prefer road transportation for national level travel.

The Table No. 4.74 (b) explains the modes of preference at regional level. It is observed that majority of all categories of tourists (77.80 per cent of domestic and 89.00 per cent of foreign tourists) use road as the travel mode and about one-fourth (22.20 per cent) of domestic tourists and just above one-tenth (11.00 per cent) foreign tourists travel by rail transport. It is also important to note that no tourists in both categories use air transportation mode at regional level.

At the local level, it is found that hired taxis (61.10 per cent), auto rickshaws (22.20per cent) are the important modes of travel for foreign tourists. A few foreign tourists also prefer slow moving vehicles and buses for local travel. On the other hand, though auto rickshaws (35.40 per cent) and taxi/ own vehicles (25.60 per cent) are the

important modes of travel for domestic tourists, buses (both tourist and normal buses) and slow moving vehicles have significance presence. It is also noted that tourist buses do not have significant presence, as very few tourists prefer this mode.

It is concluded that at national level air travel is the important mode for foreign tourists and railways is the most important means of traveling for domestic tourists. At the regional level, road is the most important modes, followed by railways for both kind of tourists and air travel has no presence. At local level, hired taxis, own light motor vehicles, auto rickshaws and slow moving vehicle such as, hand driven rickshaws are prime modes, where as organized tourist buses and other buses do not contribute much for local traveling.

4.3.11.3. Accommodation preference

Quality accommodation at affordable cost apart from availability and adequacy is an important requirement for attracting tourists to visit and stay at destination. Therefore, an attempt was made to explore the accommodation preferences of tourists in the study area. In this regard, an analysis is done on preference of overnight stay at destinations and types of accommodation preferred in the study area and the results are presented in Table No. 4.75 (a) and 4.75 (b)

Table No. 4.75 (a): Preference of Overnight stay at Destinations

Sl.No.	Preference	Foreign Tourist		Domestic Tourist		Total	
		No	Per cent	No	Per cent	No	Per cent
1	Prefers to stay at Destinations	15	83.30	52	63.40	67	67.00
2	Do not Prefers to stay at Destinations	3	16.70	30	36.60	33	33.00
3	Total	18	100.00	82	82.00	100	100.00

Source: Primary tourism survey, 2004

Table No. 4.75 (b): Accommodation Preference

Sl.No.	Type of Accommodation	Foreign Tourist		Domestic Tourist		Total	
		No	Per cent	No	Per cent	No	Per cent
1	Hotels in major urban areas	4	22.20	22	26.80	26	26.00
2	Hotels at Destinations	6	33.30	16	19.50	22	22.00
3	Panthanivas at destinations	6	33.30	23	28.00	29	29.00
4	Dharmsalas or Ashrams	1	5.60	11	13.40	11	11.00
5	Special Guest houses	0	0	3	3.70	3	3.00
6	Others	1	5.60	7	8.60	8	8.00
7	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

It is observed from the Table No. 4.75 (a) that more than four-fifth (83.30 per cent) of foreign tourists and about two-third (63.40 per cent) of domestic tourists prefers overnight stay at destinations. This reveals that 16.70 per cent of foreign tourists and 36.60 per cent of domestic tourists do not prefer overnight stay in the destinations, which is quite considerable amount.

The Table No. 4.75 (b) manifests that the preferences of tourists for various types of accommodation for staying in the study area. It is analyzed based on the availability of different types of accommodation facilities available in the study area such as, hotels in major urban areas, hotels at destinations, Panthanivas (guest houses built and managed by tourism department, Orissa state) at destinations, dharmasalas/ashrams(charitable guest houses), special guest houses and other accommodation facilities which includes, relatives, friends houses, etc. It is observed that about one-third of foreign tourists prefer hotels at destinations and another one third prefer panthanivas at destinations, where as about 22.20 per cent prefer to stay in

hotels at major urban areas. This means majority of foreign tourists prefer to stay in organized accommodation places in destinations.

In the domestic tourist category, it is found that more than one-fourth (28.00 per cent) prefer to stay in panthanivases at destinations, followed by more than another one fourth (26.80 per cent) in hotels at major urban centers, about one-fifth (19.50 per cent) in hotels at destinations, more than one-tenth (13.40 per cent) in dharmasalas/ ashrams and only a few (3.70 per cent) prefer to stay in special guest houses. It is also observed that the rest (8.60 per cent) of domestic tourists prefer to stay in other accommodation facilities, such as, houses of relatives and friends.

Therefore, it is concluded that while majority of foreign tourists prefer to stay in organized accommodation facilities, such as, hotels and panthanivases at destinations, it does not follow a particular preferenence for domestic tourists though again majority prefer to stay at destinations.

4.3.11.4. Preference of food location

Food is an essential element of the travel plan of any tourists. Tourists' perception of food is that it should be of their taste, different and varied, hygienic and affordable. These factors mostly decide the preference of food locations for tourists and in turn influence in providing employment and business in destinations. Having these knowledge in mind, an attempt was made to investigate the preference of locations of tourists visiting the study area for their food and the results are presented in Table No. 4.76, and the table results two-fifth (60.00 per cent) of the foreign tourists and more than one third (36.50) per cent of domestic tourists prefer major urban centers as food locations unless they stay in destinations. Similarly, about one-fourth (22.20 per cent) of the foreign tourists and about one-third (29.30 per cent) of the domestic tourists prefer tourist destinations as their food locations. The wayside restaurants have a

significant presence as 16.70 per cent of foreign tourists and 13.40 per cent of domestic tourists preferring food from those locations. It is, thus, concluded that the major urban centers are still the preferred locations for food as they housed better restaurants and hotels followed by destinations. It is apparent from the opinion of the tourists that it is because of availability of substandard quality of food at affordable costs at destinations. A sizable number of both foreign and domestic tourists also choose the wayside restaurants.

Table No. 4.76: Preference of Food locations

Sl. No.	Locations	Preference of food locations					
		Foreign Tourist		Domestic tourist		Total	
		No	Percent	No	Percent	No	Percent
1	At Destinations	4	22.20	24	29.30	28	28.00
2	Major urban centers	11	61.10	30	36.50	41	41.00
3	Special Guest Houses	0	0	3	3.70	3	3.00
4	Way side Restaurants	3	16.70	11	13.40	14	14.00
5	Others	0	0	14	17.10	14	14.00
6	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

4.3.11.5. Preference of shopping locations

Shopping is one of the important functions of the tourists during their travel. This creates employment opportunities for the locals as well as increases tourist expenditure thereby helping income earning opportunities at the local level. In this regard, an investigation has been made to explore the tourists preference of organized markets and various shopping locations available in the study area. The results of analysis of preference of shopping locations and opinion of creation of organized market at destinations are presented in Table Nos. 4.77 (a) and 4.77 (b) respectively.

Table No. 4.77 (a): Preference of Shopping Locations

| Sl. No. | Locations | Preference of shopping locations | | | | | |
| | | Foreign Tourist | | Domestic Tourist | | Total | |
		No	Percent	No	Percent	No	Percent
1	Tourist Destinations	9	50.00	32	39.00	41	41.00
2	Major urban centers/cities	3	16.70	27	32.90	30	30.00
3	Centre of production	6	33.30	23	28.10	29	29.00
4	Others	0	0	0	0	0	0
5	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

Table No. 4.77 (b): Tourist Opinion on creation of Organized Market at destinations

| Sl .No. | Opinion | Tourist Opinion on Organized Market at destinations | | | | | |
| | | Foreign | | Domestic | | Total | |
		No	Per cent	No	Per cent	No	Per cent
1	Yes	8	44.40	48	58.50	56	56.00
2	No	6	33.30	9	11.00	15	15.00
3	Does not matter	4	22.20	25	30.50	29	29.00
4	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

It is observed from Table No. 4.77 (a), that half (50.00 per cent) of the foreign tourists and about two-fifth (39.00 per cent) of the domestic tourists preferred tourist destinations as shopping locations. The centers of productions are the second preferred locations for foreign tourists as against major urban centers in contrast to the preference of domestic tourists. Major urban centers are second preferred locations for domestic tourists followed by centers of production.

Table No. 4.77 (b) explains that about half (44.40 per cent) of foreign tourists and more than half (58.50 per cent) of the domestic tourists opine in the favour of creation of organized markets at destinations for their shopping. The rest of the tourists

either do not have any opinion or feel that there is no need of organized markets for the said purpose. Therefore, it is concluded that organized shopping locations at destinations are the most preferred places of shopping by both categories of tourists in the study area.

4.3.12. Preference of Tourist Related Products and Handicrafts

Every destination has its specialty and offers its unique products to the tourists, which becomes additional attractive features of the destination. The study area is not an exceptional one in this regard. The study area offers various kinds of tourist related products to the tourist. So an attempt has been made to explore the preference of tourists for various tourist related products and presented in Table Nos. 4.78 (a), 4.78 (b) and 4.78 (c).

Table No 4.78 (a): Preference of tourist related products

| Sl. No | Products | Preference of tourist related products | | | | | |
| | | Foreign | | Domestic | | Total | |
		No	Per cent	No	Per cent	No	Per cent
1	Handicraft	17	94.40	73	89.00	90	90.00
2	Other than Handicrafts	1	5.60	9	11.00	10	10.00
3	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

It is observed from Table No. 4.78 (a) that most of the foreign tourists (94.40 per cent) and domestic tourists (89.00 per cent) prefer handicrafts related products as against other products available in the study area.

The Table No. 4.78 (b) reveals that of the various handicraft products available, appliqué works ranked first as preferred products, followed by filigree works, stone works and bell metal works in order of priority for foreign tourists. Similarly, the table-c reveals that the domestic tourists follow the same trend with handloom products being additional preferences, which get higher priority in shopping. The Forest based agriculture and horticulture based, and Development of Women and Children in Rural Areas (DWCRA) products are lower ranked products for both kinds of tourists.

It is concluded that handicrafts are the major products preferred by all types of tourists and among the handicrafts, unique products of aqpplique works, filigree works, stone works, bell metal and handloom are the major products preferred by most of the tourists.

Table No 4.78 (b): Preference of Handicraft related products (Foreign Tourists)

SL. No.	Handicraft Products	Rank 1		Rank2		Rank 3		Lesser Ranks		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Applique works	10	55.60	2	11.10	1	5.60	2	11.10	15	83.30
2	Filigree works	3	16.70	9	50.00	3	16.70	0	0	15	83.30
3	Stone works	2	11.10	4	22.20	6	33.30	2	11.10	14	77.80
4	Bell Metal	2	11.10	2	11.10	5	27.80	4	22.20	13	72.20
5	Handloom	1	5.60	1	5.60	2	11.10	7	38.90	11	61.10
6	Agriculture/ Horticulture based	0	0	0	0	0	0	0	0	0	0
7	DWCRA	0	0	0	0	1	5.60	0	0	1	5.60
8	Forest	0	0	0	0	0	0	3	16.70	3	16.70
9	Total	18	100.00	18	100.00	18	100.00	18	100.00		

Source: Primary tourism survey, 2004

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Table No. 4.78 (c): Preference of Handicraft related products (Domestic Tourists)

SL. No.	Handicraft Products	Preference of Handicraft products									
		Rank 1		Rank2		Rank 3		Lesser Ranks		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Applique works	31	37.80	11	13.30	16	19.50	7	8.50	65	79.20
2	Filigree works	12	14.60	27	32.90	14	17.20	6	7.30	59	71.90
3	Stone works	7	8.50	10	12.20	13	15.90	9	10.10	39	47.60
4	Bell Metal	7	8.50	14	17.20	18	21.90	13	15.90	52	63.40
5	Handloom	14	17.20	15	18.20	6	7.30	11	13.40	46	56.10
6	Agriculture/ Horticulture based	3	3.70	6	7.30	3	3.60	8	9.70	20	24.40
7	DWCRA	6	7.30	4	4.90	7	8.50	16	19.50	33	40.20

Source: Primary tourism survey, 2004

4.2.13. Condition of Tourism Elements in the Study Area

Tourism elements are the prime motivators for attracting tourists to any destination. If the elements are attractive and in proper condition, then they can attract tourists in large number to visit the destinations. On the contrary, if they are not properly maintained or loose their attraction then it may be a factor for dissuade tourist flow. The knowledge of conditions of tourism elements also help in preparing strategies and laying priority for maintenance and conservation of such elements. Having this knowledge in mind, the Investigator attempts to explore the opinion of tourists regarding various tourism elements, such as, architectural and heritage structures, wildlife and coastal beaches. The results are presented in Table Nos. 4.79 (a), 4.79 (b), and 4.79 (c).

4.2.13.1. Condition of architectural and heritage structure:

Table No. 4.79 (a): Condition of heritage structures

Sl.No.	Condition of heritage structures						
	Condition	Foreign		Domestic		Total	
		Per cent	No	Per cent	Per cent	No	Per cent
1	Satisfactory	8	44.40	30	36.60	38	38.00
2	Needs conservation	9	50.00	44	53.70	53	53.00
3	Needs landscaping	1	5.60	6	7.30	7	7.00
4	Needs better management	0	0	2	2.40	2	2.00
5	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

Table No. 4.79(a) reveals the condition of heritage structures. It has been observed that about half (44.40 per cent) of the foreign tourists, and more than one-third (36.60 per cent) of domestic tourists are satisfied about the conditions of the heritage structures. Half (50.00 per cent) of the foreign tourists and more than half (53.70 per cent) of the domestic tourists opinioned that the architectural and heritage structures need conservation. Only a few tourists observed that the structure need better

management and landscaping. This concludes that the condition of heritage structures need proper maintenance and conservation for higher longevity and retaining their attraction.

4.2.13.2. Condition of wildlife

Table No. 4.79 (b): Condition of wildlife

Sl .No.	Condition	Foreign		Domestic		Total	
		No	Per cent	Per cent	No	Per cent	Per cent
1	Satisfactory	7	38.90	36	43.90	43	43.00
2	Needs Improvement	10	55.5	41	50.00	51	51.00
3	Needs better management	1	5.60	5	6.10	6	6.00
4	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

It is reveled from the Table No. 4.79 (b) that more than half of the foreign (55.50 per cent) and half of the domestic tourists (50.00 per cent) feel that the condition of wildlife need improvement and needs better management, but the others feel that the condition of wildlife is satisfactory. Thus, it can be concluded that even though the condition of wildlife is not that bad it still needs further improvement and better management.

4.2.13.3. Condition of coastal beaches

Table No. 4.79 (c): Condition of Coastal beaches

Sl.No.	Condition	Condition		Foreign		Domestic	
		No	Per cent	No	Per cent	No	Per cent
1	Satisfactory	3	16.70	13	15.90	16	16.00
2	Creation of amenities	4	22.20	25	30.50	29	29.00
3	Needs more hygienic atmosphere	5	27.80	22	26.80	27	27.00
4	Better management	6	33.30	22	26.80	28	28.00

Source: Primary tourism survey, 2004

It is understood from the analysis of this investigation that meager amount of people (16.70 per cent of the foreign tourists and 15.90 per cent of the domestic tourists) feel the condition of coastal beeches are satisfactory. About one-fourth (22.20 per cent) of the foreign tourists and about one-third (30.50 per cent) of the domestic tourists observe that there is a need for creation of amenities in the beaches and more than one-fourth of tourists in each category feels the coastal beaches need to have better hygienic conditions. About one third of foreign tourist and one fourth of domestic tourists observe that the coastal beaches need to be better managed. Thus, it is concluded that the condition of coastal beaches is not satisfactory and needs better management in addition to creation of amenities and better hygienic conditions.

4.2.14. Tourism Related Problems in the Study Area

An attempt was made to explore the tourists' perception of various tourism related problems in the study area. The problems were categorized into three categories, such as, general problems including infrastructural and social problems, ecological and environmental problems.

4.2.14.1. General problems

In general, tourist related problems include traveling facility, accommodation facility, shopping facility, parking, congestion/ traffic problem, communication facility, knowledgeable guides, unhygienic conditions, unsuitable sanitation, drinking water, pollution, temporary resting facilities, crime, etc., are common in Indian tourists destinations. An analysis is made to understand the problems based on tourists point of view and the result is presented in Table Nos. 4.80 (a), and 4.80 (b).

As per the foreign tourists, regional traveling facilities, temporary resting facilities, are the major problems in the study area. A lack of knowledgeable guides, local traveling and unsuitable sanitation, unhygienic conditions and parking are the

second ranked problems in the destinations of the study area. Drinking water, shopping facility and pollution are the next ranked problems. Accommodation, communication facility, congestion/ traffic problems and crime are the least regarded problems for foreign tourists. Similarly, regional traveling facility, temporary resting facility, and shopping facility are top ranked problems for domestic tourists followed by local traveling, accommodation knowledgeable guides, parking and drinking water. Other problems, such as, communication, unsuitable sanitation, congestion, crime are the lesser problems for domestic tourists. Thus, it is concluded that temporary resting facilities, regional and local traveling facilities, shopping facilities, knowledgeable guides are the areas of concern to be considered on priority basis.

Table No. 4.80 (a): Major Problems in the study area (Foreign Tourists)

Sl No.	Problems	Major problems							
		Rank1		Rank2		Rank3		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Regional traveling facility	6	33.30	0	0	0	0	6	33.30
2	Local traveling facility	1	5.60	4	22.20	0	0	5	27.80
3	Accommodation facility	0	0	0	0	1	5.60	1	5.60
4	Shopping facility	0	0	1	5.60	2	11.10	3	16.70
5	Knowledgeable guides	3	16.70	1	5.60	3	16.70	7	38.90
6	Unhygienic condition	1	5.60	2	11.10	2	11.10	5	27.80
7	Unsuitable sanitation	0	0	4	22.20	1	5.60	5	27.80
8	Pollution	0	0	0	0	2	11.10	2	11.100
9	Temporary resting facility at destinations	7	38.90	1	5.60	3	16.70	11	61.10
10	Drinking Water	0	0	3	16.70	0	0	3	16.70
11	Parking	0	0	2	11.10	3	16.70	5	27.80
12	Communication Facility	0	0	0	0	0	0	0	0
13	Congestion/traffic facility	0	0	0	0	0	0	0	0
14	Crime	0	0	0	0	1	5.60	1	5.60
15	Any other	0	0	0	0	0	0	0	0
16	Total	18	100.00	18	100.00	18	100.00		

Source: Primary tourism survey, 2004

Table No. 4.80(b): Major Problems in the study area (Domestic Tourists)

Sl No.	Problems	Major problems							
		Rank1		Rank2		Rank3		Total	
		No	Per cent	No	Per cent	No	Per cent	No	Per cent
1	Regional traveling facility	24	29.30	11	13.40	5	6.10	40	48.80
2	Local traveling facility	8	9.80	27	32.90	11	13.40	46	56.10
3	Accommodation facility	4	4.90	7	8.50	14	17.10	25	30.50
4	Shopping facility	15	18.20	6	7.30	8	9.70	29	35.40
5	Knowledgeable guides	7	8.50	4	4.90	7	8.50	18	21.90
6	Unhygienic condition	0	0	2	2.40	1	1.20	3	3.60
7	Unsuitable sanitation	1	1.20	2	2.40	4	4.90	7	8.50
8	Pollution	0	0	0	0	0	0	0	0
9	Temporary resting facility at destinations	18	21.90	10	12.20	14	17.10	42	51.20
10	Drinking Water	0	0	6	7.30	4	4.90	10	12.20
11	Parking	5	6.10	7	8.50	8	9.70	20	24.40
12	Communication Facility	0	0	0	0	1	1.20	1	1.20
13	Congestion/traffic facility	0	0	0	0	4	4.90	4	4.90
14	Crime	0	0	0	0	1	1.20	1	1.20
15	Any other	0	0	0	0	0	0	0	0
16	Total	82	100.00	82	100.00	82	100.00		

Source: Primary tourism survey, 2004

4.2.14.2. Ecological problems

The pressure of population and developmental activities in any system disturb the ecological balance of the system. This in turn causes various irregularities affecting the total ecosystem, which play major roles in changing the climatic conditions, occurrences of natural disasters and upsetting the symbiotic relationship between nature and human beings. The Investigator has made an attempt in order to understand the various ecological problems, which threatens the study area. The various ecological problems considered in the investigation as per the perception of tourists are deforestation, degradation of vegetation, loss of flora and fauna, lack of care for

wildlife, inhospitable condition for migratory birds and human intervention in silent zones. The results pertain to the analysis of this investigation is presented in Table No. 4.81 (a) and 4.81 (b).

It is observed from Table No. 4.81 (a) that according to foreign tourists, deforestation is the top ranked (61.10 per cent ranked it first) ecological problem, followed by degradation of vegetation, loss of flora fauna. However, lack of care of wildlife, inhospitable conditions for migratory birds are low ranked problems in the study area. There is hardly any problem of human intervention in silent zones. Similarly, half of the domestic tourist (50.00 per cent) feels that deforestation is the top ranked problem, followed by lack of care for wildlife, loss of flora and fauna, degradation of vegetation are the next order problems. The domestic tourists also feel that inhospitable conditions for migratory birds and human intervention in silent zones are lesser problems in the study area. Therefore, it is concluded that deforestation is the most important ecological problem needs to be addressed on priority basis.

Table No 4.81(a): Major Ecological Problems (Foreign Tourists)

SL. No.	Ecological problems	Ecological problems									
		Rank 1		Rank2		Rank 3		Lesser Ranks		Total	
		No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent	No	Per Cent
1	Deforestation	11	61.10	0	0	4	22.20	0	0	15	83.30
2	Degrading of vegetation	0	0	8	44.40	2	11.10	5	27.80	15	83.30
3	Loss of flora and fauna	0	0	5	27.80	8	44.50	3	16.70	16	88.90
4	Lack of care of wildlife	3	16.70	0	0	3	16.70	7	38.80	13	72.20
5	hospitable condition for migratory birds	3	16.70	2	11.10	0	0	3	16.70	8	44.40
6	Human intervention in silent zones	1	5.50	3	16.70	1	5.60	0	0	5	27.80
7	Total	18	100.00	18	100.00	18	10.00	18	100.00		

Source: Primary tourism survey, 2004

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Table No. 4.81(b): Major Ecological Problems (Domestic Tourists)

Sl. No.	Ecological problems	Ecological problems									
		Rank 1		Rank2		Rank 3		Lesser Ranks		Total	
		No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
1	Deforestation	41	50.00	5	6.10	11	13.40	14	17.10	71	86.60
2	Degrading of vegetation	12	14.60	35	42.70	6	7.30	6	7.30	59	71.90
3	Loss of flora and fauna	7	8.50	15	18.30	37	45.10	9	11.00	68	82.90
4	Lack of care of wildlife	5	6.10	6	7.30	25	30.50	40	48.70	76	92.70
5	hospitable condition for migratory birds	14	17.10	9	11.00	0	0	8	9.70	31	37.80
6	Human intervention in silent zones	8	9.70	12	14.60	3	3.70	5	6.10	28	34.10
7	Total	82	100.00	82	100.00	82	100.00	82	100.00		

Source: Primary tourism survey, 2004

4.2.14.3. Environmental problems

Environmental problems mostly occur due to injudicious human intervention with the nature without giving proper attention for prevention of the same. A clean and pollution free environment is highly essential for a quality life in any system and provides an impetus for tourists to visit the places having clean environment. On the other hand, environmental problems affect the system adversely in the form of providing filthy atmosphere, degrading the aesthetics of the system, and thereby dissuading tourists to visit to such locations. Therefore, the Investigator has made an attempt to understand the level of environmental problems in the study area and the various environmental problems considered in this investigation are domestic waste disposal, industrial waste disposal, aquaculture waste disposal, sewage disposal, tourist and travel waste disposal, accumulation of dirt and environmental pollution. The results of this investigation except environmental pollution are presented in Table No. 4.82 (a), and 4.82 (b).

It is observed from the Table No. 4.82 (a) that according to foreign tourists, sewage disposal is the most important environmental problem as 38.80 per cent ranked it first and 100.00 per cent feel it is a major problem followed by industrial waste disposal (33.33 per cent ranked it first and of the total 88.90 per cent opinioned that it as a major problem). The tourist and travel waste disposal is the next order environmental problem. Accumulation of dirt, domestic waste disposal and aquaculture waste disposal are lesser problems in the study area. According to domestic tourists, as revealed from Table No. 4.82 (b) industrial waste disposal is the top ranked problem (53.60 per cent ranked it first, and of the total 71.90 per cent opinioned that it a major problem), followed by sewage disposal (11.00 per cent ranked it first and 74.40 per cent feel it as a major problem). It is also observed by the domestic tourists that tourists

and travel waste disposal and aquaculture waste disposal are the next order problems. Domestic waste disposal and accumulation of dirt are not the major problems in the study area.

It is, therefore, concluded that sewage disposal and industrial waste disposal are the major concerns, which may hamper tourism development and also adequate care to be taken for tourist and travel waste disposal and aquaculture waste disposal.

4.2.14.3(a). Environmental pollution

Environmental pollution is one of most important environmental problems that has engulfed many parts of world in recent times having far reaching consequences, such as, changes in the climate, creating unhealthy atmosphere, causing diseases, etc. At the micro level, pollution affects the system in the form of changes in the behaviour of seasons, rise in temperature, degrading the quality of air and water for use. An environmentally polluted system dissuades the tourists to visit the place as tourists always look for a cleaner and conducive environment for better quality of experience. Therefore, an attempt has been made to find out the level of environmental pollution, such as, air pollution, water pollution and noise pollution as observed by the tourists in he study area and results are presented in Table No. 4.83 (a) and 4.83 (b).

It is observed that more than four-fifth (82.30 per cent of the foreign tourists) and more than nine-tenth (91.50 per cent) of the domestic feels that air quality in the study area varies from very clean to average. Similarly, about two-third (61.10 per cent) of the foreign tourists and more than four-fifth (82.90 per cent) of the domestic tourists feels water quality is more than average to clean. In case of noise, almost all respondents of both foreign and domestic tourists feel that noise pollution level is very low in the study area. It is, therefore, concluded that the study area and the tourist destinations are mostly pollution free and attention may be given to maintain the same.

Table No. 4.82 (a) Major Environmental Problems (Foreign Tourists)

SL. No.	Environmental problems	Environmental problems									
		Rank 1		Rank2		Rank 3		Lesser Ranks		Total	
		No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
1	Domestic waste disposal	0	0	1	5.60	2	11.10	4	22.20	7	38.80
2	Industrial waste disposal	6	33.30	1	5.60	8	44.50	2	11.10	16	88.90
3	Aquaculture waste disposal	0	00	2	11.10	2	11.10	3	16.70	7	38.80
4	Sewage disposal	7	38.80	7	38.80	2	11.10	2	11.10	18	100.00
5	Tourist and travel waste disposal	4	22.20	6	33.30	4	22.20	4	22.20	18	100.00
6	Accumulation of dirt	1	5.60	1	5.60	0	0	3	16.70	5	27.80
7	Total	18	100.00	18	100.00	18	100.00	18	100.00		

Source: Primary tourism survey, 2004

Table No. 4.82 (b): Major Environmental Problems (Domestic Tourists)

SL. No.	Environmental problems	Environmental problems									
		Rank 1		Rank2		Rank 3		Lesser Ranks		Total	
		No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
1	Domestic waste disposal	6	7.30	3	3.60	4	4.90	11	13.40	24	29.30
2	Industrial waste disposal	44	53.60	5	6.10	4	4.90	6	7.30	59	71.90
3	Aquaculture waste disposal	3	3.60	30	36.60	19	23.20	3	3.60	55	67.10
4	Sewage disposal	9	11.00	20	24.40	28	34.10	4	4.90	61	74.40
5	Tourist and travel waste disposal	10	12.20	5	6.10	8	9.70	32	3.90	55	67.10
6	Accumulation of dirt	4	4.90	3	3.60	6	7.30	8	9.70	21	25.10
7	Total	76	92.70	66	80.40	67	81.70	64	78.00		

Source: Primary tourism survey, 2004

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Table No. 4.83 (a): Environmental Pollution Level (Foreign Tourists)

Sl. No.	Pollution Attributes	Environmental pollution Level											
		Very Clean		Clean		Average		Polluted		Very Polluted		Total	
		No	Percent	No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
1	Air	2	11.10	8	44.40	5	27.80	3	17.70	0	0	18	100.00
2	Water	0	0	2	11.10	9	50.00	5	27.80	2	11.10	18	100.00
3	Noise	4	22.20	7	38.90	5	27.80	2	11.10	0	0	18	100.00

Source: Primary tourism survey, 2004

Table No. 4.83 (b): Environmental Pollution Level (Domestic Tourists)

Sl. No.	Pollution Attributes	Environmental pollution Level											
		Very Clean		Clean		Average		Polluted		Very Polluted		Total	
		No	Percent	No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
1	Air	22	26.80	48	58.60	5	6.10	7	8.50	0	0	82	100.00
2	Water	0	0	32	39.00	36	43.90	10	12.20	4	4.90	82	100.00
3	Noise	14	17.00	57	69.40	5	6.09	5	6.09	0	0	82	100.00

Source: Primary tourism survey, 2004

4.2.15. Means of Acquiring Knowledge about the Study Area

Information and knowledge regarding Orissa state and the study area influence tourism development in the study area in particular, and the State in general. The State and the study area are lesser-known areas of the country from tourism point of view despite having rich potential for attracting the large tourists. Proper information system and knowledge regarding to the study area and the State would go a long way to help tourism development in the study area and in the State as well. It is, therefore, necessary to find the various means by which tourist acquire knowledge about the study area in the State in the present condition and an attempt was made in this regard. The result of this investigation is presented in Table No. 4.84.

Table No. 4.84: Means of acquiring knowledge study area

Sl. No.	Means	Means of acquiring knowledge about the study area					
		Foreign		Domestic		Total	
		No	Percent	No	Percent	No	Percent
1	Other Tourists	5	27.70	25	30.50	30	30.00
2	Fairs and Festivals	2	11.10	14	17.10	16	16.00
3	News Paper	1	5.60	12	14.60	13	13.00
4	Electronic media	8	44.40	26	31.70	34	34.00
5	Literature	1	5.60	5	6.10	6	6.00
6	Other sources	1	5.60	0	0.00	1	1.00
7	Total	18	100.00	82	100.00	100	100.0

Source: Primary tourism survey, 2004

It is observed that above two-fifth (44.40 per cent) of the foreign tourist and one-third (31.70 per cent) of the domestic tourists acquire knowledge about the study area through electronic media. More than one-fourth (27.70 per cent) of the foreign tourists and about one-third (30.50 per cent) of the domestic tourists obtain information from the word of mouth, i.e., from other tourists. It is also observed that more than one-tenth of (11.00 per cent) the foreign tourists, and one-eighth (17.10 per cent) of the

domestic tourists acquire knowledge about the study area from fairs and festivals. Contribution of newspapers is also significant as about one-seventh (14.60 per cent) of domestic tourists acquire knowledge about the study area. However, the contribution of literature and newspaper for foreign tourists and other sources, such as, brouchers, booklets, cultural programmes, exchange of cultural and social contingents, sporting activity, business activity, etc., have lesser contribution towards the above purpose.

Thus, it is concluded that the conventional means of electronic media is the most important means of acquiring knowledge about the study area and also words of mouth plays an important role, which is a positive sign for tourism development in the study area. This provides an opportunity for exploring many unconventional means of information dissemination and tourism promotion activities.

4.2.16. Opinion on Revisiting

A satisfied tourist prefers to revisit the destination given the opportunity. In this investigation, an attempt has been made to find the opinion of tourists in revisiting the study area and the result is presented in Table No. 4.85 and table manifests that more than four fifth (83.30 per cent) of the foreign tourists and domestic tourists (87.80 per cent) prefer revisiting the study area and the rest of the foreign tourists (16.70 per cent) and domestic tourist (12.20 per cent) are against a repeat visit to the study area. Thus, it can be inferred that the study area has more potential for repeat visit of tourists, which is an encouraging sign for tourism development in the study area.

Table No. 4.85: Opinion on Revisiting the Region

Sl. No.	Opinion on Revisiting the State	Opinion on Revisiting the Region					
		Foreign		Domestic		Total	
		No	Percent	No	Percent	No	Percent
1	Yes	15	83.30	72	87.80	87	87.00
2	No	3	16.70	10	12.20	13	13.00
3	Total	18	100.00	82	100.00	100	100.00

Source: Primary tourism survey, 2004

In this present chapter, a detailed analysis was done pertaining to socio-economic condition, industrial and tourism scenario of the system based on the grassroots level data. Analysis of the data provided an insight about this system, its functions, and also paved the way for identifying the most important control parameters, which decide the functions of the system. To understand the functions of the system, System Dynamic theory was employed, and System Dynamic models were developed based on System Dynamic theory, and employed in this investigation and are presented in the subsequent (fifth) chapter.

APPLICATION OF THEORY, AND MODELS

5.0. INTRODUCTION

In this present investigation, the Investigator has conducted thorough investigation at the grassroots level to understand the functions of the system. Larger number of parameters influence highly in deciding the functions of the system are termed as control parameters. In this chapter, the control parameters deciding the functions of the system are identified by correlation and weighted index methods.

Multiple regression models have been attempted based on the available data. Further, Systems theory is employed, and appropriate System Dynamics models are developed. Plausible scenarios are developed and tested in the validated System Dynamics model under various alternative conditions to understand the functions of the system. The Investigator observes that tourism is an integral part of the system, and therefore an attempt has been made to develop an integrated model consisting of various subsystems and their controlling parameters obtained from the analysis to evolve feasible policy recommendations for integrated development of the study area (system).

5.1. CORRELATION COEFFICIENTS METHOD

The Correlation coefficient method is used to analyze the parameters of the various subsystems that highly influence the system. The household data collected for this investigation are utilized for the said purpose and correlation coefficients between the dependent variable and independent variables have been established. Annual

income of the households is considered as the dependent variable and all other parameters are considered as independent variables for analysis.

A close examination of the data points of the household survey revealed that the annual income from various occupations in some households is mutually exclusive, and others have more than one occupation. Therefore, while calculating the correlation the data points are segregated appropriately based on major occupations carried out by the households. Accordingly, all the schedules are segregated according to major occupation, which includes incomes from other occupation as secondary source of income.

The occupations in the system are grouped into four categories, such as, Agriculture. Trade and commerce, Industry and Service. The correlations of annual income in the related occupation with various other independent variables are established and presented below in the subsequent section 5.3. The parameters, which have higher correlation with the dependent variable, are chosen as the controlling parameters for further analysis.

5.2. WEIGHTED INDEX METHOD

Weighted Index method is used to analyze the parameters to find the order of priorities on which they influence the various subsystems of the system. In this method, qualitative parameters and the parameters where it is not possible to find the correlation coefficient are investigated to decide the control parameters. The formula of the weighted index method, which is followed in this investigation, is presented in Appendix-2. While calculating the weighted average, a five point scale was employed from 0 to 1.0 (points with 0, 0.2, 0.4, 0.6, 0.8, 1.0) with equal variation in order of preference or ranking, such as, 0.2 for the lowest preference, 1.0 for the highest preference, and 0 for non applicability of the parameter in the system.

5.3. CONTROL PARAMETERS

The various control parameters of different subsystems of the system are decided based on the above-discussed methods (correlation coefficients or weighted index method) and are presented in the following sections of this chapter.

5.3.1. Economic Parameters

The parameters such as, occupation and employment are considered for analyzing the economic conditions of the system. The different occupations carried out in the system are broadly classified into agriculture (which includes horticulture), trade and commerce, own industrial activity, and service. Correlations have been attempted based on the household date collected. In this correlation, annual income has been taken as dependent variable and occupations, employment, etc., have been considered as the independent variables. While obtaining the correlation, the data points of the major occupation, incase of households having multiple occupation, have been considered for the total 247 households schedules. The correlation coefficients of these occupations and employment with the annual income are presented in Table No. 5.1.

Table No. 5.1: Correlation between Annual Income and Various Economic activities in the study area

Sl No	Dependent variable	Correlation Coefficient economic activities in the s of various system			
		Agriculture and Horticulture	Trade and Commerce	Service	Industry
1	Annual Income	0.93	0.85	0.66	0.43

While establishing correlations, the correlation coefficients in agriculture sector have been calculated by considering agriculture as an occupation alone, agriculture and

horticulture together, and agriculture, horticulture and animal husbandry in combination in order to establish which of them influence the system most, because all the three sub-sectors of the primary sector occupation are operated in the agriculture subsystem together. It is observed that agriculture and horticulture together gives higher correlation than the other two considerations. Hence, agriculture and horticulture is taken together for considering control parameters for agricultural subsystems in the system. Correlations among the annual income and various occupations and employment are attempted and important results are presented in Table No. 5.1. The details of correlation coefficients are presented in Table No 5.1 (a).

The Table-5.1 manifests that among the four broad occupations agriculture and horticulture (r= 0.93) influence the system most, followed by trade and commerce (r = 0.85), service (r=0.66) and own industry (r=0.43). Thus, agriculture is considered as an integral part along with other aspects, such as, trade and commerce, service and own industries, which influence the functions of the system to a larger extent.

Further, the correlation coefficients between annual income under various occupations and their independent variables have been attempted. They are discussed below:

5.3.1.1. Agriculture

Correlations between the annual income of the households having agriculture and horticulture as the major occupation for income earnings and the various independent variables, those influence agriculture and horticulture functions of the households has been attempted. In this regard, after proper segregation of the household schedules, 98 numbers of schedules having agriculture as major occupation have been selected for attempting correlations. The control parameters, which influence agriculture and horticulture in the system are decided based on the higher correlation

coefficients with annual income in which agriculture is the major component. Parameters having correlation coefficient higher than 0.60 are considered as the control parameters. However, personnel employed in agriculture are also considered as a control parameter despite its low correlation coefficient, as agriculture employs a large number of personnel in the system. The important correlation coefficients and control parameters of this analysis are presented in Table No. 5.2. The details of correlation coefficients of different parameters are presented in Table No. 5.2 (a)

Table No. 5.2: Control parameters in Agriculture

Sl No.	Dependent variable	Correlation Coefficients						
		Persons employed in Agriculture and horticulture	Land holding size	Total agricultural input	Input in Fertilizer and Pesticides	Total crop coverage	Total irrigation coverage	Total Crop output (production) including horticulture
1	Annual Income	0.66	0.81	0.84	0.76	0.86	0.82	0.86

It is observed that among a number of parameters, the various household and other expenditures on various aspects have high correlations with annual income, but as they do not influence the agriculture function directly except expenditures as agricultural inputs, they are not considered as control parameters in the agriculture subsystem. The input on fertilizers and pesticides alone gives a relatively lower correlation coefficient than the total agricultural input in which fertilizer and pesticides forms a part, it is considered as a control parameter along with total agricultural input. The production of various crops gives lower correlation than total crop production, so individual crop productions are not taken as control parameters.

Thus, various control parameters in the agricultural subsystem, which influence the system based on correlation, are, land holding size, total Agricultural input, inputs

in fertilizer and pesticides, total cop coverage, total irrigation coverage, total crop output and number of persons employed in agriculture and horticulture.

5.3.1.2. Trade and commerce

Trade and commerce is the second most influential parameter in the system. An attempt was made to find the most influential variables that control this subsystem of the system. In this regard, the households with trade and commerce as the major occupation have been considered. It is observed that 50 numbers of schedules are having trade and commerce as the major occupation and thus they are selected establishing correlation between annual income and other independent variables. The correlation coefficients are presented in Table No. 5.3.

It is observed that, the various expenditures provide high correlations with annual income. It also manifests that this occupation provides a high correlation with the total savings of the households. On the other hand, it establishes very low correlations with employment in this sector, total-earning members, loan repayment in the households. Savings has a very high correlation with annual income from this sector. Thus, savings and various expenditures are considered as control parameters.

Table No. 5.1 (a) Correlation Coefficients (Occupation and Employment)

Sl. No.	Dependent variable	Independent variable									
		Correlation Coefficient									
		Occupation						Employment			
		Agriculture	Agriculture and Horticulture	Agriculture, Horticulture and Animal Husbandry	Trade and Commerce	Service	Own Industry	Agriculture	Trade and Commerce	Service	Own Industry
1	Annual income	0.77	0.93	0.9	0.85	0.66	0.43	0.66	0.23	0.43	0.34

Table No. 5.2 (a): Correlation coefficients (Agriculture)

Sl No.	Dependent Variable	Correlation Coefficients																
		Independent variables																
		Persons employed in Agriculture	Land holding size	Total agricultural input including horticulture	Total crop coverage	Total irrigation coverage	Fertilizer input	Total khariff crop	Total rabi crop	Total summer crop	Total Crop including horticulture crop	Total earning members in the family	Basic expenditure	Expenditure on Energy	Expenditure in recreation	Expenditure on Transportation	Total Expenditure	Total Savings
1	Annual Income	0.66	0.81	0.88	0.86	0.82	0.76	0.86	0.68	0.58	0.86	0.35	0.92	0.92	0.9	0.89	0.94	0.31

Table No. 5.3: Correlation Coefficients (Trade and Commerce)

Sl. No.	Dependent Variable	Independent variables Correlation coefficients								
		Person employed	Total earning members in the family	Basic expenditure	Expenditure on Energy	Expenditure in recreation	Expenditure on Transportation	Total Expenditure	loan repayment	Total Savings
1	Annual Income from trade and commerce	0.23	0.23	0.95	0.88	0.92	0.94	0.92	0.22	0.97
2	Annual Income from Service	0.42	0.25	0.92	0.90	0.91	0.92	0.94	0.24	0.88
3	Annual Income from Industry	0.34	0.18	0.94	0.57	0.80	0.89	0.81	0.36	0.90

5.3.1.3. Service

Service is another important occupation in the system that influences the functions of the system. An attempt has been made to find the control parameters, which influence the system by establishing the correlations between the dependent variable annual income and various independent variables. In this regard, of the total households schedules, in which service is the most dominant occupation, are considered for establishing the relationship. The total numbers of schedules selected for the said purpose are 83. The correlation coefficients are presented in Table No. 5.3.

It is observed that Service activity has high correlations with basic expenditures ($r=0.92$), expenditures on energy ($r=0.90$), expenditure in recreation ($r=0.91$), expenditure on transportation ($r=0.82$), total expenditure ($r=0.94$), and savings (0.88). On the other hand it establishes a very low co-relationship with employment ($r=0.42$) and total earning members in the households ($r=0.24$) and expenditure on loan repayment ($r=0.24$).

Thus, savings along with various expenditures, such as, basic expenditure, expenditures on energy, transportation, and recreation are control parameters, which influence the system.

5.3.1.4. Industry

The control parameters in industrial development in the system are decided by considering two aspects, such as, general industrial scenario of the system and industries owned by sample households. The correlation coefficient of own industry with the annual income in the system reveals it influences on the functions is minimal. However, an attempt has been made to find the control parameters, which influence the system by establishing the correlations between the dependent variable annual income and various independent variables. In this regard, of the total households schedules,

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those in which own industry is the most dominant occupation are considered for establishing the relationship. The total numbers of schedules selected for the said purpose are 16. The correlation coefficients are presented in Table No. 5.3 and the table result reveals that the total savings (r=0.90), expenditures such as, expenditure on basic needs (r=0.94), expenditure on reaction (r=0.80), expenditure on transportation (r=0.81) are the most influential parameters in this sector.

In addition, an attempt was made to establish the parameters, which control the functions of industrial activity in the system. They are established based on the preferences given by the industries by weighted index average method. The results are presented in Table No. 5.4., and the weighted index averages of the industrial parameters reveals that engineering and metal industries, agro and food-based industries are the most important industries. The handicraft industry, which is more related to tourism, is not functioning well in the system. The various control parameters which influences the functions of the industry sub-system are availability of energy (W.I= 0.90), market inside state (W.I=0.90), national market (W.I=0.82), availability of capital (W.I=0.82). However, though the Weighted index averages of traditional skill (W.I=0.60) and use of local raw materials (W.I=0.67) are on the lower side, are the other important parameters which influence the system. Thus, various control parameters, which influence the industrial sub-system, are availability of capital or investment, availability of energy, State and National market, use of local raw materials, and use of traditional skill.

Table No. 5.4: Weighted index average of industrial parameters

SI No.	Annual Income	Industrial activity																	
		Use of traditional skill	Use of local raw materials for industrial use	Engg. and metal industry	Electrical and Electronics	Building materials	Rubber, Plastic and Chemical	Agro and Food based	Service Industry	Handicrafts	Export	local market	National level market	Market Inside the State	Capital	Energy	Market	Labour	Environment	Govt. Policies
1	weighted index	0.6	0.667	0.90	0.64	0.20	0.62	0.80	0.44	0.45	0.66	0.44	0.82	0.9	0.82	0.90	0.65	0.42	0.44	0.48

5.3.2. General Infrastructure

The available infrastructures in the system are classified in to two categories. They are general infrastructure and tourism infrastructure. The general infrastructure includes the physical infrastructures, such as roads, and railways under transportation, electricity, and other sources of energy under power sector, water supply, sanitation, drainage, and waste disposal under public facilities. The weighted index averages of the parameters are calculated based on the priorities attached to the parameters by households and the results are presented in Table No. 5.5.

Table No. 5.5: Weighted Indices of various Infrastructures

SI No.		General Infrastructure								
		Roads	Railways	Both roads and railways	Electricity	Other sources of energy	Water supply	Sanitation	Drainage	Waste disposal
1	Weighted index	0.83	0.69	0.78	0.71	0.57	0.54	0.57	0.57	0.76

It is observed that both roads and railways under transportation, electricity under energy infrastructure and waste disposal facilities are having higher weighted indexes that influence the system. Thus, it has been observed that they are the controlling parameters and need attention on priority basis. Other infrastructures, such as, water supply, sanitation, drainage, other sources of energy are equally important in the system, but they carry lower weightages, which implies that their influence the system is relatively less.

5.3.3. Social and Cultural Parameters

The Investigator has attempted to understand the social and cultural parameters, which influence the system to a larger extent. The social and cultural parameters being mostly qualitative in nature and difficult to quantify, the Investigator has attempted to find the control parameters through discussions with experts, and observations made during the course of investigation. The various social and cultural parameters, which influence the system, are population, population density, migration of population, employment, religion, cultural inclination, educational level, health, welfare to weaker sections, public participation, crime, etc.

5.3.4. Ecological and Environmental Parameters

Ecology and environment are integral parts of any system. The various ecological and environmental parameters, which influence the functions of the system, are various activities, such as, deforestation and degradation of vegetation, loss of flora and fauna, inhospitable condition for migratory birds, and human intervention, various types of pollutions, such as, air pollution, water pollution, noise pollution, land pollution, etc.. An attempt was made to find the most important parameters, which control the functions of the system in larger way. The weighted index method is attempted based on the priorities attached to the parameters in the primary survey to decide the control parameters. The results are presented in Table No. 5.6.

Table No. 5.6: Weighted Indices of various ecological and environmental parameters

Sl. No.	Parameter/ Weighted index	air pollution	water pollution	noise pollution	deforestation and degradation of vegetation	loss of flora and fauna	inhospitable condition for migratory birds	human intervention
1	Weighted Index	0.14	0.50	0.11	0.84	0.65	0.58	0.76

It is observed that the weighted index averages of various pollutions are very low, and therefore, it is decided that their influence in the system is very less. However, deforestation and degradation of vegetation, and human interventions are having higher weighted index averages, thus they are considered as control parameters.

5.3.5. Tourism Related Parameters

The tourism related control parameters established by employing both correlation coefficient and weighted index methods. Based on historical data, correlations have been attempted among tourist arrival, which is considered as dependent variable and investment tourism development, infrastructures such as road lengths, rail route lengths, accommodation facilities as independent variables. Further, various qualitative parameters are divided into three broad categories, such as, tourism activity, tourism infrastructure and tourism policy initiatives to decide the control parameters. The control parameters, which influence tourism in the system, are decided as per the priorities attached by the tourists in primary survey and the resulting weighted index averages. The results of correlation coefficients and weighted averages are presented in Table No. 5.7, and 5.8 respectively.

Table No. 5.7: Correlation Coefficients between tourist arrival and related variables

Sl. No.	Parameter	Correlation Coefficient	Tourist arrival	Road Length	Rail length	Accommodation	Investment in tourism development
I	Tourist arrival	Correlation	1.00	0.92	0.75	0.82	0.70

Table No. 5.8: weighed index averages tourism related parameters

Sl. No.	Parameters	Weighted Index
	Tourism Activity	
1	Recreation	0.83
2	Travel	0.56
3	Pilgrimage	0.72
4	Business/ official	0.52
5	Combination of various activities	0.56
	Infrastructure	
6	Regional Transport	0.76
7	Local Traveling	0.89
8	Accommodation	0.63
9	Temporary Resting facility	0.92
10	Parking	0.40
11	Shopping facilities	0.52
12	Sanitation	0.23
13	Water supply	0.36
14	waste disposal	0.63
	Policy initiatives	
15	Investment	0.83
16	attention to heritage structures	0.80
17	Attention to wildlife	0.72
18	Attention to coastal beaches	0.72
19	Crime	0.23

The correlation coefficient among tourist arrival and various parameters, such as, road lengths ($r=0.92$), rail route lengths ($r=0.75$), accommodation ($r=0.82$) and investment in tourism development ($r= 0.70$), are quite significant, thus influence the tourism development considerably, thereby considered as control parameters.

Further, the Table No. 5.8 manifests that recreation and pilgrimage are the two most important tourism activities, which control tourism in the system. Temporary resting facilities, local traveling facilities, regional traveling facilities are the most influential parameters under tourism infrastructure in the system. Similarly, under policy initiatives, investment in tourism is the most important parameter followed by attention to heritage structures, wildlife and coastal beaches.

Thus, it is decided that the control parameters in tourism are road and rail route length, accommodation, investment, recreation and pilgrimage activities, creation of temporary resting facilities, local and regional traveling, and attention to heritage structures, wildlife, and coastal beaches.

5.4. REGRESSION ANALYSIS

Based on the above control parameters, in this present investigation, multiple regression models have been employed to establish a relationship between income and related variables that influence the income in the study area. Multiple regression equations are attempted separately for all the occupations, but it is observed that except agriculture, other occupations do not provide tangible relationships in this investigation, thus a multiple regression equation for agriculture is established. Similarly, a multiple regression model has been attempted to compute the tourist arrival in the study area.

5.4.1. Multiple Regression Equation for Agriculture Income

In this investigation, all the 98 data points having agriculture as one of the income in the primary survey conducted has been considered. Annual income of the households from agriculture is considered as the dependent variable (y) and land holding size, persons employed in agriculture occupation at the household level, total irrigated land,

total agricultural input and total crop coverage have been taken as independent variables. The multiple regression equation employed is presented as below:

$$y = f(x_1, x_2, x_3, \ldots x_n)$$

The multiple regressions obtained by employing the above function is

$y = 560.84x_1 + 30246.11x_2 - 399.05x_3 + 1.21x4 + 4967.86x_5 - 30063.15$

$r^2 = 0.875$

y= Agricultural income

x_1= Land holding size

x_2=person employed in agriculture occupation at the household level

x_3=Total irrigated land

x_4=Total agricultural input

x_5=Total crop coverage

5.4.2. Multiple Regression Equation for Tourist Arrival

Based on the time series data, a multiple regression model is attempted in which, tourist arrival is considered as dependent variable (y_1), and length of roads, rail route lengths, number of hotel beds, and investment in tourism are taken as independent variables. The multiple regression equation employed for tourist arrival is presented as below:

$y1 = f(z_1, z_2, z_3 \ldots z_{n)}$

$y_1 = -170109946z_1 + 90084.83z_2 - 4029275.17z_3 + 17457760.14z_4 + 29.05$

$r^2 = 0.92$

y_1= Tourist arrival in numbers

z_1=Length of roads in Kms

z_2= Rail route length in Kms

z_3= Number of hotel beds

z_4=Investment in tourism in rupees.

The multiple regression models attempted give the relationship between annual household income and most influential variables for agriculture; and between tourist arrival and the most important variables in tourism development in the system. This has helped in deciding the control parameters influencing the system. It is observed that, relationships between tourist arrival and variables like road lengths, rail route lengths, accommodation and investment are established for tourism functions; and annual income of households having agriculture as an occupation and variables pertain to agriculture function for forecasting purposes. However, it is not possible to measure a number indicators (variables) pertaining to tourism functions and total system from these multiple regression models. Therefore, System Dynamics Models have been attempted in this investigation for further analysis to measure the important variables influencing tourism functions in the system and total development of the system.

Table No. 5.9: Controlling Parameters in the system

Control parameters of the system							
Economic activity				Infrastructure	Physical, Environment and Ecology	Social and cultural	Institutional
Agriculture	Industry	Trade and commerce	Service				
Land holding size	Investment	Retail trade	Transportation	Roads	Land use	Population, population density and migration	Organization and management
Agricultural input, Fertilizer input, High yield seeds input	Energy	Consumer products	Accommodation	Railways	Land Conversion	Employment Generation	Policy initiatives
Crop coverage	Local raw material	Handicrafts		Electricity	Deforestation and degradation of vegetation	Religion, cultural inclination,	Control and monitoring
Crop output commercial crops (production) including horticulture and	Traditional skill	Horticulture products	Tourist associated activity	waste disposal	Human intervention	Public participation	
Persons employed in Agriculture and horticulture	National and State level markets			Accommodation Facilities	Environmental stress	educational level, health, welfare to weaker sections	
						Crime	

Table No. 5.10: Control parameters for tourism development

Functions	Control parameters
Infrastructure	Road lengths, Rail Route length, Regional Transportation, Local transportation, Accommodation, Creation of temporary resting facilities.
Tourism activities	Recreation, Pilgrimage
Policy initiatives	Investment exclusively in tourism development, Promotion and Publicity, attention to heritage structures, Attention to wildlife, Attention to coastal beaches.

5.5. APPLICATION OF THEORY

In this present investigation, the Investigator has employed Systems theory based on systems concept, and System Dynamics models. In this present investigation, the study area is considered as a system. The Investigator observes that tourism yet has not treated, as is an integral component of the system for evolving policies, plans, programs, etc., for the development of the system. In fact, whatever initiatives are being taken by the Government or Non-Governmental Organizations in tourism development are sporadic and isolated attempts. Therefore, the Investigator has attempted to establish that tourism is an integral part of the system and function as a catalyst for comprehensive development of the system.

Further, attempts have been made to develop System Dynamics Models based on the survey data and historical data, to understand the influence of the most important controlling parameters of various subsystems while evolving optimal strategies for integrated development of the system.

5.5.1. Systems Concept

A system functions as a whole with the interaction of several subsystems. All the sub-systems of the system are interconnected, and interdependent to each other, and form a system. If one of the sub-systems of the system is defunct or functions with higher degree (taking lead role during its function) or partly function, its effects can be visualized in the entire system over a period of time. In some cases, the system may not function at all, while in some cases the system may function, but with a lot of disturbances or smooth functions of the system may be paralyzed.

5.5.1.1. System characteristics

The various major characteristics of a system as postulated by various Scholars are:

- A system is a complex grouping of human beings and machine.

- A system may be broken down in to sub-systems, the amount of sub-systems detail depending on the problem being studied.

- The outputs from the given sub-system provide the inputs to the other sub-systems. Thus, a given sub-system interacts with the other sub systems and hence cannot be studied in isolation.

- The system being studied will usually form part of a hierarchy of such-systems. The systems at the top are very important and exert considerable influence on the systems lower down.

- To function, a system must have an objective, but this is influenced by the wider system of which it forms a part. Usually, systems have multiple objectives which

are in conflict with one another, so that an overall objective is required which effects a compromise between these conflicting objectives.

- To function at maximum efficiency, a system must be designed in such a way that it is capable of achieving its overall objective in the best possible ways.

Thus, all living systems maintain steady state dynamic equilibria keeping an orderly balance among its sub-systems with respect to its super system and the environment. However, if an element of a system fails to handle a stress, other elements come forward and share this excess stress.

5.5.2. Systems Theory

Various forms of systems theories have been proposed over the years. The important ones among them are General System's theory, Cybernetics, Systems Approach, and System Dynamics approach.

General System theory has its genesis in the original research of Ludwig Von Bertalanffy on study of biological organism (1920s and 1930s) and theory of open systems (22, 23) which was both supported and criticized by many Scholars (2,14,179). The broad objectives of the theory (53) are to investigate the isomorphy of concepts, laws and models in various fields, and to help in useful transfers from one field to another, to encourage the development of adequate theoretical models in areas which lack them, to eliminate the duplication of theoretical efforts in different fields, and to promote the unity of science through improving communication between specialists. However, this theory has not properly emerged due to lack of methods capable of implementing it.

Cybernetics is proclaimed to be a theory of communication and control in animals, society, and machines (14, 17, 18, 270, 271). The elements of the theory are

feedback, self-regulation and control, and information transmission. It uses the concept of entropy in communication theory and uses this as a measure of disorder, uncertainty or variety of systems. This theory has inspired to analyze the problems arise in social systems; however remain largely verbal, and often graphical rather than mathematical.

Systems Theory is an out growth of the concepts of General Systems Theory and cybernetics. It is more of a practical philosophy of solving problems in societal systems. It suggests a holistic approach in defining the problem, defining the objectives of the system, designing the change, and evaluating the design and known as design methodology (95). The characteristics of this theory are:

1. The problem of a system is defined in relation to super-ordinate systems to which it is related by a community of objectives.

2. The objectives of the system must be viewed in relation to these super-ordinate systems or the whole system.

3. Present design must be evaluated in terms of opportunity costs or the extent of divergence of the system from the optimum design.

4. The optimum design cannot usually be found incrementally nearby present adopted forms. It involves planning, evaluation, and implementation of new alternatives, which offer innovative and creative departures from the whole system.

5. System design involves processes of thinking, such as, induction and synthesis, which differ from deductive and reductive methods used in the scientific method of system improvement.

6. Planning is conceived as a process where Planner assumes the role of a leader rather than that of a follower, so that problems are prevented from occurring rather than solved when they occur.

7. It is universally accepted that it is one of the most potent way of undertaking a systematic inquiry. However, it does not recommend any specific methodology, which guides the actual employment of approach.

The System Dynamics approach amalgamates ideas developed in various System Theories and is a result of cross-fertilization of ideas from traditional management, cybernetics, and computer simulation. It is a theory of structure and behaviour system (88). It presents a very easy to use, intitutively appealing and yet use mathematically sophisticated methodologies while undertaking practical systems enquiry. Moreover, System Dynamics has its genesis to Industrial Dynamics, where it is said to be the study of information and feedback characterization of industrial enterprises to show the interaction of structure, amplification and time delay to influence successes of an enterprise (89), and is adopted for investigating dynamic behaviour of feedback systems (89, 101). It is applicable to other complex social systems other than industrial systems with problems of controllability (63), such as, urban systems (51, 53, 86, 87, 93, 113, 139, 148, 149, 150, 151, 177, 227), world systems (86, 87), tourism systems (132, 183, 197), which deal with socio-economic systems and management.

The theory has its inherent weaknesses and criticized for the limitations such as, Scarce data was used to build models, models were highly aggregated, absence of quantitative validity, practice of trial and error during policy design, methods of judging parameters sensitivity of models etc. However, after a number of improvements, over the

years System Dynamics has emerged as one of the most powerful methodologies of social systems analysis and design at aggregate level for its ability to address itself to very important long term and short term issues of real system, its ability and simplicity to model complex, non linear relationships, its ability to model soft social and psychological variables, the ease with which the effects of alternative policy options can be tested, and the ease in communicating the model, the results and recommendations (183).

5.5.3. Application of System Dynamics Theory

System Dynamics Theory has been employed to a wide range of problem domains. It includes works in corporate planning and policy design (89, 161) economic behaviour (242), public management and policy (121), biological and medical modelling (117), energy and environment (82), theory development in the natural and social sciences (73), dynamic decision modelling (241), complex non-linear dynamics (184), software engineering(1), supply chain management (5,15, 251), tourism system dynamic model (132),and integrated tourism dynamic model (197).

In this present investigation, the study area is considered as a System, integrating physical, social, economic, ecological, environmental, infrastructure and institutional subsystems where tourism shall function as a catalyst for comprehensive development of the system. The theoretical framework and concepts developed by Jambekar and Brokaw (1989) and Patterson, et. al. (2004) is followed to establish the functions of the system (132, 197).

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5.5.4. System Dynamic Modeling

System Dynamic modeling is one approach that can help the Planners and Managers to meet the challenges of decision-making and policy formulation for the development of a system. It represents the key feedback structures in the system. Simulating the model shows the effect of the system structures on policy interventions. It is a problem evaluation approach based on the premise that the structure of a system, that is the way essential components are connected, generates its behaviour (214, 240). It is well suited to analysis of problems whose behaviour is governed by feed back relationships, have a long-term time horizon (262), and not suited to one-time decisions. The process of creating a simulation model helps clarify the resource management problem and makes modeler assumptions about the way the system works explicit. The most important advantage of this model is once the model is built, it can be used to simulate the effect of proposed actions on the problem and the system as a whole. In this regard, Forrester (1987) noted that, this kind of tool is necessary because, while people are good at observing the local structure of the system, they are not good at predicting how the complex and interdependent the system will behave (84).

System Dynamics proceeds through several major steps (81, 214) and these are the same steps followed in any problem solving process. This is also an iterative process and results at any stage can feed back to previous steps. The various steps for developing and employing the System Dynamic models are:

1. Define the problem
2. Describe the system
3. Develop the model

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4. Build confidence in the model (Validation)

5. Use the model for policy analysis

6. Use the model for public outreach.

Building a model for decision support within an organization may use only first five steps and using the model for public communication includes the next one.

5.5.4.1. Define the problem

The first step in System Dynamic modeling is to identify the key variable whose behaviour over time defines the problem. To recognize a problem that needs study through modeling it as the consequence of a system of interactions among large numbers of variables. The interactions of these variables operate on feedback mechanisms and generate the dynamics of the system. In the identification stage, it is important to interpret the problems and the causes thereof from the past behaviour of the system. In a social complex system, it is difficult to build a reference mode and identify a problem. In such situations, the problem is identified through discussions with experts, interviews, questionnaire surveys, Delphi, etc., study for building up a rich picture of the situation and record multiple perspectives for a problem situation looking at the interactions from different angles (53,156). In this present investigation, the discussion with experts and survey methods have employed to identify the problems of the system and are discussed in detail for each model in subsequent sections of model conceptualization.

5.5.4.2. Describe the system

Describing the system involves identifying the system structure that appears to be generating problematic trend. This entails extracting the essential elements and

connections from the real system that produces the anticipated or observed behaviour. At this stage, fixing model aggregate and boundary is of paramount importance and should be free from any mental fixity or obsession. All the factors relevant to the description of the problem phenomena under investigation are to be included, therefore a large number of variables those influence the system are brought within the system boundary for comprehensiveness. The final representation of key variables and causal links called dynamic hypothesis, which is the system structure is thought to explain the dynamic behaviour of the system.

5.5.4.3. Develop the model

A detailed model is developed based on the dynamic hypothesis, by representing through flow diagrams, which takes into account the physical resources and information linkages at the time of their construction. Further, the variables are presented in different forms to identify them as Stocks or Levels (accumulation), Rates (decisions), Auxiliaries (algebraic subdivision of rates) or Converters and parameters. Model assumptions are also incorporated while developing the model.

5.5.4.4. Build confidence in the model (validation of the model)

In System Dynamic modeling, the ultimate objective of the validation process is to establish the structural validity of the model with respect to the modeling purpose. It is critical because the purpose of a system dynamic study is to evaluate alternative structures (strategies, policies) to improve the behaviour. Accuracy of the model behaviour is meaningful only if there is sufficient confidence in the structure of the model. Validation needs to be applied at every stage of modeling. It is required to be validated against the observed or anticipated trend (88, 148, 149, 150, 151, 183) and

sometimes individual tests, such as, structure oriented behaviour tests (16, 85), extreme condition, behaviour sensitivity and phase relationship tests (16) are used for detection structural flaws in the model. If the model reproduces the trend and represents the real system as it actually works, then the model leads to accurate behaviour or else the second step must be revisited to revise the dynamic hypothesis or model structure.

5.5.4.5. Use the model for policy analysis

When the model structure is validated, it can be used to test the effects of policy interventions on the problem. It includes studying the model structure to identify policy levers, then simulating the effect of those changes. The effects of policies can be analyzed both quantitatively and qualitatively. In the qualitative approach, the evaluation primarily predicts the effect, which improves or worsens the system behaviour, while in quantitative approach the evaluation is rigorous and uses precise numerical values.

5.5.4.6. Use the model for public out reach

The model has the ability to involve the stakeholders, to make the models more effective for policies decisions (9, 60, 238, 262). Even when stakeholders are not involved in the model development process, a completed model can be an effective public outreach too.

The schematic diagram developed by Hamilton, et al. (1969) is presented in Fig. No. 5.1, showing the steps the model application in the System Dynamic modeling (113).

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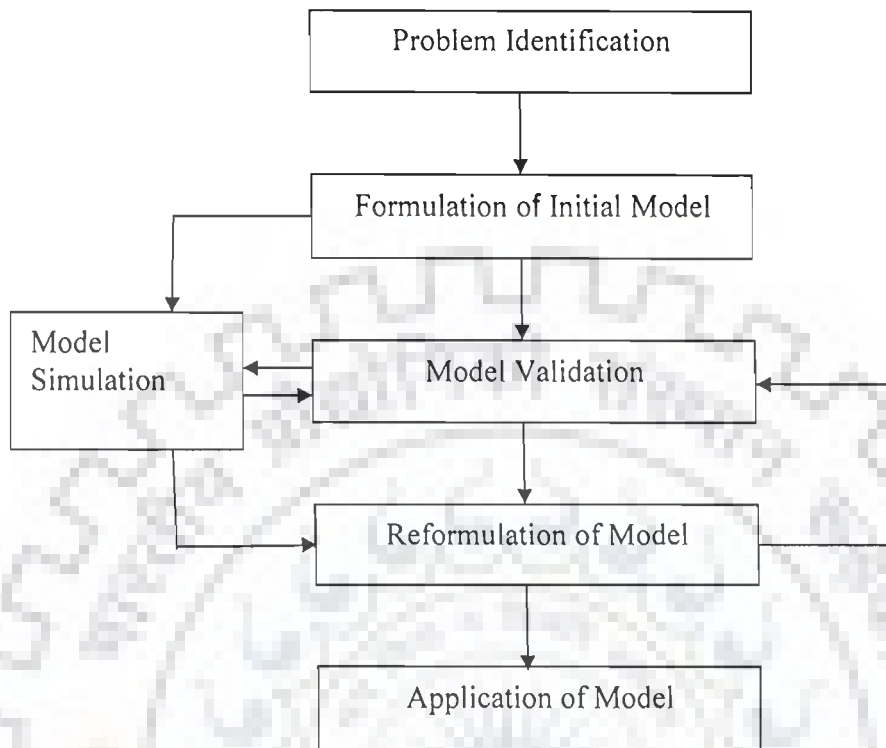
Fig. No. 5.1: Model development as an iterative process (Hamilton, et. al., 1969)

5.5.5. Notations and Equations Adopted in Modeling

The various variables in the System Dynamic models are the level, rate and auxiliary variables.

