

**STUDY OF TRANSPORTATION-TOURISM POTENTIALS IN
ANDAMAN ISLANDS**

Thesis Submitted for the Award of the Degree of

**DOCTOR OF PHILOSOPHY
IN
GEOGRAPHY**

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2023**

DECLARATION

I, hereby declared that the presented work in the thesis entitled “**Study of Transportation-Tourism Potentials in Andaman Islands**” in fulfilment of degree of **Doctor of Philosophy (Ph. D.)** is outcome of research work carried out by me under the supervision Dr Sajad Nabi Dar, working as Assistant Professor in the Department of Geography, School of Social Science and Humanities of Lovely Professional University, Punjab, India and Dr Ratan Mazumdar, Associate Professor, Jawaharlal Nehru Rajkeeya Mahavidyalaya, Port Blair. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.



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CERTIFICATE

This is to certify that the work reported in the Ph. D. thesis entitled “**Study of Transportation-Tourism Potentials in Andaman Islands**” submitted in fulfillment of the requirement for the reward of degree of **Doctor of Philosophy (Ph.D.)** in the Department of Geography, School of Social Science and Humanities, is a research work carried out by GAURAB DHALI (41800388.), is bonafide record of his/her original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.



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LIST OF ABBREVIATIONS	
ANI	Andaman & Nicobar Islands
ANIPPDA	Andaman & Nicobar Islands Private Practicing Doctors Association
ANM	Auxiliary Nursing Midwifery
ANSCB	Andaman & Nicobar State Co-operative Bank
ATR	Andaman Trunk Road
APWD	Andaman Public Work Department
AYUSH	Ayush Yoga and Naturopathy, Unani, Siddha and Homeopathy
DG Sets	Diesel Generator Sets
DBRAIT	Dr. Bhim Rao Ambedkar Institute of Technology, Port Blair
DGP	Director General of Police
DSS	Directorate of Shipping Services
HRS	Hours
IGNOU	Indira Gandhi National Open University
IPS	Indian Police Service
IP&T	Information Publicity and Tourism (Department)
JNRM	Jawaharlal Nehru Rajkeeya Mahavidyalaya, Port Blair
NSCB Island	Netaji Subhash Chandra Bose Island
OTEC Plant	Ocean Thermal energy Conversion Plant
RBI	Reserve Bank of India
SBI	State bank of India
SME	Small Medium Enterprises
TII	Tourism Infrastructure Index
UT	Union Territory
VSI Airport	Veer Savarkar International Airport
ZASI	Zonal Anthropological Survey of India

ABSTRACT

The Andaman Islands are located 1200 km average distance from the Indian mainland surrounded by the vast waterbody of the Bay of Bengal. The people who reside on these islands are having very limited economic activities with several restrictions due to sensitive environmental zone and fragile resources. An economy of a place could not survive without the use of resources, so there is a need for a kind of economic activity which cause a limited impact on the surroundings. The tourism industry emerged as a new source of the economy with less scope to exploit those resources and identification of its tourism potential become necessary to cater its benefits to communities of the islands. The study assesses different tourism resources, enlist tourism infrastructures, identify transportation facilities' performance, and review tourism-related policies to suggest appropriate tourism development strategy according to their potential. The entire research work has been done into the regional study as the study area i.e. (Andaman Islands) has been classified into six tehsils i.e., Diglipur, Mayabunder, Rangat, Ferargunj, Port Blair and Little Andaman from north to south in a linear orientation and each element of tourism studied based on these tehsils. The tourism resources are further classified into two major categories based on their origin as natural and cultural tourism resources along with their numbers and distributions in each tehsil. The tourism potential of these tourism resources has been identified with the help of 'Decision Tree Model', this model selects the tourism resources by assessing their different characteristic features and stating their potential through their scores. Their result is showing that Rangat Tehsil is only having natural tourism resources while other tehsils is having both natural and cultural tourism resources. In the context of numbers, Port Blair Tehsil is having the largest number of tourism resources while Little Andaman Tehsil is having a comparatively little number of tourism resources. The tourism resources are facilitated by tourism infrastructures and these infrastructures have been enlisted through the information gathered from primary and secondary sources. There is a total of eleven types of tourism infrastructures that have been taken for study which deals with the different units through their quantity and features. The Tourism Infrastructure Index (TII) of all tourism infrastructures of each tehsil has been calculated which makes it easy to comparative study the infrastructures from one tehsil to other. The outcome shows that Port Blair Tehsil having high TII score than other tehsils due to its physiographic, historical and administrative reasons. Among all the infrastructure transportation is the major determinant factor to cater tourism potential of an area so here, the identify the transportation facility has been done through assess the performance of different elements of transportation facilities through 'Importance-Performance Analysis' (IPA). The IPA has analysed the different transportation variables through statistical method and graphical methods. The statistical method helps to analyse the variation of importance and performance of each element of transportation facilities while the graphical method helped to select the elements which are very important and weak performing transportation elements that need immediate improvement. The result of IPA found that there is an immediate need for affordable and regular means of transportation facilities for each tehsil. The study also suggests that the transportation facilities of these islands are best in the context of safety, security and pollution efficiency of different means of transportation and worst in route condition and regular availability of them. The Port Blair Tehsil is having a large share of transportation facilities and an aggregately high score of IPA than other tehsils. Apart from the above elements of

tourism, there is a total of thirteen national and regional tourism policies have been reviewed to find out the way to suggest an appropriate tourism development strategy. These tourism policies are directly and indirectly related to the tourism industry of the Andaman & Nicobar Islands. Based on the finding of the study tourism development strategy for each tehsil has been suggested. The study also classifies the tehsils of the Andaman Islands as Port Blair as highly developed, Ferargunj and Rangat as moderately developed, and Diglipur, Mayabunder, and Little Andaman as less developed tehsil for tourism based on their score found in different tourism element assessment. There is a need for special effort on less tourism developed tehsil of the Andaman Islands to maintain the equilibrium tourism development.

CHAPTER-1

TOURISM IN ANDAMAN ISLANDS: AN INTRODUCTION

1.1 CONCEPTUAL FRAMEWORK

Humans are nomadic in nature from the beginning and they used to travel by their own feet from one place to another for different purposes. Even before civilization develops, early men used to travel in search of food and to save themselves from extremes of the nature. At that time, travel was a needful act for their survival and even this time too, but in the modern era, it has also become a means of leisure. Hence, the travel for leisure become itself a tourism activity. The word 'tourism' appeared in 1811 and it was first used as an official term in 1937 by the 'League of Nations'. The World Tourism Organization (WTO) defines tourism as activities related to persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business or other purposes. At this time of travel a tourist needs some supports and usually these supports are provided by the local people and tour agencies at the destination. Now tourism becomes the firm part of economy and different sectors of economy facilitate their resources and services to satisfy the need of tourists during their entire travel operation. Tourism has been shaped up as a well-organized industry with the help of its supporting amenities. In other words, the tourism industry is an agglomeration of resources, activities, services, and sectors that provide leisure experiences to the tourist. The people who come from various regions to experience this leisure experiences are called tourists. They are usually acted to visit the tourism resources of the destination. Basically, the tourism resources are the things that attract and motivate the tourist to visit a destination where these resources are available. Each region is unique in having a specific kind and number of tourism resources. These tourism resources are accessible through the facilities provided by the local community and service providers to the tourists. When a tourist reaches in destination sort of services are needed to them and these facilities cater by infrastructure facilities available at the destination. Tourism also needs general along with the special infrastructure facilitates at the destination. The general infrastructures are the basic functioning elements to run the economy of the society while the tourism specific infrastructures use especially for tourism operation. Hence, the availability and quality of these infrastructure facilities determine the destination attraction (Dung-Dung, 2019). According to a report

(NCAER, 2016), the tourist spends more than half (56 %) of the travel expenditure on different means of transportation. Most of the tourist choose their tour destination according to their budget and transportation seems major determinant to select a destination to visit. However, as transportation dominate the entire budget of tour operation so it could be opined that transportation is a major determinant to effect the entire tourism operation of a region. A means of transportation takes a tourist from source region to the destination. Generally, in a short distance visit, a tourist could reach the destination by walk, but long-distance travel required the assistance of a means of transportation. Hence, transportation is an integral part of tourism because it's associated with mobility for recreation (Mishra and Konar, 2008). Now it's become necessary to understand the meaning of transportation.

The term "transportation" has been used here for the service which assists a person to move from one place to another. In the context of tourism, it could be said that "transportation is a service which helps tourists to move from its source region to the destination." Availability and type of the means of transportation could be controlled by natural factors (physiography, terrain, climate) and cultural factors (government policy, technological development, socio-economic level of the tourist respondents). Tourists need means of transportation according to their budget and comfort. The selection of these means of transport may vary according to their gender, age, marital status, occupation and income. It provides a direction to the local tourism activities and some of them restrict the extent of tourism development. Each region is having its strengths and limitations; so, systematic regional planning helps to find its tourism potential.

Tourism belongs to the tertiary sector of the economy. It employs low skilled local people as well as professionals. Which is also helps to generate foreign currency and also enhances the GDP. It creates direct (economic benefits) and indirect (enhance foreign policy, international relations, soft power, develop mutual understanding between different national and international communities) gains for a country. The economic gain of the tourism industry can be determined through the expenditure incurred by the tourists to the destination country. More the time tourists spend at the destination more they spend money on tourism services and more economic benefit will be absorbed by the local community of the destination. Thats the reason a tourism industry should focus to maximum engage of tourist at destination and provide them better tourism facilities with high satisfaction. This industry contributes 3.6% directly and 10.3% indirectly to the world's GDP. In addition, it employs nearly 77 million people directly and 234 million people indirectly worldwide which comprises 3% and 8.7% respectively (UNWTO, 2020). The Indian tourism industry contributed 4.9% of GDP. It employed nearly

39 million people, which share a total of 8.0% of the total employment of the country (UNWTO, 2020). Andaman & Nicobar Islands is one of the 8 Union Territories (UTs). It contributes 0.011 % of GDP for India. The tourism industry shares 23.45 % of the total GDP of the Islands. Directly and indirectly, it shares 65000 people's engagement in the tourism industry which is contributing a total of 24 % of UT's employment. The tourism industry of this territory is in its infant stage (Banu, 2016) and further its positive development could contribute to the country's GDP and local employment.

1.2 RESEARCH PROBLEM

There are numerous reasons for selecting this research problems which are listed as follows. Research is beginning with these questions: Which kind of tourism resources are attracting the tourists in these islands? In which pattern these resources are distributed? What major infrastructures are available that help to access the tourists to the resources? How does the spatial pattern of infrastructure distribution affect tourism? What kind of transportation facilities are available on tourism sites? Which means or modes of transportation are effective over there? What factors are determining the transportation facilities of these islands? What are the implications of tourism policies over these islands? How the tourism potential of these islands could be assessed? The main aim of this research is to find how efficient transportation facilities have a key role to develop tourism in different parts of the Andaman Islands.

The following reasons are directed to selecting this problem of research in the Andaman Islands. The islands are having both natural and cultural tourism resources which are unique as per their characteristic features. Some of them are not found in any other place of the country but these resources are not distributed evenly in all parts of the islands. Their distribution could be firmly understood by the regional study of different tourism regions of these islands. The resources are accessible to tourists through the available infrastructure facilities. Transportation is the key infrastructure to develop other tourism infrastructures of the region. The means of transportation work as veins and arteries, which supply the essentials to the hinterland. The development of other infrastructures is also majorly determined by the advancement of transportation facilities in the region. As the Andaman Islands are remotely located from the Indian mainland and surrounded by the massive waterbody of the Bay of Bengal; so the islands are only connected through air and water mode of transportation to the mainland Indian cities. The major part of the Andaman Islands is connected by road networks but there are also some

other islands like Long Island and Little Andaman Island which are only connected by water transportation. The helicopter service is only provided here for emergency purposes. The quality of roads and vehicles are found in good condition near the Port Blair city area and it seems poor as far from the city. But the proximity to the city is not only the single factor for the cause of efficiency of transportation facilities. There are many other factors responsible for their efficiency i.e., quantity and quality of the vehicle, hygiene and maintenance, speed and punctuality, comfortability and associated amenities, etc. The performance of these elements varies from region to region determining the efficiency of transportation facilities and development of other infrastructures. So, tourists visit mostly those parts of islands (near capital region of the UT) where these infrastructures are firmly established. In addition to the infrastructures the government policies also help to provide direction for the development of tourism and trend of tourist arrival. Many national and regional level tourism policies and programs have been suggested from time to time. Their feasibility and applicability should be measured through a proper assessment before implementation in the field. Thus, the tourism strategy should be prepared as per the potentiality of tourism development on the basis of available tourism resources, implemented tourism infrastructures, and develop efficient transportation facilities of the regions. As the transportation facilities are uneven and diverse on these islands, so it's become a need for investigation identify the transportation characteristics which could help to address the tourism potential of these islands. Hence, this study entitled **“Study of Transportation-Tourism Potentials in the Andaman Islands.”**

1.3 REVIEW OF THE LITERATURE

Tourism is a hub of multi-sectoral services and it is affected by a different part of society. Hereafter the following pieces of literature have been selected and studied which are the most influencing factors to tourism.

1.3.1 Studies related to the tourism industry in Andaman & Nicobar Islands

Jayaraju et al. (2023) presented the potential of coastal tourism activity in Andaman Islands and it connected with the impact of covid-19 pandemic on government and people of this islands. The study reveals that the pandemic not only deficit the government revenue

generation source whether also influence the psychological and socioeconomic structure of the people involved in the tourism industry.

Kumar G.M.K. et al. (2019) ensure that sustainable tourism marketing will have a better future and scope in the tourism industry and other allied industries and services in the Andaman & Nicobar Islands. The need for sustainability has been justified by the vulnerability and fragility of these islands. He has given the 10 Ps of Marketing Mix for sustainable tourism has suggested, product, price, promotion, place, participant, physical evidence, process, packaging, programming and partnership. Sustainable tourism is referred to here as responsible tourism in which each stakeholder (tourists, tour operator, and service provider) are equally responsible to make up the sustainability of tourism by their deeds to these islands.

Dung I.D. (2018), analysed the destination loyalty of the tourist by conducting a primary survey in the Andaman & Nicobar Islands. The study has conducted to assess the appropriateness of the islands as an ecotourism and adventure tourism destination. The study measures the overall satisfaction level of the tourist. A tourism model has been prepared to check the loyalty of tourists to the visiting place. However, this model may help to build up a marketing strategy for tourism.

Sekharia P. (2018) studied the various proposed developmental plan by NITI Ayog in the Andaman & Nicobar Islands. He narrated that the strategic and developmental aspects of these islands by the supporting many works of literature revise and renowned persons with keep reminding the fragility, vulnerability and sensitivity of these islands. He also suggested that the area has less exploration and needs the implementation of proper developmental plans in various sectors.

Banu S. (2016), measured the trend of tourism growth and development in the Andaman & Nicobar Islands. The tourism industry is one of the major sources of the island's economy, which increases the GDP of the nation by getting foreign exchange and providing employment opportunities for the island community. The study reveals that tourism in terms of the number of tourists and tourism revenue increased from the year 1980 but it has declined in the period 2004-2006 and 2012-2014 due to the tsunami-earthquake influence and decline of foreign tourists in these islands. According to the study, the problem occurring in the sector of tourism is due to the lack of proper strategic policy implementation of government which can be overcome by implementation of suggested policies, strengthening of tourism and allied infrastructural facilities.

Indu Dung Dung and Dr Rajmohan S. (2016), describe the importance of the satisfaction level of the tourism product and destinations in the Andaman & Nicobar Islands. A Primary Survey has conducted of 280 tourists to get their opinion on tourism facilities and assess their socio-economic profiles. According to their finding the tourists high satisfied timeliness of the transport, cooling and heating of rooms in the hotels, tasty food served in the restaurant, entertainment in the adventure while less satisfied with the cleanliness and safety issues in the tourism services. The survey report has shown that married and private working people are more in number and prefer to visit Swaraj (Havelock) Island, Baratang Island and Port Blair respectively than the rest islands.

Singh, Deepanshu (2015), found that dive tourism is an emerging sector of Tourism in the Andaman & Nicobar Islands. The study mainly concentrates to identifying the diving suitability of places and assessing the satisfaction level of the tourists in the context of the diving experiences. The study is mainly focused on the dive tourism specifically in Havelock Island. Some suggestions are provided to improve the tourism services. The tourist perception on the diving has been taken. The study revealed that satisfaction level is high and more than half of the tourists want to come back once again to this place.

Bera S. et al. (2015), estimated the tourism carrying capacity of Niel Island by the secondary data and conduct a primary survey. The estimation has been done by taking four tourist spots on the island by assessing physical carrying capacity, real carrying capacity and effective carrying capacity. The coastal zone with natural resources of these islands is having more potential of developing as a tourist spot, so it becomes necessary to know the carrying capacity for tourists. It added that the carrying capacity measurement becomes necessary when it becomes a part of environmental concern. The resources, area and services on this island have a futuristic scope of full-fledged development.

Reddy S. (2007) has suggested reviving and expanding infrastructure to support the tourism industry of the Andaman & Nicobar Islands after the tsunami. It explained the pre tsunami development of tourism and its impact on the islands. She told how haphazard development could lead for the vulnerability to the island's sustainability. It is also introduced that tourism proposal plans to undertake high-speed ships, boats, helicopters, water sports equipment, like Jet Ski, rides etc. Like fastest means of transport to invest crores of rupees by the government. She also suggested that tourism can be sustained only if the implementation of high value, low

intensity-environment friendly tourism. The tourism plan must be considered according to the previous experiences of events, geology and demographic structure of the islands.

Reddy, M.V. (2005), examined the tourism status of Andaman & Nicobar Islands pre and after tsunami-2004. The study started with the evolution of tourism which starts here officially recognised by Govt. of India in 1982. He assesses the various facilities regarding tourism in Andaman & Nicobar Islands through various literature reviews, public interviews and field observations. Some pre-tsunami tourism policies and strategies have been described which had the capabilities and support of various departments and Govt. agencies. The tsunami impacted majorly the geology and resources of the islands with the destruction of tourism destinations. It influenced severely the workers who depend upon their wages directly or indirectly in the tourism industry. The tourism industry struggles a lot to rebuild its basic structure on these islands. It is also found that post tsunami period is the challenging 'pause' stage of tourism on these islands.

Purushottaman V. (1996) mentioned that the tourism festival has the potential to develop the Andaman & Nicobar Islands as a renowned destination on the tourist map of the world. It represents the glimpses of the lifestyle, culture and art of the local folk and joined the islands to the global arena which reduces the remoteness feeling of the islands and opens a new corridor for the world. Tourism is a sustainable option despite any industrial activity which is difficult to do in this fragile environment. It is also mentioned that these has been fabulous development taken place in various sectors, progress and prosperity challenges despite of its geographical isolation and environmental consideration. In the various sector of economic generation fisheries, tourism and ship repairing are perhaps the only areas that can generate jobs and economic productivity for the islands.

1.3.2 Studies related to island tourism

Gossling S. et.al. (2018), illustrated the importance of coastal and marine tourism for the coastal region. It having the immense potentials for least developed island state economy. The significant consequences are parallel described the coastal tourism impact upon the economy and environment the coastal water degradation like sewage wastage flow, coastal erosion, climate change, serious biological invasion, outbreak. There is also a strategy has suggested for stockholder in different level to sort out these problems.

Hong G. (2018), supported the enclavisation of the island. The development of the region beneficial to local community of the island tourism and getting various services. The study is based on the Qi'ao Island of China is mainly depends on the enclave of the developed region. The study said that due to the remoteness and physical hind rage the island escape from creating history and other economic development. However, the globalisation and technological advancement the enclavisation may help to generate the economy of the island through tourism instance the traditional activities like agriculture and others practices.

Wijaya et. al. (2018), studied the sustainability of coral reefs and scuba diving at Saebus Island. They have referred tourism sustainability index in four stations for the sustainability of scuba diving. For assessing the diving suitability, the expert team of UKSA-387 diving club, Diponegoro University measured the coral coverage and species, water transparency, enumeration of coral fishes, measuring the speed of sea current from four stations of Saebus Island. The analysed data result shows the diving suitability and high appropriateness of diving tourism.

Seetanah B. et al (2011), have assessed the role of infrastructure in tourism destination attractiveness and development of Mauritius. They classified the arriving tourist into three categories European-American, Asian, and African. The study measures the tourist satisfaction. It measured the infrastructure influenced upon them by using regression analysis on an econometric (log-linear) modelling. They found that the tourists of developed countries (Europe-America) are more sensitive to infrastructure facilities than tourists of developing countries (Africa and Asia).

1.3.3 Studies related to tourism destination

Iandolo F. et al. (2019) has done a systematic study of Arbatax Park as a tourism destination. This study was an attempt to understand the tourism function of the territory and its different variables. To assess the territory as a tourism destination the theoretical model has been taken for comprehensive analysis.

Quinn B. (2019), especially focused on the art festivals in the context of an urban area that is untraditional and quite different from the rural art festivals. She also intended to know the potential for the development of the art festival in the urban region or cities. The different values, policies, celebrating styles, aptitudes of people of urban region develops a new trend of

tourism pattern. It is also showing the cultural consumption are changing the festival modes dramatically. A city is a dynamic place that is the hub of growth, generating and spurring innovation and creativity support to develop a hybrid nature of culture. The art festival and tourism activities play a major role to shape and transforming the city. Mainly this study was focused on the urban tourism.

Sharma K. et al., (2019) suggested measuring the hospitality rank among the Indian States and UTs for making tourism strategy by Govt. agencies, organisations and appropriate planning or decision making for visiting the tourism destination by the tourists. Mainly this study was focused on urban tourism. This kind of studies are helpful to make the tourism strategy.

Cleste Eusebio et al. (2018), believed that place attachment and host-tourist interaction, directly and indirectly, influence the resident's attitudes towards tourism development. This study is mainly based on the resident's perception. Residents' aptitude and involvement are very essential for the sustainable development of tourism destinations. Therefore, the place attachment and host tourist interaction have assessed by proposing a conceptual framework to show the channels of factors that determine the residence perception and ultimately, it's developed the attitude of the residence tourism development in their locality. It denotes that the social contact is the most significant among all for making the perception of residents. The study also reveals the negative perception of a resident about tourism impact is stronger than the positive perception due to the tourism development in the region being dependent mainly on foreign investment. However, due to the high place attachment and host tourist interaction, the people develop a positive attitude towards tourism growth.

Fyall A. (2018) deals with the positioning and repositioning of tourism destinations by comparison between two major destinations in the USA i.e., Orlando and Las Vegas. The whole study is revolving around the transformation of the tourism destination to having a distinctive position in the marketplace. The study is attempted to show the destination is a great place to live, work and study.

Pookaiyaudom G. (2017) discussed about a specific tourism potential of Phicit Province. The long-boat race has the potential to develop as an event of sports tourism and it can be an approach to pressure this cultural heritage product sustainably with commercial benefits. The study plan for takeout this local event to develop as a commercial perspective. It may raise the tourism growth at Phichit Province and by-product also may generate economy. The local communities will also be able to generate an economy and enrich this voluntary cultural event

as a new source of economy profits. The study reveals that the longboat race has its five dimensions of meets as a tangible product, visiting experiences, organiser's cultural perspectives, community development perspectives and organise as event tourism. It's a multidimensional approach to sustainable development by this long-boat event.

Hanifah M. H. et al. (2016), suggested that responsible tourism practices make and enhance the quality of local people's living standards. The study assesses the key elements of economic, environmental and social perceptions of residents over tourism activities. It suggested that responsible tourism practices (RTP) reduce the adverse effect of tourism development in a region. The RTP should firstly apply to tourism stakeholders mainly to the residents and government authorities who initiated tourism because they are the pivotal factors for shaping tourism practice at any destination.

Koveri I. and Zimanyi K. (2011), agreed that safety and security play a significant role to determine travel and tourism experience. The study has attempted to introduce the different types of safety and security issues regarding the tourism industry at the global level which is the need of the hour to research. This study suggests that tourism planning and development should follow appropriate safety and security backup. It is also revealed how the dimension of the perception of safety and security has changed with the phase of time.

Prideaux B. (2005), examined the factors of the bilateral flow of tourism between two different nations. Factors determine the proportion of tourist flow compared from one nation to another. These factors have been systematically analysed through literature reviews of the previous study, the flow pattern of different countries and a case study of Australia. The study reveals that these factors affect the tourism flow independently, inherently and integrating manner. It also shows the relations and impediments to determining factors of bilateral tourist flow which have not been identified in any previous study.

Akama J.S. (2002), suggested that the government has to play a vital role in the development of tourism, especially in a less developed country like Kenya in Africa. The study reveals that lack of hotels and poor transport system are the major hurdles in tourism development due to the inappropriate strategy and bureaucratic mismanagement of the administration. The study suggested for fiscal support, financial investment and local involvement to develop and maintain the tourism infrastructure.

1.3.4 Studies related to tourism resources

Lee, Wang, & Zuo (2021) studied the water-energy-food nexus relation of the Chinese tourism industry through environmental extended input-output analysis. Accommodation and transportation consume more water energy directly and the food supply sector indirectly. The indirect consumption of water energy is (6 times) more than the direct consumption. It suggested that the standard structures and high energy-saving technology could save the water. Technological advancement along with proper management and policies are required to conserve the resources.

Mallorqui, Gracia, & Ribas (2017) found hotel with greater tourist capacity and outdoor swimming pool consume less water than its counterpart. This fact is supported by a scientific literature review of the concern issue and a case study of a coastal town by the Generalized Linear Mixed Model (GLMM). It also suggested for the implementation of environmental and business management practices and creating awareness about water-saving measures are needful for future efficient water consumption for the tourism industry.

Gössling, Peeters, C. Michael Hall, Lehman, & Scott (2012) reveals that the freshwater consumption is varied according to the type of tourists, levels of hotels and the regions. The study is based on secondary data regarding water use and its tourism parameters. It's shown that international tourists consume less water than domestic tourists. It also indicates that the adaption of a new water management strategy is required as a response to the world's climate change. Tourism is having more virtual indirect consumption than its direct use. Hence, there is a need for a study on indirect uses of water in tourism. Different pieces of literature have been taken to suggest the requirement of both demand-side and supply-side water management.

Aziz and Sulaiman (2011) have identified natural resources and infrastructural facilities to develop tourism. The study has used the unstructured observation technique and checklist tools for the assessment of six different domains of resources in the tourist site and the depth interviews have been conducted by asking unstructured questions to the expert stakeholders and local community for situational analysis for the tourist sites. Apart from this the new suitable tourism activities and products were also identified with the help of the assessment of different resources.

Smith (1987) has identified the tourism regions by regional analysis method on the basis of tourism resources. These tourism resources have been classified into four groups urban

tourism, outdoor tourism, cottage and boating and urban fringe tourism according to their respective nature and the study area has been classified according to the scores of indices to counties into specific regions. The tourism potential level of these regions has been identified by regional analysis.

1.3.5 Studies related to the tourism product

Arias J.L.A. et al. (2019) constitute input-output matrices study of tourism productivity and tourism product relationship at Mexico. It took 30 subsectors of tourism products and has found the negative and positive sectors by analysing of data. It is a kind of longitudinal research about the tourism products. Different determinant factors of productivity have been described which significantly contribute to the Mexican economy through the tourism activities.

Yachin J.M., (2017) refer to the innovation practice of tourism product in rural area of Sweden. It has taken 40 tourism products to assess the innovative practice of tourism products at micro-level entrepreneurship in the rural area of Sweden. The study contains a model which explains the interrelation between entrepreneurship and opportunities at the geographical context. The opportunities are constituted of equilibrating and dis-equilibrating driving forces while entrepreneurship is characterised by personal traits, knowledge and social network. The study tried to enhance the better understanding of tourism product innovations by the entrepreneurs.