Level variable (L)

Auxiliary variable (A)

Constant (C)
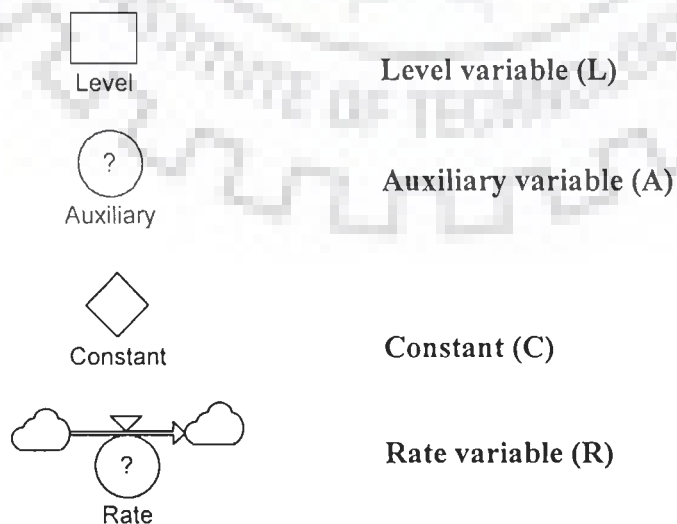
Rate variable (R)

A level variable depends only on a rate variable; and presented by

$$L(t) = f_1(R(t))$$

A rate depends on level variables and/ or auxiliary variables, and on constants, and is presented in any of the forms depending on the various variables and used based on the requirements. The equations are as given below:

$$R(t) = f_{r1}(L(t), C)$$
$$R(t) = f_{r2}(A(t), C)$$
$$R(t) = f_{r3}(L(t), A(t), C)$$

An auxiliary variable can be a function of level and/or other auxiliary variables and constants and is presented in any of the forms depending on the variables and used based on the requirements. The equations are as given below:

$$A(t) = f_{a1}(L(t), C)$$
$$A(t) = f_{a2}(A(t), C)$$
$$A(t) = f_{a3}(L(t), A(t), C)$$

The algorithm for numerical solutions by Euler integration of the system dynamic model is presented as:

$$L_i(t) = L_i(t-DT) + \Delta L_i(t-DT, t), \text{ for all } i$$
$$\Delta L_i(t-DT,t) = DT*d/dt(L_i(t-DT))$$

Where, $L_i(t)$ = Level values at the end of the time step for all i

$\quad$ t = time period

$\quad$ DT = time step

5.6.   INTEGRATED SYSTEM MODEL

In this investigation, the study area is considered as a system, and it has several subsystems. The various subsystems of the system are physical, social, economic, ecological, environmental, infrastructure and institution. All these sub-systems are interlinked and interdependent to each other and function as a whole dynamically. The dynamic functions of the system along with its different subsystems are presented in Fig. No. 5.2
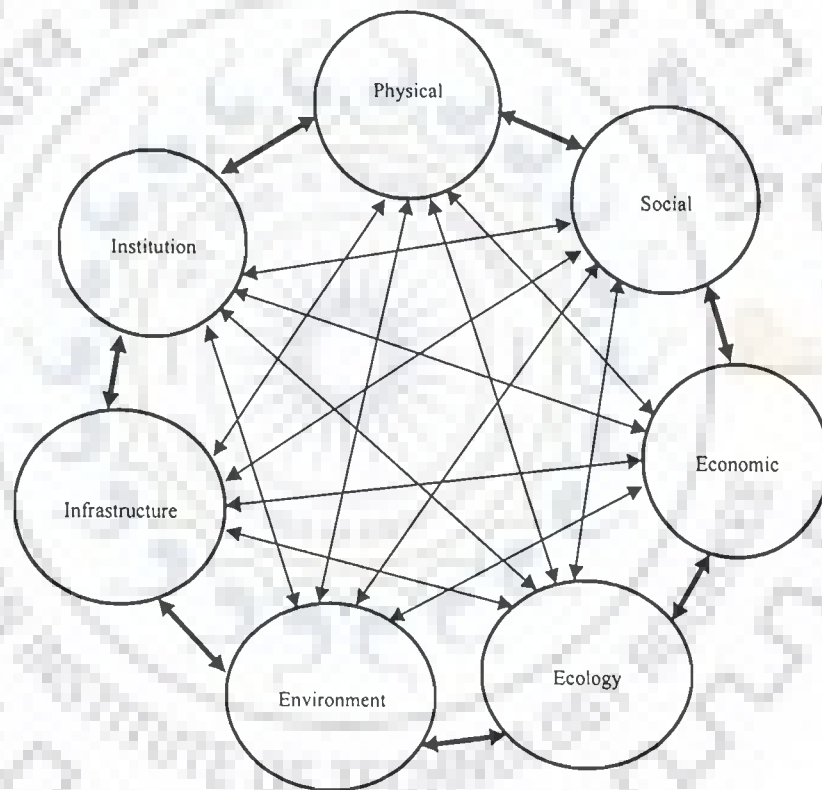
Fig. N. 5.2: Functions of the system along with the sub systems

5.7.   CONCEPTUALIZATION OF INTEGRATED SYSTEM MODEL

Each subsystem as described in the previous section is a system in itself and has several subsystems, which are also interdependent and interlinked. For convenience, all

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the subsystems are grouped into four categories, such as, socio-economic; physical, ecological and environmental; infrastructure and institution by combining one or more subsystems together. The various functions of these subsystems are put under individual and integration of different domains and are presented in Fig. No. 5.3. Arriving at economic capital and social capital are the ultimate results of the integration of various functions of the system.

5.8.   CONCEPTUALIZATION OF INTEGRATED TOURISM MODEL

Tourism is a function of several activities under various subsystems, such as, physical, social, economic, ecology and environmental, infrastructure and institutions, of the system. The functions of the various subsystems of the system contribute to the tourism development on one hand, and tourism contributes to the development of the system on the other. The functions of various subsystems of the system, which contributes to tourism development are put under different individual and integrated domains, such as, physical; social-economic; Physical, ecological and environmental, infrastructure; institutions and their combinations. A schematic diagram indicating various functions under different domains are shown in Fig. No. 5.4. The various functions ultimately lead to the maximization of tourist flow to the system, tourist receipts and the quality of tourist experience.

SOCIO-ECONOMIC

Population
Migration
Culture &
Religion
Public
participation
Safety and
Security
Education

Primary sector
Secondary sector
Tertiary Sector

Investment
Administration
Management
Awareness

Per capita
income
Socio-cultural
development
Socio-cultural
stress

Economic
Development,
Service Activity
Social Welfare

INFRASTRUCTURE

Transportation
Accommodation
Power
Water supply
Sanitation
Public Facilities

INSTITUTION

Financial Institution
Management &
Organization
Legal Institution
Cultural Institution

Plan
Implementation

Economic capital
Social capital

Production
Employment
generation

Control

Monitoring

Ecological stress
environmental
Stress
Carrying capacity

Physiography
Climate
Land
Land use
Built Habitat

Pollution
Ecological
degradation

**PHYSICAL, ECOLOGY
AND ENVIRONMENT**

Fig. No. 5.3: Conceptualized integrated model for the system and its
various functions

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SOCIO-ECONOMIC

Population
Migration
Culture &
Religion
Public
participation
Safety and
Security
Education

Agriculture &
Horticulture
Handicrafts
Industry
Trade and
commerce
Investment

Employment
generation
Handicrafts
production and
marketing
Socio-cultural
development
Socio-cultural

Investment
Administration
Management

Service Activity
Social Welfare
Hospitality

INFRASTR
UCTURE

Transportation
Accommodation
Power
Water supply
Sanitation
Public Facilities

INSTITUTION

Financial Institution
Management &
Organization
Legal Institution
Cultural Institution

Tourist flow
Tourist receipts
Quality of
experience

Tourist attraction
Tourist satisfaction

Promotion and
publicity
Awareness
Word of mouth

Monitoring

Control

Ecological stress
environmental
Stress
Carrying capacity

Land use
Built Environment
Artifacts/ Heritage
structures

Environmental
Pollution
Ecological
degradation

PHYSICAL, ECOLOGY
AND ENVIRONMENT

Fig. No. 5.4: Conceptualized integrated model for the tourism system and its
various functions

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5.9. APPLICATION OF THE SYSTEM DYNAMIC MODEL

In this present investigation, the most important controlling parameters, such as, population, infrastructure in the form of road lengths, rail route lengths, accommodation (Hotels), investment in tourist destination developments including publicity and promotion, enrichment of cultural heritage, and attention of tourism environment (local infrastructural development) are considered for evolving an integrated System Dynamic model for tourism development. Further, System Dynamic models for physical condition of the system incorporating land use and conversion of land; and agricultural System Dynamics model for various crops are evolved to understand the total system behavior in this regard. At the outset, all the subsystems are developed separately, and then respective subsystems are amalgamated together to evolve an integrated tourism model and integrated system model for the total system. The detailed methods used for developing the models by subsystem wise are presented as below:

5.9.1. Population

Population and population density are considered as important parameters, which influence the system. A System Dynamic model is built to calculate population, and population density, by considering the influential variables, such as, Birth Rate, Death Rate, Normal Birth Rate Fraction (BRF), Normal Death Rate Fraction (DRF), In-migration Rate (IMR), In-migration fraction (IMF), Out migration Rate (OMR), Out migration fraction (OMF), and total area of the system. A functional flow diagram is developed and presented in Fig. No. 5.5. In this model, population (P) is considered as a function of birth rate (BR), death rate (DR), in migration rate (IMR) and out migration rate (OMR) the system experiences in the past years. Population density (PD) refers as the number of persons per square Kilometer of land area of the system and is a function

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of population (P) and area (A) of the system. Population is considered as the level variable, birth rate, death rate, in migration and out migration rates are taken as rate variables. Population density is considered as an auxiliary variable. The model, which is employed for computing the Population and population density are presented in a functional flow diagram (Fig. No. 5.5) and the functional relationships among the variables are presented below. The model equations used for the above purpose is presented in Appendix-3.

$P = f(BR, DR, IMR, OMR)$

$PD = f(P, A)$

$BR = f(P, BRF)$

$DR = f(P, DRF)$

$IMR = f(P, IMF)$

$OMR = f(P, OMF)$

The definitions of each variable, and mathematical (algebraic equations) are described in the model equations.
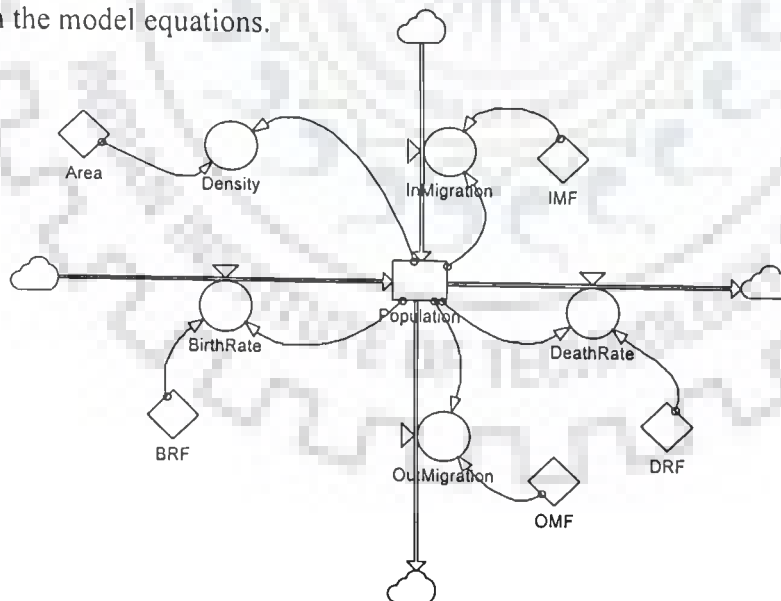
Fig. No. 5.5: System Dynamics Model for Population and Population Density

5.9.2. Infrastructure

Roads, Railways and Accommodation functions are considered under the infrastructure subsystem of the system in System Dynamic model building for tourism industrial development as well as for the entire system, in this investigation. System Dynamic models for all these three subsystems are developed separately for each functions and presented below:

5.9.2.1. Road

Road is one of the most important subsystem in the system for both regional and local transportation needs and accessibility, as the entire road transportation system is dependent on the availability of road lengths and their quality. A System Dynamic model has been developed to compute the demand and supply of road lengths and satisfaction of the road system in the system. The important control variables considered for developing the model are normal available road length, road construction growth rate, investment in road construction contributed from annual Gross Domestic Product, average cost for construction per unit length of road, time to allocate the fund and construction, minimum requirement and desired road length, perceived road length, conversion to higher order roads are considered. The normal available (supply) road length is calculated based on the normal construction rate, which is a function of investment as a fraction contributed from Gross Domestic Product of the State and time allocating for the same. Desired road length (Demand) is considered as a function of minimum requirement of road length per Square Kilometer of land area. Perceived road length is a function of the projected investment based on priorities attached to the development of this sector from time to time. The road satisfaction of the system is considered as a function of the discrepancy

between the demand of road length and supply of road length. The effect of road on tourism development and tourist satisfaction is a function of ratio of growth of road of perceived and normal supply of road length, and tourist perception delay. Further, in the model qualitative development of roads have been considered as a function of conversion of road lengths to higher order roads. Higher order roads refers to the roads belonging to National Highways, State Highways, Major Districts Roads and Other districts roads together. In this model development, normal available road length, desired road length, projected road length, higher order road length and Gross Domestic Product are considered as level variables. The road construction rate, Gross Domestic product change rate, road length change rate are the rate variables and all others are considered as auxiliary variables. The functional model diagram is presented in Fig. No. 5.6, as below, and the model equations for the same are presented in the Appendix-3.

NRL= f (NCR, I, GDP, T)

DRL= f (A, D, RCR)

PRL=f (PRRL, I, PCR, PDL)

HRL= f (NRL, CR)

RS= f (DS)

DS= f (DRL, NCR)

TS= f (PRL, NRL, PDL)

Where,

NRL= Normal Road Length

DRL= Desired Road Length

PRL= Perceived Road Length

HRL=Higher Order Road Length

CR= Conversion Rate of Normal Road length to Higher Order Road Length

PPRL= Projected Road Length

GDP= Gross Domestic Product

T= Time allocation

D= Demand of road

NCR= Normal Construction Rate

PCR=Perceived Construction Rate

RCR= Road Length Change Rate

RS= Road Satisfaction

DS= Discrepancy

I= Investment

A = Area

PDL= Tourist Perception Delay
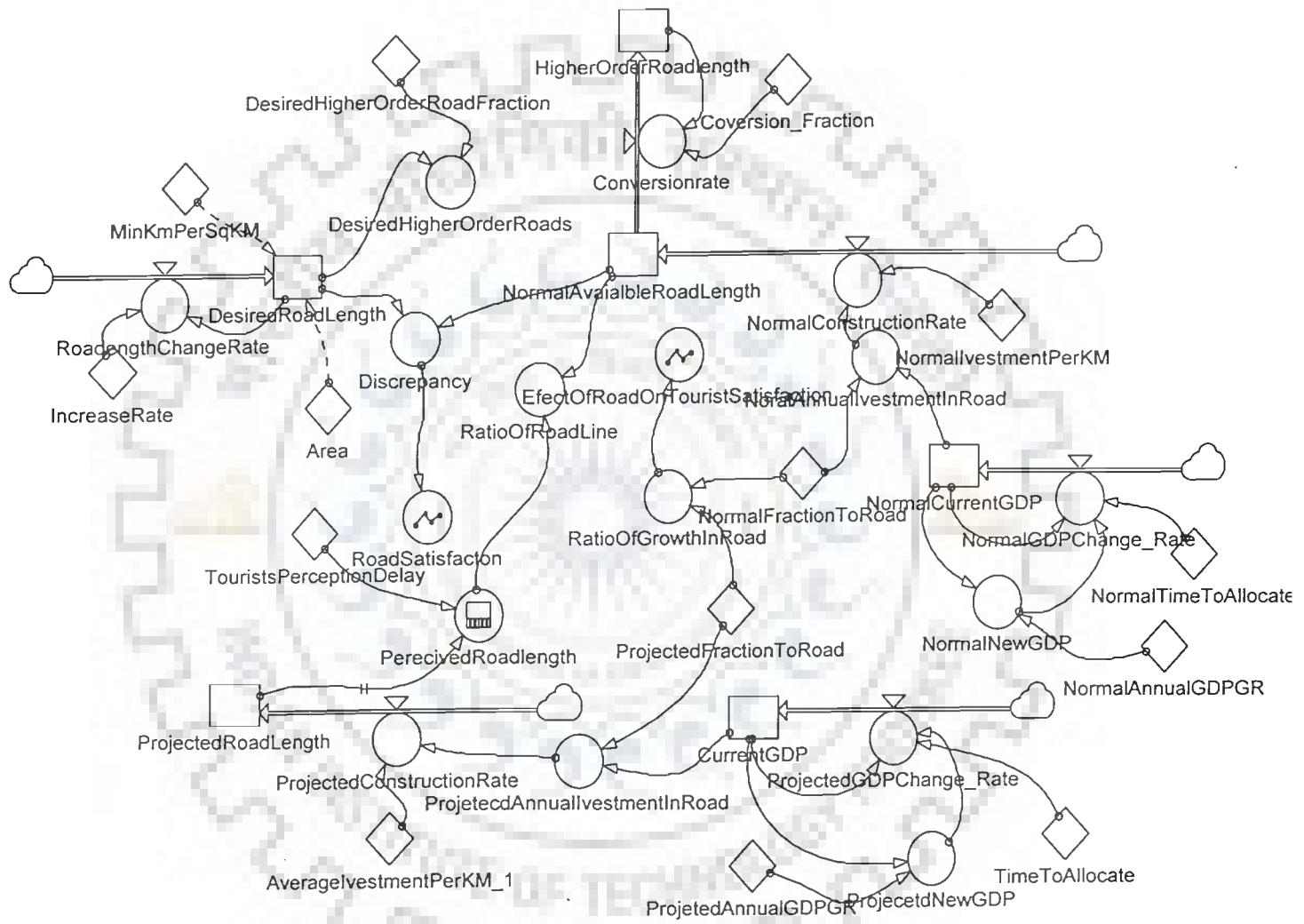
Fig. No. 5.6: System Dynamics Model for Road in the Study area

5.9.2.2. Railway

Railway is another essential most subsystem in the system for National, regional and local transportation needs and accessibility. It is also more important and cheap mode for travel needs of the tourists and other travelers. At regional level, availability of rail route length is considered essential for regional and local transportation needs. The development of railway in the system is considered as exogenous to the system, as the State does not contribute financially to its development, because it is a subject, which belongs to Central Government. A System Dynamic model is developed in order to compute the demand and supply of rail route lengths and satisfaction level of the rail sub system in the system, and effect of rail development on tourist satisfaction and tourism development. The important control variables considered for developing the model are Population, available rail route length, rail route length growth rate, minimum requirement or desired density of rail route length, actual rail route length density, perceived rail route length, tourist perception delay are considered. While supply (available length) is computed based on rail route length growth rate, demand (desired rail route length is considered as a function of population and rail density as envisaged by the Planning Commission, Government of India, in Vision 2020. Perceived rail line is the projected rail route length based on priorities attached to this sector from time to time. Rail satisfaction is a function discrepancy in demand and supply position of rail route length. Effect of rail on tourism and tourist satisfaction are considered as functions of ratio of rail route length (perceived rail route length to available rail route length), ratio of growth in rail route length (perceived growth to available growth) and tourist perception delay factor. Sensitive analysis is done to fine tune the model. The functional model

diagram is presented in Fig. No. 5.7 and the model equations for the same are presented inappendix-3.

ARL= f (RLGR)

ARL = f (P, DRD)

PRRL= f (PRGL)

PRL=f (PRRL, PRGR, TDL)

RLS=f (DS)

DS= f (ARD, PRD)

TS= (PRGR, RLGR)

Where,

P= Population

ARL= Available rail route length

DRL= Desired rail route length

PPRL= Projected rail route length

PRL=Perceived rail route length

PRGR= Projected rail route growth rate

RLGR= Rail route growth rate

DRD= Desired rail route length density

TDL= Tourist Perception delay

DS= Discrepancy between demand and supply of rail route length

TS= Tourist satisfaction

ARD= Actual rail route length density

DRD= Desired rail route length density
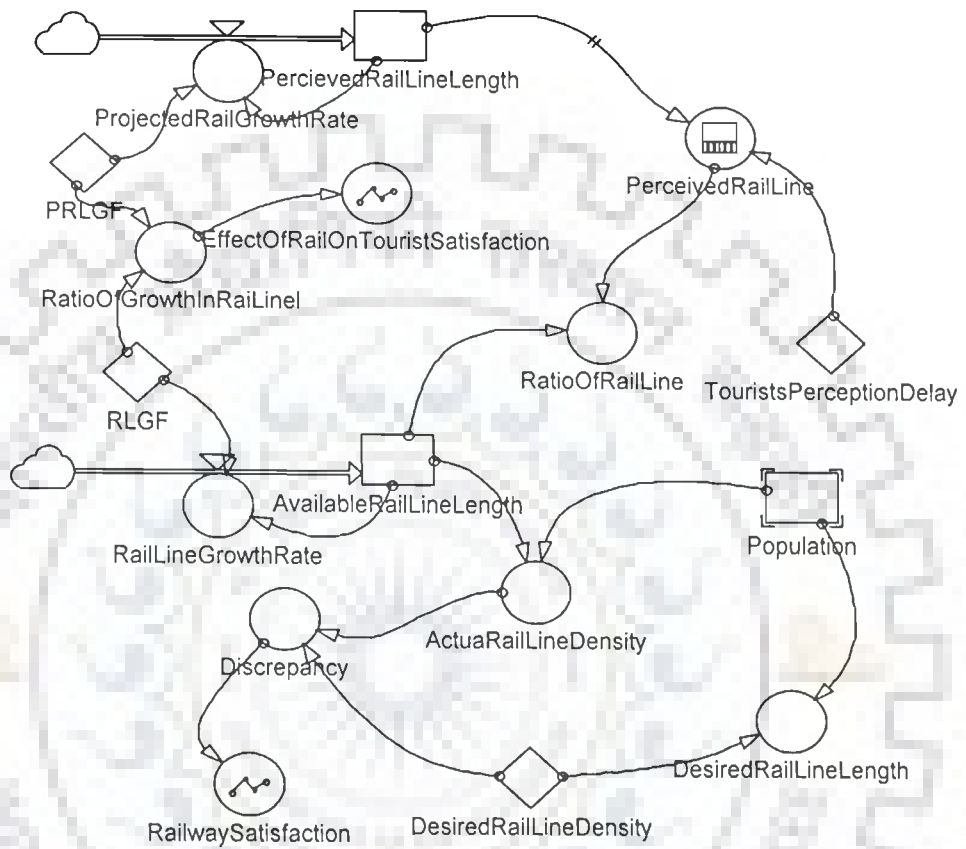
Fig. No. 5.7: System Dynamics model for Railways in the Study area

5.9.2.3. Accommodation

Accommodation is another important subsystem in the system for tourism industrial development in the system. This is considered as an endogenous factor, as development of this subsystem is highly dependent on the tourist flow and their stay in the system and the tourist stay in the destinations depends on the availability of adequate hotels at affordable costs. In this present investigation, hotels in organized sector and guesthouses (Panthanivases) run by Orissa State Tourism Development Corporation together are considered under accommodation facilities. The accommodation facilities are taken in terms of hotel beds in these previously mentioned organized accommodation facilities. The hotel beds are further classified into high spending and affordable category based on qualitative service. A system Dynamic model is developed in order to compute the demand and supply of accommodation facilities in terms of hotel beds under different categories, satisfaction level of the accommodation facilities in the system, and effect of accommodation sector on tourist satisfaction and tourism development. The important control variables considered for developing the model are total tourist flow, available hotel beds, accommodation growth rate, desired fraction requirement for accommodation and demand of beds ratio, perceived accommodation, perceived growth rate, tourist perception delay are considered. In this model available accommodation, projected accommodation are considered as level variables, where as demand of accommodation is considered as auxiliary variable. While supply (available hotel beds) is computed based on normal growth rate, demand of hotel beds is considered as a function of tourists and demand of ratio of hotel beds, which is decided based on the standards and hotel occupancy rates envisaged by the entrepreneurs and hoteliers. Perceived accommodation

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is projected based on priorities attached to this sector from time to time by the government and entrepreneurs. Accommodation satisfaction is a function discrepancy in demand and supply position of hotel beds. Effect of accommodation on tourism and tourist satisfaction are considered as functions of ratio of accommodation, (perceived hotel beds to available hotel beds), ratio of growth in accommodation (perceived growth to available growth) and tourist perception delay factor. Further, computation of demand, supply and perceived supply of high spending and affordable accommodation (in terms of hotel beds) are done considering them as auxiliary variables. The mathematical functions used in the model equations are presented below. The functional model diagram is presented in the Fig. No. 5.8 as below and the model equations for the same are presented in the Appendix-3.

AA= f (AAGR, AGRF)

DA=f (TA, FA, DB)

PA=f (PPA, PAGR, PAGRF, TPDL)

SLA=f (GA)

GA = f (DA, AA)

TS= f (AGRF, PAGRF)

AA= Available accommodation (supply of hotel beds)

DA= Demand of accommodation

PA= Perceived accommodation

PPA= Projected accommodation

TA= Tourists per annum

FA= Fraction required for accommodation

DB= Demand of bed ratio

G A= Gap in accommodation between Demand and Supply

SLA= Satisfaction level of accommodation

PAGR=Perceived accommodation growth rate

PAGRF= Perceived accommodation growth rate faction

AGRF= accommodation growth rate faction

TS= Tourist satisfaction
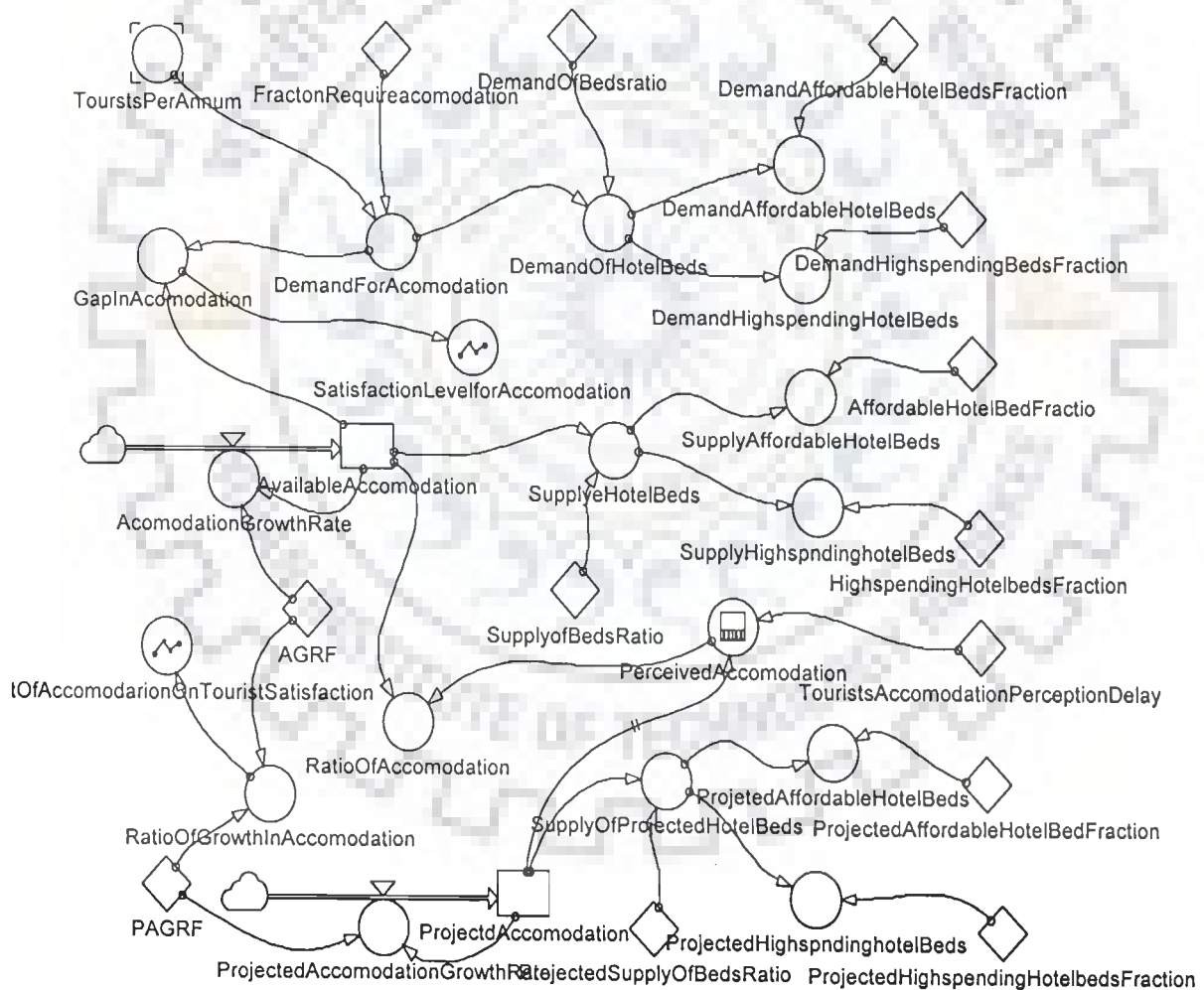
Fig. No. 5.8: System Dynamics model for Accommodation in the Study area

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5.9.3. Land Use

Physical segment is an indispensable subsystem of any system. The physical subsystem includes Land use, Physiographic, climate, built form, etc. In this investigation, land use is considered as the most important subsystem, which influences the system to the larger extent, because the total habitat and productivity of the system depend on it. Therefore, a System Dynamic model for this subsystem is developed to find the land use area of the system and possible shift in land use in future. In this model, the total land area of the system is categorized into four categories, such as Agricultural land area, Forest Land area, Habitat land area, and other land area. The habitat land area includes the built up area and allied areas used for human habitation. The other land area includes permanent pastures, trees and grooves, barren and uncultivable, and fallow land. It is observed that a portion of agricultural land and other land area are transferred to habitat land areas due to pressure of human habitats and portion of forest and being converted into other land areas due to deforestation and human intervention. Thus, the most important variables considered in this system dynamic model are total land area, land areas under the aforesaid four categories of the land area, conversion rate from agricultural land and other land to habitat land area, conversion rate from forest land to other land areas. Agricultural area, forest area, habitat area, and other areas are considered as level variables, which are functions of conversion rate variables and conversion fractions. The total land area is taken as an auxiliary variable, which is a function of all the land areas. The functional system dynamic model diagram developed for quantification of various land uses in future is presented in Fig. No. 5.9 as below and the model equations for the same are presented in the Appendix-3.

TLA=f(AA, FA, HA, OA)

AA= F(CRAA, CFAA)

HA=f(AA, OA, CRAA, CROA)

FA= f(CRFA, CFFA)

OA=f (CROA, CFOA)

TA= Total land area

AA= Agricultural land area

HA= Habitat land area

OA= Other land area

CRAA= Conversion rate of agricultural area

CRFA= Conversion rate of forest area

CROA= Conversion rate of other area

CFAA= Conversion fraction of agricultural area

CFFA= Conversion fraction of forest area

CFOA= Conversion fraction of other area
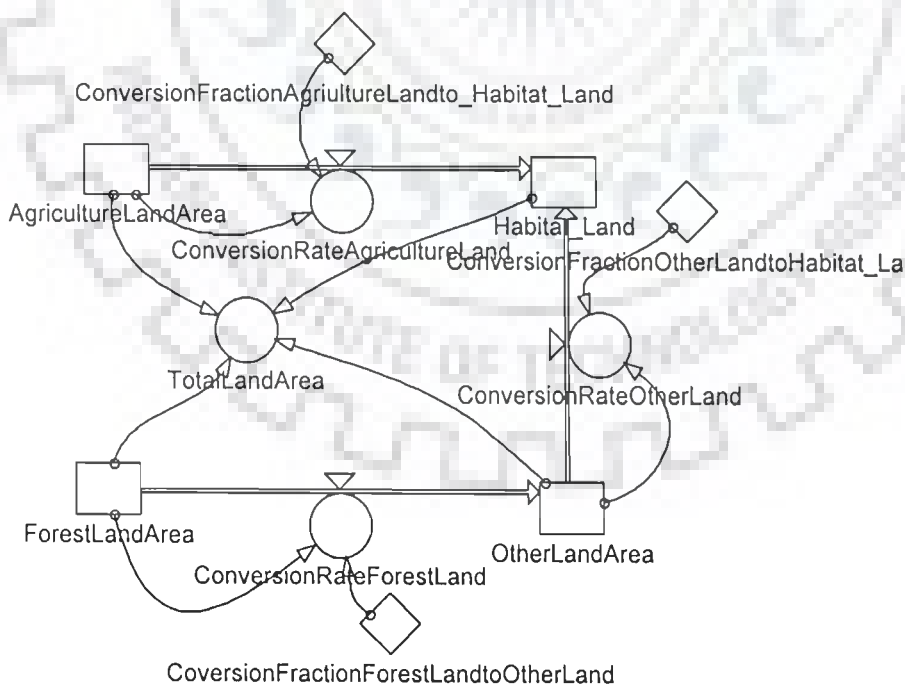
Fig. No. 5.9: System Dynamics model for Land Use in the study area

5.9.4. Agriculture

The investigation of socio-economic conditions of the system as analyzed in the chapter- IV reveals that Agriculture is an indispensable function of the system, which influence the economy of the system to the larger extent. This makes Agriculture as important subsystem of the economic subsystem of the system. In the event of gradual decrease in agricultural land due to human pressure, investigation of the performances of this sector is highly essential. It is understood from the previous analysis enumerated in chapter-IV, Cereals, such as; paddy crop, pulses and commercial crops, such as, vegetables are the important crops in the system. Therefore, System Dynamic models are developed to comprehend performance of the agriculture system and for the above said purpose separate models for each of the three types of the crops, such as, cereals, pulses and commercial crops are developed.

The important variables considered in the model development are available agricultural area, conversion rate of agricultural area to habitat area, which computes the net availability of agricultural land area for production, fraction of land area utilized for the particular crop, quality of seeds, fertilizer inputs, effective yield time, effective time required to change the yield, and crop yield rate. In this investigation, the total crop coverage is considered, which includes the cropping intensity for the particular crop. It is revealed from the socio-economic condition analysis of the system that agricultural inputs are influential variables for crop production along with land area. It is observed from the same analysis that input, such as, fertilizer and qualities of seeds are the major inputs, which influence the production rate and total production. The effect of fertilizer is taken as a function of initial fertilizer input and actual fertilizer inputs. Similarly, effect of

seeds on yield rate is taken as a function of current quality of seeds and actual quality of seeds. The improved yield rate is a function of current yield rate, effect of fertilizer and effect of quality of seeds. The total yield is a function of improved yield rate and time to change, and the total crop area. Three different system dynamic models for cereal crops, pulses crops and commercial crops are developed for computing the agricultural yield of these crops and the functional diagrams of the said models developed are presented in Fig. Nos. 5.10, 5.11, 5.12.

5.9.4.1. Model for cereal crops

In this model, agricultural area and actual annual cereal crop production are taken as level variables; agricultural area for cereal crops, annual cereal yield are considered as auxiliary variables. Table functions and sensitive analysis are done to find the effect of fertilizer and effect of high yielding variety (HYV) seeds in crop yield. The mathematical functions for computing various variables are as given below and the model equation is presented in the Appendix-3.

AACC=f (AA, CR, CCAF)

ACCY=f (AACC, ES, EF, CYR)

EF=f (CF, AF, CEY, CYT)

ES= f (CSQ, ASQ,)

AACCP= f (ACCY, CGR, T)

Where,

AACC= Agricultural area for cereal crop

AA= Agricultural area

CR=Conversion area

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CCAF= Cereal crop conversion fraction

ACCY= Annual cereal crop yield

AACCP = Actual annual cereal Crop production

ES=Effect of seeds

EF=Effect of fertilizer

CF= Current fertilizer for cereal crop

AF= Actual fertilizer for cereal crop

CEY= Cereal effective yield

CYT= Cereal yield time

CQCS= Current quality of cereal seed

AQCS =Actual   quality of cereal seed

CGR= Cereal growth rate

T= effective time to change

Fig. No. 5.10: System Dynamic model for Cereal Crops in the system.

5.9.4.2. Model for pulses crops

In this model, agricultural area and actual annual pulses crop production are taken as level variables, agricultural area for pulses crops, annual pulses yield are considered as auxiliary variables. Table functions are used and sensitive analysis are done to find the effect of fertilizer and effect of high yielding variety (HYV) seeds in the crop yield. The mathematical functions for the computation of various variables are as given below and the model equations are presented in the appendix-3.

AAPC=f (AA, CR, PCAF)

APCY=f (AACC, ES, EF, PYR)

EF=f (CF, AF, PEY, PYT)

ES= f (CSQ, ASQ,)

AAPCP= f (APCY, PGR, T)

Where,

AAPC= Agricultural area for pulses crop

AA= Agricultural area

CR=Conversion area

PCAF=Pulses crop conversion fraction

APCY= Annual pulses crop yield

AAPCP = Actual annual Pulses Crop production

ES=Effect of seeds

EF=Effect of fertilizer

CF= Current fertilizer for pulses crop

AF= Actual fertilizer for pulses crop

PEY= Pulses effective yield

PYT= Pulses yield time

CQPS= Current quality of commercial crop seed

AQPS =Actual   quality of commercial crop seed

PGR= Pulses growth rate

T= effective time to change
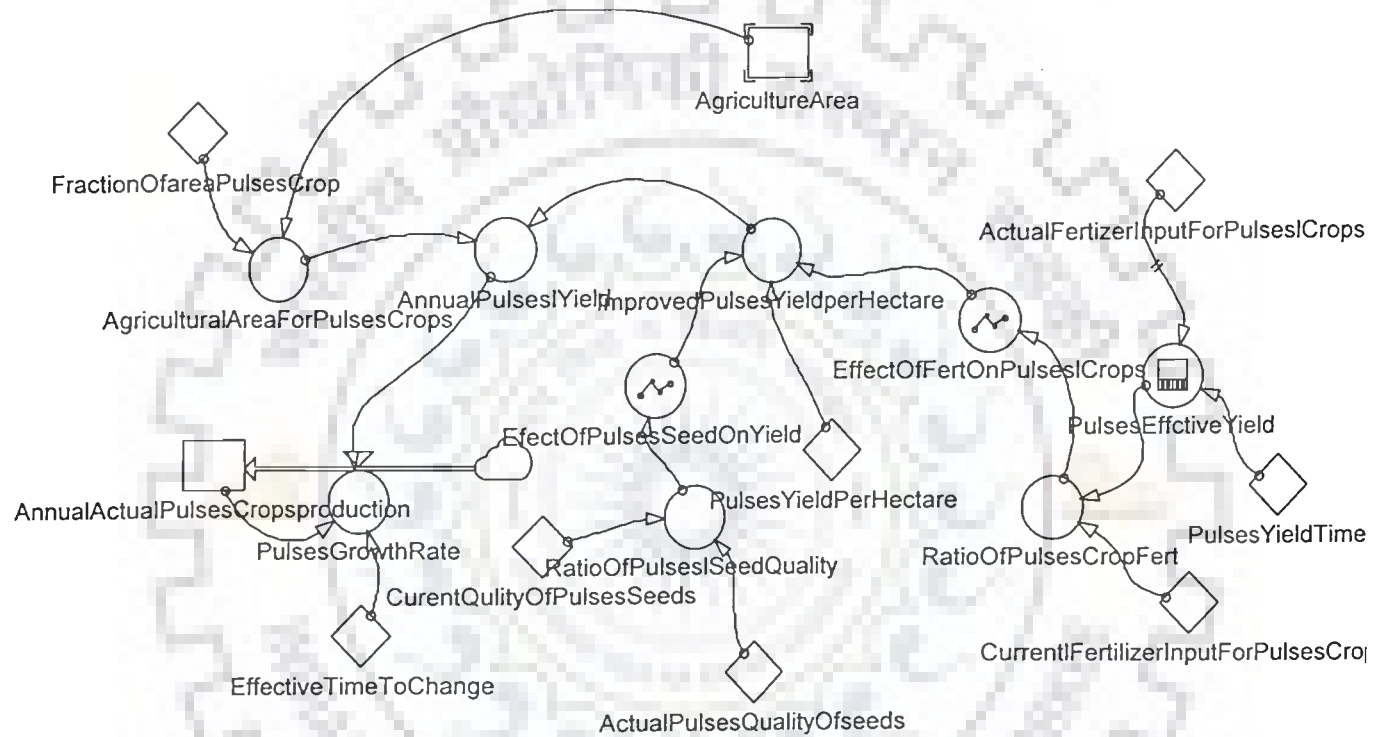
Fig. No. 5.11: System Dynamic model for Pulses Crops in the system.

AgricultureArea

FractionOfareaPulsesCrop

ActualFertizerInputForPulseslCrops

AgriculturalAreaForPulsesCrops

AnnualPulseslYield ImprovedPulsesYieldperHectare

EffectOfFertOnPulseslCrops

PulsesEffctiveYield

EfectOfPulsesSeedOnYield

AnnualActualPulsesCropsproduction

PulsesGrowthRate

PulsesYieldPerHectare

PulsesYieldTime

RatioOfPulseslSeedQuality

RatioOfPulsesCropFert

CurentQulityOfPulsesSeeds

EffectiveTimeToChange

CurrentlFertilizerInputForPulsesCrop

ActualPulsesQualityOfseeds

5.9.4.3. Model for commercial crops

In this model, agricultural area and actual annual pulses crop production are take as level variables, agricultural area for commercial crops, annual commercial crop yield are considered as auxiliary variables. Table functions are used and sensitive analysis are done to find the effect of fertilizer and effect of high yielding variety (HYV) seeds in the crop yield. The mathematical functions for the computation of various variables are as given below and the model equations are presented in appendix-3.

AACMC=f (AA, CR, CMCAF)
ACMCY=f (AACMC, ES, EF, CMYR)
EF=f (CF, AF, CMEY, CMYT)
ES= f (CSQ, ASQ,)
AAPCP= f (ACMCY, CMGR, T)
Where,
AACMC= Agricultural area for commercial crop
AA= Agricultural area
CR=Conversion area
CMCAF=Commercial crop conversion fraction
ACMCY= Annual commercial crop yield
AACMCP = Actual annual commercial Crop production
ES=Effect of seeds
EF=Effect of fertilizer
CF= Current fertilizer for commercial crop
AF= Actual fertilizer for commercial crop
CMEY= Commercial crop effective yield
CMYT= Commercial crop yield time
CQCMS= Current quality of commercial crop seed
AQCMS =Actual   quality of commercial seed
CMGR= Commercial growth rate
T= effective time to change
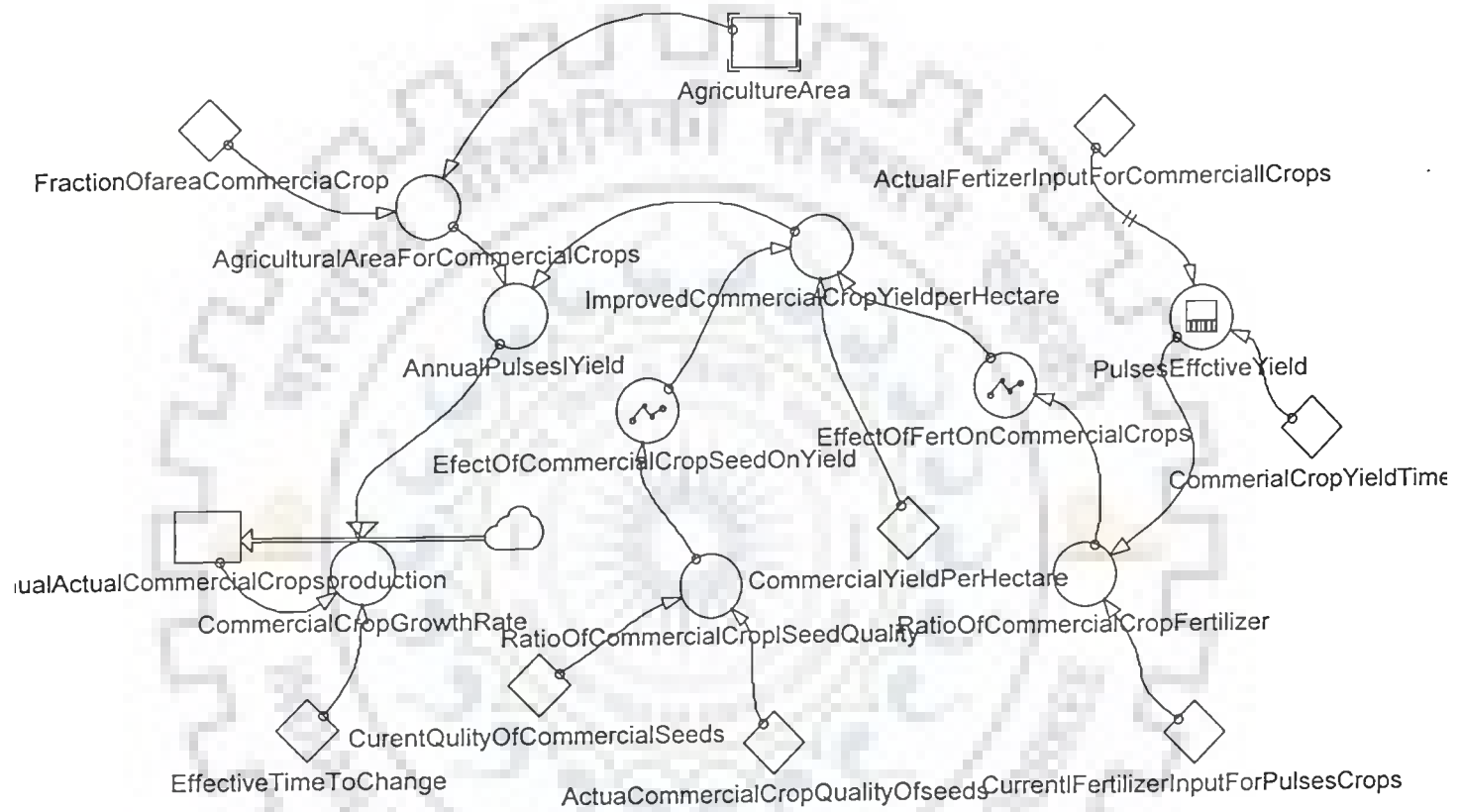
Fig. No. 5.12: System Dynamic model for Commercial Crops in the system.

5.9.5. Integrated Tourism Development Model

Tourism industry is one of the most dynamic and complex industries in the system and various functions, which are highly interlinked and interdependent to each other. The development of the tourism industry is influenced by various exogenous and endogenous variables those function in the system. A tourism destination finds priority in the minds of potential tourists if the destination satisfies both the attractive features, such as, prime attraction elements and their attractiveness, recreational and leisure activities, other associated activities related to tourist interests, etc., and satisfiers, such as, availability of adequate and quality infrastructures. In addition to the above, promotion and publicity, experience of tourist, tourist satisfaction, and environmental condition play important roles in attracting tourists.

In this investigation, an attempt has been made to integrate all the variables such as, transportation infrastructures, accommodation facilities, attraction features of destinations, environmental stress, which influence the tourist flow to the system to the larger extent to the normal growth of tourists. In this model, the effects of road and railway infrastructure that are exogenous to the tourism industrial development are considered under transportation infrastructure. Effect of availability of hotels in the system is considered under accommodation sector. Further, investments in tourism development at regional and local level are considered in this tourism model. Various endogenous variables to tourism development, such as, development of attractiveness of tourists' destinations, creation of tourists' amenities in the destinations including local infrastructure, development of cultural heritage, conservation of archeological and historical monuments and promotion and publicity, etc., are considered in the form of investment in this model, which influences these functions largely.

The tourist arrival in both foreign and domestic category in the system is computed initially separately, which are based on the normal growth rate experienced in the system. The total tourist arrival is the sum of total tourist arrival on both foreign and domestic tourists' categories. The duration of stays of tourists in both categories of tourists and per capita tourist expenditures are considered for arriving at the annual (yearly) tourist revenue generation in the system. Employment generation is considered in both informal and formal sectors of tourism, and are computed based on the employment generation per tourists in the system. The total tourist satisfaction is considered as a function of the effects of roads, railways, accommodation, and tourism investment on tourist satisfaction. The environmental stress is computed based on the ratio of peak tourist arrival flow rate and observed maximum tourist flow rate. The peak tourist arrival flow rate is a function of peak flow in the tourist season and habitat area available to carry the total tourists at that point of time. The observed maximum tourist flow is the tourist arrival observed during the Car festival (Rathayatra) in Puri, which occurs for a very limited period of time of about 15 days in a year.

In this model, both domestic tourists and foreign tourist arrival are considered as level variables, total tourist arrival, annual tourist revenue from domestic tourists, foreign tourists and total annual tourist revenue, total employment generation from tourism activities, employment generation opportunities from informal sector activities from tourism, tourist satisfaction and environmental stress are considered as auxiliary variables. Domestic tourists flow growth rate and foreign tourist flow growth rate are taken as rate variables in this model.

The effect of the various variables, such as, road lengths, rail route lengths, accommodation, investment are then integrated to the normal tourism model by incorporating the table functions arrived through the primary survey results, and also

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having discussions with experts to develop the projected year (2031 A.D.) model. Further, sensitive analysis is done in order to fine tune the model and arrive at the plausible results in the projected year, 2031 A.D. The functional diagram of the model developed is presented in Fig. No. 5.13 and the mathematical functions of the model equations for the same are presented below. The model equations for the same are presented in appendix-3.

TT= f (DT, FT)

DT= f (DTGR, ERL, ERRL, EA, EI)

FT= f (FTGR, ERL, ERRL, EA, EI)

ADTR= f (DT, DTDS, DTRD)

FTTR= f (FT, FTDS, FTRD)

ATR= f (ADTR, AFTR)

TS=f (TSRL, TSRRL, TSA, TSI)

ES=f (TT, HA, PFR, AFC, MFC)

TE= f (TT, EPT)

IE=f (TT, EPT, IEF)

TT= Annual total tourist arrival

DT= Annual total tourist arrival

FT= Annual foreign tourist arrival

DTGR= Domestic tourist arrival growth rate

FTGR= Foreign tourist arrival growth rate

ERL= Effect of road length on tourist arrival

ERRL= Effect of rail route length on tourist arrival

EA= Effect of accommodation tourist arrival

EI= Effect of investment on tourist arrival

ADTR= Annual Domestic tourist revenue generation

AFTR= Annual Foreign tourist revenue generation

ATR=Annual tourist revenue generation

DTDS= Duration of stay (Domestic tourist)

FTDS= Duration of stay (Foreign tourist)

DTRD= Revenue generation per day per tourist (from Domestic tourist expenditure)

FTRD= Revenue generation per day per tourist (from Foreign tourist expenditure)

TS=Total Tourist satisfaction

TSRL= Tourist satisfaction from road length

TSRRL= Tourist satisfaction from rail route length

TSA=Tourist satisfaction from accommodation

TSI =Tourist satisfaction from investment

ES=Environmental Stress

HA= Habitat area

PFR= Peak tourist flow rate

AFC= Actual tourist flow capacity

MFC= Maximum tourist flow capacity
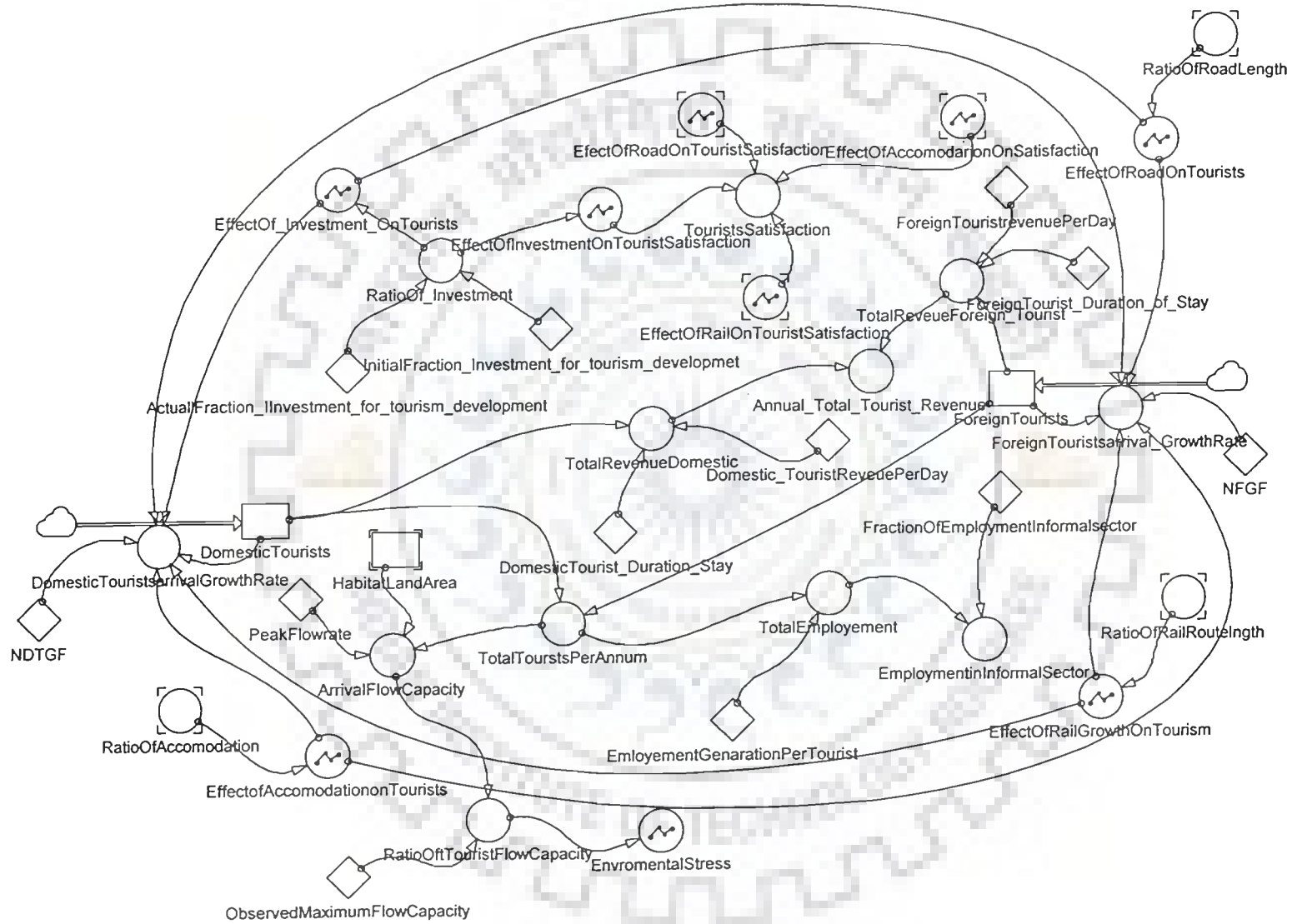
Fig. No. 5.13: System dynamic model for integrated tourism development

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5.9.6. Integrated System Model

An internal socio-economic model has been developed by incorporating various economic sectors and social indicators to assess the economic and social capital status in the system. The State Gross Domestic Product and employment in both organized and informal sectors are considered as the indicators of economic and social capital in the system respectively. The various economic sectors present in the system such as, primary sector, secondary sector and tertiary sector are considered in model building. In model building, contribution from primary sector is divided into two categories, such as, contribution of commercial crop and all other activities as agriculture is primarily subsistence in nature and it is expected that commercial crop would influence the economy to a great extent. Similarly, contribution from secondary sector are categories under manufacturing industries and handicraft industries, as it is expected that handicraft industries have huge potential for contributing to the economy of the system. The contribution from tertiary sector is considered as a whole in the model. In the above model, contributions from tourism industry in the form of revenue generation and employment generation are integrated with the system model to arrive at an integrated system model. While constructing the structure of the model, the contribution of tourism to the Gross Domestic Product has been excluded from the initial values and added separately to arrive at the total Gross Domestic Product of the system. The per capita Goss Domestic product, employment generation in organized sector and informal sector are computed from the evolved integrated system model. The mathematical functional relationships among the variables are defined below and presented in the model equation. The integrated system model developed in this present investigation is presented in Fig. No. 5.14 and the mathematical functions are presented below. The model equations for the same are presented in appendix 3.

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CGDP=f (PS, SS, TS, GDPGR)

PGDP=f (CGDP, ATTR)

PS= f (CC, OPS)

SS= f (HS, MS)

PCGDP=f (P, PGDP)

TE=f (OES, ETS)

ITE=f (IES, IETS, MDE)

Where,

CGDP= Current Gross Domestic Product excluding tourist revenue

PGDP= Projected Gross Domestic Product including tourist revenue

PCGDP= per capita Gross Domestic Product

P=Population

PS= Primary sector

SS= Secondary sector

TS= Tertiary sector

GDPGR= Gross Domestic Product growth rate

ATTR= Annual total tourist revenue

CC= Commercial crops

OPS= Other Primary sector

HS=Handicrafts sector

MS=Manufacturing sector

TE= Total employment including tourism sector

OES= Employment in study area from all sectors excluding tourism

ETS= Employment in tourism sector

ITE= Total employment in informal sector

IES= Informal employment in study area from other sectors excluding tourism sector

IETS= Informal employment from tourism sector,

MDE= Man days per employee
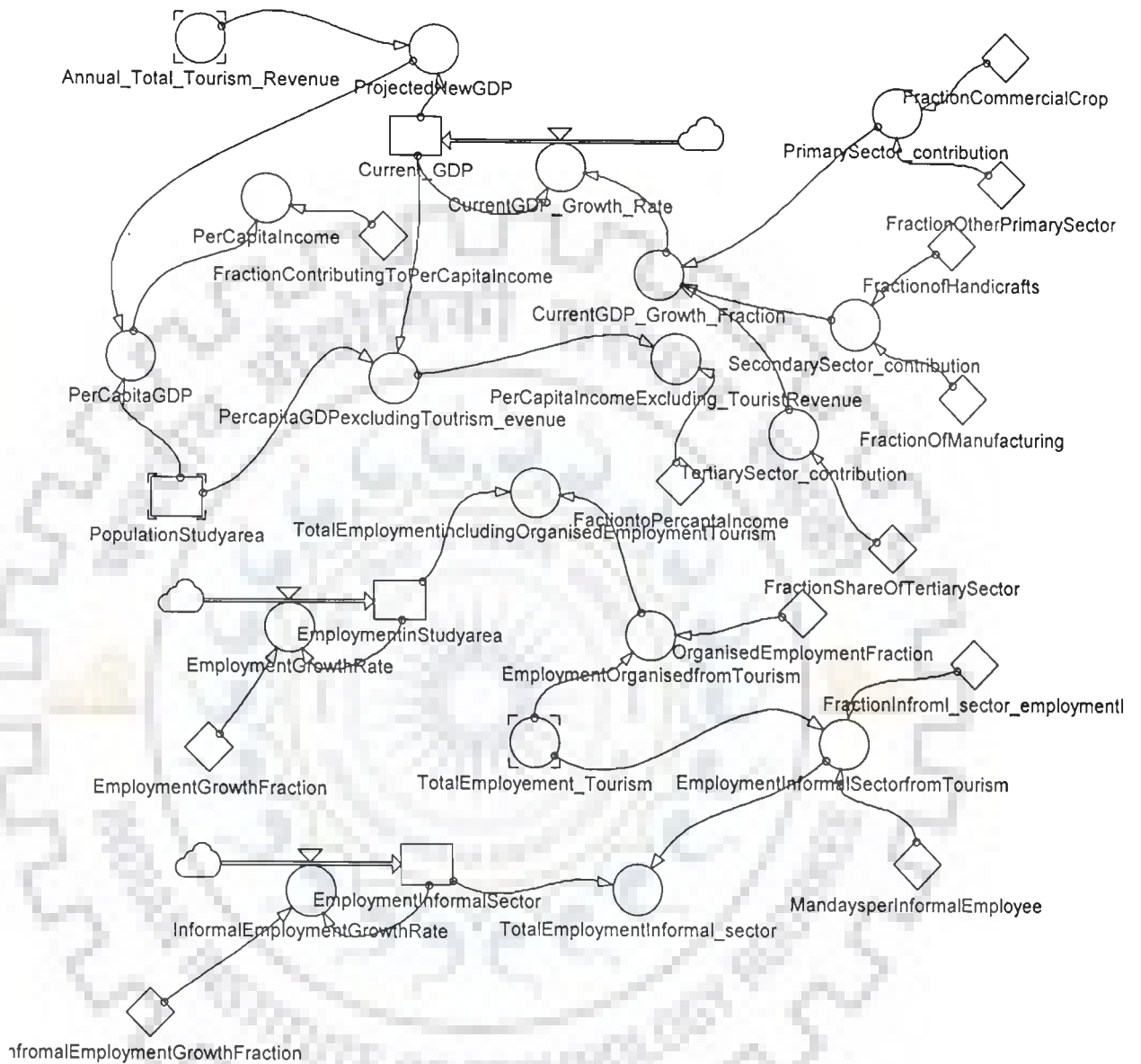
Fig. No. 5.14: System dynamic model for integrated system (study area)

5.10. BASE YEAR MODEL RESULTS (2001)

The System Dynamic models developed in this investigation are employed to understand the functions of the system. In these models, year 2001 is considered as the base year to understand the functions of the system and its various subsystems together. The results of the various variables computed from the models considering year 2001 as the base year are population, population density, land use pattern, demand and supply in various infrastructures, such as, road lengths, rail route lengths, accommodation in terms of hotel beds, total domestic tourist arrival, total foreign tourist arrival, total tourist arrival, revenue generation from tourist expenditures, employment opportunities from tourism, production of cereal crops, pulses crops and commercial crops, Per Capita Gross Domestic Product, Per Capita Income, total employment opportunities from tourism, total employment generation from informal sector from tourism, total organized and informal employment in the system, level of satisfaction of various infrastructures such as roads, rail route lengths, accommodation facilities, tourist satisfaction and environmental stress. The results are presented in Table Nos. 5.11 to 5.21

The Table No.5.11 clearly indicates that the population available in the study area is 17051151 having a density of 476 per square kilometer. It is observed from the Table No. 5.12 that the agriculture land area, forest land area, habitat land area and land area under other uses are 1897000.00, 748000.00, 388000.00, 492000.00 hectares respectively to a total land area in the study area (system) of 3525000.00 hectares. The total available road length in the study area and in the State are 70056 .00 Kms and 226846.00 kms respectively (Table Nos. 5.13 and 5.14). The availability of higher order roads in the study area and in the State are 6867.00 Kms and 17633.00 Kms (tables- 5.13 and 5.14) respectively. The rail lengths in the study area and in the Orissa

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State are 647.00 Kms and 2046.00 Kms (table-5.15). The availability of hotel beds in the affordable and high spending categories are 18682.00 and 3297.00 numbers respectively to total hotel bed availability of 21979.00 numbers in the system (Table No. 5.15). The levels of satisfaction in road lengths in the study area and in the State are 0.24 and 0.20 respectively (Table No. 5.13 & 5.14). The levels of rail route length satisfaction in the study area and in the State are 0.177 and 0.570 respectively (Table No. 5.15). The level of satisfaction in accommodation facilities in the study area is 0.92 (Table No. 5.16). The annual productions in the cereal crops, pulses and commercial crops in the study area are 1629811.18tons, 242737.84 tons and 175423.98 tons respectively (tables- 5.18 and 5.19). The tourist flow to the study area in the base year 2001 in domestic and foreign tourist categories are 3084500.00 and 13220.00 respectively to 3097720.00 numbers (Table No. 5.17). The total annual tourist receipts from tourist expenditures in domestic and foreign tourist categories are Rs. 7866215280.00, and Rs. 122783394.00 respectively generating total annual tourism revenue of Rs. 7988998674.00 in the study area (Table No. 5.17). The total employment generation from tourism is 32774 numbers (Table No.5.17). The Per Capita Gross Domestic Product in the study area is Rs 6824.35 and Per Capita Income is Rs. 5800.70 (Table No. 5.21). The employment generations in the informal sector from tourism and from other activities are 4719438 man days and 26724160 man days respectively making a total employment generation of 31443598 man days in the study area in the base year (Table No. 5.20). It is also observed that the environmental stress in the base year is 0.08 and total tourist satisfaction is 0.41 Table No. 5.17).

5.11. MODEL VALIDATION

The models are employed to compute outputs from a set of inputs for the year 2001, which is referred as the base year for the model in this investigation and up to the

year 2004 for which data for the study area pertaining to a number of variables are available.

The model results are closely examined and compared to the data available in the real system and the comparison between model results and the real system data are presented in Fig. Nos. 5.15 to 5.21.
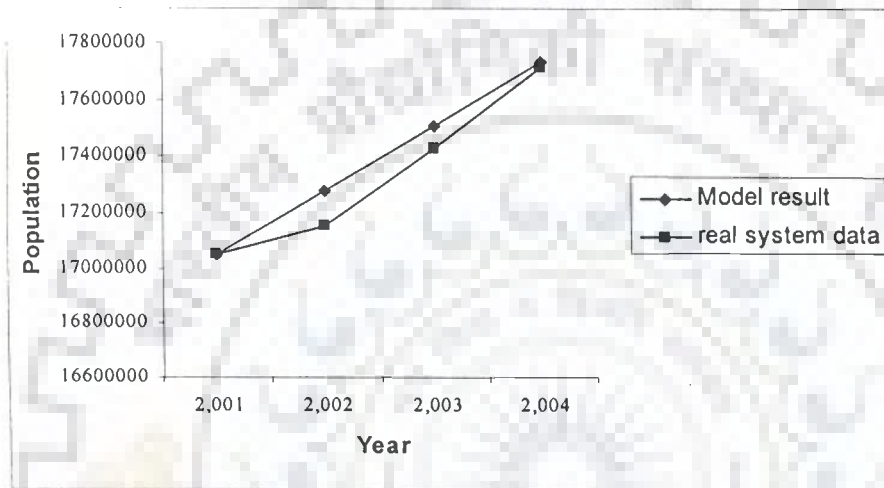
Fig. No. 5.15: Population
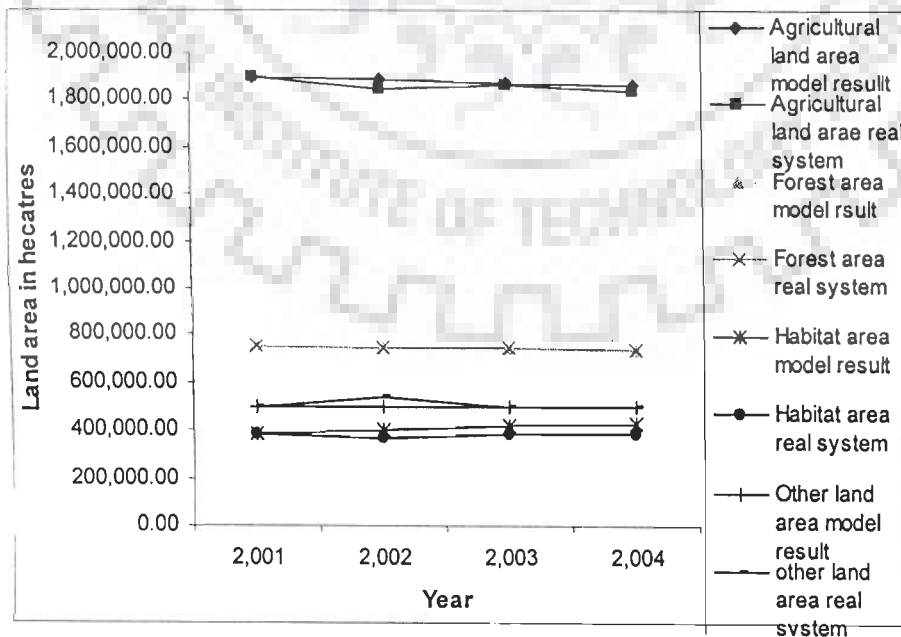
Fig. No. 5.16: Land use
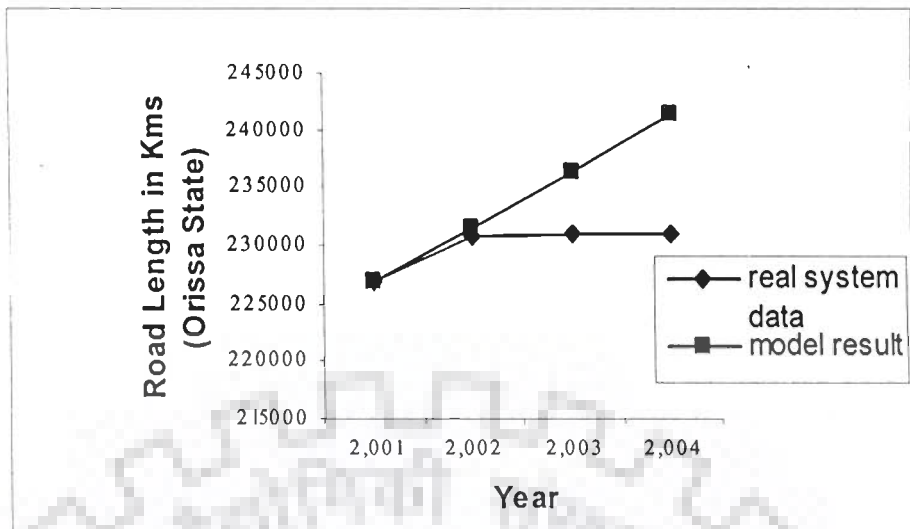
Fig. No. 5.17: Road Lengths
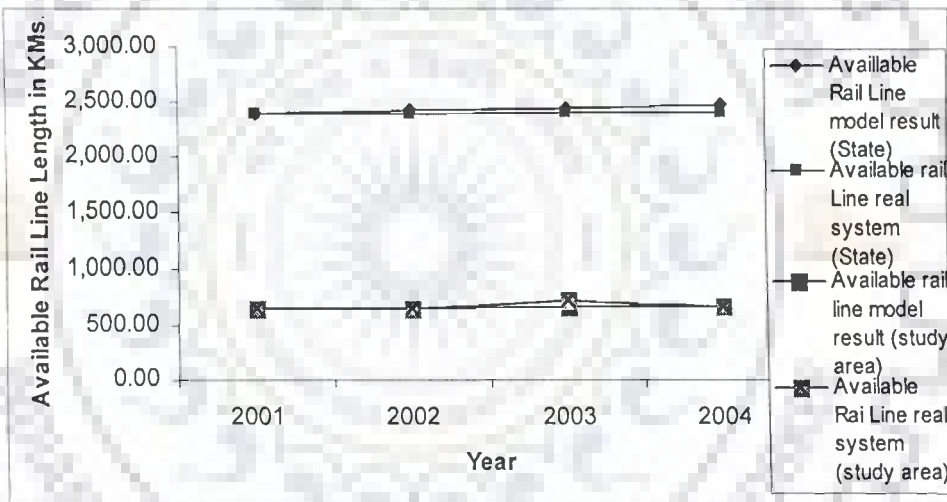
Fig. No. 5.18: Rail Route Length
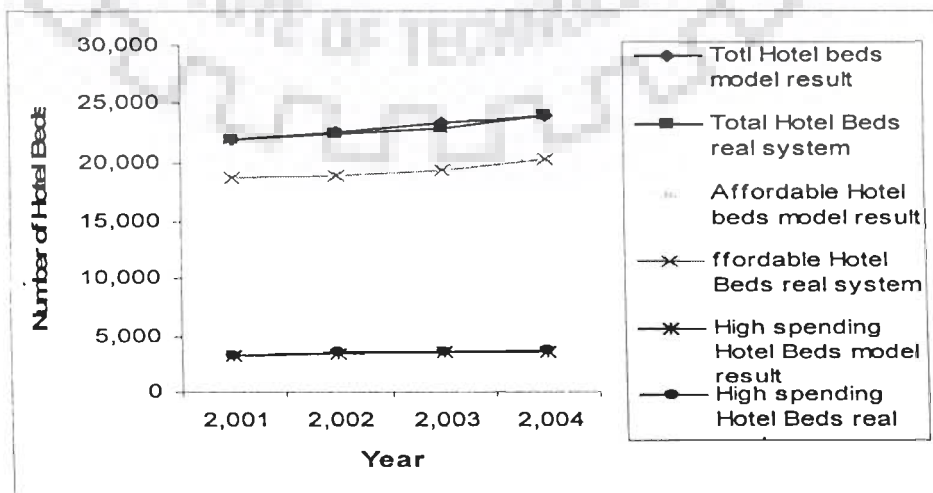
Fig. No. 5.19: Accommodation (Hotel Beds)
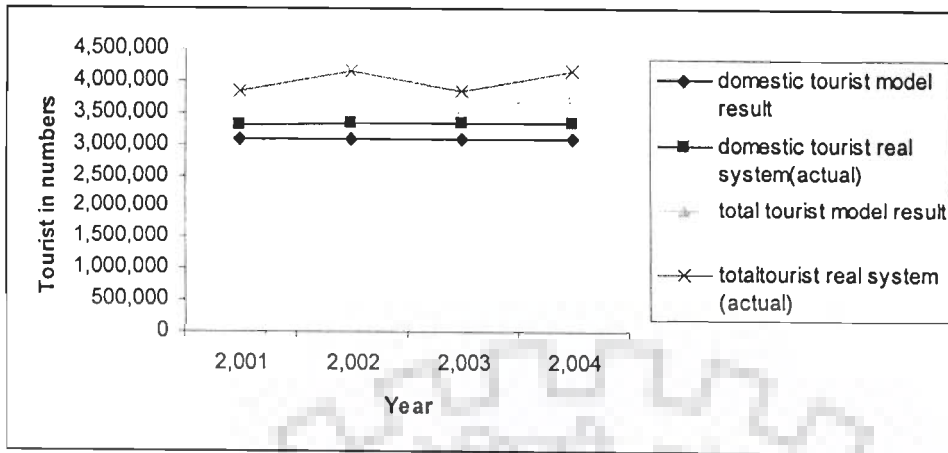
Fig. No. 5.20: Total Tourists and Domestic Tourists
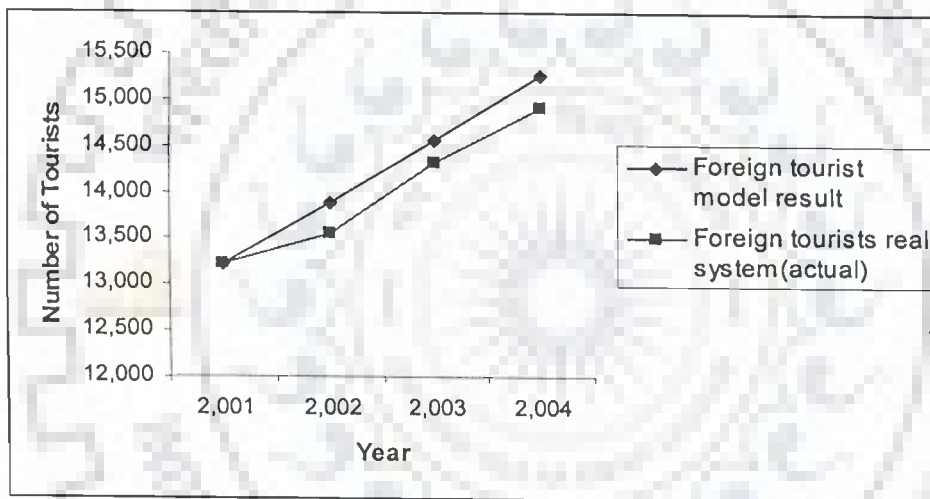
Fig. No. 5.21 Foreign Tourists

It is observed that the model results and real system data of various important parameters, such as, population, road and rail route length, accommodation facilities in terms of hotel beds, domestic tourists, foreign tourists and total tourists flow are very closely matched with minimum variation, thus making both behavoiural and structural validity of the models and closely reflecting the real system.

5.12. PROJECTIONS

In this present investigation, the various control parameters of different subsystems of the system, which influence the functions of the system largely such as, population, land use infrastructure (road, rail and accommodation), tourist arrival in both domestic and foreign categories, revenue generation from tourist expenditures, employment generation from tourism and other activities in both organized and informal sector, Per capita Gross Domestic Product, Per capita income, environmental stress and tourist satisfaction have been considered for projecting their value up to 2031 A.D. for strategic planning. Projection was done in the validated integrated base year (year 2001) model by employing Powersim software by considering the time series data available in the system.

5.13. PROJECTED YEAR (2031) MODEL RESULTS

The projected year model results are presented as below:

5.13.1. Population and Population Density

The population and population density in the study area and in Orissa State are presented in Table No. 5.11 and Fig. No. 5.22 & 5.23. The results reveal that the population in the study area and in Orissa State would be 249503223 and 53257577 respectively in the year 2031 A.D. The density of population in the study area and in Orissa State would be 342 and 697 persons per square kilometer respectively.

Table No. 5.11: Projected Population Growth and Population Density in study area and in Orissa State

Sl No.	Year	Population in Study area	Density Study area (Persons/ Square Km.)	Population in Orissa State	Density Orissa State(Persons/ Square Km.)
1	2001	17051151	476	36706920	236
2	2006	18168001	507	39056163	251
3	2011	19358005	541	41555757	267
4	2016	20625955	576	44215326	284
5	2021	21976955	614	47045107	302
6	2026	23416445	654	50055993	321
7	2031	24950223	697	53259577	342
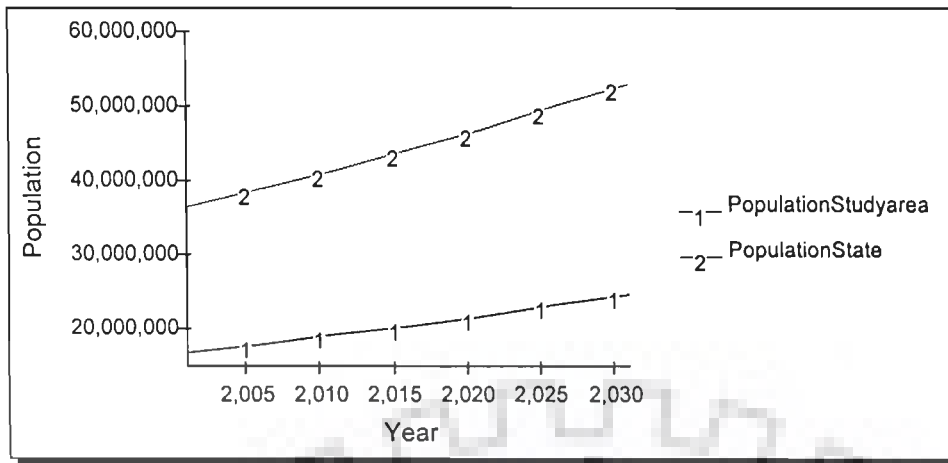
Fig. No. 5.22: Population in the study area and in Orissa State up to 2031A.D.
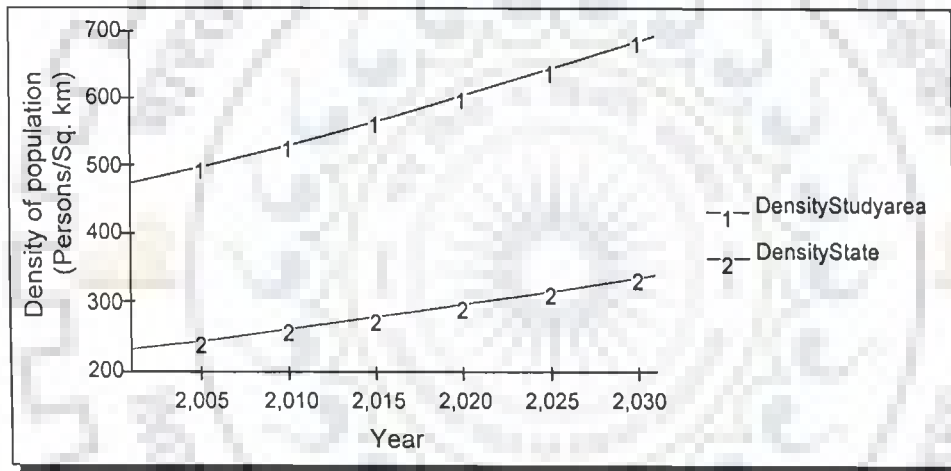
Fig. No. 5.23: Population density in the study area and in Orissa State up to 2031A.D.

5.13.2. Land Use

The land use pattern in the study area is categorized into four categories such as, land used for agricultural, Forestland, Habitat area, and land used for other activities. The projected land use under the above mentioned categories are presented in Table No. 5.12 and Fig. No. 5.24. The results reveal that land under agriculture and forest would decrease to 1583648.75 hectares and 643567. 38 hectares respectively, whereas the habitat area and land use for other activities would register an increasing trend and

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would reach to 777454.64 hectares and 520329.23 hectares respectively in the year 2031A.D.

Table No. 5.12: Projected and use in the study area

Sl No	Year	Land Area in Hectares				
		Agriculture Land	Forest Land	Habitat Land	Other Land	Total Land
1	2,001	1,897,000.00	748,000.00	388,000.00	492,000.00	3,525,000.00
2	2,006	1,840,768.83	729,486.07	456,593.92	498,151.18	3,525,000.00
3	2,016	1,733,257.53	693,821.59	589,258.83	508,662.04	3,525,000.00
4	2,021	1,681,880.05	676,648.64	653,398.07	513,073.24	3,525,000.00
5	2,026	1,632,025.50	659,900.74	716,119.29	516,954.46	3,525,000.00
6	2,031	1,583,648.75	643,567.38	777,454.64	520,329.23	3,525,000.00
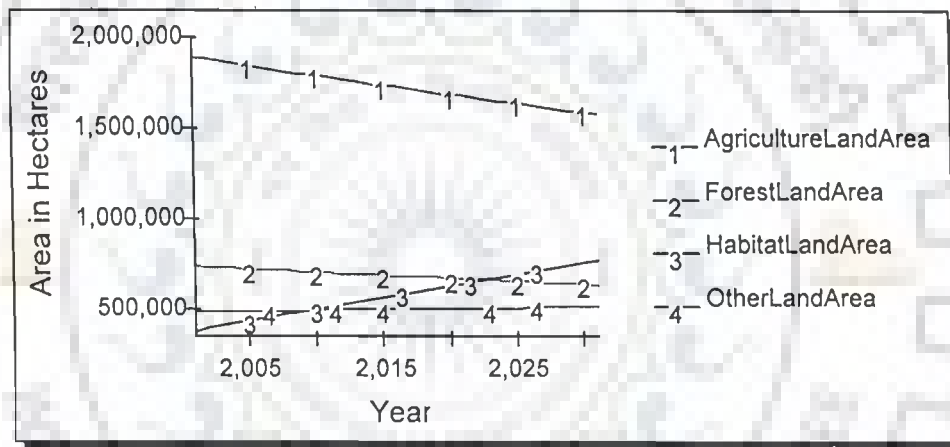
Fig. No. 5.24: Projected Land use in the study area

5.13.3. Demand and Supply of Infrastructure

The demand and supply of important infrastructures, which influence the tourism development as well as the system as a whole such as, Road length, Rail route length and accommodation in terms of hotel beds, are projected up to the year 2031 A.D. and presented in the following sections separately.

5.13.3.1. Road

The results of the demand and supply situation in road infrastructure have been presented in the Table Nos-5.13 and 5.14 and in Fig. Nos. 5.25 to 5.30. It is observed

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that the total supply of road length in the State and in the study area in 2031 A.D., would be 476008 Kms and 118726 Kms. respectively, and in contrast the demand of road length in the State and study area would be 709424 Kms and 341879 Kms. The supply of higher order roads in the State and in the study area would be 23767 Kms and 9256 Kms respectively. The Demand of the higher order roads in the State and in the study area would be 106413 Kms and 51377 Kms. It is also manifested that the level of road satisfaction the State and study area would increase to 0.78 and 0.50 respectively.

Table No. 5.13: Projected Road Length and Road Satisfaction in Orissa State up to 2031 A.D.

Sl No.	Time	Available (Supply) Road Length	Desired (Demand) Road Length	Available (Supply) Higher Order Road length	Desired (Desired)Higher Order Road Lengths	Road Satisfaction
1	2001	226846	529383	17633	79407	0.18
2	2006	252085	555182	18532	83377	0.22
3	2011	282334	583645	19478	87546	0.27
4	2016	318569	612827	20471	91924	0.34
5	2021	361954	643468	21516	95520	0.43
6	2026	413881	675642	22613	101346	0.59
7	2031	476008	709424	23767	106413	0.78

Table No. 5.14: Projected Road Length and Road Satisfaction in the study area

Sl No.	Year	Available (Supply) Road Length	Desired (Demand) Road Length	Available (Supply) Higher Order Road Length	Desired (Demand) Higher Order Roads	Road Satisfaction
1	2001	70056	193546	6867	29001	0.24
3	2006	74933	212901	7217	31901	0.25
4	2011	80804	234191	7585	35091	0.27
5	2016	87863	257610	7972	38600	0.30
6	2021	96342	283371	8379	42460	0.35
7	2026	106519	311709	8806	46706	0.41
8	2031	118726	341879	9256	51377	0.50
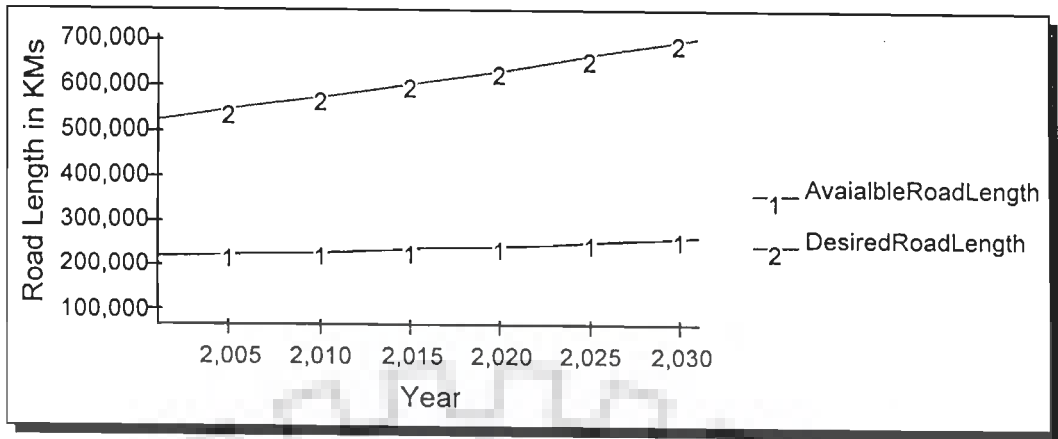
Fig. No. 5.25: Demand and Supply of Total Road Length in the State
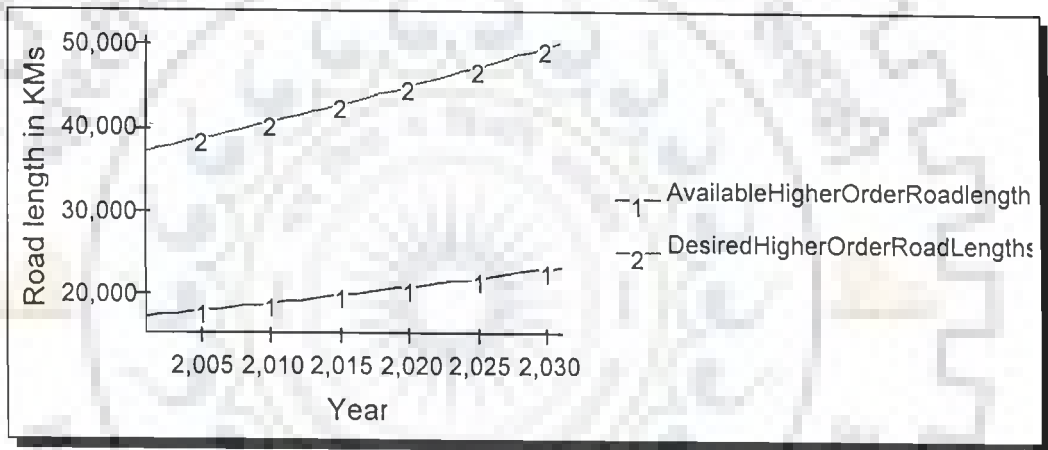
Fig. No. 5.26: Demand and Supply of Total Road Length in the study area
up to 2031 A.D.
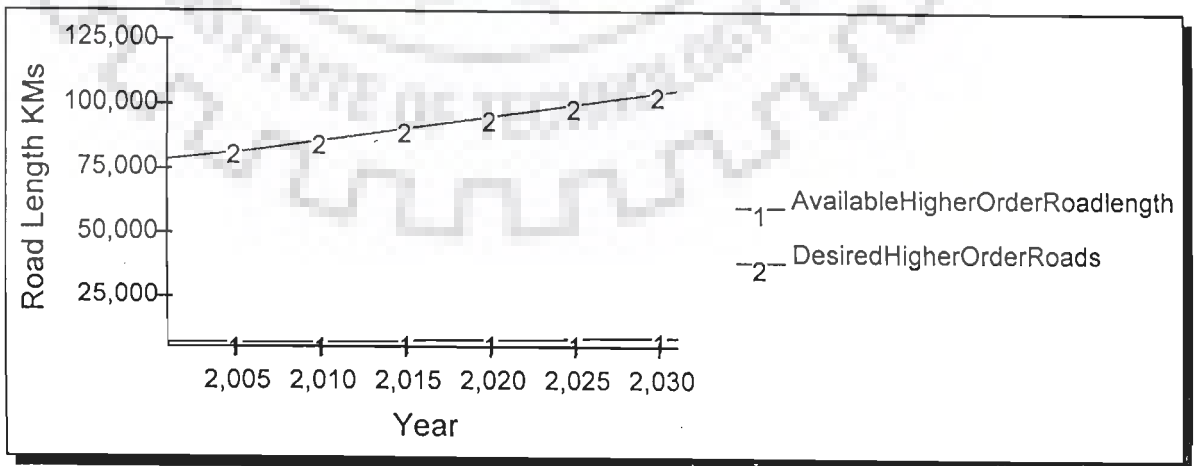
Fig. No. 5.27: Demand and Supply of Higher Road Length in the State
up to 2031 A.D.

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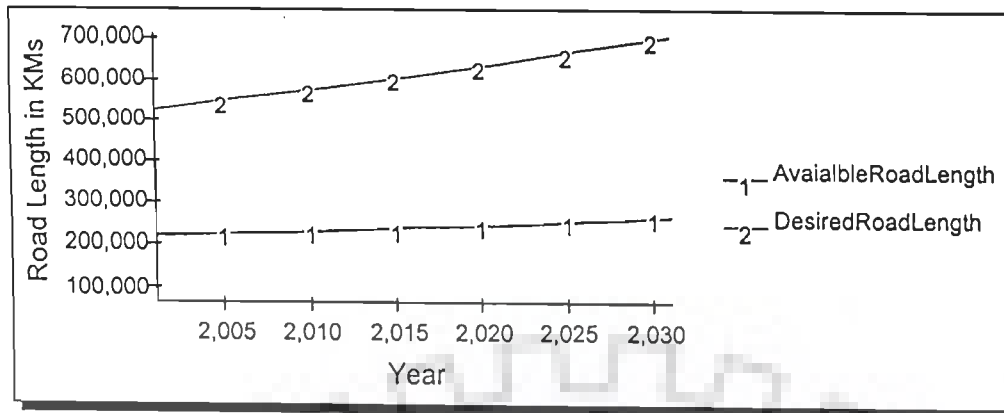
Fig. No. 5.28: Demand and Supply Higher order Road Length in the study area up to 2031
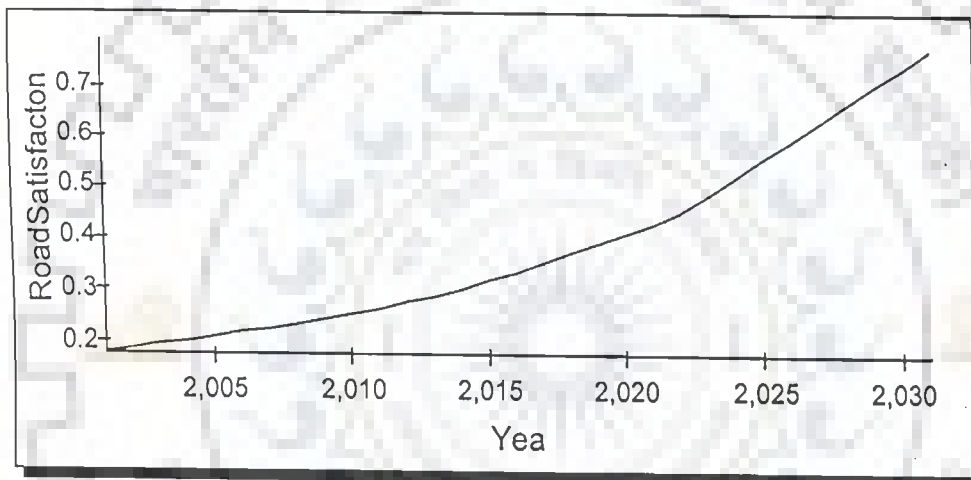
Fig. No. 5.29: Level of Road Satisfaction in the State
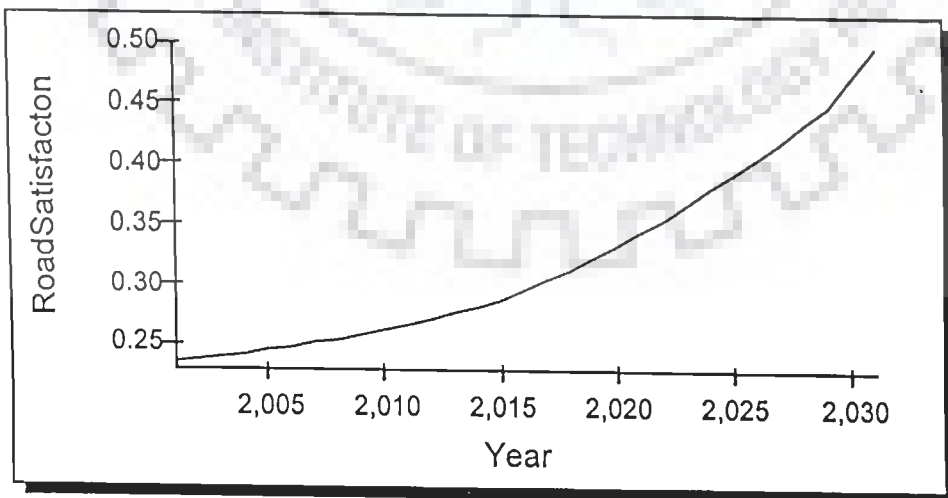
Fig. No. 5.30: Level of Satisfaction in study area

This clearly reflects that the road infrastructure availability in the State as a whole is little better than the study area. The supply of higher order roads are much lesser compared to the demand in both study area and the State.

5.13.3.2. Railway

The projected demand and supply of rail route length in the study area and in Orissa State have been presented in Table No. 5.15 and Fig. Nos.5.31 to 5.34. It is observed that the supply of rail line in the State and in the study area would be 3618 kms and 982 Kms in the year 2031 as against the demand of 6451 Kms and 3023Kms respectively. The level of satisfaction would be 0.185 in the study area and 0.61 in the State. Thus, it is clearly manifested that the level of rail route length infrastructure in the State and in the study area is very poor though the State is marginally better than the study area in this regard.

Table No. 5.15: Projected Rail Line Length and Rail Satisfaction in the study area and in Orissa State up to 2031 A.D.

Sl No	Year	Available (Supply) Rail Line Length Orissa State (Kms)	Desired Rail Line (Demand) Length Orissa State (Kms)	Available (Supply) Rail Line Length Study area (Kms)	Desired (Demand) Rail Line Length Orissa State (Kms)	Railway Satisfaction Orissa State	Railway Satisfaction Study area
1	2001	2384	4405	647	2046	0.57	0.177
2	2006	2556	4694	694	2184	0.58	0.178
3	2011	2740	5002	744	2331	0.58	0.180
4	2016	2937	5331	797	2487	0.59	0.180
5	2021	3148	5681	854	2654	0.59	0.182
6	2026	3375	6054	916	2833	0.60	0.183
7	2031	3618	6451	982	3023	0.61	0.185
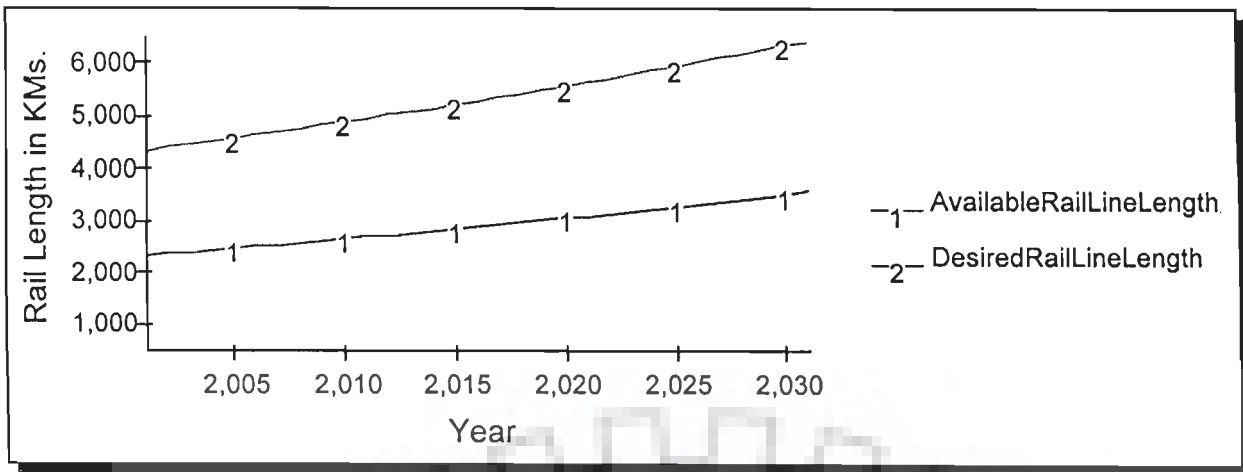
Fig. No. 5.31: Projected Supply and Demand of Rail route length in Orissa State up to 2031 A.D.
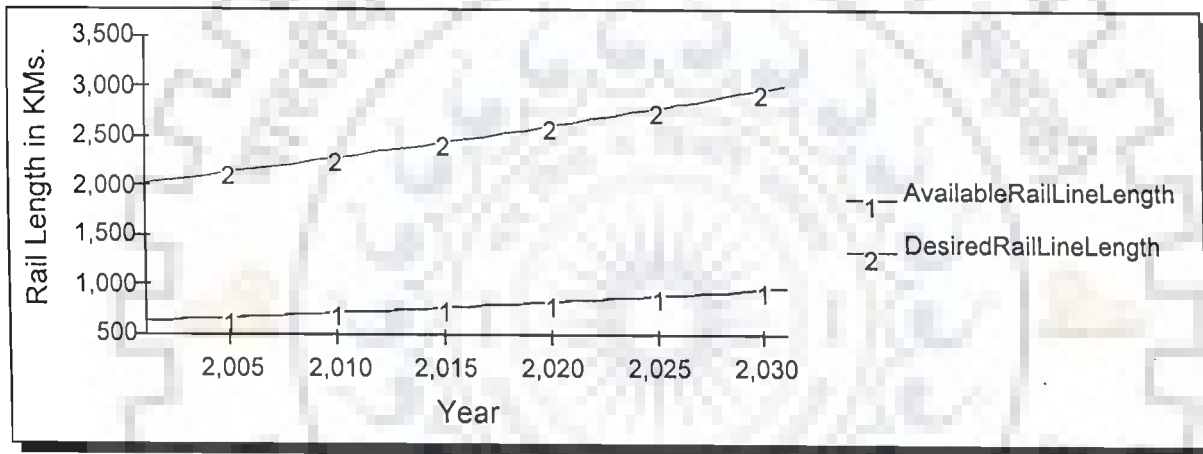
Fig. No. 5.32: Projected supply and Demand of Rail route length in the study area up to 2031 A.D.
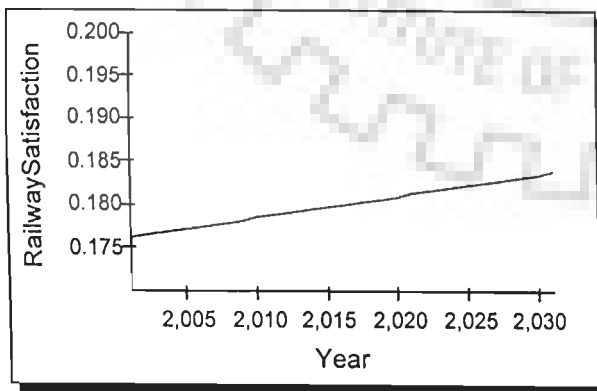
Fig. No. 5.33: Level of Rail route Satisfaction in the study area
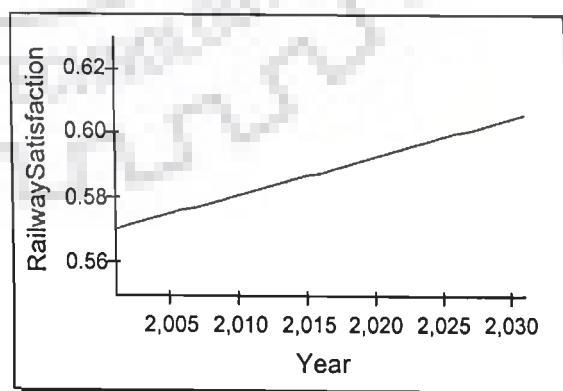
Fig. No. 5.34Level of Rail route Length Satisfaction in Orissa State

5.13.3.3. Accommodation

The demand and supply of accommodation (hotel beds) and level of satisfaction have been presented in Table No. 5.16 and in Fig. Nos. 5.35 and 5.36. It is observed that the supply of hotel bed in affordable and high spending categories would be 45347 and 8002 numbers respectively making a total supply of 53349 numbers in 2031 A.D., in the study area. The demand of hotel beds in the above two categories would be 76967 and 27652 numbers making a total demand of 102610 number of beds in the study area. It is also revealed that the level of satisfaction would decrease from 0.92 to 0.66.

Table No. 5.16: Supply and Demand of Hotel Beds in the study area up to 2031 A.D.

Sl No.	Year	Supply of total Hotel Beds	Demand of total of Hotel Beds	Supply of Affordable Hotel Beds	Demand of Affordable Hotel Beds	Supply of High spending Hotel Beds	Demand of High spending Hotel Beds	Level of Satisfaction
1	2,001	21,979	11,616	18,682	8,712	3,297	2,904	0.92
6	2,006	25,480	16,686	21,658	12,514	3,822	4,171	0.92
11	2,011	29,538	23,969	25,107	17,977	4,431	5,992	0.92
16	2,016	34,243	34,433	29,106	25,825	5,136	8,608	0.92
21	2,021	39,697	49,470	33,742	37,103	5,955	12,368	0.89
26	2,026	46,020	71,170	39,117	53,378	6,903	17,793	0.80
31	2,031	53,349	102,610	45,347	76,957	8,002	25,652	0.66
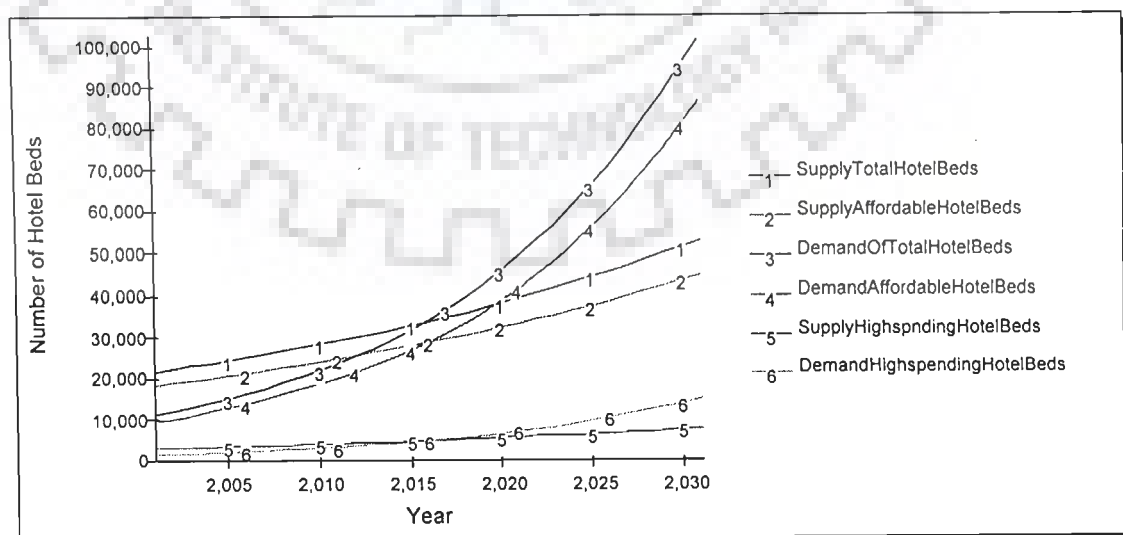
Fig. No. 5.35: Demand and Supply of Hotel Beds in the study area up to 2031 A.D.
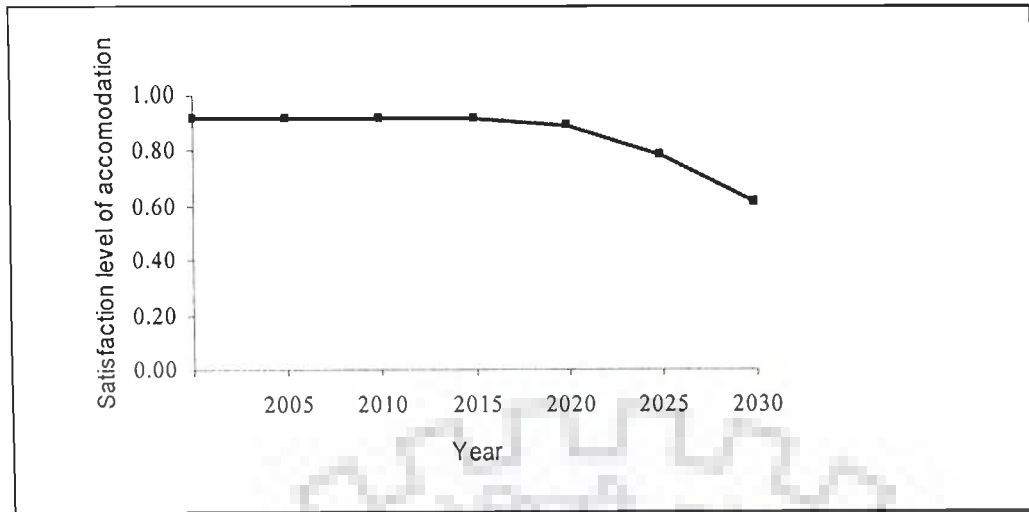
Fig. No. 5.36: Level of Satisfaction of hotel beds in the study area up to 2031 A.D.

5.13.4. Tourist Flow

The flow of tourists in both domestic and foreign categories and total tourist flow are presented in Table No. 5.17 and Fig. Nos.5.37 and 5.38. It is observed from the table and figures that there would be a domestic tourist's flow of 27004974 numbers and foreign tourist flow of 56182 numbers respectively amounting 27061156 numbers of tourists flow in the study area in 2031 A.D.
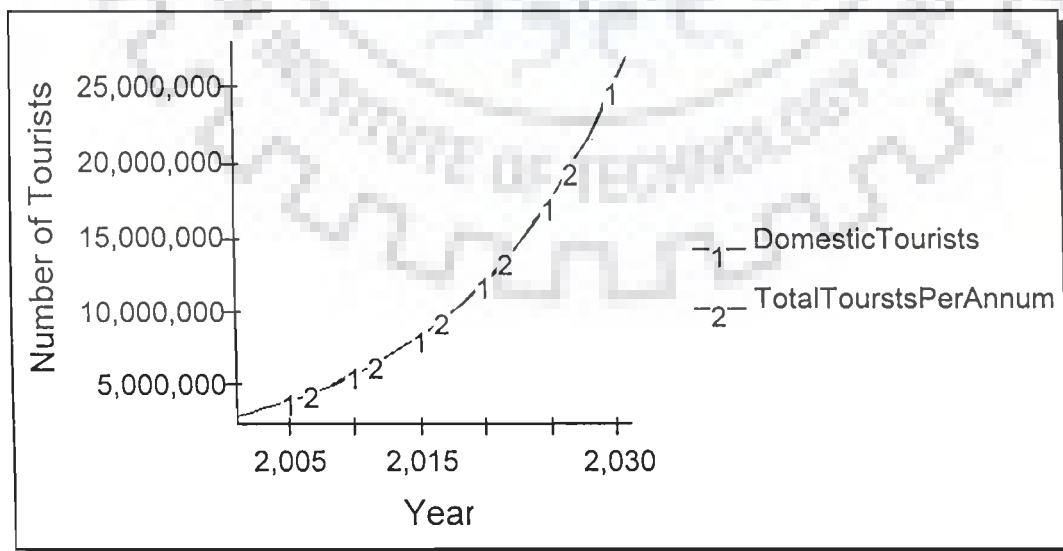
Fig. No. 5.37: Domestic tourists and total tourist flow to the study area up to 2031A.D.
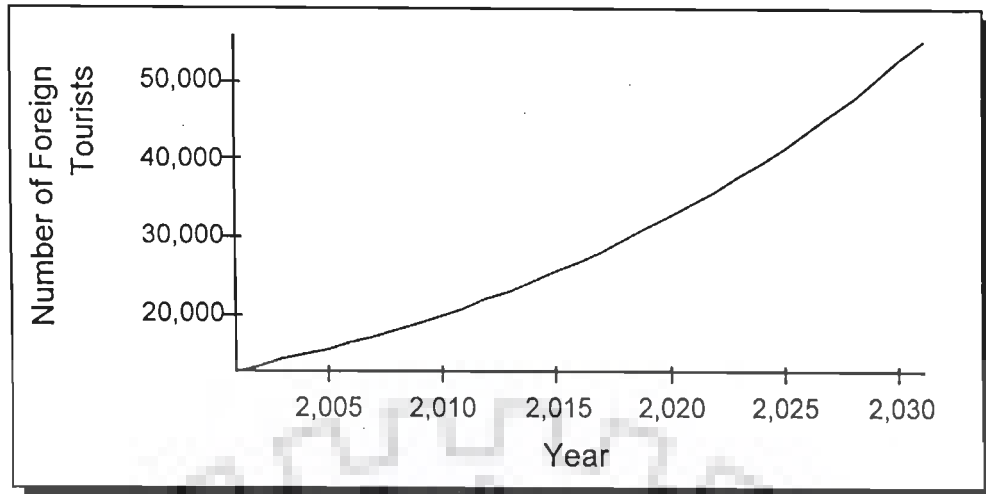
Fig. No. 5.38: Foreign tourists and total tourist flow to the study area up to 2031 A.D.

5.13.5. Annual Tourist Revenue (Receipts from tourist Expenditures)

The annual tourists revenue (receipts from tourists expenditure) in both domestic, foreign categories and total tourist flow in the study area are presented in Table No. 5.17, and Fig Nos 5.39 and 5.40. It is observed from the table and the figures that annual revenue generation from domestic tourists and foreign tourists would be Rs. 68,869,101074.07 and Rs. 521,831816.59 amounting respectively to a total yearly revenue generation of Rs. 69,390,93,2890.66 in the study area in the year 2031 A.D.
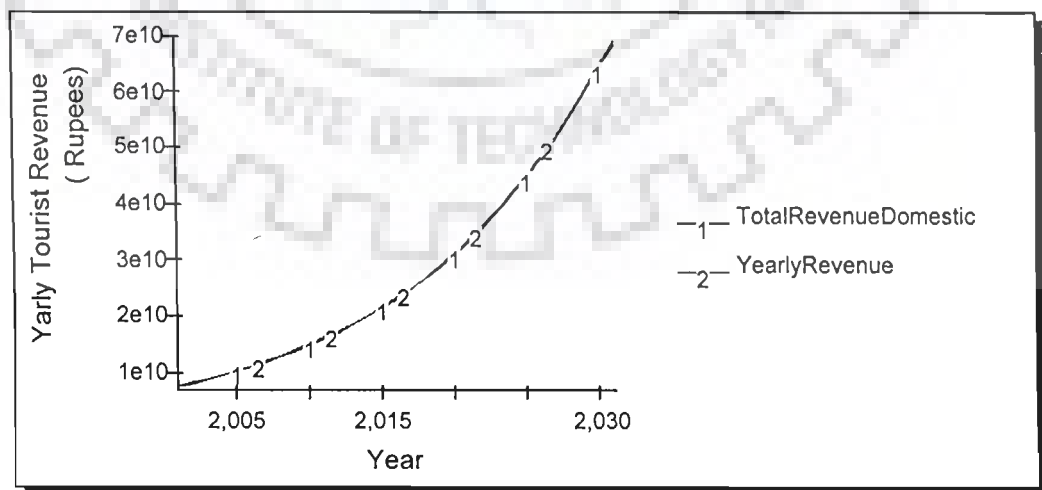
Fig. No. 5.39: Annual total tourists revenue and revenue generation from domestic tourists up to 2031 A.D.
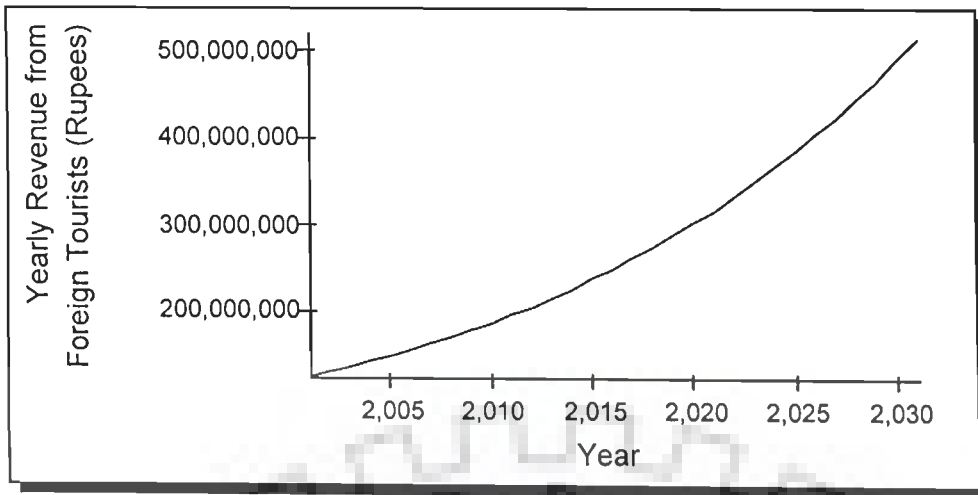
Fig. No. 5.40: Annual revenue generation from foreign tourists up to 2031 A.D.

5.13.6. Employment Generation from Tourism

The employment generations from tourism activities have been presented in Table No. 5.17, and in Fig. No.5.41. The table and the figures reveal that the total employment generation from tourism activities would be 286397 numbers, of which 230098 numbers would be generated through informal sector and 56299 numbers would be generated through organized sector.
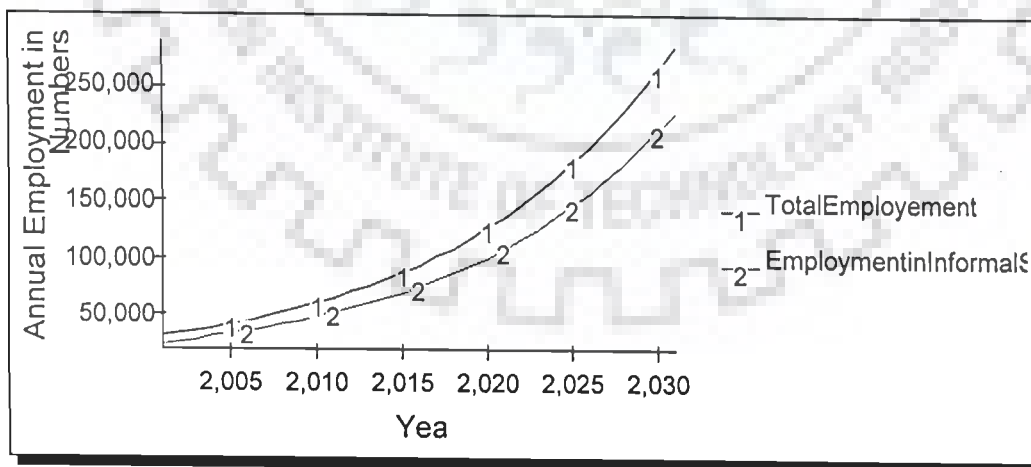
Fig. No. 5.41: Employment generation from tourism activities up to 2031 A.D. due to tourist flow

5.13.7. Environmental Stress

The environmental stress is presented in Table No. 5.17, and in Fig. No. 5.42. It is observed from the table ad the figures that the environmental stress would experience an increase from 0.08 at present to 0.34 in the study area in the year 2031 A.D.
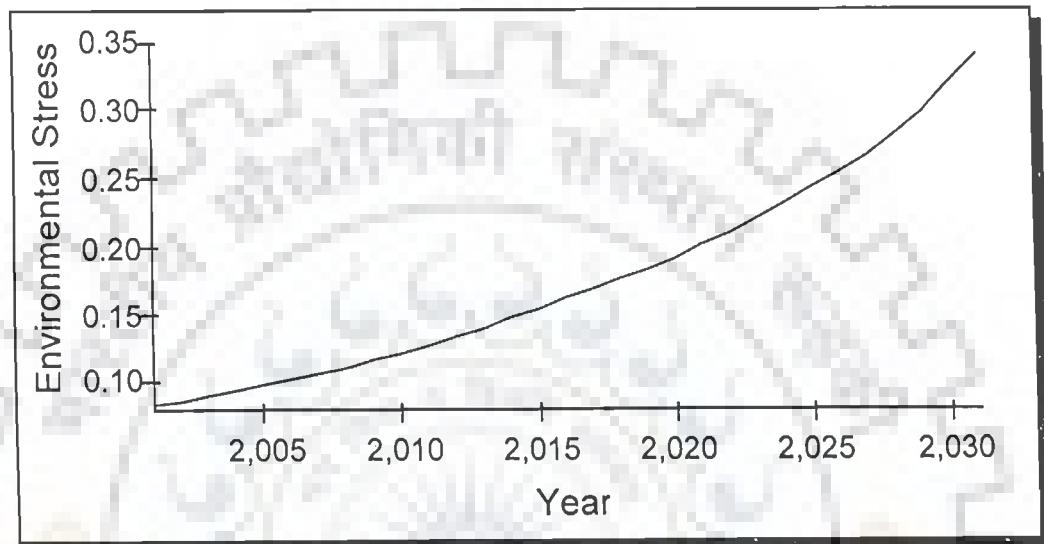
Fig. No. 5.42 Environmental Stress in the study area due to tourist flow up to 2031 A.D.

5.13.8. Tourist Satisfaction

The tourists' satisfaction that would be experienced under the normal circumstances is 0.41 in 2031 A.D.

Table No. 5.17: Projected year Tourist flow, revenue generation, employment, environmental stress and tourist satisfaction up to 2031A.D.

SL. No.	Year	Domestic Tourists Per Annum	Foreign Tourists Per Annum	Total Tourists Per Annum	Total Annual revenue (Receipts) from Domestic tourists (Rs.)	Total Annual revenue (Receipts) from Foreign tourists (Rs.)	Total Annual revenue from Tourism (tourists Receipts) (Rs.)	Total Employ-ment	Employment In Informal Sector	Environ-mental Stress	Tourists Satis-faction
1	2,001	3,084,500	13,220	3,097,720	7,866,215,280.00	122,783,394.00	7,988,998,674.00	32,774	26,219	0.08	0.407
2	2,006	4,428,222	16,807	4,445,029	11,293,029,473.64	156,094,911.65	11,449,124,385.30	47,028	37,623	0.10	0.407
3	2,011	6,357,309	21,360	6,378,669	16,212,664,245.52	198,386,962.22	16,411,051,207.74	67,486	53,989	0.13	0.407
4	2,016	9,126,763	27,142	9,153,905	23,275,436,532.35	252,082,549.61	23,527,519,081.96	96,848	77,479	0.16	0.407
5	2,021	13,102,918	34,482	13,137,400	33,415,585,773.49	320,260,911.29	33,735,846,684.79	138,994	111,195	0.20	0.407
6	2,026	18,834,752	43,839	18,878,591	48,033,137,798.40	407,162,483.20	48,440,300,281.60	199,735	159,788	0.26	0.407
7	2,031	27004974	56182	27061156	68,869,101074.07	521,831816.59	69,390,93,2890.66	286,307	230,098	0.35	0.407

5.13.9. Agricultural Crop Area and Agricultural Production

The projected agricultural crop area and annual crop production in the system up to 2031 A.D. are presented in Table Nos. 5.18, & 5.19, and Fig. Nos. 5.43 to 5.45.

Table No. 5.18: Agricultural crop area and annual agricultural production up to 2031 A.D. under normal conditions

Sl No.	Year	Agricultural Area For Cereal Crops (Hectares)	Agricultural Area For Pulses Crops (Hectares)	Agricultural Area For Commercial Crops (Hectares)	Total Area under Agriculture (Hectares)	Annual Cereal Yield (Tons)	Annual Pulses Yield (Tons)	Annual Commercial Yield (Tons)
1	2,001	1,515,703.00	170,730.00	208,670.00	1805103.00	1,629,811.18	242,737.84	175,423.98
2	2,006	1,470,774.30	165,669.20	202,484.57	1838928.07	1,581,500.07	235,542.56	170,224.04
3	2,011	1,427,177.38	160,758.40	196,482.49	1784418.27	1,534,621.00	228,560.57	165,178.23
4	2,016	1,384,872.77	155,993.18	190,658.33	1731524.28	1,489,131.53	221,785.55	160,281.99
5	2,021	1,343,822.16	151,369.20	185,006.81	1680198.17	1,444,990.47	215,211.35	155,530.89
6	2,026	1,303,988.38	146,882.30	179,522.81	1630393.49	1,402,157.84	208,832.02	150,920.62
7	2,031	1,265,335.35	142,528.39	174,201.36	1582065.10	1,360,594.86	202,641.79	146,447.01

Table No. 5.19: Projected annual agricultural production under enhanced Fertilizer and application of high yield variety seeds

Sl. No.	Year	Annual Actual Cereal Crops production (Tons)	Annual Actual Pulses Crops production (Tons)	Annual Actual Commercial Crops production (Tons)
1	2,001	1,629,811.18	242,737.84	175,423.98
2	2,006	4,001,086.21	309,449.57	416,534.45
3	2,011	5,150,550.90	321,846.43	549,750.14
4	2,016	5,413,397.18	341,703.21	581,152.34
5	2,021	5,389,089.93	367,016.88	579,555.41
6	2,026	5,273,961.79	386,991.87	567,497.67
7	2,031	5,132,250.00	488,985.49	552,354.04

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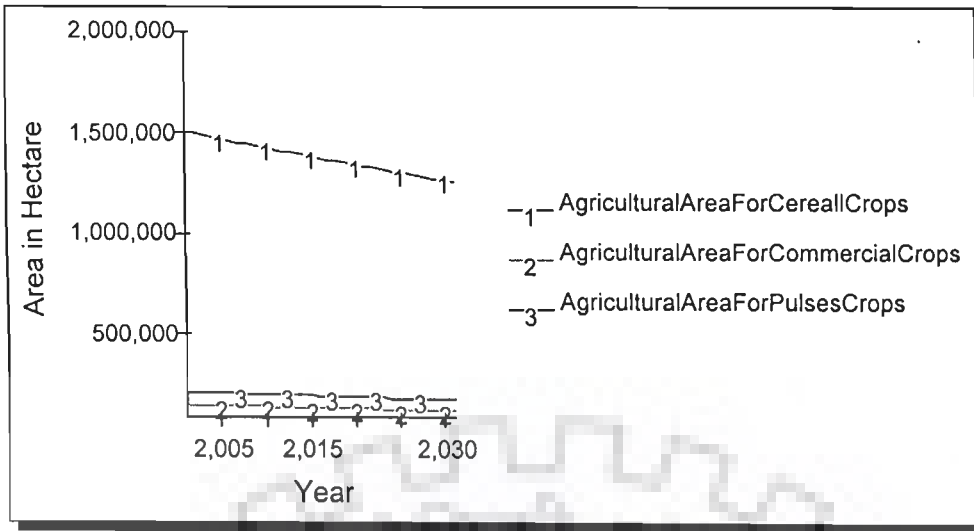
Fig. No. 5.43: Agricultural area up to 2031A.D.
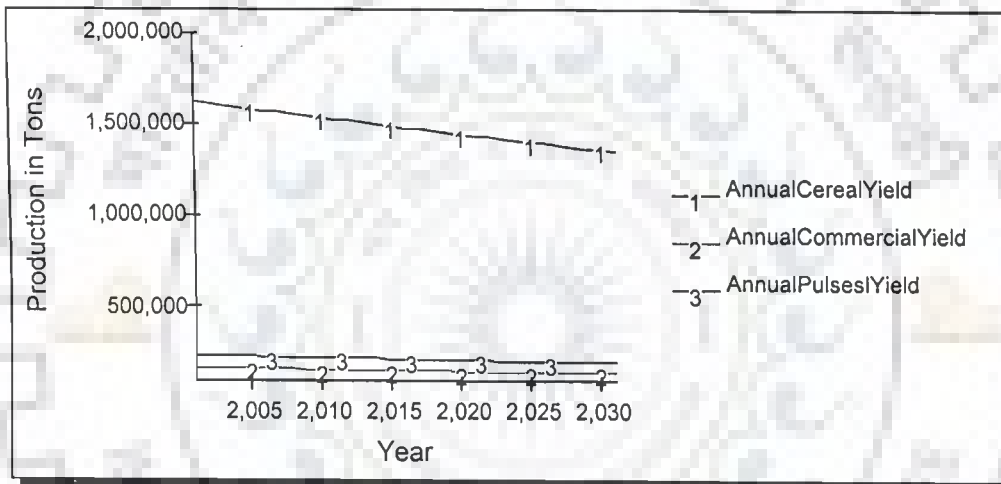
Fig. No. 5.44: Agricultural production in the study area if existing Scenario persists up to 2031 A.D.
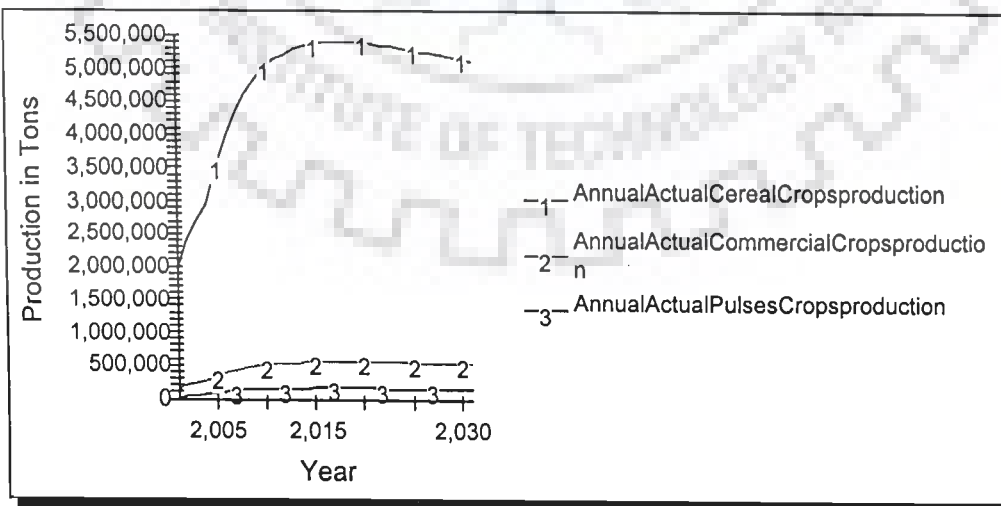
Fig. No. 5.45: Agricultural production in the study area under enhanced conditions (application of more fertilizer and high yielding variety seeds) up to 2031A.D.

The results reveal that the agricultural crop area will follow a decreasing trend in all the categories of crops such as, cereal crops, pulses crops and commercial crops. The projected crop area in cereal crops, pulses crops and commercial crops would be 1,265,335.35 hectares, 142,528.39 hectares and 174,201.36 respectively. Similar trend is also observed in annual crop production all the above three crops. It is found that the projected annual crop production in cereal crops, pulses crops and commercial crops would be 1,360,594.86 tons, 202,641.79 tons and 146,447.01 tons respectively. However, it is observed that the agricultural production would increase considerably in the system by employing enhanced agricultural practices at the farm level, i.e., application of fertilizer twice the quantity of present level and the entire crop area would be under high yielding variety seeds (HYV). Under these conditions, the projected annual crop production of cereal crops, pulses crops and commercial crops would be 5132250.00 tons, 181985.00 tons and 552354.00 tons respectively in 2031 A.D.

5.13.10. Employment Generation in the System

The projected employment generation excluding employment in organized tourism activities, and including employment in organized tourism activities, employment in the informal sector excluding tourism activities and employment in informal sector from tourism activities are presented in Table No. 5.20 and Fig. Nos. 5.46 and 5.47.

The table and figures reveal that the employment excluding organized employment and including organized employment in tourism sector would be 10495019 numbers and 10552280 numbers respectively showing marginal contribution from organized employment from tourism industry to the study area. The employment

generation from informal sector in the study area excluding tourism activities and informal employment in tourism activities would be 57719809 and 41228213 maydays respectively amounting to a total employment generation of 98948022 maydays in the informal sector. Thus, the contribution of tourism activities in the informal sector employment in the study area is Phenomenal.

Table No. 5.20: Employment generation opportunities excluding and including tourism sector in the study area up to 2031 A.D.