1.3.6 Studies related to tourist's perception of the tourism industry

Bhandari K. (2019), explores the geopolitical influence on tourism and Buddhists heritage in Nepal. The geopolitical power-sharing and planning on Lumbini and Buddhist culture. The case of India and China are also examined in this study. The study revolves around the qualitative assessment of the geopolitics relationship between China and India. It restating the international identity of Lumbini village as a world heritage site in Nepal. The main focus of the study is to revive the Buddhist heritage in Nepal generally and establish it as a tourist site to gain social and economic benefits to the local community.

Dixit S. K. et al. (2019) identified the behaviour of consumers in the tourism industry. It helps to know the changing lifestyles, desires and aspirations of the tourists. It is also helpful to the market to redesign the various marketing policies and strategies for updating the market for

sustainable tourism. According to this study, there are four factors: internal, external, situational and market factors that determine the decision process of the consumer. It is also assessing that the post-purchase behaviours influence the consumer's future purchase intention and behaviours.

Teng H-Y. (2019), examines the influence of job crafting on customer service behaviour and satisfaction level. The study investigates and recognises that harmonious passion for job craft as a critical antecedent variable that stimulates employee's customer service behaviours. Job crafting also influences the persons' job fit, work engagement and job satisfaction. The study has perceived the interrelation of job crafting, job passion and customer service behaviour among hospitality employees.

Xu A. et al. (2019) presented the correlation between advertised attitude and purchase intention of ecotourism products. During the experiment, it has found the customers do rational thinking than an emotional attitude to purchase the tourism product in the advertisement. The study is followed to know the concept of advertisement. The study is followed to know the concept of advertising appeal, attitude toward advertisement to develop the purchase intention of the customer to buy the tourism product. The study also suggested that cognitive or rational appeal should be included during the advertisement. Along with this a suitable celebrity or theme may use in the advertisement which may represent appropriate for the ecological product.

Levi E. et al. (2018) suggested in their study that tourism active persons have a higher level of happiness and it's also useful for remedial for Major Depressive Disorder which has been proved by several literature reviews and tests in this study. Tourism helps to bust the stress and enhance the psychological ability of a person. The study has constituted of 14 psychological patient's test. Various measurement methods have been used to know the tourism influence which reveals that aggregately post tourism patient's behaviours are more positive than pre tourism patient's behaviours.

Alie A. R. (2017), studied tourism by the sentiment analysis of the tourists with the help of big data gets from social media platforms. The study added that the social media and the online tourist service portal and websites may use to insight into the tourist attitudes, behaviours, experiences, opinions, personal feelings, beliefs and judgement of the tourist. The word of mouth and state of the art is given more importance to knowing the sentiments of the tourists in this modern period.

1.3.7 Studies related to tourism-transportation

Dhali G. and Dar S.N. (2019), have identified the different nature of internal transportation problems in Andaman & Nicobar Islands. The Andaman Islands are having land and water mode of transport while the Nicobar group of islands are having only a water mode of the transportation system. These islands are also having air support (helicopter) for emergency and urgent services only.

Hermawati, P. et al. (2019), explained the significance of designing trip chain and their mode of transportation on Bali Island of Indonesia. They proposed some categories of trip chain models for destinations visit to the Bali Island and determine the mode of transportation. They studied different determinant factors of making the choices for tourism destinations like gender, age, educational level and occupation which are the personal traits of the tourists, other factors like duration of visiting and the cost of travel. The model had developed to assess the desirable tendency of tourists to the respective destination and their degree of selecting the mode of transport.

Kanwal, Rasheed, Pitafi, Pitafi, & Ren (2019), perceived that road and transport infrastructure development is positively related to community satisfaction for tourism and its benefits.

Peeters P., et al. (2019), relate the tourism and transport future with climate change and its influences. It explores the transformation of tourism by the futuristic means of transport in a sustainable path. It also has both scenarios like desirable opportunities and undesirable threats by the evolution of the tourism transportation services.

Song H., et al. (2019), mention that excessive tourism taxation has negative impacts on destination competition and a huge burden placed on the consumers and producers of the tourism products and services. Extreme rate of fare for air travel causes the fall of burden mainly on the consumers. The study presents some models which influenced by Air Passenger Duty (APD) on the consumption of UK outbound tourist expenditure. It also assesses the influence of taxation on the decisions making and behaviour of the traveller. The high APD may compel the tourist to pay the hiked cost of airfare by reducing the expenditure on the other services at the destination. This compromise could spoil the entire travel experience of the tourists.

Vieira J., et al. (2019), explained that liberalization and the cheaper mode of air transportation have a high potential for tourism growth at the destination like Azores. They suggested that the low fare of aircraft and more alternatives of flights services have the power of attraction to the destination. The study has noticed the changes in tourist trend due to the deregulation and liberalization of air transportation at Azores Island. The effect of airline choice on tourism growth has been mainly assessed for the three business alternatives air services have studied which are full services airlines, low-cost airlines and charter flights.

Yan Qi (2019), explain the role of cruise ship tourism in leisure activities in the present scenario. It has also been associated with the hotel, gambling and other transportation modes and services. It constitutes economic benefits and creates a special socio-cultural environment that provides an entirely different kind of tourism product. The study has concentrated operation, management, marketing, consumer behaviour and industrialization of the cruise Tourism product with cruise-based destination planning and its development strategies. This industry specializes in the characteristics of refreshing, inspiring and soul-searching experiences with paid attention to safety and health issues. Some marketing strategies also discussed like a branding marketing channel, image building utilisation of the latest technologies for cruise travel which may implement based on the 3S strategy of cruise travel brand i.e., safe, secure and sustainable travel experience. Environmental protection is the core issue of the study with due regard to making cruise tourism destination.

Balli H. O. et al. (2018), examined the relationship between tourism demand, airlines seats and trade as a multidimensional assessment of New Zealand tourism stakeholders. The study indicates the relation between the above activities are the internal movement of people, good and money exchange. These all are influenced and determined by each other. The study is also tending toward making international politics and the domestic economy of the country through tourism.

Seetanah B. et al. (2018), explained the impact of air accessibility and marketing promotion on the development of tourism. Some current policies in Mauritius are constraints in front of tourism up-gradation. Which could be resolved by the liberalization of air access because time is the crucial factor for tourism and the geographical isolation of the place can efficiently be accessed by air transport only. The study finds that liberalization of air access leads to facilitating competition among airlines and having the availability of low airfare which may promote tourism marketing. It is also added that the unplanned air liberalization and excessive

marketing promotion may also cause harmful effects on the local economy and the environment.

Maparu & Mazumder (2017), examined the causal relationship between transport infrastructure, economic development and urbanisation. It was a temporal analysis method to method to determine the cause and outcome. The variables have been fixed by cointegration and analysis of the Granger Causality Method. This study presents a sound approach to the selection method of the variable for further analysis. The transportation infrastructure is having a long-run relationship with economic developments.

Yang Y. et al. (2017), studied the transport facilities of 343 Chinese cities and the pattern of tourist flows by the different modes of transport facilities. The study revealed that air transport influences more than railway transport the daily mobility of tourists. The study also reveals that tourists are looking for a safe, comfortable and efficient system of transportation for travelling to their destination. As the availability of alternatives of transportation system facilities, the tourist travellers to choose the better option according to their budget, length of stay and travel distance. The international transport competition has been assessed mainly in this study by the various pattern of tourist movement.

Lohmann G. and Pearce D.G. (2012), raised some issues in regards to tourism and transport from the supplier's perspective. This study presented the contribution of the mode of transportation as a destination promotion and direct linkage to the other products of tourism. The semi-structured in-depth interviews have been conducted to know the perception of the different stakeholders about different aspects of ferry transport to tourism gateways. The research output reveals the transport is complimentary for tourism rather than a product. It is also suggested for studies on further issues of transportation and tourism.

Kimbu A., (2011), supported upon the major role of transport and non-transport infrastructure mainly as accommodation in eco-tourism. To study the ecotourism and nature potential and transport-accommodation infrastructure assessment the study area has been classified into three-part as western, south-east and littoral and Northern Camoran region. It assesses the biological resources and their accessibility by a different mode of transportation. The entire study area has based on forest regions to identify the potential of nature-based tourism. The northern part of Cameroon is accepted for transportation and other infrastructural development with comparison to other regions. Tourism is mostly hampered in the northern region despite

of its immense potential. Privatization of air services, lack of a transportation system also determines and negatively influence the staying of the tourist at the destination.

Seetanah, B. and Khadaroo, J. (2009), encompass the role of transport infrastructure for the arrival of overseas tourists. The study has investigated the contribution of non-transport infrastructure generally and transport infrastructure especially. The study has been based on rigorous time-series analysis to assess the role of infrastructure to develop international tourism. The dynamism and endogeneity of tourism infrastructures have been accounted for by vector autoregression (VAR) which account for the number of tourists arriving, their income, tourism infrastructure like hotel, rooms etc. Vector Error Correction Model (VECM) has been used in the study to analyse the relationship among the variables of infrastructure. It has shown the transport capital stock of the state has in long-run equilibrium. The study suggests that the government should allow a sufficient budget for transportation, to support tourism.

Henderson J. (2009), supported a safe and efficient transportation system is essential for a tourism destination's progress. This study conducts some literature analysis with a special focus on the paucity of transportation infrastructure and policies especially the European Union ban on Indonesian airlines that influenced to degrade the pride and frame of the country. A comparative study has been done with Indonesia and its neighbouring countries which reveal that the country with good transportation has high tourist attraction even in another country that has more tourism product and attraction. The facts prove that transport has a direct and positive relationship with the tourism development of a place.

Khadaroo J. and Seetanah B. (2007), advocate the role of transport to develop tourism. The statistical study reveals that the distance and capital efficiency mainly determine the number of tourists from their respective countries to travel-specific tourism destinations on islands like Mauritius. The data has been used to analyse from 1978-2003 show that the American-European tourist arrival increased due to the infrastructure facilities increased in Mauritius Island. In the other side it's also shown the share proportion is low from American tourists. The growth rate is showing the significance of infrastructure development and the proportion is showing the distance factor restricted the tourism flow. However, the study reveals transportation controls the tourism outgrowth at this island.

Sorupia E. (2005), addressed that transport is an integral part of tourism and it has the main role in accessibility for the tourism destination. The tourist tendency of choosing the mode of transport and destination, stakeholder vision towards sustainability, and management policies

and strategy has been studied to understand the transportation-tourism related issues. The finding shows that the poor and uncontrolled management of the transport sector in nature tourism is the major cause of ecological disturbances. It also explained the negative consequences of the unplanned transportation development. These problems have occurred due to the cheap rate of high and easy accessibility to the destination degrades the natural sites which indicate the lack of transport management.

Lumsdon L.M. (2006), investigated the factors which determine the bus service system for tourism purposes. It is an empirical study that consists of in-depth interviews with the stakeholders and regional officers. It revealed the major issues of the transport-tourism linkage and analysed the impact of tourist bus operation by following a proper strategy. The finding of the study is that most tourist operators were not keenly interested in the bus as a mode of transport in place of the car. The tourist bus and appropriate strategy for a means of transport is a sustainable approach to developing tourism. The study suggested a transport plan for reducing car users.

Seetanah B., (2006), argued transport is an important determinant for tourism development. The study has based on a time series analysis of transport and other tourism infrastructure. An error correction model and along with a co-integration analysis have been done to identify the significance of tourism infrastructure. The study revealed that the tourism infrastructure is more significant than the transport infrastructure. However, the focus of the study was mainly centred on reviling the significance of transport infrastructure that can be attained by not cutting of transport infrastructure budget from the annual budget of the country.

Downward P. and Lumsdon L. (2004), investigated the trend of spending by the tourist on different modes of transport and the role of public mode of transportation in rural tourism destinations as a national park in a developed country. The study is also concerned with other aspects of transportation tourism linkage like sustainable tourism; reduced traffic, local area development. It has taken a survey account to investigate the significance of the proper mode of transport. A pilot survey has done before a preview of the main survey at the tourism destination, random sampling has taken to survey the structured questionnaire of 1200 responders. Among them only 356 responded and travel dairy also referred to know the spending and face to face interview also conducted while they return from visiting. Tourists were mostly travelled by car and the car-borne visitor typically stay longer than the people who were using the public mode of transportation. Car borne transportation controlled the duration

of visitors' stay, group composition and spending amount at the destination. The study suggests the long-term stay can enhance more spending at the destination and as the average composition of the travellers is the same; the appropriate transportation strategy for public mode can play a better role in future to solve the traffic problems and create sustainability and other benefits to the tourist destination.

Lumsdon L. (2000), explain the role and potential of the cycle in the sector of transport at tourism destination for the sustainability of tourism. The paper suggests an alternative model for tourism transport development at the destination level. The study analysis the function of the National Cycle Network (NCN) in providing transport facilities and transport offerings. Cycling and walking both have become the sustainable mode of movement at the destination tourist approach for cycling in the context of casual, healthy, and recreational purposes. A model has been proposed as a synthesis of the tourism-transport interface by the integration of tourism transport policy reconciliation, synthesis of transport-tourism flow data and audit of tourism-transport infrastructure. It suggested that NCN and La Route Verte provide a sustainable alternative in transport for the existing tourism.

Hall, D.R. (1999), redefined that transportation is not only the key factor of the tourism industry even it's a tourism end product itself. The study has mainly based on tourism-transport as a gateway to tourist-host interaction and creates inequalities and externalities among the people. The tourism transport inequalities content has fewer studies according to previous literature reviews. The study assesses the differentiation and inequality and their problem with implemented transport policies and incentives. It significantly concentrates on the sustainability and proper land use of tourism destinations.

1.3.8 Studies related to communication and tourism

Ankomah P., (2019), introduce the significance of ICT to develop virtual tourism in Sub-Saharan Countries. Virtual Tourism (VT) can show the potential of tourism destinations in the Virtual Realm (VR) before going to the real tourism destination. VR and VT have access to know it relations and ICT tools also get examined to the supportive ability for VR and VT. The thrust area of the study mainly certified to know the role of VT and identifies its efforts in tourism development. The main application of VT is to the marketing of tourism destinations

and providing glimpses of the destination before the actual tours, which may be navigated, interacted and enrolment by the tourist itself.

Cardia G. et al. (2019), explain that smart movies have broad significance for marketing promotion of the World Heritage Sites for tourism development in Europe. The study has focuses to use the psychology of film tourism, media consumption and innovative technologies for the development of tourism in UNESCO World Heritage Sites. It's also providing glimpses of virtual realism of the cultural, social and physical entities of the destination. The influence of movies and media has also been assessed by the literature reviews and using appropriate methodologies in this sector. Screen tourism also paid significant focus on the European project 'Film Festivals and Movies tourism at UNESCO Sites' (FAMOUS). The entire study has intended to integrate tourism into the film industry.

Pierdicca R. et al (2019), have suggested the innovation of ICT in tourism development. The different modules of ICT tools can efficient helpful in tourism. The French information System La Valle del Pensare provides the thematic tourism map and tourist updates. This system is also helpful to analyse the tourist data get from the information system.

Jovicic D.Z. (2017), presents a research study on the evolution of tourism destinations. The whole study is revolving around the innovations, advancements and well-equipped services development of the tourism spot to become smart destination. In the previous period, tourism was mostly related to geographical entities (physical, human, socio-cultural resource-based). The system approach has been applied to knowing the tourism destination. The main determinant factor of the destination transformation is considered by the Information and Communication technologies which connect the tourist to its destination and inform about it by various means. Social media and cloud services play a crucial role to develop smart tourism destination which is meant to connect the real world to the digital realm. According to Jovicic (2017), the transformation of the traditional destination to smart started in the late 1990s due to the advancement of the IT sector and grew up due to the digital revolution.

Bethapudi, A. (2013), explained the need for integration of tourism and business, which will make the tourism industry more flexible and accessible. The integration of ICT, business and tourism products will make it more reliable to the consumer. This study finds the gap in the uses of ICT in Indian tourism. For this study here, the five scales Likert method has been taken to measure the role impact and implication of ICT tools among stakeholders. The study

analyzed that the updated tourism, well-established ICT network in tourism can make the tourism industry more efficient and easier to access for tourists.

Morosan C. and Fesnmaier C. (2007), have recognised the framework of perspective architecture of tourism in a virtual dimension. They provide a concept to guide the consumer to get tourism products. The study reveals the efficient websites which can pursue the consumer (tourist) to get information and develop an interest in the tourism website. The three-dimension of communication traits destination marketing organisation, consumer and tourism industry are the main factors making a perspective about the tourism website.

Harris R. W., and Vogel D. (2002), want to share the significance of e-commerce to developed community-based tourism for poverty deviations and economic development in rural areas communities of developing countries like the Asia Pacific region. This study supported that e-community Based Tourism (e-CBT) helps direct connectivity to tourism servers and tourists, it reduces the role of mediator which is beneficial for both stakeholders. The e-CBT can mitigate the regional imbalance that occurred due to tourism in a specific region and help to make tourism sustainability.

1.3.9 Studies related to tourism and disaster

Corbet S. et al. (2019), finds that the tourism industry is also vulnerable to manmade crisis like terrorism which causes very significant social and economic effects on the tourism destination. It's a multivariable study of tourism, transport and terrorism, in which terrorism makes constraints in front of both sectors of services. The study reveals that the airline services cut the capacity after the terrorist attack in that place, the business traveller reduces in numbers than the tourist travellers, the US and European passengers restricted their respective journey to different places due to the terrorist attacks.

Rittichainuwat B. N. (2006), assesses the recovery of the tourism industry after a major Indian oceanic tsunami in 2004. She found that the low-cost tour packages are ineffective for tourism marketing promotion. The tourists of East Asia were having fear of ghosts while the tourists of European countries were afraid of inappropriate disaster warning systems on tsunami-affected Andaman Coast of Myanmar. The tourism of this region is majorly influenced by the media which made the image of the place in front of the world's tourists. Here the surroundings influencing factors of the tourists as a major determinant to motivate a visit after a disaster.

1.3.10 Studies related to sustainable tourism or ecotourism

(**Jin, Yang, Wang, & Liu, 2020**), explained that high-speed transportation means to influence the regional distribution and quantity of tourists.

David D.C. and Warnick R.B. (2019), assess the relationship between the level of tourism the Green House Gases (GHG) emission (environmental impact). They emphasised the sustainability of the environment through tourism activity. Tourism co-sectors are the transportation, restaurants, lodging facilities operation emission GHG. The study has tried to determine the contribution of GHG emissions to the environment by tourism activities. The study also reveals that among the GHGs the methane and nitrous oxide emissions are less than the emission of carbon dioxide. Here the proper implementation of government regulation and mitigation policies may lead to maintained the sustainability of the tourism destination.

Font X. et al. (2019), present a study impact of research works on sustainable tourism and explain the key role of this research on society. They have tried to define the role of the journal to help by providing intellectual aid to the research community and developing opportunities to encourage them for sustainable tourism research. They tried to promote a culture of social responsibilities of the researcher in the same field which will lead to form some outstanding work and contribution to the sustainability of tourism and it will help the stakeholders and policymakers to adopt and determine the new strategy for sustainable tourism growth. For a broader study viewpoint, they wanted to include a multidisciplinary approach and use social media to form an online research community and culture.

Mrda A. and Caric H. (2019) have developed a model for having sustainability of Heritage Tourism (HT). The study has focused to assess the sustainability of HT without jeopardizing the natural and anthropogenic features of the surrounding area with community inclusion. The study has a prime concern with a high sensible approach to knowing the conditions and function of HT without disturbing the socio-cultural and spatial attributes.

Wang C-F. And Chiu Y. J. (2019) discussed the perception of words of a mouse and the value of a customer for an eco-tourism product. Its reveals that the higher perceiving indicates the high value of ecotourism product purchasing intention by the tourist customer. The good obliged fulfilment of ecotourism service also gets the great customer value. The study

approached for correlation among the word of mouse, customer value and purchase intention of the tourist consumer for the eco-tourism product.

Absalyanamav T. et al. (2018) analysed the impact of sustainable tourism on social implications. The study assesses the environmental and socio-cultural problems of tourism activities and suggested some management strategies to maintain the sustainability of the environment and implementation of tourism activities according to regional planning. The research is mainly intended to find a new way to develop a modern improved model of tourism with the consideration of regional development. It suggests that the tourism activities must link tend to assimilate to local communities and have respect towards their socio-cultural fabric.

Ahmed M. (2018) planned for research on sustainable eco-tourism planning for Sagar Island. He suggested that ecotourism has a channel to economic generation for the local people as well as maintain the sustainability of the local resources. The proper implementation of eco-tourism may help the local economy as well the ecology to sustain.

Hameed B. et al. (2017) reveals that ecotourism makes an impact on the sustainable development of the tourism industry. It majorly focused on the environmental consideration issue of tourism impact and their assessment of the positive impact of eco-tourism on the suitability of the environment. It concentrates based on the natural and socio-cultural resources of India especially their developmental aspects by ecotourism with maintaining sustainability.

Ng, S.I. et al (2017), evaluate the tourism sustainability of Tioman Island in Malaysia. Tourism sustainability can maintain when all elements of tourism (resources, community, and tourism) will help to develop relationships and contribute to the well-being of each other. The study measures the sustainability level by assessing 50 indicators (Tsaour et al., 2006) among the stakeholder. The raw score and show them as a percentage in SEIS (Sustainable Ecotourism Indicators System) framework. The result shown that the island has below the sustainable level and it also has the potential for sustainable tourism if the stakeholders support each other.

Goswami, Rana and Rana (2016), have explored the potential of eco-tourism in the Yamuna Basin Region of Garhwal Himalaya. The study has used an appropriate qualitative and quantitative approach to determine the eco-tourism sites and their potential. The observation of sites, household surveys, and interviews have been conducted to evaluate the different aspects of these sites. Secondary data like information regarding relief, slope, location and land use have been taken from different literature sources and relevant departments. This area is due

to the mountainous terrain and fragile environment another sector of the economy i.e., industries can't prevail here whether ecotourism is the most suitable activity to protect the natural resources and develop the economy of the region.

Sesotyaningtyas M. et al. (2015) expressed the possibilities of sustainable development in Kutohajro village have some slum problems. They tried to assess the feasibility of various sectors like tourism anatomy, social and economic feasibility has good condition except for the financial feasibility of the village. It had been intended to resolve the slum problems by promoting village tourism. The potentialities of the village categorised as religious sites, natural sceneries and unique cuisine. The local community's involvement in village tourism has the ability to the drastic transformation of this village.

Abdollahzadeh G. and Sharifzadeh A. (2014), identified the perception of rural people about tourism development. The local people play a significant role in tourism planning and sustainable development tourism. The perception of residents varies according to different demographic characteristics like age, economic condition, gender, occupation, living status and educational level. The positive and negative perception of resident depends upon the above characteristics. The linear structural equation model has been used to analyse the demographic variables of tourists. The factor analysis has been used to know the latent dimension of different variables which measures their perception. The result shown that the male, people who lived from childhood, older people, civic servants have a more positive attitude toward tourism development than other demographic categories for tourism development of the study area.

Malik et al. (2013) has suggested a new tourism dimension in the Pahalgam region of Kashmir Valley in a sustainable manner. The natural resources and their significance have been identified and the area has been classified into pockets. The resources, features and infrastructure have been assessed with the help of suitable indicators by a primary survey and secondary data has been collected from local authorities. The study suggested the new potential tourism supports the sustainability of the economy and protection of the environment.

Nazaruddin et al. (2013) identified the natural resources and features of the Keltan delta region of Malaysia for ecotourism development. The study uses the base map, satellite image, air photograph, photographs, literature and field observation to identify the natural resources and physical features of the region. The mangroves, flora, fauna, river and the delta are identified as the major resources, which have the potential to develop ecotourism. Stakeholder participation and the appropriate plan are needed to develop efficient ecotourism.

Snyman, S.L. (2012), identified eco-tourism as an instrument for poverty elimination. The rural livelihoods are mostly dependent upon primary activities which are highly dependent upon the exploitation of natural resources of the region. Whether the study suggests that tourism adds here some alternative shift of those livelihoods on eco-tourism activities and develop a positive attitude towards the conservation of the natural resource. The eco-tourism has direct benefits on poverty elevation, local employment, biodiversity conservation and checking of rural-urban migration.

Tsaur S.H. et al. (2006), evaluated the tourism destination sustainability of the Saviki region of Taiwan. The study was empirical research that investigated the sustainability of tourism destinations by measuring the perceptions of stakeholders (tourist, community, resource administration) interaction with each other. It adopted the Eco-tourism Sustainability Indicator Model (ETSIM) which evaluated ecotourism sustainability has called evaluation framework of sustainability indicator in the study. In this framework, the model analysed the interrelation of economic, social and environmental dimensions. The feasibility of these indicators is evaluated through the Delphi technique. The survey output has presented on a model graph called SEIS (Sustainable Ecotourism Indicator System). It shows that the tourism destination (Saviki region) is in the potentially sustainable category. The sustainability of this region can be maintained by better interpretation to tourists, regular administration monitoring and cooperation among all stakeholders.

1.4 RESEARCH GAP

The review of the literature was mainly focused on the different aspects of tourism and its relation with transportation facilities. The main aim of this review is to find out whether there any previous study has done on performance of transportation system in any part of the Andaman Islands. But there is absence of works on transportation as a significant tool to develop tourism neither for India nor for these islands. In addition, the most of the studies show that transportation is only for connectivity. A large part of the study had been done on ecotourism, sustainable tourism, and the satisfaction of tourism stakeholders. Very little pieces of literature are available about tourism resources (Knezivic, 2008 & Nazaruddin, 2013). Literature like Kathirvel, 2014 classifies the tourism resources but it was specific for the mountain region where most of the infrastructures could not be the same as required for tourism regions like these islands. Fewer numbers of direct studies are available for transportation

facilities but there is a lack of studies that review the tourism policies made for India in general and specifically for the Andaman Islands. The master plans only have been made for Port Blair and its associate region while the rest part of the Andaman Islands not included in the plan. There was no literature has been found about transportation contribution and its performance for the tourism industry of the Andaman Islands. Henceforth the objectives of the research have been framed as per the research gaps found from the literature review.

1.5 OBJECTIVES

The research objectives are:

1. To explore the tourism resources of the Andaman Islands.
2. To enlist the tourism infrastructures of the islands.
3. To identify the transportation facilities in tourism destinations of the islands.
4. To review government initiatives in promoting the tourism industry in the islands.
5. To suggest an appropriate tourism development strategy for the islands.

1.6 DATA SOURCES AND METHODOLOGY

1.6.1 Data Sources

Data is the basic input of research that produce the meaningful output of the research question. Both primary data and secondary data have been used. To answer the research questions and through following the objectives the data have been collected from different sources. Primary data have been collected for that information which is not available in any record or source of literature at the time of study while the secondary data have been collected from different tangible-intangible major sources like libraries, websites and official archives. For this study primary data have been collected from first-hand sources i.e. tourism stakeholders (tourists, local people, and tourism service providers) by using the tools like observation schedules, questionnaires and interview schedule. Here, the secondary data is the kind of data available

the other than its sources of primary origin from the source directly in the form of pieces of literature- books, journals, gazetteers, newspapers; maps and kind of online information.

Primary data

Primary data has been collected from the field works through observation schedules, interview schedules and questionnaire surveys. Most of the anthropogenic or cultural tourism resources are enlisted through visiting their respective place and recording the information through the observation schedule. Apart from the number of resources it also records their other qualities of them i.e., characteristic features, photographs, available means of transport, and distance from the hub. The observation schedule survey enumerated the cultural tourism resources like memorial units, historical heritage sites, profane buildings, archaeological sites, weaponry, objects illustrating science and technology, artistic resources-sculptures, paintings, craft items of tribal and other non-tribal communities, ambient resources like famous buildings of the islands. Observation schedule is also used to enumerate the tourism infrastructures like different types of accommodations (hotel, motel, paying guest, dharamshala, resort, and lodge); means and modes of transportation (types of vehicles, vehicle supported infrastructures-bridges, vehicle-carrying vessels, jetty facilities, alternative transportation); food facilities and services (restaurants, *dhaba*, food kiosks, food court, food trucks, bakery and sweet stalls, juice bar, and cafeteria); other miscellaneous tourism specific infrastructures (interpretation centers, informative hoardings and signboards, site with first aid facilities, sites with ticket houses, site with trekking services, amusement parks, and tourist shopping centers). The observation schedule has been collected those resources and infrastructures which are not available collectively in any piece of literature or official record.