Sl No	Year	Total Employment in the study area	Employment in Organized From Tourism	Total Employment Including organized sector in Tourism	Total Employment in Informal Sector	Employment in Informal Sector From Tourism	Total Employment In informal sector Informal
1	2001	6615846	6555	6622401	26724160	4719438	31443598
2	2006	7144717	9415	7154132	30383715	6778960	37162675
3	2011	7715866	13525	7729391	34544401	9738069	44282470
4	2016	8332672	19481	8352154	39274845	14026587	53301432
5	2021	8998786	28208	9026994	44653065	20309842	64962908
6	2026	9718150	41125	9759274	50767769	29609906	80377676
7	2031	10495019	57261	10552280	57719809	41228213	98948022
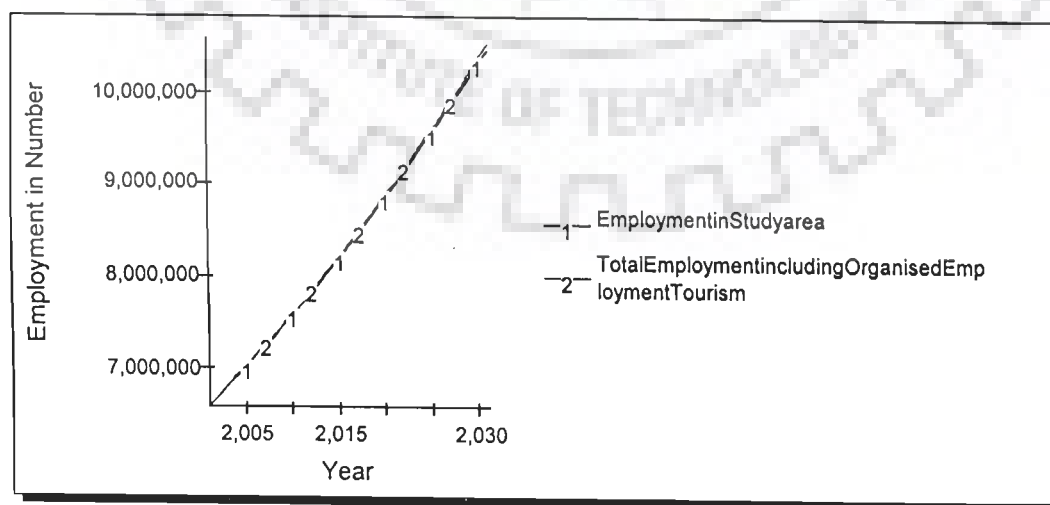
Fig. No. 5.46: Employment excluding organized employment and including organized employment in tourism sector in the study area up to 2031 A.D.

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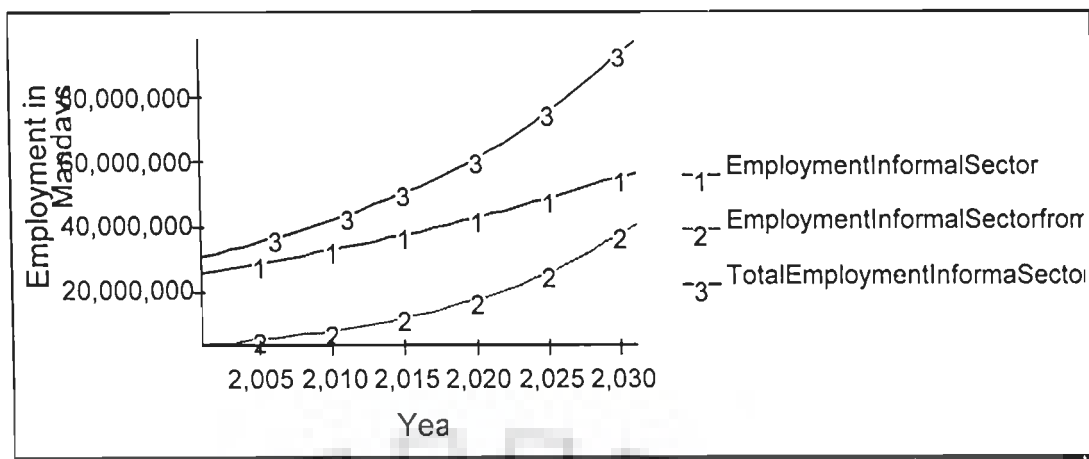
Fig. No. 5.47: Employment in informal sector excluding and including informal sector employment from tourism sector in the study area up to 2031 A.D.

5.13.11. Gross Domestic Product and Per Capita Income

The State Gross Domestic Product both excluding and including contribution from tourism revenue and Per capita income are considered as the indicators of the economic development of the study area. The results of the projected State Gross Domestic Product and Per Capita Income are presented in Table No. 5.21and in Fig. No. 5.48.

Table No. 5.21: Projected Per Capita Gross Domestic Product and Per Capita Income in the study area up to 2031 A.D.

Sl No	Year	Total Per Capita Sate Gross Domestic Product (Rs.)	Per Capita Income (Rs.)	Per Capita Gross Domestic Product excluding Tourism Revenue (Rs.)
1	2,001	6,824.35	5,800.70	6,355.82
2	2,006	7,690.93	6,537.29	7,059.48
3	2,011	8,692.28	7,388.43	7,841.03
4	2,016	9,859.96	8,380.96	8,709.12
5	2,021	11,237.72	9,552.06	9,673.31
6	2,026	12,886.06	10,953.15	10,744.24
7	2,031	14,687.49	12,484.53	11,933.74
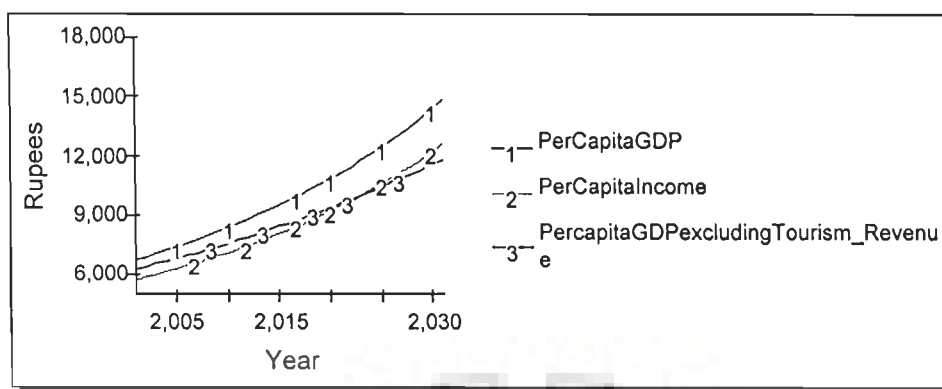
Fig. No. 5.48: Per Capita Gross Domestic Product and Per Capita Income In the study area up to 2031 A.D.

The results reveal that both total State Per Capita Gross Domestic Product and Per Capita Income would experience upward trend. The total State Per Capita Gross Domestic Product including contribution from tourism receipts would be Rs.14687.49 and excluding tourism receipts would be Rs. 11933.74 respectively in the projected year 2031 A.D. The projected Per Capita Income would be Rs. 12484.53 in the system.

5.14. SUMMERY RESULT

The results of the various indicators of development in the system have been summarized and presented in Table No. 5.22. The various indicators considered are total tourist arrival, total annual revenue (total tourist receipts) generation from tourism, per capita State Gross Domestic product, total employment generation opportunities from tourism, employment opportunities in informal sector from tourism, and employment generation opportunities in the informal sector in the system including tourism. The table reveals that the total tourist arrival to the study area and total annual revenue generation from tourism would increase by 773.58 per cent and 768.51 per cent respectively in the projected year 2031 A.D from the base year 2001. The per capita State Gross Domestic product in the system would increase by 115.22 per cent when tourism revenue is included in the State Gross Domestic Product in the projected

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year 2031 A.D., from the base year 2001. The total employment generation opportunities from tourism alone would increase by 777.60 per cent and employment generation in informal sector from tourism alone would increase by 773.58 per cent in the projected year 2031 A.D., from the base year 2001. The total employment generation in informal sector including informal employment from tourism activities would increase by 214.68 per cent from its present status in the projected year 2031 A.D.

5.15.   HYPOTHESIS TESTING

The hypothesis framed in this present investigation, that integrated development brings about sustainable development in the system in which tourism activity functions as a catalyst where considerable amount of potential is available for tourism industrial development, thereby helping the over all development of the system while experiencing growth in itself is tested. It is manifested from the summery result that tourism industry development in the system would help in increasing the per capita State Gross Domestic Product, total employment generation opportunities in tourism sector, employment generation opportunities in informal sector from tourism and total employment generation in informal sector in the system by 115.22 per cent, 777.60 per cent, 773.53 per cent, and 214.68 per cent respectively in the projected year 2031 A.D from their base year 2001 values. Further, it is also observed that the environmental stress occurs due tourism development would be marginal and would be within tolerable limits. At the same time, it is also found that total annual tourist flow and total annual revenue generation from tourism receipts would increase by 773.58 per cent and 768.51 per cent respectively, thereby achieving phenomenal growth by the projected year. Thus, it is observed that tourism development would bring about sustainable development in the system while experiencing phenomenal growth in itself, thereby functioning as a catalyst for development. Therefore, the hypothesis framed in this present investigation is tested and found suitable.

Table No. 5.22: Summery result

Sl No.	Year	Total annual tourist arrival	Per cent increase over year 2001	Total Annual revenue from Tourism (tourists Receipts) (Rs. in Millions)	Per cent increase over year 2001	Total Per Capita Sate Gross Domestic Product (Rs.)	Per cent increase over year 2001	Total employment generation from tourism activities	Per cent increase over year 2001	Total employment generation from tourism activities in informal sector	Per cent increase over year 2001	Employment in informal sector from tourism activities in man days	Per cent increase over year 2001	Total employment generation in informal sector including tourism	Per cent increase over year 2001
1	2,001	3,097,720		7,988.99		6,824.35		32,774		26,219		4719438		31443598	
2	2,006	4,445,029	43.49	11,449.12	43.31	7,690.93	12.70	47,028	43.49	37,623	43.50	6778960	43.64	37162675	18.19
3	2,011	6,378,669	105.91	16,411.05	105.42	8,692.28	27.37	67,486	105.91	53,989	105.92	9738069	106.34	44282470	40.83
4	2,016	9,153,905	195.50	23,527.51	194.50	9,859.96	44.48	96,848	195.50	77,479	195.51	14026587	197.21	53301432	69.51
5	2,021	13,137,400	324.10	33,735.84	322.28	11,237.72	64.67	138,994	324.10	111,195	324.10	20309842	330.34	64962908	106.60
6	2,026	18,878,591	509.44	48,440.30	506.34	12,886.06	88.82	199,735	509.43	159,788	509.44	29609906	527.40	80377676	155.62
7	2,031	27,061,156	773.58	69,390.93	768.51	14,687.49	115.22	286,307	773.58	230,098	777.60	41228213	773.58	98948022	214.68

5.16. SCENARIOS

A set of plausible policy runs are made and scenarios are generated based on the prevailing trend in the system, Government policies and priorities, aspirations of local people and tourists as well as expert opinions in order to arrive at plausible decisions. The following control parameters are considered for developing the scenarios. They are:

1. Increase of road length
2. Increase of Rail Route Length
3. Increase of Hotel Beds
4. Increase of Investment in tourism development
5. Increase in handicraft activity
6. Increase in Commercial crop activity

A good number of policy runs are made and scenarios are generated by considering these above parameters individually and in combination. The detail results of all the scenario generated are presented in Appendix -4. It is observed that enhancement of individual parameters except railways alone do not influence tourism development and social and economic capital of the system very much. A combination of different parameters is also tried and the scenarios are generated. It is reflected in a few scenarios have given almost same results without much variations as that of the other combinations of parameters with lower growth rate. Therefore, non-influential scenarios are neglected and the scenarios, which influence the system highly, are considered and tested. The scenarios, which are tested with their values, are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g). The most important tested scenarios and their results are presented as follows:

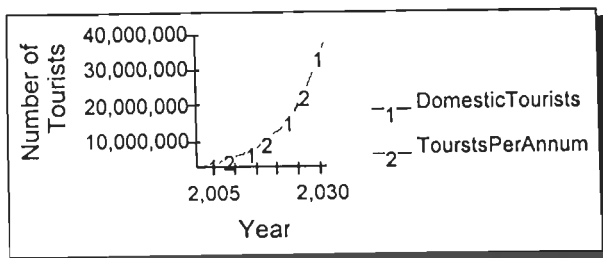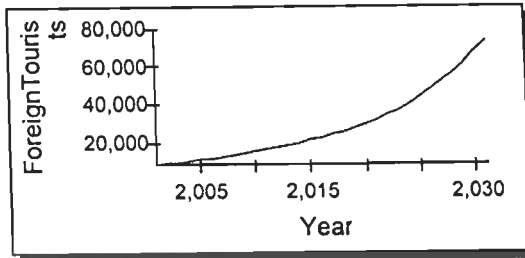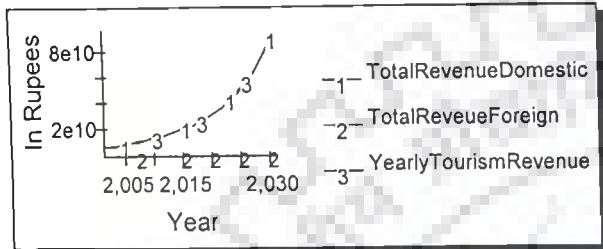### 5.16.1: Scenario 1: Increase of Rail Route Length Growth rate from 1.40 per cent to 3.00 per cent

It has been observed rail is one of the most important parameters, which has higher demand and influence the tourism development and other economic and social functions in the study area. As already pointed out there would be a huge gap between the demand and the supply of rail lengths by 2031 A.D in the system. Therefore, an attempt has been made to understand functions of the system by enhancing the rail route length growth rate from 1.40 per cent to 3.00 per cent alone. The model results are presented in Table Nos-5.23 (a) to 5.23 (g) and in Fig. Nos. 5.49 (a) to 5.49 (h)

It is observed that domestic tourist flow would be 284667245 numbers and foreign tourist flow would be 58638 numbers amounting to a total tourist flow of 28525885. The domestic tourist flow and foreign tourist flow in the study area would increase by 5.41 per cent and 4.37 per cent respectively and total tourist flow would increase by 5.41 per cent over the base result. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs. 72598.30 million and Rs. 544.60 million amounting to a total of Rs. 73142.90 millions. The total annual tourist receipts would increase by 5.41 per cent over the projected year (2031 A.D.) result. The per capita Gross Domestic Product would be Rs. 14836.00, which would be higher than the projected year (2031 A.D.) result by 1.01 per cent. The employment in tourism sector would increase to 301803 numbers, which is in excess of projected year (2031 A.D.) value by 5.41 per cent. It would generate an employment of 43459736 man days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) by 5.41 per cent. The increase in tourists would require accommodation facilities of 106972 hotel beds in the study area. At the same time, the environmental stress would be 0.37 and tourist satisfaction level would be 0.43, which

are marginally higher than the projected year (2031 A.D.) result. This shows that rail route length growth plays a major role in the system.

5.16.2: Scenario 2: Increase of Rail Route Length Growth rate from 1.40 per cent to 5.00 per cent

An increase of rail route length growth rate to five per cent in the projected year model, 2031 A.D. was tested by keeping all other parameters constant and the results are presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and in Fig. Nos. 5.50 (a) to 5.50 (h).
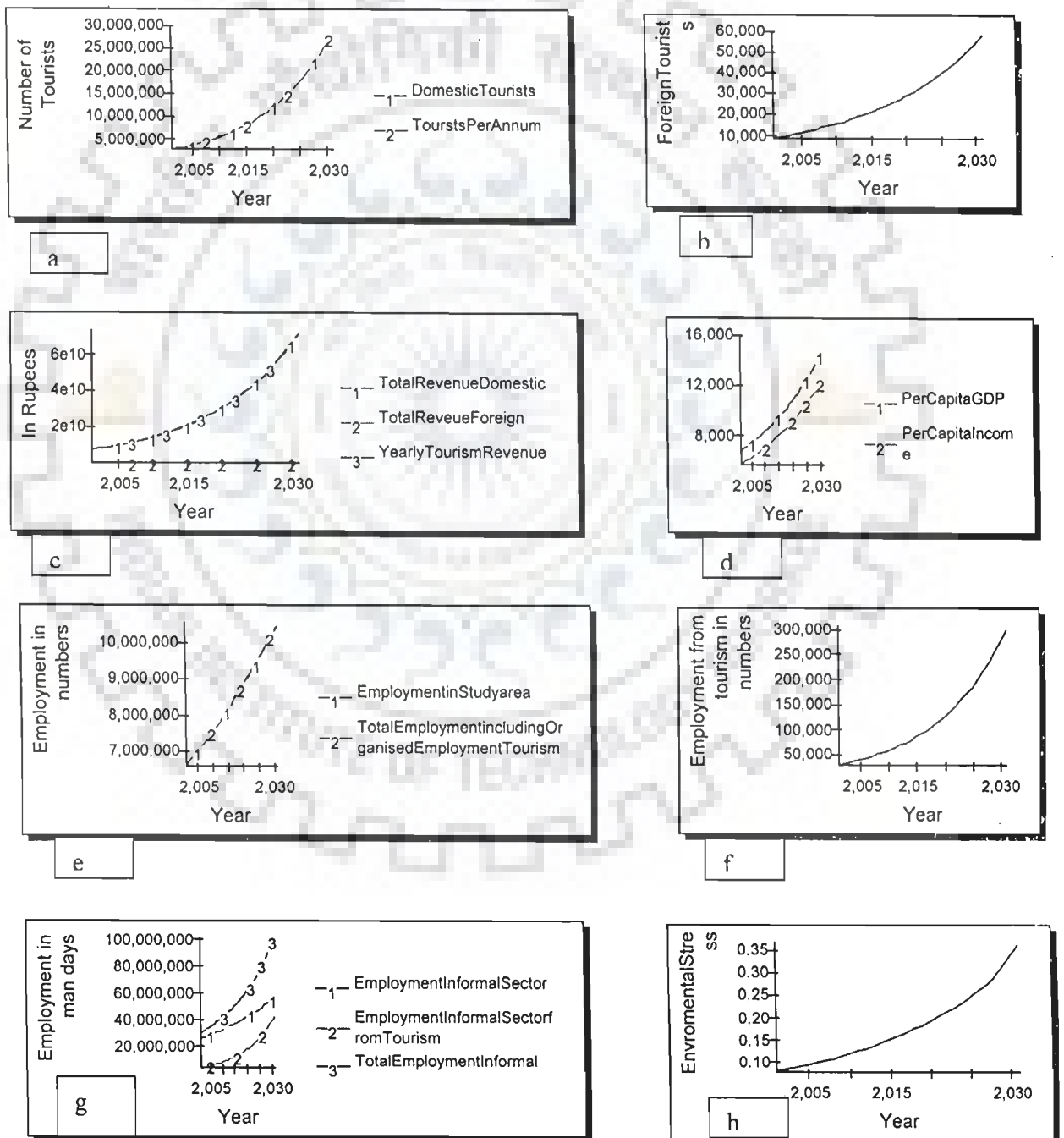
Fig. No. 5.49 (a to h): Scenario 1: Increase of Rail Route Length Growth rate from 1.40 per cent to 3.00 per
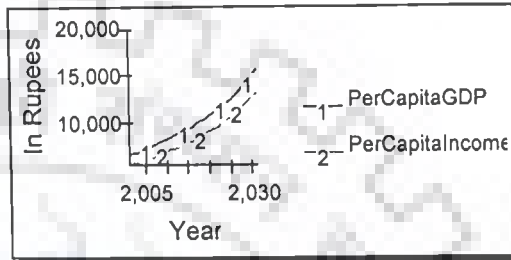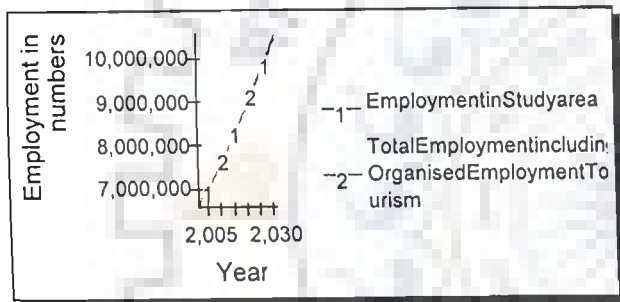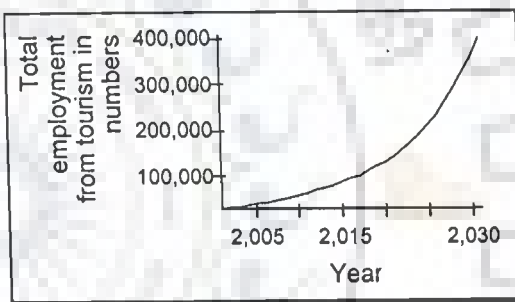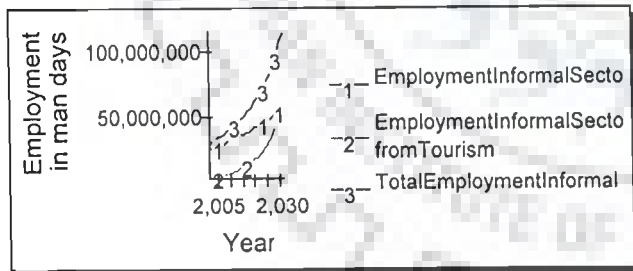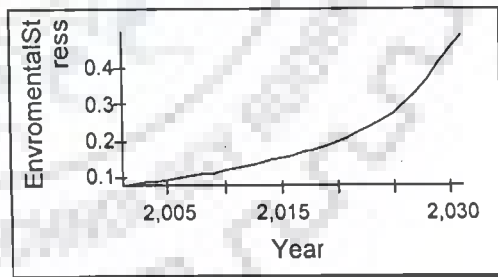
Fig. No. 5.50 (a to h): Scenario 2 (Increase of Rail Route Length Growth rate from 1.40 per cent to 5.00 per cent)

This increase in rail route length growth rate would result domestic tourist flow of 38049303 numbers and foreign tourist flow would be 74232 numbers amounting to a total tourist flow of 38119536. The domestic tourist flow and foreign tourist flow to the study area would increase by 40.89 per cent and 32.12 per cent respectively and total tourist flow would increase by 40.81 per cent over the projected year (2031 A.D.) result. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs. 97024.60 million and Rs. 689.40 million amounting to a total of Rs. 97714.10 millions which is in excess of the projected year (2031 A.D.) by 40.81 per cent. The per capita Gross Domestic Product would be Rs. 15811, which would be higher than the projected year (2031 A.D.) result by 7.65 per cent. The employment in tourism sector would increase to 403304 numbers, which would increase by 40.86 per cent over projected year (2031 A.D.) results. It would generate an employment of 58075876 man days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 40.86 per cent. The increase in tourists would require accommodation facilities of 142948 hotel beds in the study area. At the same time, the environmental stress would be 0.49 and the level of tourist satisfaction would be 0.45, which are marginally higher than the projected year (2031 A.D.) result. This shows that a higher rail route length growth would influence the system highly economically, socially and environmentally.

5.16.3: Scenario 3: Increase of Road Length Growth rate from 1.00 per cent to 2.00 per cent and Rail route length Growth rate from 1.40 per cent to 3.0 per cent

A composite scenario has been tried with a road length growth rate from 1.00per cent to 2.00 per cent and rail route length growth rate from 1.40 per cent to 3.00 per cent and tested in the projected year model; as it is found earlier both rail and road form the most influential infrastructural requirements for tourism development and for over all development of the study area. The results of the scenario are presented in Table Nos. 5.23

(a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and in Fig. Nos.51 (a) to 5.51 (h).

It has been observed that it would generate a domestic tourist flow of 31705065 numbers and foreign tourist flow would be 77300 numbers amounting to a total tourist flow of 31782366. The domestic tourist flow and foreign tourist flow to the study area would increase by 17.40 per cent and 37.58 per cent respectively and total tourist flow would increase by 17.45 per cent over the projected year (2031 A.D.) result. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs. 80855.50 million and Rs. 717.90 million respectively amounting to a total of Rs. 81378.40 millions, which is in excess of the projected year (2031 A.D.) by 17.27 per cent. The per capita Gross Domestic Product would be Rs. 15171.00, which would be higher than the projected year (2031 A.D.) result by 3.29 per cent. The employment in tourism sector would increase to 336257 numbers, which would increase by 17.44 per cent over the projected year (2031 A.D.) results. It would generate an employment of 48421070 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 17.44 per cent. The increase in tourists would require accommodation facilities of 119183 hotel beds in the study area. At the same time, the environmental stress would increase to 0.41 and the level of tourist satisfaction would be higher (0.48), than the projected year (2031 A.D.) result. This shows that a higher growth rate in both rail and road would influence the system highly.

5.16.4: Scenario 4: Increase of Road Length Growth rate from 1.00 per cent to 2.00 per cent and Rail route length Growth from 1.40 per cent rate to 5.0 per cent

A composite scenario has been tried with the same road length growth rate of 2.00 per cent and a higher rail route length growth rate of 5.00 per cent and tested in the projected year model; to understand the influence of such a scenario in the study area and

the results of the scenario is presented in Table No. 5.23 (a), 5.23(b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and in Fig. Nos. 5.52 (a) to 5.52 (h)

It has been observed that this combination would generate a domestic tourist flow of 42985194 numbers and foreign tourist flow would be 98664 numbers respectively, amounting to a total tourist flow of 43080407. The domestic tourist flow and foreign tourist flow to the study area would increase by 59.16 per cent and 75.61 per cent respectively and total tourist flow would increase by 59.21 per cent over the projected year (2031 A.D.), which is quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.103613.70 million and Rs. 916.30 million respectively amounting to a total of Rs.110530.10 millions which is in excess of the projected year (2031 A.D.) by 59.33 per cent. The per capita Gross Domestic Product would be Rs. 16320.00, which would be higher than the projected year (2031 A.D.) result by 11.11 per cent. The employment in tourism sector would increase to 455790 numbers, which would increase by 59.19 per cent over projected year (2031 A.D.) results. It would generate an employment of 65633282 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 59.19 per cent. These results also show that this scenario would generate employment opportunities in informal sector from tourism more than other informal sector employment in the study area. The increase in tourists would require accommodation facilities of 161511 hotel beds in the study area. At the same time, the environmental stress would increase significantly to 0.54 and the level of tourist satisfaction also increases to 0.50. This shows that a higher growth rate in rail in composite growth of infrastructures more influential than other growth in other parameters.

5.16.5: Scenario 5: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth from 1.40 per cent rate to 2.00 per cent and investment of 10.0 per cent in tourism development

It is observed that the investment in the tourism development in the system is very meager. It is also observed in the enhancement of investment alone does not influence tourism development. Therefore, a composite scenario with enhancement of investment along with enhancement of rail and road infrastructure is attempted to understand their influence in the study area and tested in the projected year model, and results are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. Nos. 5.53 (a) to 5.53 (h)

It has been observed that this combination of road growth rate of 5.00 per cent, rail growth rate of 2.0 per cent and investment of 10.00 per cent in tourism development would result a domestic tourist flow of 31757556 numbers and foreign tourist flow would be 116570 numbers respectively amounting to a total tourist flow of 31874126. The domestic tourist flow and foreign tourist flow to the study area would increase by 17.59 per cent and 107.48 per cent respectively and total tourist flow would increase by 17.78 per cent over the projected year (2031 A.D.) result, which is quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.80989.30 million and Rs. 1082.60 million respectively amounting to a total of Rs.82072.00 millions which is in excess of the projected year (2031 A.D.) by 18.27 per cent. The per capita Gross Domestic Product would be Rs. 15191.00, which would be higher than the projected year (2031 A.D.) by 3.43 per cent. The employment in tourism sector would increase to 337228 numbers, which would increase by 17.79 per cent over projected year (2031 A.D.) results. It would generate an employment of 48560868 man-days from informal sector from tourism alone, which is higher than the base value by 17.79 per cent.
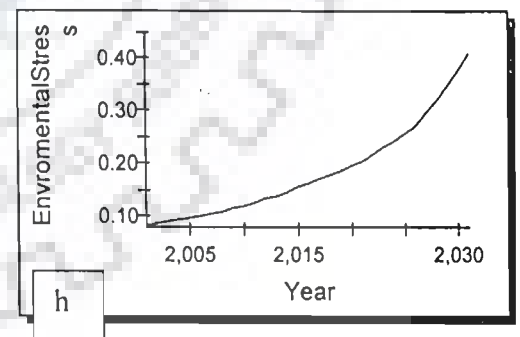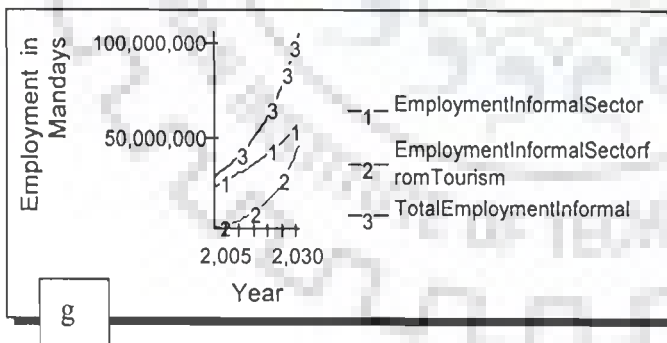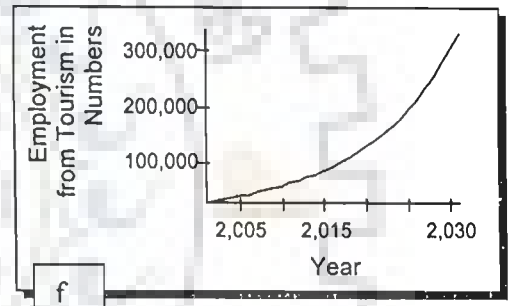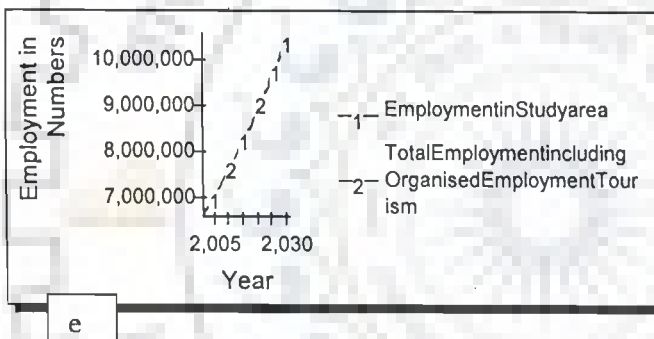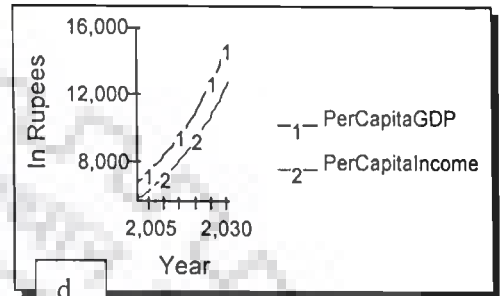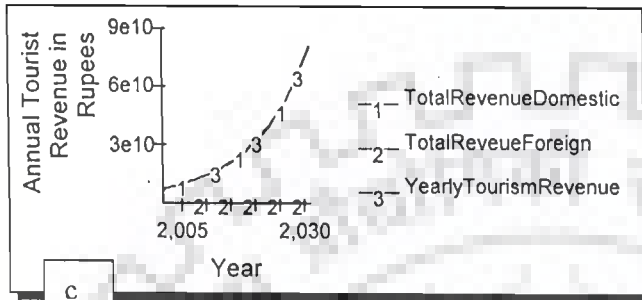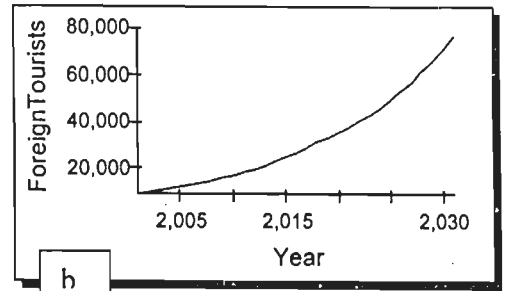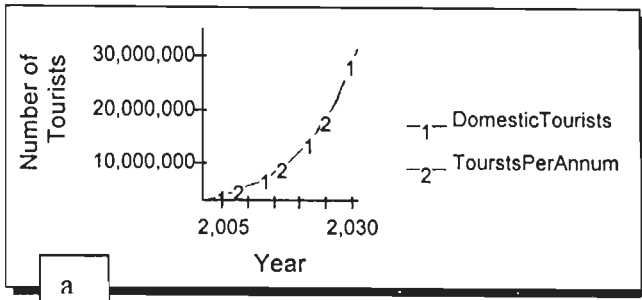
Fig. No. 5.51: Scenario 3- Increase of Road Length Growth rate from 1.00 per cent to 2.00 per cent and Rail route length Growth rate from 1.40 per cent to 3.0 per cent
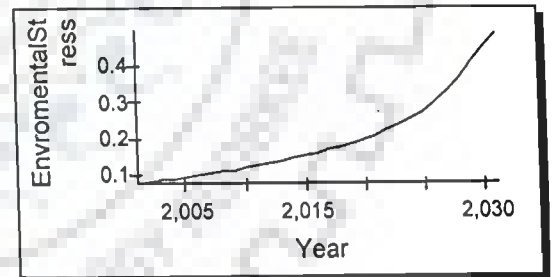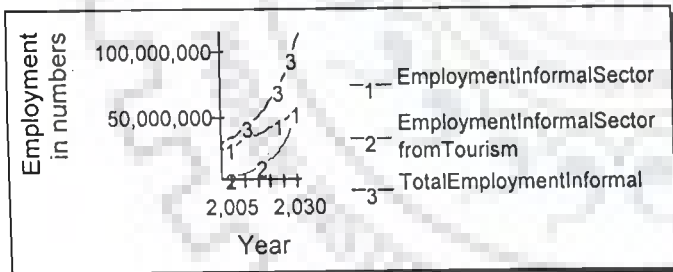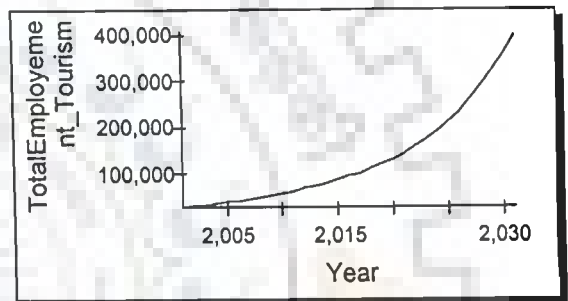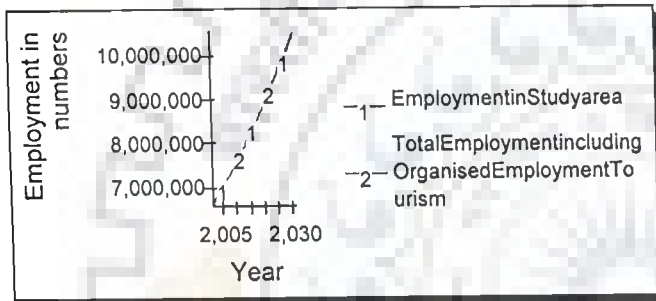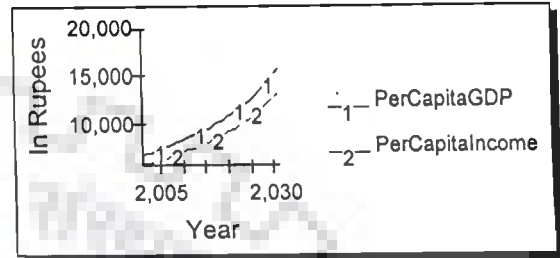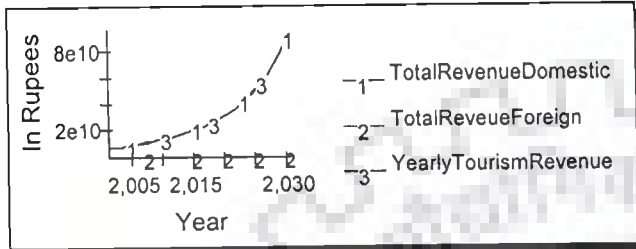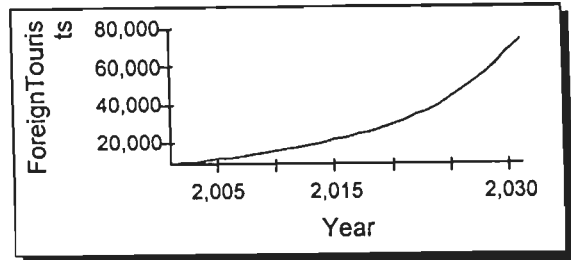
Fig. No. 5.52: Scenario 4- Increase of Road Length Growth rate from 1.00 per cent to 2.00 per cent and Rail route length Growth from 1.40 per cent rate to 5.0 per cent
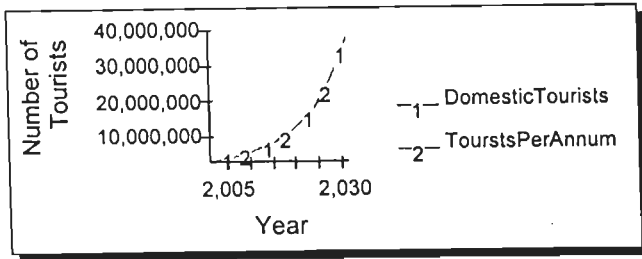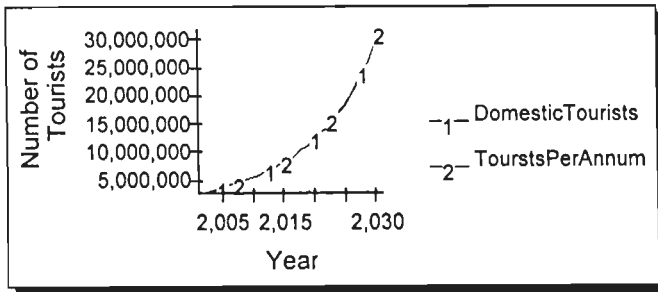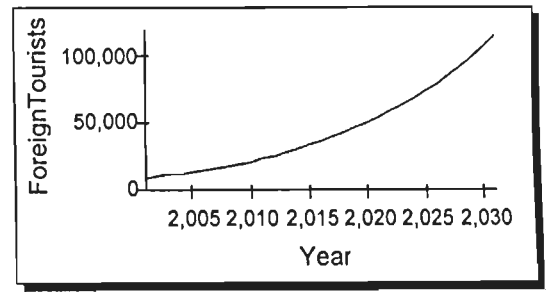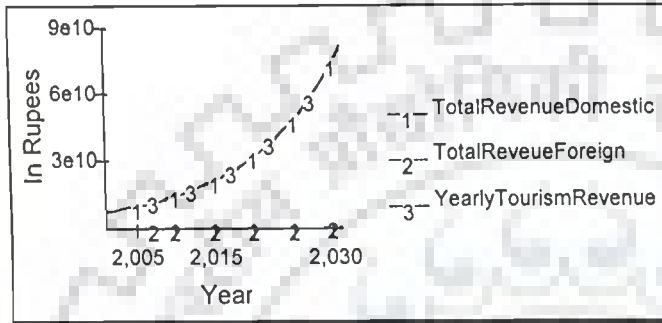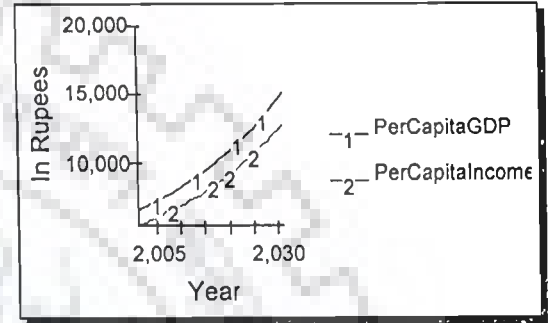
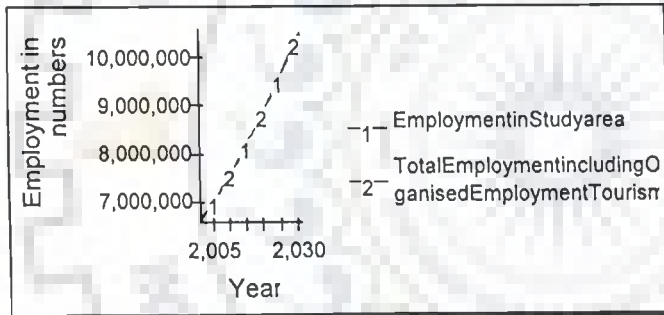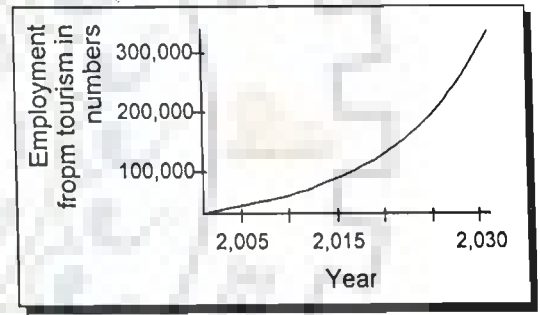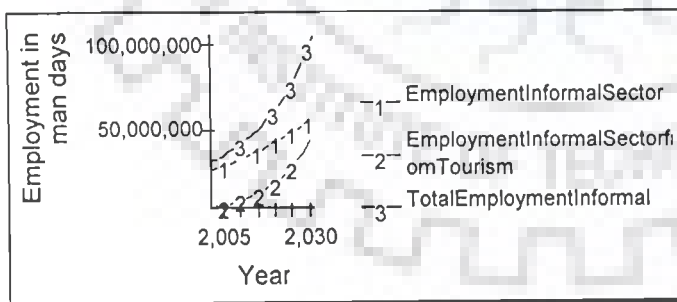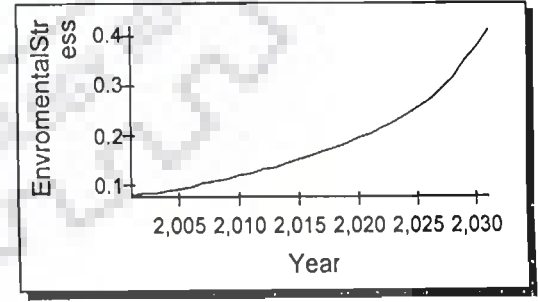Fig. No. 5.53: Scenario 5- Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth from 1.40 per cent rate to 2.00 per cent and investment of 10.0 per cent in tourism development

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The increase in tourists would require accommodation facilities of 119527 hotel beds in the study area. At the same time, the environmental stress would increase to 0.41 and tourist satisfaction also increases to 0.75. This shows that an investment of 10.00 would not influence the functions of the system to a higher extent unless there is higher growth rate in road and rail infrastructural development. However, it would result a substantial increase in tourist satisfaction.

5.16.6: Scenario 6: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth rate from 1.40 per cent to 5.00 per cent and investment of 10.0 per cent in tourism development

Since rail route length growth found to influence the system to a higher extent, a composite scenario with enhanced rail route length growth rate of 5.00 per cent along with of investment in tourism development of 10.00 per cent, and road length growth rate of 5.0 is attempted to understand their influence in the study area and tested in the projected year model, and results are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. Nos.5.54 (a) to 5.54 (h). It is found that the scenario would result a domestic tourist flow of 43105389 numbers and foreign tourist flow would be 185875 numbers respectively amounting to a total tourist flow of 43291264. The domestic tourist flow and foreign tourist flow to the study area would increase by 59.62 per cent and 230.84 per cent respectively and total tourist flow would increase by 59.97 per cent over the projected year (2031 A.D.) result, which is quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.109929.00 million and Rs. 1726.00 million respectively amounting to a total of Rs.111655.00 millions which is in excess of the projected year (2031 A.D.) by 60.90 per cent. The per capita Gross Domestic Product would be Rs. 16365.00, which would be higher than the projected year

(2031 A.D.) result by 11.42 per cent. The employment in tourism sector would increase to 338016 numbers, which would increase by 59.97 per cent over projected year (2031 A.D.) results. It would generate an employment of 65955107 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 59.97 per cent. The increase in tourists would require accommodation facilities of 162342 hotel beds in the study area. At the same time, the environmental stress would increase to 0.54 and level of tourist satisfaction also increases to 0.77. This shows that an investment higher rail and road growth rate along with high substantial investment in tourism development would influence the functions of the study area immensely leading to higher economic development and tourist satisfaction though environmental stress also increase along with them.

5.16.7: Scenario 7: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent and Rail route length Growth rate from 1.40 per cent to 5.00 per cent and investment of 20.0 per cent in tourism development

Investment is an important parameter, which influence the functions of the system, Understanding this, a scenario is attempted with high growth rate of road length, rail line length and a high investment of 20 per cent total tourism revenue in tourism development and tested I the projected year model and the results are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig Nos- Fig. No. 5.55 (a) to 5.55 (h).

It is observed that this scenario would result a domestic tourist flow of 43294271 numbers and foreign tourist flow would be 318429 numbers respectively amounting to a total tourist flow of 43612700. The domestic tourist flow and foreign tourist flow to the study area would increase by 60.31 per cent and 466.78 per cent respectively and total tourist flow would increase by 61.16 per cent over the projected year (2031 A.D.) result,

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which is quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.110410.70 million and Rs. 2957.40 million respectively amounting to a total of Rs.111998.10 millions which is in excess of the projected year (2031 A.D.) by 61.40 per cent. The per capita Gross Domestic Product would be Rs. 16433.00, which would be higher than the projected year (2031 A.D.) result by 11.88 per cent. The employment in tourism sector would increase to 461422 numbers, which would increase by 61.16 per cent over projected year results. It would generate an employment of 6644821 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 61.16 per cent. The increase in tourists would require accommodation facilities of 163547 hotel beds in the study area. At the same time, the environmental stress would increase to 0.55 and level of tourist satisfaction also increases to 0.77. This shows a higher investment in tourism development along with higher rail and road growth rate would not influence the functions in the study area in comparison with a scenario with higher rail and road growth rate and lower investment. However, this scenario would increase the foreign tourist flow more than twice of that of earlier scenario (Scenario-6).

5.16.8: Scenario 8: Increase of Road Length Growth rate from 1.00 per cent to 10.0 per cent and Rail route length form 1.40 Growth rate to 5.00 per cent and investment of 10.0 per cent in tourism development

A scenario is attempted with a further increase inroad length growth rate to 10.00 per cent keeping the rail route length growth rate to 5.00 per cent and investment of 10.00 per cent of total tourism revenue generation and tested to the their influence the functions of the study area is observed. The results of the tested scenario are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. Nos. 5.56 (a) to 5.56 (h).

It is observed that this scenario would result a domestic tourist flow of 52826630 numbers and foreign tourist flow would be 389023 numbers respectively, amounting to a total tourist flow of 53215653. The domestic tourist flow and foreign tourist flow to the study area would increase by 95.61 per cent and 592.43 per cent respectively and total tourist flow would increase by 96.64 per cent over the projected year (2031 A.D.) result, which is quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.134720.50 million and Rs. 3613.10 million respectively amounting to a total of Rs.138338.60 millions which is in excess of the projected year (2031 A.D.) by 99.36 per cent. The per capita Gross Domestic Product would be Rs. 17424.00, which would be higher than the projected year (2031 A.D.) result by 18.35 per cent. The employment in tourism sector would increase to 563021 numbers, which would increase by 96.64 per cent over projected year (2031 A.D.) results. It would generate an employment of 81075112 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 96.64 per cent. The increase in tourists would require accommodation facilities of 199558 hotel beds in the study area. At the same time, the environmental stress would increase to 0.63 and level of tourist satisfaction also increases to 0.89. This shows that such a scenario with very high growth rate in road sector along with enhance rail route length and investment would influence the functions in the study area considerably. However, it is also observed that, this scenario while bringing a very high tourist satisfaction would also result in higher environmental stress.
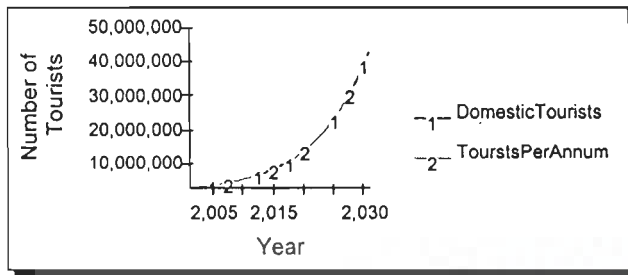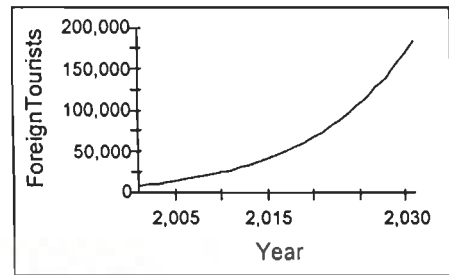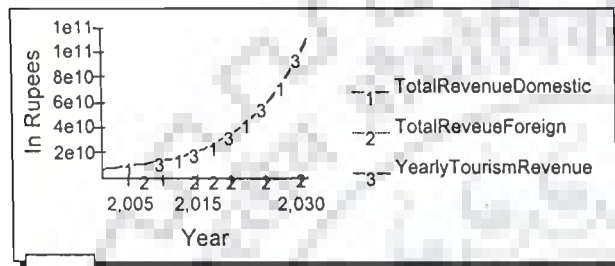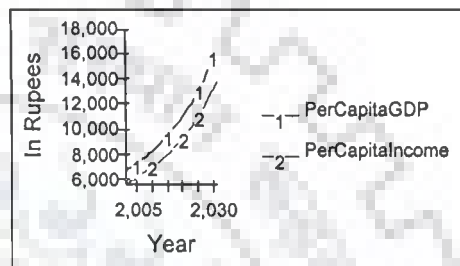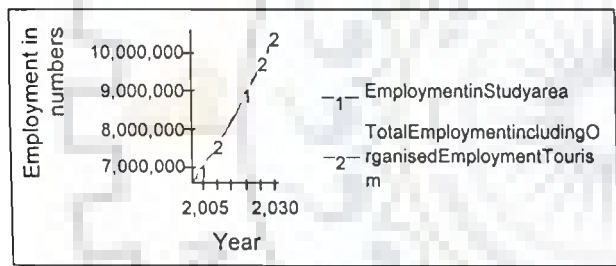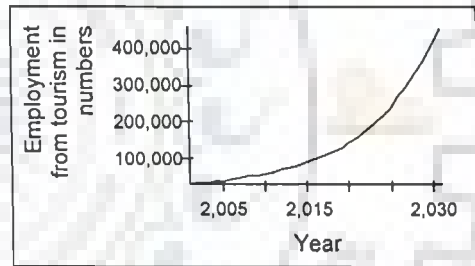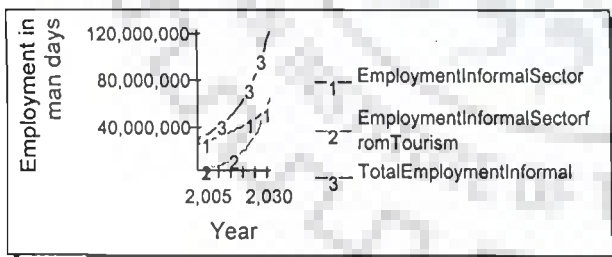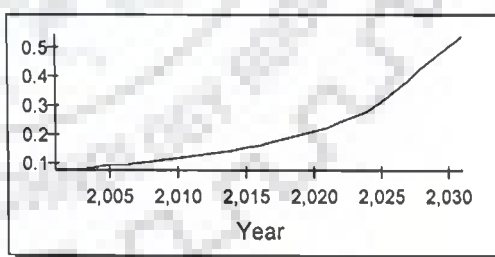
Fig. No. 5.54: Scenario 6: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth rate from 1.40 per cent to 5.00 per cent and investment of 10.0 per cent in tourism development
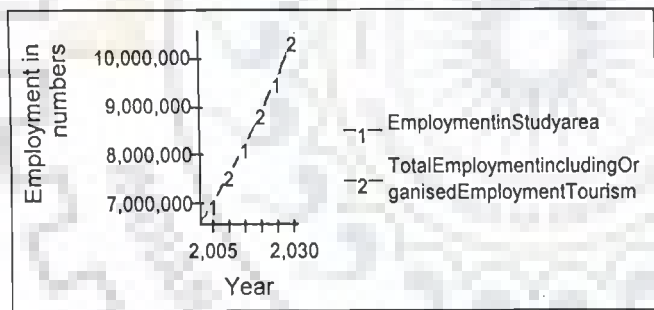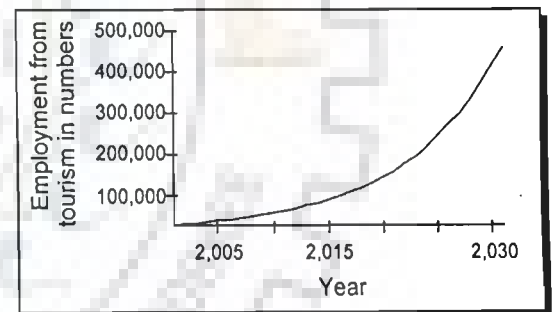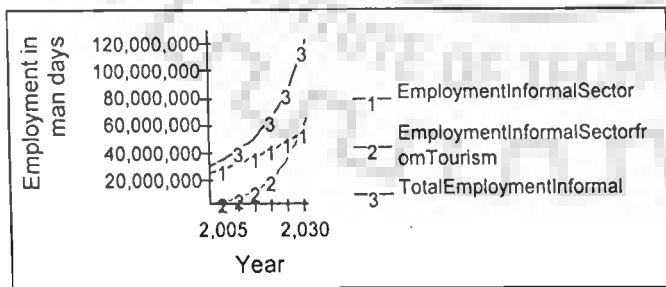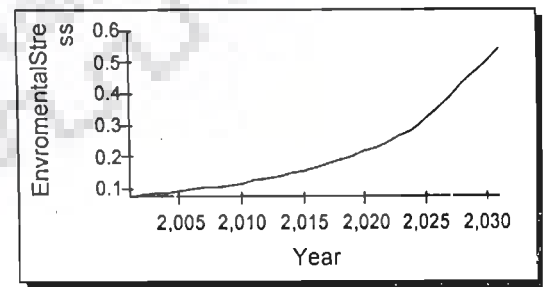
Fig. No. 5.55: Scenario 7: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent and Rail route length Growth rate from 1.40 per cent to 5.00 per cent and investment of 20.0 per cent in tourism development

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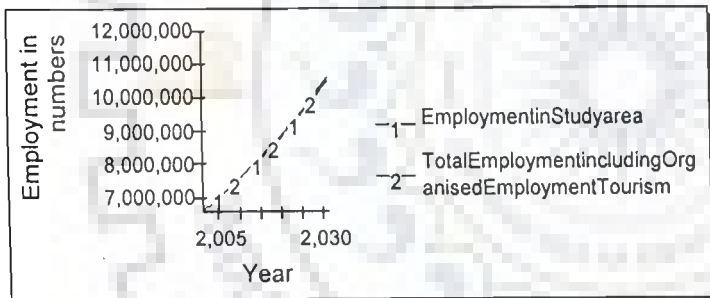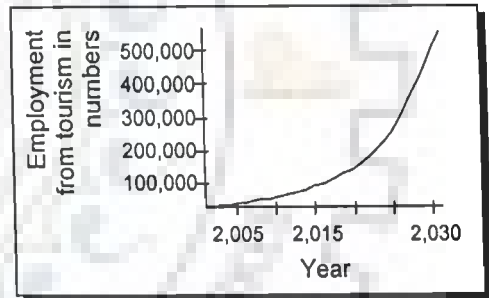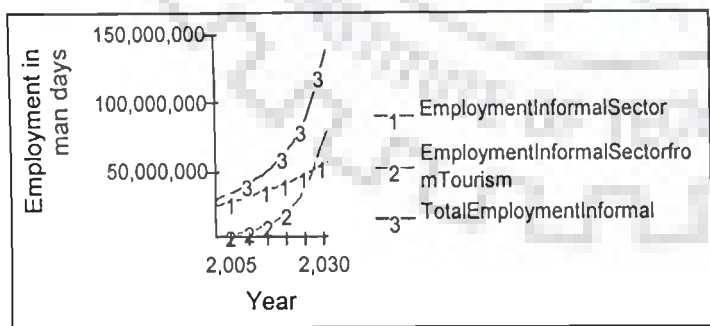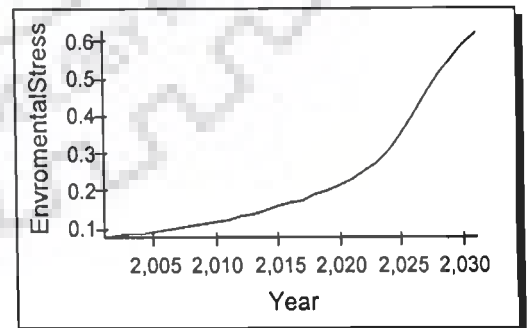
Fig. No. 5.56: Scenario 8: Increase of Road Length Growth rate from 1.00 per cent to
10.0 per cent and Rail route length form 1.40 Growth rate to 5.00 per cent and
investment of 10.0 per cent in tourism development

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5.16.9: Scenario 9: Increase of Road Length Growth rate from 1.00 per cento 5.0 per cent, Rail route length Growth rate from 1.40 per cent to 3.0 per cent, investment of 10.0 per cent in tourism development and increase of accommodation growth rate from 4.10 per cent to 5.0 per cent.

Accommodation, as already discussed is another important aspect, which influence the tourism development in the study area. It is also observed from simulation results that accommodation alone does not influence the tourism development much alone. Therefore, a composite scenario is attempted with increase of accommodation growth rate to 5.00 per cent in the study area along with road length growth rate of 5.00 per cent, rail route length growth rate of 3.00 per cent , investment in tourism development of 10.00 per cent of total tourism revenue generated and tested in the projected year model and the results are presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g), and Fig Nos.5.57 (a) to5.57 (h).

It is revealed from this scenario that would result a domestic tourist flow of 32093798 numbers and foreign tourist flow would be 368091 numbers respectively amounting to a total tourist flow of 32461890. The domestic tourist flow and foreign tourist flow to the study area would increase by 18.84 per cent and 555.17 per cent respectively and total tourist flow would increase by 19.95 per cent over the projected year (2031A.D.) result, which is quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.81846.80 million and Rs. 3418.70 million respectively amounting to a total of Rs.8526.56 millions which is in excess of the projected year (2031 A.D.) by 22.87 per cent. The per capita Gross Domestic Product would be Rs. 15317.00, which would be higher than the projected year (2031 A.D.) result by 4.28 per

cent. The employment in tourism sector would increase to 343446 numbers, which would increase by 19.95 per cent over projected year (2031 A.D) results. It would generate an employment of 49456839 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 19.95 per cent. The increase in tourists would require accommodation facilities of 121732 hotel beds in the study area. At the same time, the environmental stress would increase to 0.42 and level of tourist satisfaction also increases to 0.72. This shows that such a scenario with increase of accommodation growth rate 5.00 per cent in accommodation along with moderate growth in road sector, rail route length and investment would moderately influence tourism development and development in the study area. However, it is also observed that, this scenario would result in a reasonably high tourist satisfaction while creating low environmental stress.

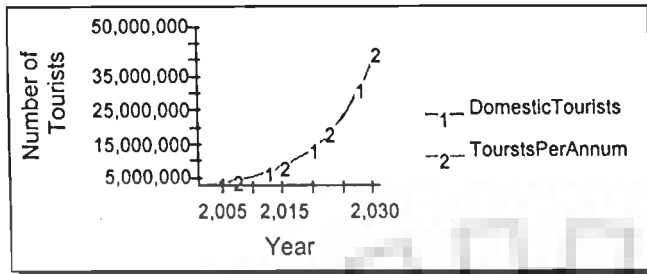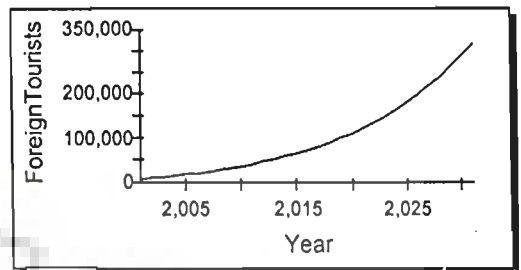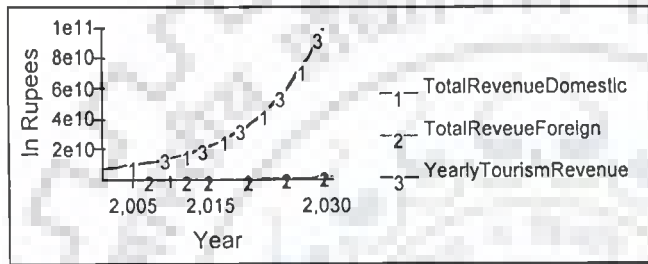**5.16.10: Scenario 10: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent, Rail route length Growth rate to 3.0 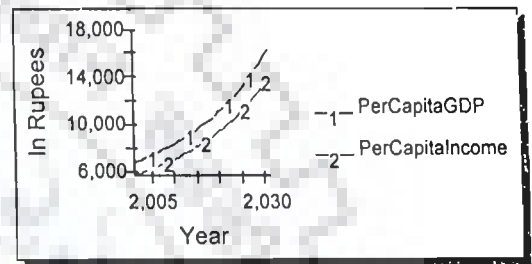per cent, investment of 20.0 per cent in tourism development and increase of accommodation growth rate to 5.0 per cent.**

A scenario is attempted with an enhancement in investment to 20.00 of total tourist revenue generation in tourism development keeping all the parameters same in the previous scenario (scenario-9) to understand its influence in the study area and tested in the projected year model. The tested scenario results are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. No. 5 58 (a) to 5.58 (h).

It is observed that this scenario would result a domestic tourist flow of 32199117 numbers and foreign tourist flow would be 556674 numbers respectively amounting to a total tourist flow of 32645792. The domestic tourist flow and foreign tourist flow to the study area would increase by 19.23 per cent and 695.04 per cent respectively and total tourist flow would increase by 20.63 per cent over the projected year (2031 A.D.) result, which is quite noteworthy. The projected annual tourist receipts from domestic tourists and

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foreign tourists would be Rs.82115.40 million and Rs. 4148.50 million respectively amounting to a total of Rs.8626.40 millions, which is in excess of the projected year by 24.31 per cent. The per capita Gross Domestic Product would be Rs.15357.00, which would be higher than the projected year (2031 A. D.) result by 4.56 per cent. The employment in tourism sector would increase to 345392 numbers, which would increase by 20.63 per cent over the projected year (2031 .D.) results. It would generate an employment of 49736517 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 20.63 per cent. The increase in tourists would require accommodation facilities of 122421 hotel beds in the study area. At the same time, the environmental stress would increase to 0.42 and level of tourist satisfaction also increases to 0.73. This shows that such a scenario with increase of investment rate of 20.00 per cent in tourism development along with moderate growth in road sector, rail route length and accommodation would marginally influence tourism development and development in the study area in comparison to the previous scenario (scenario-9). However, it is also observed that, this scenario would result in further increase in tourist satisfaction while keeping the environmental stress low.
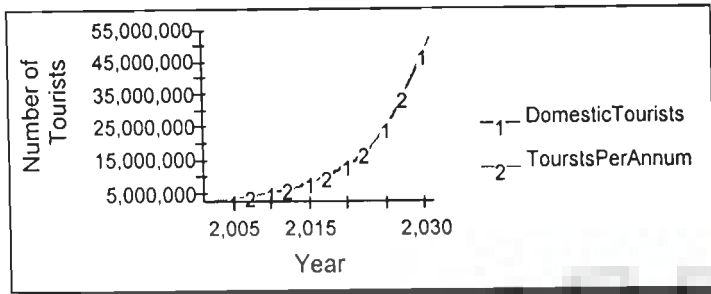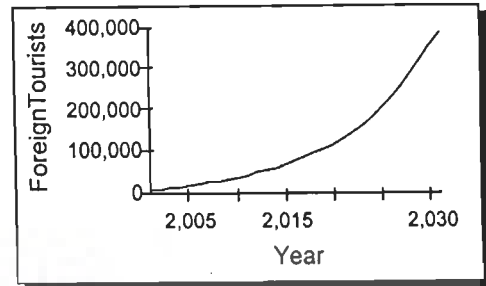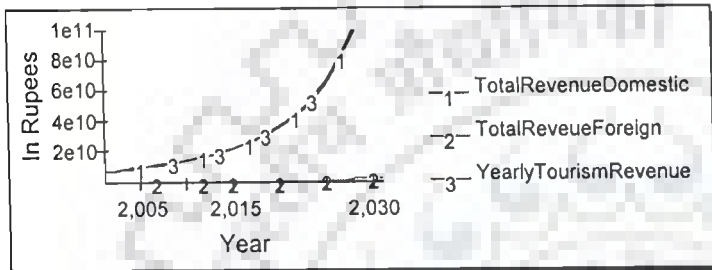
5.16.11: Scenario 11: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent, Rail route length Growth rate from 1.40 per cent to 5.0 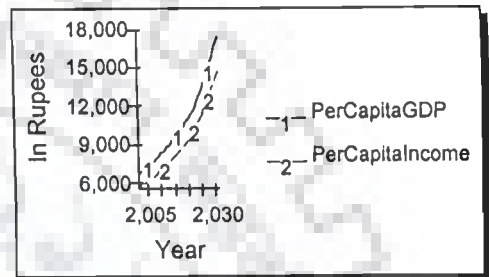per cent, investment of 20.0 per cent in tourism development and increase of accommodation growth rate to 10.0 per cent.

A composite scenario was attempted with a very high enhancement in all sectors, such as, increase or road length growth rate to 5.00 per cent, rail route length growth rate to 5.00 per cent , investment in tourism development of 20.00 per cent and accommodation growth rate of 10.00 per cent and tested in the projected year model and the results are

presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. Nos. 5.59 (a) to 5.59 (h).

It is observed that the scenario would result a domestic tourist flow of 53395282 numbers and foreign tourist flow would be 773696 numbers respectively amounting to a total tourist flow of 54168979. The domestic tourist flow and foreign tourist flow to the study area would increase by 97.72 per cent and 1277.12 per cent respectively and total tourist flow would increase by 100.17 per cent over the projected year (2031A.D.) result, which highly significant, and the foreign tourist flow particularly would increase immensely. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.136170.70 million and Rs. 7185.58 million respectively amounting to a total of Rs.143356.60 millions, which is in excess of the projected year (2031 A.D.) result by 106.51 per cent. The per capita Gross Domestic Product would be Rs.17623.00, which would be higher than the projected year (2031 A.D.) result by 19.99 per cent. The employment in tourism sector would increase to 573107 numbers, which would increase by 100.17 per cent over the projected year (2031 A.D.) results. It would generate an employment of 82527523 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 100.17 per cent. The increase in tourists would require accommodation facilities of 203133 hotel beds in the study area. At the same time, the environmental stress would increase to 0.64 and the level of tourist satisfaction increases to 0.77. This shows that such a scenario would influence the study area very highly, as it would result a very high tourist flow, and tourist revenue generation, accommodation requirement. It would also result in huge employment generation opportunities particularly in informal sector, which would be even more than from other sectors. At the same time, it would create reasonably good tourist satisfaction though

experience very high environmental stress, thus influencing the study area economically, socially, physically and environmentally.

5.16.12: Scenario 12: Increase of Road Length Growth rate from 1.00 per cent to10.00per cent and Rail route length Growth rate 1.40 per cent to 5.0 per cent, investment of 20.0 per cent in tourism development and increase of accommodation growth rate form 4.10 per cent to 10.0 per cent.

A composite scenario was attempted with a further enhancement in road length growth rate to 10.00 per cent, along with rail route length growth rate to 5.00 per cent, investment in tourism development of 20.00 per cent and accommodation growth rate of 10.00 per cent and tested in the projected year model and the results are presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig Nos. 5.60(a) to 5.60 (h).

It is observed that the scenario would result a domestic tourist flow of 53545433 numbers and foreign tourist flow would be 884607 numbers respectively, amounting to a total tourist flow of 54430040. The domestic tourist flow and foreign tourist flow to the study area would increase by 98.27 per cent and 1474.53 per cent respectively and total tourist flow would increase by 101.17 per cent over the projected year (2031 A.D.) result, which highly significant, and the foreign tourist flow particularly would increase immensely. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.136553.70 million and Rs. 8215.90 million respectively amounting to a total of Rs.144769.60 millions which is in excess of the projected year by 108.62 per cent. The per capita Gross Domestic Product would be Rs.17679.00, which would be higher than the base result by 20.37 per cent. The employment in tourism sector would increase to 575869 numbers, which would increase by 101.13 per cent over projected year (2031 A.D.) results. It would generate an employment of 82925255 man-days from

informal sector from tourism alone, which is higher than the projected year (2031A.D.) value by 101.13 per cent. The increase in tourists would require accommodation facilities of 204112 hotel beds in the study area. At the same time, the environmental stress would increase to 0.64 and tourist satisfaction increases to 0.89. This shows that such a scenario would influence the study area very highly, as it would result a very high tourist flow, and tourist revenue generation, accommodation requirement. It would also result in huge employment generation opportunities particularly in informal sector, which would be even more than the other sectors in the system. At the same time, it would create very high tourist satisfaction though experience very high environmental stress also, thus influencing the study area economically, socially, physically and environmentally.

5.16.13: Scenario 13: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth rate fro 1.40 per cent to 3.00 per cent, investment of 10.0 per cent in tourism development, increase of handicraft share to 15.00 per cent and increase of commercial crop share to 15.00 per cent.

It is understood from the investigation that handicraft industries and cultivation of commercial crop are highly valuable for tourism as well as total development of the study area. Therefore, a composite scenario is attempted by considering the contribution of handicrafts and commercial crops in the projected year model along with infrastructural development and investment in tourism development. In this scenario, the share of handicrafts and commercial crop of 15.00 per cent each have been added to road length growth of 5.00 per cent , rail route length growth rate of 3.00 per cent and an investment of 10.00 per cent in tourism development and tested in the projected year model and the results are presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. No. 5.61 (a) to 5.61(h).

It is observed that this scenario would result a domestic tourist flow of 31757556 numbers and foreign tourist flow would be 116570 numbers respectively amounting to a total tourist flow of 31874126. The domestic tourist flow and foreign tourist flow to the study area would increase by 17.59 per cent and 107.48 per cent respectively and total tourist flow would increase by 17.78 per cent over the projected year (2031A.D.) results, which are marginally more than the projected year value. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.80989.30million and Rs. 1082.60 million respectively amounting to a total of Rs.82072.00 millions, which is in excess of the projected year (2031 A.D).by 18.27 per cent. The per capita State Gross Domestic Product would be Rs.15501.00, which would be higher than the projected year (2031 A.D.) result by 5.54 per cent. The employment in tourism sector would increase to 337228 numbers, which would increase by 17.78 per cent over projected year (2031 A.D.) results. It would generate an employment of 45860868 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 17.78 per cent. The increase in tourists would require accommodation facilities of 119527 hotel beds in the study area. At the same time, the environmental stress would be 0.41 and tourist satisfaction would be 0.74. This shows that increase of handicrafts and commercial crops would not influence much unless there is higher growth in infrastructure sector and investment in tourism development.

5.16.14: Scenario 14: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth rate from 1.40 per cent to 5.0 per cent, accommodation from 4.10 per cent to 10.00 per cent, investment of 10.0 per cent in tourism development, increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent.

A composite scenario is attempted with a higher increase in rail route length growth rate to 5.00 percent along with road length growth rate of 5.00 per cent, investment of 10.00 per cent tourism development, increase in accommodation growth rate from 4.10 per cent to 10.00 per cent along with increase of handicraft share to 15.00 per cent and increase of commercial crop share to 15.00 per cent to understand its influence in the study area. The scenario is tested in the projected year model and the results are presented in Table No. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig. Nos. 5.62 (a) to 5.62 (h).

It is observed that this combination would result a domestic tourist flow of 53466843 numbers and foreign tourist flow would be 773693 numbers respectively amounting to a total tourist flow of 53544209. The domestic tourist flow and foreign tourist flow to the study area would increase by 97.72 per cent and 1277.12 per cent respectively and total tourist flow would increase by 97.86 per cent over the projected year (2031 A.D.) results, which are quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.136170.70millions and Rs. 7185.80 millions respectively amounting to a total of Rs.143356.60 millions, which is in excess of the projected year by 106.59 per cent. The per capita Gross Domestic Product would be Rs.17941.00, which would be higher than the projected year (2031 A.D.) results by 22.15 per cent. The employment in tourism sector would increase to 555456 numbers, which would increase by 93.65 per cent over projected year (2031A.D.) result. It would generate an employment of 82271783 man-days from informal sector from tourism alone, which is

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higher than the projected year (2031 A.D.) value by 99.53 per cent. The increase in tourists would require accommodation facilities of 202054 hotel beds in the study area. At the same time, the environmental stress would be 0.64 and level of tourist satisfaction would be 0.77. This shows that increase of handicrafts and commercial crops along with high investment and reasonably higher infrastructural development would influence the study area .economically, socially, and environmentally.

5.16.15: Scenario 15: Increase of Road Length Growth rate from 1.00 per cent to 10.0 per cent, Rail route length Growth rate from 1.40 per cent to 5.0 per cent, Accommodation growth rate from 4.10 per cent to 10.00 per cent, Investment of 20.0 per cent in tourism development, Increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent.

An attempt is made with a composite scenario of very high rood length growth rate of 10.00per cent, rail line growth rate of 5.00 per cent, accommodation growth rate of 10.00 per cent, investment of 20.00 in tourism development, increasing the share of handicrafts to 15 per cent and increase of share of commercial crops to 15.00 per cent and tested in the projected year model to understand the functions of the study area, and the results are presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig Nos. 5.63 (a) to 5.63 (h).

It is revealed that this scenario would result a domestic tourist flow of 53545233 numbers and foreign tourist flow would be 830141 numbers amounting to a total tourist flow of 54375374. The domestic tourist flow and foreign tourist flow to the study area would increase by 97.98 per cent and 1377.59 per cent respectively and total tourist flow would increase by 100.17 per cent over the projected year (2031A.D.) results, which are even higher than the previous scenario results (snario-14) and quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs.136352.00 million and Rs. 7710.10 million amounting to a total of Rs.144062.10

millions which is in excess of the projected year by 107.60 per cent. The per capita Gross Domestic Product would be Rs.17961.00, which would be higher than the projected year result (2031A.D.) by 22.29 per cent. The employment in tourism sector would increase to 573107 numbers, which would increase by 100.17 per cent over projected year 92031 A.D.) results. It would generate an employment of 82521523 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 100.17 per cent. The increase in tourists would require accommodation facilities of 203133 hotel beds in the study area. At the same time, the environmental stress would be 0.63 and level of tourist satisfaction would be 0.89. This shows that increase of handicrafts and commercial crops along with high investment and reasonably higher infrastructural development would influence the study area economically, socially, physically and environmentally to a great extent.

5.16.16: Scenario 16: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent, Rail route length Growth rate from 1.40 per cent to 5.0 per cent, investment of 20.0 per cent in tourism development, Increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent.

A composite scenario is attempted with a little higher increase in rail line growth rate to 5.00 percent along with road length growth rate of 5.00 per cent, investment of 20.00 per cent tourism development, along with increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent to understand its influence in the study area. The scenario is tested in the projected year model and the results are presented in Table Nos. 5.23 (a), 5.23 (b), 5.23 (c), 5.23 (d), 5.23 (e), 5.23 (f), and 5.23 (g) and Fig Nos.5.64 (a) 5.64 (h).

It is observed that this combination would result a domestic tourist flow of 52826630 numbers and foreign tourist flow would be 769023 numbers, amounting to a

total tourist flow of 53595653. The domestic tourist flow and foreign tourist flow to the study area would increase by 95.61 per cent and 1268.80 per cent respectively and total tourist flow would increase by 96.64 per cent over the projected year (2031 A.D.) results, which are quite significant. The projected annual tourist receipts from domestic tourists and foreign tourists would be Rs. 134720.50 millions and Rs. 7613.10 millions respectively amounting to a total of Rs. 138338.70 millions, which is in excess of the projected year (2031 A.D.) by 99.36 per cent. The per capita Gross Domestic Product would be Rs.17734.00, which would be higher than the projected year (2031 A.D.) result by 20.74 per cent. The employment in tourism sector would increase to 563021 numbers, which would increase by 96.64 per cent over projected year (2031 A.D.) results. It would generate an employment of 81075112 man-days from informal sector from tourism alone, which is higher than the projected year (2031 A.D.) value by 96.64 per cent. The increase in tourists would require accommodation facilities of 199558 hotel beds in the study area. At the same time, the environmental stress would be 0.64 and level of tourist satisfaction would be 0.77. This shows that increase of handicrafts and commercial crops along with high investment and reasonably higher infrastructural development would influence the study area economically, socially, and environmentally.

Fig. No. .5.57: Increase of Road Length Growth rate from 1.00 per cento 5.0 per cent, Rail route length Growth rate from 1.40 per cent to 3.0 per cent, investment of 10.0 per cent in tourism development and increase of accommodation growth rate from 4.10 per cent to 5.0 per cent.
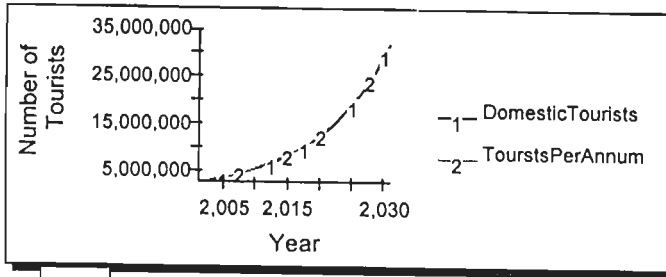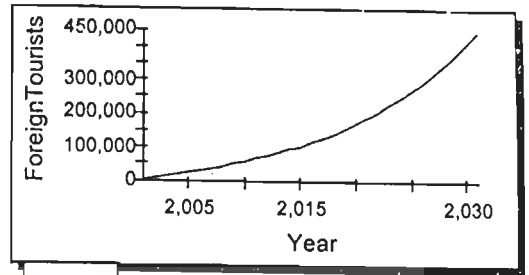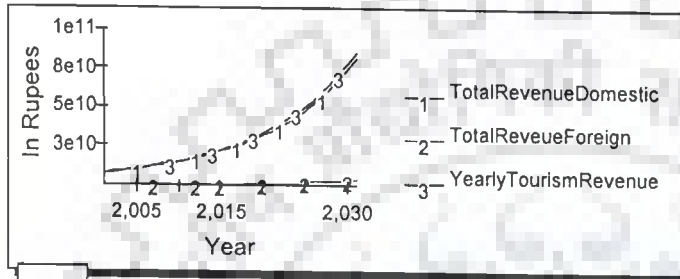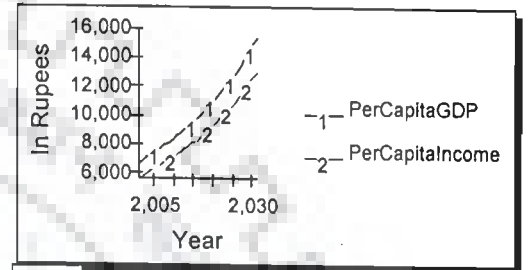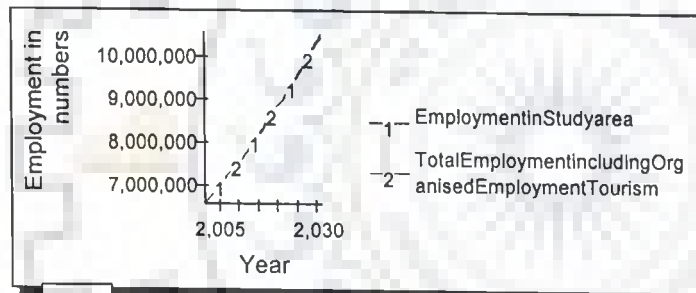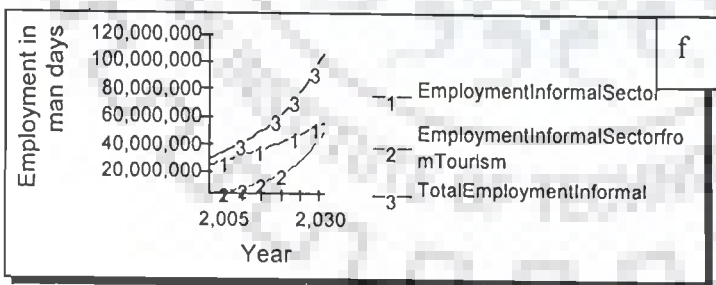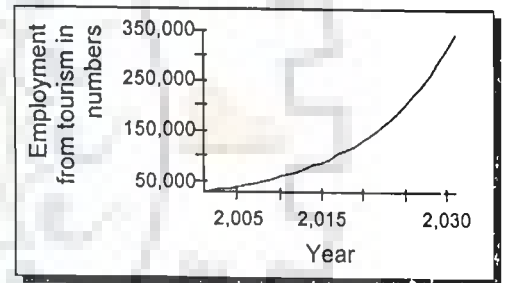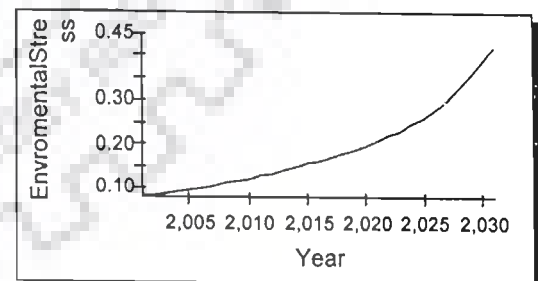
Fig. No. 5.58: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent, Rail route length Growth rate to 3.0 per cent, investment of 20.0 per cent in tourism development and increase of accommodation growth rate to 5.0 per cent.
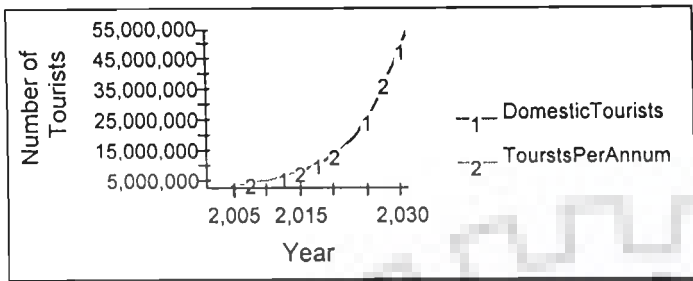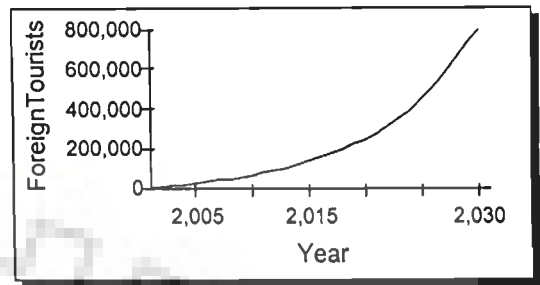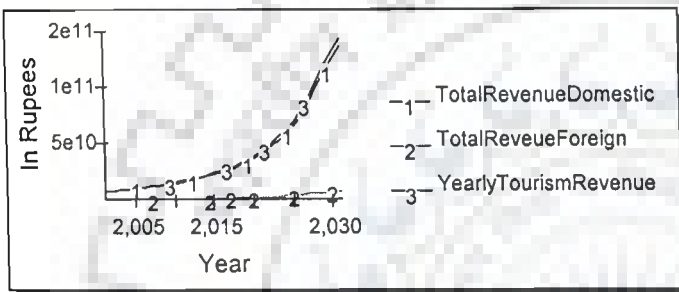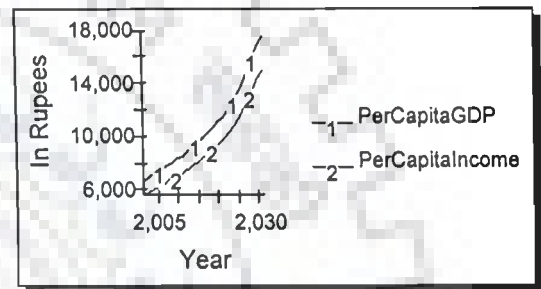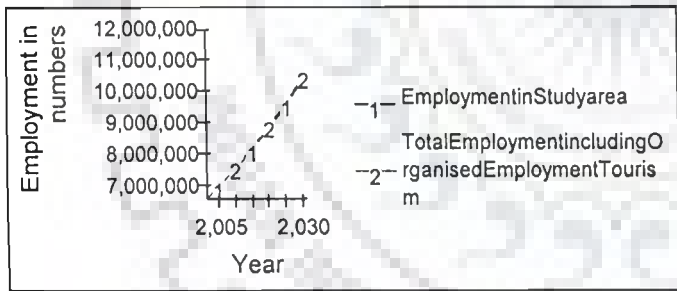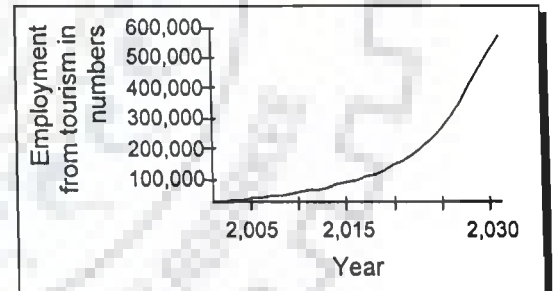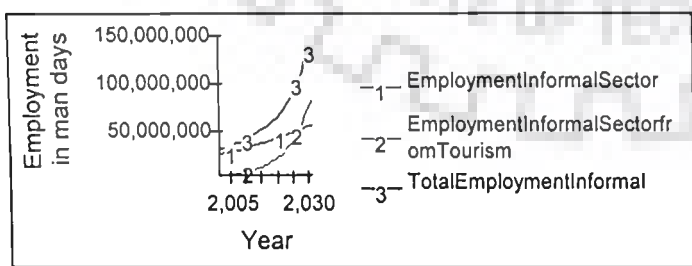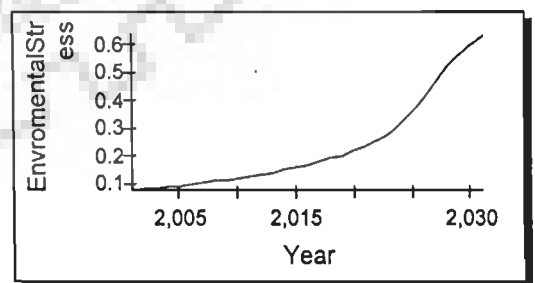
Fig. No. 5.59: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent, Rail route length Growth rate from 1.40 per cent to 5.0 per cent, investment of 20.0 per cent in tourism development and increase of accommodation growth rate to 10.0 per cent.
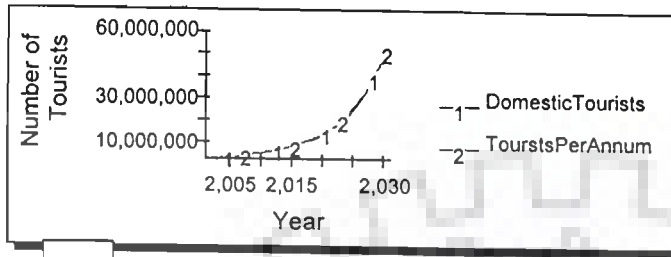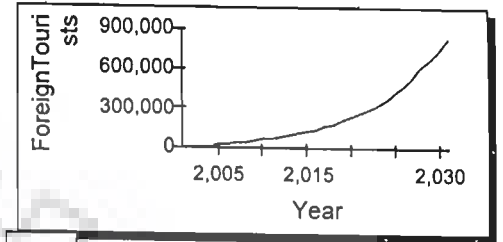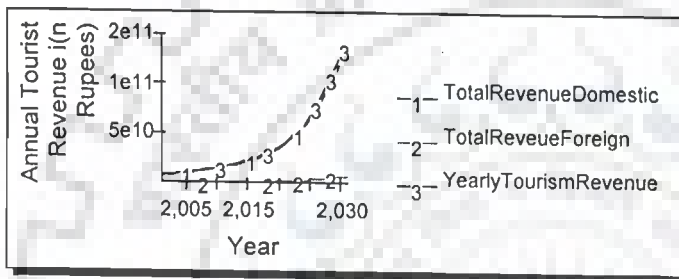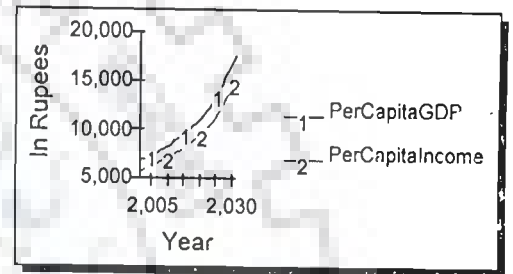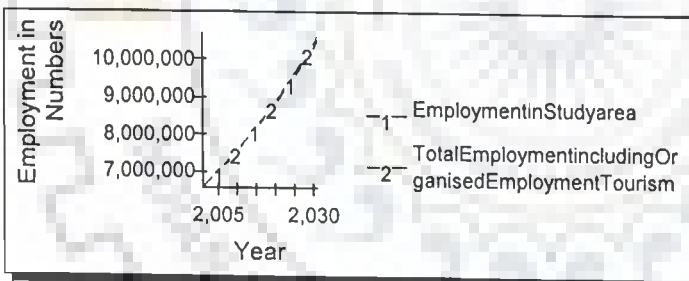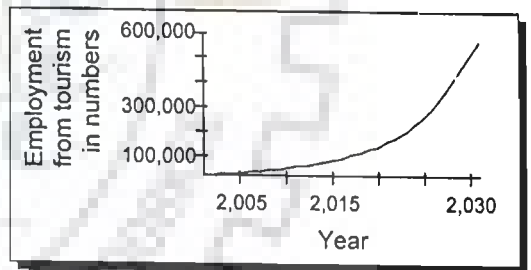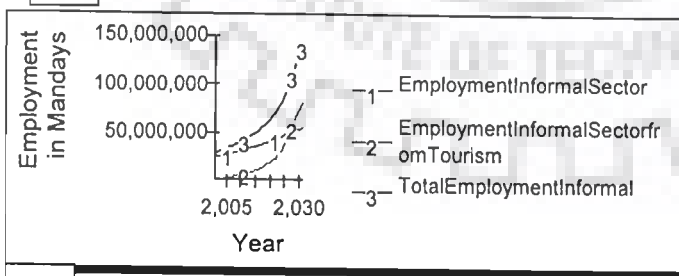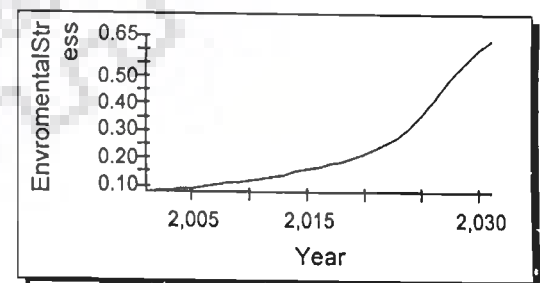
Fig. No. 5.60: Increase of Road Length Growth rate from 1.00 per cent to10.00per cent and Rail route length Growth rate 1.40 per cent to 5.0 per cent, investment of 20.0 per cent in tourism development and increase of accommodation growth rate form 4.10 per cent to 10.0 per cent.

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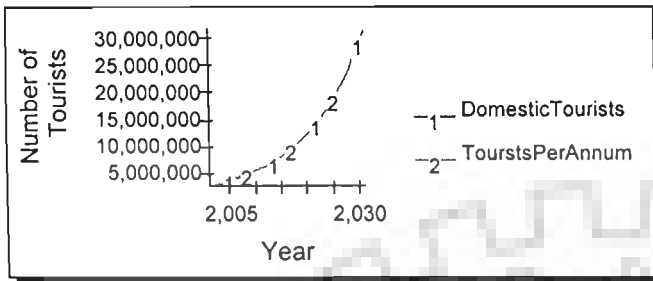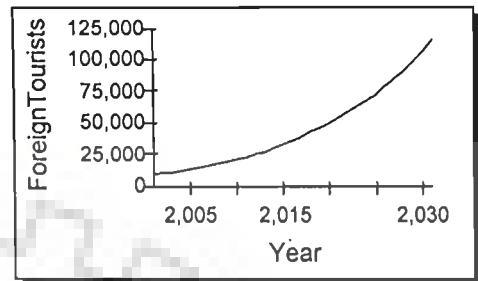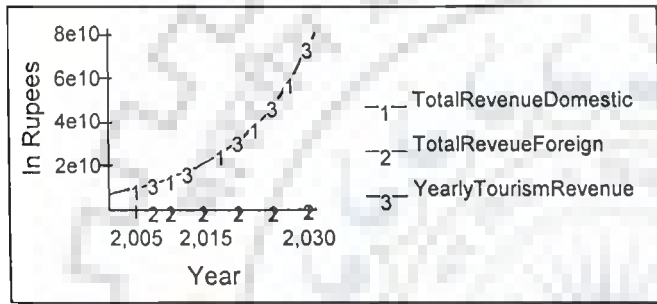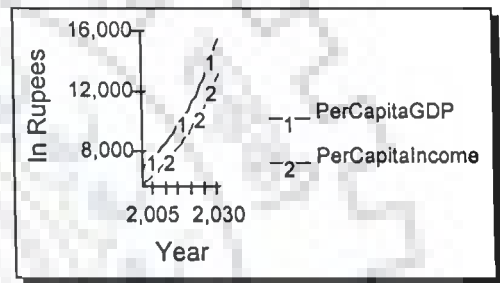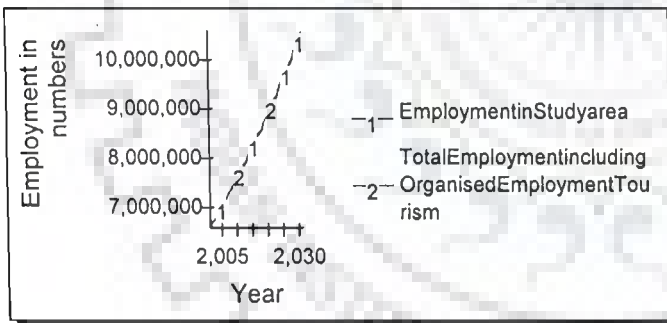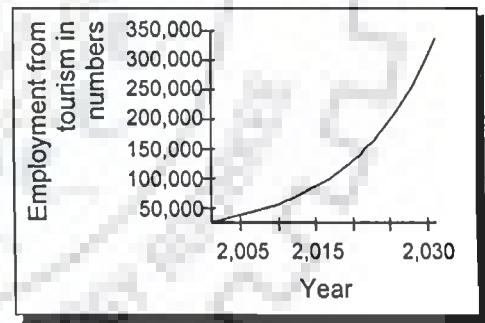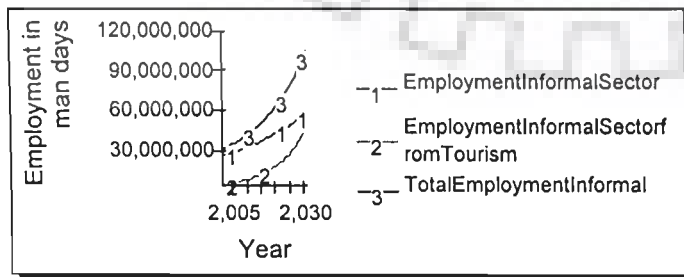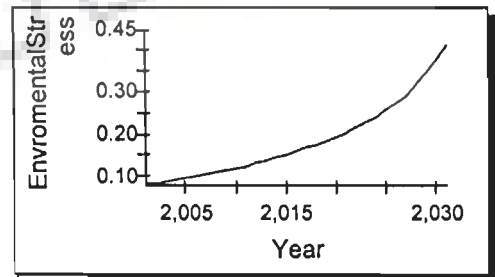
Fig. No. 5.61: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth rate fro 1.40 per cent to 3.00 per cent, investment of 10.0 per cent in tourism development, increase of handicraft share to 15.00 per cent and increase of commercial crop share to 15.00 per cent.
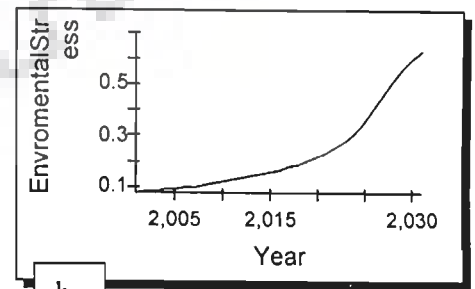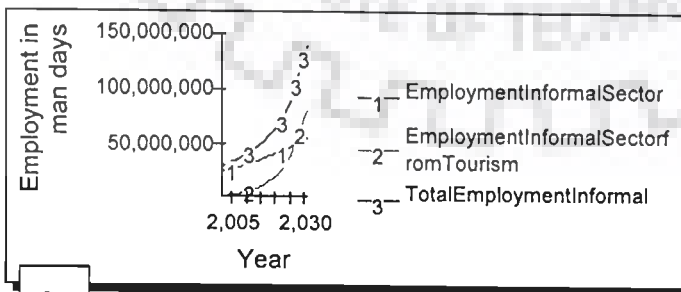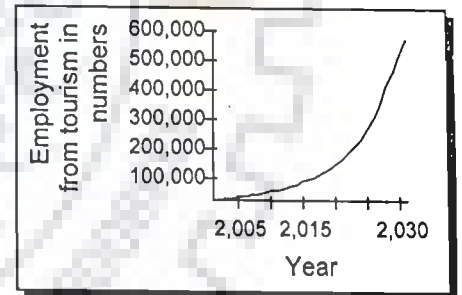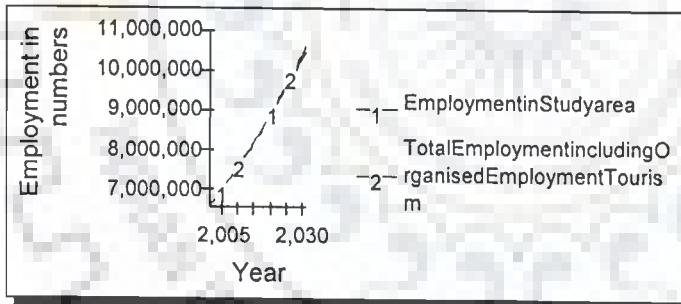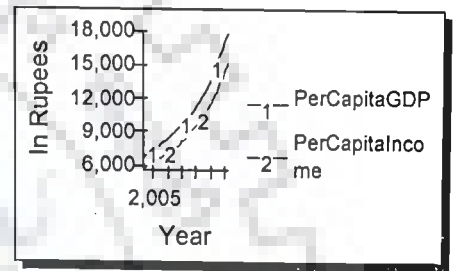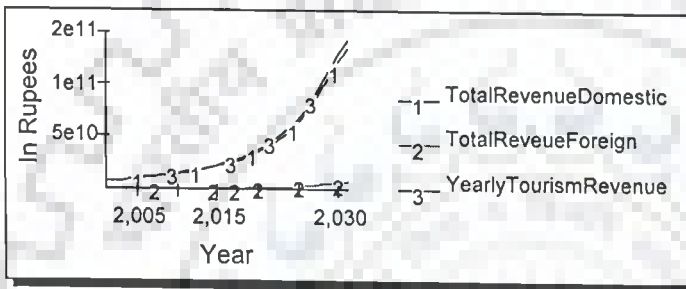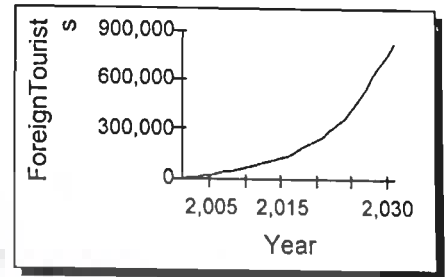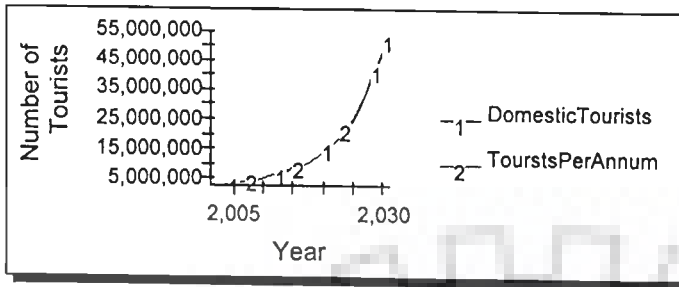
Fig. No. 5.62: Increase of Road Length Growth rate from 1.00 per cent to 5.00 per cent and Rail route length Growth rate from 1.40 per cent to 5.0 per cent, accommodation from 4.10 per cent to 10.00 per cent, investment of 10.0 per cent in tourism development, increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent.

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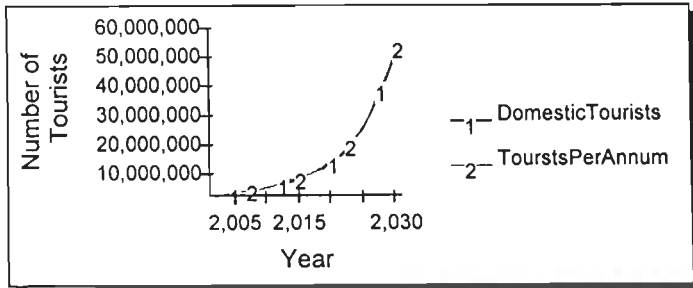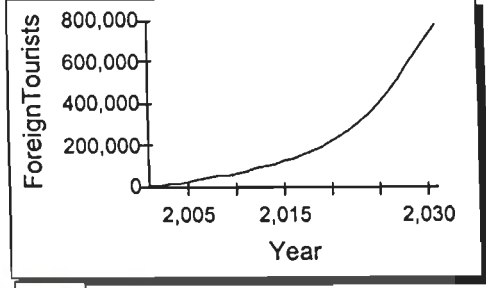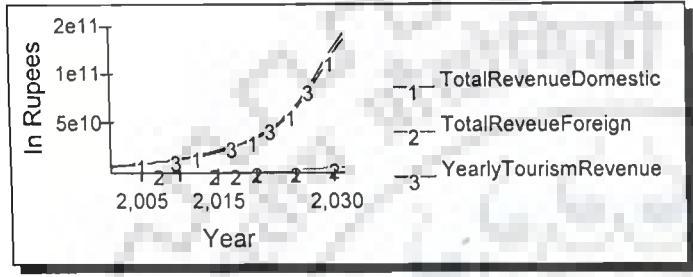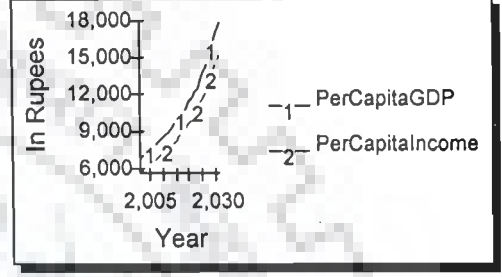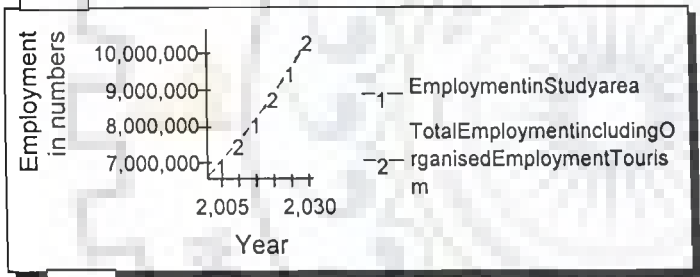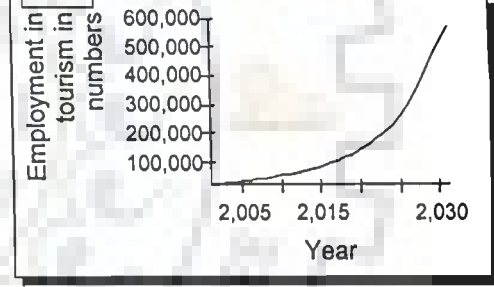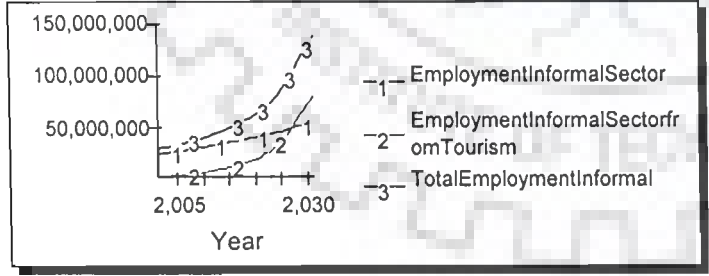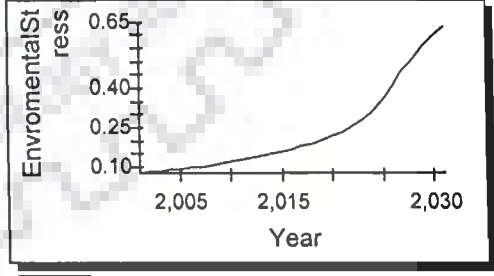
Fig. No. 5.63: Increase of Road Length Growth rate from 1.00 per cent to 10.0 per cent, Rail route length Growth rate from 1.40 per cent to 5.0 per cent, Accommodation growth rate from 4.10 per cent to 10.00 per cent, Investment of 20.0 per cent in tourism development, Increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent.
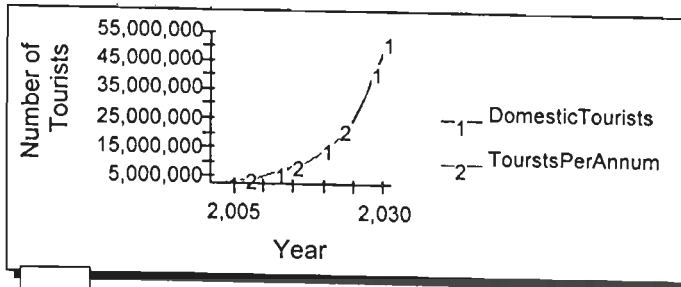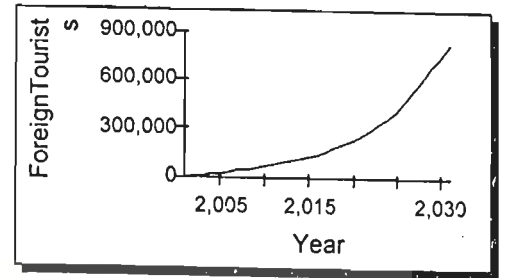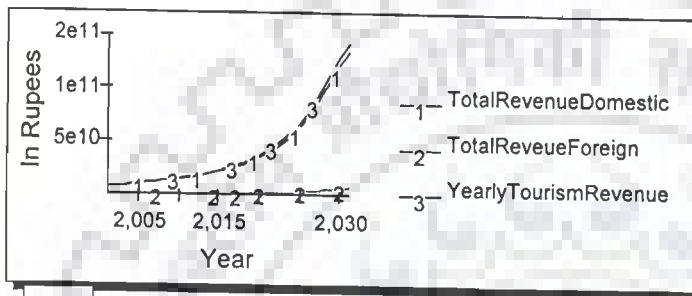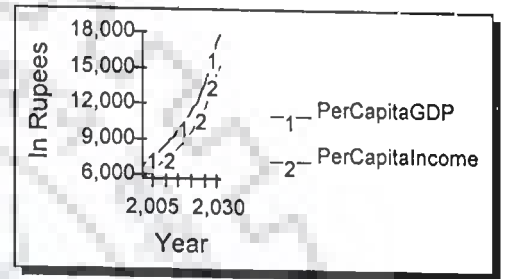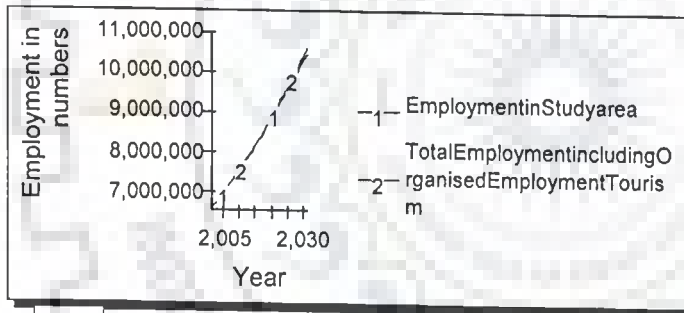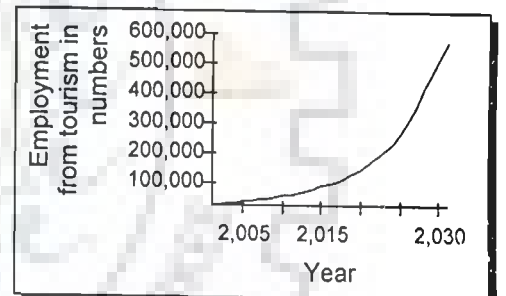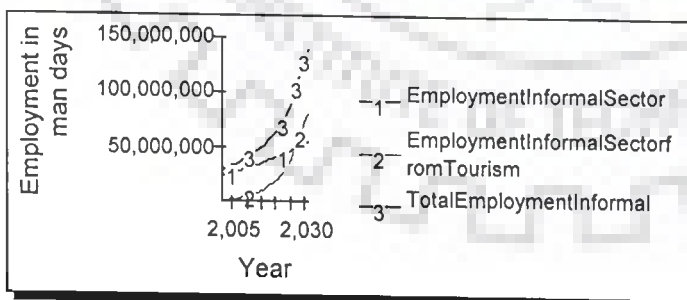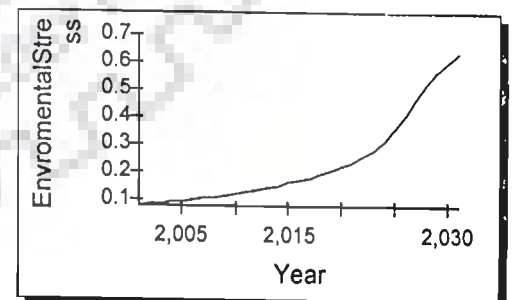
Fig. No. 5.64: Increase of Road Length Growth rate from 1.00 per cent to 5.0 per cent, Rail route length Growth rate from 1.40 per cent to 5.0 per cent, investment of 20.0 per cent in tourism development, Increase of handicraft share to 15.0 per cent and increase of commercial crop share to 15 per cent.
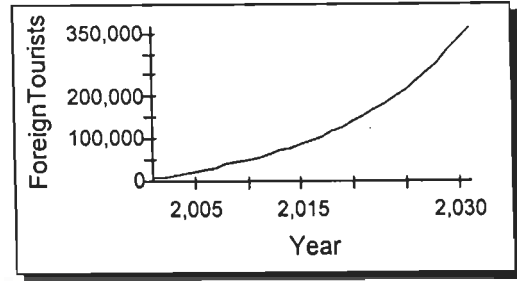
Table No. 5.23 (a): Tourist Arrival in the study area

Sl.No.	Scenarios With growth rate of control parameters (per cent)		Domestic tourist	Per cent variation	Foreign tourist	Per cent variation	Total tourist	Per cent variation
1		Projected year result	27004974		56182		27061156	
2	S_1	Rail 3	28467247	5.41	58638	4.37	28525885	5.41
3	S_2	Rail 5	38049303	40.89	74232	32.12	38119536	40.86
4	S_3	Road-2, Raill-3	31705065	17.40	77300	37.58	31782366	17.44
5	S_4	Road-2, Raill-5	42981742	59.16	98664	75.61	43080407	59.19
6	S_5	Road-5,Rail-2,Investent -10	31757556	17.59	116570	107.48	31874126	17.78
7	S_6	Road-5,Rail-5, Investment-10	43105389	59.62	185875	230.84	43291264	59.97
8	S_7	Road -5, Rail -5 Investment -20	43294271	60.31	318429	466.78	43612700	61.16
9	S_8	Road -10, Rail -5, Investment -10	52826630	95.61	389023	592.43	53215653	96.64
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	32093798	18.84	368091	555.176	32461890	19.95
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	32199117	19.23	446674	695.04	32645792	20.63
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	53395282	97.72	773696	1277.12	54168979	100.17
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	53545433	98.27	884607	1474.53	54430040	101.13
14	S_{13}	Road -5, Rail -3, Investment -10, Handlcraft-15 Commercial crop 15	31757556	17.59	116570	107.48	31874126	17.78
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 Handlcraft-15 Commercial crop 15	53466843	97.72	773696	1277.12	54204539	97.86
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	53545233	97.98	830141	1377.59	54375374	100.93
17	S_{16}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	52826630	95.61	769023	1268.80	53595653	98.05

Table No. 5.23 (b): Annual Tourist Revenue

Sl.No.	Scenarios With growth rate of control parameters (per cent)		Revenue from Domestic Tourist revenue (Rs. in Millions)	Per cent Variation	Revenue from Foreign Tourist (Rs. in Millions)	Per cent Variation	Total annual tourist revenue (Rs. in Millions)	Per cent Variation
1		Projected year result	68869.10		521.80		69390.90	
2	S_1	Rail 3	72598.30	5.41	544.60	4.36	73142.90	5.401
3	S_2	Rail 5	97024.60	40.88	689.40	32.11	97714.10	40.81
4	S_3	Road-2, Raill-3	80855.50	17.40	717.90	37.57	81378.40	17.27
5	S_4	Road-2, Raill-5	103613.70	50.45	916.30	75.58	110530.10	59.28
6	S_5	Road-5,Rail—2,Investent-10	80989.30	17.59	1082.60	107.45	82072.00	18.27
7	S_6	Road-5,Rail-5, Investment-10	81050.10	17.68	1246.80	138.91	82297.00	18.59
8	S_7	Road -5, Rail -5 Investment -20	110410.70	60.31	2957.40	466.67	113368.20	63.37
9	S_8	Road -10, Rail -5, Investment -10	134720.50	95.61	3613.10	592.316	138338.70	99.36
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	81846.80	18.84	3418.70	555.06	85265.60	22.87
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	82115.40	19.23	4148.50	694.902	86264.00	24.31
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	136170.70	97.72	7185.80	1276.87	143356.60	106.59
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	136553.70	98.28007	8215.90	1474.24	144769.60	108.62
14	S_{13}	Road -5, Rail -3, Investment -10, HandIcraft-15 Commercial crop 15	80989.30	17.59	1082.60	107.45	82072.00	18.27
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 HandIcraft-15 Commercial crop 15	136170.70	97.72	7185.80	1276.87	143356.60	106.59
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	136352.00	97.98	7710.20	1377.61	144062.20	107.60
17	S_{16}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	134720.50	95.61	7613.10	1359.00	138338.70	99.36

Table No. 5.23 (c): Per capita GDP and Per capita Income

Sl.No.		Scenarios With growth rate of control parameters (per cent)	Per Capita GDP (Rs.)	Per Cent Variation	Per Capita income (Rs.)	Per Cent Variation	Per Capita GDP excluding Tourism (Rs.)	Per Capita income excluding Tourism (Rs.)
1		Projected Year Result	14687.00		12484		11934	10144
2	S_1	Rail 3	14836	1.01	12611	1.01	11934	10444
3	S_2	Rail 5	15811	7.65	13440	7.65	11934	10444
4	S_3	Road-2, Raill-3	19171	30.53	12895	3.29	11934	10444
5	S_4	Road-2, Raill-5	16320	11.11	13872	11.11	11934	10444
6	S_5	Road-5,Rail—2,Investent -10	15191	3.43	12912	3.42	11933	10144
7	S_6	Road-5,Rail-5, Investment-10	16365	11.42	13910	11.42	11933	10144
8	S_7	Road -5, Rail -5 Investment -20	16433	11.88	13968	11.88	11933	10444
9	S_8	Road -10, Rail -5, Investment -10	17424	18.63	14810	18.63	11933	10444
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	15317	4.28	13020	4.29	11933	10144
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	15357	4.56	13093	4.87	11933	10144
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	17623	19.99	14979	19.98	11933	10144
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	17679	20.37	15027	20.37	11933	10144
14	S_{13}	Road -5, Rail -3, Investment -10, Handicraft-15 Commercial crop 15	15501	5.54	13176	5.54	12244	10407
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 Handicraft-15 Commercial crop 15	17941	22.15	15265	22.15	12244	10407
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	17961	22.29	15267	22.29	12244	10407
17	S_{16}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	17734	20.74	15074	20.74	12244	10407

Table No. 5.23 (d): Total Employment and Employment from Tourism

Sl.No.	Scenarios With growth rate of control parameters (per cent)		Employment other than tourism	Employment in Tourism Sector	Per cent Variation	Total employment including tourism in organized sector	Per cent Variation
1		Projected year Result	10495018	286307		10552280	
2	S_1	Rail 3	10495020	301803	5.41	10555379	0.02
3	S_2	Rail 5	10495020	403304	40.86	10575679	0.22
4	S_3	Road-2, Raill-3	10495018	336257	17.44	10562270	0.09
5	S_4	Road-2, Raill-5	10495018	455790	59.19	10586176	0.32
6	S_5	Road-5,Rail—2,Investent -10	10495020	337228	17.78	10562464	0.09
7	S_6	Road-5,Rail-5, Investment-10	10495020	458021	59.97	10586623	0.32
8	S_7	Road -5, Rail -5 Investment -20	10495020	461422	61.16	10587303	0.33
9	S_8	Road -10, Rail -5, Investment -10	10495020	563021	96.64	10607623	0.52
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	10495020	343446	19.957	10563708	0.10
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	10495020	345392	20.63	10564097	0.11
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	10495020	573107	100.17	10609640	0.54
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	10495020	575869	101.13	10610192	0.54
14	S_{13}	Road -5, Rail -3, Investment -10, Handlcraft-15 Commercial crop 15	10495020	337228	17.78	10562464	0.09
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 Handlcraft-15 Commercial crop 15	10495020	554456	93.65	10599465	0.44
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	10495020	573107	100.17	10609640	0.54
17	S_{17}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	10495020	563021	96.64	10607623	0.52

Table No. 5.23 (e): Informal Employment

Sl.No.	Scenarios With growth rate of control parameters (per cent)		Employment in informal sector	Employment in informal sector due to tourism	Per cent Variation	Total employment in informal sector	Per cent Variation
I		Projected year Result	57719809	41228213		98948022	
2	S_1	Rail 3	57719809	43459736	5.41	101179565	2.25
3	S_2	Rail 5	57719809	58075876	40.86	115795685	17.02
4	S_3	Road-2, Raill-3	57719809	48421070	17.44	106140879	7.26
5	S_4	Road-2, Raill-5	57719809	65633862	59.19	123353671	24.66
6	S_5	Road-5,Rail—2,Investent -10	57719809	48560868	17.78	106280677	7.41
7	S_6	Road-5,Rail-5, Investment-10	57719809	65955107	59.97	123674916	24.98
8	S_7	Road -5, Rail -5 Investment -20	57719809	66444821	61.16	124164630	25.48
9	S_8	Road -10, Rail -5, Investment -10	57719809	81075112	96.64	138794921	40.27
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	57719809	49456839	19.95	107176148	8.31
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	57719809	49736517	20.63	107456326	8.59
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	57719809	82527523	100.17	140247332	41.73
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	57719809	82925255	101.13	140645064	42.14
14	S_{13}	Road -5, Rail -3, Investment -10, Handlcraft-15 Commercial crop 15	57719809	48560868	17.78	106280677	7.41
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 Handlcraft-15 Commercial crop 15	57719809	82271783	99.53	139991592	41.47
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	57719809	82527523	100.17	140247332	41.73
17	S_{16}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	57719809	81075112	96.64	138794921	40.27

Table No. 5.23 (f): Accommodation

Sl.No.		Scenarios With growth rate of control parameters (per cent)	Affordable hotel bed demand	Per cent Variation	Demand of high spending beds	Per cent Variation	Total demand of beds	Per cent Variation
1		Projected year Result	76109		25369		101479	
2	S_1	Rail- 3	80229	5.41	26743	5.41	106972	5.41
3	S_2	Rail -5	107211	40.86	35737	40.86	142948	40.86
4	S_3	Road-2, Raill-3	89387	17.44	29795	17.44	119183	17.44
5	S_4	Road-2, Raill-5	121163	59.19	40387	59.19	161511	59.15
6	S_5	Road-5,Rail-2,Investent -10	89645	17.78	29881	17.78	119527	17.78
7	S_6	Road-5,Rail-5, Investment-10	121756	59.97	40585	59.97	162342	59.97
8	S_7	Road -5, Rail -5 Investment - 20	122660	61.16	40886	61.16	163547	61.16
9	S_8	Road -10, Rail -5, Investment -10	149669	96.65	49889	96.65	199558	96.64
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	91299	19.95	30432	19.95	121732	19.95
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	91816	20.63	30605	20.63	122421	20.63
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	152350	100.17	50783	100.17	203133	100.17
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	153084	101.13	51028	101.14	204112	101.13
14	S_{13}	Road -5, Rail -3, Investment -10, HandIcraft-15 Commercial crop 15	89645	17.78	29881	17.78	119527	17.78
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 HandIcraft-15 Commercial crop 15	151708	99.32	50346	98.45	202054	99.10
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	152350	100.17	50783	100.17	203133	100.174
17	S_{16}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	149669	96.65	49889	96.65	199558	96.60

Table No. 5.23 (g): Environmental Stress and Tourist Satisfaction

Sl.No.	Scenarios With growth rate of control parameters (per cent)		Environmental Stress	Per Cent Variation	Tourist satisfaction	Per Cent Variation
1		Projected year Result	0.34		0.41	
2	S_1	Rail 3	0.37	6.41	0.43	4.66
3	S_2	Rail 5	0.49	43.14	0.45	10.31
4	S_3	Road-2, Raill-3	0.41	20.11	0.48	17.93
5	S_4	Road-2, Raill-5	0.54	58.01	0.50	23.58
6	S_5	Road-5, Rail—2, Investent -10	0.41	20.40	0.75	83.04
7	S_6	Road-5, Rail-5, Investment-10	0.54	58.60	0.75	88.69
8	S_7	Road -5, Rail -5 Investment -20	0.55	59.47	0.75	88.69
9	S_8	Road -10, Rail -5, Investment -10	0.63	83.38	0.89	117.93
10	S_9	Road -5, Rail -3, Investment -10 Accomodation-5	0.42	23.61	0.72	76.16
11	S_{10}	Road -5, Rail -3, Investment -20 Accommodation -5)	0.42	23.61	0.73	79.60
12	S_{11}	Road -5, Rail -5, Investment -20 Accommodation.-10	0.64	85.71	0.77	88.69
13	S_{12}	Road -10, Rail -5, Investment -20 Accommodation-10	0.64	86.58	0.89	118.67
14	S_{13}	Road -5, Rail -3, Investment -10, HandIcraft-15 Commercial crop 15	0.42	20.40	0.75	83.04
15	S_{14}	Road -5, Rail -5, Investment -10, Accommodation- 10 HandIcraft-15 Commercial crop 15	0.64	85.58	0.77	88.69
16	S_{15}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	0.63	83.38	0.89	117.93
17	S_{16}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	0.64	85.71	0.77	88.69

Note: The numbers in the column three of tables 5.23 (a) to 5.23(g) represent the growth percentages used in control parameters for various scenario generations.

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In this chapter, various control parameters are identified and the dynamic functions of the system are quantified by considering the most important control parameters, which decide the functions of the system. System Dynamics model was developed validated for various functions of the system. The validated projected year model was employed for making projections to have a perspective look at the system for the year 2031 A.D. In the projected year model, several plausible scenarios were tested to have a look at the system under various alternative conditions to arrive at plausible decisions. The findings of the investigations are presented in the subsequent (sixth) chapter.

RESULTS, DISCUSSION AND FINDINGS

6.0.   INTRODUCTION

In this present investigation, different kinds of analysis are made at various stages, such as, review of literature, analysis of secondary data, analysis of primary household survey, industrial survey, tourism survey, regression models and analysis of System Dynamic models. In this chapter, the results of the analysis are thoroughly discussed to arrive at inferences. The inferences derived from the results are grouped in two categories, such as, inferences based on literature and primary survey; and inferences drawn based on System Dynamics model analysis, which are used for evolving policies and plausible recommendations for integrated development of the system, and are presented in the subsequent sections as below:

6.1.   DISCUSSION OF VARIOUS CONTROL PARAMETERS

At the outset, the results of the various control parameters, which are enumerated in the preceding chapters are discussed thoroughly and are as follows. They are:

6.1.1. Population

The population of the study area and in Orissa State both would experience an increasing trend and it would be marginally higher in the study area   than the State. The density of population in the study area would be significantly higher, i.e., about twice of that of the State as a whole. This could be due to the presence of more urban areas and availability of potential for income earning opportunities in the study area as compared to the State. In addition, the out migration and immigration though found significantly low both in the study area and in the State, the immigration to the study

area is higher than other areas of the State, and at the same time out migration from the study area is lower than the State. Thus, the population growth in the study area signifies the availability of economic potential in the study area is slightly better compared to other regions of the State, which attracts more population to the study area.

6.1.2. Spatial and Physical Aspects

The spatial and physical aspects include the urban and the rural composition and land use of the system. It is observed that the study area encompasses more than two fifth (43.70 per cent) of the urban areas of the State. The most important urban and industrial centers including the State capital city 'Bhubaneswar'; are located in the study area, thus having higher economic growth potential, and there by increasing the population pressure in the study area.

The land use analysis reveals that the study area is confined in area of a little more than one-fifth (22.63 per cent) of total land area of the State. Of the total land area available in the study area, more than half (53.79 per cent) of the land area is under agriculture, a little above one-fifth (21.21 per cent) is under forestland, about one-ninth (11.00) belongs to habitat area and rest one-seventh (14.00 per cent) belongs to other category. As there is conversion of agricultural land area and other land area to habitat area; and forest area is converting to other land area considerably, it is observed from the model result that there would be a significant reduction in agriculture and forestland area in the study area. On the other hand, the habitat area would be increased considerably while other land area would increase marginally. Thus, it is evident from the result that less area would be available for agricultural production and if advanced methods of cultivation are not practiced there would be substantial reduction in agricultural production in the system, thereby adversely affecting the economy of the

system. The reduction of forestland would also adversely affect the system pertaining to climate, natural flora and fauna, etc.

6.1.3. Economic Conditions

The economic conditions of the study area are predominantly governed by agriculture, industrial development and trade and commerce activities. The study area being mostly agrarian and agriculture forms the backbone of the system, where as the contribution of industries to the economy of the study area is very low. The trade and commerce activities are mostly confined to urban areas of the study area. The results of various economic aspects of the study area are as discussed below. They are:

6.1.3.1. Agriculture

It is observed that the study area is predominantly governed by agriculture and its allied activities, and it forms the backbone of the economy as majority of people practices this occupation. It is revealed that majority (86.14 per cent) of operational land holdings belongs to small and marginal land holding size of farms and more than half of the operated area is owned by small and marginal farmers. Cereal is the major crop having about four-fifth (79.91 per cent) of the total agricultural area followed by pulses and commercial crops (cultivated in one tenth of the total agricultural area each) practiced in the study area. The agricultural practices are characterized by low agricultural inputs in terms of chemical fertilizer and other inputs such as labour and seeds. The cropping intensity is just above more than 150.00 per cent, irrigation intensity is about 135.00 per cent, and double crops are usually practiced in the system. The yield rates obtained are very low, thus making agriculture subsistence in nature. The primary household survey reveals that horticulture contributes agricultural output in the study area significantly, as agriculture and horticulture are practiced together. It

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is also found that coconut is the prime horticultural crop with industrial value in the study area.

It is observed that as the area under agriculture is decreasing continuously along with practice of less advanced methods of cultivation, low inputs of chemical fertilizer, inadequate irrigation facility, and use of local seeds etc., it would lead to reduction in agricultural production in all the crops, such as, cereals, pulses and commercial crops. However, it is found that the attention to the two most important aspects of agriculture practice such as, increased inputs in the form of high yielding variety (HYV) seeds and application of chemical fertilizer would increase the crop production considerably, there by making the agriculture more efficient in the study area.

6.1.3.2. Industry

The results of industrial scenario based on secondary survey and primary survey in the study area reveals that most of the industrialization has taken place in late 1990s'. Small Scale industries in private sector or proprietorship ownership form bulk of the available industries in the study area though large and medium scale industries mostly belong to public sector. It is also observed that all types of industries based on products are almost evenly distributed except engineering and metal based industries, which have the largest (25.50 per cent) share of total industries. The industries are functioning below their utilization capacity.

It is also observed that the agro and food based, and engineering and metal industries are performing well, where as the handicraft industries are not doing well despite availability of local raw materials and availability of skills because of its unorganized approach and non-availability of capital for timely investment.

The non-availability of capital for investment and energy are the major problems, which hinder the industrial development process in the study area.

Entrepreneurship, which either is absent or at best of first generation among the people of the study area, is found to be another deterrent in industrial development. This is caused due to lack of adequate availability of capital for investment, awareness, and congenial atmosphere and promotion measures in this regard. Thus, the overall industrial scenario presents a very grim picture in the study area, and contributes about one-sixth to the total Gross Domestic Product of the study area. However, according to the opinions persons from industries and experts the future prospects of industrial development in the study area is promising (c.r.t. 4.62, Chapter- 4).

Handicraft and cottage industries are found to be a part and parcel of the industrial development in the study area though its contribution is very meager, i.e., about one tenth of the total industrial contribution to the Gross Domestic Products. However, it contributes significantly in employment generation opportunities. It is also observed that even though the overall performance of this sector is not high, organized handicraft activities have shown better performance as revealed from handicraft locations, such as, Pipilli, and Raghurajpur, which are famous for their exclusive handicrafts products. Apart from the above, the household survey result reveals that there are adequate skilled personnel available in the system, which is a big advantage for growth of handicrafts industry in the study area. The discussion with industrial experts and opinion of tourists reveal that this sector has bright future if proper attention is given for its development (c.r.t. 4.62, Chapter- 4).

6.1.3.3. Trade & commerce and Service

The tertiary sector includes trade and commerce and service activity and is the major contributor (about 48.00 per cent) to the State Gross Domestic Product of the study area. The trade and commerce activities are confined to wholesale and retail trade activities. In the wholesale trade consumer, agricultural, handicraft and textile

products are preferred trade and commercial activities. Similarly, consumer goods, textile and handicrafts are significant trade and commercial activities in the study area. However, the higher capital-intensive trade and commerce activities are not preferred in the study area due to lack of investment capability.

Among the various service activities, it is observed that transportation, accommodation, providing food facility, entertainment and tourism are the most the significant ones and have reasonable potential for growth in this sector, which would influence the other functions including tourism development in the study area.

6.1.3.4. Employment

Employment is an important indicator of both economic and social development of any system. In this investigation, it is found that about one-third of the total populations are employed in different forms of occupations in both organized and informal sectors. The employment in agriculture sector is most significant compared to other sectors of economy in the study area. It is also revealed that growing unemployment and disguised employment are major problems particularly among the educated youths, which hindered the economic growth of the study area to a larger extent. The employment in organized sector, which is confined to Governmental and private services are very meager in the study area. On the other hand, the model results manifest that the informal sector employment is quite significant in the study area. It is observed that the growth of tourism would generate huge amount of employment opportunities in the informal sector from tourism activities, which may also lead to generate further employment opportunities by developing other economic activities, such as, strengthening handicrafts industries, trade and commerce, service sectors, etc.

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6.1.3.5. Income expenditure status

The study area is characterized by low to medium level income generation by the inhabitants. Agriculture being the primary activity and subsistence in nature, low industrial development, service activities and confinement of trade and commerce mostly to the urban areas, are the basic reasons for low income generation in the study area. The expenditure is found to be having very high correlation with income. About half of the income is being spent in basic elements food, clothing, health, education and water supply. Expenditures on transportation and energy are about one-fifteenth of total income each, which is also quite significant. This income and expenditure pattern leaves a very low scope of expenditure in recreational activities. Above all, it is observed that there is low saving, which leads to low or no investment in the study area, thereby generating low-income earning opportunities. Further, the low-income generation and subsequent low expenditure on recreational activities lead to low internal domestic tourist flow, and in turn act as obstacles in the growth of tourism activities in the study area.