A questionnaire survey has been conducted to know the transportation characteristic perception of tourism stakeholders in each tehsil. For the questionnaire survey total of 300 samples have been taken. The samples are the tourism stakeholders that constitute both domestic and international tourists. The survey has collected demographic, socio-economic information and their perception about the transportation facilities. The perception was about different aspects of land and water means of transportation. The air transport was not included in this perception because it is not generally available for tourism purpose in interisland commuting. Most of the data are quantitative in nature.

Interview schedule query about the different aspects of tourism policy from the expert of different backgrounds who are having intellectual grip about the field of tourism for ANI. The

experts are taken as prominent academicians, industrialists, officials, entrepreneurs and administration. The schedule has asked about the review of environmental sustainability achievement, hindrance, contradiction, significance, demerits, inclusiveness of local communities, repercussion of the policy implementation. Interview has been taken from physical, telephonic mode as well as using through the google forms. The questionnaire and interview schedule are validated with the experts. Several pilot studies also conduct before the main survey and interview.

Secondary data

The secondary data has been collected from different places of the data sources i.e., libraries, tour websites, stationery shops government offices and private establishments. Among all the places library is found as treasure-land for the authentic and desired materials. During the study of different libraries (In Punjab, New Delhi, A & N Islands) have approached to gather the information from available books, journals, gazetteers, memoirs and newspapers. In Punjab - Central Library, Lovely Professional University (LPU), Departmental Library, School of Languages and Humanities, LPU; Delhi-Delhi Public Library; A & N Islands- Port Blair – J.N.R. Mahavidyalaya Library, Tagore Govt. College of Education Library, Zonal Anthropological Survey of India Museum and Library, State Library; Diglipur - Zonal Library. Most of the information about natural tourism resources is collected through books, records, statistical booklets, and office documents. Information about the relief features of these islands is found in the book (Naidu, 2007), Hydrological Resources from National Wetland Atlas: A & N Islands, 2009, Flora & Fauna (Dhingra, 2009).

Official websites Directorate of Economics and Statistics and Directorate of Information, Publicity and Tourism, are the other sources of authentic information about different infrastructure facilities. Google Map and tourism blogs are helped to enlist the hotel, guest houses, post offices and bars. Google Maps is mainly used to locate the tourist sites. Official websites like the Directorate of Economics and Statistics provide information about the availability and location of govt. hospitals, primary health centers, community health centers, sub-health centers and dispensaries, means of transportation; while the Directorate of Information, Publicity and Tourism provided information about the quantity, location of registered/non-registered tour agencies, bed-breakfast facilities and other tourism services.

The map is another source of secondary data used to locate tourism sites and abstract information on different themes. For example, Tehsil wise maps- Andaman & Nicobar Islands,

Census Atlas collected from Directorate of Census Operations. The tehsil maps have been used to make the base map of each tehsil. District series map and Tourist Map have been used to locate the tourism sites. District Series map of 'Andaman District' (Erstwhile 1992 when A & N territory was having 2 districts: Andaman district and Nicobar District) has purchased from the authorized dealer of Survey of India Shop, New Delhi. National Atlas and Thematic Mapping Organization (NATMO) released tourist map of Andaman Islands has been accessed from Head of the Department Room, P.G. Department of Geography, J.N.R. Mahavidyalaya, Port Blair.

1.6.2 Methodology

This research has systematically suggested tourism potentials through exploring the tourism resources, infrastructures, transportation facilities and tourism policies by following methodologies.

1.6.2.1 Exploring Tourism Resources through Decision Tree Model

Tourism resources are taken from the general classification of resources given in Negi, 1995. Further, it has been classified into two categories – natural and anthropogenic tourism resources. The further sub-classification of the above tourism resources has been taken from Knezevic (2007). A list of tourism resources of different tehsil has been assessed through the decision tree model (DTM). The model helps to select the tourism which having potential for tourism development and also classified them according to their scored number as poor, good, and excellent type of tourism resources.

1.6.2.2 Enlisting Tourism Infrastructures through Tourism Infrastructure Index

Classification of tourism infrastructure has been taken from Kathirvel (2007). A total of eleven types of tourism infrastructures have been selected for the study area and it is classified into subunits. The unavailable data in literature have been gathered through field surveys while the secondary data have been gathered from the library source and official websites. The distribution of the resources has been calculated through tourism infrastructure index (TII). This model provides the component wise and aggregate values for comparing the existence of tourism infrastructure in single unit value. This model makes possible to compare the TII value of each tehsil to another.

1.6.2.3 Identification of Transportation Facilities through Importance Performance Analysis

First a detail enlisting of existing transportation facilities has been gathering for each tehsil to identify the capacity to their present performance. Later on, the perception of tourist stakeholders' perception on importance and performance of these transportation facilities have been analyzed. The analysis has been done through statistical and graphical method. The statistical tools help to determine the best performing elements and graphical method for select the most important elements which need an immediate improvement in order to improve the performance of the tehsil.

1.6.2.4 Policy Review

Tourism experts from different backgrounds (academicians, industrialists, entrepreneurs, local people, administrative officials) have been provided with a critical viewpoint on the policies. The policy review also has been done through the chronological assessment of related policies to know the characteristics evolution of the tourism industry of the Andaman Islands. Critical analysis has been done to know the positive and negative impacts that are happening in society through the implementation of those policies.

To implement these methodologies the use of means of information technology (IT) helped the study easy and accurate. In this field of IT software play a major role make the Hercules work of research easy. Some of the software have used to present, classify and analyze the data in this research are the following:

Software Used

The software was mainly used to solve the complex problems related to research as process and analyses the huge amount of data and present their output within minimum time and effort. The usage of these software skills have been acquired through the workshops and YouTube tutorials, which is

Arc GIS

Arc GIS is geospatial software to view, edit, manage and analyse the geographical available data. In this research, this software has been used to show the location map of the Andaman Islands. As the Andaman Islands are located far from the Indian mainland and it has been

shown in a separate site map by excluding the Nicobar group of Islands. The other thematic map like distribution of tourism resources, tourism infrastructures and map of transportation terminals with their approaches in Andaman Islands. The shapefile of each tehsil has been prepared through georeferenced map of India and base map of each tehsil has been prepared. Each tehsil maps administrative boundary has been drawn on the basis of Administrative Atlas of Andaman & Nicobar Islands. These base maps have been using tourism resources distribution in each tehsil. There were conventional and non-conventional signs has been used to show the location of the tourism resources, which could easily interpret by a person. The tehsil wise tourism resources with road approach have been shown which indicate the transportation proximity from one tourism resource to another. The tourism resource shown by point symbol, the roads shown by line symbol and administrative area shown by area symbol. The tourism resources of the Andaman & Nicobar Islands have been shown total six maps and each map having same standard of symbols but their map scale size is different. A base map of Andaman Islands has been prepared and used it for study area location map and transportation map of Andaman Islands. The transportation map has been prepared showing the different terminals of Andaman Islands and their connectivity approaches while the study area map showing the location of Andaman Islands in the inset maps Indian Outline map and Union Territory of Andaman & Nicobar Islands respectively. The GIS software has been used because it makes accurate representation of the area location of the map which actually lying position of them in ground.

SPSS

SPSS stands for Software Package for Social Sciences, developed and owned by IBM. It is a software platform to calculate the complex statistical calculation and data analysis. The input of raw data processed in this software and provide most accurate result. For this research work SPSS software has been used for t-test and get the level of significance about importance and performance of transportation facilities. The raw data has been input as MS Excel spread sheet in the software and select the variables (importance and performance of transportation facilities) for t-test procedure. The software produces the t-test result in statement after a single command. The result of each transportation facilities has been noted down manually and presented in a tabular form for further interpretation of that data. The SPSS has been mainly used to calculate the responses about transportation facilities in their variation in horizontal alignment but the relation of responder profile and their response could not study with this software as it very difficult to calculate the selected elements lies in vertical alignment.

STATA

STATA is an advanced software platform calculate statistical calculation with using some coded command with their analysis. This software is mainly use in Data Science but its application is done in different disciplines of natural sciences, social sciences, medicines and engineering. This software mainly used for calculate the relation of responder profile with their responses. The software facilitates to select elements in both horizontal and vertical alignments; and calculate their relation values with a single command.

1.7 SCOPE OF STUDY

This study is mainly deals with the tourism potential in Andaman Islands trough development of transportation facilities in its different parts. The study deals with the transportation facility as regional phenomena, which varies from one region to another. The general physiography, climate and demography of these islands are seeming as homogenous but the nature of transportation facilities and its performance varies in ground. To firm understanding of this variation the study area of these islands has been classified in six tehsil and further micro level study its tourism resources, tourism infrastructures and transportation facilities have been done which are interconnected with each other. Tourism resources attracts the tourist while presence of tourism infrastructures enhance their tour experiences. In all tourism infrastructures transportation consider major determinant for a satisfied tourism experience as it direct relation with the access of tourism resources to the tourist as well as indirectly it determined the development of other tourism infrastructures of the region. Apart from these micro level regional studies of different tourism elements, the study also review the national and regional tourism policies to suggest appropriate strategy for tourism development of these islands.

1.8 SIGNIFICANCE OF THE STUDY

This study is all about tourism development as one of the major aspects of economic activity in the Andaman Islands. The study suggests the importance transportation facilities for tourism which is having the high determining ability to inculcate the tourism potential of an area. The study area is only taken from the Andaman group of Islands that having so many places for point of tourism attractions. These Islands are having a very limited areal extension of 8249 sq.

km among that area 86% part is covered by forest, which is reserved and protected by the Department of Environment and Forest where the development of any economic establishment is not allowed. The major economic activities are confined up to the revenue land of settlement. Apart is the above challenge the fragile environment does not allow for the growth of major industries and unscientific agricultural practices. It makes very limited scope of economic development which could least impact local resources and provide significant benefits in return. Tourism is one kind of economic activity which provide maximum benefits with the least impact on the environment. A sustainable and planned tourism can provide economic benefit through employing local youth and new entrepreneurs, enhancing GDP, increasing foreign direct investment etc. It could also help for social inclusion of local people in tourism-related work, involved them in training and skill development programs, include them in the planning committee, enhance the local art and craft for the global recognition. It also conserves the environment by making the destination as heritage sites, appreciation of the culture and nature, appreciation of the sacral value of the site with tourism education.

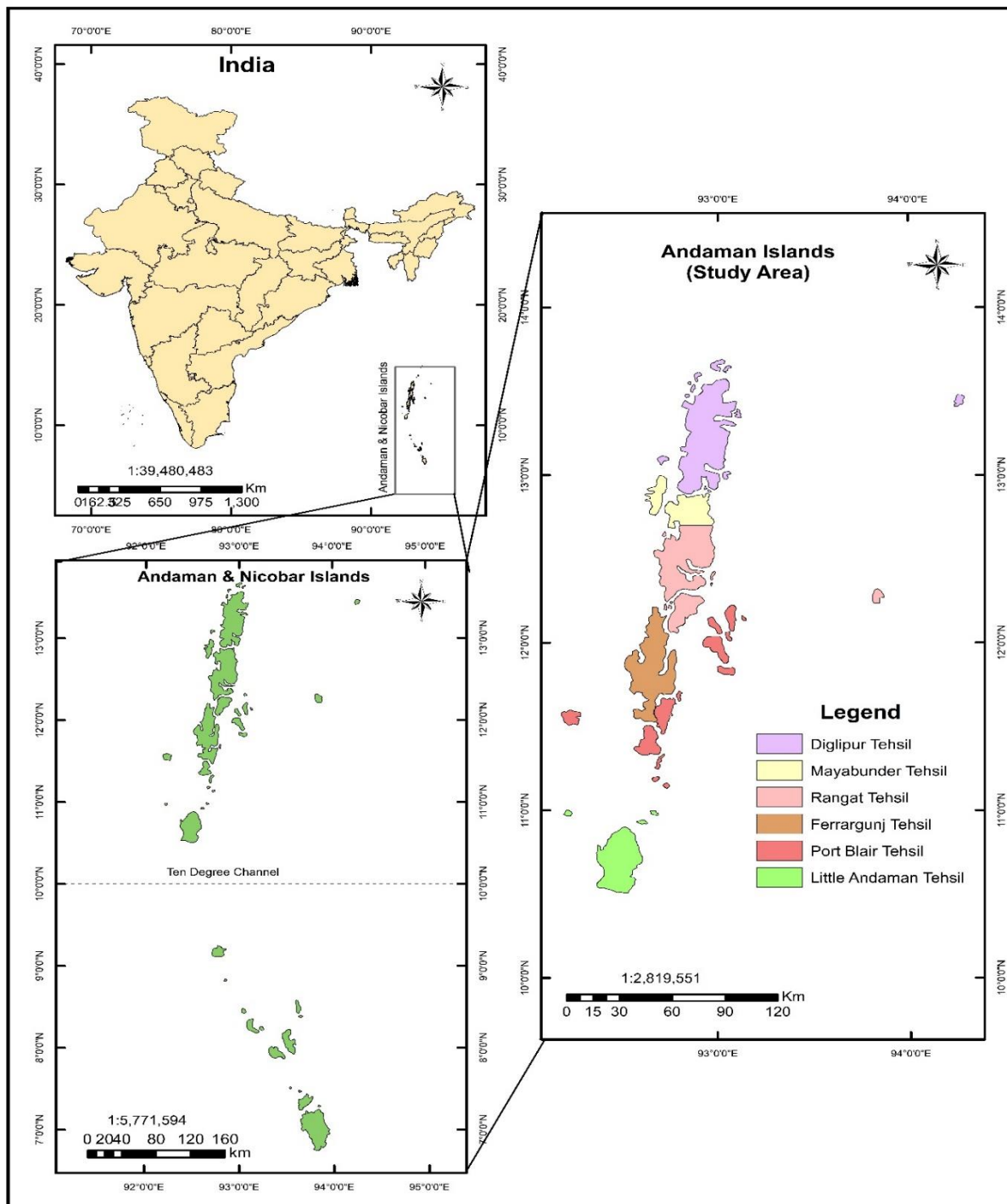
1.9 BRIEF DESCRIPTION OF STUDY AREA

1.9.1 Location and Extension

The Andaman Islands is located in between 10° N to 14° N latitude and 92° E to 94° E longitude at Bay of Bengal. It is the part of Andaman & Nicobar Islands, the Union Territory (UT) of India. It is located in the Bay of Bengal. These islands are separated from the Nicobar Islands through the "Ten Degree Channel". The channel mis name after its location parallel to the 10° of latitude. The channel is 278 km long, 40 km wide and 1.2 km deep. The islands are extended in a form of an arch formation with a length of 352 km from Landfall Island in north and Little Andaman Island in the south. The average distance of these Islands from mainland India is 1200 km. The major Indian coastal cities like Kolkata, Vizag and Chennai are located at 1150 km, 1200 km, and 1250 km respectively. The national capital New Delhi is 2480 km far from an aerial distance. The far remoteness restricts the exotic species to mix here and give chance to grow the biological resources with high endemism. It provides specific species of flora and fauna. These flora and fauna are potential biological tourism resources. Apart from the biological resources significance these is a geopolitical significance of the islands. It is near to the foreign countries than the Indian mainland. Islands are located in surrounded by Myanmar

(626 km) and Thailand (880 km) in the North, Indonesia (733 Km) in the south, the Andaman Sea in the east and the Bay of Bengal in the west. Coco Island (Myanmar) is just 40 km far from the northern tip of Landfall Island and Java Island (Indonesia) is 733 km far from the Little Andaman Island. The remoteness also checks the urbanization than other parts of Indian Sub-continent. One could find peaceful environment far from the busiest cities. Proximity to South Asian countries provide opportunity to connect them with the international tourism circuit.

Map 1.1: Location Map of Study Area: Andaman Islands



Source: Census of India-Administrative Atlas, Andaman & Nicobar Islands, 2012

1.9.2 Geography

1.9.2.1 Physiography and Relief

The Andaman Islands are extended in linear arc formation that explains these Islands were emerged due to the convergent movement (mountain building) process. The formation of the islands takes place through geological evolution like upheaval of landmass, subsidence and volcanic process. In many parts of Andaman, the submarine hilltops provide a platform for the coral reefs to the formation of coral islands. Coral reefs could be seen near to the coral made islands and it is also formed on the submerged hill platforms. Few islands like Ritchie's Archipelago are of coral origin, forming on the accumulation of dead coral colonies. The coral is a major point of attraction for the world over tourist especially for the Europeans and its only found in the tropical shallow water with exclusive suitable conditions to thrive the coral polyps. These islands are mainly composed of two sedimentary series of rocks serpentine and grabbed. Igneous rock is also altered the geological formation of the islands in most places. These islands have emerged a range of Arakanyoma from the Bay of Bengal. The irregular terrain formed due to the irregular occurrence of endogenic forces. The plate movements is the one of the major factor. The Andaman Nicobar plate had been gradually shifted into the Indo-Myanmar plate. As these Islands are located on the plate margin the volcanoes have formed along with the convergent plate boundary. Barred Island (active volcano), Narcondam Island (extinct volcano), and mud volcanoes formed along with the Islands. These kinds of islands are rich in igneous rock. Barren is a volcanic island. It is the only active volcano of India. It could be more attractive for the domestic tourists because no any other part of India has this physiographic feature. It can only observe by a far safe distance because it is vulnerable and explosive. Nearby observation could be threat for health and life while extinct and mud volcanoes could be observed closely. The highest point of the island is named saddle peak (732 m) located of North Andaman Island. The volcanic origin Narcondam Island is having the second highest point, followed by some major peaks i.e., Kala Pahad (Ford's Peak) (426 m) in Rutland Island, Mt. Harriet (353 m) in South Andaman and the only peak of the Little Andaman Island is having the height of 182 m, rest of the terrain is flat here. Peaks and valleys provide panoramic view for sight-seeing. Saddle Peak and Mount Harriet could be a trekking and picnic spot for the leisure seekers. In between these peaks, the major valleys are found like Mc Cathy Valley, Rangat Valley, Panchavati Valley, Burham Valley, and Valley Ground of Middle Andaman (Aka. Billyground). The coastlines are formed by numerous creeks, backwaters, bays, straits

and lagoons. The indented coastline provides some of the best natural harbours i.e., Port Blair, Port Meadows, Port Campbell (South Andaman Island), Mayabunder Harbor (erstwhile Bonington), Diglipur Harbor (Erstwhile Cornwallis), Stewards Sound Harbor (North Andaman Island), Kwangtung Harbor (Western side of Humphrey and Middle Strait). The natural harbors provide safe parts and place for making water sports sites.

1.9.2.2 Hydrology

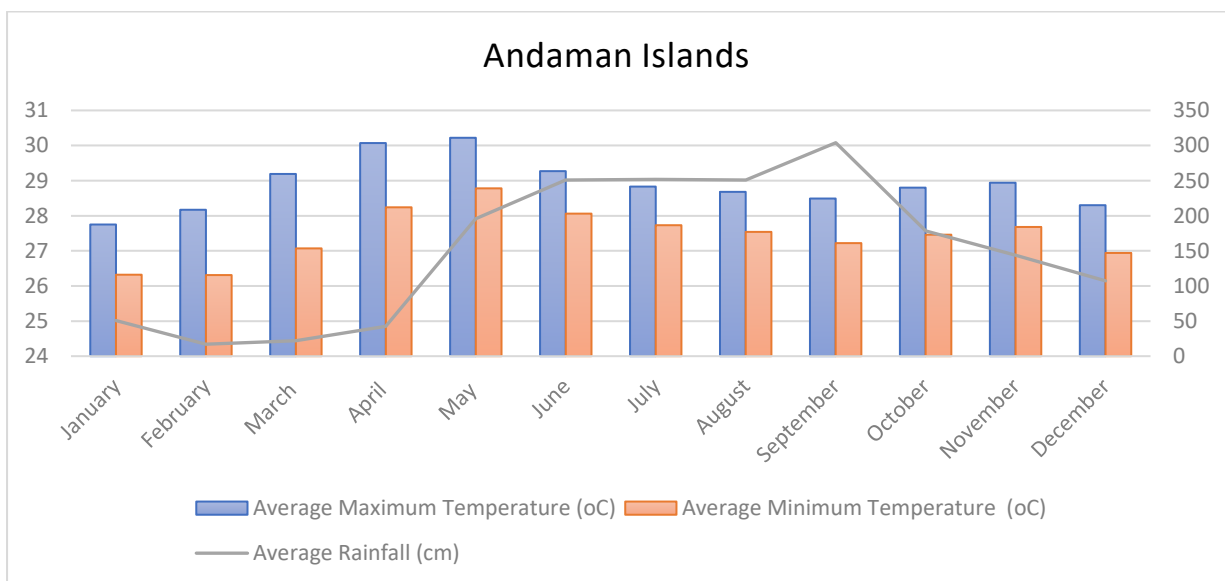
Rain is the primary source of water on the islands. In the rainy season, Nallah (streams) rush downhill in torrents carrying fertile topsoil and mud to the sea. The low underlying terrain causes high run off and most of the runoff flow towards the sea. The concentration of watersheds is high on the eastern coast of the islands. The springs are the perennial source of water, that distributes its water to the entire parts of Great Andaman Islands. Groundwater is the major source of water in Little Andaman Island and an island like Swaraj Dweep. Kalpong River and its associate streams are located in North Andaman Island, CFO Nallah, Brumvally Nallah in Middle Andaman Island; Jharna Nallah and South Creek stream in Baratang Island; Dhanikhadi water storage dam and Dilthaman Tank in South Andaman Island, Ford's stream in Rutland Island, R.K. Pur Nallah, Vishnu Nallah in Little Andaman Island are the major source of surface water for their respective islands. Kalpong River provide 14.83 MU unit of electricity and water for the users of the local area (North Andaman Island). This electricity and water could also use in hotels and restaurants to serve the visiting tourists along with the local residents. Other major streams and springs are also the other source of surface water used by residents and tourists.

1.9.2.3 Climate

These islands are located in between the parallel's tropic of cancer and the equator. The tropical climate is dominated by high humidity prevailing throughout the year. High humidity causes high evaporation but the proximal presence of the sea causes high moisture content in the air. Hence, the high humidity moderates the climatic conditions. Aggregately it could conclude that these islands are having a typical tropical Island climate. According to Koppen's Climatic classification (1918,1936), the islands are fall in the 'Am' type of climate. Tourist who does not like extreme climatic conditions should visit these islands. The atmosphere temperature never goes down to 18° C. The day of 27 January 2020 was the coldest (19.1°C) of the decade (it is recorded at 0500 hours at Indian Standard Time). It shows that the climate over here is

winterless. Most of the rainfall occurs during the southwest monsoon (June to October) and the northeast monsoon (November to December) season. The occurrence of the rainfall is uncertain even in the dry season (January to May). In the rainy season, cyclonic rainfall occurs on these islands. Most cyclone moves from these islands to the eastern coast of India (the direction of the cyclone is often east to west). Both dry and wet season is having its unique kind of characteristics. The water sports, trekking, game fishing, flea market could be enjoyed in summer season while monsoon festival is quite famous among the tourist who like rainfall and wet season. Hot and humid climate provide a perfect destination to the tourist for sun basking and sun-bath at coastal sites. As the mean annual precipitation is more than 300 cm. Accumulation of the water in monsoon season could facilitate the tourist (as extra population to these islands) in the dry and peak tourism season while high intensity sunlight in summer could help to produce solar energy to facilitate to run the electrical and electronic equipment in the hotels.

Figure 1.1: Average annual rainfall and temperature of Andaman Islands, 2021



Source: Indian Meteorological Department, 2021

1.9.2.4 Flora and Fauna

The natural vegetation of the Andaman Islands sets in distinctive layers. From the coast to the interior part of the islands the vegetation is generally distributed as mangrove, littoral, and evergreen forests share most of the natural vegetation. This primaeval forest is further classified into the three-storied canopy – giant evergreen forest, evergreen forest and shrubs with mixed

deciduous trees (in descending order from their height). Mangrove vegetation is the transition zone for the island territory and marine water). This mangrove vegetation is having many environmental significances like it protects the coast from sea erosion and extreme hydraulic events like a tsunami, tides etc. It also provides unique ecosystem support for both territorial and aquatic organisms. Behind these mangroves vegetations, the littoral forest work as 'Wind Breaker'. 'Pandanus' (screw pine) is one of the species of this kind of forest that provide stable flood for the local tribe. The remote location of these islands causes high biological endemism (10% floral and 14% faunal endemism) which makes this forest the ecological hot spot. Islands are blessed with 2000 indigenous angiosperms, 500 exotic species and 100 Fern species. Padauk, Pynma, Teak, Black Chuglam and White Chuglam are the major timber producing trees found in the forests.



Image 1.1: State Animal - Dugong

Image 1.2: State Bird – Andaman Wood Pigeon

Source: Andaman Holiday (Travel Website),2022

There is a total of 6119 species of fauna have been recorded in these islands, among them 631 (10%) species are endemic. The most ferocious endemic mammals are the Crab-eating Macaque and Andaman Wild Pig. Andaman Wild Pigs are the main diet of the autochthons i.e., Jarawa, Ongee, Great Andamanese etc. Other small species of mammals are terrestrial shrews, bats, and rats (a total of 46 species in mammals) while elephants, goats, cattle and deer are exotic species. These exotic species introduced by colonial people and settlers. There is a total of 778 different species of reptiles found. Among them Saltwater crocodile Andaman water monitor lizards, Olive green, Ridley leatherback and Hawkbill turtle, Andaman day lizard and Ghechko are the major types. A total of 32% of reptile species are endemic. Avifauna plays a major role to spread the vegetation by spreading their seeds in different parts of the woods. There are 270 species and sub-species birds are found in these islands and among them

39 per cent of species are endemic (Dhingra, 2005). Name of some endemic species of birds are Narcondam hornbill, Andaman teal, and Grayrumped swiftlet is the edible item for Mitochthibs- Great Andamanese. The seasonal migrating birds are Horsfield's bronze-cuckoo, Zeppey's cather and Javan pond heron. Common mynah, House sparrows, and Grey partridge. Peafowl and peacock are some exotic species introduced to Netaji Subhash Chandra Bose (Ross) Island. Flora and fauna are the special attraction of a tourist destination. As these islands are biological hotspot, it attracts the environmentalists, scientists and the person who are interested in ecological diversity. State representative flora and fauna could represent the environmental characteristics of the place. The visitors will mostly like to watch these biological species in their natural environment.

1.9.3 Brief History

History is based on recorded shreds of evidence and the source of observation. The history of these islands could classify into three periods based on the event of the British Colonial occupation i.e., pre-colonial era (before 1858), and colonial occupation (1856-1947), post-independence period (1947- present). Three periods of historical background attract the scholars and the person who are particularly interested in to watch the remaining of these historical events. One of the most interesting facts about its history is the nomenclature of these Islands. There is a different view given for its name. According to the chroniclers, the name of these islands is associated with the epic 'Ramayana'. As per legend, these islands were the first choice of site for making a bridge to Lanka to rescue the Sita. This led to the link of the islands with hanuman (a mythological character from Ramayana), who is the explorer of Lanka. The Malayans who were the visitors to these islands called the inhabitants as hanumans and thence it called Handuman or Andaman. Ptolemy is the first person who mentioned these islands on world maps. When he visited these islands, the early inhabitants are called it 'Agadaemon'. Hence the name of its inhabitants is 'Andaman' which is the rendition of the term 'Agedaman' in the seventh century a Chinese traveller, who visited these islands named them 'Andaman'. Followed by explored from different parts of the world that mentioned these islands in their record in different times. The first phase of history remains mostly unknown and full of false perceptions about these islands. In that ancient time, the travelers who visited these islands many of them spread rumors about the native inhabitants that they are dog faced and cannibal. In this modern type these type of legends but curiosity is still remains among the outside people.

Even many of these people wanted to see the autochthons that most of them still living in their primitive conditions.

Image 1.3: Cellular Jail - Erstwhile Kalapani

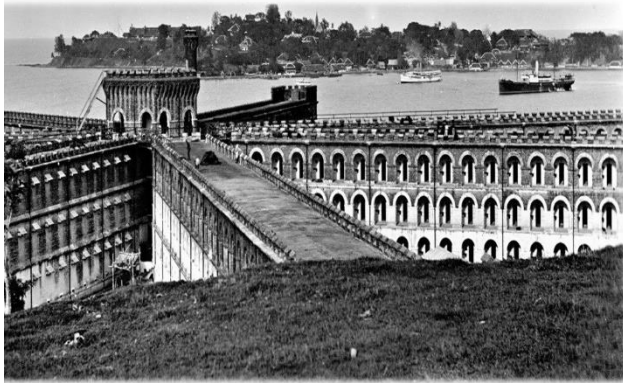


Image 1.4: Netaji on his Cellular Jail visit, 1943



Source: Amritmahotsav Official Website, 2023

The second phase of the history is mostly related with the British Colonial rule and the saga of Indian independence struggle. Their torture and barbarism could be seen through the models kept in the National Memorial Cellular Jail. A significant part of the British Occupation remains could be watch as the ruins of the jails, military barracks. The settlement areas like village and islands named after contemporary British cities and officers. One could relate the present name of the British nomenclature who visit these places. The Japanese occupation remains 3 years in these islands, that could be seen as remains of bunkers and the temple made by them. Balidan Bedi, Humphreygunj- the place of massacre done by the Japanese soldiers to the innocent islanders now become a symbol of patriotism. As per the reliable sources of history in the year 1789 when Lieutenant Archibald Blair (British Navy Officer) came here to survey and hoist the Union Jack. He set up the harbour in these islands because these islands were a strategically important way to South-East Asia. Apart from that the inhospitable climate, ship accidents, and the threat of Malay Pirates are the major issues that attracted the British to make a colony here. The settlement begins here in three phases (phase-1 1789-96, phase-2 1858-1947, phase-3 after 1947). At first, Lieutenant Blair found the south-eastern part of the South Andaman Islands' best site to establish a new settlement. Formally this place is called Port Cornwallis successful accomplishment of the survey of the island led to permission to start a new settlement from higher authority. On September 1789 he had again come here along with two officers, 200 mechanics, craftsmen, sepoy and labourers. 12 acres area of Chatham Island

was selected for the establishment of the settlement. Later on, in 1791 the settlers had brought their families. A few years later Governor-General of India had ordered to shift the settlement to the northeast of the Great Andaman Island (present eastern coast of North Andaman Island) with the same name Port Cornwallis and the former settlement harbour site used to call Old Harbour. The settlement lasts up there to the next three years. The losses of lives led to the closure of the first phase of settlement. For the next 62 years (1794-1854), this island was kept free from the only settlement. The first war of independence (1857) aroused the thought to start the re-settlement of war prisoners to these islands. The second phase of settlement in these islands starts on '22 January 1858 with the raising again of union jack at Old Harbour (presently known as Port Blair) by Captain Man. Captain Walker takes over the charge of these islands on 10 March 1858. He arrived with 200 convicts, an overseer, two doctors and fifty naval guards. So many times, they encounter autochthons and occur major conflicts between them. On 17 May 1859 tribe men fought with British Soldiers. Many tribe men died as their firepower is insignificant (with typical bow and arrows) in comparison to their contrary British Soldiers armed with modern weaponries. That event was famous in the name "Battle of Aberdeen". The destiny of these islands took a new turn when the famous 'Cellular Jail' (building 1856-1906) get ready its gate for the political prisoner. The prisoners are kept of the guilt of political movements like the Khulna Conspiracy, Nasik Bomb Conspiracy, Lahore Conspiracy. The jail was quite infamous for solitary confinement. It is also called as Indian Bastle. The name Kalapani (literary meaning 'Black Water') was quite a buzzword in those days of the Indian freedom movement. Another chapter was added as the Japanese occupation (1942-1945) of the Andaman Islands happened during World War II. Japanese forces were the enemies of British and allied forces. They have war with them throughout the part of South East Asia. At that time, it also occupied these islands. That time known as Japanese Occupation (1943-45) in these islands. The Japanese made bunkers, airfields and tunnels to secure these islands. This place was also part of a war zone as bombardment by British-raid and mass killing by Japanese soldiers of the local population are major torture. Many locals were executed mercilessly on the suspicion of British spies. One of the significant events had happened when the famous freedom fighter Netaji Subhas Chandra Bose visited these islands on 29 December 1943 and raised the tricolour in front of gymkhana ground on 30 December 1945. With the help of Japanese authority provisional government of independent India had been formed and renamed "Shaheed" (Martyr) Dweep but the original control was having to the Japanese, later after it has retaken by the British government. After the end of the war and the British reoccupation, the Imam-ul-Majid become chief commissioner of the A & N islands on February 1947 and he

had continued the position even after the independence of India. With the era of independence, the new phase of settlement (phase-3) in these islands had started. It goes with the rapid increase of the population of the island. The Ministry of Rehabilitation had planned to resettle East Pakistan's refugees. It begins with the arrival of two batches of refugees in a group of 198 families in March 1949. They were boarded on the ship S. S. Maharaja. People from other parts of India (Kerala, Tamilnadu, Bihar, UP, Punjab and Andhra Pradesh) are resettled here through various schemes and later on, other people immigrated in search of employment opportunities (Tripathi, 2016). In this third phase the Indian ocean Tsunami now also became a part of modern history of the islands.

1.9.4 Demographic Characteristics

Recorded demographic data of the Andaman Islands is available from the year 1858 but it is mixed with information with the Nicobar Islands. Separate Andaman demographic information was rare and irregular for that period. The regular demographic census of the Andaman Islands is available from the year 1901. The growth rate of the population was very high throughout the century but it has fluctuated decline in the decade between 1911 and 1951. The negative growth rate occurs in the former one because of the disease outbreaks among the Andamanese tribe and the latter is because of the repatriation and genocide that happened at the time of Second World War. After independence, the growth rate has been grown positively and it was at its peak (158.33%) in the decade 1960s. Population raised after the independence of India because of the rehabilitation schemes and job opportunities. Working population (62%) high than the dependent population (38%). The sex ratio is high (849) in compare with the other Indian states and the literacy rate is 86.3 % which is provide a solid ground or manpower for the tourism industry.

Table 1.1: Demographic Characteristics of the Andaman Islands, 2011

Attributes	North & Middle Andaman	South Andaman	Andaman Islands
Total Population	105597	238142	343739
Male	54861	127283	182144
Female	50736	110859	161595
population Growth	-0.02%	14.23	7.1149
Area Sq. Km	3736	2672	6408
Density	28	89	58.5
Sex Ratio	974	871	922.5
Average Literacy	83.91	89.13	86.52

Source: Census of India, 2011

1.9.5 Socio-Cultural Aspects

For a firm understanding, the different communities of the Andaman Islands are classified into tribal and non-tribal categories. Non Tribals are most dominant as their population is far high than the aboriginal tribal communities. Presently the study area is inhabited by 5 indigenous tribal groups. 4 tribal groups of them belong to the Nigroto race who resided in different parts of the Andaman Islands for immemorial time. Jarawa (*Aang*) reside in the western part of South Andaman and Middle Andaman Island, Ongee Tribe at Dugong Creek and South Bay areas of Little Andaman Island, and Sentinelese at North Sentinel Island. Before the pre-colonial time, there were more than 22 sub-groups were found in these islands and they are estimated from 3000 to 4000 numbers extending from North Andaman Island to Little Andaman Island. They are nomadic in nature and most of them still live their primitive lifestyles, Sentinelese tribe is very hostile and never likes to contact to the outside world. The presently estimated population of these 4 tribes are constitute 1% of the total population of islands. Nicobarese is another tribal community and it belongs to the Mongoloid Race. Nicobarese is the most modern and dominant tribal group of the UT and basically, they are belonging to the Nicobar group of Island. They shifted from the Nicobar Islands to Herminder Bay, Little Andama. Here only 8% population is shared by the tribal community while 92% population are belonging to the non-tribal population are having a diverse language, caste, region, religious background and mixed culture. Apart from the tribal group in non-tribal people the local born community is the oldest clan of these islands' residents.

Local born were the dominant population at the time of independence but after the independence, their proportion got decalin due to receive huge migration from different parts of the Indian subcontinent. The local-born community are the wards of convicts and labourers they brought in bought in the colonial period. They have no specific caste, language or religion. Mismatch marriage was a common practice in those days. As these islands were part of the penal colony. Most of the convicts were male. The number of women was very low at 1 woman to 7 men in a comparable ratio. Now their descendants are called as 'local born' people.

Bantu community presently inhabited Caddlegunj and Aniket village. They were the decedents of declared 'Criminal Tribe' notified by the British Government in India. They were belonging to the united province (present Uttar Pradesh) and the central province (presently Madhya Pradesh). There is a total of 285 Bhantus have brought by the British government from 1924 to 1926.

Ranchiwalas (hardly and capable workers) were employed in the forest department by the British Government from 1925. Most of them were belongs to the Chota Nagpur Region (parts of Bihar, Jharkhand and Chhattisgarh). These families were settled in the decade of 1920s. presently they are settled in Ram Nagar, Karmatang, Jirkatang, Dairy Farm, and Long Island and most of them were settled near the forest camps. In the Post-independence period, the A&N administration resettled 197 families of Ranchiwalas at Baratang Island.

Apart from these local dialect the above three communities mostly use Hindi as their communication language. The other non-tribal community known according to their linguistic background.

Moplah people are the Malayalam speaking Muslim peasant from the Malabar region in Kerala. They revolt against British supported so-called oppressive Hindu landlords during the late 19th century. The convicts of this community were sentenced to life imprisonment in the Andaman panel colony in 1922. Total 1885 Moplah brought by British Government and later on settled around them near to Port Blair. At present time, their main settlement villages are Calicut. Bambooglat, Wimberlygunj, Ferrargunj, Ograbraj and Tushnabad.

Karens are the ethnic community that belongs to the southern parts of Burma (Myanmar). A total of 166 Karen people were bought by the British in 1925 to work as labourers in the forest. They are mainly settled in the villages of the northern part of the Middle Andaman Island like Weby, Karmatang and Lucknow.

Bengali is the most dominant community found in the entire islands. The one-fourth population of the islands speaks Bengali as their mother tongue. Most of them are settled here by the Government of India. They were in these islands under resettlement schemes (1948-75) from East Pakistan and another group of this community belongs to present West Bengal. The latter one was belonging to freedom fighters and workers. The former group formed through resettling of 3694 families in North Andaman Island, Middle Andaman Island, South Andaman Island, Little Andaman Island, Shaheed Dweep, and Swaraj Dweep.

Tamil people had come to these islands for business and job opportunities. Their number has raised during the post-independence period. Another group of this community belongs to the reparation Sri- Lankan Tamil. They were settled by the Government of India was settled in Little Andaman Island in 1965 and their settlement was especially recommended to work for rubber plantations. Most of this community's people are found in Port Blair and its surrounding region.

Telegu people were brought from coastal districts of Andhra Pradesh i.e., Krishna, East Godavari, Vijayanagaram, Visakhapatnam and Srikakulam for exploiting the fishing resources of the island territory waters. Most of them belong to the fisherman occupation settled in coastal parts of the Islands like Hutbay, Little Andaman, Junglighat, Dairy farm, Baratang Island and Nimbutala etc.

Malayalam speaking people belong to the state of Kerala. Most of them came for getting the prevailing job opportunity. They are well skilled in office and management related work. Some of them are also known for farming activities. People of this community settled in Betapur, Middle Andaman Island; V S Pally, Keralapuram in North Andaman Island.

People of the Punjabi community are mainly occupying the business and armed forces. Many of them are also wards of colonial convicts and servicemen. Apart from these major communities, other small groups of people found as Marathi, Burmese, Kanada and Nepali.

About 70% of people are having faith in the Hindu religion. It followed by Christianity (21%) and Islam (8.5%). The other religion like Sikh Buddhist Jains, are very few in number aggregately they do not make even (0.50%) of the population Dusshera, Deepawali, Holi, Eid, Christmas are the major festivals celebrated in most of the islands. People of the other community invite and help to celebrate another group. This cultural milieu and feeling of integration make these islands 'Mini India. Art- handicrafts, folkdance, folksongs, festivals,

traditional cuisine, multiethnic, cultural landscape attracts the tourists. Filmography and contact with aboriginal tribesmen are not permitted. But their folk culture and art could be shown by souvenirs shops and theme restaurants to promote the tourism.

1.9.6 Economic Sector

A fragile environment, limited resources and low level of technology cause limited economic sectors in these islands. Local peasants and farmers are working in the agricultural sector to grow food grains, vegetables, fruits and cash crops. Rice is a staple food cultivated here in the wet season only. Pulses, seasonal fruits, leafy vegetable through the farming activities. Arecanut and coconut are the major cash crops. Food crops share the largest yield of agriculture but its scope is limited as the crop fields are becoming residential areas, infrastructure and plantation grounds. Long coastline (1912 km) and extensive (600000 sq. km) EEZ provide a wide opportunity for coastal and offshore fishing. Mackerel, Sardine, Tuna, Crab, and Prawn are the major marine produce while Silvercup, Helsa, and Magur (Catfish) are produced in freshwater tanks. Apart from domestic animals like Hen, Duck, Koel, Goat, Pig, Cattle are tame for their animal products. Stone querying is a mining activity conducted through open surface mining only. Plantation of timber producing trees comes cinder the forestry activities. The commercial trees are Teak, Padauk, Mahogany, Black Chuglam, Dhup Trees etc. It is only produced by the Department of Environment & Forest. Apart from these primary activities the islands people are involved in secondary economic activities. Self-help groups like Naari, Yuva- Sakthi, Surbhi, and Saheli encourage the local youth in cottage industries like manufacturing paper cups, jute products, pickles, tailoring, and souvenir making. A small number of residents are engaged in mason and carpenter related work. Lack of skilled labour is one of the major reasons that skilled and semi-skilled workers come from other states. The local people not take interest in most of the manufacturing works. Government service is the largest sector to contribute to the tertiary activity. The private sector includes business, health, education, petty services and tourism. Different sectors of economy support the tourism industry. Agricultural sector provides food crops, vegetables, fruits and medicines. The non-vegetarian diet materials are getting from the marine culture and livestock rearing. The cottage industry provides souvenirs, small utilities products, pickle items, and the dresses through the tailoring. The skilled and semi-skilled labors make residential and allied infrastructures for the tourists who visit these islands.

1.9.7 Administration

The Andaman Islands are having only two districts as 'North and Middle Andaman' and 'South Andaman'. Each district is having 3 tehsils i.e., Diglipur, Maybunder and Rangat thesil come under the North & Middle Andaman; and Ferrargunj, Port Blair, Little Andaman in South Andaman. The study area is a part of UT, so it is directly controlled by the central government. The Lieutenant Governor is the supreme administrator and the chief secretary is the executive head of the secretariat. Each department is controlled by the respective secretariat. At the time of independence, the chief commissioner was the head of the islands but afterwards, this post is exchanged with the Lieutenant Governor. Each district is administered by an assistant commissioner under the control of the deputy commissioner. This administrative hierarchy is top to bottom. From the grass-root level. Panchayat Raj Institution (PRI) works in these islands on a basic level model. The village panchayat is worked at the village level and it administrates 3 to 4 adjutant villages. Several village panchayats functions under the Panchayat Samiti. The head of the Panchayat Samiti is called 'Pradhan'. Zilla Parishad work at the district level. This three-tier system is called PRI. They are the elected representatives of the local public. There is only one seat for a Member of Parliament (MP) representing the legislative interest of these islands' people. The Andaman Islands has prominently classified into tehsil for this study. Description of each tehsil is given below:

1.9.7.1 Diglipur Tehsil: Diglipur is the northernmost tehsil of the UT and share largest proportion (1523 sq km) of area among all tehsil of the Andaman Islands. This tehsil is having total 72 villages which is inhabited by 43183 people according to the Census of India, 2011. The southern part of this tehsil near by the Mayabunder Tehsil. Subhashgram Market is the transportation hub of this tehsil. This place connected with other tehsils.

1.9.7.2 Mayabunder Tehsil: Mayabunder Tehsil located in between north in Diglipur and South in Rangat Tehsil. The part of Interview Island, Curlew Island, Aves Island, and Sound Island come under the administrative boundary of this tehsil. This tehsil comprises of 857 sq km of land. Total 47 villages are come under the administrative boundary of this tehsil. Which is inhabited by 25788 population according to the Census of India, 2011. Mayabunder Market is the main transportation hub of this tehsil.

1.9.7.3 Rangat Tehsil: Rangat Tehsil is located between north in Mayabunder Tehsil and South in Ferrargunj Tehsil. The part of Middle Andaman Island, Baratang Island, Long

Island, Strait Island, are come under the administrative boundary of this tehsil. This tehsil is consisting of 1355 sq km of land. Total 79 villages are come under the administrative boundary of this tehsil. Which is inhabited by 366216 population according to the Census of India, 2011. Rangat Market is the main transportation hub of this tehsil.

1.9.7.4 Ferrargunj Tehsil: Ferrargunj Tehsil is located between north in Rangat Tehsil and south in Port Blair Tehsil. The northern part of the South Andaman Island, Jolly Bouy Island, Redskin Island, Cinque Island, and Viper Island under its administrative boundary. This tehsil is consisting of 1085 sq. km. of land. Total 65 villages come under its administrative boundary, which is inhabited by 53565 people according to the Census of India, 2011. Bambooflat Market is the transportation hub of this tehsil. This jetty is just situated along with this market and also connected with the local four wheelers and buses.

1.9.7.5 Port Blair: Port Blair Tehsil is located between north in Ferrargunj and south in Little Andaman Tehsil. The southern part of South Andaman Island, Netaji Subash Chandra Bose Island, Swaraj Island, Rutland Island come under its administrative boundary. This tehsil is consisting of 1289.40 sq. km of land. Total 30 villages and a municipal council come under its administrative boundary. The number of villages are lowest but the inhabited population is 65754, which is the highest as compare to the all-other tehsils of the Andaman Islands according to the Census of India, 2011. Aberdeen Bazar is the main transportation hub of this tehsil. The airport is 3 km and harbour are 4 km far from this place. The capital city of the UT i.e., Port Blair come under its administrative boundary.

1.9.7.6 Little Andaman: Little Andaman Tehsil is located between Port Blair in north and the Car Nicobar Tehsil is in south. It covers the entire Little Andaman Island under is administrative area, which cover 707 sq km of land. It is smallest tehsil as compare to area and its population. Total 16 villages come under its administrative boundary which is inhabited by 18823 people according to the Census of India, 2011. Hutbay Market is the main transportation hub of this tehsil. It located 3km far from the port which connect it the Port Blair.

1.10 TOURISM TREND IN ANDAMAN ISLANDS

According to IP&T 2019, there was 498784 domestic tourists have visited these islands came from different part of the country. The flow of tourist dramatically rose till the year 2004 and at the end of this year the smaller number of tourists are started to visit this island due to the 26 December 2004 Indian Ocean Tsunami caused a massive negative impact on tourist arrival. It was a massive hit on Island tourism industrial history ever. The disaster causes psychological trauma and the threat of different diseases among the tourist who was willing to visit these islands. In the year 2008, a small fluctuation has seen in the growth rate (Figure 1.1) which may cause for due to the influence of the Mumbai Terror attack and economic deflation in the country. The tourists from the different foreign country visit the islands to see the coastal tropical environment, marine resources, beaches and cultural features of these islands. The International and national flight services facilitate the foreign tourist to these remote islands easily from the last decade of the 20th century. There were 34490 foreign tourists has visited in the year 1991 and after this period the numbers of foreign tourists has increased slowly and gradually, the growth of foreign tourist's visit has increased by several fluctuations due to the different issues like exchange rate, changing of foreign policies and the international relationship between different countries, threat and disaster. A serious change of foreign tourist trend has observed in the period 2005-2006. The massive fall of tourist in the year cause for tsunami hit these islands in the year 2004 and a sudden huge increase of no. foreign tourist after this successive year caused for destroying of coral –marine resources of neighbouring countries like Thailand (Rittichainuwat, 2006) and tourist sites attract them to these islands due to the similar resources was still sustaining here with little damages.

Figure 1.2: Growth rate of Total Tourist in Andaman & Nicobar Islands, 1991-2022



The growth rate graph of total tourist flow in these islands is very similar to the trending growth rate of the domestic forest because the domestic tourists are more in numbers than the foreign (international) tourists. After the earthquake and tsunami on 26, December 2004 the mode of transportation got severely influenced, the Public and defence transportation means are engaged in relief and rehabilitation services in these islands. In the end of the year 2020 the whole world as well as this island tourism industry also negatively affected by the COVID pandemic. The tourist's movement has been fallen down throughout the year 2021. The tourism trend has been again upraised after getting the worldwide vaccination drive for this pandemic with prevention measures.

1.11 ORGANIZATION OF THE THESIS

Chapter 1 introduce the entire research structure briefly. It includes the conceptual framework, research problem, review of literature, research gaps, objectives, data sources and methodology, software used, scope of the study, significance of study and chapterization. Chapter 2 discussed the distribution of natural and anthropologic (cultural) tourism resources. Chapter 3 described the concentration of tourism infrastructure. Chapter 4 deals with the identification of transportation facilities. Chapter 5 reviews different tourism policies for the context of tourism industry of these islands. Chapter 6 presents the entire summary and conclusion of the study. This chapter also discussed its limitations and strategy for future tourism development.

CHAPTER-2

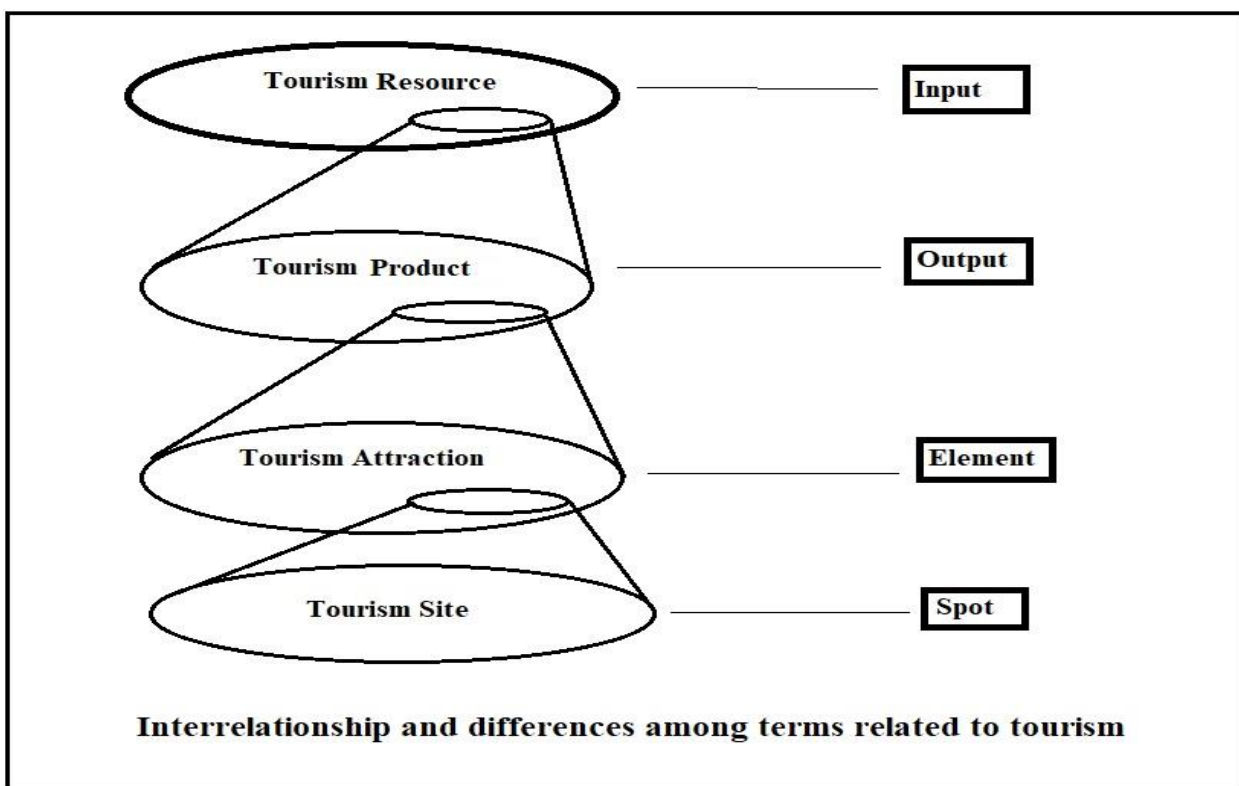
TOURISM RESOURCES OF THE ANDAMAN ISLANDS

A successful tourism goal could be achieved through sound tourism development planning. Tourism planning is the overall process of deploying the development goals and the implementation of a comprehensive tourism system (Chao-Zhi & Tao, 2017). The planning includes the management of fundamental elements of tourism i.e., tourism products, attractions, resources, and sites. First, there is a need to understand the meaning of resource and tourism resource to understand its meaning. In economics, the resource is the service or other asset used to produce goods and services that meet human needs and desires. In the same way, tourism resources are the service or assets used to meet the needs and satisfaction of the tourists at the destination. According to the SAGE International Encyclopedia of Travel and Tourism (2017), the tourism resources are natural and man-made attractions, infrastructures, services, and the conditions that attract tourists to an area and may contribute to the formulation of a tourism destination. In general, resources are the medium to achieve satisfy the need while a product is a result. The second term that need to understand is a tourism product. A tourism product is having the instinctive value to fulfil the need of the tourist, it could be a thing, place, person, event, or activity. It satisfies the leisure, pleasure, or business needs at places other than the residence (Dixit & Sheela, 2016). Some products are tangible-intangible, consumable and non-consumable, or subject to reliability. In simple words, tourism product attracts tourists to the tourist destination. The third term is tourism attraction. Tourism attraction is the one of the elements of tourism product, In the presence of tourism attraction only a tourist would be encouraged to visit that particular place (Tourismbeast.com, 2002). Dixit and Sheela, 2016 explained tourism attraction is a user's presence phenomena that brought to the user. The user has to come to the tourist destination personally to use and visit it. There is a thing to need firmly understand that attraction not a destination itself whether it located within the destination or it could say that tourism attraction lies within a tourist destination. Fourth term is tourist destination, which is a place that relies heavily on the economic benefits of tourism (Tourismteacher.com, 2022). It is a spatial phenomenon which is located at a specific location and offers attractions.

These terms are interconnected with each other (Figure 2.1). Even sometime they encroach on the respective fields but their function is different. There is a vital need to understand the differences and hierarchy between these terms. Figure 2.1 is explaining the difference and relationship among these terms. Tourism is a kind of service industry and its also produce output. That's why many times, tourism products and resources consider synonyms but that varied as per their academic meaning.

Sometimes the tourism attractions are misunderstood as only tourism resources themselves, but tourism resources is a holistic term while tourist attraction is part of it. The similarities between them are both tourism resources and attractions have natural and man-made elements but the tourism resource is having a broad concept which includes infrastructures and other facilities. According to Swain and Mishra (2015), the tourist attractions are made of natural and cultural tourism resources. The above statements seem contradictory. Through an analytical observation, it could be noticed that both terminologies of tourism resources and tourism attractions are used interchangeably for each other.