6.1.4. Social Conditions

Education, health, poverty, women and child welfare, etc., are the important indicators considered for understanding the social condition of the study area. The results reveal that literacy rate in both male and female is experiencing an increasing trend with an over all literacy rate of 63.60 per cent, which is low in comparison with other developed States of the country. Steps are being taken by the State Government and private participants in the field of education for the development of lower (elementary, primary and secondary levels) and higher education including professional and technical educations. However, the per capita expenditure on general education manifests the educational backwardness of the study area.

Health facilities are very meager and are mostly looked after by the Government. Private health facilities are increasingly being established in the study area, though mostly confined in the urban areas and large cities. It is also observed that the household expenditure on health takes a low priority in the study area and even in certain segments of people from low income group do not spend anything on health aspects and remain totally dependent on the free Government facilities.

Government of Orissa and Government of India are taking various programmes and schemes to overcome the poverty in the State as a whole. A number of schemes and programmes pertaining to poverty alleviation are in operation in the study area. It is observed that about two-fifth of the total population remain under poverty in the State as a whole until now. Conservative social attitude in the State does not help for the development of women in the State and in the study area. However, a number of measures are being taken for women empowerment, providing income earning opportunities for women and giving equal status to women in the society, though these measures are found inadequate for women development for the larger sections of the society. Thus, it is found that the study area is socially and educationally backward, which also function as a barrier for tourism development in the study area.

6.1.5. Infrastructure

The major basic infrastructures, which are considered in tourism development are roads, railways and power and tourism infrastructures includes temporary resting facilities, parking facilities in destinations, shopping facilities, water supply and sanitation, etc. The results of the investigation conducted pertain to these infrastructures are discussed as below:

6.1.5.1. Railway

The model result reveals the supply of railway route length is much lower than the demand of railway route length in the study area and in the State as whole providing very low level of satisfaction. It is also observed that though a number trains are running connecting major cities and States of the country as well as different areas inside the State, many of the tourist centers of the study area and of the country are not connected with the rail connectivity. It is also revealed from model simulation results that there would be more tourist flow to the study area with higher growth of rail connectivity, which also helps in increasing the tourist satisfaction. Thus, rail infrastructure is found to be one of the most important infrastructures from tourism development point of view in the study area.

6.1.5.2. Roads

The model result reveals that the availability of total road lengths and higher order roads lengths are much lower than the demand of road lengths in the above categories in the State and in the study area, thereby providing a low level of road satisfaction. It is also observed that the availability of higher order roads is very meager in comparison with the total road availability. The condition of roads is also not satisfactory as per the opinion of the people and tourists as well. Further, it is found from the simulation results that the increase in road lengths alone may not impact much on tourist flow, but increases the tourist satisfaction significantly. Thus, the poor condition of roads plays a deterrent role in tourism development and its development is of paramount importance for the development of tourism industry in the study area.

6.1.5.3. Air connectivity

The State has only one major airport, which is located in the capital city of Bhubaneswar connecting a few major cities of the Country. A number of flights are

plying to this airport by different airlines from time to time, though the low level of passenger movement has become an obstacle in plying of more flights to the State. The low level of air communication does not motivate more tourists, particularly foreign tourists to travel to the study area. It is also observed that the major tourist centers of the country, to which large number of tourists visit, such as, Agra, Jaipur, Jammu and Kashmir, Kanyakumari, Madurai, etc., to name a few, are not connected directly by air connectivity, thus barring the study area to attract tourists who visit those places. However, the primary survey conducted among the tourists reveal that majority of foreign tourist would prefer to travel by air to visit to the study area, and it would be possible only if proper connectivity and higher frequency of flights at affordable level are provided and would help tourism development in the study area.

6.1.5.4. Accommodation

Accommodation is one of the most important infrastructures in tourism development. The model results reveals that the supply of hotel bed in both affordable and high spending category are matching and would be same way up to 2015 A.D, after which the demand will be more than the supply creating low satisfaction level. Thus, gradual creation of more accommodation facilities in organized sector in the form of hotel beds are of higher necessity.

6.1.5.5. Temporary resting facilities

Temporary resting facilities at the destinations are one of the most important infrastructures sought at the local level by the tourists, which are by and large not available in the study area. The very absence creates resentment among the tourists and dissatisfaction thus forms an obstacle in tourism attraction to the destinations.

6.1.5.6. Water supply and sanitation facilities

Water supply and sanitation forms important infrastructural facilities, particularly at local tourist destination levels. Public drinking water supply system mostly confined to few urban areas and about half of the people are dependent on it in the system, whereas the rest depend on own drinking water supply. Similarly, sewerage and drainage system have a very meager presence in the system. Therefore, careful and immediate attention is necessary to cater to the needs of the people in general and tourist destinations in the study area in particular.

6.1.6. Ecological and Environmental Conditions

The investigation shows that there is very low level of environmental pollution in the study area except in the industrial locations and forms a congenial environment for tourist visit. Deforestation and degradation of vegetation are the most important ecological problems, which disturb the ecological balance in the study area. The coastal ecosystem, which is very fragile also at times disturbed by the human intervention, and need attention. The model results also reveal that the environmental stress would increase with increase in the tourists flow to the study area. However, the model results also reveal that the environmental stress would remain within tolerable limit in a few exceptional cases. Thus, ecological and environmental conditions of the study area are quite congenial and healthy for tourism development as a whole though measures are needed for protecting the same.

6.1.7. Culture and Cultural Heritage

Orissa State and the study area is particularly known for its culture and cultural heritage. The Jaganath culture is a unique blend of spiritual, philosophical and human dimensions is known as the soul of the cultural activities of the State. The tribal culture

of the State has also created its niche. The various kinds of dance music, folk plays, fairs and festivals, etc., are the integral part of the culture of the State, make the State culturally unique place. However, even though the culture of the State has tremendous potential to attract tourists and can influence many, is not so far contribute significantly in tourism development, because of the lack of promotion and planned approach of development of cultural activities.

Orissa State, particularly the study area is full of archeological and cultural heritages. They are among the most important tourist attraction elements in the State. The cultural heritages of the study area are mostly religious places, such as temples, Buddhist stupas, Jain caves, forts, etc., and built centuries ago. The grand temple dedicated to Sun God 'Konark' which is unique for its architectural splendour and exquisite beauty along with Puri Jagannath temple, Buddhist stupas at Dhauligiri, Ratnagiri and Lalitgiri, Jain caves at Khandagiri, etc., are the epitome of numerous cultural and archeological heritages available in the study area, having tremendous potential to attract tourists. However, it is observed that though they still retain their importance for tourist visits as prime attraction elements, their dwindling nature due to lack of proper attention make them to loose their importance.

Conservation of Cultural heritage structures and tourist attraction elements are important factors for tourism development. A few organizations like Indian Archeological Society, State Archeological Society, Indian National Trust for Art and Cultural Heritage (INTACH) and other Non-Governmental Organisations belonging to both Government and Non Government Sector are operating in the State in their related spheres, such as, conservation of archeological sites, conservation of heritage monuments, paintings, etc., thereby contributing to the promotion of tourism in the State. However, it is also understood that despite efforts are made at various levels,

paucity of fund make it difficult for proper attention and conservation of the heritages to retain their attractiveness for tourism development.

6.1.8. People's Participation

People's participation and community involvement in tourism development at local level is another key element in growth of tourism in the study area. Understanding this, local tourism development committees have been constituted at certain destinations such as, Dhauli, Barunei, Ramchandi, Satapada, Konark, Panchalingeswar, Huma, etc., and it is observed that these committees are basically advisory in nature and lack any legal authority for development. In addition, the lacks of fund for development of destinations make these committees almost defunct. Further, even though after the 73rd and 74th Constitution Amendment Act of India, empowerment of people have been done through Local Self Government administration, it is observed that hardly any tourism development activities are being taken by these bodies. Thus, people's participation for tourism development is at very elementary stage, and thereby hampers tourism development in the study area.

6.1.9. Tourist Flow and Tourist Receipts

The literature survey reveals that the annual tourist flow in the study area in domestic category is very meager and is almost stagnant in foreign tourist category. The domestic tourist forms the bulk of the total tourist as the foreign tourist is limited to a few thousand only, which also varies between on 0.30 per cent to 2.00 per cent in various years. Combining with this it is also observed that there is reduction in duration of stay as revealed from primary survey, which occurs due to better communication facilities, therefore less tourist spending in the study area. The various reason for low growth rate of tourist flow are multifarious as discussed earlier, such as, inadequate infrastructure, lack of promotion and publicity, investment in tourism

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development, etc. It is observed from the model results that there would be about 6.50 times increase in domestic tourist flow and about 4.50 times increase in foreign tourist flow in the study area. However, the various simulation scenarios reveal that with enhancement of infrastructure, and investment in tourism development would increase the total tourist flow between less than 1.00 per cent to about 100.93 percent (total number of tourists varies between 27061159 and 54375374) over the result in the projected year 2031 A.D. The domestic tourist flow would show a growth of about 1.00 per cent to 98.00 per cent (number of domestic tourists varies between 27004976 and 53545233), whereas foreign tourist flow would increase between 1.00 per cent and 1475.00 per cent (number of foreign tourists varies between 56182 and 830141) in different combinations over result in the projected year 2031 A.D. Similarly, the tourist revenue would increase about five folds in both domestic foreign tourist categories with an over all increase of about five times of the present amount in the year 2031 A.D. The simulation results reveal that the domestic tourist receipts would increase between less than 1.0 per cent and 97.98 per cent, and the foreign tourist receipts would be enhanced between less than 1.00 per cent and about 1377.59 per cent with an over all increase between 1.00 per cent and 100.93 per cent in the projected year. The various simulation results manifest that the development of tourism and increase in tourist flow depends on various combinations of infrastructural development and investment. An enhancement of isolated aspects does not influence the tourist flow and tourist receipts much.

6.1.10. System Development Indicators

The various indicators, which are measured to find the influence of tourism in development of the system, are Per Capita State Gross Domestic Product, employment

from tourism, employment in informal sector, the level of tourist satisfaction and environmental stress.

It is found that the Gross Per Capita Gross Domestic Product in the study area would increase by more than 2.50 times that of present amount. However, the simulation results show that the Per Capita Gross Domestic Product would increase from zero per cent to more than 20.00 per cent in the study area with increase in tourist flow and tourist receipt, and increase in contribution from handicrafts, and commercial crops in 2031 A.D. The Per capita Gross Domestic Product would increase from 23.00 per cent to 42.50 per cent when tourism receipts are included in the calculation, there by manifesting that tourism development would contribute significantly in economic development in the system.

The employment generation by tourism sector would increase by seven times of its present employment generation in the projected year. The simulation results show that with addition of the same control parameters for tourism development the employment generation in tourism sector would increase between zero per cent and about 100.00 per cent in the projected year. The employment in informal sector would match with other sectors and sometimes even, it would exceed the other programmes by the projected year 2031 A.D, at low investment. This is because tourism provides huge opportunity for employment generation compared to organized sectors.

It is also observed that the tourist satisfaction at present is 0.41, which would increase up to 0.89 because of the enhancement in the infrastructure provision, investment in development of tourist attraction elements, etc., thus indicating that infrastructure development, and tourist destination area development, cultural development, promotion and publicity would led to higher tourist satisfaction.

It is observed that, at present, the environmental stress due to tourist flow is very meager and would increase up to 0.35 in the projected year 2031 A.D. This would increase up to 0.64 with higher tourist flow as manifested by simulation results, which is also within tolerable limits. Thus, there would not be much problem in the carrying capacity of tourists in the study area. However, proper care needs to be taken for protection of the fragile ecosystem and abatement of environmental degradation due to human intervention.

6.2. FINDING BASED ON LITERATURE AND PRIMARY SURVEY

The following very important inference drawn based on the extensive literature survey and intensive primary survey conducted during the course of this investigation. They are:

6.2.1. Socio-Economic Conditions

1. The study area has kept its identity and carved a niche of it's own despite having an unstable and torrid administrative set up throughout the history.

2. The study area is characterized by coastal plains having a long stretch of plain land adjoining to the coastline and alluvial deposits of rivers.

3. It has a good and soothing climate for about nine months of the year, except the summer months of March, April, and May. It is influenced by South-west monsoon for about four months in a year from the month of May to August having annual rain fall of 1500 mm.

4. The study area is highly agrarian and rural in character and the urbanization level is very low. However, most of the important urban centers of the State including the State capital are confined in the study area.

5. The decadal population growth rate in the study area is slightly higher than the State growth rate and the density of population in the study is almost double in size of that of the State.

6. Hinduism is the predominant religion in the study area and other religions, such as, Muslim and Christianity have very meager presence.

7. About one third of the agricultural area of the State is confined in the study area, which is about half of the total area of the study area.

8. The primary sector dominates study area as a whole. The contribution of secondary sector is meager though industrial activities have been encouraged in the study area since the year early nineteen eighties. The tertiary sector dominates in the urban areas of the study area.

9. The study area is having low per capita income though it is on the increasing trend in the last decade.

10. The annual income among the households show marked variation. It observed that most of the households are confined to lower and lower middle-income groups. More than two-fifth of the households are having annual income less than Rs. 72000.00 and the number of households in the highest income range having annual income of above Rs.180000.00 is the lowest with a size of only 7.29 per cent of total households. The rest i.e., about half of the surveyed households are confined in the annual middle income range between Rs. 72001.00 and Rs.180000.00.

11. It is observed that agriculture is mostly a major activity among the lower income groups and its function decreases with increase in income.

12. Majority of the farmers of the study area belongs to low landholding and have low operational land area, which function as barriers in the agricultural development in the system.

13. It is observed that the average cropping intensity is more than one hundred fifty per cent (151.80 per cent) in the study area. Khariff crops are the prime crops followed by Rabi crops and summer crops. The cropping intensity shows that more than one crop are practiced in the system. It is also found that crop coverage and cropping intensity among the households increases along with increase in income level in the system.

14. Paddy and pulses are the two most cultivated crops in the study area. Vegetables are the most important commercial crops, though crops, like coconut and sugarcane are also cultivated in the study area, but their share is low. This manifests that the system is subsistence in nature and the commercial crop cultivation has a meager presence in the study area.

15. There are lower agricultural inputs such as, inputs in fertilizer (40.84 kg/ ha as against national average of 90.12 kg/ha) and practice of high yielding variety seeds is insignificant in the system, which means the agricultural practices are not much advanced in nature, which reiterates the subsistence nature of agriculture in the system.

16. The average yield of paddy and pulses in the system are 1.44 tones per hectare and 0.25 tones per hectare respectively, which are on the lower side of the average yield for an advanced agriculture system. Also, it is observed that crop output increases with higher agricultural input.

17. Major and medium irrigation potential are the prime sources of irrigation, followed by minor lift irrigation and minor flow irrigation in the study area. The average irrigation intensity in the study area is 133.00 per cent.

18. Horticulture and Animal husbandry are considered as supplemental occupation to the agricultural activity in the system. Horticulture and agriculture are practiced together in the system.

19. In the study area, fishery is an important economic activity due to the presence of long coastal area, and number of lakes including brackish water lake Chilka in the system. A significant quantity of fish and fish products are transported to other States of the country and exported to different countries too.

20. Orissa State is very rich in mineral resources, but in comparison with the other regions of the State, the study area has scarce mineral resources.

21. All the urban areas of the study area are engaged in various kinds of trade and commerce activities, of which the consumer goods, agriculture products, food and allied, textile products, and other industrial and manufacturing products are the important ones. Trade and commerce activity of handicraft products have gained significance at certain particular centers such, as Pipili, Raghurajpur, etc., in the study area.

22. The study area is bestowed with products with high export value of marine, handicraft products, and agricultural and horticultural products, which are transported from the study area to the other parts of the country and so also exported to foreign countries, thus making trade and commerce activity as an important activity in the study area.

23. Service activity has significant influence in the system. Transportation activity, accommodation, food, tourism, religious activity, entertainment activity, etc., are major service activities apart from employment in Government, Public sector, Private organizations or professional activity;

24. The lower and middle-income groups mostly prefer the transportation and religious activity; where as, accommodation and entertainment activities are preferred by the higher income groups. Food and tourism related activities are confined to all income groups in the study area. It is also observed that except religious activity all other activities have reasonable potential for growth in the system in the service occupation.

25. In spite of the meager contribution of industry to overall economic development, it is observed that small scale and cottage industries are important components of industrial development in the study area.

26. About one third of the total population in the study area is employed in different occupations. Of the total employed persons it is observed that more than half belongs to age group of 15-35 years and, a little less than half belong to the age group of 36 to 60 years, and very few of total employed persons are above 60 years of age. There is no child labour in the study area among the surveyed households.

27. The study area is blessed with exquisite and skilled artisans, who perform craft, based activities. Several types of crafts such as, Applique works, Silver filigree, Golden grass works, Art textile, Stone Carving, Sea shell works, Coir crafts, Brass and Bell metal works, Cane and Bamboo works,, Pattachitra, Terracotta, Carpet, Wood carving, etc., are practiced in the study area making the handicraft an

important industrial activity. It is also observed that the crafts are highly location specific and each craft is practiced at few particular locations in the study area.

28. Growing unemployment and disguised employment particularly among the educated segment are the burning problems of the study area and in the State as well, though Government has accorded high priority for generation of employment opportunities through self-employment ventures, and in informal sector in addition to employment in organized sector.

29. About half of the households of the study area practice more than one occupation. Agriculture, horticulture and animal husbandry occupations are mostly practiced in lower income group households; service activity is concentrated in middle-income groups. Trade and commerce does not follow any pattern and has its presence in all the categories of income groups. Industry activity with own industry occupation is only confined to the two highest income groups of the surveyed households.

30. It is reveled that the system shall move in the direction of tertiary sector economy in future occupation trend and primary sector may loose its priority among the people in the system.

31. More than three fourth of the average annual income is spent on total expenditures of households. The remaining amount of total income is available for investment, expenditure for other social activities and savings.

32. About half of total income is spent for basic expenditure, such as, food, clothing, heaths, education and water supply in the system. The expenditures on transportation, energy are very low. The expenditure on recreational activities alone is insignificant.

33. It is also observed that the share of basic expenditure and total expenditure decreases with increase in income and balance amount or savings increases with increase in income. The lower and lower middle income groups have very high expenditure (more than 80.00 per cent of the income) and low savings as compared to higher income groups. It is revealed that lowest income group spend almost the entire income, of which about two-third amount is spent on food only.

34. Majority of the households do not avail credit facilities and only about one seventh of households avail credit facilities. It may be due to the inaccessibility of the people to credit facilities and lending agencies because of their poor economic conditions.

35. Majority of higher technological, medical and management institutions are confined in the study area.

36. The family welfare program is being implemented by the State Government with the objective of population control, universal immunization and health care.

37. Health care, family welfare, development of women, welfare of backward classes such as, Scheduled castes and Scheduled tribes, and poverty alleviation are priority areas of concern and Government has attached high importance to them.

38. About three-fourth of the households own houses in the study area and the rest reside in rented houses. About two-third of the population stay in detached houses, more than one-fifth lives in semi-detached houses and the rest (15.38 per cent) live in flats. It is also observed that higher income of households leads to better housing situation in the system. The study area possesses mixed type of ownership of houses with mixed housing conditions.

39. A low percentage (about one-tenth) of the households avail housing finance facility as many do not have economic capacity to qualify for the housing finance from lending institutions.

40. Temporary accommodation facilities are available in the study area to some extent and that higher income group people have positive attitudes towards providing temporary accommodation facilities.

41. Railway is one of the important modes of transportation in the study area and in Orissa State. It is observed that the railway route length density is very low in both the study area and in the State. The growth rate of railway route length in the study area and in the State is also very low. The frequency of passenger trains in the study area is also very less and inadequate as about two third of households have access to passenger train at an interval of more than two hours.

42. The local transportation of people by rail mode is marginal in the study area. Most of the important places and tourist destinations in the study area are not connected by the railway link.

43. Qualitative improvement of railway service such as, high speed trains, track electrification of routes are meager. The satisfaction level of railway route length in the study area is also lower than the State.

44. Road is the most important modes of transportation the study area and in the State. It is observed that the density of road length both in the study area and in Orissa State are marginally higher than many areas of the country, but lower than developed areas of the country. The share of the higher-grade roads, such as, National Highways, State Highways, District level roads are very meager compared to other lower grades of roads. There are also attempts for quality improvement of

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roads in the State and in the study area as it is evident from up gradation of certain stretches of National Highways in the State.

45. It is also observed that the growth of road lengths in the study area and in the State is very slow. The supply of road lengths is much lesser than the demand of road length leading to satisfaction level of road length in the study area and in the State.

46. Significant portions of the study area and in the State are yet to be connected with all weather roads. Among the all weather roads, even a considerable portion do not have permanent surfaces with concrete or bituminous or asphalt surfaces showing the availability of low quality roads in the study area. It is also observed that the road maintenance situation is not healthy, which leads to inefficient transportation system in the study area

47. Passenger Buses are the most preferred mode of transportation in the study area. About two-third of the households have access to buses within one hour interval and about one-fifth have access to bus between one and two hour interval. This means that the bus transport system is reasonably fair in providing movement in the study area (system). There is significant presence of two wheelers, which are being used by middle and higher middle-income groups' people for transportation needs. The availability of three and four wheelers are low.

48. The use of waterways in the study area for mass transportation is very rare However; there are inland water transport services in the study area through motorized launches in different inaccessible areas being provided by the Government of Orissa and individuals. There are eight such water routes in operation in three sectors, such as, Chandabali sector, Balugaon Sector and

Astaranga sector and in few places non-motorized boat services provided by individuals are also used for crossing waterways.

49. It is observed that the power generation is more than the power demand in the State and the installed capacity is much higher indicating the potential of the State in power sector. The per capita power consumption is 156.89 KWh as against the national average consumption of 360.00 KWh, which indicates the poorly developed environment in the State. There is electrification coverage of 80.01 per cent of inhabited villages in the State through conventional and non-conventional energy sources. The study area as such does not have much power problems, but quality service in terms of voltage fluctuation, load shedding and maintenance is very poor.

50. The communication network in the form of telecommunication, availability of internet and postal services are reasonably developed both quantitatively and qualitatively in the study area.

51. Most of the urban areas of the study area are supplied with public water supply system and at places supplemented by hand pumps. A few rural area are supplied with drinking water and rest of them have to depend on their own arrangement, such as, tube wells, open wells, streams, etc. Many of the urban areas and rural areas experience shortage of water supply in summer season. The quality of available water is also reasonably good, except in certain saline belts.

52. The organized pubic sanitation facilities, such as, sewerage, drainage, solid waste and garbage disposal system are not available in most of places of the study area except in few urban areas. These sanitation facilities are also partly available in a few developed and large urban centers, which are looked after by the local bodies

and are almost non-existent in the rural area. The study area has a very poor artificial drainage system. The availability of covered drains in the system is very meager.

53. Priority has been given in providing various outdoor and indoor recreational facilities such as, open playgrounds, recreational parks and open spaces to the inhabitants and tourists to the study area and in the State. Entertainment infrastructures in form of theatres, festival arenas and organizations for cultural recreations such as, dances, folklores also form integral part of the study area.

54. There are several financial and banking institutions in both public and private sectors operating in the study area, but the credit ratio is very low signifying low investment rate in the study area.

55. The ecological systems in the study area are forest ecosystems, coastal ecosystems, habitat ecosystem and mining ecosystem. It contains tremendous amount of bio-diversity including forest, agriculture, marine and plant resources. Of these, the forest and coastal ecosystems are very important as they confine wildlife and marine elements, flora and fauna and thus highly fragile. The environment and ecological balance of the State are under stress due to human intervention in the said ecosystems, which is indicated from the ecological irregularities, such as, depletion of mangrove forests, decrease in visit of migratory birds to the State, and change in climate in the system.

56. Environmental pollution is experienced to some extent in the large cities and industrial cities, like Bhubaneswar, Cuttack, Berhampur, Puri etc., in the study area, but in the rural areas, it is not observed. It is also observed that the concentration of various pollutants in pertain to both water and air in the State and in the study area

in general are within the permissible ranges. However, the environment of the State is under stress as evident from the contrasting and extreme climatic changes experienced in last few years.

6.2.2. Industrial Scenario

1. It is observed that about 95.00 per cent of the industries surveyed are small-scale industries of which 20.00 per cent belong to tiny and cottage industries. Only about 2.00 per cent of industries are large-scale industries and 3.00 per cent belong to medium scale category

2. About two-third of industries surveyed belong to private sector undertakings, a little less than one-fifth of the sample industries confined to proprietorship ownership in the study area. The shares of cooperative industries, partnerships and public sectors are very meager in the study area.

3. About one-fourth of total industries surveyed are Engineering and metal industries, and a little less than one-fifth belong to agro and food based industries. Electrical and electronics industries, rubber, plastic and chemical industries, handicrafts, and service industries are almost equally distributed each having a share of more than 10.00 per cent in the system. Building material industrial units have meager presence in the study area.

4. There is no particular preference of industrial set up based on products in the system. However, handicraft industries have a low share despite the presence of high-grade skill available in the study area.

5. The increase in the annual installation capacity of all categories of industries is very low, and in most categories, it is almost stagnant.

6. The industries show an increase of 26.70 per cent over initial production level, in which service industries (49.30 per cent), and engineering and metal industries (39.64 per cent) show appreciable increase in production. On the other hand, building material, agro and food based, rubber, plastic and chemical based and electrical and electronics industries show average enhancement in production capacity. The handicraft industries have experienced a very meager enhancement in the production.

7. Agro and food based and engineering and metal-based industries in the system perform efficiently having greater demand. The handicraft industries do not function in efficient manner and less organized. It is also observed that the production level of all these industries is lower than the installation capacity, means that there is underutilization of industrial installation in the system.

8. There is about 25.60 per cent overall increase in employment in all categories of industries. Agro and food based industries, engineering and metal-based industries, and electrical and electronics industries have experienced reasonable growth in employment generation. On the other hand, handicraft industries, service industries and rubber, plastic and chemical industries show marginal growth in employment generation. The building material industries do not experience any increase in employment at all.

9. A majority of industries in all categories do not have any proposal for future expansion.

10. Nationalized Banks are most important sources of capital for industrial development, and are financing about three-fourth of the industries. Cooperative banks, boards/corporations finance about one tenth of industries each. Self-

financers have meager presence as sources of capital. Private banks do not contribute anything for industrial development in the study area.

11. Local area is the source of raw material for almost all the agro and food based and building material industries, more than four-fifth of handicrafts industries, two third of the service industries, and more than half of electrical and electronics industries. On the other hand, a higher percentage of engineering and metal industries and rubber, plastic and chemical industries depends on outside sources for raw materials.

12. Orissa State is the major market for all types of products except building materials and rubber, plastic and chemical industries. Most of the industrial products of the State have a very low presence in the national market. Most of the building material, some of the handicraft, engineering and metal and agro and food-based products have greater demand in foreign market.

13. Availability of land and accessibility are the two most important advantages for all most all categories of industries. Availability of skill and Government incentives are the important advantages for handicraft industries. In addition, Government incentives are important advantages for agro and foods based and building material industries. Cost of land and power are the least level of advantages in the study area.

14. Energy and capital are the two most important major problems. Environmental consideration is another problem, which hinder a certain type of industries in rubber, plastic and chemical and building material category.

17. A majority of the industry people feels that the future prospects of industries in the study area is good or promising. Every one is unanimous about the better future prospect of handicraft industries and building material industries in the study area.

6.2.3. Tourism Industry

1. The study area is bestowed with rich cultural heritage, grand artifacts, religious places, long and beautiful coastline with natural scenic beaches, wildlife sanctuaries, largest backwater lake (Chilika), and immigration of beautiful birds and tortoises (Olive riddles), the presence of dolphins, etc., which are major potential for tourism development.

2. The study area also possesses adequate resources for craft based products. There is availability of high-grade skill for craft based products and creation of heritage structures, etc., in the study area and in the State as a whole.

3.. The share of domestic tourist inflow in the State is observed to be little above 1.00 per cent and the share of foreign tourist is less than 1.00 per cent to that of tourist arrival in the country in the last five years between 2000 and 2004. It indicates that the presence of Orissa State in national tourism map is insignificant, and the State is yet to become a prime tourism destination in the country

5. Majority of domestic tourists visit are from neighboring States/regions such as, West Bengal State followed by Andhra Pradesh State, Bihar and Jharkhand region, Madhya Pradesh and Chhatisgarh region, etc., of the country. It is observed that the State is a major contributor to domestic tourists flow, having contributing more than half of the total domestic tourists visit to the State. Thus, Orissa State tourism has not made much influence in many regions of the country.

6. Western Europe contributes more than half of the foreign tourists flow in the State. North America, East Asia, Australia, etc., are the other important foreign tourist contributing regions to Orissa State.

7. Many countries across the globe and many regions of the county are at present away from the influence of tourism in Orissa State.

8. The domestic tourist inflow in the State and in the study area has increased steadily over the years and the foreign tourist inflow is almost stagnant.

9. Domestic tourists contribute about more than 99.00 per cent of total tourist arrival in the State, and in the study area.

10. At present, about 98.00 per cent of domestic tourists and 45.00 per cent of foreign tourist visiting to the State visit to the study area.

11. There is a steady growth in domestic tourists to both the study area and in the State, where as there is minor fluctuations in growth in foreign tourist category.

12. There are large variations in tourists flow to various destinations in the study area. Most of the tourist flow in domestic category is due to religious reasons, followed by archeological and architectural sites. Sea beaches and organized wildlife also attract good number of domestic tourists.

13. Most of the domestic tourist flow is to the well-publicized destinations and a number of important destinations despite their attractive features do not attract many tourists for other reasons such as, lack of transportation facilities, accommodation and proper promotion and publicity.

14. The foreign tourists concentrate in the most publicized destinations, which are located in and around Bhubaneswar and Puri. The architectural and archeological artifacts are prime attractions for foreign tourists.

15. Organized handicrafts destinations like Pipli and Raghurajpur, which are exclusively known for their handicrafts, attract significant number foreign tourists than domestic tourists.

16. Puri is the highest receiver of total tourists' inflow, followed by Konark, Nandan Kanan at Bhubaneswar, Khandagiri and Udaygiri and Dhauligiri at Bhubaneswar in order of preference in the domestic category. The other important destinations, which attract large number of domestic tourists, are Chilka, Pipli, Satyabadi, Chandipur, Remuna, Chandaneswar, Aradi, Gopalpur and Taratareni.

17. A number of destinations despite having tourist attraction features, such as, Lalit giri and Ratna giri (Archeological sites), Bhitarkanika and Satapara (wildlife such as, Crocodile sanctuary, Dolphin sites, etc.), Chandikhol, (summer resort), etc., do not attract many tourists at present.

18. Smaller religious destinations in the study area are, at present, less preferred by domestic tourists, but it is observed that during festival seasons there is large tourist flow to those destinations.

19. Puri Konark Bhubaneswar Dhauligiri, Khandagiri and Udaygiri, Pipli, Raghurajpur, Chilka, Nandan Kanan, etc., are the most preferred destinations in order of preferences among the foreign tourists.. Other destinations do not attract much of the foreign tourists.

20. About three-fourth of the foreign tourists and one fourth of domestic tourists prefer to visit other destinations of the State. Tribal Orissa and Western Orissa are other preferred regions for both categories of tourists.

21. Most of the tourists in both foreign and domestic category belong to age group of 41 - 60 years, followed by age group of 26 - 40 years.

22. More than three-fourth of foreign tourist visit first time and in contrast about three-fourth of domestic tourists visit the study area more than once.

23. The average of duration of stay for foreign tourist is 8.30 days and for domestic tourists is 3.96 days.

24. Travel is the most important purpose for three-fourth of foreign tourists. More than one-tenth foreign tourists visit for pilgrimage and about one-twentieth visit for business activity. The purpose of tourists for a combination of different activities is also significant in this category. In the domestic tourist category about one-third visit for recreation, and one-fifth for pilgrimage. Business and travel are also other purposes of visit for domestic tourists on priority basis. Thus, that travel, recreation pilgrimage, etc., are the major purposes of tourism in the study area.

25. Recreation and travel, religious activity and pilgrimage, visiting heritage and archeological sights, seeing of sculptures, etc., are the most important tourism activities in the study area. On the other hand, adventure sports, boating, affinities towards cultural programmes are the least preferred tourism activities in the study area.

26. Months of October, November, December and January with the peak flow in December, draw maximum domestic tourist flow. In other period of the year, the tourist inflow is almost constant. In case of foreign category, majority of tourist inflow occurs in the period of October, November, December, January, February March and it is peak in the months of December and January. Thus, the winter and early spring are the best seasons fro tourist flow in the State and in the study area.

27. The inflow of money from domestic tourist expenditure form the bulk of total tourist receipts in the State, and the share of tourist receipts from foreign tourist

expenditure is negligible. The inflow of money from domestic tourist expenditure is on increasing trend, and the inflow from foreign tourist expenditure is experiencing fluctuations.

28. A majority of the notable destinations in the study area are within the range of 150 KMs on either directions of North-East and South-West from Bhubaneswar city. A number of destinations are within 200 KMs range and a few are located just above two hundred kilometers away from Bhubaneswar city.

29. The contribution of employment from tourism to total employment is very low and most of them are in informal sector. Accommodation, restaurants and transportation are the major tourist related activities generate bulk of the employment.

30. About of three-fourth of foreign tourists travel by air for transportation and one-fifth travel by rail at national level to visit the study area.

31. Three fourth of domestic tourists prefer rail for and one fifth of domestic tourists prefer road at national level to visit the study area.

32. At regional level, majority of foreign and domestic tourists travel by road.

33. At local level, taxies and auto rickshaws are important modes of travel for both foreign and domestic tourists. Few foreign tourists also prefer cycle rickshaws for local traveling. Buses and slow moving vehicles are utilized by domestic tourists for local traveling. Tourist buses have a meager presence.

34. Half of the foreign tourists and a little above half of domestic tourists feels that road condition is satisfactory and the rest feels that roads condition in the study area is not good.

35. According to more than half of the foreign tourists and domestic tourists visiting the study area, accommodation facilities are satisfactory and others feel the condition needs improvement.

36. About two-third of the foreign tourists and three-fourth of domestic tourists feels that sanitation condition is unsatisfactory and needs improvement

37. Parking facilities and shopping facilities in the study area are unorganized according to majority of both categories of tourists.

38. There are only four nationally recognized tour operators and travel agencies operate in the State. In addition, a number of unrecognized travel agencies operate in the study area and a majority of the travel agencies is located in Bhubaneswar, Cuttack and Puri.

39. The study area does not have organized service tour packages connecting a number of destinations to facilitate tourists visit in the study area and in the State as well, except Orissa State Tourism Development Corporation, which provides limited services to a very few tourist destination on sporadic basis, no other travel agencies or tour operators provide service tour packages in the study area,

40. Various accommodation facilities in the State and study area are hotels, panthanivases (Guest houses with all modern and hospitality facilities run by Tourism Department), Dharmasalas (Charitable Guest Houses), tourist bungalows, etc.

41. . The availability of hotels, rooms and beds nearly constitute more than 60.00 per cent of the total availability in the State having a steady growth rate of about four per cent every year.

42. Majority of the hotels are concentrated in Puri and Khurda districts, followed by Ganjam and Cuttack districts.

43. About 90.00 per cent of the hotels belong to low spending and medium spending groups, which is considered as affordable category and one tenth belong to high spending category.

44. About four-fifth of foreign tourists and two-third of domestic tourists prefers overnight stay at destinations during their travel.

45. Majority of foreign tourists prefer to stay in organized accommodation facilities such as, hotels and panthanivases at destinations, whereas, it does not follow a particular preference for domestic tourists.

46. Major urban centers are the preferred locations for food as they housed better restaurants and hotels followed by destinations. A sizable number of both foreign and domestic tourists also choose the wayside restaurants.

47. Tourist destinations are preferred shopping locations for half of the foreign tourists and for about two-fifth of the domestic tourists. The centers of productions are the second preferred locations for foreign tourists as against major urban centers in contrast to the preference of domestic tourists. Major urban centers are second preferred locations for domestic tourists followed by centers of production.

48. Handicrafts are the major products preferred by all types of tourists. Among the handicrafts, unique products of appliqué works, filigree works, stone works, bell metal and handloom are the important products chosen by most of the tourists.

49. Majority of tourists feels that architectural and heritage structures need conservation, better management, wildlife needs improvement, and costal beeches requires more amenities, and better hygienic conditions.

50. Regional and local traveling facilities, temporary resting facilities, shopping facilities, knowledgeable guides are the areas of concern to be considered on priority basis.

51. Deforestation is most important ecological problem needs to be addressed on priority.

52. Sewage disposal and industrial waste disposal are the major concerns, which may hamper the tourism development and also care need to be taken for tourist and travel waste disposal as well as aquaculture waste disposal.

53. Most of the tourist destinations do not have much pollution problems.

54. At preset, the conventional means of electronic media is the most important means for promotion and publicity. Words of mouth play an important role, which is a positive sign for tourism development in the study area. This provides an opportunity for exploring many unconventional means of information dissemination and tourism promotion activities

55. Majority of foreign tourists and domestic tourists prefer revisiting the study area and the rest are against a repeated visit to the study area.

56. The investment in tourism sector is very low in five-year plan outlays and it even does not find place in budgetary provisions of the State budget.

57. The Orissa State tourism policy accords a very high priority for development of tourism in the State in general with the objectives of optimum harnessing of the resources to attract the maximum number of domestic and foreign tourists with increased average duration of their stay in the State.

58. Development of tourism-related industries, promotion of rich handicrafts and handlooms, promotion of natural grandeur and cultural heritage, promotion of

cross-cultural interaction, socio-cultural amity and economic development through tourism are given importance.

59. Involvement of the private sector, autonomous bodies, local authorities and the people at large in promotion of tourism, are the other key areas of concern to which priorities have been attached by the State.

60. The Government of Orissa has an established organizational structure under the department of tourism and culture, which looks after tourism development in the State. A public sector undertaking is also functioning under the department of tourism and culture for facilitating tourism development in the areas of accommodation, travel and tourist guidance.

6.2.3. Model Based Findings

1. The growth rate of population and population density in the study area will continue that would be higher than the Orissa State as a whole. The population in the study area will reach 24950223 having a population density of 697 persons per square kilometer as compared to the State's population and population density of 53259577 and 342 persons per square kilometers respectively.

2. The agricultural land area and forestland area would follow a decreasing trend and reduce to 1583648.75 hectares and 643567.38 hectares respectively. The habitat land area would register an increasing trend and it would reach 777454.64 hectares, which would occur due to conversion of agricultural land area and forest land area to habitat area in the year 2031A.D.

3. The model result reveals that the supply of total road lengths and higher order road lengths are considerably lower than the demand of road lengths in the study area and in Orissa State as a whole. The level of road satisfaction in the State and in the

study area would be 0.78 and 0.50 respectively in 2031 A.D., which manifest that the road infrastructure in the study area is poor in comparison with the State as a whole.

4. It is observed from the model result that the supply of rail route length would be about half of the demand in the State and about one third of the demand of the study area in the year 2031 A.D. The level of satisfaction would be 0.61 in the State and 0.185 in the study area. Thus, it is clearly manifested that the level of rail infrastructure in the State and in the study area is very poor though the situation in the State would be marginally better than the study area in this regard.

5. It is found that availability accommodation facilities in terms of hotel beds in high spending and affordable categories are satisfactory at present. However, the model result shown that the demand of hotel beds in affordable and high spending categories would be about 1.5 times and more than three times that of supply respectively. The satisfaction level in the availability of hotel beds would be about 0.66, which clearly reveals that there would be huge shortfall in the availability of hotel beds in the year 2031 A.D.

6. It is observed from the model results that the study area would witness inflow of 27004974 domestic tourists and 56182 foreign tourists to the total of 27061156 tourists with annual tourist receipts of Rs. 69390.90 millions. The per capita Gross Domestic Product in the system would be Rs. 14687.00. The total employment generation due to tourism alone would be 286307 numbers with an employment generation of 41228213 man-days in informal sector. This would result an environmental stress of 0.34 and the level of tourist satisfaction of 0.41 in the system in the year 2031 A.D.

7. A scenario, at growth rate 3.00 per cent in rail route length, resulted an increase the arrival of 5.41 per cent in domestic tourists and 4.37 per cent in foreign tourists with an over all increase of 5.41 per cent total tourist flow in the system. The annual tourists' receipts would increase by 5.41 per cent. The total employment generation from tourism activities would increase by 5.41 per cent. The per capita Gross Domestic Product would increase by 1.01 per cent. The level of tourist satisfaction and environmental stress would be 0.43 and 0.37 respectively in the system.

8. A scenario, at growth rate 5.00 per cent in rail route length, resulted an increase the arrival of 40.89 per cent in domestic tourists and 32.12 per cent in foreign tourists with an over all increase of 40.81 per cent total tourist flow in the system. The annual tourists' receipts would increase by 40.81 per cent. The total employment generation from tourism activities would increase by 40.86 per cent. The per capita Gross Domestic Product would increase by 7.65 per cent. The level of tourist satisfaction and environmental stress would be 0.45 and 0.49espectively in the system.

9. A scenario, at growth rate of 2.00 per cent in road length and 3.00 per cent in rail route length, resulted an increase the arrival of 17.40 per cent in domestic tourists and 37.58 per cent in foreign tourists with an over all increase of 17.45 per cent total tourist flow in the system. The annual tourists' receipts would increase by 17.27 per cent. The total employment generation from tourism activities would increase by 17.44 per cent. The per capita Gross Domestic Product would increase by 3.29 per cent. The level of tourist satisfaction and environmental stress would be 0.48 and 0.41 respectively in the system.

10. A scenario, at growth rate of 2.00 per cent in road length and 5.00 per cent in rail route length, resulted an increase the arrival of 59.16 per cent in domestic tourists,

and 75.61 per cent in foreign tourists with an over all increase of 59.21 per cent total tourist flow in the system. The annual tourists' receipts would increase by 59.33 per cent. The total employment generation from tourism activities alone would increase by 59.19 per cent. The per capita Gross Domestic Product would increase by 11.11 per cent. The level of tourist satisfaction and environmental stress would be 0.54 and 0.50 respectively in the system.

11. A scenario, at growth rate of 5.00 per cent in road length and 2.00 per cent in rail route length, and investment of 10.00 per cent of total tourism receipt, in tourism development resulted an increase the arrival of 17.59 per cent in domestic tourists, and 107.48 per cent in foreign tourists with an over all increase of 17.79 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 18.27 per cent. The total employment generation from tourism activities alone would increase by 17.78 per cent. The per capita Gross Domestic Product would increase by 3.43 per cent. The level of tourist satisfaction and environmental stress would be 0.75 and 0.41 respectively in the system.

12. A scenario, at growth rate of 5.00 per cent in road length and 5.00 per cent in rail route length, and investment of 10.00 per cent of total tourism receipt, in tourism development resulted an increase the arrival of 59.62 per cent in domestic tourists, and 230.84 per cent in foreign tourists with an over all increase of 59.97 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 60.90 per cent. The total employment generation from tourism activities alone would increase by 59.97 per cent. The per capita Gross Domestic Product would increase by 11.42 per cent. The level of tourist satisfaction and environmental stress would be 0.77 and 0.54 respectively in the system.

12. A scenario, at growth rate of 5.00 per cent in road length, 5.00 per cent in rail route length, and investment of 20.00 per cent of total tourism receipt in tourism development resulted an increase the arrival of 60.31 per cent in domestic tourists, and 466.78 per cent in foreign tourists with an over all increase of 61.16 per cent total tourist flow in the system. The annual tourists' receipts would increase by 61.40 per cent. The total employment generation from tourism activities alone would increase by 61.16 per cent. The per capita Gross Domestic Product would increase by 11.88 per cent. The level of tourist satisfaction and environmental stress would be 0.77 and 0.55 respectively in the system.

13. A scenario, at growth rate of 10.00 per cent in road length, 5.00 per cent in rail route length, and investment of 10.00 per cent of total tourism receipt in tourism development resulted an increase the arrival of 95.61 per cent in domestic tourists, and 592.43 per cent in foreign tourists with an over all increase of 96.64 per cent total tourist flow in the system. The annual tourists' receipts would increase by 99.36 per cent. The total employment generation from tourism activities alone would increase by 96.64 per cent. The per capita Gross Domestic Product would increase by 18.35 per cent. The level of tourist satisfaction and environmental stress would be 0.89 and 0.63 respectively in the system.

14. A scenario, at growth rate of 10.00 per cent in road length, 5.00 per cent in rail route length, and investment of 20.00 per cent of total tourism receipt in tourism development and accommodation growth rate of 10.00 per cent resulted an increase the arrival of 97.72 per cent in domestic tourists, and 1377.59 per cent in foreign tourists with an over all increase of 100.93 per cent total tourist flow in the system. The annual tourists' receipts would increase by 107.60 per cent. The total employment generation from tourism activities alone would increase by 101.13 per

cent. The per capita Gross Domestic Product would increase by 20.37 per cent. The level of tourist satisfaction and environmental stress would be 0.89 and 0.64 respectively in the system.

14. A scenario, at growth rate of 5.00 per cent in road length, 3.00 per cent in rail route length, and investment of 10.00 per cent of total tourism receipt in tourism development and 5.00 per cent growth in accommodation resulted an increase the arrival of 18.84 per cent in domestic tourists and 555.17 per cent in foreign tourists with an over all increase of 19.95 per cent total tourist flow in the system. The annual tourists' receipts would increase by 22.87 per cent. The total employment generation from tourism activities alone would increase by 19.95 per cent. The per capita Gross Domestic Product would increase by 4.28 per cent. The level of tourist satisfaction and environmental stress would be 0.72 and 0.42 respectively in the system.

15. A scenario, at growth rate of 5.00 per cent in road length, 3.00 per cent in rail route length, and investment of 20.00 per cent of total tourism receipt in tourism development and 5.00 per cent growth in accommodation resulted an increase the arrival of 19.23 per cent in domestic tourists, and 695.04 per cent in foreign tourists with an over all increase of 20.63 per cent total tourist flow in the system. The annual tourists' receipts would increase by 24.31 per cent. The total employment generation from tourism activities alone would increase by 20.63 per cent. The per capita Gross Domestic Product would increase by 4.56 per cent. The level of tourist satisfaction and environmental stress would be 0.73 and 0.42 respectively in the system.

16. A scenario, at growth rate of 5.00 per cent in road length, 5.00 per cent in rail route length, and investment of 20.00 per cent of total tourism receipt in tourism

development and 10.00 per cent growth in accommodation resulted an increase the arrival of 97.72 per cent in domestic tourists, and 1277.12 per cent in foreign tourists with an over all increase of 100.17 per cent total tourist flow in the system. The annual tourists' receipts would increase by 106.51 per cent. The total employment generation from tourism activities alone would increase by 100.17 per cent. The per capita Gross Domestic Product would increase by 19.99 per cent. The level of tourist satisfaction and environmental stress would be 0.77 and 0.64 respectively in the system.

17. A scenario, at growth rate of 5.00 per cent in road length, 3.00 per cent in rail route length, investment of 10.00 per cent of total tourist receipts in tourism development, increase of handicraft share to 15.00 per cent and share of commercial crop to 15.00 per cent resulted an increase the arrival of 17.59 per cent in domestic tourists, and 107.48 per cent in foreign tourists with an over all increase of 17.78 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 18.27 per cent. The total employment generation from tourism activities would increase by 17.78 per cent. The per capita Gross Domestic Product would increase by 5.54 per cent. The level of tourist satisfaction and environmental stress would be 0.75 and 0.41 respectively in the system.

18. A scenario, at growth rate of 5.00 per cent in road length, 5.00 per cent in rail route length, investment of 10.00 per cent of total tourist receipts in tourism development, increase of handicraft share to 15.00 per cent and share of commercial crop to 15.00 per cent resulted an increase the arrival of 97.73 per cent in domestic tourists and 1277.12 per cent in foreign tourists with an over all increase of 100.72 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 106.59 per cent. The total employment generation from tourism activities would

increase by 100.17 per cent. The per capita Gross Domestic Product would increase by 18.20 per cent. The level of tourist satisfaction and environmental stress would be 0.77 and 0.64 respectively in the system.

19. A scenario, at growth rate of 5.00 per cent in road, 5.00 per cent in rail, investment of 10.00 per cent of total tourist receipts in tourism development, 10.00 per cent in accommodation, increase of handicraft share to 15.00 per cent and share of commercial crop to 15.00 per cent resulted an increase the arrival of 97.98 per cent in domestic tourists and 1277.12 per cent in foreign tourists with an over all increase of 100.17 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 106.59 per cent. The total employment generation from tourism activities would increase by 100.64 per cent. The per capita Gross Domestic Product would increase by 22.15 per cent. The level of tourist satisfaction and environmental stress would be 0.77 and 0.64 respectively in the system.

20. A scenario, at growth rate of 10.00 per cent in road, 5.00 per cent in rail, investment of 20.00 per cent of total tourist receipts in tourism development, 10.00 per cent in accommodation, increase of handicraft share to 15.00 per cent and share of commercial crop to 15.00 per cent resulted an increase the arrival of 98.98 per cent in domestic tourists and 1377.59 per cent in foreign tourists with an over all increase of 100.93 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 107.60 per cent. The total employment generation from tourism activities would increase by 101.17 per cent. The per capita Gross Domestic Product would increase by 22.29 per cent. The level of tourist satisfaction and environmental stress would be 0.89 and 0.64 respectively in the system.

21. A scenario, at growth rate of 5.00 per cent in road, 5.00 per cent in rail route length, investment of 20.00 per cent of total tourist receipts in tourism development,

increase of handicraft share to 15.00 per cent and share of commercial crop to 15.00 per cent resulted an increase the arrival of 95.61 per cent in domestic tourists and 11268.80 per cent in foreign tourists with an over all increase of 98.05 per cent in total tourist flow in the system. The annual tourists' receipts would increase by 99.36 per cent. The total employment generation from tourism activities would increase by 96.64 per cent. The per capita Gross Domestic Product would increase by 20.74 per cent. The level of tourist satisfaction and environmental stress would be 0.77 and 0.64 respectively in the system.

22. Various simulation results show that the employment in informal sector generated from tourism activity would be more or less equal or even sometimes more than the employment generation in informal sector by various other governmental programmes and schemes being operated in the study area by utilizing huge amount of investment.

23. It is observed that the increase in road sector leads to higher amount of tourist satisfaction, where as increase in rail sector draws more tourists to the study area.

24. Development of isolated sectors, such as, road sector, rail sector, or accommodation sector alone does not have much impact on tourism development in the study area (system). Similarly high investment in tourism development alone without developing other sectors such as, infrastructural development does not contribute much in attracting tourists to the study area (system).

25. Growth in handicrafts and increase in commercial crop practices do not contribute much directly to the tourism development. However, they contribute significantly to growth in State Gross Domestic Products and employment Generation in the study area.

26. The model result also reveals that with higher inputs in agriculture, such as, application of high yielding variety (HYV) seeds and enhanced utilization of chemical fertilizer would increase the production in all the three major crops (cereals, pulses and commercial crops) by significant quantity. It is observed that by bringing the entire crop area under high yielding variety (HYV) seeds and increasing the quantity of chemical fertilizer to two times of present quantity in the system, would increase the cereal and commercial crop production by three times and pulses crop production by two times respectively.

6.3. SUMMERY

In this section, an attempt has been made to present the summery of this investigation, based on the findings from literature survey, survey results and System Dynamic model results before evolving a set of policy guidelines and plausible recommendations for the development of tourism and total development of the study area. The summery of the investigation is presented as below:

1. The study area and the Orissa State is socially and economically backward, even though bestowed with enormous amount of resources.

2. The study area is predominantly rural with a very low urbanization level.

3. The study are experience marginally higher population growth than the State as a whole, and the density is more than twice of that of the State.

4. Agriculture and its allied activities are the prime economic activities in the study area, though it is largely subsistence in nature and its contribution to the economy is only about one third only.

5. The State is also not industrially developed and its contribution is very low, i.e., about one-fifth to the economy, of which the share of manufacturing sector is

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only one-third. Handicrafts industry has not developed highly despite availability of high-grade skill, labour and raw material.

6. The study area possesses enormous amount of tourism attraction elements and has potential for tourism development.

7. Culture, cultural heritages, monuments, natural scenic areas are the strengths of the study area for tourism development.

8. The growth rate in tourist flow to the study area is very slow, particularly foreign tourist flow is abysmally low and almost stagnant.

9. The level of infrastructure development, roads, and railways is very poor both qualitatively and quantitatively.

10. Power generation situation at present is adequate.

11. Other infrastructural facilities such as, water supply, sanitation, drainage, waste disposal systems are unsatisfactory.

12. Parking facilities, temporary resting facilities for tourists, organized market at tourist destinations are inadequate.

13. Investment in tourism development is very meager.

14. The study area is also affected by various problems, of which occurrences of natural disasters every alternate year are the greatest obstacles in the development of the study area.

15. Very less planned efforts are made for tourism development and development of the study area so far.

16. Infrastructural developments, such as, development of road sector, railway routes, accommodation facilities, etc., are highly essential for tourism development in the study area.

17. Air communication is inadequate and found highly essential for attracting foreign tourists.

18. Development of railways would attract more tourists to visit the study area where as development of roads would create more tourist satisfaction.

19. Investment in tourism development, such as, destination development, enhancement of attraction features of the elements, conservation of heritage structures, enhancement of cultural activities, management of various amenities and adequate promotion of publicity are the key parameters, which would be responsible for giving a huge boost to tourism development in the study area.

The investigation reveals that tourism development is possible in the study area with proper and careful planning by considering local level location specific prevailing various control parameters of all the subsystems of the system, such as, physical, social, economic, ecological, environmental, infrastructure and institutions together. Tourism would contribute immensely to the economy and help in socio-economic development in terms of revenue generation from tourists receipts, thereby increasing the per capita State Gross Domestic Products; and employment generation in both organized and informal sectors and, thus can function as a catalyst for the development of the study area (system). Further, plausible policies and recommendations are evolved based on the aforesaid findings for the development of the system and are presented in the subsequent chapter, i.e., chapter No.7.

POLICIES, RECOMMENDATIONS AND CONCLUSION

7.0. INTRODUCTION

The study area presents unique features for its potential to develop as an agrarian and industrially developed region in Orissa State. Further, the economic reforms and the liberalization process initiated in the post 1990s' provide an important opportunity to the State and the study area to leverage available natural, mineral and tourism resources and attract both domestic and international investment. Additionally, the availability of tourism industrial development resources in the study area put it in an advantageous position to develop the study area as a prime tourism destination in the country, which would function as a catalyst for its total development. However, there exists a huge gap between the demand and supply of general infrastructures, particularly, railway, roads, increasing demand of accommodation facilities, apprehensions in the availability of power at an affordable price, very marginal investment particularly for tourism destination development and associated activities, etc., which hinder the tourism development in the study area. Moreover, the subsistence and practice of primitive nature of agriculture, which is also in decline, poor industrial development scenario particularly locally available raw material and skill based industries, and regular occurrences of natural disasters are prime reasons for the low level of development at the grassroots level. It is also understood that the combined forces of economic globalization, decentralization of governance, barrier free communication system (Advent of Information Communication Technologies) pose new challenges in this changing scenario. In this situation, it is felt inevitable to have

comprehensive and plausible policy guidelines for tourism development in particular and total development of the study area in general.

7.1. DEVELOPMENT CONCEPT

A development concept has been deduced for tourism and total development of the study area, based on the most influential control parameters, which decides the functions of the study area to a larger extent in order to maximize both domestic and foreign tourist arrival, receipts from tourism, achieving higher State Per Capita Income, employment generation opportunities in the formal and informal sector, increased tourist satisfaction and a reasonably tolerable environmental stress. This investigation reveals that enhancement of basic infrastructure, such as roads and railway route lengths, tourism infrastructures at the destination level, improvement of quality of services and facilities at destination level, enhanced accommodation facilities, higher investment particularly in tourism destination development, promotion and publicity, cultural development, etc., is the controlling parameters, which influence tourism development in the study area. It is also observed that peoples and private sector participation, conservation of culture and heritage, biodiversity are the key elements in tourism development in the study area. Further, the enhancement of performance and share of handicrafts industry and increase of share of commercial crops are two most important parameters, which would increase both economic and social capital in the study area. Steps for minimization of the barriers, in tourism planning, and abatement of obstacles particularly natural disasters which hinder tourism development in the study area are also considered as a part of development process in the study area. Keeping these inevitable requirements of development in the study area in mind, a set of broad policy guidelines and plausible recommendations are made based on the in-depth investigation done, i.e., model results, survey findings, observations made during

investigation at grassroots level and discussions with experts, administrators, and the tourists.

In order to develop a set of broad policy guidelines and plausible recommendations, the following broad strategies have been adopted. They are:

1. Gradual increase of total road lengths growth rate from minimum of 2.0 per cent to maximum 10.00 per cent by the year 2031, until it reaches the maximum demand (desired road length) of road. The share of higher order road length to the total road length shall be minimum of 10.00 per cent and incrementally increases up to 20.00 per cent by the year 2031 A.D. both in the study area and in the State.

2. Gradual increase of rail route lengths growth rate from minimum of 2.00 per cent to maximum of 5.00 per cent in the study area and in the State along with direct linkage to major tourist destinations in the State and in the country.

3. Gradual increase of accommodation facilities, i.e., the hotel beds growth rate from minimum of 5.00 per cent to maximum of 10.00 per cent in the study area and a proportion of 80:20 share in affordable and high spending categories of hotel beds.

4. Increase of investment to a level of minimum of 10.00 per cent to maximum of 20.00 per cent of total revenue generation from tourism receipts in tourism development, particularly in tourism destination development including creation and maintenance micro-level infrastructural facilities, promotion and publicity, development of cultural activities, maintenance and conservation of tourism elements including bio-diversities, etc.

5. Increase of share of handicraft industry to a minimum of 15.00 per cent of total contribution from secondary (industrial) sector to the economy (State Gross Domestic Product) of the study area.

6. Increase of share of commercial crop to a minimum of 15.00 per cent of total contribution from primary sector (agriculture) to the economy (State Gross Domestic Product) of the study area. Bringing the entire crop area under high yielding variety (HYV) seeds and increased chemical fertilizer use to a minimum level of twice the present quantity by projected year 2031.

7. Integrating different types of tourism activities such as, architectural, archeological and pilgrimage tourism, leisure, holiday, sports and adventure tourism, cultural and art tourism, beach and lake tourism, wildlife tourism and farm tourism in the study area.

8. In addition, steps for eradication or minimization and management of barriers in the tourism development, such as, occurrences of natural disasters, poverty, fiscal deficit, etc.

9. People's participation at tourist destination level, private and public partnerships in tourism development in the study area.

10. Encouragement of tourism related entrepreneurial activities among the educated youths.

11. Encouragement for informal sector in tourism development and development of skilled human resources.

12. Proactive organization and management system for professionally management of tourism development activities.

13. Integration of tourist destinations in proximity to each other and travel circuits development, and encouragement for organized package tours and travel facilities.

14. Interlinking of the tourist destinations of the study area with major tourist destinations in the State and in the country.

15. Enhancement of higher and affordable air transport facilities to the State with direct connectivity to major tourist centers in the country, which are drawing more tourists.

16. Implementation of separate tourist police and abatement of increasing crimes in the study area.

Further, the perceived supply of various important infrastructures, such as, rail route length, road length and accommodation for 2031 A.D. are calculated based on the model results and policy run results (scenarios) and are presented in Table No. 7.1, and the various alternatives policies are formulated and the results of various parameters are measured and presented in Table No. 7.2.

Table No. 7.1: Perceived Infrastructure Supply in the projected year 2031 A.D.

Sl. No	Perceived Enhanced rate (per cent)	Total Road Length (Kms)	Total Higher Order Road Length (Kms)	Total Rail Route Length (Kms)	Total No. of Hotel Beds	No. of Affordable Hotel Beds	No. of High Spending Hotel Beds
1	Projected result at present situation in the projected year model 2031A. D.	234915.00	23491.50	808.00	55403.00	47093.00	8310.00
2	2.00	267887.00	26788.70	1146.00	55403.00	47093.00	8310.00
3	3.00	284337.00	34120.44	1496.00	55403.00	47093.00	8310.00
4	5.00	317344.00	38081.28	1974.00	91372.00	77666.00	13707.00
5	7.50	358559.00	50198.26	1974.00*	161871.00	137590.00	24281.00
6	10.00	399774.00	59966.10	1974.00*	272835.00	231910.00	40925.00

Note: * The rail route length corresponds to the maximum perceived rail route length at the growth rate of 5.00 per cent

Table No. 7.2: Perceived infrastructure and Policy results

Sl.No.	Projected year model and policy scenarios		Total tourist	Total annual tourist revenue (Rs. in Millions)	Per capita State Gross Domestic Product	Perceived road lengths	Perceived higher order road lengths	Perceived Rail route lengths	Perceived total No. hotel Beds	Perceived No. of affordable hotel beds	Perceived no. of high spending hotel beds	Environmental Stress	Tourist satisfaction
1	Policies	Projected year Result	27061156.00	69390.90	14687.00	234915.00	23491.50	808.00	53349.00	45347.00	8002.00	0.34	0.41
2	Policy 1	Rail -3	28525885.00	73142.90	14836.00	234915.00	23491.50	1496.00	53349.00	45347.00	8002.00	0.37	0.43
3	Policy 2	Rail- 5	38119536.00	97714.10	15811.00	234915.00	23491.50	1974.00	53349.00	45347.00	8002.00	0.49	0.45
4	Policy 3	Road-2, Raill-3	31782366.00	81378.40	15171.00	267887.00	26788.70	1496.00	53349.00	45347.00	8002.00	0.41	0.48
5	Policy 4	Road-2, Raill-5	43080407.00	110530.10	16320.00	267887.00	26788.70	1974.00	53349.00	45347.00	8002.00	0.54	0.50
6	Policy 5	Road-5,Rail-2, Investment -10	31874126.00	82072.00	15191.00	317344.00	38081.28	1146.00	53349.00	45347.00	8002.00	0.41	0.75
7	Policy 6	Road-5,Rail-5, Investment-10	43291264.00	82297.00	16365.00	317344.00	38081.28	1974.00	53349.00	45347.00	8002.00	0.54	0.77
8	Policy 7	Road -5, Rail -5 Investment -20	43612700.00	113368.20	16433.00	317344.00	38081.28	1974.00	53349.00	45347.00	8002.00	0.55	0.77
9	Policy 8	Road -10, Rail -5, Investment -10	53215653.00	138338.70	17424.00	399774.00	59966.10	1974.00	53349.00	45347.00	8002.00	0.63	0.89
10	Policy 9	Road -5, Rail -3, Investment -10 Accomodation-5	32461890.00	85265.60	15317.00	317344.00	38081.28	1496.00	91372.00	77666.00	13706.00	0.42	0.72
11	Policy 10	Road -5, Rail -3, Investment -20 Accommodation -5	32645792.00	86264.00	15357.00	317344.00	38081.28	1496.00	91372.00	77666.00	13706.00	0.42	0.73

12	Policy 11	Road -5, Rail -5, Investment -20 Accommodation.-10	54168979.00	143356.60	17623.00	317344.00	38081.28	1974.00	272835.00	231910.00	40925.00	0.64	0.77
13	Policy 12	Road -10, Rail -5, Investment -20 Accommodation-10	54375374.00	144062.20	17679.00	399774.00	59966.10	1974.00	272835.00	231910.00	40925.00	0.64	0.89
14	Policy 13	Road -5, Rail -3, Investment -10, HandIcraft-15 Commercial crop 15	31874126.00	82072.00	15501.00	317344.00	38081.28	1496.00	53349.00	45347.00	8002.00	0.41	0.75
15	Policy 14	Road -5, Rail -5, Investment -10, Accomodation-10 Handicraft15 Commercial crop-15	54204539.00	143356.60	17941.00	317344.00	38081.28	1974.00	272835.00	231910.00	40925.00	0.64	0.76
15	Policy 15	Road -10, Rail -5, Investment -20, Accomodation-10 Handicraft-15 Commercial crop-15	54375374.00	144062.20	17961.00	399774.00	59966.10	1974.00	272835.00	231910.00	40925.00	0.63	0.89
17	Policy 16	Road -10, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	5359595653	138338.70	17734.00	399774.00	59966.10	1974.00	53349.00	45347.00	8002.00	0.64	0.77

Note: Numbers in the column three adjacent to parameters, such as, rail route length, road lengths and accommodation are perceived growth rate in percentages. The numbers adjacent to parameters such as, investment, handicrafts and commercial crops are perceived share of total tourist revenue as investment in tourism development, perceived share of handicrafts to contribution from industries and perceived share of commercial crops to the total agriculture respectively in the study area.

7.2. ALTERNATE POLICY SCENARIOS

A number of alternative policy scenarios have been evolved based on the various scenarios developed in the projected year model (2031A.D) by considering the various parameters and the perceived results are obtained and are presented as below:

7.2.1. Policy-1

A policy has been developed by considering the rail route growth rate of 3.00 per cent in the projected year model (2031 A.D.).It results that that tourist arrival in the study area would be 28525885.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 73142.90 millions and Per capita State Gross Domestic Product would be Rs 14836.00. The level of tourist satisfaction would be 0.43 and environmental stress would be 0.37. The perceived road length would be 234915.00 kms, and the perceived higher order road length would be 23491.50 kms. The perceived rail route length would be 1496.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.2. Policy-2

A policy has been developed by considering the rail route growth rate of 5.00 per cent in the projected year model (2031 A.D.). It results that that tourist arrival in the study area would be 38119536.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 97714.10 millions and the Per capita State Gross Domestic Product would be Rs. 15811.00. The level of tourist satisfaction would be 0.45, and the environmental stress would be 0.49. The perceived road length would be 234915.00 kms and the perceived higher order road length would be 23491.50 kms. The perceived rail

route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.3. Policy-3

A policy has been developed by considering the road length growth rate of 2.00 per cent and rail route growth rate of 3.00 per cent in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 31782366.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 81378.40 millions and the Per capita State Gross Domestic Product would be Rs. 15171.00. The level of tourist satisfaction would be 0.41 and the environmental stress would be 0.48. The perceived road length would be 267887.00 kms and the perceived higher order road length would be 26788.70 kms. The perceived rail route length would be 1496.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.4. Policy-4

A policy has been developed by considering the road length growth rate of 2.00 per cent and rail route growth rate of 5.00 per cent in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 43080407.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 110530.10 millions and the Per capita State Gross Domestic Product would be Rs. 16320.00. The level of tourist satisfaction would be 0.50 and the environmental stress would be 0.54. The perceived road length would be 267887.00 kms and the perceived higher order road length would be 26788.70 kms. The perceived rail route length would be 1974.00 kms in

the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.5. Policy-5

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 2.00 per cent and investment of 10.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 31874126.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 82072.00 millions and Per capita State Gross Domestic Product would be Rs. 15191.00. The level of tourist satisfaction would be 0.75 and the environmental stress would be 0.41. The perceived road length would be 317344.00 kms and the perceived higher order road length would be 38081.28 kms. The perceived rail route length would be 1146.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.6. Policy-6

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 5.00 per cent and investment of 10.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 43291264.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 82297.00 millions and Per capita State Gross Domestic Product would be Rs. 16365.00. The level of tourist satisfaction would be 0.77 and the environmental stress would be 0.54. The perceived

road length would be 317344.00 kms and the perceived higher order road length would be 38081.28 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.7. Policy-7

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 5.00 per cent and investment of 20.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 43612700.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 113368.20 millions and Per capita State Gross Domestic Product would be Rs. 16433.00. The level of tourist satisfaction would be 0.77 and environmental stress would be 0.55. The perceived road length would be 317344.00 kms and the perceived higher order road length would be 38081.28 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.8. Policy-8

A policy has been developed by considering the road length growth rate of 10.00 per cent and rail route growth rate of 5.00 per cent and investment of 10.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 53215653.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 138338.70 millions and Per capita State Gross Domestic Product would be Rs. 17424.00. The level of tourist

satisfaction would be 0.89 and environmental stress would be 0.63. The perceived road length would be 39977.00 kms and perceived higher order road length would be 59966.10 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00 and 8002.00 numbers respectively.

7.2.9. Policy-9

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 3.00 per cent, accommodation growth rate of 5.00 per cent, and investment of 10.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 32461890.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 85265.60 millions and Per capita State Gross Domestic Product would be Rs. 15317.00. The level of tourist satisfaction would be 0.72 and environmental stress would be 0.42. The perceived road length would be 317344.00 kms and the perceived higher order road length would be 38081.28 kms. The perceived rail route length would be 1496.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 91372.00, 77666.00, and 13706.00 numbers respectively.

7.2.10. Policy-10

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 3.00 per cent, accommodation growth rate of 5.00 per cent, and investment of 20.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that that tourist arrival in the study

area would be 32645792.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 86264.0millions and Per capita State Gross Domestic Product would be Rs. 15357.00. The level of tourist satisfaction would be 0.73 and the environmental stress would be 0.42. The perceived road length would be 317344.00 kms and perceived the higher order road length would be 38081.28 kms. The perceived rail route length would be 1496.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 91372.00, 77666.00, and 13706.00 numbers respectively.

7.2.11. Policy-11

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 5.00 per cent, accommodation growth rate of 10.00 per cent, and investment of 20.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 54168979.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 143356.60 millions and Per capita State Gross Domestic Product would be Rs. 17623.00. The tourist satisfaction would be 0.77 and environmental stress would be 0.64. The perceived road length would be 317344.00 kms and the perceived higher order road length would be 38081.28 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 272835, 231910.00, and 40925.00numbers respectively.

7.2.12. Policy-12

A policy has been developed by considering the road length growth rate of 10.00 per cent and rail route growth rate of 5.00 per cent, accommodation growth rate of 10.00 per cent, and investment of 20.00 per cent of total tourist receipts in tourism development in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 54375374.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 144062.20 millions and Per capita State Gross Domestic Product would be Rs. 17679.00. The tourist satisfaction would be 0.89 and environmental stress would be 0.64. The perceived road length would be 399774.00 kms and the perceived higher order road length would be 59966.10 kms. The perceived rail route length would be 2468.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 272835.00, 231910.00 and 40925.00numbers respectively.

7.2.13. Policy-13

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 3.00 per cent, investment of 10.00 per cent of total tourist receipts in tourism development, increase of handicraft share to 15.00 per cent, and increase of commercial crop share to 15.00 per cent in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 31874126.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 82072.00. millions and the Per capita State Gross Domestic Product would be Rs. 15501.00. The level of tourist satisfaction would be 0.65 and the environmental stress would be 0.41. The perceived road length would be 317344.00 kms and the perceived

higher order road length would be 38081.28 kms. The perceived rail route length would be 1496.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be53349.00, 45347.00, and 8002.00 numbers respectively.

7.2.14. Policy-14

A policy has been developed by considering the road length growth rate of 5.00 per cent and rail route growth rate of 5.00 per cent, investment of 10.00 per cent of total tourist receipts in tourism development, accommodation growth rate of 10.00 per cent, increase of handicrafts share to 15.00 per cent, and increase of commercial crop share to 15.00 per cent in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 54204539.00 numbers. The total annual revenue generation from tourist receipts would be Rs. 1433556.60 millions and the Per capita State Gross Domestic Product would be Rs. 17941.00. The level of tourist satisfaction would be 0.77 and the environmental stress would be 0.64. The perceived road length would be 317344.00 kms and perceived the higher order road length would be 38081.28 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 272835.00, 231910.00, and 40925.00 numbers respectively.

7.2.15. Policy-15

A policy has been developed by considering the road length growth rate of 10.00 per cent and rail route growth rate of 5.00 per cent, investment of 20.00 per cent of total tourist receipts in tourism development, accommodation growth rate of 10.00 per cent, increase of handicrafts share to 15.00 per cent, and increase of commercial crop share to

15.00 per cent in the projected year model (2031 A.D.). It results that tourist arrival in the study area would be 54375374 numbers. The total annual revenue generation from tourist receipts would be Rs. 144062.20 millions and Per capita State Gross Domestic Product would be Rs. 17961.00. The level of tourist satisfaction would be 0.89 and the environmental stress would be 0.63. The perceived road length would be 399774.00 kms and the perceived higher order road length would be 59966.10 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 272835.00, 231910.00, and 40925.00 numbers respectively.

7.2.16. Policy-16

A policy has been developed by considering the road length growth rate of 10.00 per cent and rail route growth rate of 5.00 per cent, investment of 20.00 per cent of total tourist receipts in tourism development, increase of handicrafts share to 15.00 per cent, and increase of commercial crop share to 15.00 per cent in the projected year model (2031 A.D.). It results that that tourist arrival in the study area would be 53595653 numbers. The total annual revenue generation from tourist receipts would be Rs. 138338.70 millions and Per capita State Gross Domestic Product would be Rs. 17734.00. The tourist satisfaction would be 0.77 and environmental stress would be 0.64. The perceived road length would be 399774.00 kms and the perceived higher order road length would be 59966.10 kms. The perceived rail route length would be 1974.00 kms in the study area. The perceived accommodation facilities in terms of total, affordable and high spending categories would be 53349.00, 45347.00, and 8002.00numbers respectively.

7.3. RECCOMMENDED POLICIES

The investigator observed that the policy number 14 would be more suitable for tourism development and development of the system based on the detailed analysis of the policies and their results. The policy is developed based on the composite scenario of 5.00 per cent growth rate in road length and rail route length respectively, 10.00 per cent growth rate in accommodation (hotel beds), investment of 10.00 per cent of total annual revenue generation from tourist receipts, increase of share of handicraft industries to 15.00 per cent of contribution from industries and increase of share of commercial crops to 15.00 per cent of contribution from total agriculture.

The Investigator, therefore, has considered this policy for recommendation, and phase wise tourism, social, economic, achievements, infrastructural requirements and environmental stress creation are calculated from 2006 to 2031 A.D., and presented in Table Nos. 7.3, 7.4 and 7.5. The tables reveal that the achievements and thrust areas at different phases vary considerably in the study area. The phase wise social and economic achievements and infrastructural requirements in different phases are presented below. They are:

Table No. 7.3: Phase wise Tourist arrival and Annual revenue generation from tourism receipts due to adoption of recommended policy in the study area

Sl No	Year	Total Domestic Tourists	Total Foreign Tourists	Total Tourists	Annual Revenue generation from Domestic Tourists Expenditure	Annual Revenue generation from Foreign Tourists Expenditure	Total Annual Revenue generation from Tourist expenditure
1	2006-2011	6477448	84025	6561474	16518.04	780.40	17299.45
2	2011-2016	9780195	153891	9934086	24941.84	1429.29	26371.14
3	2016-2021	15757091	267992	16025013	40184.36	2488.38	42672.74
4	2021-2026	28973078	480603	29453682	73888.30	4463.70	78352.00
5	2026-2031	53466343	773696	54204539	136170.70	5185.80	143356.60

Table No. 7.4: Phase wise Per capita State Gross Domestic Product, Employment Generation and Environmental Stress due to adoption of recommended policy in the study area

Sl No	Year	Per Capita Gross Domestic Product (Rs.)	Total Employment Generation opportunities from Tourism in the study area	Total Employment Generation opportunities in the study area	Total Employment Generation opportunities in informal sector from Tourism in the study aea	Total Employment Generation opportunities in informal sector in the study area	Environmental Stress due to tourists flow in the study area
1	2006-2011	8799.19	69420	7729794	9996537	44540938	0.13
2	2011-2016	10093.97	105102	8353692	15134780	54409624	0.18
3	2016-2021	11769.42	169544	9032695	24414428	69067493	0.24
4	2021-2026	14295.50	315619	9780473	44873273	95641044	0.42
5	2026-2031	17941.00	554456	10609910	82721783	139991592	0.64

Table No. 7.5: Phase wise infrastructure requirement and tourist satisfaction due to adoption of recommended policy in the study area

Sl No	Year	Perceived rail route length in the study area	Perceived total road length in the study area	Perceived higher order road length in the study area	Perceived affordable hotel beds	Perceived high spending hotel beds	Perceived total hotel beds in the	Perceived Investment in tourism development (Rs. in Millions)	Tourist Satisfaction
1	2006-2011	808	191670	19167	45809	8084	53893	1729.94	0.77
2	2011-2016	1010	317334*	38081	68714	12126	80840	2637.11	0.77
3	2016-2021	1263	317334*	38081	103071	18189	121280	4267.27	0.77
4	2021-2026	1579	317334*	38081	154606	27283	181890	7835.22	0.77
5	2026-2031	1974	317334*	38081	231910	40925	272835	14335.60	0.77

Note:* indicates that the perceived supply of road length wood exceed demand of road lengths for the study area by the year 2016, and therefore further growth rate has been limited beyond the demand of road lengths.

Phase -1

Phase- 1 considers the period between the year 2006 and 2011, i.e., for a period of five years. This period would experience domestic tourists flow and foreign tourists flow of 6477448 and 84025 accounting to 6561474 in the study area.

During this period the perceived total road length and higher order road lengths would be 191670.00 kms and 19167.00 kms respectively. The perceived rail route length would be 808.00 kms, and the hotel beds in affordable and high spending categories would be 45809 and 8084 numbers respectively accounting to 53893 numbers in the study area.

The total revenue generation from tourist receipts would be Rs.17299.45 millions and the Per capita Gross Domestic Products would be Rs. 8799.19. There would be an employment generation opportunities of 69420 numbers from total tourism activities, and 7729794 numbers from all functions in the study area. It would also generate

employment opportunities of 9996537 and 44540938 man-days in the study area from tourism and all other functions in informal sectors respectively in the study area. During this period, there would be very marginal increase of the environmental stress in the study area and the level of tourist satisfaction would be 0.77.

Phase -II

Phase- II considers the period between the year 2011 and 2016, i.e., for a period of five years. This period would experience domestic tourists flow and foreign tourists flow 9780195 and 153891 accounting to 9934086 in the study area.

During this period the perceived total road length and higher order, road lengths would be 317344.00 kms and 38081.00 kms respectively. The perceived rail route length would be 1010.00 kms, and the hotel beds in affordable and high spending categories would be 68714 and 12126 numbers respectively accounting to 80840 numbers in the study area.

The total revenue generation from tourist receipts would be Rs. 26371.14 millions and the per Capita Gross Domestic Products would be Rs. 10093.97, and having an employment generation opportunities of 105102 numbers from total tourism activities, and 8353692 numbers from all functions in the study area. It would also generate employment opportunities of 15134780 and 54409624 man-days in the study area from tourism and all other functions respectively in the study area. During this period, the environmental stress in the study would be very low, i.e., 0.18 and the level of tourist satisfaction would be 0.77.

Phase -III

Phase- III considers the period between the year 2016 and 2021, i.e., for a period of five years. This period would experience domestic tourists flow and foreign tourists flow of 15757091 and 267992 accounting to 16025013 in the study area.

During this period the perceived total road length and higher order, road lengths would be 317344.00 kms and 38081.00 kms respectively. The perceived rail route length would be 1263.00 kms, and the hotel beds in affordable and high spending categories would be 103071 and 18189 numbers respectively accounting to 121280 numbers in the study area. The total investment requirement in tourism development would be Rs. 4267.27 millions.

The total revenue generation from tourist receipts would be Rs. 42672.74 millions and the per capita Gross Domestic Products would be Rs. 11769.00 and having an employment generation opportunities of 169544 numbers from total tourism activities, and 9032695 numbers from all functions in the study area. It would also generate employment opportunities of 24414428 and 69067493 man-days in the study area from tourism and all other functions respectively in the study area. During this period, the environmental stress in the study area would be very low, i.e., 0.24 and the level of tourist satisfaction would be 0.77.

Phase -IV

Phase- IV considers the period between the year 2021 and 2026, i.e., for a period of five years. This period would experience domestic tourists flow and foreign tourists flow of 28973078 and 480603 accounting to 29453682 in the study area.

During this period the perceived total road length and higher order, road lengths would be 317334.00 kms and 50825.00 kms respectively. The perceived rail route length would be 1579.00 kms, and the hotel beds in affordable and high spending categories would be 154606 and 27283 numbers respectively accounting to 181890 numbers in the study area. The total investment requirement in tourism development would be Rs. 7835.22 millions.

The total revenue generation from tourist receipts would be Rs. 78352.00 millions and the per capita Gross Domestic Products would be Rs. 14295.50 and having an employment generation opportunities of 315619 numbers from total tourism activities, and 9780473 numbers from all functions in the study area. It would also generate employment opportunities of 44873273 and 95641044 man-days in the study area from tourism and all other functions respectively in the study area. During this period, the environmental stress in the study area would be low, i.e., 0.42 and the level of tourist satisfaction would be 0.77.

Phase -V

Phase- V considers the period between the year 2026 and 2031, i.e., for a period of five years. This period would experience domestic tourists flow and foreign tourists flow of 53466343 and 830141 accounting to 54296485 in the study area.

During this period the perceived total road length and higher order, road lengths would be 317344.00 kms and 38081.00 kms respectively. The perceived rail route length would be 1974.00 kms, and the hotel beds in affordable and high spending categories would be 231910 and 40925 numbers respectively accounting to a total of   272835

numbers in the study area. The total investment requirement in tourism development would be Rs. 14335.60 millions.

The total revenue generation from tourist receipts would be Rs. 143356.600 millions and the per capita Gross Domestic Products would be Rs. 14295.50 and having an employment generation opportunities of 315619 numbers from total tourism activities, and 9780473 numbers from all functions in the study area. It would also generate employment opportunities of 44873273 and 95641044 man-days in the study area from tourism and all other functions respectively in the study area. During this period, the environmental stress in the study area would be 0.63, and the level of tourist satisfaction would be 0.77.

This analysis shows that there is a gradual increase of infrastructural requirement and investment in tourism development from phase –I to phase-V. The study area would experience both social and economic development with a relatively low environmental stress generation. It would also provide reasonably high tourist satisfaction to the tourists.

Thus, in the perspective planning, thrust need to be given in the infrastructural requirements in road lengths, rail route lengths, accommodation in terms of hotel beds, and investment in tourism development in the study area.

Further, optimal projects, schemes have to be evolved pertaining to infrastructural development, such as roads, railway, accommodation, tourism functions and activities, etc., by considering micro level location (location specific) control parameters and tourist destination control parameters in the study area and shall be implemented for the development of the study area. The proposed projects/schemes should be technically feasible, economically viable, socially acceptable and practically implementable.

7.4. RECOMMENDATIONS

In addition to the above policy guidelines presented above in this chapter, the following plausible recommendations are evolved based on the analysis of various factors, results of the survey inferred, expert discussions and observations made for integrated tourism development and total development in the system.

7.4.1. Recommendations for Tourism Development

1. The perennial problem of natural disasters warrants adequate preventive measures through appropriate technology, development of appropriate infrastructures and strengthening of existing disaster management infrastructures, and developing separate agencies to deal with the problem. In this regard, there is more of a need of professional management and continuous monitoring, unlike traditional ways of administration and dealing of the issue. Prevention, proper management and minimization of the loss, would not only help in development of the study area but also go a long way in building an image contrary to the prevailing popular belief of a poorly developed State, which shall benefit the tourism sector in the study area.

2. Investment is the key control parameter in tourism development in the study area. At present, the investment in the study area is very meager is the major obstacle in the development process. Therefore, adequate investment, about 10.00 per cent of the total annual revenue generation from tourist receipts should be invested exclusively for tourism development, which includes tourist destination development, development and maintenance of local and micro level infrastructure, cultural development, and publicity and promotion measures.

3. Special provision for allocation of funds for tourism development as a separate item in the study area should be made in annual plan outlays, five year plans and annual budgets of the State.

4. Clustering and concentrating attractions and services is another technique of creating the visitor domain based on the physical and communicable distances of the tourist destinations, and offering of variety of attractions to tourists. This leads ultimately to a critical mass of tourist products, which establishes a place as a tourist destination in the tourist market. With a critical mass, tourists become aware of the place and will purposely begin to choose to go to that place. In this regard, it is observed that careful attention need to be given to interlink the tourist destinations from all the parts of the study area and also with important destinations in other parts of the State and harness the tourism potential optimally. The inter-linkage should facilitate tourist flow from one part to the other part of the study area and also to other regions of the State within minimum cost and less wastage of time.

5. The State Government need to realize that development of tourism in the State rests more with it than the Central Government. The Union Ministry of Tourism may be the nodal agency for sanctioning Central projects; entrusted with creation of India's tourism network around the world, and the responsibility of marketing the country's tourism potential. Also once every few years, the Central Government comes up with a new or revised tourism policy, but such a policy can only provide a national focus to the development and promotion of tourism, by trying to knit the potential of the country together and organize effective packages

for tourists of all kinds. Beyond such point, the Central Government cannot deliver except acting as a facilitator. Ultimately, everything boils down to the State government, and the Central government can remove the bottlenecks and assist in improving infrastructure facilities.

6. The various important tourism activities such as, architectural and archeological visits, pilgrimage activities, recreation and leisure, cultural activities, sporting and adventure activities, wildlife, etc., should be promoted together in the study area.

7. Adequate and related infrastructures for enhancement of most preferred tourism activities, like pilgrimage, architectural and archeological site visits, recreation activities, etc., should be given on priority in the study area.

8. The State needs to look for its own strengths in developing general infrastructure in the State, and high quality tourist infrastructures at tourist destinations for successfully attracting the tourists without waiting for the Central Government.

9. The presence of adequate and affordable infrastructure complementary to the attractions at tourist destinations helps in more favourable publicity generated by words of mouth by tourists, who have been on a visit, than by any marketing strategy as such. Hence, adequate steps at the micro level development are highly essential.

10. Air transport being an important communication system for enabling growth in tourism in the Study area particularly in drawing foreign tourists, it is time to give a lead in the working of Tourism and Civil aviation together for the promotion of the important tourist centers. Identifying key areas and corridors for integrated

development, attracting the private sector to tourism projects and working, as a team to promote special destinations and packages will be the recipe for success.

11. Bhubaneswar airport should be converted to an international airport, and until that is set up endeavor need to be made for the possibility of making nearer international airport, such as Calcutta airport as the port of entry to all East bound flights from South and South East Asia. Also initiatives may be taken to encourage private tour operators run chartered flights to the State bringing in large numbers of overseas tourists. Domestic air links to important destinations within the country are of equal importance. Efforts need to be made in order to connect Orissa State by direct air links to important tourist destinations of the country, through which a considerable number of foreign tourists can visit the State. In this regard, important tourist destinations of the country, such as, Kovallam of Kerala State, Goa State, Agra of Uttar Pradesh State, Jaipur of Rajasthan State, Gowalior (as it is near to Khajuraho) of Madhya Pradesh State, Madurai, Tiruchillapalli, Thanjvur, Chennai and Kanyakumari of Tamil Nadu State, Bangalore, Mysore of Karnataka State to name a few may be considered. This direct air access to the State may encourage the foreign tourists to visit Orissa State from these destinations in preference to the other destinations of the country. Unless such immediate steps are taken, the alarming drop in foreign tourist inflow to the State and in the study area will continue and the tourism industry in the State will suffer greatly.

12. The rail and road infrastructure are observed to be inadequate in the study area and found growing at a very slow rate. It is, therefore, imperative to enhance the

rail route length growth rate and road length growth rate both up to 5.00 per cent as mentioned in recommended policy. Further, adequate measures need to be taken for qualitative improvement in terms of construction of higher order roads in the study area. Maintenance and repair of roads are also key aspects, which should be taken up periodically.

13. Lack of infrastructure particularly well laid communication keeps the State out of the itinerary of most overseas tourists. Looking at micro level, improvements in certain road sections connecting prime tourist destinations, such as, Four-laning of Bhubaneswar-Konark, are of paramount importance and needs to be considered immediately. Improvement of Pipili-Puri, Bhubaneswar-Chilika road is an urgent necessity. Similarly, widening of the road to Ratnagiri complex needs top priority.

14. All the roads leading to tourist destinations needs to made all weather with qualitative permanent ways of bituminous or asphalt surfaces.

15. Public bus transport, bus transport by private service providers are also to be encouraged for easing out the regional transportation problem. Similarly, alternative small and light passenger vehicles operation should be encouraged for satisfying the local transportation needs at destination level. In addition, plying of three wheeler automobiles (auto rickshaws) may be encouraged on organized ways.

16. High-speed trains may be run in the study area for regular passengers, which would also cater to the needs of the tourists.

17. The various small tourist centers should be interlinked with most popular tourist centers in the study area, such as, Puri, Konark, Bhubanswar, Gopalpur, Balasore,

etc., with adequate communication facilities, such that tourists would have better chances of visiting the lesser known tourist centers at lower costs and limited time providing opportunities for higher tourist flow to those centers.

18. Smaller but important destinations with special tourist attraction elements, such as, Satapada, Bhitarkanika, Atri, Taptapani, Kakatpur, Banki, etc., may be promoted properly to attract a large number of tourists to these locations.

19. Accommodation is another key area, which plays an important role in tourism development. The State Government has taken a number of steps in facilitating the development of accommodation facilities in the study area and Orissa State is the first State to declare hotel as an industry, which is a forward step in the right direction. In addition to the hotels by private hotel owners, the Orissa Tourism Development Corporation also has set up a number of accommodation facilities (Panthanivases) in key locations, but the capacity in both affordable and high spending range group will be inadequate in the future years as found from the projected results. In addition, accommodation facilities are also not available in smaller tourist destinations and most of the facilities are concentrated in the neighbouring larger urban centers. The key issue here is to develop affordable and better accommodation facilities keeping in view the requirements both of the foreign and domestic tourists. Therefore, the growth rate of hotel beds should be enhanced from its present rate of 4.10 per cent to 10.00 per cent. In this regard, the State can take advantage of the Central Government policy of allowing 100 per cent equity for foreign investors, and create a congenial atmosphere for

foreign investment in development of infrastructure, basic amenities and entertainment aids.

20. Further, in this context of providing accommodation facilities, the local residents at smaller destinations may also be encouraged to participate in providing such services, which does not need much specialized skill and investment.

21. Adequate good quality and affordable restaurants at destinations, wayside restaurants, and other food locations may be encouraged. Private entrepreneurs may be encouraged to participate in this sector. Appropriate infrastructure may be created by Government agencies and handed over to the entrepreneurs for the utilization of the same.

22. It is observed temporary resting facilities are one of most sought after local infrastructures requirement at tourist destinations. Therefore, adequate temporary resting facilities with qualitative sanitation facilities near to the tourist destination premises or near by should be constructed to cater to the needs of large number of tourists.

23. Organized parking is highly essential in almost all tourist destinations and need to be constructed at convenience locations and they should be handed over to the local bodies for their management and maintenance and operation.

24. Water supply and Sanitation facilities are to be created at destinations as per the planning standards given in the Urban Development Plan Formulation and Implementation guidelines (UDPFI), which provides basic guidelines and standards for the country.

25. Creation of organized marketing places (shopping complexes) at suitable locations should be considered and constructed at important tourist destinations, which draw large tourists in the study area.

26. Creation of adequate amenities (lighting, sanitation, parking, recreational, etc.,), better management and maintenance of sea beaches should be taken up on priority basis. Further, a few beaches such as, Talasari, Tosali beaches, etc., should be made easily accessible through better road connectivity.

27. Protecting the environment-natural, cultural and social is now an accepted mainstay of successful tourism planning. It is also need to be understood that tourism is a prime user of the natural environmental, cultural and social assets, to work in partnership to use and not to abuse the environment. Orientation should be, such as, to ensure long-term availability of the natural asset in the form of a consumer commodity. This can be achieved by attracting quality tourists and by managing tourist flows and access while they are in the visitor domain. The bountiful of natural elements and artifacts in the study area are to be preserved in the same way and can be used as durable consumer products of tourism without making any damage to nature.

28. Conservation of archeological and architectural heritages in the study area is of paramount importance. It is observed that the measures, which are being taken, are not adequate and paucity of funds and overlapping authority are the major obstacles. Therefore, measures are to be taken for adequate funding and avoidance of multiple authorities responsible for the act of conservation.

29. Conservation of biodiversity is another key issue, which has cropped up in the study area. It is observed that the biodiversity is in danger because of the two major factors such as, large-scale deforestation and human intervention. Adequate legal provisions and awareness needs to be created to minimize these problems in the study area.

30. Tourism is a subject fundamentally concerned with perceptions of image and identity. Creation of an appropriate and positive image of the State as a prime tourist destination will play a vital role in the highly competitive and constantly changing market. In this regard, the State may consider intensive publicity and promotion measures such as, active tourism promotion offices and centers at all State capitals of the country to woo and facilitate both the domestic tourist and foreign tourist to visit the State. Similarly, regular and sincere efforts may be made to create an authentic and undisputable positive image of the State and in the study area through proper publicity; projection and dissemination of the cultural values, information regarding heritage sites, adoptable social attitudes, etc., at potential India bound foreign countries.

31. India is bestowed with extraordinary and exquisite heritage monuments and artifacts that make the tourists spellbound by their splendor and magnificent sculpture and artistic values. In this regard, this study area in the State is richly endowed with such artifacts. The Central Government and other State Governments may consider declaring seven wonders of India in the light of World Heritages and Seven Wonders of the World. The magnificent Konark (Sun temple) temple and splendorous Puri Jagannath temple of Orissa may be included

in the seven wonders of the country along with the Taj Mahal of Agra, Khajuraho group of monuments of Madhya Pradesh State, Minaskhi temple of Madurai, Brihadiswara temple of Thanjavur of Tamilnadu State, palaces of Jaipur of Rajsthan State, and Ajanta and Ellora caves. This effort may provide an additional impetus to the foreign visitors to visit the State.

32. Acknowledgement of heritage structures and cultural landscape is critical in Orissa's tourism development. In this, protection is not essentially need to physical but the way of life. The approach to heritage protection requires new ways of thinking as cultural landscape, which usually interacts very closely with its physical environment and a reflection of the past life of the society. The protection of such elements needs to be done not with brute physical protection but with an attitude towards the value, symbol and cultures attached to them. In this regard, the historical and cultural assets, such as, sites of Great Kalinga war, the various archeological sites of yester years, etc., of various kingdoms may be revitalized manifesting the culture and heritage of the State.

33. The rich culture of dances, folk plays and festivals need to be conducted in an organized manner with proper marketing attitudes and publicity. These elements may be treated as base for image creation of the study area, which can be achieved through advertisements in print and electronics media, road shows, creation of logos and emblems, etc.

34. In addition, steps in the form of propagating the unique tribal culture in a professional and regular basis by conducting various cultural programmes, popularizing tribal products, initiating adventure tourism facilities in the hilly,

mountainous and coastal regions, creating summer resorts at various splendorous locations with salubrious climate need to be considered.

35. The handicrafts of the study area and the State are well known, yet the activity suffers due to low investment, poor marketing and unorganized and informal set up. The Government of Orissa though has tried to give a formal set up to this activity through creation of Cooperatives and providing administrative set up by means of creating Corporations and Boards. The steps taken have not yielded any appreciable result so far. Hence, a professional, more intensively organized and participatory approach is needed to strengthen this sector, there by making it an important element of tourism development in the study area. In this context, creation of organized market at production centers, building of an image of the location, and easy access to these locations should be considered.

36. Partnership and stakeholders participation is another principle to be incorporated into successful tourism planning because of the pluralistic nature of tourism, which involves multiple stakeholders including Public Authorities, local residents at destinations, business interest groups, service providers, developers, Non Governmental Organisations (NGOs), tourists and other external actors, etc. There is a need of a collaborative and shared vision for decision-making, mutual sharing of responsibilities and benefits. Moreover, the destination partnerships can more effectively take advantage of the product offerings of each member of the partnership group. In the study area, considering the paucity of funds for investment, threat of environmental degradation and lack of awareness among the people, this principle of participation and partnership and a flexible democratic

approach may help in creating a healthy environment for tourism development than the prevailing top down and sporadic participatory approach. For example: tourism should be made a joint venture with the private sector to hone marketing skills and strategy, instead of leaving it to the Government official procedures. Encouragement may be given to large corporate business houses to invest in infrastructure development in transportation, accommodation, entertainment; encouraging small business communities to develop and maintain civic infrastructure inside their business area; and allowing local residents to provide services, which does not demand specialized skills, such as, low cost kitchen facilities, and accommodation to backpacker tourists; etc., in an organized manner. In this regard, the key issues are conflicting interest management and leadership development. The local self-governments under the Panchayati Raj system in the State may be made more responsible in furthering tourism activity in the concerned local bodies.

37. Further, at local and destination level, the local tourism development committees are to be made more active and responsible for development and maintenance of the destinations. Adequate funding and authority should be made available to make them more functional instead of their present status of being merely advisory. The local bodies such as, Zillaparishads at district level, Panchayat Samities at Block level, and Gram Panchayats at village level and municipalities in urban areas should be empowered with Authority and funds to take necessary development activities relating to tourism development in respective areas.

38. It must be an endeavor to weave together the best tourist attractions and information that the study area has to offer, as information dissemination has become one of the most important parameters in any development. The information may be made available on the easiest possible way, such as, providing through Internet and other sophisticated aids. There must be separate approaches for international and domestic tourists.

39. The State need to privatize tourism promotion corporations or at least managed by professionals so that the tourism potential can be better harnessed and marketed. The hotel industry must be invited to explore the market, identify places where new hotels or motels can be built eliminating the proliferation of sub standard lodges; but it is more important that the focus must be on preserving the environment, maintaining basic standards of cleanliness and hygiene and offering comfortable and affordable transport. The touts and unauthentic agents who only swindle tourists must be eliminated.

40. Promotion of professional tour operators must be done and the total lack of transport and communication facilities in many of the tourist spots have to be addressed. Accordingly, tourist circuits depending on the communicable distances may be created and package tours by approved and professional tours and travel operators are to be encouraged.

41. The scheme for development of `Special Tourism Areas' by the Centre, need to be exploited by the State by taking initiatives to add to the selected list. Puri has already been selected among other areas like Bekal in Kerala, Sindhudurg in Maharashtra, Mamallapuram (or Mahabalipuram) in Tamil Nadu, and Diu in

Daman and Diu. Though the Centre may release some funds for infrastructure development, it is the responsibility of the State to formulate the schemes and involve both foreign investors and Non-Resident Indians to take up specific projects for development. It is also pertinent to start dialogues and partnership with private sectors and prepare specific object oriented and time bound blue-prints for development of specific tourist locations and destinations.

42. Efforts need to be made to include tourist destinations like Konark, Chilka, etc., under this special tourism area programmes.

43. In addition, the prospect of integrating the smaller State level travels circuits and destination with the identified national 21 travel circuits and 12 destinations. It is essential to have separate and specific plans for each travel circuits and an overall scheme to link them up in order to enable the foreign tourists to cover the vast distances in lesser time. So the basic objective of improving connectivity among the States and within the State to get the best in a limited span of time may be achieved.

44. One of the options may be for the State to coordinate and come up short duration packages for tourists and make the tourists able to see the maximum within that time, with a mix of tourist attractions such as, historical, religious, hill stations and scenic splendors. Different packages are needed for the budget tourists, the premium or charter travelers and business visitors who may have only a weekend. Such a programme will necessitate a close rapport among the tourism promotion agency, the tour and travel operators and the hotel industry to get the best possible deal for the visitors.

45. The organizational and administrative of tourism development in the State is purely bureaucratic and lacks professional approach. There is lack of adequate professionally qualified and experienced technical expertise (human resources), and clarity in assignment of responsibility and delegation of Authority. A procedural and organizational reforms in the same manner as the reform being taken for industrial development both at State and local level set up need to be considered.

46. Apart from this, democratization, decentralization, qualitative changes, an expansive tendency in the demand professional management and participation of stakeholders, protection of natural environment as well as integration of tourism into Regional development are essential vectors for a healthy tourism development in the State. Hence, an integrated development plan considering all aspects, such as, physical, social, economic, ecological and environmental along with tourism development must be considered for tourism as well as overall development of the State.

47. Further, in addition to strengthening the established organization and administrative set up with professional attitude and adequately trained manpower, tourist offices at major locations of the country, such as, important tourist destinations and large cities may be set up. Consulting agencies for promoting tourism of the State and study area may be engaged in different cities of various foreign counties to promote tourism in the study area.

48. The possibility of seasonal tourism, such as, monsoon tourism (tourism during monsoon months) may be explored.

49. The possibilities for transforming agricultural and horticultural farms particularly coconut orchards in rural areas to tourism farms may be explored in order to provide a serene, pollution free, rural environment close to nature, which are highly preferred by the foreign tourists.

7.4.2. Recommendations for Total Development in the Study Area

In addition to the recommendation for tourism development in the study area, the following plausible broad recommendations are evolved based on the analysis of various parameters, results of the survey inferred, expert discussions and observations made for total development in the system.

1. Agricultural land area is converting into habitat areas; as a consequence there is decline in the availability of land for agriculture. Adequate regulatory measures may be taken for abatement of such blind and rampant conversion of land needs to be done on priority basis.

2. Agriculture is the main stay of the system. It is highly essential to transform the subsistence nature of cultivation to commercialized and profitable. In order to achieve this enhancement, cropping intensity, productivity of the land, and production are the most important aspects to be looked after.

3. The irrigation intensity shall be enhanced considerably from its present status and the water resource available in the State should be harnessed optimally.

4. The entire cultivated land should be brought under high yielding variety (HYV) of seeds by the year 2031 A.D, and enhancement of use of chemical fertilizer quantity

to at least the level of national average or minimum twice of the present utilized quantity shall be encouraged in the system.

5. Stress may be given on commercial crops such as, vegetable cultivation, other horticulture products, such as, coconut, sugarcane, etc.

6. Creation of adequate and trained human resource for agriculture practices, which may be done through extensive training, conducting strong extensive activities related to agriculture and its allied activities in the system.

7. Adequate and timely credit facility needs to be made available to the farmers for farming and its associated activities.

8. Organized marketing facilities by professionals or private entrepreneurs for agricultural products are to be encouraged in the system.

9. Incentives should be given and encouragement may be made for setting up agriculture based industries at the local level.

10. Efforts may be made to integrate animal husbandry and fishery activities with agriculture in the system.

11. A highly intensive and professional approach is the need of the hour for development of industrial activities in the system. The local and young entrepreneurs should be encouraged with provision of infrastructural and credit facilities for the same.

12. Lack of availability of capital being one of the most important deterrents in industrial development, it is imperative to strengthen to the credit facility in the system. Efforts need to be made to make the entrepreneurs accessible to the

nationalized, commercial and private banks and so also banks may be advised to smoothen their procedure for making the credit availability in time.

13. The traditional skill based products have demand both within the system and outside market including foreign market. Appropriate steps may be taken to encourage the enhancement of production of traditional and skill based products. Efforts need be done to enhance the share of handicrafts industries considerably to the total industrial contribution.

14. Non-availability of Power being one of the major obstacles in industrial development in the system, despite adequate generation of electricity in the State, it is of paramount importance to supply power to industrial units with quality service and efforts may be made for necessary reforms in this regard.

15. Education is the most powerful tool to improve the social backwardness of the system, therefore adequate steps may be considered for strengthening education at all level, such as, elementary to higher education. Special consideration maybe made for enhancing professional and vocational education in the system, and care need to be taken to permeate these education to the rural areas too.

16. Special programmes for child welfare and empowerment women in the system may be considered on priority basis.

17. In addition to the various schemes and programmes in operation from time to time for poverty alleviation and generation of employment, programmes relating to large scale self employment and making people free from dependency may be considered instead of limited direct employment opportunities being created by Government.

18. Environmental and ecological values of the system need to be preserved. In this direction creation of awareness among the people and abatement of human intervention in fragile ecosystems are of high necessity and efforts need to be done on priority basis. Further, any development is always followed by certain environmental degradation and pollution, so appropriate technological and management measures at the source may be taken to prevent such problems.

19. Various institutions and organizations both Government and private, which are involved in the development process, should be made more accountable for their responsibility towards development. Control and regular monitoring of the planned efforts and implementation are of paramount importance and need to be adhered to.

20. Any development in the system should be properly planned with objectivity having flexibility to adopt the changes that occur over a period and made time bound and implemented with due precision.

7.5. CONCLUSION

The prime objective of a tourism industrial development plan is achieving tourism development in a particular system, where there is tremendous potential for tourism development, such that it would function as a catalyst for the total development of the system. This requires a feasible plan and plausible policy guidelines for which thorough grassroots level investigation is essential. In the wake of priorities given by various Governments and private sectors in India, at different levels to boost tourism and its allied activities, an investigation of such kind has become further more essential. In addition, available literature in this field reveals that much work has not been done in this regard, in which tourism form an integral part of total development process, particularly

in India. In this present investigation, an attempt was made to evolve plausible policy guidelines and recommendations for tourism development plan, which would help in bringing about total development of a system (coastal and flood plains region of Orissa State, India) by considering most important control parameters, which decides the functions of the system. It is observed that although steps are being taken by the Government agencies for the development of the same in the system, lack of comprehensive plan becomes a deterrent in the development process. Therefore, a through grassroots level investigation has been carried out by the Investigator through primary survey and exploration of available literature, to understand the various functions of the system, which influence tourism and the total system. Further, by considering the most important control parameters of various sub-systems of the system, System Dynamic models for tourism industrial development and for the total system as a whole have been evolved. Long-range projections are made to understand the demand and supply of most important infrastructures, which influence the system largely and plausible socio-economic and environmental conditions of the system in the projected year 2031 A.D. The functions of the system under various alternative conditions are closely examined by developing various scenarios and tested by employing simulation technique, to arrive at alternative policy decisions. Finally, a set of policy guidelines is prepared by phase wise achievements and requirements in alternative conditions for tourism development along with total development of the system. The investigation concludes that if the recommended policies are considered and optimal, feasible, and viable plans and schemes are developed based on the recommended policies and

implemented in time with statutory baking, tourism development along with total development shall be achieved in the system, definitely.

7.6.   SUGGESTIONS FOR FURTHER RESEARCH

The present investigation has got a lot of scope for further research and extension. It has a few limitations, such as, limited samples are considered for conducting the present investigation at the grassroots level due to limited time and resources availability. Further, the investigation is made at the macro level of system. Therefore, the investigator observes that the present investigation has ample scope to extend. A few of further research scopes are:

1. Survey at large scale shall be conducted to have exact picture of the socio-economic conditions, industrial scenario and tourism status of the system.

2. Micro level studies shall be conducted to evolve integrated development plans, spanning the period of five years by employing location analysis, optimization techniques, Discounted Cash Flow (DCF), input and output models, etc. Further annual plans shall be prepared based on the integrated development plan. Subsequently, projects/ schemes shall be prepared to implement programmes to achieve realistic development in the system.

3. Integration of local natural and artificial resources along with the handicraft industries on tourism development may be explored.

4. Integration of tourism with socio-economic condition of the system at the micro level at various locations may be attempted.

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PLANNING FOR TOURISM DEVELOPMENT IN ORISSA STATE, INDIA
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Schedule –1

Socio- Economic Survey

1. Demographic and Socio-Economic Characteristics:
   a. Name of the person:
   b. Location:
   c. Fathers Name:
   d. Religion:
   e. Family Details:

Gender	No/ Age Group in years.					No. Employed					Academic Qualification			
	0-14	15-35	36-60	>60	total	0-14	15-35	36-60	>60	total	HSC	UG	PG	Technical
Male														
Female														
Total														

2. Income of the Family Members: (Monthly)

2.1 Income level of Family members

Members	Income (Rs)				
	I	II	III	IV	V
Male					
Female					
Total					

2.2 Present Primary occupation:
   a. Agriculture/Own Business/ Govt. Service/Own enterprise/Pvt. Service / any other (specify)
   b. If own enterprise- specify Type of enterprise
   c. If Business – Specify the activity
   d. Income generates:

2.3. Secondary occupation of Family Members:

   2.3.1 Agriculture/Own Business/ Govt. Service/Own enterprise/Pvt. Service / any other (specify)
   2.3.2 If own enterprise- specify Type of enterprise

2.3.3 If Business – Specify the activity

2.3.4 Monthly Income generates:

2.4. Income of the family from different sources (Rs)

Sl.No.	Particulars	Amount (Rs)
1	Govt.Service	
2	Pvt.Service	
3	Agriculture	
4	Horticulture	
5	Animal Husbandry	
6	Trade and commerce	
7	Industry (Specify)	
8	Psciculture	
9	Self Employed (Professional)	
10	Others (Specify)	

3 Monthly Expenditure (Rs)

a. Food   b. cloths   c. Education
d. Health   e. Recreation   f. Transportation
e. Loan Repayment.   g. Electricity
h. Water supply   i. Cooking gas
j. Kerosene
k. Agriculture
l. Any Other.

4 Future interest in occupation:

Govt. Service/Pvt. Service/Own Business/Own Enterprise/Agriculture/ Psciculture/ any other

5 Physical Infrastructure:

5.1. Housing:
- Type of house: Detached/Twin/ Flat
- Physical condition: RCC roofed /Pucca without Rcc roof/Kutcha
- Ownership: Rented/owned/other
- If Rented- monthly rent:
- Financed by: Bank/ self/ancestral/any other
- Housing available at temporary market places for brief stay: Yes/no

5.2. Transportation Facility in the area:
- Roads/Railway/Waterways
- Condition of road: Pucca/ all weather/ Fair weather
- Well maintained/ poorly maintained/ no maintenance
- Frequency of passenger vehicles:
- Frequency of Trains:
- Mode of Transportation: Train/ Bus/ own vehicles (car/ two wheeler/Bicycle)
- Frequency of boats:

5.3. Water Supply:

- Supply system: Public supply system/ own source/ both
- Source: Public distribution/ Public well/ Public tube well/ own Open well/ own tube well/ other

5.4. Electricity:

- Available/ not available
- If available: load shedding condition/ voltage fluctuation
- Other source of energy: generator/ solar cells/ other

5.5. Sanitation:

- Public sewerage/ own arrangement/ Both/ no sanitation facility
- Open drains/ covered drains/ no drainage

5.6. Waste Disposal:

- Available/ not available
- Clearance frequency
- Type of disposal

6   Economic activity: (Rank)

- Predominantly dependent on agriculture
- Industrial activity
- Trade and Commerce
- Service
- Others (specify)

6.1. Agriculture:

- Land Holding Size.(ha)
- Seasonal input per ha.
- Seasonal output per ha
- Major crops: Rice/ wheat/ sugarcane/pulses/ vegetables/other
- Other horticultural major products: specify fruits, Flowers etc.
- Special type of agricultural or horticultural products available

6.1.1   Cropping Pattern (area in hectares)

Sl. No	Crop	Khariff			Rabi			Summer		
		Irrigated	Non irrigated	Total	Irrigated	Non irrigated	Total	Irrigated	Non irrigated	total
1	Cereal									
2	Pulses									
3	Oilseeds									
4	Vegetables									
5	Spices									
6	Cash Crops									
7	Sericulture									
8	Others									

6.1.2 Particulars of Crop Input

Sl. No.	Type of crop	Seed Kg	Organic manure (Kg)			Fertilizers			Pesti cides ml.	Labo ur (No.)
			Cow dung	Green manu re	Farm year manure	N Kg	P Kg	K Kg		
1	Cereals									
2	Pulses									
3	Oilsee ds									
4	Vegeta bles									
5	Spices									
6	Cash crops									
7	Sericul ture									
8	Others									
9	Total									

6.1.3. Particulars of Crop out put:

Sl. No.	Type of crop	Major out put In tonne				Minor Output in tonne/ relevant units			
		Khariff	Rabi	Summer	Total	Khariff	Rabi	Sum mer	Total
1	Cereals								
2	Pulses								
3	Oilseeds								
4	Vegetables								
5	Spices								
6	Cash crops								
7	Sericulture								
8	Others								
9	Total								

6.2 Live stock and Animal Husbandry

Sl. No	Type	Breed in no.			Input		Output			
		Indigeneous	Improved	Total	Quantity (kg)/unit	Amount (Rs.)/ Unit	Milk (ltr)	Egg. (No)	Meat (kg)	Dung
1	Cattle									
2	Buffalo									
3	Goat									
4	Sheep									
5	Pig									
6	Poultry									
7	other									

7.0 Industrial activity:

7.1 Industrial influence on the area

Category	Type	Product	Raw material (Local/ non local)	Influence on local economics (Market/ employment)

7.2 Local Raw material available for industrial use: salt/ coconut/coir/keora Flower/ Khandlite stones/granites/sea Products such as sponges, Counches/ Fish etc/ any other

7.3. Traditional skill available: weaving/ stone work/ appliqué work/ filigree/ Other

8.0   Trade and commerce:

8.1   Retail trade: type: Traditional skill based Products.(Please specify) / Usual consumer products/ agriculture or Horticulture Products/ Industrial Products /Textile/other

8.2 Wholesale trade: Traditional skill based Products.(Please specify) /
Usual consumer products/ agriculture or
Horticulture Products/ Industrial
Products/Textile/other

8.3 Service: Provides service in
Transportation / accommodation/food/tourism activity at local level
Religious activities/entertainment/et

9.0 Other Activities: fishing/ aquaculture/ (please specify the
Major location activity)

Sl.No	Items	Source	Output in tonnes	Marketing Places		
				Local	Other market of state	Export
1	Fish	Sweet water				
		Marine				
		Back water				
2	Shrimp	Sweet				
		Marine				
		Backwater				
3	Crab	Marine				

10.0 Energy consumption:

Sl.No.	Type of Fuel	Purpose	Quantity	Remarks
1	Electricity	Domestic		
		Cottage Industry		
		Business		
		Irrigation and Agriculture		
2	LPG	Domestic		
5	Diesel (Generator)	Irrigation and agriculture		
6	Kerosene	Domestic		
7	Fire wood	Domestic		
8	Others	Specify		

Note: The survey is being conducted by Dillip kumar Das, Research Scholar, Department of Architecture and Planning, IIT, Roorkee, and will be exclusively used for academic purposes.

PLANNING FOR TOURISM DEVELOPMENT IN ORISSA STATE, INDIA

By

Department of Architecture and Planning, Indian Institute of Technology, Roorkee

Schedule –II

Industrial Survey

1.   Name of the unit:
2.   Location:
3.   Year of Establishment:
4.   Type of Organization: Public sector/Pvt. Sector/Partnership/ Cooperative/ others
5.   Category: Large scale/ medium scale/small scale/ Tiny/ cottage
6.   Nature of industrial activity: Manufacturing/ Engineering/ Agro based/ Food processing/ Other Processing/Marine/ Handicraft/ Chemical/Building material/Livestock based/Aquaculture based/Leather/Textile/Paper products/Rubber and plastic/Forest based/Repairing and Services/others (specify)
7.   What does it produce:
8.   Installed Capacity and Production:

Sl. No.	Particulars	Quantity in tonnes				
		1997-98	1998-99	1999-2000	2000-01	2001-02
1	Annual Installed capacity					
2	Annual input of Raw materials					
3	Annual Production					
4	Short fall					
5	Reasons for short fall					

9.

9.1   Investment: (Rs.)
           Fixed capital: (Rs.)
           Working Capital (Rs.)
           Total: (Rs.)

9.2   Sources of Capital:
           Self-Financed: (Rs)
           Loan (Rs):   Banks/ Cooperative societies/ Pvt. Banks/ other

10. Employment position:

Sl.No.	Category of Employees	Employment at inception	Employment at present	Reasons for change
1	Skilled			
2	Unskilled			
3	Managerial and office personnel			

11. Raw material requirement of the industry:

Sl. No.	Item	Monthly req. in tones	Value (Rs)	Source of supply	Distance from unit	Transport mode	Cost of Transport

12. Infrastructure Requirement:
12.1

Sl. No.	Item	Monthly Consumption	Cost (Rs)	Source of supply	Distance from unit
1	Water	Ltr			
2	Power	MW			

12.2 Waste disposal method / place

Sl. No.	Type of Waste	Quantity generates from the industry (tonne)	Method	Place	Remarks
1	Solid Waste				
2	Lequid Waste				
3	Gaseous Waste				

12.3. Distance from transport nodes in KM

From Nearest Railway station	NH	SH	MDR	Other

12.4. Area Requirement for the following activities in sq. m.

Storage of Raw Material	Finished product/stacking	Parking	Loading and Unloading

13. Future Expansion:

No. of Units	Employment	Area Requirement (sq. m)

14. Future ancillary programme:

15. Reason of location of the industry: (Rank)
    Accessibility/cost of land/ availability of land/ availability of skill/Assured Raw material/Power /water availability/Assured market/ Govt. incentives/ others (Specify)

16. General problems faced by the industry: (Rank)
    Shortage of Raw material/ shortage of capital/ shortage of energy/ shortage of water/ marketing problem/Transportation problem/ Technological Problems/Environmental problems/ Labour problems/ government policies/ others (specify).

17. What is the market of the product:

18. Future prospects of the industry in the state.

APPENDIX-1 (B)

PLANNING FOR TOURISM DEVELOPMENT IN ORISSA STATE, INDIA
By
Department of Architecture and Planning, Indian Institute of Technology, Roorkee

Schedule –III
Tourism Development Survey

1. Name:
2. Resident of: state: Nationality:
3. Gender: Age:
4. Purpose of visit: Travel / Pilgrimage/ Recreation / Official/ Business / combination
            of Any / any other
5. First visit/ Repeat visit/ subsequent visit)
6. In case multipurpose visit (Rank): Travel / Pilgrimage/ Religious/Recreation /
            Official/

                        Business / combination of any / any other
7. Priority in Travel destinations: Puri / Konark / Bhubaneswar / golden triangle
            (Combined) / Chilika / smaller destinations near by
    /
            Beaches / wild life sanctuaries / towards east coast /
            Towards western coast / other regions of the state
        etc.
8. Plan to visit other tourist destinations of the state: Yes/ No. If Yes. Destination:
                        Region: central Orissa/ tribal area/
                        Western Orissa
9. Rank the recreational or tourism activity: Recreation / Sight seeing / adventure
                        Sports / Boating/ Bird watching/ wild life
                        Watching /Boating/ visiting religious
                        places / seeing sculptures / Visiting
                        heritage and Archeological sites/
                        marketing of traditional skill based
                        handicraft products/
                        Cultural programs / other.
10 Period of Visit: Through out the year / during winter/ spring/ summer/ Festival
            Times
11. Mode of Travel: National: air / rail / road
                Regional: rail / road (Tourist Bus, other bus, Hire taxis)
                Local: Taxi/ bus/ auto/ slow moving vehicles
12. Accomodation: (a) Like to stay at: Hotels in major urban areas/ hotels in
                Destinations/ Panthanivas at destinations / Dharma Salas or
                Ashrams / special guest Houses / other

                (b) Over night stay at destinations: Yes/ No/ Does not matter
                No. of days staying in the state:

13. Food: In destinations / Major urban areas/ special guest houses/ way side
        Restaurants / other

14. Marketing or shopping: Like to buy: (Rank)
    o Handicrafts
    o Appliqué works
    o Filigree works
    o Stone sculptures
    o Handloom products
    o Other industrial products
    o Other agricultural or horticultural products
    o Dwcra works
    o Tribal products
    o Forest products

15. Like to make shopping in market places of: major cities / centers of production / Tourist destinations.

16. Major problems faced: Rank: (1st, 2nd, 3rd, minor)
    o Inadequate regional traveling facility
    o Inadequate local traveling facility
    o Inadequate accommodation facility
    o Marketing facility
    o Non availability of knowledgeable guides
    o Unhygienic condition
    o Inadequate and Unsuitable sanitation
    o Pollution
    o Temporary resting facilities at destinations
    o Drinking water
    o Parking
    o Communication facilities
    o Congestion / Traffic Problems
    o Crime
    o Any other: (specify)

17. Quality of Infrastructure and Services:
    o Road condition: satisfactory/ bad
    o Accommodation: Satisfactory/ needs improvement/ bad
    o Parking facility: organized/ unorganized
    o Sanitation: satisfactory/ needs improvement/ bad
    o Organized market center: yes/no
    o Like market at organized market centers at destinations: Yes/no/ does not matter

18. Condition of Tourist Destinations:
    o Heritage monuments: satisfactory/needs conservation/land scaping/better management
    o Wild life: satisfactory/ needs improvement/ better management
    o Coastal beaches: satisfactory/ creation of amenities/ needs more clean and hygienic atmosphere/ better management.

19. Major ecological problems: (Opinion/Rank)
   o Deforestation.
   o Degradation of vegetation
   o Loss of flora and fauna
   o Lack of care to wild life
   o Creating in hospitable condition for migratory birds and creatures
   o Human intervention in silent zones

20. Environmental conditions (Quality wise) to be looked after:
20.1

Sl.No.	Type of Pollution	Environmental Status				
		Very clean	Clean	Average	Polluted	Very Polluted
1	Air					
2	Water					
3	Noise					

20.2 Rank the following problems in order of their gravity.

   o Domestic waste disposal
   o Industrial waste disposal
   o Aquaculture waste disposal
   o Sewerage/ drainage
   o Tourist and Travel Waste disposal

21. How did you know about Orissa: Other tourists/fairs festival conducted at different areas/ news paper/electronic media/literatures/ others.

22. Would you like to revisit the place: Yes/No

Note: The survey is being conducted by Dillip kumar Das, Research Scholar, Department of Architecture and Planning, IIT, Roorkee, and will be exclusively used for academic purposes.

In this present investigation, the investigator employed weighted index method to analyze the preferential order of priorities under consideration. This is obtained by summing up the preferential values obtained for a particular variable, which is under consideration to the total number for the particular variable, using the formula

$$\bar{x} = \frac{f_1x_1+f_2x_2+\text{-------}+f_dx_n}{f_1+f_2+\text{--------}+f_n}$$

Where x_1, x_2, x_n are the preferences of respondent and f_1, f_2, f_n are frequency of respondents.

MODEL EQUATION FOR POPULATION

☐ Population
INIT 17051151
⊠ -dt*OutMigration
   -dt*DeathRate
   +dt*BirthRate
   +dt*InMigration

○ BirthRate
   = Population*BRF

○ DeathRate
   = Population*DRF

○ InMigration
   = Population*IMF

○ OutMigration
   = Population*OMF

○ Density
   = Population/Area

◇ Area
   = 35804

◇ BRF
   = 0.0231

◇ DRF
   = 0.009

◇ IMF
   = 0.0060

◇ OMF
   = 0.0070
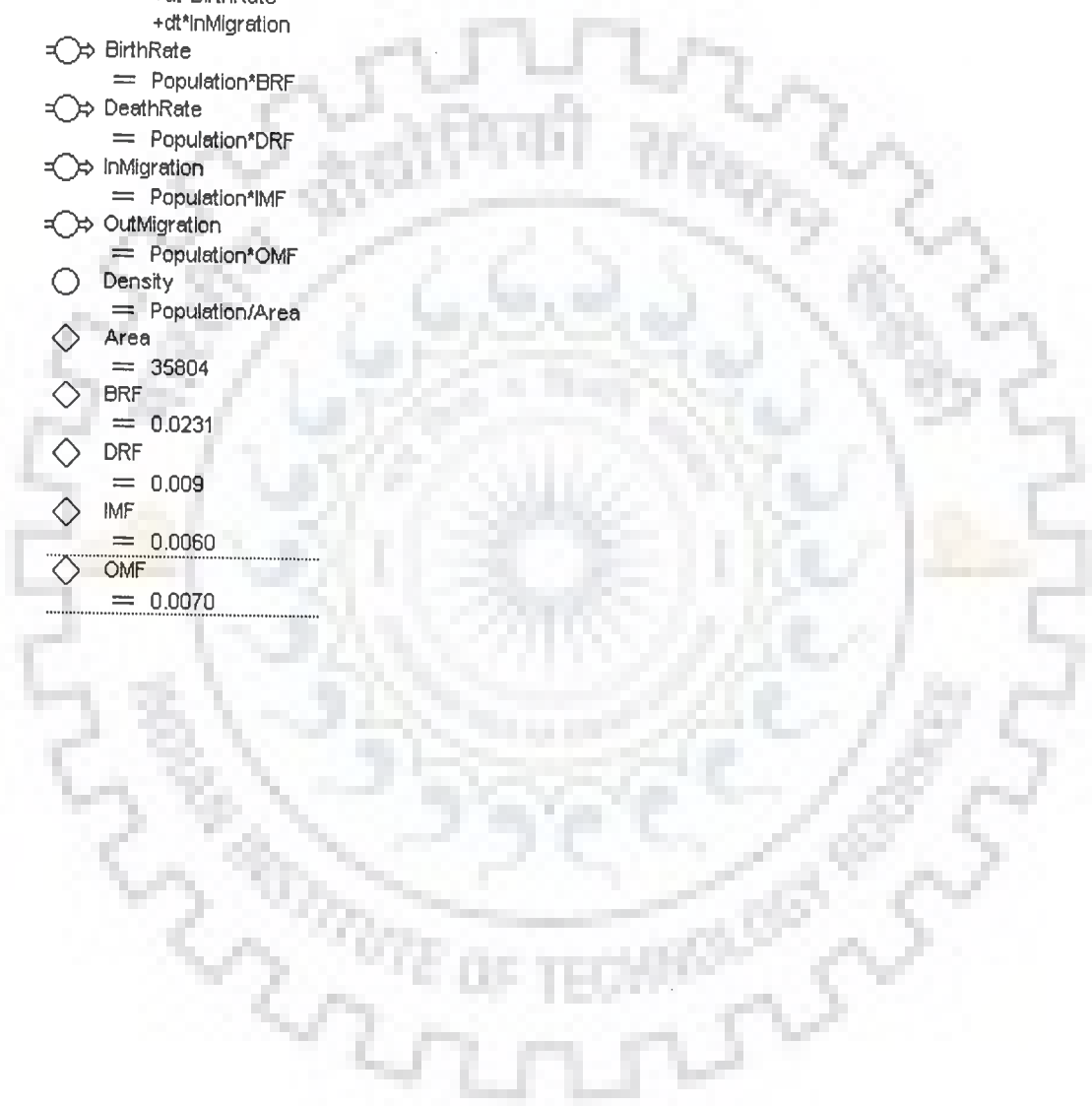
MODEL EQUATION FOR RAIL ROUTE LENGTH

☐ Population
  NT 17051151
  ⇄ -dt* Death Rate Studyarea
    +dt* Birth Rate Studyarea
    -dt* OutMigration Studyarea
    +dt* InMigration Studyarea
☐ Projected Rail Line
  NT 674
  ⇄ +dt* Projected Rail Growth Rate
☐ Rail Line
  NT 674
  ⇄ +dt* Rail Line Growth Rate
  📄 KM
○⇨ Birth Rate Studyarea
    = Population* BRF Studyarea
○⇨ Death Rate Studyarea
    = Population* DRF Studyarea
○⇨ InMigration Studyarea
    = Population* IMF Studyarea
○⇨ OutMigration Studyarea
    = Population* OMF Studyarea
○⇨ Projected Rail Growth Rate
    = Projected Rail Line* PRLGF
○⇨ Rail Line Growth Rate
    = Rail Line* RLGF
○ Actua Rail Line Density
    = Rail Line/(Population/1000000)
○ Desired Rail Length
    = (Population* Desired Rail Line Density)/1000000
○ Discrepancy
    = (Desired Rail Line Density - Actua Rail Line Density)/Desired Rail Line Density
○ Effect Of Rail On Satisfaction
    = GRAPH(Ratio Of Growth In Rail,1,1,[1,1.18,1.34,1.54,1.87,2.29,2.85,3.12,3.36,3.5'Min:1;Max:3.5'])
○ Perceived Rail Line
    = DELAYINF(Projected Rail Line,Tourists Perception Delay,1,674)
○ Railway Satisfaction
    = GRAPH(Discrepancy,0,0.083,[1,0.97,0.92,0.85,0.77,0.65,0.6,0.3,0.194,0.12,0.054,0.027,0'Min:0;Max:'
○ Ratio Of Growth In Rail
    = PRLGF/RLGF
○ Ratio Of Rail Line
    = Perceived Rail Line/Rail Line
◇ BRF Studyarea
    = 0.0231

◇ Desired Rail Line Density
    = 120
  📄 KM Per million Population
◇ DRF Studyarea
    = 0.009
◇ IMF Studyarea
    = 0.0060
◇ OMF Studyarea
    = 0.0070
◇ PRLGF
    = 0.02
◇ RLGF
    = 0.014
◇ Tourists Perception Delay
    = 1

MODELEQUATION FOR ROAD LENGTH

☐ Avaialble Road Length
  NT 71076
  ⇶ +dt* Normal Construction Rate
    -dt* Conversionrate
☐ Available Higher Order Roadlength
  NT 6867
  ⇶ +dt* Conversionrate
  📄 kms
☐ Current GDP
  NT 255390000000
  ⇶ +dt* Projected GDP Change_Rate
☐ Desired Road Length
  NT Area*Min Km Per SqKM
  ⇶ +dt* Roadength Change Rate
☐ Normal Current GDP
  NT 255390000000
  ⇶ +dt* Normal GDP Change_Rate
  📄 RS
☐ Percieved Road Length
  NT 71076
  ⇶ +dt* Percieved Construction Rate
  📄 KMS
⊶ Conversionrate
  — Available Higher Order Roadlength* Coversion_Fraction
⊶ Normal Construction Rate
  — Noral Annual Ivestment In Road/Normal Ivestment PerKM
⊶ Normal GDP Change_Rate
  — (Normal New GDP- Normal Current GDP)/Normal Time To Allocate
⊶ Percieved Construction Rate
  = Percieved Annual Ivestment In Road/Average Ivestment PerKM_1
⊶ Projected GDP Change_Rate
  — (Projecetd New GDP- Current GDP)/Time To Allocate
⊶ Roadength Change Rate
  = Desired Road Length* Increase Rate
○ Desired Higher Order Roads
  — Desired Road Length* Desired Higher Order Road Fraction
○ Discrepanoy
  = (Desired Road Length- Avaialble Road Length)/Desired Road Length
○ Efect Of Road On Tourist Satisfaction
  — GRAPH(Ratio Of Growth In Road,1,1,[1,1.1,1.24,1.48,1.82,2.29,2.67,2.96,3.15,3.23"Min:1;Max:3.225"])
○ Noral Annual Ivestment In Road
  = Normal Current GDP* Normal Fraction To Road
○ Normal New GDP
  — Normal Current GDP* Normal Annual GDP GR+ Normal Current GDP
○ Percieved Annual Ivestment In Road
  = Current GDP* Percieved Fraction To Road

○ Perecived Roadlength
  — DELAYINF(Percieved Road Length, Tourists Perception Delay, 1,71076)
○ Projecetd New GDP
  = Current GDP*Projeted Annual GDPGR+Current GDP
○ Ratio Of Growth In Road
  — Percieved Fraction To Road/Normal Fraction To Road
○ Ratio Of Road Length
  — Percieved Roadlength/Avaialble Road Length
○ Road Satisfacton
  — GRAPH(Discrepancy,0,0.1,[0.91,0.69,0.45,0.29,0.18,0.12,0.08,0.06,0.03,0.03,0.05'Min:0;Max:1'])
◇ Area
  — 35804
  📄 SQKM
◇ Average Ivestment PerKM_1
  — 525000
◇ Coversion_Fraction
  — 0.01
◇ Desired Higher Order Road Fraction
  — 0.15
◇ Increase Rate
  — 0.01
◇ Min Km Per SqKM
  = 3.4
◇ Normal Annual GDPGR
  — 0.036
◇ Normal Fraction To Road
  = 0.01
◇ Normal Ivestment PerKM
  — 525000
◇ Normal Time To Allocate
  = 1
◇ Percieved Fraction To Road
  — 0.01
◇ Projeted Annual GDPGR
  = 0.036
◇ Time To Allocate
  — 1
◇ Tourists Perception Delay
  — 3
  📄 YEARS