Figure 2.1: Hierarchy between the terms related to tourism



So, it could say that the meaning of these terms may vary from content to content and studies. The world of academics also ambiguously uses these terms in each other place. According to Luyou Xuekan (2014), most Chinese scholars use tourist attractions term as scenic spots. They use connotation of tourism resources in China is equivalent to that of the term tourism attraction as used by Western Scholars. Jufang and Xinui 2014, mentioned the word tourism-attraction is having sufficient ambiguity to allow it regarded variously as a tourist attraction, tourism resource, scenic spot or tourist area.

Meanwhile, we could understand that site is a spot, the product is an output, attraction is an element of the product and tourism resources are the overall assets of a particular tourism destination. In this study, each tourist site is dominated by a particular type of resources characteristics. For this study, the tourism resources term would use for these tourism sites with special tourism features. Their specialty and different types could be firmly understood by the schematic diagram of tourism resources classification (Figure 2.2). This classification scheme has been taken from Knezevic (2008).

2.1 CLASSIFICATION OF TOURISM RESOURCES

2.1.1 Natural Tourism Resources

Climatic, topography or altitude, geological structure and petrological characteristics are the basic factors that cause regional differentiation of natural tourism resources. Geomorphological Tourism Resources are the geomorphic landscape with an aesthetic value that formed as a result of geological processes on the earth's surface. It includes mountains, hills, valleys, plans, landforms, and volcanoes having tourism values. It is formed due to the landform evolution through geological agents. These factors may be endogenic or exogenic in their origin. The geomorphological resource is further classified and it found as five subcategories i.e., beaches, islands, relief features, geological phenomena, and volcanoes. Beaches are the coastal depositional landform. It constitutes granules and broken particles of sea creatures, skeletons, rock debris and mud. The sea currents and coastal location are the main determinants of its formations. The beaches are profoundly found mostly along the island. It formed through the depositional actions of sea waves and currents. Islands are the regional phenomena and medium scale landform origin due to the tectonic movement, volcanic activity and accumulation of remains of sea creatures like large coral reefs. Relief features are the terrain structure of the earth's surface. It may include mountains and their associates – hills peaks, plateau, plain, valley, coastal plain, desert. Geological agents like surface water, ground water, air, and sea waves create different landforms. Wind creates aeoline, surface water creates fluvial, groundwater creates karst, and seawater creates coastal landforms. All are formed by erosional and depositional formation. Volcanos form through the Endogenic forces. It is generally a vent open on the earth's surface and erupts the materials like magma, lava, ash, fumes and mud. According to their activities, irrupted material and forms of eruption. It is classified as a different type of volcano. sometimes these underwater volcanoes are becoming a platform for an island or an emerged volcano from the water surface becomes a volcanic island. Volcano is a rare tourism resources found in the Indian subcontinent.

The aggregate weather condition makes the climate of a particular place. The weather conditions of a particular place suitable for tourism activities become climatic tourism resources. These weather conditions affect the comfort of tourists at the destination. The most common goal of climatic tourism resources is to protect the tourist from extreme climatic conditions.

Hydrological tourism resources are resource systems with tourism value composed of water bodies. The hydrosphere is a collective term for all water bodies. It includes the oceans, rivers, lakes, swamps, glaciers, and groundwater. The aesthetic feature made these water bodies utilized for tourism purposes are generally called hydrological tourism resources. It includes rivers, streams, check dams, multipurpose projects, lakes and associate phenomena. The water activities available in the site also consider as tourism resource.

An area consisting of a specific biological community with tourism and aesthetic value is called biological tourism resources. Different flora and fauna under varied geographical conditions have made extensive features of tourism resources on the earth's surface. All living Organism that has utility for the tourism activity is called biological tourism resources. Broadly, the biological kingdoms are classified into animals, plants, and micro-organisms. All-natural vegetation comes under floral tourism resources and wildlife or livestock organisms as faunal tourism resources. It also includes the activities like safari, bird watching, heritage or explore walk and excursion.

Protected natural heritage is having an outstanding uniform value in line with the principles of integrity and under the management framework of effective protection. From the perspectives of science, resource conservation and aesthetics. Article 2 of the World Heritage Convention Classified natural heritage as natural features, geological and physiographical formations, and natural sites.

2.1.2 Cultural Tourism Resources

The basic factors that cause a regional differential in cultural tourism resources are the history, culture, tradition, and customs of the inhabited community. Apart from these cultural elements the natural factors also determine the type of cultural tourism resources. According to the Dictionary of Geo-tourism, 2020 the factors of geoscience assess the causes of formation, distribution usage of formation, distribution, usage, and preservation of the cultural landscape. The classification is preliminary based on their nature i.e., cultural tourism resources are tangible and intangible resources. The tangible resources are physically available for utilization while the intangible resources are related to the elements of human beliefs, rituals, practice and customs. The manmade physical utility built-up sites and their parts that have aesthetic and tourism value are called tangible cultural

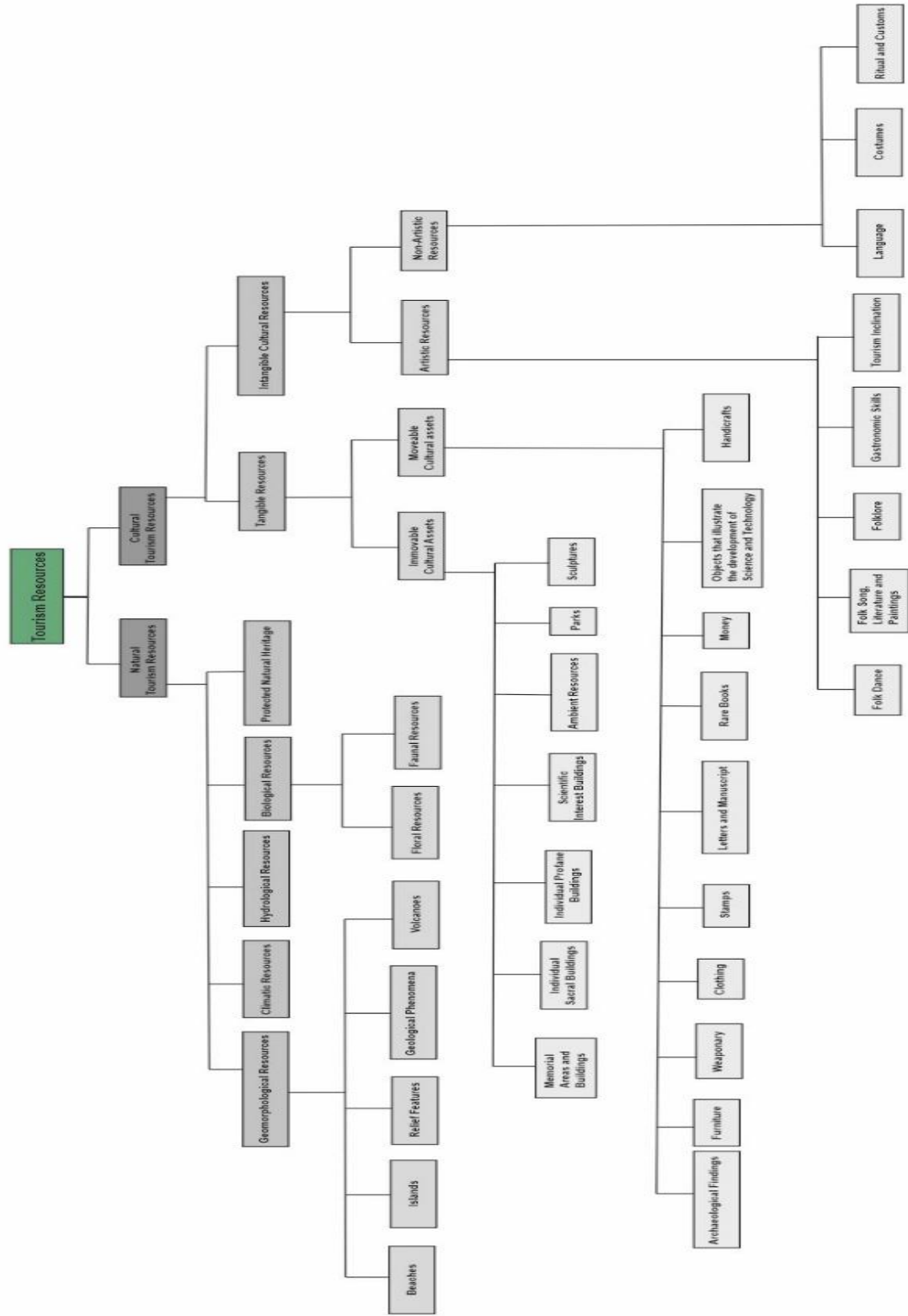
tourism resources. The resources may create or conserved tourism for example material of ancient and modern ages. The prominent buildings, monuments, ruins, castles, tombs, temples, dwellings, villages, and their associate could consider tangible cultural tourism resources. The tangible tourism resources from one place to another are called movable cultural assets. These things may with wheels, are small in size, and are easy to carry, in their nature. The cultural assets that are statutory in nature, heavy, large in structure fix from the ground are called immovable cultural assets. According to their importance, manufacture, and purpose, these cultural assets are classified in further subtopics as memorial areas and buildings, individual sacred buildings, individual profane building, scientific interest building, ambient resources, parks, and sculptures. Most of them are buildings and related to the area's specific interest. The memorials are specially constructed for the memory of any person, creature, period, or event. Individual sacred buildings are the built-up spiritual, faith, and theological philosophy. Non-famous buildings or built-up sites are considered here as individual profane buildings. If this profane building comes under the category to develop scientific temperament, it will come under the scientific interest building. The associated resources of the above are subclassified and considered ambient resources. Park is a site for recreation made of natural semi-natural and human environment. Parks are decorated with ornamental trees, playing equipment and sculpture. These sculptures may be human or non-human, full or bust, ordinary or exceptional pieces of work. The type of sculptures also varies as per the material has been used.

Movable cultural tourism resources are further classified as archaeological findings, furniture, weaponry, clothing, stamps, letters and manuscripts, rare books, money, objects, illustrations, science and handicrafts. This tourism resources could be swift from one place to another for the exhibition purpose. The archaeological findings are related to human society and the past. The furniture related to aesthetic, economic and historic components become an important part of tourism. Old weaponry shows the glorious past, and modern weaponry represents the present military strength of the territory. The weapons mounted and displayed in important places inculcate aesthetic value as well as the reuse of the decommissioned weaponry. Although, the clothing represents not only social needs, it is also a kind of play metric, cultural, and institutional traits. Stamps are generally used for posting, but it is also a hobby to collect these stamps. The government release different type of stamp on the special occasion for inculcate values among the collectors. These stamps become attractive elements for those collectors. Manuscripts are strong evidence of history, reports and events. Most of the histories base and assessed upon these manuscripts and letters. The writers collect this kind of information and store them as books. Many books are printed in limited numbers. Those books are becoming showpieces for the readers. Like the stamps, the money materials i.e., currency, coins, and old and rare collections become a matter of amazement for many people. The money material

belongs to any special person, or event, becomes the point of attraction, and it is kept in museums for display. That things of science like the telescope, microscope, materials of scientific tricks could be presented to people in an artistic way and artistic handicraft materials. Their scientific application and activities inculcate learning, appreciation, and aesthetic values.

The intangible cultural tourism resources are related to the spiritual aspects of a society used to inculcate tourism or aesthetic value are called tangible cultural tourism resources. Oral pieces of literature, performing arts, social customs, traditional handicrafts and forms of visual arts, and culinary skills are an example of intangible cultural tourism resources. The part of entangled culture has some traits that are classified into artistic and non-artistic resources that attract tourists. The artistic traits are to develop through special efforts and interests i.e., folk dance, folk song, literature and paintings, folklore, gastronomic skills and tourism inclination. Most of these artistic traits are belongs to two communities but many of them become part of general society. Gastronomic skills of a particular region now become a global attraction. Specific cuisines become resource for the destination. As tourism inclination the local bodies organizes events, programs and festivals to promote tourism through a different theme. Apart from the artistic traits, there are many non-artistic elements used in the daily life of a community to attract tourism-seeking people. The non-artistic traits are classified as languages, customs, rituals and customs of the host community

Figure 2.2: Classification of Tourism Resources



2.2 DATABASE AND METHODOLOGY

2.2.1 Database

In the first step of tourism planning comes the selection of tourism resources from the destination. The core function of the tourism resources is to provide the facilities and entire tourism experience through their visit. The islands are blessed with both natural and cultural tourism resources. Among these resources most of them are beaches. This classification also provides the fundamental framework to identify the potentiality to tourism resources. There is total 100 tourism resources have been taken from the different tehsils of the Andaman Islands. These resources are also grouped according to the adopted classification (Figure No. 2.1). The tourism resources are further evaluated for selection of significant tourism resources for respective tehsil.

Table 2.1: Classification of tourism resources in the Andaman Islands.

Type of Tourism Resources	Sites
Natural Tourism Resources	
Geomorphological Tourism Resources	
Beaches	Kalipur Beach, Lamiya Bay Beach, Radhanagar Beach, Paschim Sagar Beach, Ramnagar Beach, Garjan Bay, Pokkadera Beach, Karmatang Beach, Rampur Beach, Cuthbert Bay Beach, Moricedera Beach, Aamkunj Beach, Panchawati, Raman Bagicha Beach, Lalaji Beach, Mark Bay Beach, Baludera Beach, Roglachang Beach, Bada-Balu Beach, Madhuban, North Bay, Kurmadera Beach, Collinpur Beach, Florance Point, Wandoor Beach, Carbyn’s Cove Beach, Chidiyatapu Beach, Minto Bay, Sa Ga Tekwe Bay, Kalapathar Beach, Vijay Nagar Beach, Radha Nagar Beach, Elephant Beach, Bharatpur Beach, Laxmanpur Beach, Sitapur Beach, Butler Bay Beach, Netaji Nagar Beach, Kalapathar Beach, Chattan Beach, Herminder Bay Beach.
Islands	Tombolo, Ross and Smith Island, Craggy Island, Curlew Island, Austin Island, Guitar Island, Redskin Island, Cinque Island, Jolly Bouy Island, Inglis Island, Tamada Juru,
Relief Features	Saddle Peak, Ray Hill, Mount Harriet,
Geological Phenomena	Alfred Caves, Limestone Cave, Natural Bridge
Volcanoes	Mud Volcano, Hathi Level, Mud Volcano, Jarawa Creek, Jal Tikry, Barren Island,

Hydrological Resources	Kaalighat Creek, Parachattan, Ram Krishna Pur Dam, White Surf Waterfall, Ravindra Nagar Dam, Wishperwave Waterfall,
Biological Resources	
Floral Resources	Aerial Bay, Forest Museum, Dhanni Nalah Mangrove Habited, Yerrata Mangrove Park, Organic Horticultural Farm, Mouth of Creek, Dalda Plantation
Faunal Resources	Parrot Island, Aquarium, Biological Park, Samudrika Naval Marine Museum
Protected Natural Heritage	Mahatma Gandhi Marine National Park
Cultural Tourism Resources	
Tangible Cultural Resources	
Immovable Cultural Resources	
Memorial Areas and Buildings	Viper Island, National Memorial Cellular Jail, Tiranga Memorial
Individual Profane Buildings	Austin Bridge, German Jetty
Scientific Interest Buildings	Kalpong Hydroelectricity Project
Parks	Zilla Parishad Park, Marina Park, Gandhi Park, Jogger's Park
Archaeological Findings	Netaji Subhash Chandra Bose Island
Furniture	Chatham Saw Mill, Anthropological Survey of India Museum
Letters and Manuscripts	Kalapani Museum
Objects that Illustrate Science and Technology	Rajiv Gandhi Water Sports Complex, Science Centre
Handicrafts	Anmol Driftwood Museum, Sagarika Emporium

2.2.2 Methodology

Primary data has been collected from tourism experts of different backgrounds. These data were collected through a questionnaire tool (Appendix 1). The questionnaire has asked for preliminary information about the place, date and time, and details of the interviews. It mainly asked 14 closed-ended questions about the proposed tourism sites. Their responses have been used in the methodology to assess the level and accessibility to the tourism resources of the respective sites. The

questions have been framed according to the attributes of the methodology model. These attributes have been determined through the vast literature survey related to the selection of tourism sites.

As per the first objective, this model will use to explore the tourism resource of the sites. A selection model has been adopted to explore the potential of the sites. The name of the proposed model is "Decision Tree Model for Tourism Site Selection". The model has been adopted from Lo's (2012) "A Decision Tree Model" which worked on developing site selection criteria for coastal tourism facilities. The component of this model here has been modified to evaluate both natural and cultural tourism resources. The site selection criteria are mainly focused on natural and man-made criteria and proximity to the amenities.

This model works as selects the site through selection criteria at four levels. A site could be assessed in the first level whether the site comes under any protection regulation and zoning. The second level assesses whether the owner of the site (private or government body) agrees to utilize the site for tourism development. The third level evaluates the natural and cultural attributes of the sites. In this level, the site must score 30 points or more from 6 attributes (each attribute carries 10 points) for proceeding to the next level. In the fourth level, the accessibility level of amenities available on the site will be evaluated through 6 attributes. At this level the site must score 30 points at least and aggregately 60 points at least. The total score of a site determines the level of tourism potential as excellent (90-120 Points), good (60-90 Points), and poor (0-60 Points). The site will only select after clear of all 4 levels of the decision tree model. The poor scored site will be rejected in the selection process.

Level one checks whether there is any regulation or zone implemented in that particular site. Aboriginal Tribal Regulation 1956; Wild Life Protection Act 1972, Coastal Regulation Zone 2019, and other restrictions often consider the site for no development zone. The level will pass if the site does not come under any no development zone and regulation process. At the second level, permission of the concerned owners is willing for the development of the tourist site. The site may be public, cooperative, or private property. In the second level, the permission of the concerned owner will make the tourist site available for further assessment. In the third level, natural and cultural attributes evaluate the specific natural and cultural resources respectively.

There is a total of six indicators have taken in natural attribute evolution- i.e., surface topography, underwater topography, soil composition, vegetation, site orientation, and environmental impact.

Surface Topography

The slope gradient of the surface influences the place to accommodate the tourist efficiently and to provide site associate services. The slope gradient could be classified into three classes steep, moderate, and gentle or no slope.

Underwater Topography

The coastal landscape includes beach features, littoral vegetation, and underwater physiography. The depth of the marine water body, type of marine physical and biological entity, clarity of the water, and ocean current determine the underwater topography. The great inclusion of these elements will score the maximum of points.

Soil Composition

The nature and extension of the rock strata determine the quality of the site and the scope for further development. The quality of soil depends upon the parent matter and regional topographical phenomena. The underlying support of soil to the site features, water bodies, and vegetables will determine the suitability of the soil.

Vegetation

Vegetation not only balances the ecology it also increases the aesthetic value of the site. Vegetation cover may be natural or man-made plantation. Even historical and cultural sites are also beautified with decorative plants, trees, and shrubs. It cools the environment and provides oxygen supply to the surrounding. The tree shed also provides a cool place to observe the panoramic view of the sites even on the sunny midday. The greater quality of vegetation more points will carry.

Site Orientation

Site orientation is determined by the location of the selected region and its proximate surroundings. The excellent condition of site orientation varies on the type of sites and concentration of resources. Exposing the coastal area to the direction of the current will be the best for the deposition of sea debris to the formation of a beach. The mountain hill site located in the west direction could provide a good sunset view at the local time of the evening.

Environmental Impact

The level of fragility and nature of the site determine the level of impact through tourism development of a site. A fragile and sensitive site should avoid degradation of the environment. The type of tourism site should determine the level of degradation. The high environmental sensitive zone will be given a low score and vice versa.

The cultural tourism site is evolute through six indicators of cultural attributes i.e., historical heritage, scientific value, ethnological value, preservation value, and environmental impact.

Historical heritage

History is having a glorious past of the place is one of the important cultural elements. The historical period of these islands could classify it in three phases – pre-colonial, colonial, and post-colonial. The things related to these places will consider historical heritage. Their quality and remaining past determine the score of its indicator.

Artistic value

Performing, and visual art include assessment. In performing arts folk song, dance, folklore and visual art drawing, painting, carpenter handicraft, building design, Architectural design. Practicing or display of those artistic elements could raise the score of the cultural site.

Scientific value

The building, place, or institution equipment inculcates scientific value. Modern science is becoming an inseparable part of the cultural component. Sure, appreciation of scientific value Intellectuality is an understanding of the function of natural phenomena and its system.

Ethnological value

The value related to the human lifestyle routine and beliefs is related to the ethnological value. The style, structure, and pattern of the built-up area or site show the ethnological impression of the related culture. The more ethnological impression will show a high number of site selection scores.

Preservation value

The buildings, crafts, structures, and manuscripts are having the ability to conserve the traditional values of the related community. The richness of these traditional values inculcates the site selection score.

In the fourth level accessibility to the amenities has been evaluated for both natural and cultural tourism sites. There are a total of six indicators taken i.e., landscape amenities, transportation (multiple accessibilities), Proximity to other tourist sites, emergency services, utility services, human settlement and amenities, and environmental impact.

Landscape Amenities

Visually appealing features with distinctive surroundings make the base landscape of the site.

Transportation (Multiple Accessibility)

The accessibility of the site determines the experience of its resources. The accessibility may countable through several modes, frequency of trip, alternatives, and complexity. Less

complex, more frequent, and availability of alternative means of transportation score the points for site selection criteria.

Proximity to other Tourist Sites

Less distance from a proposed site to another tourist site saves time and energy. A worthwhile tour is determined by a greater number of site visits with less effort. The presence of historic sites and their proximity make a site more scorable for selecting an effective tourism site.

Proximity to Emergency Services

Adventurous and non-adventurous tourism activities are prone to any kind of medical emergencies. The emergency services are required at the site like first aid, ambulance, fire brigade, police, lifeguards, and rescue divers' availability at the tourist site. Their availability and further proximity helped to achieve the score point to select the tourist site.

Proximity to Utility Services

Tourism sites supported by other utilitarian services make it more attractive. The utilitarian services include the availability and sufficiency of common amenities like a drinking water system, changing room, restroom, eateries, restaurants, and utilitarian shops.

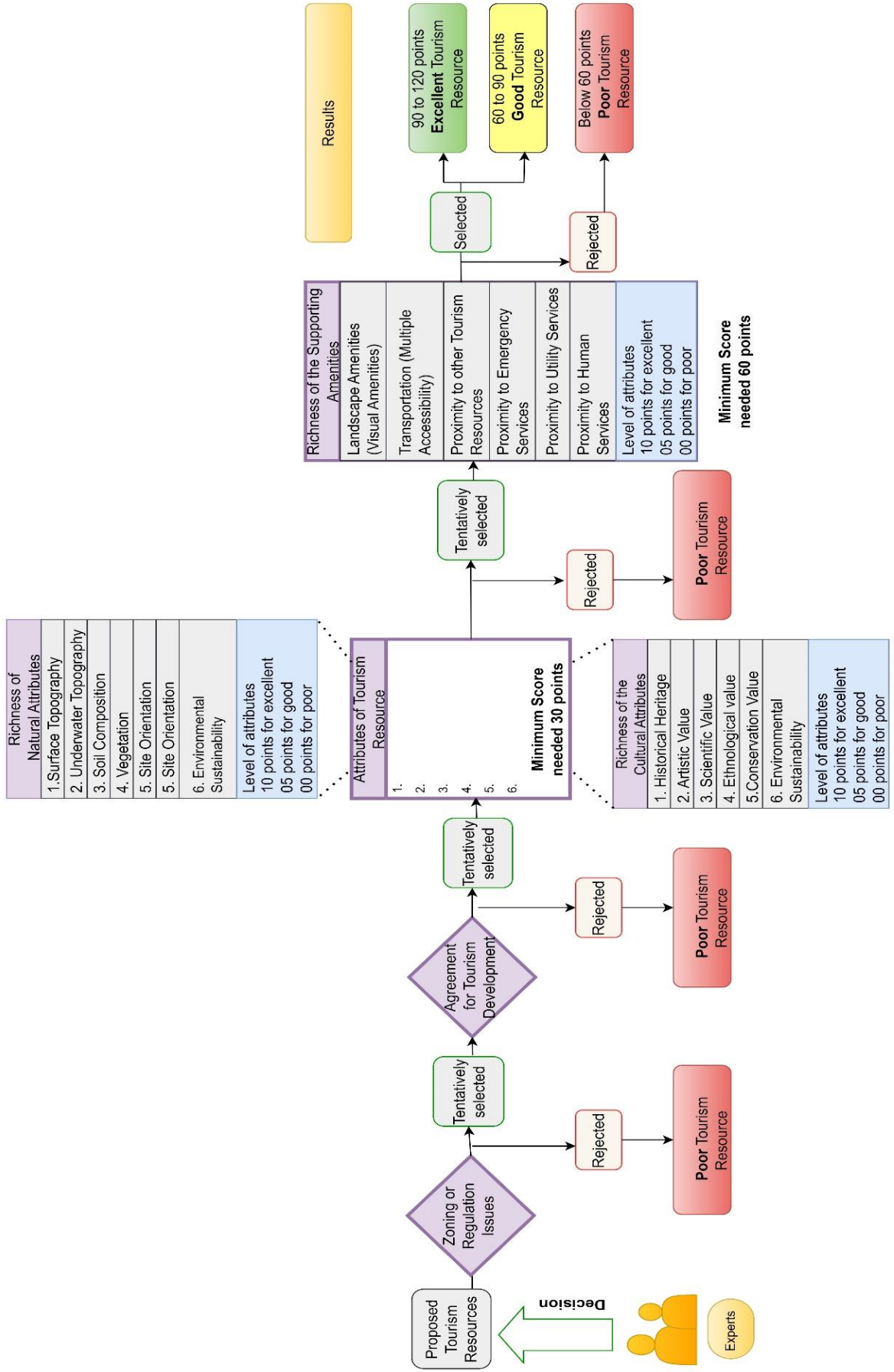
Proximity to Settlement

The human settlement represents the availability of all needful facilities for any arrived tourist site. Most people avoid visiting any deserted tourist site far from the human settlement. Proximity to any nearby human settlement makes a proposed site more scorable.

Need for this methodology

This methodology is needed to evaluate the multidimensional potentiality and feasibility of the tourism resources for using them in tourism development purposes. All sites suggested by the Department of Tourism (A & N Islands) has identified and discussed using this model.

Figure 2.3: Methodology for assessment of tourism resources.



Decision Tree Model (DTM) to Select Tourism Resources

2.3 RESULT AND DISCUSSION

Tourism Resources have been discussed according to tehsil wise distribution.

2.3.1 Tourism Resources (Sites) for Diglipur Tehsil

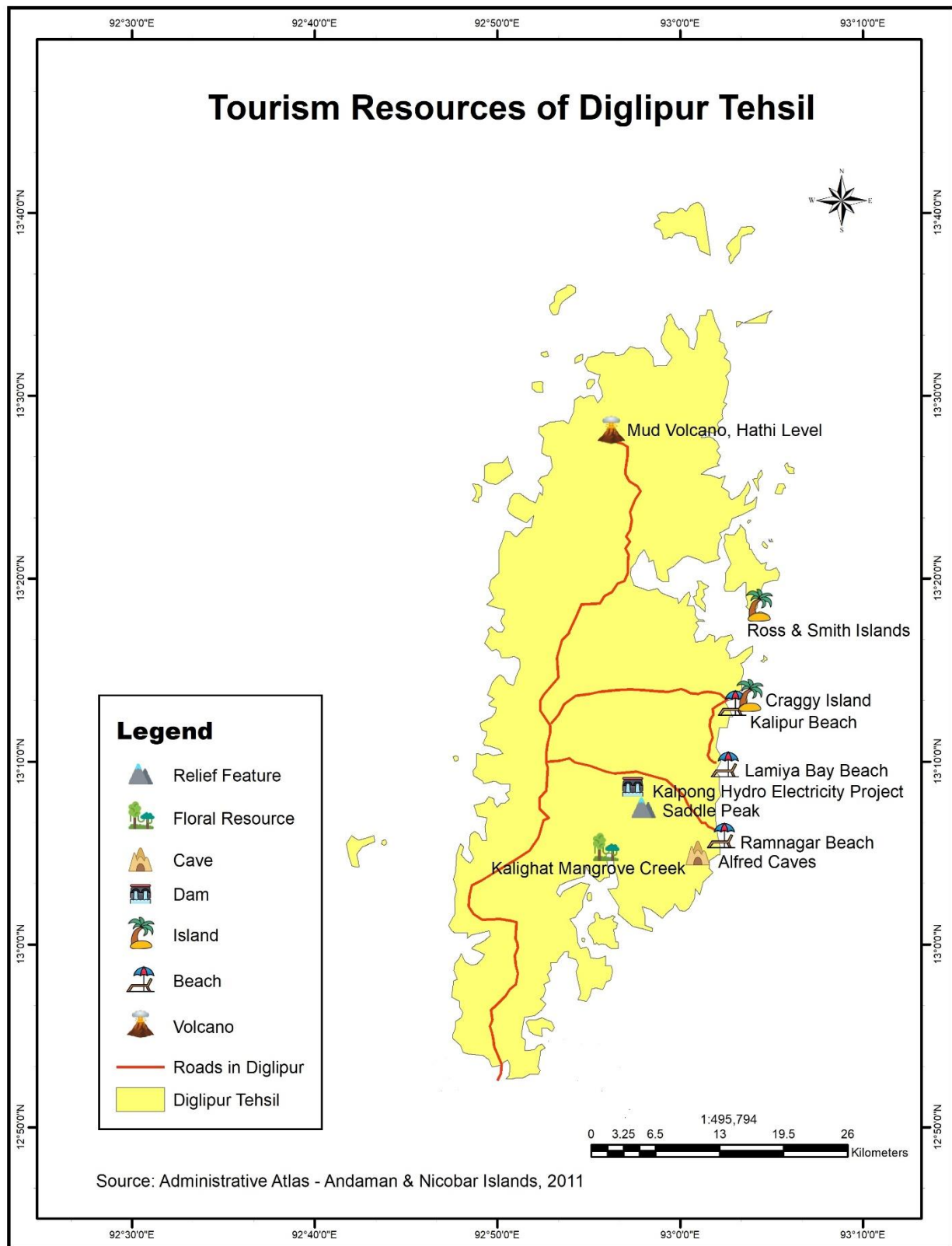
According to the administration classification, the sites are selected and their potential has been determined.

Table 2.2: Selected tourism sites of Diglipur Tehsil

Tehsil	Tourist Site	Zoning	Agreement	Natural Attributes Score	Cultural Attributes Score	Total Score	Level
Diglipur	Natural Tourism Resources						
	Mud Volcano, Hathi Level	No	Yes	40	20	60	Good
	Ross and Smith Island	No	Yes	50	40	90	Excellent
	Saddle Peak	No	Yes	45	30	75	Good
	Kalipur Beach	No	Yes	45	45	90	Excellent
	Craggy Island	No	Yes	40	20	60	Good
	Lamiya Bay Beach	No	Yes	40	40	80	Good
	Radhanagar Beach	No	Yes	35	30	65	Good
	Kaalighat Creek	No	Yes	45	40	85	Good
	Paschim Sagar Beach	No	Yes	45	10	50	Poor
	Ramnagar Beach	No	Yes	55	40	95	Excellent

	Alfred Caves	No	Yes	35	35	70	Good
	Jal Tikry, Mud Volcano	No	Yes	40	55	95	Excellent
	Aerial Bay Beach	No	Yes	40	45	85	Good
Cultural Tourism Resources							
	Kalpong Hydroelectricity Project	No	Yes	45	40	85	Good

Map 2.1: Tourism Resources of Diglipur Tehsil



There is a total of 13 tourism resources that have been selected from the Diglipur tehsil. Natural tourism resources are more dominant in this tehsil. Twelve sites belong to natural tourism resources and one site as cultural tourism resources. There is only one site named Paschim Sagar Beach not selected through the model. It selected as poor site of tourism development as the cultural element score found very low. Subhashgram Market is the transportation hub of the Diglipur tehsil because most of the means of land transportation are found from this area. This market is also 6 km far from the Arial Bay port.

Natural Tourism Resources

Mud Volcano, Hathi Level

The northern part of North Andaman Island has some groups of mud volcano craters in the Hathi Level village. It is located 25 km far from the Subash Gram Market. The site score is 60 points and it is having a good level of tourism potential.

Ross, and Smith Island

A connecting sand bar joint the Ross and Smith Island near the western side of North Andaman Island. At the time of high tide, this sand bar submerged under the seawater, and both of these islands got separated at the time of low tide, the connecting sand bar makes them one island feature. A tourist could easily walk and reach one island to another. It is located 40 km far from the Subash Gram Market. The site score is 90 points and it is having an excellent level of tourism potential.

Kalipur Beach

Kalipur beach is located on the eastern side of North Andaman Island. It is 8 km far from Arial Bay Jetty and 12 km far from Subshgram Bazar. This beach is rich in marine resources. Sea turtle lay their eggs in November- December season. The forest department takes care of the entire hatching process. They also made nesting and hatching sites for the turtles. Saddle Peak (the highest elevation of these islands) is also visible from this beach. This beach provides a picturesque vision of the peak. The site score is 90 points and it is having an excellent level of tourism potential.

Craggy Island

This island is a swim away from Kalipur Beach. This place is suitable for snorkelling and swimming activities. It is located 13 km far from the Subash Gram Market. The site score is 60 points and it is having a good level of tourism potential.

Saddle Peak

Saddle peak is the highest peak (732 m) of the Andaman Islands and is located in the eastern part of the North Andaman Island. This hill is enriched with some specific species of flora. A magnificent site view of the Diglipur area could be watched from its hilltop. It is located 17 km far from the Subash Gram Market. The site score is 75 points and it is having a good level of tourism potential.

Lamiya Bay Beach

Lamiya Bay is located at the foothill of the Saddle Peak. The site is surrounded by rock structures. It is one of the picnic spots of Diglipur. The site score is 80 points and it is having a good level of tourism potential.

Radhanagar Beach

Radhanagar Beach is located in near Lamiya Bay Beach. The site is surrounded by rock structures. It is one of the picnic spots of Diglipur. The site score is 65 points and it is having a good level of tourism potential.

Kaalighat Creek

Kalighat Creek is a mangrove habited previously it connected the passenger vessels to the Panighat Jetty of Mayabunder area. It is an ideal place for a creek safari. The canopy cover of mangrove trees provides sheds and mesmerizing environment during the boat ride. The site score is 85 points and it is having a good level of tourism potential.

Ramnagar Beach

Ramnagar Beach is located on the eastern coast of the North Andaman Islands. This site is 35 km far from the Subhashgram Bazar. The site score is 95 points and it is having an excellent level of tourism potential.

Alfred Caves

Alfred caves are located near the Ramnagar Beach. In geomorphological terms, it is called karst topography. This site is a cluster of 41 caves. Most of the caves are narrow and dark. Some of the caves are can't approach by the people as they are too small to enter within. These caves are adobe of swiftlet birds and fruit-eating bats. This site is located 39 km far from the Subash Gram Market. The site score is 60 points and it is having a good level of tourism potential.

Mud Volcanoes, Jal Tikry

This site is having 41 mud volcano craters. These volcanoes are typically different from magmatic volcanoes. It erupts mud and bubbles from the craters. It is located 40 km far from the Subash Gram Market. The site score is 95 points and it is having an excellent level of tourism potential.

Aerial Bay

The site is popular for visiting the beach and watching the sunset in the evening. It is located 13 km far from the Subash Gram Market. This site is having port facilities, that connect the Diglipur tehsil to other parts of the Andaman Islands. It is also a juncture for many boats that visit nearby tourist sites. The site score is 85 points and it is having a good level of tourism potential.



Image 2.1: Natural Tourism Resources of Diglipur Tehsil

Cultural Tourism Resources

Kalpong Hydro-Electricity Power Project

Kalpong is the only river in the Andaman Islands. It rises from the Saddle Peak of North Andaman Island and flows towards the Andaman Sea. This power project has established in 2001 near the village Nabagram. It's a rock-filled and concrete gravity dam. It has a capacity of 15,270,000 m³ of storage capacity and produces 5.25 MW of electricity. This dam provides a picturesque background of the peak. The site score is 85 points and it is having a good level of tourism potential.

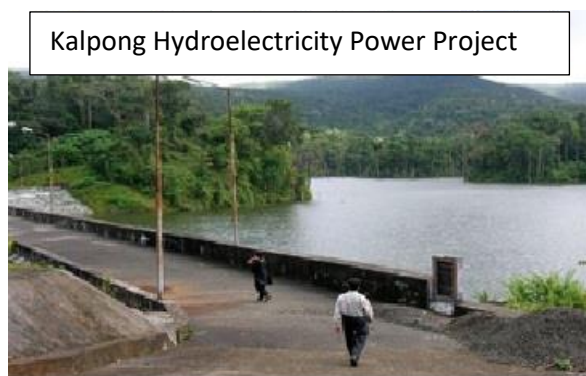


Image 2.1: Cultural Tourism Resources of Diglipur Tehsil

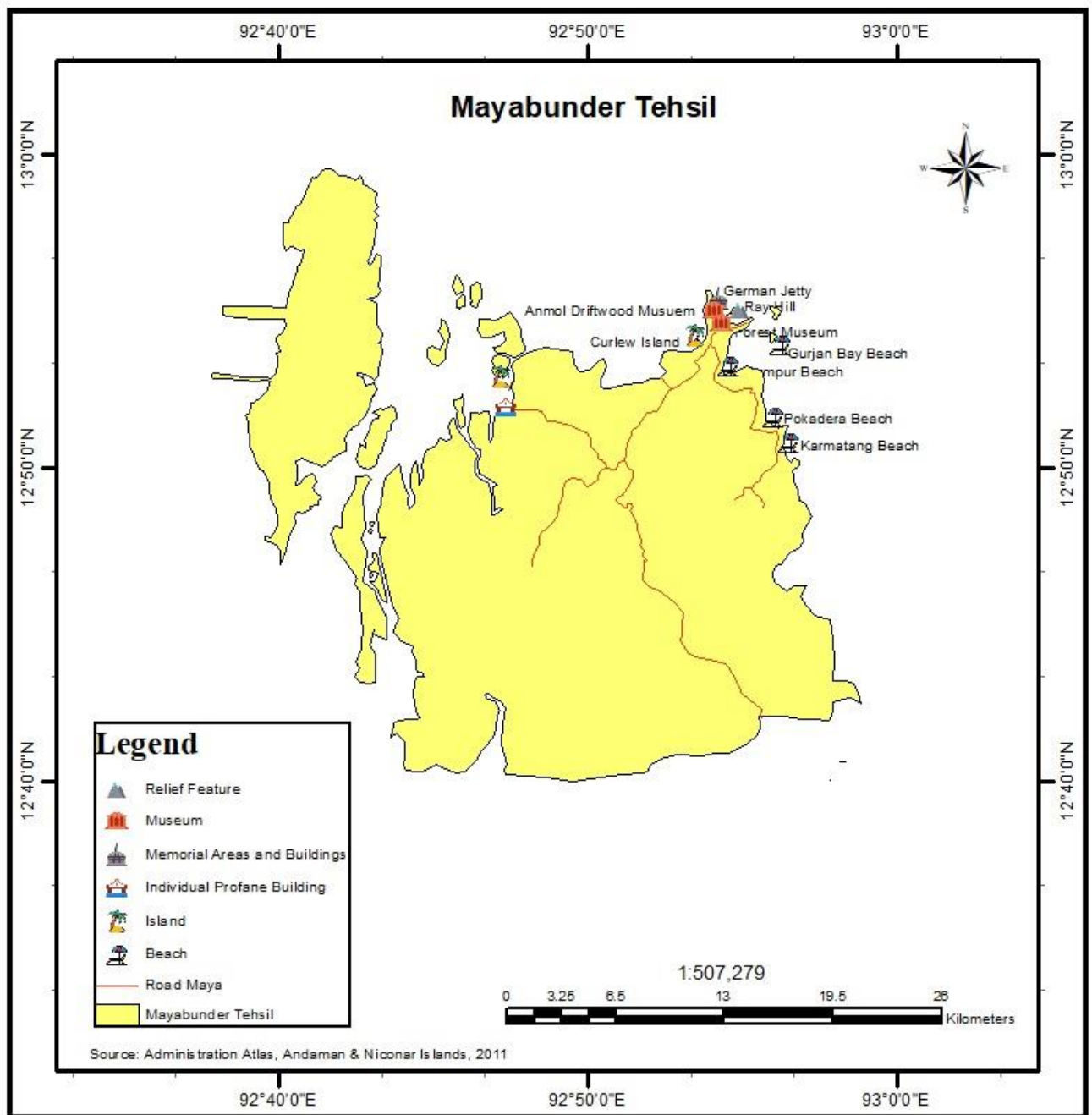
2.3.2 Tourism Resources (Sites) for Mayabunder Tehsil

Mayabunder Tehsil is a total of 9 tourism resources have been selected from the Mayabunder tehsil. Both Natural and Cultural tourism resources are equally dominant in this tehsil. Five sites belong to natural tourism resources and four sites as cultural tourism resources. Only two natural tourism resources named Garjan Bay and Austin Island found poor tourism potential because the cultural attributes performance are underscore. Mayabunder Market is the transportation hub of the Mayabunder tehsil because most of the means of land transportation are found from this area. This market is also 2 km and 1 km far from the helipad and the Mayabunder port respectively.

Table 2.3: Selected tourism sites of Mayabunder Tehsil

Tehsil	Tourist Site	Zoning	Agreement	Natural Attributes Score	Cultural Attributes Score	Total Score	Level
Mayabunder	Natural Tourism Resources						
	Garjan Bay	No	Yes	40	10	50	Poor
	Curlew Island	No	Yes	35	25	60	Good
	Pokkadera Beach	No	Yes	45	35	80	Good
	Karmatang Beach	No	Yes	55	45	100	Excellent
	Rampur Beach	No	Yes	55	40	95	Excellent
	Austin Island	No	Yes	35	5	40	Poor
	Cultural Tourism Resources						
	Ray Hill	No	Yes	35	30	65	Good
	Austin Bridge	No	Yes	35	40	75	Good
	Forest Museum	No	Yes	40	55	95	Excellent
	Anmol Driftwood Museum	No	Yes	55	55	110	Excellent
	German Jetty	No	Yes	45	60	105	Excellent

Map 2.2: Tourism Resources of Mayabunder Tehsil



Natural Tourism Resources

Curlew Island

This island belongs to the Stewart Sound Group of islands. The most amazing factor is it is the smallest village on the Andaman Islands. It is having a population of only two inhabited. The island is located 15 km far from the Mayabunder Market. The peaceful environment, lush green surrounding and clean beaches are very attractive points for eco-tourists. The site score is 60 points and it is having a good level of tourism potential.

Pokadera Beach

Pokadera beach has been named after the nearby village named Pokadera. This beach is the most nearby beach to the Mayabunder Market. It is located 2 km far from the Mayabunder Market. The site score is 60 points and it is having a good level of tourism potential.

Karmatang Beach

Karmatang Beach is famous for the turtles (Leatherback turtles, Green ocean turtles, Hawksbill turtles, and Olive ridley turtles) nesting ground and white sandy beach. It is located 12 km far from the Mayabunder Market. Karmatang Beach is facilitated by tree-houses, eco-shades, and eco-furniture layout for the visitors. The beach area is covered with large coconut groves. The site score is 100 points and it is having an excellent level of tourism potential.

Rampur Beach

Rampur is a small gorgeous beach. It is surrounded by mangrove vegetation. It is located 13 km far from the Mayabunder Market. The site score is 5 points and it is having a good level of tourism potential.



Image 2.3: Natural Tourism Resources of Mayabunder Tehsil

Cultural Tourism Resources

Ray Hill

Ray Hill is an Eco-Tourism Village in the Andaman Islands that is a completely environmentally friendly and pollution-free model of a village. This site is developed by the agency of the Department of Environment and Forest i.e., Andaman & Nicobar Islands Forest & Plantation Department Corporation Limited (ANIFPDCL). Some remains of imperial occupation could be seen over here. The mysterious past is the great heritage of this place. It's also ideal for elephant safari, angling, game fishing, trekking, and sun-basking. It is located 11 km far from the Mayabunder Market. The site score is 65 points and it is having a good level of tourism potential.

Austin Bridge

Austin Bridge is also known as Chengappa Bridge. This bridge is named after the renowned Forest Officer i.e., B.S. Chengappa. It is the second-longest bridge (186 m) of the Andaman Islands that connects the Middle Andaman to the North Andaman Island. It is located 13 km far from the Mayabunder Market. The site score is 75 points and it is having a good level of tourism potential.

Forest Museum

Forest Museum has been developed and managed by the Department of Environment and Forest. It is located 13 km far from the Mayabunder Market. This museum has developed to inculcate awareness and feeling of forest conservation of forest resources among the people. Presently the museum is enriched by the woodwork locally available hardwood trees like Padauk, Marble, Satin Wood, and Pynma.

Anmol Driftwood Museum

Anmol driftwood museum is a privately owned tourism site. It is located 13 km far from the Mayabunder Market. The site score is 110 points and it is having an excellent level of tourism potential. It has been developed for entertainment and leisure for the local community.

German Jetty

German Jetty is the old remains of World War II. This structure has been named after the German Architect who designed this jetty. This place is having the Sea facing structured and an old canon

kept towards the seaside. It is located 1.5 km far from the Mayabunder Market. The site score is 105 points and it is having an excellent level of tourism potential.



Image 2.4: Cultural Tourism Resources of Mayabunder Tehsil

2.3.3 Tourism Resources (Sites) for Rangat Tehsil

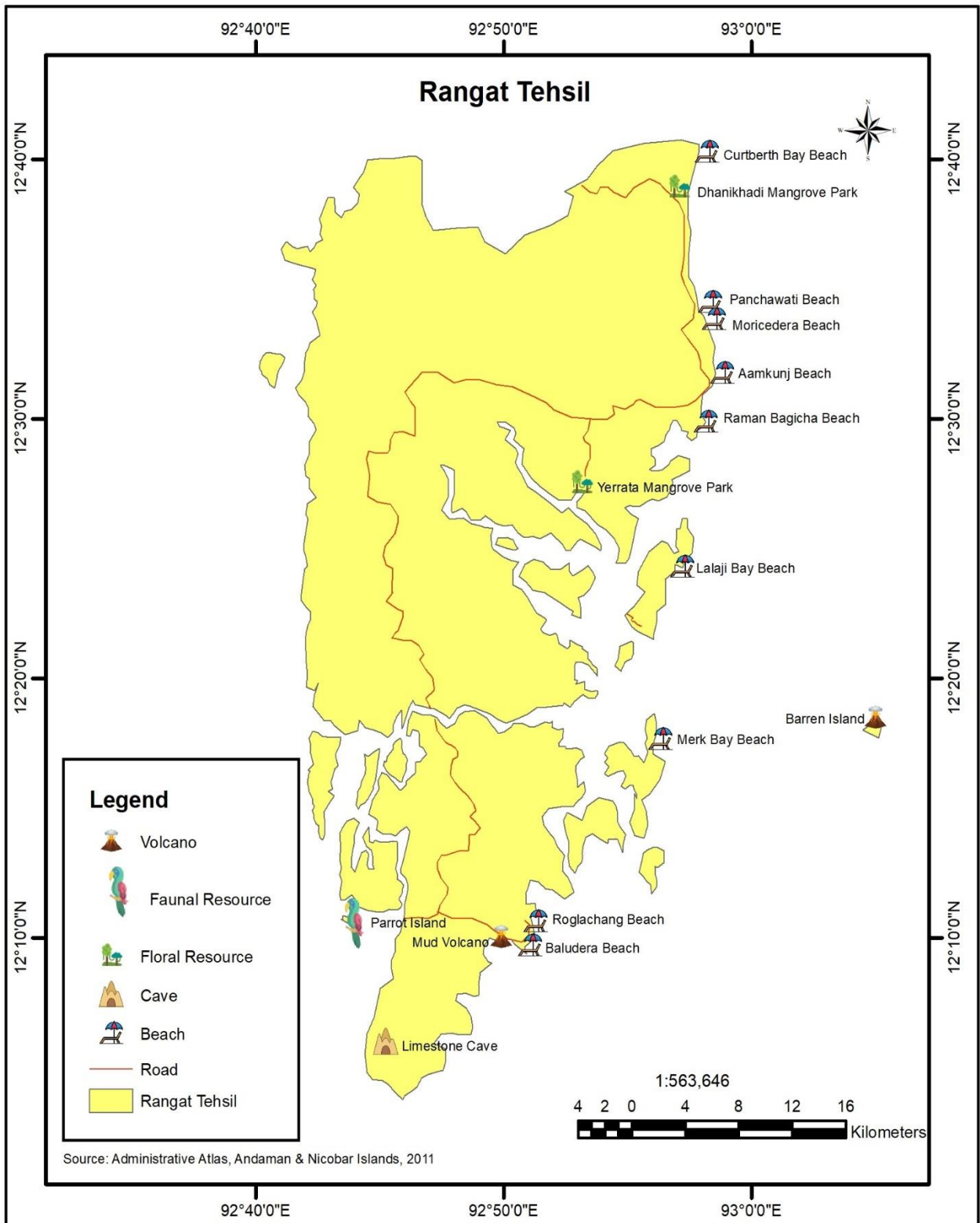
Rangat Tehsil is having total of 18 tourism resources have been selected from the Rangat tehsil. Only natural tourism resources are dominant in this tehsil. All the eighteen sites belong to natural tourism resources and no sites belong to cultural tourism resources. Only one tourism resources named guitar island was not selected through the model as its cultural attributes are underscored. Rangat Market is the transportation hub of the Rangat tehsil because most of the means of land transportation are found in this area. This market is also 2 km and 4 km far from the helipad and the Nimbutala Jetty respectively.

Table 2.4: Selected tourism sites of Rangat Tehsil

Tehsil	Tourist Site	Zoning	Agreement	Natural Attributes Score	Cultural Attributes Score	Total Score	Level
Rangat	Natural Tourism Resources						
	Cuthbert Bay Beach	No	Yes	40	25	65	Good

	Dhanni Nalah Mangrove Habited	No	Yes	40	45	95	Excellent
	Moricedera Beach	No	Yes	45	45	90	Excellent
	Aamkunj Beach	No	Yes	50	45	95	Excellent
	Panchawati Beach	No	Yes	40	35	75	Good
	Barren Island	No	Yes	45	15	60	Good
	Lalaji Beach	No	Yes	50	15	65	Good
	Raman Bagicha Beach	No	Yes	50	45	95	Excellent
	Yerrata Mangrove Park	No	Yes	35	30	65	Good
	Barren Island	No	Yes	45	15	60	Good
	Lalaji Beach	No	Yes	55	15	70	Good
	Mark Bay Beach	No	Yes	45	15	60	Good
	Guitar Island	No	Yes	35	10	45	Poor
	Mud Volcano, Jarawa Creek	No	Yes	45	45	90	Excellent
	Parrot Island	No	Yes	45	15	60	Good
	Baludera Beach	No	Yes	35	40	75	Good
	Limestone Cave	No	Yes	40	20	60	Good
	Roglachang Beach	No	Yes	35	30	65	Good

Map 2.3: Tourism Resources of Rangat Tehsil



Natural Tourism Resources

Cuthbert Bay Beach

Cuthbert Bay Beach is a lengthy beach located on the eastern coast of the Middle Andaman Island. It is one of the important breeding grounds of sea turtles. It is located 12 km far from the Rangat Market. The site score is 65 points and it is having a good level of tourism potential.

Dhanni Nalah Mangrove Habitat

Dhaninalah is located 8 km far from the Rangat Market. It is distant 100 m from the main road. This beach is the ideal place for swimming, sun-basking, and water sports activities. The beach is resourceful with innovative tourism amenities like log sofa, log teapoy, and eco-huts. The site score is 95 points and it is having an excellent level of tourism potential.

Moricedera Beach

Dhaninalah is a small rocky beach with the deposition of sand outcrops. It is not very broad attractive beaches like other beaches of Andaman nor very good for swimming activity. But it is a peaceful place to rest and family picnic. The traveller often take rest at this beach for a while over here. It is located 12 km far from the Rangat Market. The site score is 90 points and it is having an excellent level of tourism potential.

Aamkunj Beach

Amkunj is a rocky beach located 8 km far from the Rangat Market. The beach is ideal for turtle spotting, sea sidewalks, and picnic. The treehouse structure provides a panoramic view of the locality. At present time this beach become an eco-park. The site score is 95 points and it is having an excellent level of tourism potential.

Panchawati Beach

Panchwati is a small village located 11 km far from the Rangat Market. The village is surrounded by agricultural fields, coconut groves, and commercial plantation crops. A waterfall is located near the Panchawati Hills alive in the rainy season. The rocky beach is a picnic spot for the local community. The site score is 75 points and it is having a good level of tourism potential.

Raman Bagicha Beach

Raman Bagicha Beach is located 8 km distant from the Rangat Market. This beach is an excellent place for swimming and sun-basking activities. The beach is covered by coconut groves and it is facilitated

with the wooden log sofa and eco-huts. There is a floating jetty available on the beach. It could be used for fishing and diving into the deep water. The site score is 95 points and it is having an excellent level of tourism potential.

Yerrata Mangrove Park

Yerrata mangrove park is a mangrove habitat located 7 km far from the Rangat Market. This site is having a variety of mangrove tree species. There is a wooden pathway and a bridge structure has been made in the creek for mangrove safari. A watchtower is also available to see the panoramic view of the mangrove valley. It is located 13 km far from the Subash Gram Market. The site score is 65 points and it is having a good level of tourism potential.

Barren Island

Barren Island is the only active volcano in India. It is located 156 km east of Port Blair and 42 km from the Rangat Market. It was noticed active in 1814 and an abrupt eruption is occurring in between. This island is also having some marvelous geological formations and biological resources. The feral goat is one of the most unique creatures found on this island that thrive on saline water. The site score is 60 points and it is having a good level of tourism potential.

Lalaji Bay Beach

Lalaji Bay located in Long Island under the administrative boundary of Rangat Tehsil. This beach is located 13 km and 54 km far from the Long Island Jetty and Rangat Market respectively. The tour to Lalaji Bay Beach is a package of experiences which provide trekking through the dense forest, swimming in the sea, and sun basking in the seashore. The site score is 70 points and it is having a good level of tourism potential.

Merk Bay Beach

Merk Bay Beach is covered with mangrove vegetation and it is located on North Passage Island. Long Island is an inhabited island that is in proximity to this site. Strait Island is very near as compared to Long Island but it is the habitat of the aboriginal tribal community named Great Andamanese. Visitors are not allowed to that very island. So, making of special arrangements of that island is required. It is located 20 km far from the Long Island Jetty. The site score is 60 points and it is having a good level of tourism potential.

Mud Volcano, Jarawa Creek

A mud volcano is 'Mud Dome,' it is formed by the eruption of mud slurries, clay, water, and gases. A group of mud erupted craters are surrounded by palm trees near the village name Jarawa Creek. This mud volcano is located at the Baratang Island. Mud spewing out from the craters. These materials are not hot as the usual magma erupted volcano. An observatory is also set near the volcano mound. It is located 13 km far from the Nilambur Jetty of Baratang Island. The site score is 90 points and it is having an excellent level of tourism potential.

Parrot Island

Parrot Island is located proximity to Baratang Island. This island is renowned for its mesmerizing view of the islands created by parrots who resided here. Flocks of parrots return in the evening with a chattering sound. It is located 30 km far from the Subash Gram Market. The site score is 60 points and it is having a good level of tourism potential.