MODEL EQUATION FOR LAND USE

☐ Agriculture Land Area
  NT 1897000
  ⇥ -dt*Conversion Rate Agriculture Land
  📄 Hectare
☐ Forest Land Area
  NT 748000
  ⇥ -dt*Conversion Rate Forest Land
  📄 hectare
☐ Habitat Land Area
  NT 388000
  ⇥ +dt*Conversion Rate Other Land
     +dt*Conversion Rate Agriculture Land
  📄 Hectare
☐ Other Land Area
  NT 492000
  ⇥ +dt*Conversion Rate Forest Land
     -dt*Conversion Rate Other Land
  📄 hectare,trees, permanent pasture, barren,fallow
○→ Conversion Rate Agriculture Land
  = Agriculture Land Area*Conversion Fraction Agriulture Land to Habitat Land
○→ Conversion Rate Forest Land
  = Forest Land Area*Coversion Fraction Forest Land to Other Land
○→ Conversion Rate Other Land
  = Other Land Area*Conversion Fraction Other Land to Habitat Land
○ Total Land Area
  = Agriculture Land Area+Habitat Land Area+Forest Land Area+Other Land Area
◇ Conversion Fraction Agriulture Land to Habitat Land
  = 0.006
  📄 Percent getting converted to builtup
◇ Conversion Fraction Other Land to Habitat Land
  = 0.005
◇ Coversion Fraction Forest Land to Other Land
  = 0.005

MODL EQUATIONS FOR ACCOMODATION (HOTEL BEDS)

☐ Available Accomodation
  [INIT] 21985*365*0.66
  ⧉ +dt*Acomodation Growth Rate
☐ Domestic Tourists
  [INIT] 3084500
  ⧉ +dt*Domestic Tourists Growth Rate
  📄 study area domestic
☐ Foreign Tourists
  [INIT] 13220
  ⧉ +dt*Foreign Tourists Growth Rate
☐ Percievedd Accomodation
  [INIT] 5771723
  ⧉ +dt*Percieved Accomodation Growth Rate
○ Acomodation Growth Rate
  = Available Accomodation*AGRF
○ Domestic Tourists Growth Rate
  = Domestic Tourists*NDTGF
○ Foreign Tourists Growth Rate
  = Foreign Tourists*NFGF
○ Percieved Accomodation Growth Rate
  = Percievedd Accomodation*PAGRF
○ Demand Affordable Hotel Beds
  = Demand Of Total Hotel Beds*Demand Affordable Hotel Beds Fraction
○ Demand For Acomodation
  = Tourists Per Annum*Fracton Requireacomodation
○ Demand Highspending Hotel Beds
  = Demand Of Total Hotel Beds*Demand Highspending Beds Fraction
○ Demand Of Total Hotel Beds
  = Demand For Acomodation*Demand Of Bedsratio
○ Effect Of Accomodarion On Satisfaction
  = GRAPH(Ratio Of Growth In Accomodation,1,1,[1,1.18,1.34,1.54,1.87,2.29,2.85,3.12,3.38,3.6'Min:1;Max:3.6'])
○ Employment in Informal Sector
  = Total Employement*Fraction Of Employment Informalsector
○ Gap In Acomodation
  = (Demand For Acomodation-Available Accomodation)/Demand For Acomodation
○ Perceived Accomodation
  = DELAYINF(Percievedd Accomodation,Tourists Accomodation Perception Delay,1,5771723)
○ Perceived Affordable Hotel Beds
  = Supply Of Projected Hotel Beds*Perceived Affordable Hotel Bed Fraction
○ Percieved Highspnding hotel Beds
  = Supply Of Projected Hotel Beds*Perceived Highspending Hotelbeds Fraction
○ Ratio Of Accomodation
  = Perceived Accomodation/Available Accomodation
○ Ratio Of Growth In Accomodation

○ Satisfaction Level for Accomodation
  — GRAPH(Gap In Accomodation,0,0.2,[0.92,0.2,0.05,0.03,0.01"Min:0;Max:1"])
○ Supply Affordable Hotel Beds
  = Supply Total Hotel Beds*Supply Affordable Hotel Bed Fractio
○ Supply Highspnding Hotel Beds
  — Supply Total Hotel Beds*Supply Highspending Hotelbeds Fraction
○ Supply Of Projected Hotel Beds
  = Percievedd Accomodation*Percievedd Supply Of Beds Ratio
○ Supply Total Hotel Beds
  — Available Accomodation*Supply of Beds Ratio
○ Total Employement
  — Toursts PerAnnum*Emloyement Genaration PerTourist
○ Total Revenue Domestic Tourist
  — Domestic Tourists*Domestic Tourist Reveue PerDay*Duration Domesti Tourist Stay
○ Total Reveua Foreign Tourist
  — Foreign Tourists*Foreign Tourisst Revenue PerDay*Duration Of Foreigntourist Stay
○ Toursts PerAnnum
  — Domestic Tourists+Foreign Tourists
○ Yearly Revenue
  — Total Revenue Domestic Tourist+Total Reveue Foreign Tourist
◇ AGRF
  = 0.03
◇ Demand Affordable Hotel Beds Fraction
  — 0.85
◇ Demand Highspending Beds Fraction
  = 0.15
◇ Demand Of Bedsratio
  — 0.0075
◇ Domestic Tourist Reveue PerDay
  = 602
◇ Duration Domesti Tourist Stay
  — 3.96
◇ Duration Of Foreigntourist Stay
  = 8.3
◇ Emloyement Genaration PerTourist
  — 10.58/1000
◇ Foreign Tourisst Revenue PerDay
  = 1119
◇ Fraction Of Employment Informal sector
  — 0.80
◇ Fracton Requireacomodation
  = 0.60
◇ NDTGF
  — 0.075
◇ NFGF
  = 0.10

◇ PAGRF
  — 0.05
◇ Percieved Affordable Hotel Bed Fraction
  = 0.85
◇ Percievedd Supply Of Beds Ratio
  — 0.00415
◇ Percieved Highspending Hotelbeds Fraction
  = 0.15
◇ Supply Affordable Hotel Bed Fractio
  — 0.85
◇ Supply Highspending Hotelbeds Fraction
  = 0.15
◇ Supply of Beds Ratio
  — 0.00415
◇ Tourists Accomodation Perception Delay
  = 6

MODL EQUATIONS FOR AGRICULTURE CROPS

☐ Agriculture Land Area
  [NT] 1897000
  [⇨] -dt*Conversion Rate Agriculture Land
  [📄] Hectare
☐ Annual Actual Cereal Crops production
  [NT] 2121984.2
  [⇨] +dt*Cereal Crop Growth Rate
  [📄] mt
☐ Annual Actual Commercial Crops production
  [NT] 2170188
  [⇨] +dt*Commercial Crop Growth Rate
  [📄] mt
☐ Annual Actual Pulses Crops production
  [NT] 48335.58
  [⇨] +dt*Pulses Growth Rate
  [📄] tonnes
☐ Forest Land Area
  [NT] 748000
  [⇨] -dt*Conversion Rate Forest Land
  [📄] hectare
☐ Habitat Land Area
  [NT] 388000
  [⇨] +dt*Conversion Rate Other Land
      +dt*Conversion Rate Agriculture Land
  [📄] Hectare
☐ Other Land Area
  [NT] 492000
  [⇨] +dt*Conversion Rate Forest Land
      -dt*Conversion Rate Other Land
  [📄] hectare,trees, permanent pasture, barren,fallow
⧀⇨ Cereal Crop Growth Rate
  = (Annual Cereal Yield-Annual Actual Cereal Crops production)/Effective Time To Change_1
⧀⇨ Commercial Crop Growth Rate
  = (Annual Commercial Yield-Annual Actual Commercial Crops production)/Effective Time To Change
⧀⇨ Conversion Rate Agriculture Land
  = Agriculture Land Area*Conversion Fraction Agriulture Land to Habitat Land
⧀⇨ Conversion Rate Forest Land
  — Forest Land Area*Coversion Fraction Forest Land to Other Land
⧀⇨ Conversion Rate Other Land
  = Other Land Area*Conversion Fraction Other Land to Habitat Land
⧀⇨ Pulses Growth Rate
  — (Annual Pulsesl Yield-Annual Actual Pulses Crops production)/Effective Time To Change_2
○ Agricultural Area For Cereall Crops
  = Agriculture Land Area*Fraction Ofarea Cereal Crop
○ Agricultural Area For Commercial Crops
  — Agriculture Land Area*Fraction Ofarea Commercia Crop
○ Agricultural Area For Pulses Crops
  = Agriculture Land Area*Fraction Ofarea Pulses Crop
○ Annual Cereal Yield
  — Agricultural Area For Cereall Crops*Improved Cereall Crop Yield per Hectare
○ Annual Commercial Yield
  = Agricultural Area For Commercial Crops*Improved Commercial Crop Yield per Hectare
○ Annual Pulsesl Yield
  — Agricultural Area For Pulses Crops*Improved Pulses Yield per Hectare
○ Cereal Effctive Yield
  = DELAYINF(Actual Fertizer Input For Cereal Crops,Cereal Crop Yield Time,3,40.52)
○ Efect Of Cereal Crop Seed On Yield
  — GRAPH(Ratio Of Cereal Cropl Seed Quality,1,0.1,[1.02,1.1,1.2,1.36,1.54,1.85,2.1,2.31,2.46,2.51"Mn:1;Max:3"])
○ Efect Of Commercial Crop Seed On Yield
  = GRAPH(Ratio Of Commercial Cropl Seed Quality,1,0.1,[1.02,1.1,1.2,1.36,1.54,1.85,2.1,2.31,2.46,2.51"Mn:1;Max:3"])

○ Efect Of Pulses Seed On Yield
  — GRAPH(Ratio Of Pulsesl Seed Quality,1,0.1,[1.02,1.1,1.2,1.36,1.54,1.85,2.1,2.31,2.46,2.51'Mn:1;Max:3'])
○ Effect Of Fert On Cereal Crops
  = GRAPH(Ratio Of Cereal Crop Fertilizer,1,0.1,[1.004,1.032,1.088,1.172,1.309,1.495,1.667,1.751,1.789,1.796'Mn:1;Max:1.8'])
○ Effect Of Fert On Commercial Crops
  — GRAPH(Ratio Of Commercial Crop Fertilizer,1,0.1,[1.004,1.032,1.088,1.172,1.309,1.495,1.667,1.751,1.789,1.796'Mn:1;Max:1.8'])
○ Effect Of Fert On Pulsesl Crops
  — GRAPH(Ratio Of Pulses Crop Fert,1,0.1,[1.004,1.032,1.088,1.172,1.309,1.495,1.667,1.751,1.789,1.796'Mn:1;Max:1.8'])
○ Improved Cereall Crop Yieldper Hectare
  — Cereal Yield Per Hectare*Effect Of Fert On Cereal Crops*Efect Of Cereal Crop Seed On Yield
○ Improved Commercial Crop Yieldper Hectare
  — Commercial Yield Per Hectare*Effect Of Fert On Commercial Crops*Efect Of Commercial Crop Seed On Yield
○ Improved Pulses Yieldper Hectare
  = Pulses Yield Per Hectare*Effect Of Fert On Pulsesl Crops*Efect Of Pulses Seed On Yield
○ Pulses Effctive Yield
  — DELAYINF(Actual Fertizer Input For Commerciall Crops,Commerial Crop Yield Time,3,40.52)
○ Pulses Effctive Yield_1
  = DELAYINF(Actual Fertizer Input For Pulsesl Crops,Pulses Yield Time,3,40.52)
○ Ratio Of Cereal Crop Fertilizer
  — Cereal Effctive Yield/Currentl Fertilizer Input For Cereal Crops
○ Ratio Of Cereal Cropl Seed Quality
  = Actua Cereal Crop Quality Ofseeds/Curent Qulity Of Cereall Seeds
○ Ratio Of Commercial Crop Fertilizer
  — Pulses Effctive Yield/Currentl Fertilizer Input For Commercial Crops
○ Ratio Of Commercial Cropl Seed Quality
  = Actual Commercial Crop Quality Ofseeds/Curent Qulity Of Commercial Seeds
○ Ratio Of Pulses Crop Fert
  — Pulses Effctive Yield_1/Currentl Fertilizer Input For Pulses Crops
○ Ratio Of Pulsesl Seed Quality
  — Actual Pulses Quality Ofseeds/Curent Qulity Of Pulses Seeds
○ Total Land Area
  — Agriculture Land Area+Habitat Land Area+Forest Land Area+Other Land Area
◇ Actua Cereal Crop Quality Ofseeds
  — 1
◇ Actual Commercial Crop Quality Ofseeds
  = 1
◇ Actual Fertizer Input For Cereal Crops
  — 40.52
  📄 KgPer Hctare
◇ Actual Fertizer Input For Commerciall Crops
  — 40.52
  📄 KgPer Hctare
◇ Actual Fertizer Input For Pulsesl Crops
  — 40.52
  📄 KgPer Hctare
◇ Actual Pulses Quality Ofseeds
  — 1
◇ Cereal Crop Yield Time
  = .5
◇ Cereal Yield Per Hectare
  — 1.45
  📄 Tones Per Hectare
◇ Commercial Yield Per Hectare
  — 5.5
  📄 Tones Per Hectare
◇ Commerial Crop Yield Time
  = .5
◇ Conversion Fraction Agriulture Land to Habitat Land
  = 0.006
  📄 Percent getting converted to builtup

◇ Conversion Fraction Other Land to Habitat Land
— 0.005
◇ Coversion Fraction Forest Land to Other Land
= 0.005
◇ Curent Qulity Of Cereall Seeds
— 1
◇ Curent Qulity Of Commercial Seeds
— 1
◇ Curent Qulity Of Pulses Seeds
— 1
◇ Currentl Fertilizer Input For Cereal Crops
— 40.52
📄 Kg Per Hectare
◇ Currentl Fertilizer Input For Commercial Crops
— 40.52
📄 Kg Per Hectare
◇ Currentl Fertilizer Input For Pulses Crops
= 40.52
📄 Kg Per Hectare
◇ Effective Time To Change
— 1
◇ Effective Time To Change_1
= 1
◇ Effective Time To Change_2
— 1
◇ Fraction Of area Cereal Crop
= 0.799
◇ Fraction Of area Commercia Crop
— 0.11
◇ Fraction Of area Pulses Crop
= 0.09
◇ Pulses Yield Per Hectare
— 0.28
📄 Tones Per Hectare
◇ Pulses Yield Time
= .5

☐ Agriculture Land Area
NT 1897000
⇶ -dt* Conversion Rate Agriculture Land
📄 Hectare
☐ Available Accomodation
NT 21985*365*0.66
⇶ +dt* Acomodation Growth Rate
☐ Current_GDP
NT 108374096500
⇶ +dt* Current GDP_Growth_Rate
☐ Current GDP
NT 255390000000
⇶ +dt* Projected GDP Change_Rate
☐ Domestic Tourists
NT 3084500
⇶ +dt* Domestic Tourists Growth Rate
📄 study area domestic
☐ Employment Informal Sector
NT 28724160
⇶ +dt* Informal Employment Growth Rate
📄 study area mandays 0.46 share of state
☐ Employment in Study area
NT 6615846
⇶ +dt* Employment Growth Rate
☐ Foreign Tourists
NT 9740
⇶ +dt* Foreign Tourists Growth Rate
☐ Forest Land Area
NT 748000
⇶ -dt* Conversion Rate Forest Land
📄 hectare
☐ Habitat Land Area
NT 388000
⇶ +dt* Conversion Rate Other Land
+dt* Conversion Rate Agriculture Land
📄 Hectare
☐ Normal Avaialble Road Length
NT 231034
⇶ +dt* Normal Construction Rate
☐ Normal Current GDP
NT 255390000000
⇶ +dt* Normal GDP Change_Rate

MODEL EQUATIONS FOR INTEGRATED TOURISM MODEL AND FOR INTEGRATED SYSTEM MODEL

☐ OtherLandArea
  [NT] 492000
  ⇨ -dt*ConversionRateOtherLand
      +dt*ConversionRateForestLand
  📄 hectare,trees, permanent pasture, barren,fallow
☐ PercievedAccomodation
  [NT] 5771723
  ⇨ +dt*PercievedAccomodationGrowthRate
☐ Population
  [NT] 36706920
  ⇨ -dt*DeathRate
      +dt*BirthRate
      -dt*OutMigration
      +dt*InMigration
☐ PopulationStudyarea
  [NT] 17051151
  ⇨ +dt*InMigrationStudyarea
      -dt*DeathRateStudyarea
      +dt*BirthRateStudyarea
      -dt*OutMigrationStudyarea
☐ ProjectdRailLine
  [NT] 2401
  ⇨ +dt*ProjectedRailGrowthRate
☐ ProjectedRoadLength
  [NT] 231034
  ⇨ +dt*ProjectedConstructionRate
☐ RailLine
  [NT] 2401
  ⇨ +dt*RailLineGrowthRate
  📄 KM
○→ AcomodationGrowthRate
  — AvailableAccomodation*AGRF
○→ BirthRate
  — Population*BRF
○→ BirthRateStudyarea
  — PopulationStudyarea*BRFStudyarea
○→ ConversionRateAgricultureLand
  — AgricultureLandArea*ConversionFractionAgrilutureLandtoHabitatLand
○→ ConversionRateForestLand
  = ForestLandArea*CoversionFractionForestLandtoOtherLand
○→ ConversionRateOtherLand
  — OtherLandArea*ConversionFractionOtherLandtoHabitatLand
○→ CurrentGDP_Growth_Rate
  = Current_GDP*CurrentGDP_Growth_Fraction
○→ DeathRate
  — Population*DRF
○→ DeathRateStudyarea
  = PopulationStudyarea*DRFStudyarea
○→ DomesticTouristsGrowthRate
  — DomesticTourists*NDTGF*EffectOfRailGrowthOnTourism+EffectOfRoadOnTourists+EffectOfAttractionOnTourists+EffectofAccomodationonTourists
○→ EmploymentGrowthRate
  — EmploymentInStudyarea*EmploymentGrowthFraction
○→ ForeignTouristsGrowthRate
  — ForeignTourists*NFGF*EffectOfRailGrowthOnTourism+EffectOfRoadOnTourists+EffectOfAttractionOnTourists+EffectofAccomodationonTourists
○→ InformalEmploymentGrowthRate
  — EmploymentInformalSector*InfromalEmploymentGrowthFraction
○→ InMigration
  = Population*IMF
○→ InMigrationStudyarea
  — PopulationStudyarea*IMFStudyarea
○→ NormalConstructionRate
  = NoralAnnualIvestmentInRoad/NormalIvestmentPerKM
○→ NormalGDPChange_Rate
  — (NormalNewGDP-NormalCurrentGDP)/NormalTimeToAllocate
○→ OutMigration
  = Population*OMF

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⊸◯⊸ OutMigration Studyarea
— Population Studyarea*OMF Studyarea
⊸◯⊸ Percieved Accomodation Growth Rate
= Percieveddd Accomodation*PAGRF
⊸◯⊸ Projected Construction Rate
— Projetecd Annual Ivestment In Road_1/Average Ivestment PerKM
⊸◯⊸ Projected GDP Change_Rate
= (Projecetd New GDP-Current GDP)/TimeToAllocate
⊸◯⊸ Projected Rail Growth Rate
— Projectd Rail Line*PRLGF
⊸◯⊸ Rail Line Growth Rate
= Rail Line*RLGF
◯ Actua Rail Line Density
— Rail Line/(Population/1000000)
◯ Annual_Total_Tourism_Revenue
= Total Revenue Domestic+Total Reveue Foreign
◯ Arrival Flow Capacity
— Toursts PerAnnum*Peak Flowrate/Habitat Land Area
◯ Current GDP_Growth_Fraction
= Primary Sector_contribution+Secondary Sector_contribution+Tertiary Sector_contribution

◯ Demand Affordable Hotel Beds
— Demand Of Hotel Beds*Demand Affordable Hotel Beds Fraction
◯ Demand For Acomodation
= Toursts PerAnnum*Fracton Requireacomodation
◯ Demand Highspending Hotel Beds
— Demand Of Hotel Beds*Demand Highspending Beds Fraction
◯ Demand Of Hotel Beds
= Demand For Acomodation*Demand Of Bedsratio
◯ Discrepancy
— (Desired Rail Line Density-Actua Rail Line Density)/Desired Rail Line Density
◯ Effect Of Road On Tourist Satisfaction
— GRAPH(Ratio Of Growth In Road,1,1,[1,1.1,1.24,1.48,1.82,2.29,2.67,2.96,3.15,3.23"Min:1;Max:3.225"])
◯ Effect Of Accomodarion On Satisfaction
— GRAPH(Ratio Of Growth In Accomodation,1,1,[1,1.18,1.34,1.54,1.87,2.29,2.85,3.12,3.36,3.5"Min:1;Max:3.5"])
◯ Effect of Accomodation on Tourists
— GRAPH(Ratio Of Accomodation,1,0.1,[1,7,103,207,323,466,680,1050,1860,2230,2480,0"Min:1;Max:2500"])
◯ Effect Of Attraction On Tourists
— GRAPH(Ratio Of Budget To Attraction,1,1,[1,900,2350,4210,4870"Min:1;Max:5000"])
◯ Effect Of Budget On Satisfaction
— GRAPH(Ratio Of Budget To Attraction,1,0.5,[1.03,1.16,1.43,1.76,2.3,2.81,3.27,3.47,3.5"Min:1;Max:3.5"])
◯ Effect Of Rail Growth On Tourism
= GRAPH(Ratio Of Rail Line,1,0.1,[1,1.05,1.14,1.23,1.31,1.44,1.62,1.79,1.95,2.13,1.47"Min:1;Max:2.25"])
◯ Effect Of Rail On Tourist Satisfaction
— GRAPH(Ratio Of Growth In Rail,1,1,[1,1.18,1.34,1.54,1.87,2.29,2.85,3.12,3.36,3.5"Min:1;Max:3.5"])
◯ Effect Of Road On Tourists
= GRAPH(Ratio Of Road Line,1,0.1,[1.01,16,170,390,670,1050,1410,1680,1850,1980,1980"Min:1;Max:2000"])
◯ Employement Informal Sector from Tourism
— Total Employement_Tourism*Fraction Infroml_sector_employmentl*Mandays per Informal Employee
◯ Employment in Informal Sector Tourism
= Total Employement_Tourism*Fraction Of Employment Informalsector
◯ Employment Organised from Tourism
— Total Employement_Tourism*Organised Employment Fraction
◯ Envromental Stress
= GRAPH(Ratio Oft Tourist Flow Capacity,0,0.1,[0,0.16,0.29,0.46,0.58,0.67,0.76,0.84,0.9,0.95,1"Min:0;Max:1"])
◯ Gap In Acomodation
— (Demand For Acomodation-Available Accomodation)/Demand For Acomodation
◯ Noral Annual Ivestment In Road
= Normal Current GDP*Normal Fraction To Road
◯ Normal New GDP
— Normal Current GDP*Normal Annual GDPGR+Normal Current GDP
◯ PerCapita GDP
= Projected New GDP/Population Studyarea
◯ Percapita GDP excluding Toutrism_evenue
— Current_GDP/Population Studyarea
◯ PerCapita Income
= PerCapita GDP*Fraction Contributing To PerCapita Income

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○ Railway Satisfaction
  — GRAPH(Discrepancy,0,0.083,[1,0.97,0.92,0.85,0.77,0.65,0.5,0.3,0.194,0.12,0.054,0.027,0"Min:0;Max:1"])
○ Ratio Of Accomodation
  = Perceived Accomodation/Available Accomodation
○ Ratio Of Budget To Attraction
  — Actuall Fraction To Attraction/Initial Fraction To Attraction
○ Ratio Of Growth In Accomodation
  — PAGRF/AGRF
○ Ratio Of Growth In Rail
  — PRLGF/RLGF
○ Ratio Of Growth In Road
  — Projected Fraction To Road/Normal Fraction To Road
○ Ratio Of Rail Line
  = Perceived Rail Line/Rail Line
○ Ratio Of Road Line
  — Perecived Roadlength/Normal Avaialble Road Length
○ Ratio Oft Tourist Flow Capacity
  = Arrival Flow Capacity/Observed Maximum Flow Capacity
○ Satisfaction Level for Accomodation
  — GRAPH(Gap In Acomodation,0,0.1,[0.95,0.43,0.25,0.17,0.13,0.1,0.09,0.07,0.04,0.01,0.08"Min:0;Max:1"])
○ Secondary Sector_contribution
  = Fraction of Handicrafts+Fraction Of Manufacturing
○ Supply Affordable Hotel Beds
  — Supply Hotel Beds* Supply Affordable Hotel Bed Fractio
○ Supply Highspnding Hotel Beds
  — Supply Hotel Beds* Supply Highspending Hotelbeds Fraction
○ Supply Hotel Beds
  — Available Accomodation* Supply of Beds Ratio
○ Supply Of Projected Hotel Beds
  — Percievedd Accomodation* Percievedd Supply Of Beds Ratio
○ Tertiary Sector_contribution
  — Fraction Share Of Tertiary Sector
○ Total Employement_Tourism
  — Tourst Per Annum* Emloyement Genaration Per Tourist
○ Total Employment including Organised Employment Tourism
  = Employment in Study area+Employment Organised from Tourism
○ Total Employment Informal_sector
  — Employment Informal Sector+Employment Informal Sector from Tourism
○ Total Land Area
  = Agriculture Land Area+Habitat Land Area+Forest Land Area+Other Land Area
○ Total Revenue Domestic
  — Domestic Tourists* DT Reveue Per Day* DT Stay
○ Total Reveue Foreign
  = Foreign Tourists* FT Revenue Per Day* FT Stay

○ Per Capita Income Excluding_Tourist Revenue
  — Percapita GDP excluding Toutrism_evenue* Factionto Percapta Income
○ Perceived Accomodation
  = DELAYINF(Percievedd Accomodation,Tourists Accomodation Perception Delay,1,5771723)
○ Perceived Rail Line
  — DELAYINF(Projectd Rail Line,Tourists Perception Delay,1,2401)
○ Percieved Affordable Hotel Beds
  = Supply Of Projected Hotel Beds* Percieved Affordable Hotel Bed Fraction
○ Percieved Highspnding hotel Beds
  — Supply Of Projected Hotel Beds* Percieved Highspending Hotelbeds Fraction
○ Perecived Roadlength
  = DELAYINF(Projected Road Length,Tourists Perception Delay,1,234034)
○ Primary Sector_contribution
  — Fraction Commercial Crop+Fraction Other Primary Sector
○ Projecetd New GDP
  = Current GDP* Projeted Annual GDPGR+Current GDP
○ Projected New GDP
  — Current_GDP+Annual_Total_Tourism_Revenue
○ Projeteod Annual Ivestment In Road_1
  = Current GDP* Projected Fraction To Road

○ Tourists Satisfaction
  = Efect Of Road On Tourist Satisfaction*.155+Effect Of Budget On Satisfaction*.062+Effect Of Rail On Tourist Satisfaction*0.093+Effect Of Accomodarion On Satisfaction*0.095

◇ IMF
— 0.0050

◇ IMF Studyarea
= 0.0060

◇ Infromal Employment Growth Fraction
— 0.028
📄 incidence of employment in informal

◇ Initial Fraction To Attraction
— 0.01

◇ Mandays per Informal Employee
— 180

◇ NDTGF
— 0.075

◇ NFGF
= 0.06

◇ Normal Annual GDPGR
— 0.036

◇ Normal Fraction To Road
= 0.01

◇ Normal Ivestment Per KM
— 525000

◇ Normal Time To Allocate
= 1

◇ Observed Maximum Flow Capacity
— 21.14
📄 tourists/hectare puri rathyatra

◇ OMF
= 0.0070

◇ OMF Studyarea
— 0.0070

◇ Organised Employment Fraction
= 0.20

◇ PAGRF
— 0.10

◇ Peak Flowrate
— 0.1405
📄 Peal Flow in December

◇ Percieved Affordable Hotel Bed Fraction
— 0.85

◇ Percievedd Supply Of Beds Ratio
= 0.00415

◇ Percieved Highspending Hotelbeds Fraction
— 0.15

◇ PRLGF
— 0.05

◇ Projected Fraction To Road
— 0.05

◇ Projeted Annual GDPGR
— 0.036

◇ RLGF
= 0.014

◇ Supply Affordable Hotel Bed Fractio
— 0.85

◇ Supply Highspending Hotelbeds Fraction
= 0.15

◇ Supply of Beds Ratio
— 0.00415

◇ Time To Allocate
= 1

◇ Tourists Accomodation Perception Delay
— 6

◇ Tourists Perception Delay
= 6

Tourist arrival in the study area

Sl. No.	Scenario		Domestic tourist	Per cent variation	Foreign tourist	Per cent variation	Total tourist	Per cent variation
1	Projected year result		27004974		56182		27061156	
2	S_1	Road 2%	27004976	7.40 E-06	56183	0.001	27061159	1.10 E-05
3	S_2	Road 3%	27004984	3.70 E-05	56191	0.01	27061175	7.02 E-05
4	S_3	Road 5%	27005009	0.0001	56213	0.05	27061222	0.0002
5	S_4	Road 10%	27005036	0.0002	56234	0.09	27061270	0.0004
6	S_5	Rail 2%	27129611	0.46	56292	0.19	27186003	0.46
7	S_6	Rail 3%	28467247	5.41	58638	4.37	28525885	5.41
8	S_7	Rail 5%	38049303	40.89	74232	32.12	38119536	40.86
9	S_8	Investment 2%	27005015	0.0001	56214	0.05	27061229	0.0002
10	S_9	Investment 5%	27005077	0.0003	56261	0.14	27061339	0.0006
12	S_{11}	Investment 10%	27015169	0.037	63977	13.87	27079146	0.066
13	S_{12}	Investment 15%	27020380	0.057	67962	20.96	27088342	0.104
14	S_{13}	Investment 20%	27056570	0.19	95632	70.21	27152202	0.33
15	S_{14}	Investment 25%	27071460	0.24	107016	90.48	27178476	0.43
16	S_{15}	Accommodation 5%	27005032	0.0002	56231	0.08	27061263	0.0003
17	S_{16}	Accommodation 7.5%	27008826	0.01	59288	5.52	27068054	0.02
18	S_{17}	Accommodation 10%	27020105	0.05	67720	20.53	27087826	0.09
19	S_{18}	(Rd-2%, Rl-2%)	27144813	0.51	67975	20.99	27212789	0.56
20	S_{19}	(Rd-5%, Rl-2%)	27144934	0.51	68079	21.17	27213013	0.56
21	S_{20}	(Rd-10%, Rl-2%)	27145960	0.52	68847	22.54	27214807	0.56
22	S_{21}	(Rd-2%, Rl-3%)	31705065	17.40	77300	37.58	31782366	17.446
23	S_{22}	(Rd-2%, Rl-3%)	42981742	59.16	98664	75.61	43080407	59.19
24	S_{23}	(Rd-5%, Rl-5%)	42985194	59.17	101277	80.26	43086471	59.21
25	S_{24}	(Rd-10%, Rl-5%)	42988090	59.18	103008	83.34	43091099	59.23
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	27364600	1.33	92694	64.98	27457295	1.46
27	S_{26}	(Rd-2,Rl-2, Inv-10%)	27385194	1.40	108406	92.95	27493601	1.59

28	S_{27}	(Rd-2,Rl-2, Inv-15%)	27395544	1.44	116302	107.00	27511847	1.66
29	S_{28}	(RD-2,Rl-2,Inv-20)	27405266	1.48	123719	120.21	27528986	1.72
30	S_{29}	(Rd-5,Rl-2, Inv -10)	31757556	17.59	116570	107.48	31874126	17.78
31	S_{30}	(Rd-5,Rl-3, Inv -15)	31781383	17.68	134251	138.95	31915635	17.93
32	S_{31}	(RD-5,Rl-3, Inv -20)	31800302	17.75	148289	163.94	31948591	18.06
33	S_{32}	(RD-5,Rl-5, Inv -10)	43105389	59.62	185875	230.84	43291264	59.97
34	S_{33}	(RD-5,Rl-5, Inv -15)	43143384	59.76	212538	278.30	43355922	60.21
35	S_{34}	(RD-5,Rl-5, Inv -20)	43294271	60.31	318429	466.78	43612700	61.16
36	S_{35}	(RD-10,Rl-3, Inv 10)	31961393	18.35	268838	378.51	32230231	19.10
37	S_{36}	(RD-10,Rl-5, Inv -10)	52826630	95.61	389023	592.43	53215653	96.64
38	S_{37}	(RD-10,Rl-5, Inv -15)	53022081	96.34	521179	827.66	53543259	97.86
39	S_{38}	(RD-10,Rl-35, Inv -20)	53193099	96.97	636815	1033.48	53829915	98.91
40	S_{39}	(RD-5,Rl-3, Inv -10 Accn-5)	32093798	18.84	368091	555.17	32461890	19.95
41	S_{40}	(RD-5,Rl-3, Inv -20 Accn-5)	32199117	19.23	446674	695.04	32645792	20.63
42	S_{41}	(RD-5,Rl-5 Inv -10 Accn.-10)	53395282	97.72	773696	1277.12	54168979	100.17
43	S_{42}	(RD-10,Rl-5, Inv -20 Accn.-10)	53545233	97.98	830141	1377.59	54375374	100.93
44	S_{43}	(Rd-5,Rl-3, Inv -10, handicrat15% Comcrop15%)	31757556	17.59	116570	107.48	31874126	17.78
45	S_{44}	Road -5, Rail -5, Investment -10, Accommodation-10 HandIcraft-15 Commercial crop 15	53466843	97.72	773696	1277.12	54204539	97.86
46	S_{44}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	53545233	97.98	830141	1377.59	54375374	100.93
47	S_{46}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	52826630	95.61	769023	1268.80	53595653	98.05

Tourist Revenue (in Million Rs.)

Sl. No.	Scenario		Domestic Tourist revenue	Per cent Variation	Foreign Tourist revenue	Per cent Variation	Total annual tourist revenue	Per cent Variation
1	Projected year result		68869.10		521.80		69390.90	
2	S_1	Road 2%	68869.10	0	521.90	0.01	69391.00	0.0001
3	S_2	Road 3%	68869.20	0.0001	521.90	0.01	69391.10	0.0002
4	S_3	Road 5%	68869.30	0.0002	522.10	0.05	69391.40	0.0007
5	S_4	Road 10%	68869.40	0.0004	522.30	0.09	69391.60	0.001
6	S_5	Rail 2%	69187.00	0.46	523.70	0.36	69710.70	0.46
7	S_6	Rail 3%	72598.30	5.41	544.60	4.36	73142.90	5.40
8	S_7	Rail 5%	97024.60	40.88	689.40	32.11	97714.10	40.81
9	S_8	Investment 2%	68869.20	0.0001	522.10	0.05	69391.30	0.0005
10	S_9	Investment 5%	68869.40	0.0004	522.50	0.13	69391.90	0.001
12	S_{11}	Investment 10%	68895.10	0.03	594.20	13.87	69489.30	0.14
13	S_{12}	Investment 15%	68908.40	0.05	631.20	20.96	69539.60	0.21
14	S_{13}	Investment 20%	69000.70	0.19	888.20	70.20	69888.90	0.71
15	S_{14}	Investment 25%	69038.70	0.24	993.90	90.45	70036.50	0.93
16	S_{15}	Accommodation 5%	68869.30	0.0002	522.30	0.09	69391.50	0.0008
17	S_{16}	Accommodation 7.5%	68878.90	0.01	550.10	5.42	69429.00	0.054
18	S_{17}	Accommodation 10%	68707.70	-0.23	628.90	20.52	69536.70	0.21
19	S_{18}	(Rd-2%, Rl-2%)	69225.70	0.51	631.30	20.98	69887.10	0.71
20	S_{19}	(Rd-5%, Rl-2%)	69226.00	0.51	632.30	21.17	69868.30	0.68
21	S_{20}	(Rd-10%, Rl-2%)	69228.70	0.52	639.40	22.53	69868.10	0.68
22	S_{21}	(Rd-2%, Rl-3%)	80855.50	17.40	717.90	37.57	813.84.00	17.27
23	S_{22}	(Rd-2%, Rl-3%)	103613.70	50.45	916.30	75.58	110530.10	59.28
24	S_{23}	(Rd-5%, Rl-5%)	109622.50	59.17	940.60	80.24	110563.10	59.33
25	S_{24}	(Rd-10%, Rl-5%)	109629.90	59.18	956.70	83.33	110586.60	59.36
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	69786.20	1.33	860.90	64.97	70647.20	1.81
27	S_{26}	(Rd-2,Rl-2, Inv-10%)	69838.80	1.40	1006.80	92.92	70845.60	2.09
28	S_{27}	(Rd-2,Rl-2, Inv-15%)	69868.20	1.45	1080.10	106.97	70945.30	2.24
29	S_{28}	(RD-2,Rl-2,Inv-20)	69890.00	1.48	1149.00	120.17	71039.00	2.37
30	S_{29}	(Rd-5,Rl-2,Inv-10)	80989.30	17.59	1082.60	107.45	82072.00	18.27
31	S_{30}	(Rd-5,Rl-3,Inv-15)	81050.10	17.68	1246.80	138.91	82297.00	18.59

32	S_{11}	(RD-5,Rl-3,Inv-20)	81098.40	17.75	1377.20	163.90	82475.60	18.85
33	S_{32}	(RD-5,Rl-5,Inv-10)	109929.00	59.62	1726.00	230.73	111655.40	60.90
34	S_{33}	(RD-5,Rl-5,Inv-15)	110025.90	59.76	1973.90	278.23	111999.90	61.40
35	S_{34}	(RD-5,Rl-5,Inv-20)	110410.70	60.31	2957.40	466.67	113368.20	63.37
36	S_{35}	(RD-10,Rl-3,Inv-10)	81509.20	18.35	2496.80	378.42	84006.10	21.06
37	S_{36}	(RD-10,Rl-5,Inv-10)	134720.50	95.61	3613.10	592.31	138338.70	99.36
38	S_{37}	(RD-10,Rl-5,Inv-15)	135219.00	96.34	4840.90	827.57	140059.50	101.84
39	S_{38}	(RD-10,Rl-35,Inv-20)	135655.10	96.97	5914.50	1033.28	141569.70	104.01
40	S_{39}	(RD-5,Rl-3,Inv-10 Accn-5)	81846.80	18.84	3418.70	555.06	85265.60	22.87
41	S_{40}	(RD-5,Rl-3,Inv-20 Accn-5)	82115.40	19.23	4148.50	694.90	86264.00	24.31
42	S_{41}	(RD-5,Rl-5,Inv-10 Accn.-10)	136170.70	97.72	7185.80	1276.87	143356.60	106.59
43	S_{42}	(RD-10,Rl-5,Inv-20 Accn.-10)	136352.00	97.98	7710.200	1377.61	144062.20	107.60
44	S43	(Rd-5,Rl-3,Inv-10, handucrat15% Commercial crop15%)	80989.30	17.59	1082.60	107.45	82072.00	18.27
45	S_{44}	Road -5, Rail -5, Investment -10, Accommodation-10 Handlcraft-15 Commercial crop 15	136170.70	97.72	7185.80	1276.87	143356.60	106.59
46	S_{45}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	136352.00	97.98	7710.20	1377.61	144062.20	107.60
47	S_{46}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	134720.50	95.61	7613.10	1359.00	138338.70	99.36

Per capita Gross Domestic Product (GDP) and Per Capita Income (in Rs.)

Sl.No.	Scenario		Per Capita GDP	Per Cent Variation	Per Capita income	Per Cent Variation	Per Capita GDP excluding Tourism	Per Capita income excluding Tourism
1	Projected year result		14687		12484		11934	10144
2	S_1	Road 2%	14687	0	12485	0.008	11934	10144
3	S_2	Road 3%	14688	0.006	12485	0.008	11934	10144
4	S_3	Road 5%	14688	0.006	12485	0.008	11934	10144
5	S_4	Road 10%	14688	0.006	12485	0.008	11934	10144
6	S_5	Rail 2%	14700	0.08	12495	0.08	11934	10144
7	S_6	Rail 3%	14836	1.01	12611	1.01	11934	10444
8	S_7	Rail 5%	15811	7.65	13440	7.65	11934	10444
9	S_8	Investment 2%	14688	0.006	12484	0	11934	10444
10	S_9	Investment 5%	14688	0.006	12484	0	11934	10444
12	S_{11}	Investment 10%	14691	0.02	12488	0.03	11933	10444
13	S_{12}	Investment 15%	14693	0.04	12489	0.04	11934	10444
14	S_{13}	Investment 25%	14707	0.13	12501	0.13	11934	10144
15	S_{14}	Investment 25%	14713	0.17	12506	0.17	11934	10144
16	S_{15}	Accommodation 5%	14688	0.006	12485	0.008	11934	10144
17	S_{16}	Accommodation 7.5%	14689	0.01	12486	0.01	11934	10144
18	S_{17}	Accommodation 10%	14693	0.04	12489	0.04	11934	10144
19	S_{18}	(Rd-2%, Rl-2%)	14706	0.12	12500	0.12	11934	10144
20	S_{19}	(Rd-5%, Rl-2%)	14706	0.12	12500	0.12	11934	10144
21	S_{20}	(Rd-10%, Rl-2%)	14706	0.12	12500	0.12	11934	10144
22	S_{21}	(Rd-2%, Rl-3%)	19171	30.53	12895	3.29	11934	10444
23	S_{22}	(Rd-2%, Rl-3%)	16320	11.11	13872	11.11	11934	10444
24	S_{23}	(Rd-5%, Rl-5%)	16321	11.12	13873	11.12	11934	10444
25	S_{24}	(Rd-10%, Rl-5%)	16322	11.13	13874	11.13	11934	10444
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	14737	0.34	12527	0.34	11934	10144
27	S_{26}	(Rd-2,Rl-2, Inv-10%)	14745	0.39	12533	0.39	11934	10144
28	S_{27}	(Rd-2,Rl-2, Inv-15%)	14749	0.42	12537	0.42	11934	10144
29	S_{28}	(RD-2,Rl-2,Inv-20)	14753	0.44	12540	0.44	11933	10144
30	S_{29}	(Rd-5,Rl-2,Inv-10)	15191	3.43	12912	3.42	11933	10144
31	S_{30}	(Rd-5,Rl-3,Inv-15)	15200	3.49	12920	3.49	11933	10144

32	S_{31}	(RD-5,RI-3,Inv-20)	15207	3.54	12926	3.54	11933	10144
33	S_{32}	(RD-5,RI-5,Inv-10)	16365	11.42	13910	11.42	11933	10144
34	S_{33}	(RD-5,RI-5,Inv-15)	16378	11.51	13922	11.51	11933	10444
35	S_{34}	(RD-5,RI-5,Inv-20)	16433	11.88	13968	11.88	11933	10444
36	S_{35}	(RD-10,RI-3,Inv-10)	19267	31.18	12977	3.94	11933	10444
37	S_{36}	(RD-10,RI-5,Inv-10)	17424	18.63	14810	18.63	11933	10444
38	S_{37}	(RD-10,RI-5,Inv-15)	17492	19.09	14868	19.09	11933	10144
39	S_{38}	(RD-10,RI-35,Inv-20)	17552	19.50	14919	19.50	11933	10144
40	S_{39}	(RD-5,RI-3,Inv-10 Accn-5)	15317	4.28	13020	4.29	11933	10144
41	S_{40}	(RD-5,RI-3,Inv-20 Accn-5)	15357	4.56	13093	4.87	11933	10144
42	S_{41}	(RD-5,RI-5,Inv-20 Accn.-10)	17623	19.99	14979	19.98	11933	10144
43	S_{42}	(RD-10,RI-5,Inv-20 Accn.-10)	17679	20.37	15027	20.37	11933	10144
44	S43	(Rd-5,RI-3,Inv-10, handucrat15% Commercial crop15%)	15501	5.54	13176	5.54	12244	10407
45	S_{44}	Road -5, Rail -5, Investment -10, Accommodation-10 HandIcraft-15 Commercial crop 15	17941	22.15	15265	22.15	12244	10407
46	S_{45}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	17961	22.29	15267	22.29	12244	10407
47	S_{46}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	17734	20.74	15074	20.74	12244	10407

Employment generations

(in Nos.)

Sl.No.		Scenario	Employment other than tourism	Employment in Tourism Sector	Per cent Variation	Total employment including tourism in organized sector	Per cent Variation
1		Projected year result	10495018	286307		10552280	
2	S_1	Road 2%	10495019	286307	0	10552281	9.48E-06
3	S_2	Road 3%	10495020	286307	0	10552281	9.48E-06
4	S_3	Road 5%	10495020	286307	0	10552281	9.48E-06
5	S_4	Road 10%	10495020	286308	0.0003	10552281	9.48E-06
6	S_5	Rail 2%	10495020	287627	0.46	10552544	0.002
7	S_6	Rail 3%	10495020	301803	5.41	10555379	0.02
8	S_7	Rail 5%	10495020	403304	40.86	10575679	0.22
9	S_8	Investment 2%	10495020	286308	0.0003	10552280	0
10	S_9	Investment 5%	10495020	286309	0.0006	10552281	9.48E-06
12	S_{11}	Investment 10%	10495018	286497	0.06	10552318	0.0003
13	S_{12}	Investment 15%	10495018	286594	0.10	10552337	0.0005
14	S_{13}	Investment 20%	10495018	287270	0.33	10552472	0.001
15	S_{14}	Investment 25%	10495018	287548	0.43	10552528	0.002
16	S_{15}	Accommodation 5%	10495018	286308	0.0003	10552280	0
17	S_{16}	Accommodation 7.5%	10495018	286380	0.02	10552294	0.0001
18	S_{17}	Accommodation 10%	10495018	286589	0.09	10552336	0.0005
19	S_{18}	(Rd-2%, Rl-2%)	10495018	287911	0.56	10552601	0.003
20	S_{19}	(Rd-5%, Rl-2%)	10495018	287913	0.56	10552601	0.003
21	S_{20}	(Rd-10%, Rl-2%)	10495018	287932	0.56	10552605	0.003
22	S_{21}	(Rd-2%, Rl-3%)	10495018	336257	17.44	10562270	0.09
23	S_{22}	(Rd-2%, Rl-3%)	10495018	455790	59.19	10586176	0.32
24	S_{23}	(Rd-5%, Rl-5%)	10495018	455854	59.21	10586189	0.32
25	S_{24}	(Rd-10%, Rl-5%)	10495018	455903	59.23	10586199	0.32
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	10495018	290498	1.46	10553118	0.007

27	S_{26}	(Rd-2,Rl-2, Inv-10%)	10495018	290882	1.59	10553195	0.008
28	S_{27}	(Rd-2,Rl-2, Inv-15%)	10495018	291075	1.66	10553233	0.009
29	S_{28}	(RD-2,Rl-2,Inv-20)	10495020	291256	1.72	10553270	0.009
30	S_{29}	(Rd-5,Rl-2,Inv-10)	10495020	337228	17.78	10562464	0.09
31	S_{30}	(Rd-5,Rl-3,Inv-15)	10495020	337667	17.93	10562552	0.09
32	S_{31}	(RD-5,Rl-3,Inv-20)	10495020	338016	18.06	10562621	0.09
33	S_{32}	(RD-5,Rl-5,Inv-10)	10495020	458021	59.97	10586623	0.32
34	S_{33}	(RD-5,Rl-5,Inv-15)	10495020	458705	60.21	10586759	0.32
35	S_{34}	(RD-5,Rl-5,Inv-20)	10495020	461422	61.16	10587303	0.33
36	S_{35}	(RD-10,Rl-3,Inv-10)	10495020	340955	19.08	10563217	0.10
37	S_{36}	(RD-10,Rl-5,Inv-10)	10495020	563021	96.64	10607623	0.52
38	S_{37}	(RD-10,Rl-5,Inv-15)	10495020	566487	97.85	10608316	0.53
39	S_{38}	(RD-10,Rl-35,Inv-20)	10495020	569520	98.91	10608922	0.53
40	S_{39}	(RD-5,Rl-3,Inv-10 Accn-5)	10495020	343446	19.95	10563708	0.10
41	S_{40}	(RD-5,Rl-3,Inv-20 Accn-5)	10495020	345392	20.63	10564097	0.11
42	S_{41}	(RD-5,Rl-5,Inv-20 Accn.-10)	10495020	573107	100.17	10609640	0.54
43	S_{42}	(RD-10,Rl-5,Inv-20 Accn.-10)	10495020	575869	101.13	10610192	0.54
44	S_{43}	(Rd-5,Rl-3,Inv-10, hand15% Comcrop15%)	10495020	337228	17.78	10562464	0.09
45	S_{44}	Road -5, Rail -5, Investment -10, Accommodation- 10 HandIcraft-15 Commercial crop 15	10495020	554456	93.65	10599465	0.44
46	S_{45}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	10495020	573107	100.17	10609640	0.54
47	S_{46}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	10495020	563021	96.64	10607623	0.52

Informal Employment   **(in Man days)**

Sl.No.	Scenario		Employment in informal sector	Employment in informal sector due to tourism	Per cent Variation	Total employment in informal sector	Per cent Variation
1	Projected year result		57719809	41228213		98948022	
2	S_1	Road 2%	57719809	41228217	0.00001	98948026	4.04 E-06
3	S_2	Road 3%	57719809	41228242	0.00007	98948051	2.93 E-05
4	S_3	Road 5%	57719809	41228313	0.0002	98948122	0.0001
5	S_4	Road 10%	57719809	41228395	0.0004	98948195	0.0001
6	S_5	Rail 2%	57719809	41418420	0.46	99138229	0.19
7	S_6	Rail 3%	57719809	43459736	5.41	101179565	2.25
8	S_7	Rail 5%	57719809	58075876	40.86	115795685	17.02
9	S_8	Investment 2%	57719809	41228324	0.0002	98948134	0.0001
10	S_9	Investment 5%	57719809	41288491	0.14	98948200	0.0001
12	S_{11}	Investment 10%	57719809	41259621	0.07	98975431	0.02
13	S_{12}	Investment 15%	57719809	41269631	0.10	98989441	0.04
14	S_{13}	Investment 20%	57719809	41366924	0.33	99086733	0.14
15	S_{14}	Investment 25%	57719809	41406953	0.43	99126762	0.18
16	S_{15}	Accommodation 5%	57719809	41228375	0.0003	98948185	0.0001
17	S_{16}	Accommodation 7.5%	57719809	41238722	0.02	98958531	0.01
18	S_{17}	Accommodation 10%	57719809	41268845	0.09	98988654	0.04
19	S_{18}	(Rd-2%, Rl-2%)	57719809	41459228	0.56	99179037	0.23
20	S_{19}	(Rd-5%, Rl-2%)	57719809	41459570	0.56	99179379	0.23
21	S_{20}	(Rd-10%, Rl-2%)	57719809	41462303	0.56	99182112	0.23
22	S_{21}	(Rd-2%, Rl-3%)	57719809	48421070	17.44	106140879	7.26
23	S_{22}	(Rd-2%, Rl-3%)	57719809	65633862	59.19	123353671	24.66
24	S_{23}	(Rd-5%, Rl-5%)	57719809	65643100	59.21	123362909	24.67
25	S_{24}	(Rd-10%, Rl-5%)	57719809	65650151	59.23	123369960	24.68
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	41831738	41831738	1.46	99551547	0.60
27	S_{26}	(Rd-2,Rl-2, Inv-10%)	41831738	41887052	1.59	99606861	0.66
28	S_{27}	(Rd-2,Rl-2, Inv-15%)	41831738	41914849	1.66	99634658	0.69
29	S_{28}	(RD-2,Rl-2,Inv-20)	57719809	41940961	1.72	99660770	0.72

30	S_{29}	(Rd-5,Rl-2,Inv-10)	57719809	48560868	17.78	106280677	7.41
31	S_{30}	(Rd-5,Rl-3,Inv-15)	57719809	48624108	17.93	106343917	7.47
32	S_{31}	(RD-5,Rl-3,Inv-20)	57719809	48674318	18.06	106394127	7.52
33	S_{32}	(RD-5,Rl-5,Inv-10)	57719809	65955107	59.97	123674916	24.98
34	S_{33}	(RD-5,Rl-5,Inv-15)	57719809	66053615	60.21	123733424	25.04
35	S_{34}	(RD-5,Rl-5,Inv-20)	57719809	66444821	61.16	124164630	25.48
36	S_{35}	(RD-10,Rl-3,Inv-10)	57719809	39103402	-5.15	106823211	7.95
37	S_{36}	(RD-10,Rl-5,Inv-10)	57719809	81075112	96.64	138794921	40.27
38	S_{37}	(RD-10,Rl-5,Inv-15)	57719809	81574227	97.86	139294036	40.77
39	S_{38}	(RD-10,Rl-35,Inv-20)	57719809	82010952	98.91	139730762	41.21
40	S_{39}	(RD-5,Rl-3,Inv-10 Accn-5)	57719809	49456839	19.95	107176148	8.31
41	S_{40}	(RD-5,Rl-3,Inv-20 Accn-5)	57719809	49736517	20.63	107456326	8.59
42	S_{41}	(RD-5,Rl-5,Inv-20 Accn.-10)	57719809	82527523	100.17	140247332	41.73
43	S_{42}	(RD-10,Rl-5,Inv-20 Accn.-10)	57719809	82925255	101.13	140645064	42.14
44	S_{43}	(Rd-5,Rl-3,Inv-10, handucrat15% Commercial crop15%)	57719809	48560868	17.78	106280677	7.41
45	S_{44}	Road -5, Rail -5, Investment -10, Accommodation-10 Handcraft-15 Commercial crop 15	57719809	82271783	99.53	139991592	41.47
46	S_{45}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	57719809	82527523	100.17	140247332	41.73
47	S_{46}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	57719809	81075112	96.64	138794921	40.27

Accommodation

(Hotel beds in Nos.)

Sl.No.	Scenario		Affordable hotel bed demand	Per cent Variation	Demand of high spending beds	Per cent Variation	Total demand of beds	Per cent Variation
1		Projected year result	76109		25369		101479	
2	S_1	Road 2%	76109	0	25369	0	101479	0
3	S_2	Road 3%	76110	0.001	25370	0.003	101480	0.0009
4	S_3	Road 5%	76110	0.001	25370	0.003	101480	0.0009
5	S_4	Road 10%	76110	0.001	25370	0.003	101480	0.0009
6	S_5	Rail 2%	76460	0.46	25486	0.46	101947	0.46
7	S_6	Rail 3%	80229	5.41	26743	5.41	106972	5.41
8	S_7	Rail 5%	107211	40.86	35737	40.86	142948	40.86
9	S_8	Investment 2%	76109	0	25369	0	101479	0
10	S_9	Investment 5%	76110	0.001	25370	0.003	101480	0.0009
12	S_{11}	Investment 10%	76160	0.067	25386	0.06	101546	0.06
13	S_{12}	Investment 15%	76185	0.09	25395	0.10	101581	0.10
14	S_{13}	Investment 25%	76365	0.33	25455	0.33	101820	0.33
15	S_{14}	Investment 25%	76439	0.43	25479	0.43	101919	0.43
16	S_{15}	Accommodation 5%	76109	0	25369	0	101479	0
17	S_{16}	Accommodation 7.5%	76128	0.02	25376	0.02	101535	0.05
18	S_{17}	Accommodation 10%	76184	0.09	25394	0.09	101579	0.09
19	S_{18}	(Rd-2%, Rl-2%)	76535	0.55	25511	0.55	102047	0.55
20	S_{19}	(Rd-5%, Rl-2%)	76536	0.56	25512	0.56	102048	0.56
21	S_{20}	(Rd-10%, Rl-2%)	76541	0.56	25513	0.56	102055	0.56
22	S_{21}	(Rd-2%, Rl-3%)	89387	17.44	29795	17.44	119183	17.44
23	S_{22}	(Rd-2%, Rl-3%)	121163	59.19	40387	59.19	161511	59.15
24	S_{23}	(Rd-5%, Rl-5%)	121180	59.21	40393	59.22	161574	59.21
25	S_{24}	(Rd-10%, Rl-5%)	121190	59.23	40397	59.23	161591	59.23
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	77223	1.46	25741	1.46	102964	1.46

27	S$_{26}$	(Rd-2,Rl-2, Inv-10%)	77325	1.59	25775	1.60	103101	1.59
28	S$_{27}$	(Rd-2,Rl-2, Inv-15%)	77377	1.66	25792	1.66	103169	1.66
29	S$_{28}$	(RD-2,Rl-2,Inv-20)	77425	1.72	25808	1.73	103233	1.72
30	S$_{29}$	(Rd-5,Rl-2,Inv-10)	89645	17.78	29881	17.78	119527	17.78
31	S$_{30}$	(Rd-5,Rl-3,Inv-15)	89762	17.93	29920	17.93	119683	17.93
32	S$_{31}$	(RD-5,Rl-3,Inv-20)	89855	18.06	29951	18.06	119807	18.06
33	S$_{32}$	(RD-5,Rl-5,Inv-10)	121756	59.97	40585	59.97	162342	59.97
34	S$_{33}$	(RD-5,Rl-5,Inv-15)	121938	60.21	40646	60.21	162584	60.21
35	S$_{34}$	(RD-5,Rl-5,Inv-20)	122660	61.16	40886	61.16	163547	61.16
36	S$_{35}$	(RD-10,Rl-3,Inv-10)	90647	19.10	30215	19.10	120863	19.10
37	S$_{36}$	(RD-10,Rl-5,Inv-10)	149669	96.65	49889	96.65	199558	96.64
38	S$_{37}$	(RD-10,Rl-5,Inv-15)	150390	97.59	50196	97.86	200787	97.86
39	S$_{38}$	(RD-10,Rl-35,Inv-20)	151396	98.91	50465	98.92	201862	98.91
40	S$_{39}$	(RD-5,Rl-3,Inv-10 Accn-5)	91299	19.95	30432	19.95	121732	19.95
41	S$_{40}$	(RD-5,Rl-3,Inv-20 Accn-5)	91816	20.63	30605	20.63	122421	20.63
42	S$_{41}$	(RD-5,Rl-5,Inv-20 Accn.-10)	152350	100.17	50783	100.17	203133	100.17
43	S$_{42}$	(RD-10,Rl-5,Inv-20 Accn.-10)	153084	101.13	51028	101.14	204112	101.13
44	S$_{43}$	(Rd-5,Rl-3,Inv-10, hand15% Comml15%)	89645	17.78	29881	17.78	119527	17.78
45	S$_{44}$	Road -5, Rail -5, Investment -10, Accommodation- 10 Handicraft-15 Commercial crop 15	151708	99.32	50346	98.45	202054	99.10
46	S$_{45}$	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	152350	100.17	50783	100.17	203133	100.17
47	S$_{46}$	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	149669	96.65	49889	96.65	199558	96.60

Environmental Stress and Tourist Satisfaction

Sl .No.		Scenario	Environmental Stress	Per Cent Variation	Tourist satisfaction	Per Cent Variation
1		Projected year result	0.34		0.41	
2	S_1	Road 2%	0.34	0	0.42	3.68
3	S_2	Road 3%	0.34	0	0.44	8.10
4	S_3	Road 5%	0.34	0	0.53	31.20
5	S_4	Road 10%	0.35	0.58	0.75	85.01
6	S_5	Rail 2%	0.35	0.58	0.41	1.71
7	S_6	Rail 3%	0.37	6.41	0.43	4.66
8	S_7	Rail 5%	0.49	43.14	0.45	10.31
9	S_8	Investment 2%	0.34	0	0.43	4.66
10	S_9	Investment 5%	0.34	0	0.53	29.97
12	S_{11}	Investment 10%	0.34	0.29	0.53	29.97
13	S_{12}	Investment 15%	0.34	0.29	0.53	29.97
14	S_{13}	Investment 25%	0.35	0.58	0.53	29.97
15	S_{14}	Investment 25%	0.35	0.58	0.56	37.59
16	S_{15}	Accommodation 5%	0.34	0	0.42	2.70
17	S_{16}	Accommodation 7.5%	0.34	0	0.43	6.14
18	S_{17}	Accommodation 10%	0.34	0.29	0.45	9.33
19	S_{18}	(Rd-2%, Rl-2%)	0.35	0.58	0.47	14.98
20	S_{19}	(Rd-5%, Rl-2%)	0.35	0.58	0.58	42.50
21	S_{20}	(Rd-10%, Rl-2%)	0.35	0.87	0.79	94.10
22	S_{21}	(Rd-2%, Rl-3%)	0.41	20.11	0.48	17.93
23	S_{22}	(Rd-2%, Rl-3%)	0.54	58.01	0.50	23.58
24	S_{23}	(Rd-5%, Rl-5%)	0.54	58.01	0.62	51.10
25	S_{24}	(Rd-10%, Rl-5%)	0.54	58.01	0.83	104.66
26	S_{25}	(Rd-2,Rl-2, Inv-5%)	0.35	1.74	0.62	52.57

27	S_{26}	(Rd-2,Rl-2, Inv-10%)	0.35	2.04	0.62	**52.57**
28	S_{27}	(Rd-2,Rl-2, Inv-15%)	0.35	2.04	0.62	52.57
29	S_{28}	(RD-2,Rl-2,Inv-20)	0.35	2.04	0.62	52.57
30	S_{29}	(Rd-5,Rl-2,Inv-10)	0.41	20.40	0.75	83.04
31	S_{30}	(Rd-5,Rl-3,Inv-15)	0.41	20.69	0.75	83.04
32	S_{31}	(RD-5,Rl-3,Inv-20)	0.41	20.69	0.75	83.04
33	S_{32}	(RD-5,Rl-5,Inv-10)	0.54	58.60	0.77	88.69
34	S_{33}	(RD-5,Rl-5,Inv-15)	0.55	58.89	0.77	88.69
35	S_{34}	(RD-5,Rl-5,Inv-20)	0.55	59.47	0.77	88.69
36	S_{35}	(RD-10,Rl-3,Inv-10)	0.42	21.86	0.86	112.03
37	S_{36}	(RD-10,Rl-5,Inv-10)	0.63	83.38	0.89	117.93
38	S_{37}	(RD-10,Rl-5,Inv-15)	0.63	84.25	0.89	117.93
39	S_{38}	(RD-10,Rl-35,Inv-20)	0.63	84.83	0.89	117.93
40	S_{39}	(RD-5,Rl-3,Inv-10 Accn-5)	0.42	23.61	0.72	76.16
41	S_{40}	(RD-5,Rl-3,Inv-20 Accn-5)	0.42	23.61	0.73	79.60
42	S_{41}	(RD-5,Rl-5,Inv-20 Accn.-10)	0.64	85.71	0.77	88.69
43	S_{42}	(RD-10,Rl-5,Inv-20 Accn.-10)	0.64	86.58	0.89	118.67
44	S_{43}	(Rd-5,Rl-3,Inv-10, handucrat15% Commercial crop15%)	0.41	20.40	0.75	83.04
45	S_{44}	Road -5, Rail -5, Investment -10, Accommodation- 10 HandIcraft-15 Commercial crop 15	0.64	85.58	0.77	88.69
46	S_{45}	Road -10, Rail -5, Investment -20, Acco10 Handicraft15 Commercial crop-15	0.63	83.38	0.89	117.93
47	S_{46}	Road -5, Rail -5, Investment -20, Handicrafts-15 Commercial crop-15	0.64	85.71	0.77	88.69

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	Design of Double Track two-way Steel
	Girder Railway Bridge. (Bachelors Thesis)

APPENDIX-6

LIST OF PUBLICATIONS

The following papers have been published / presented during this thesis work

(1) **Devadas, V., and Das, Dillp.** (2006). Integrated Tourism Planning for Sustainable Development, Accepted for presentation in International Conference on Gulf Urban Planning and Development, Kuwait, February, 2006.

(2) **Devadas, V., and Das, Dillp.** (2006). Strategies for Integrated Development of Cuttack and Bhubaneswar Region of Orissa State, India. Accepted for presentation in Ecocity Conference, Bangalore, 2006.

(3) **Devadas, V., Das, Dillp. and Sonar, S.G.** (2005). Role of ICTs on Transportation Planning in Pune City, India, National Conference on Urban Transport Planning and Management, Central Institute of Road Transport, India, Pune, Published in the proceeding, October 20-22, 2005.

(4) **Devadas, V., Das, Dillp. and Sonar, S.G.** (2005). Emerging Urban Pattern in the context of Information Technology Revolution, National Conference on Urban Transport Planning and Management, Central Institute of Road Transport, India, Pune, Published in the proceeding, October 20-22, 2005.

(5) **Devadas, V., Das, Dillp. and Sonar, S.G.** (2005). Planning for Appropriate Infrastructure for sustainable Ecotourism Development in Protected Hilly Areas, International Conference on Ecotourism Planning and Management in Protected Areas, Mussoorie, Center for Mountain Tourism and Hospitality Studies, Garhwal University, Srinagar, Uttaranchal State, India, Presented and Published in the Proceedings, 28th February- 3rd March, 2005.

(6)   **Devadas, V., Das, Dillp. and Najamuddin.** (2005). Strategies for Stakeholders Participation and Partnerships for Sustainable Ecotourism Development in protected area., International Conference on Ecotourism Planning and Management in Protected Areas, Mussoorie, Center for Mountain Tourism and Hospitality Studies, Garhwal University, Srinagar, Uttaranchal State, India, Presented and Published in the Proceedings, 28th February- 3rd March, 2005.

(7)   **Devadas, V., and Das, Dillp,** (2004). Urbanization Process in Bhubaneswar, Capital City of Orissa State, India, Regional workshop of Orissa Chapter, Institute of Town Planners, India, Presented and Published in the proceedings, 6th February, 2005.

(8)   **Devadas, V., Das, Dillp. and Najamuddin.** (2004). Stakeholders Participation and Partnerships in Integrated Tourism Development, Plan implementation and Enforcement: Innovative Mechanisms and Techniques, National Town and Country Planning Congress, Technical papers proceeding p. 254-264.

(9)   **Devadas, V., and Das, Dillp.** Tourism: A catalyst for Development in Orissa State, India, Communicated to Journal of Tourism Management, Pergamon, Elsevier Publication, 2005.

(10)   **Devadas, V., and Das, Dillp.** Integrated Tourism Development: An Analysis, Communicated to Annals of Tourism Research, Pergamon, Elsevier Publication, 2005.