Baludera Beach

Baludera is the most famous picnic spot for residents of Baratang Island. Local people also prefer this place for coastal fishing activities. Department of Environment and Forest made eco-hut and treehouses for the beatification of this beach. It is located 7 km and 85 km far from the Nilambur Jetty and Rangat Market respectively. The site score is 75 points and it is having a good level of tourism potential.

Limestone Cave

The limestone cave is a marvelous geological formation that has evolved through the deposition of sea creatures' skeletons. There is total 40 numbers of caves are located only a few are open for the touring exhibition. These caves are dwellings of swiftlet and fruit eating bats. These caves could be reached by It is located 13 km far from the Nilambur Jetty. It could be approach through the different adventure activities on its route like creek safari, mangrove canopy walks, and trekking. The site score is 60 points and it is having a good level of tourism potential.

Roglachang Beach

Roglachang Beach is another beach found at the Baratang Island but this beach is less famous than Baludera Beach. This site is most famous for leisure activities among residents. It is located 10 km far from the Nilambur Jetty at Baratang.

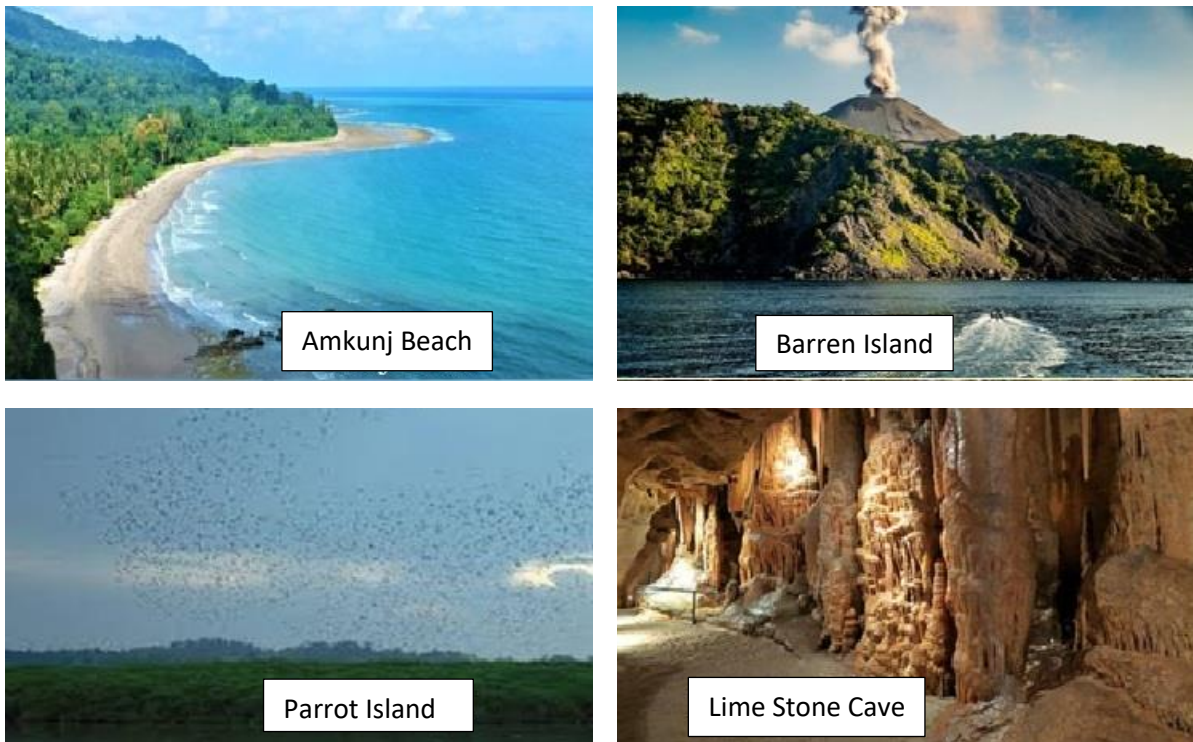


image 2.5: Natural Tourism Resources of Rangat Tehsil

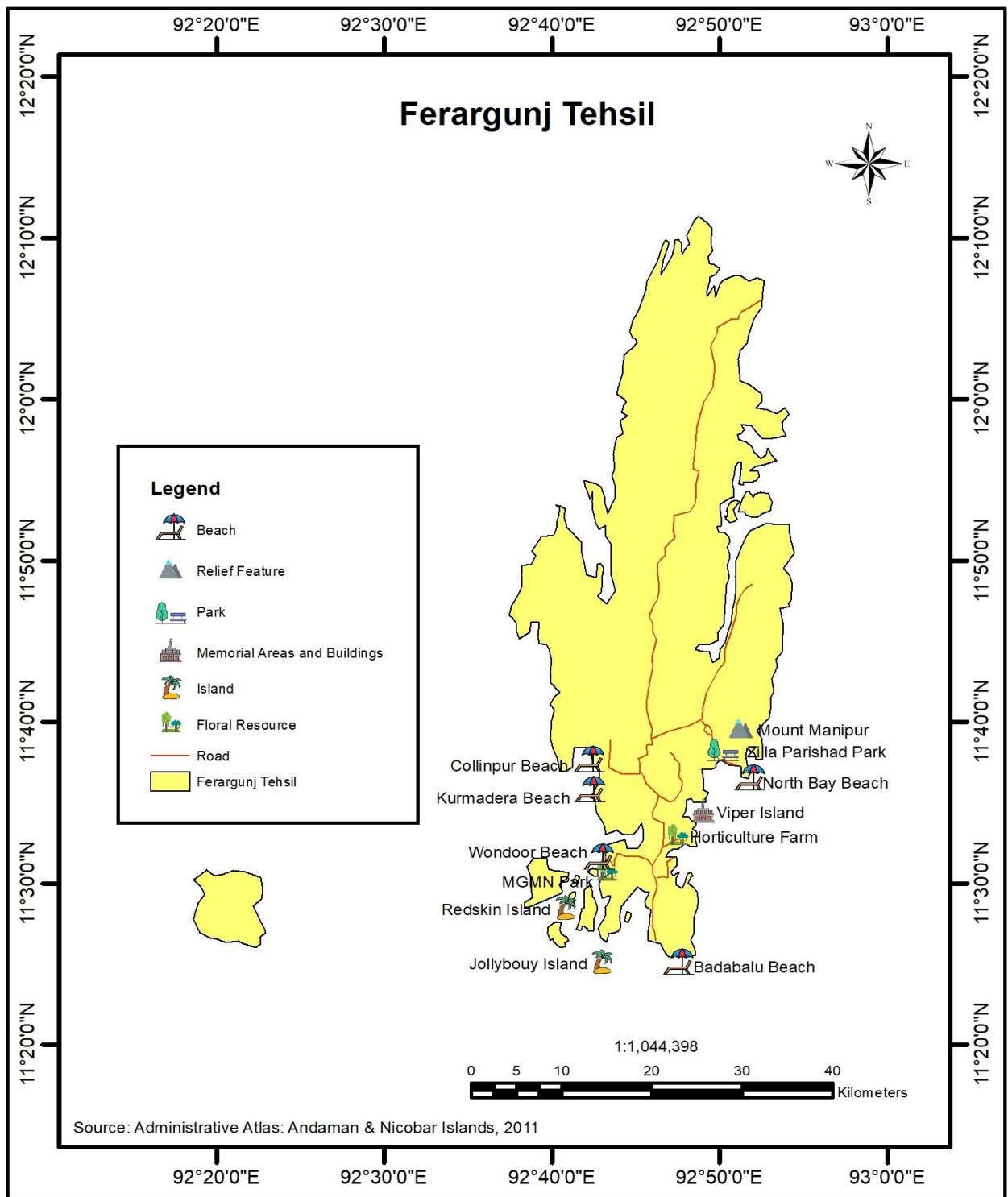
2.3.4 Tourism Resources (Sites) for Ferrargunj Tehsil

Ferrargunj Tehsil is having a total of 16 tourism resources. It has been selected from the Ferrargunj tehsil. Natural tourism resources are more dominant in this tehsil. Twelve sites belong to natural tourism resources and one site as cultural tourism resources found in poor trough the model i.e., Madhuban and Florance Point as they had week score at cultural attributes. There is total two sites Bambooflat Jetty is the transportation hub for the Ferrargunj tehsil because most of the means of land and water transportation are found in this area. This jetty is also 8 km far from the Port Blair tehsil through land and water mode of transportation. Bamboflat Jetty is the main transportation hub in this tehsil while Chatham and Aberdeen Jetty are secondary and alternative transportation hubs respectively to visit tourism sites of Ferrargunj tehsil.

Table 2.5: Selected tourism sites of Ferrargunj Tehsil

Tehsil	Tourist Site	Zoning	Agreement	Natural Attributes Score	Cultural Attributes Score	Total Score	Level
Ferrargunj	Natural Tourism Resources						
	Bada-Balu Beach	No	Yes	45	15	60	Good
	Madhuban	No	Yes	35	15	50	Poor
	Mount Harriet	No	Yes	50	25	75	Good
	North Bay Beach	No	Yes	60	30	90	Excellent
	Kurmadera Beach	No	Yes	45	20	65	Good
	Redskin Island	No	Yes	45	15	60	Good
	Collinpur Beach	No	Yes	40	25	65	Good
	Florance Point	No	Yes	30	5	35	Poor
	Wandoor Beach	No	Yes	50	45	95	Excellent
	Mahatma Gandhi Marine National Park	No	Yes	50	25	75	Good
	Cinque island	No	Yes	45	15	60	Good
	Jolly Bouy Island	No	Yes	45	15	60	Good
	Parachattan Waterfall	No	Yes	35	35	70	Good
	Cultural Tourism Resources						
	Agricultural Farm	No	Yes	40	45	85	Good
	Viper Island	No	Yes	45	15	60	Good
Zilla Parishad Park	No	Yes	35	55	90	Excellent	

Map 2.4: Tourism Resources of Ferrargunj Tehsil



Natural Tourism Resources

Bada-Balu Beach

Bada-Balu Beach is having quite a significant deposition of white sand on the South Andaman Island. It's a less crowded beach located far from the urban locality. This beach is not having any such visitor facility or nearby shops. It is located 13 km far from the Bambooflat Jetty. The site score is 60 visitors have to carry their eatables and drinks at the time of visit. points and it is having a good level of tourism potential.

Mount Manipur

Mount Manipur (erstwhile Mount Harriet) is having geological, historical, and biological importance for these islands. This place is one of the high elevated points of South Andaman Island. This site is in proximity to the pre-independence British capital of the territory named Ross Island. At the time of summer, this place becomes the summer capital for these islands. Now at present time, it's known as Mount Manipur National Park and it is a famous tourist spot for whom blessed with both natural and cultural features. It is located 15 km far from the Bambooflat Jetty. The site score is 75 points and it is having a good level of tourism potential.

North Bay

North Bay is the ideal place for water sports activity near the Port Blair region. From an administrative perspective, it comes under the Ferrargunj tehsil but via the means of water transportation, it is comparatively more in proximity to Port Blair tehsil. It is located 13 km far from the Bambooflat Jetty. The site score is 90 points and it is having an excellent level of tourism potential.

Kurmadera Beach

Kurmadera's name is derived from the terms 'Kurma' which means shell and 'Dera' means village. This beach is famous for its shells and its pristine location. This beach comes under a private property which could be explored by giving a minimum gate entry fee. It's a less crowded beach. One could reach here by hiring a private vehicle. It is located 13 km far from the Bambooflat Jetty The site score is 65 points and it is having a good level of tourism potential.

Redskin Island

Redskin Island is a part of Mahatma Gandhi Marine National Park, Wondoor. This is a non-inhabited island where limited tourists are allowed to visit. This site is ideal for snorkelling, scuba diving, and sun-basking. It is located 23 km far from the Bambooflat Jetty but the main approach path passes

through the Port Blair Tehsil. The site score is 60 points and it is having a good level of tourism potential.

Collinpur Beach

This beach is named after the nearby village name Collinpur. The beach is having shallow water providing a perfect place for swimming and snorkelling. It is a less crowded beach and one of the favourite places for a picnic among the residents. It is located 33 km far from the Bambooflat Jetty. The site score is 65 points and it is having a good level of tourism potential.

Wandoor Beach

Wandoor Beach is named after a village located in the southwestern part of South Andaman Island. This beach is facilitated by petty shops, washrooms, eco-huts, swimming area, and a marine interpretation center. This site is also located near the gateway of Mahatma Gandhi Marine National Park. It is located 40 km far from the Bambooflat Jetty. The site score is 95 points and it is having an excellent level of tourism potential.

Mahatma Gandhi Marine National Park, Wandoor

Mahatma Gandhi Marine National Park is an integrated area of terrestrial and marine areas. It is a kind of national park famous for marine resource conservation. One could visit this site by getting the pass and entry ticket from the local jetty. It is located 38 km far from the Bambooflat Jetty. The site score is 75 points and it is having a good level of tourism potential.

Cinque Island

Cinque Island is a part of Mahatma Gandhi Marine National Park, Wandoor. It's a twin island (North Cinque Island and South Cinque Island) connected with a sandbar. This is a non-inhabited island where limited tourists are allowed to visit. This site is ideal for snorkelling, scuba diving, sea walking and sun basking. It is located 26 km far from the Bambooflat Jetty. The site score is 60 points and it is having a good level of tourism potential.

Jolly Bouy Island

Jolly Bouy Island is a part of Mahatma Gandhi Marine National Park, Wandoor. This is a non-inhabited island where limited tourists are allowed to visit. This site is ideal for snorkelling, scuba diving, and

sun-basking. It is located 18 km far from the Bambooflat Jetty. The site score is 60 points and it is having a good level of tourism potential.

Parachattan Waterfall

Parachattan is a local tourist site having a seasonal waterfall in the dense forest. The water is crystal clear and clean. It remains cool even in the summer as the streams flow from the dense forest. It is located 9 km far from the Bambooflat Jetty. The site score is 70 points and it is having a good level of tourism potential.

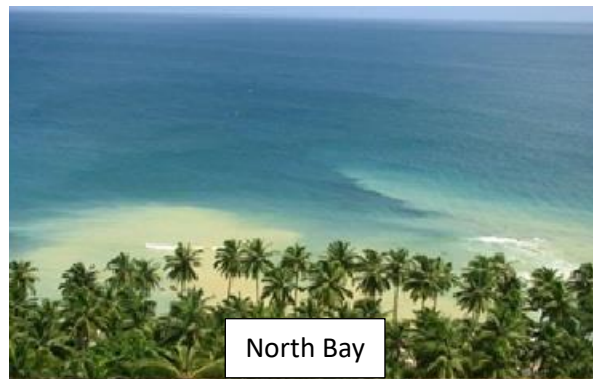


Image 2.6: Natural Tourism Resources of Ferrargunj Tehsil

Cultural Tourism Resources

Agricultural Farm

Department of Agriculture and Krishi Vigyan Kendra has an agricultural farm and research centre near the Coffee Bagicha locality in South Andaman Island. This site is an attractive point for agriculturists, researchers, and people who like crop materials. A new variety of crops and vegetables are investigated at this place. It is located 29 km far from the Bambooflat Jetty. The site score is 85 points and it is having a good level of tourism potential.

Viper Island

Viper Island is named after the famous British Ship Viper which is a wreck in a storm near this Island in the year. At the time of British Colonial rule, this island is used for female prisoners' jails and gallows. The old remnants of the gallows structure could be observed here. The entire island is covered by coconut groves and wild vegetation. It is located 05 km far from the Bambooflat Jetty. The site score is 60 points and it is having a good level of tourism potential.

Zilla Parishad Park

Zilla Parishad Park has been made for residents to spend their leisure time with their loved ones. This park is quite famous among tourists who visit nearby tourist sites. It is constructed and maintained by the District Councillor of South Andaman. It is located 3 km far from the Bambooflat Jetty. The site score is 90 points and it is having an excellent level of tourism potential.



Image 2.7: Cultural Tourism Resources of Ferrargunj Tehsil

2.3.5 Tourism Resources (Sites) for Port Blair Tehsil

Port Blair Tehsil is having a total of 30 tourism resources. Both natural and cultural tourism resources are equally dominant in this tehsil. Fifteen sites belong to natural tourism resources and fifteen sites as cultural tourism resources. Total three resources have been identified as poor potential for tourism i.e., Minto Bay, Sa Ga. Takwe Bay, and Tamada Juru. Sa Ga Takwe Bay fall in tribal resided area and it could not be developed for any economic activity. This resource has rejected by first phase of model. Remaining both resources have been rejected due to their poor score in cultural attributes at the fourth stage of the model. Aberdeen Bazar is the transportation hub of the Port Blair tehsil because most of the means of land transportation are found from this area. This market is also 3 km and 1 km far from the helipad and the Marine Jetty.

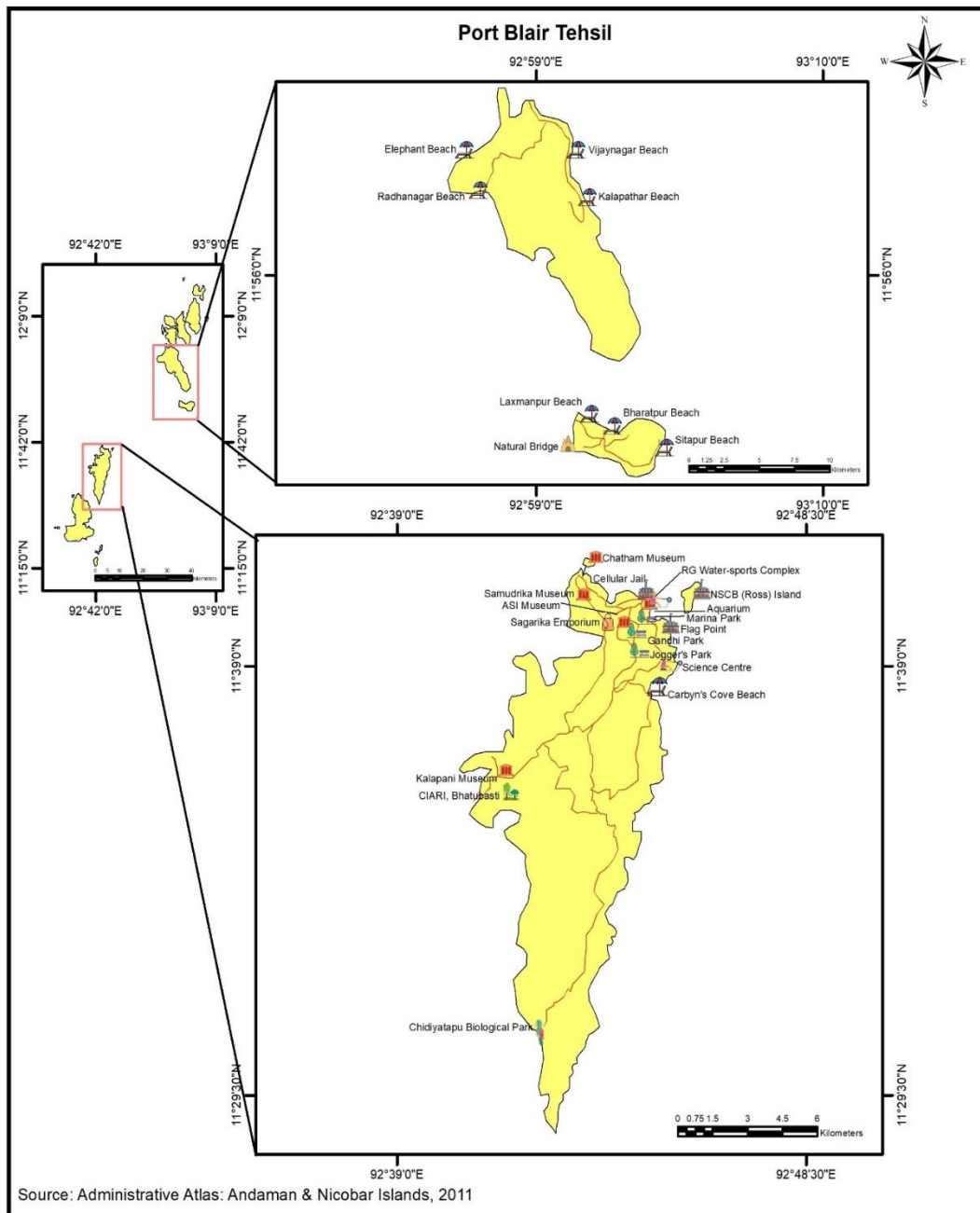
Table 2.1: Selected tourism sites of Port Blair Tehsil

Tehsil	Tourist Site	Zoning	Agreement	Natural Attributes Score	Cultural Attributes Score	Total Score	Level
Port Blair	Natural Tourism Resources						
	Carbyn's Cove Beach	No	Yes	40	60	100	Excellent
	Biological Park	No	Yes	50	30	80	Good
	Chidiyatapu Beach	No	Yes	40	30	70	Good
	Minto Bay	No	Yes	35	5	40	Poor
	Sa Ga Tekwe Bay	Yes					Poor
	Kalapathar Beach	No	Yes	45	35	80	Good
	Vijay Nagar Beach	No	Yes	45	35	80	Good
	Radha Nagar Beach	No	Yes	60	55	115	Excellent
	Elephant Beach	No	Yes	55	35	90	Excellent
	Inglis Island	No	Yes	35	25	60	Good

Tamada Juru	No	Yes	35	10	45	Poor
Bharatpur Beach	No	Yes	45	60	105	Excellent
Laxmanpur Beach	No	Yes	45	55	100	Excellent
Sitapur Beach	No	Yes	50	60	110	Excellent
Natural Bridge	No	Yes	35	60	95	Excellent
Cultural Tourism Resources						
Chatham Saw Mill	No	Yes	50	55	105	Excellent
Samudrika Naval Marine Museum	No	Yes	40	60	100	Excellent
Sagarika Emporium	No	Yes	35	55	90	Excellent
Anthropological Survey of India Museum	No	Yes	55	55	110	Excellent
National Memorial Cellular Jail	No	Yes	50	60	110	Excellent
Rajiv Gandhi Water Sports Complex	No	Yes	45	60	105	Excellent
Marina Park	No	Yes	35	60	95	Excellent
Aquarium	No	Yes	40	60	100	Excellent
Tiranga Memorial	No	Yes	40	60	100	Excellent
Science Centre	No	Yes	45	60	105	Excellent
Gandhi Park	No	Yes	50	60	110	Excellent
Jogger's Park	No	Yes	35	60	95	Excellent
Netaji Subhash Chandra Bose Island	No	Yes	50	40	90	Excellent

	Kalapani Museum	No	Yes	45	50	95	Excellent
	Organic Horticultural Farm	No	Yes	40	45	85	Good

Map 2.5: Tourism Resources of Port Blair Tehsil



Natural Tourism Resources

Corbyn's Cove Beach

Corbyn's Cove Beach is a spectacular geomorphological formation of a beach within a cove. It is a most developed and facilitated beach located near the city region. The beach is having sun-basking seats, a watchtower, a restaurant, bathing and washroom facilities, parking and petty shops. Like most of the beaches of the Andaman Islands, this beach is also covered with coconut groves. There are some festivals like beach festival, monsoon festival, sea-food festival celebrated in this beach area. It is located 6 km far from the Aberdeen Bazar. The site score is 95 points and it is having an excellent level of tourism potential.

Biological Park

Biological Park has been developed and maintained by the Department of Environment and Forest. The park is enriched with floral and faunal diversity. Trees in their natural habited could be observed along with their name and characteristics. Some faunal species like Andaman wood pigeon, Serpentine eagle, Spotted deer, Andaman wild pig, Water monitor lizard, monkeys could be watched in cages and some other non-dangerous animals found free and in their natural conditions. The park is also provided with a travel car facility within the park for needy people. It is located 37 km far from the Aberdeen Bazar. The site score is 80 points and it is having a good level of tourism potential.

Chidiyatapu Beach

Chidiyatapu Beach is located just behind the biological park. This beach is famous among local people and it is one of the favourite places for a picnic. The beach is also facilitated by an eco-hut and washrooms. Munda Pahad is adjoined site located near the beach. It's a cliff having a magnificent view of the southern tip of South Andaman Island. It is located 38 km far from the Aberdeen Bazar. The site score is 70 points and it is having a good level of tourism potential.

Kalapathar Beach

The name of the beach is derived from the Hindi term Kalapather means black stones. This beach is having several eroded black stones along with the sand deposition. It is located 13 km far from the Swaraj Dweep Jetty. The site score is 80 points and it is having a good level of tourism potential.

Vijay Nagar Beach

Vijay Nagar beach is also called Bijoy Nagar Beach by the locals. It is another sandy beach found near the village known as Vijay Nagar. This beach does not have any relative facilities. It is located 11 km far from the Swaraj Dweep Jetty. The site score is 80 points and it is having a good level of tourism potential.

Radhanagar Beach

Radhanagar is Asia's number 1 beach according to the Times Magazine in 2003. This beach is facilitated by a large sand extension with Mahua Tree. The high wave from the open sea makes this beach suitable for surfing activities. It is located 12 km far from the Swaraj Dweep Jetty. The site score is 115 points and it is having an excellent level of tourism potential.

Elephant Beach

Elephant Beach is famous among foreign tourists for sunbath, snorkelling, scuba diving, and sea walking. This beach could be reached by walk or more convenient ferry services. It is located 13 km far from the Swaraj Dweep Jetty. The site score is 90 points and it is having an excellent level of tourism potential.

Inglis Island

Inglis Island is a picnic spot for the local people. It is an uninhabited island having beautiful coastal land with tropical forests. It is located 10 km far from the Swaraj Dweep Jetty. The site score is 60 points and it is having a good level of tourism potential.

Bharatpur Beach

Bharatpur Beach is just beside the Shaheed Dweep Jetty. This is the most approachable beach on this island. There is no means of transportation is required to approach this site. The site score is 105 points and it is having an excellent level of tourism potential.

Laxmanpur Beach

It is located 06 km far from the Shaheed Dweep Jetty. The site score is 100 points and it is having an excellent level of tourism potential.

Sitapur Beach

It is located 13 km far from the Shaheed Dweep Jetty. The site score is 110 points and it is having an excellent level of tourism potential.

Natural Bridge

Natural Bridge is a coastal erosion landform. In geomorphological terms, it is known as Sea Arch. The site is having a total of two sea arches. The local people call them bridges or sea bridge. It is located 07 km far from the Shaheed Dweep Jetty. The site score is 95 points and it is having an excellent level of tourism potential.



Image 2.8: Natural Tourism Resources of Port Blair Tehsil

Cultural Tourism Resources

Chatham Saw Mill

Chatham saw Mill is known as Asia's number one Saw Mill. It is located on Chatham Island. This island is also having historical significance. Chatham Island is the primary location of the early settlement of

the British Colony on this island. At the time of World War II, the Japanese bombarded on this island, that impact could be seen here as a large pit over here. The mill supplies timber material for local requirements. It is also having a museum to show the woodcraft and historical records. It is located 7 km far from the Aberdeen Bazar. The site score is 105 points and it is having an excellent level of tourism potential.

Samudrika Naval Marine Museum

Samudrika Museum is made and maintained by the Indian Navy. This resource is a zone to get specific tourism product of the Andaman Islands. It displays a collection of shells, marine creature skeletons and fishes. Different kind of coral species and their information could be observed here in the museum, it charges only a nominal entry fee from the visitors. It is located 4 km far from the Aberdeen Bazar. The site score is 100 points and it is having an excellent level of tourism potential.

Sagarika Government Emporium

Sagarika emporium is a shopping complex developed and organized by local industrial development authority. It displays and sells shell craft items, wooden material souvenirs, clothes, and books related to the Andaman Islands. This emporium is having also a sell unit of Khadi Gramudyog Products. It is located 1 km far from the Aberdeen Bazar. The site score is 90 points and it is having an excellent level of tourism potential.

Anthropological Survey of India Museum

This museum is maintained and administrated by the Zonal Anthropological Survey of India. It is one of the prominent cultural tourism sites in this tehsil. One could observe the handicrafts, and glimpses of tribal and non-tribal lifestyles, who inhabited of these islands as their costumes, tools, dwellings model, and traditional boats. It is located 1 km far from the Aberdeen Bazar. The site score is 110 points and it is having a good level of tourism potential.

National Memorial Cellular Jail

National Memorial Cellular Jail was earlier known as Kalapani or Indian Bastille. It is great evidence of British colonial atrocities on Indian political prisoners by giving them severe punishment like chain-gang, solitary confinement, bullying, and life imprisonment. This jail has now become a national memorial that displayed contemporary things in the museum and past events of the jail through light and sound shows. It is located 1 km far from the Aberdeen Bazar. The site score is 110 points and it is having an excellent level of tourism potential.

Rajiv Gandhi Water Sports Complex

Rajiv Gandhi Water Sports Complex provides a water sports facility as a safety amenity. It's a Centre to provides activities like banana rides, jet ski rides, parasailing, kayaking and swimming. This complex is also providing a scenic seaside landscape and walking area. The complex itself has some points of attractions like the Battle of Aberdeen Memorial, Tsunami Memorial, Rajiv Gandhi statue, café, walking pathway, Aberdeen jetty and it is adjoined the Marina Park. It is located 1 km far from the Aberdeen Bazar. The site score is 105 points and it is having an excellent level of tourism potential.

Marina Park

Marina Park is the central attraction of Port Blair city. This park is a famous site for leisure among the local community. This place gets rushed during the weekends and holidays. The park is having some prime attractions like seaside walking paths, a children's traffic park, a playing area, a café, washroom facilities, memorial fountains and hedges of beautiful flowers and decorative plants. This park is attached to Rajiv Gandhi Water Sports Complex and the Aquarium. It is located 13 km far from the Aberdeen Bazar. The site score is 95 points and it is having an excellent level of tourism potential.

Aquarium

The aquarium is maintained and organized by the Department of Fisheries. It is having great collections of decorative fishes found in these Andaman Islands. There are some other live marine creatures displayed as shrimps, sea cucumbers, crabs, and stingrays. The skeletons of marine organisms and their preserved body also stored in a separate room. It is located 1 km far from the Aberdeen Bazar. The site score is 100 points, and it is having an excellent level of tourism potential.

Tiranga Memorial

Tiranga Memorial is a recently developed tourism spot in this area. It is a 50 ft high tricolour pole near the seashore of South Point. The site is in proximity to the Government College, Government Press and a local temple. This site also facilitated with seating area, attractive lighting, garden and washroom facilities. The Prime Minister of India Shri Narendra Modi inaugurated this site on 30, December 2019. It is located 2.5 km far from the Aberdeen Bazar. The site score is 100 points, and it is having an excellent level of tourism potential.

Science Centre

Science Centre is a place where scientific tools and equipment has displayed to inculcate scientific temperament among the visitors. The site is located near a seashore having space theatre, 3D theatre,

Jurassic Park, Sea plane display, walking path and parking area. Some events like telescope shows and science fests are also organized for different institutions of the islands. It is located in Goodwill Estate, which is 4 km far from the Aberdeen Bazar. The site score is 105 points and it is having an excellent level of tourism potential.

Gandhi Park

Gandhi Park has been developed and maintained by the local municipal body named PBMC. The park surrounded the Dilthaman Tank. This tank was the earlier source of water for the town. Now it is the point of leisure attractions for the visitors. There is a Japanese Temple and bunkers could be seen in this park. There is a giant statue of Mahatma Gandhi at the center of the park. A playground equipped with swings, a see-saw and flower beds. It is located 1.5 km far from the Aberdeen Bazar. The site score is 105 points and it is having an excellent level of tourism potential.

Jogger's Park

Joggers Park has been developed and maintained by the PBMC. It is situated on the hilltop of Chakkar Gaon locality. People of the city come in the morning and the evening for jogging, walking and yogic activities. A magnificent view of the Veer Savarkar International Airport could be seen through this park. It is located 4 km far from the Aberdeen Bazar. The site score is 110 points and it is having an excellent level of tourism potential.

Netaji Subhash Chandra Bose Island

Netaji Subhash Chandra Bose Island erstwhile known as Ross Island was the territorial capital during the British Colonial period. Presently this island is under the care of the Indian Navy. This place is having historical importance. Visitors could be watching the old remains of the church, bakery, graveyards, swimming pool, army barrack, and other important buildings. At the time of colonization, it was called as Paris of east. Now it's the remains and memories of that old charms. This island becomes the abode of some exotic species like the peacock, spotted deer, squirrels etc. Most of the land is covered with coconut trees. There are many pathways to visit each part of the island. It is located 4 km far from the Aberdeen Bazar. The site score is 90 points and it is having excellent tourism potential.

Kalapani Museum

Kalapani Museum is a privately developed museum and archive of old testimonials of records, photographs, and documents related to these islands at colonial time. It is located 13 km far from the Aberdeen Bazar. The site score is 95 points and it is having an excellent level of tourism potential.

Organic Horticultural Farm, Sippighat

Horticultural Garden is a nursery of different agricultural plants. It is developed and managed by the Department of Agriculture. This site is entirely decorated and managed like a park. People could purchase the plants and other agricultural products from the departmental sales unit site. It is located 21 km far from the Aberdeen Bazar. The site score is 85 points and it is having a good level of tourism potential.

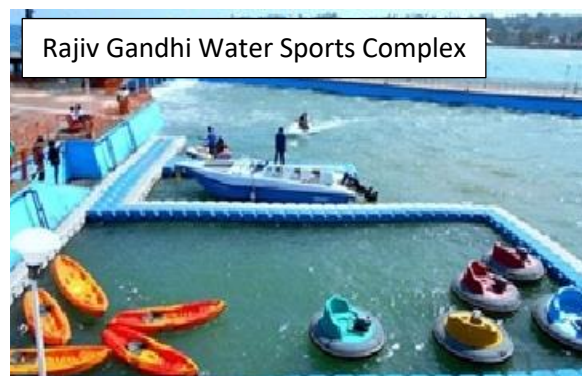
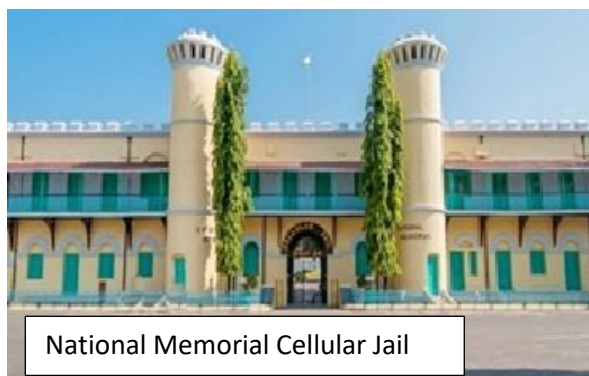


Image 2.9: Cultural Tourism Resources of Port Blair Tehsil

2.3.6 Tourism Resources (Sites) for Little Andaman Tehsil

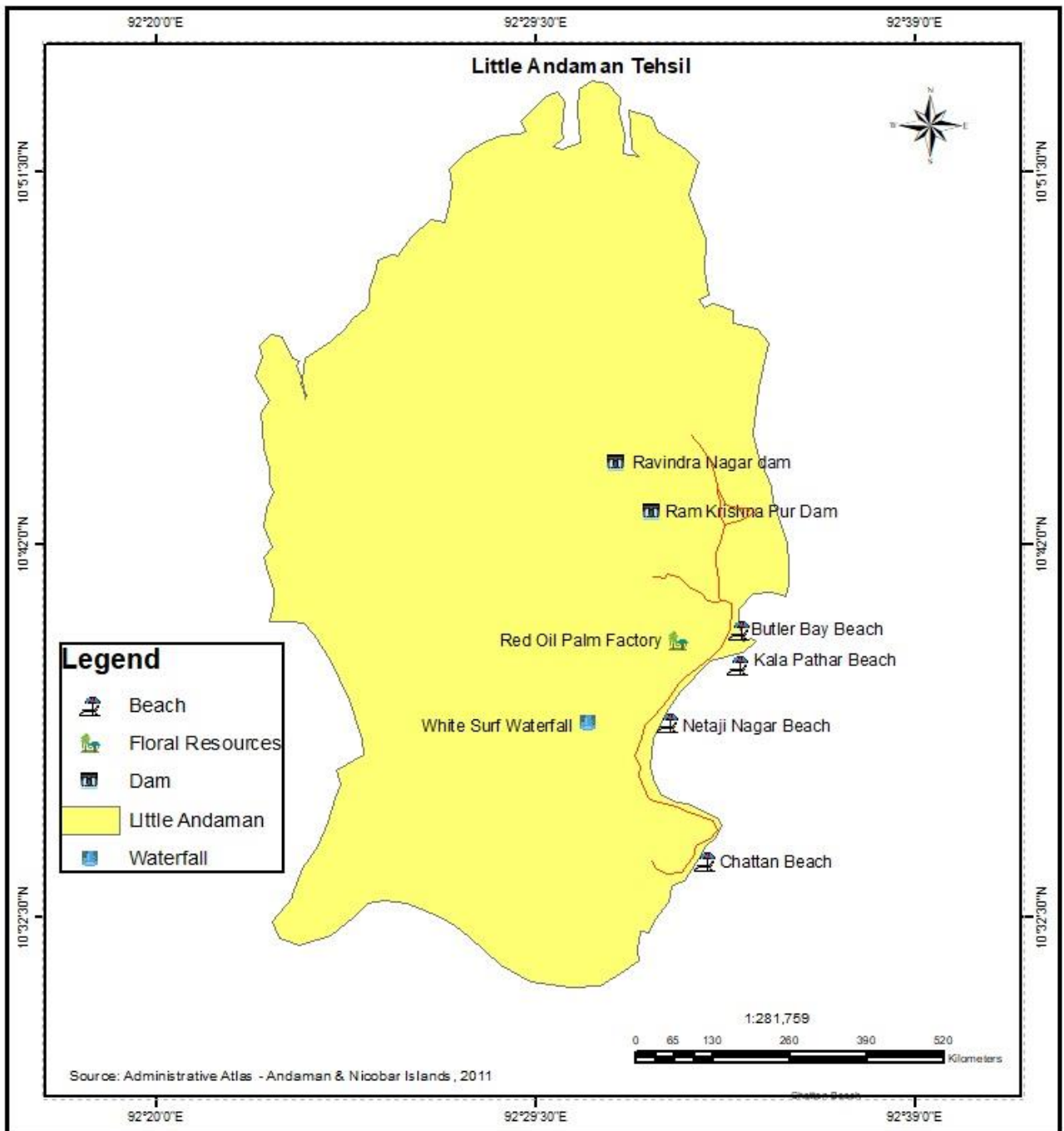
Little Andaman Tehsil is having a total of 8 tourism resources, which have been selected through the model. Five sites belong to natural tourism resources and three cultural tourism resources. There is total three tourism resources are poor i.e., mouth of river, Harminder Bay Beach, and Wishper-wave Waterfall. Herminder Bay Beach is fall under the tribal reserved area and any kind of economic activity is prohibited over here. So, it is rejected in the first stage of the model while the remaining resources

were not selected because they were underscored in cultural attributes in the fourth stage of the model. Hutbay Market is the transportation hub for the Little Andaman Tehsil because most of the means of land and water transportation are found nearby to this area.

Table 2.7: Selected tourism sites of Little Andaman Tehsil

Tehsil	Tourist Site	Zoning	Agreement	Natural Attributes Score	Cultural Attributes Score	Total Score	Level
Little Andaman	Natural Tourism Resources						
	Butler Bay Beach	No	Yes	50	30	80	Good
	Mouth of Creek	No	Yes	30	10	40	Poor
	Netaji Nagar Beach	No	Yes	40	25	65	Good
	Kalapathar Beach	No	Yes	35	25	60	Good
	White Surf Waterfall	No	Yes	45	20	65	Good
	Chattan Beach	No	Yes	30	30	60	Good
	Herminder Bay Beach	Yes					Poor
	Wishperwave Waterfall	No	Yes	40	15	55	Poor
	Cultural Tourism Resources						
	Ram Krishna Pur Dam	No	Yes	35	35	70	Good
	Ravindra Nagar Dam	No	Yes	30	40	70	Good
	Dalda Plantation	No	Yes	30	30	60	Good

Map 2.6: Tourism Resources of Little Andaman Tehsil



Natural Tourism Resources

Butler Bay Beach

Butler Bay Beach is the most beautiful and clean beach on Little Andaman Island. It is surrounded by coconut groves from the land part. swimming is not permissible as this place is having crocodile zone. It is located 8 km far from the Hutbay Market. The site score is 80 points and it is having a good level of tourism potential.

Netaji Nagar Beach

It is located 11 km far from the Hutbay Market. The site score is 65 points and it is having a good level of tourism potential.

Kalapathar Beach

Kalapathar is a rocky beach. It is more like a sea wave-cut platform. It is located 13 km far from the Hutbay Market. The site score is 60 points and it is having a good level of tourism potential.

White Surf Waterfall

It is located 15 km far from the Hutbay Market. The site score is 65 points and it is having a good level of tourism potential.

Chattan Beach

The term 'Chattan' is derived from the Hindi language means rock. This beach is a rocky shore area with little sand deposition. It is very near (1 km) to the Hutbay Jetty. It is located 4 km far from the Hutbay Market. The site score is 60 points and it is having a good level of tourism potential.



Image 2.10: Natural Tourism Resources of Little Andaman Tehsil

Cultural Tourism Resources

Ram Krishna Pur Dam

It is located 13 km far from the Hutbay Market. The site score is 70 points and it is having a good level of tourism potential.

Ravindra Nagar Dam

This Dam is named after the adjoining village named Ravindra Nagar. It is located 13 km far from the Hutbay Market. The site score is 70 points and it is having a good level of tourism potential.

Red Oil Palm Plantation

The plantation is spread over an area of 1,593 hectares. There was a oil extracting factory established by the Government of India in 1979 and now, it is closed. The visitors could watch the entire plantation and old factory remains on this site. It is located 8 km far from the Hutbay Market. The site score is 60 points and it is having a good level of tourism potential.



Image 2.11: Natural Tourism Resources of Little Andaman Tehsil

The results show that the cultural resources are more in numbers in Port Blair, Ferrargunj and Mayabunder tehsils while there are very less cultural resources are found in the Diglipur and Mayabunder tehsil. Even the Rangat tehsil are not having any cultural tourism resources. The Port Blair tehsil is having most of the numbers of cultural tourism resources and its overall numbers of tourism resources are more than the other tourism resources. The main reason is the early settlement in these islands take place in Port Blair and its proximity region which was earlier known as Port Cornwallis. The British Empire had decided to make penal settlement in these islands and they made further development in these regions. The Political grip and economic benefits are the main reason to make settlement over here. Afterword the Imperial Japanese Occupation make many cultural elements during their occupation (1942-45). The remaining of cultural elements of British and Japanese Occupation over here presently identified as cultural tourism resources in Port Blair Ferrargunj and Mayabunder Tehsil. Apart from that, the local administration made many museums, parks and leisure services in these localities after the Independence. Whereas, the other parts of the Andaman Islands and its tehsils like Diglipur, Rangat, and Little Andaman have been settled the people from different parts of India after the independence. So, their short historical background and less populated area does not have any significant historical heritage and sources of leisure activities.

CHAPTER 3

TOURISM INFRASTRUCTURES OF THE ANDAMAN ISLANDS

3.1 INTRODUCTION

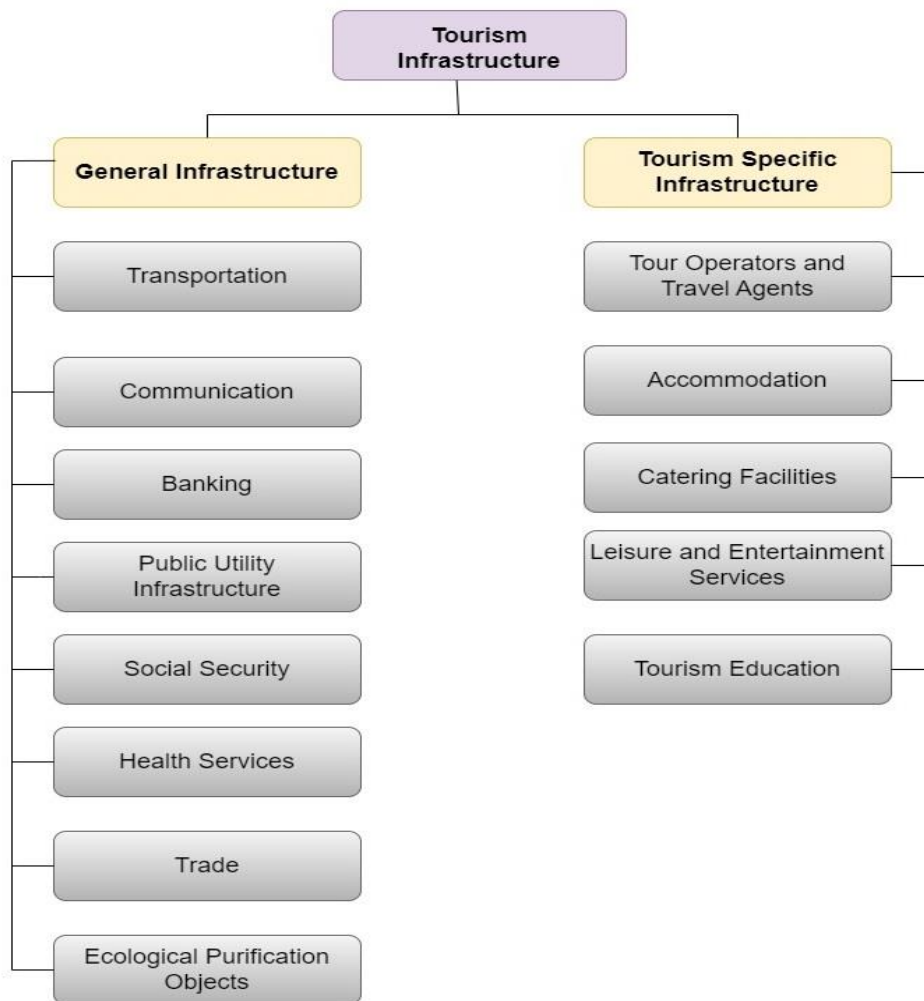
Infrastructures generally conjure up the notion of a large-scale physical resource made by humans for public consumption (Frischmann, 2012). It is the set of basic facilities and systems that support the sustainable functionality of households and firms. It serves the country, city, or other areas, including the services and facilities necessary for its economy to function. On the basis of the function, it could be classified into a general and specific type of infrastructure.

General infrastructure or basic infrastructure composed of basic organizational and physical structure that is required to run a function smoothly. In an organization or a country, a basic infrastructure includes communication and transportation, sewage, water, electricity, banking, education system, health system, clean drinking water, and monetary system (Koshaka, 2007). Basic infrastructure is use generally for day today purpose. Specific infrastructures deals in any specific sector or organization is required special arrangements or facilities. An IT industry required high speed internet connection and advanced technological equipment; an educational hub required variety of stationary materials. Most the economic activities are required general infrastructure facilities but some of the sectors are exclusive need of specific kind of infrastructure (Weill, Subramani, Broadbent, 2002; Admiraal, A. R. Sequeira, & Doepel, 2017; Aleixo, Pena, Heller, & Rezende, 2019) in (Ramadhan, 2019). To cater the special needs of tourist in a destination required extra arrangements along with the general infrastructures. Services which enable tourists to enter and to move around the country with maximum of ease and minimum of obstacles, securing maximum enjoyment of their visit is known as tourism infrastructures (Bhatia, 2002 in Mohhamad, 2009). Many regions in the world are rich in tourism attractions but they are not in a position to reap those benefits of tourism simply because of the lack of these infrastructures (Velichkina, 2014). Tourists usually expect facilities in their chosen destination to be comparable to what they enjoy at home (Khadooro and

Seetanah, 2014). Hence, tourism infrastructure of a particular place plays major role in providing overall effective tourism experience.

The tourism industry also required the general infrastructures (Seetanah, Juwaheer, Lamport, Rojid, Sannasee, & Subaddar, 2011; Imakim & Ekpo,2012) along with tourism specific infrastructures like accommodation, ticket houses, tour and travel agents, etc. (Abdullah, Razak & Jafar,2014; Victoronva & Ivanovich, 2019). Both of these general and tourism specific infrastructures aggregately facilitate the tourists in the destination. Different type of infrastructures that will be directly or indirectly used for tourism industry, commonly referred as components of tourism infrastructures. On the basis of above pieces of literature, the tourism infrastructures have been classified in following category:

Figure 3.1: Classification of Tourism Infrastructures



Transportation

The movement of people and freight from one place to another is called transportation (Microsoft Encranta, Microsoft Corporation, 2019). Transportation is the foremost important service to tour operations. An efficient transport system can make the tour easier and comfortable while a problematic or insufficient transport system may fade the entire tour experience.

Communication

Communication is the exchange and flow of information and ideas from one person to another. It involves a sender transmitting an idea, information, or feeling to a receiver (US_Army, 1983). To manage the entire tour operation the strong connectivity of the communication network is the foremost requisite. The tourist also communicate with their family and get guidance instructions during the tour operation from the different means of communication. Social media play a significant role to efficiently communicate at this age.

Public Utility Services

Common utilitarian services which are required for daily survival is known as public utility services. For example, washrooms, restrooms, and drinking water facilities at tourist destinations.

Social Security

Tourism destinations are having different natures of safety and security issues related to tourism i.e., health epidemics, food security, natural disasters, terrorism, war, political instability, cross-cultural differences-disputes, and petty crime (Lepp, Gibson, & Cane, 2011) (Sofield, 2006). The nature of these and security issues varies from place to place but social security is ubiquitous vulnerable for all tourism destinations hence a strong vigil, and systematic police security in the tourism destination is a prime necessity. To maintain law and order in society and safety for a migrant floating population like tourists (Who are unaware and need special arrangements of the police force). Increasing tourist movement in destinations and increasing responding of safety and security of them poses a great challenge to the police department (Muehsam & P.E.Tarlaw, 1995) in (Tyagi, Dhar, & Sharma, 2016). To maintain efficiency tourists, have to follow some guidelines for the islands and vice versa.

Health Services

Health services count top among all the essential services. Good health is an indicator of a progressive society. Human Development Index (HDI) count health as one of the variables to count the country's progress, Human is the user and themselves a resource who make different services and facilities. A healthy person has efficient economic productivity for society. To

maintain the health of the people health services are a significant necessity for society. A mentally and physically healthy person could enjoy all the leisure activities of a tourist destination. Now, these days medical tourism is growing as a new sector of economic tourism. In medical tourism, people look for a place where they can both enjoy their vocation as well as obtain high-quality medical services at a competitive price (Sadeh & Garkaz, 2018).

Banking Services

Banking services provide financial facilities to society among different sectors of the economy. For an entrepreneur like a tour operator, hotelier, transport provider as a stakeholder directly related to tourism activities the banking facilities are the foremost required. The tourist who is the actual consumer of the tourism product does not carry bundles of cash while they are on travel. Usually, they depend upon the cash withdrawal facilities of local banking services at the destination. They also require financial services to fund their travel arrangements foreign exchange is the most important service for international tourism (Camilleri, 2018). They also need insurance and credit facilities from financial institutions from banks and insurance companies. Foreign tourists are exchange currency in their home country before the trip in an exchange. They also re-exchange the currency before leaving the host country from their financial institutions (Krusela, 2014). Banking tourism infrastructure helps to use the tourism facilities and tourism products by the tourists. Willingness to visit the same company or bank again after currency exchange and transaction indicate the bank is meeting the tourist satisfaction. Foreign tourist facilitates the money exchange service through financial infrastructure mainly there is three sector of banking administration- Public, private and cooperative banks.

Trade

Tourist shopping centres are the place where tourists have to purchase necessities such as toiletries or souvenirs and gifts which reflect the culture of the destination, where they visited (Camilleri, 2018). The sales unit of the different departments and souvenir shops can be considered tourist shopping centres. The tourists who travel to the tourism destination collect souvenirs and special utility products, and goods as their tour memories.

Tour Operators and Travel Agencies

Tourist guide is the host to the tourists and provide appropriate information about the destination to the visitors. Most of the tour operators involve in tour organise agencies. A registered tour and travel agency is the safest unit for tourism activities. Thomas Cook is the world's first organizer of the work of the tour guides who accompany and guide the tourist via train trips. According to (Khattab et al., 2018) the role of a tourist guide has changed in the

modern age from a simple job of giving direction to being well equipped with knowledge about archaeology and history in archaeology (tourist) sites. The absence of efficient tourist guides would lead the whole tourist sector to collapse. A tour guide with adequate knowledge and problem-solving ability can lead to symmetrical effects on tourist satisfaction (Kuo, Cheng, Chang, & Lily, 2018).

Meanwhile, the tour agencies offer tourism services, consult and provide valuable information to the tourist. In the tourism sector, the tour agencies are the service provider and tourists are the customer. Tour operators and travel agents are tourist intermediaries they act as an information provider, facilitators between the tourist and supplier (Budeanu, 2005) (Silva, Costa, & Moreira, 2018). They play important role in the construction of destination images by their quality and management as well as the services. There are numbers of tours and travel agents are operating in organising individual ways. Most of the tour and travel agents are generally registered themselves in the local tourism department.

Accommodation

Accommodation is a facility for living at the time of the tour at the destination, which is usually a distance from the home. The tourists are the outsider persons for the destination. They also need all basic social requirements like food, water and accommodation. But among them, accommodation facilities are unmoveable (except in the case of vehicle rooms, tents and houseboats). A destination may call a place where they visit need a space to rest is a known accommodation facility.

Catering Facilities

After water, food is the essential commodity and biological need for humans. Food consumption is one of the strongest memories of travellers that makes a critical impact on the entire tourism experience (Ferreira, 2022). The different places and societies are having a variety of foods and cuisine. Most of the tourist wants to try the local and their special dish at the destination. Foods also count as a tourism product and an essential part of the entire tour operations done by the tourists. Few tourists are also hesitant to have foods from different places; for them, multi-cuisine restaurants arrange the food according to their interests. It provides a variety of meals and snacks which are famous at the international level i.e., Chinese, Continental, Indian and Tandoori etc. However, most of the tourist like to enjoy the local cuisine as for their travel experience.

Leisure and Entertainment Services

The services provided for the inculcate and promote the tourism of the region is known as leisure and entertainment services.

Ecological Purification Objects

Tourism industry also caused degradation of the environment, in order to maintain the quality of the environment and ecological balance the local authority and government have to expenses some capital upon them. The Department of Environment and Forest, local NGOs, local bodies are responsible institutions to conserve the tourism resources.

Tourism Education

Tourism-appropriate behaviour is needed among the local residents, and tour operators as well as for the tourist to maintain the proper tourism atmosphere of the destination. There are some government and private agencies that conduct community awareness programs, workshops, seminars, and signboards planted near tourist sites to inculcate the tourism appropriate values.

3.2 DATABASE AND METHODOLOGY

3.2.1 Database

Mostly secondary data has been used for enlist the tourism infrastructure. Most of the data has been taken from Directorate of Economic and Statistics, 2020-21. These data are available in the official website of Economic and Statistics. It is available as content (department) wise and also in aggregately. Elements of these content has been taken as indicators for their content. The secondary data related to the different component found in the respective portal of the website of Economic and Statistics like the information regarding transportation in transport, communication in postal and communication, public utility services in the APWD, civil supply, and power, health services in medical, trade in labour and employment, tour operators and travel agents, accommodation in tourism, catering facilities in labour and employment, ecology and environment infrastructure in planning section. The data related to banking are got from the website e.g., Sulekha. Sports facilities and source of entertainment (parks and theatre) enumerate through primary data collection. The entire database has been prepared as tehsil wise available in the Appendix-X. Thehsilwise appendix has to prepare for the tourism infrastructures' quantity.

3.2.2 Methodology

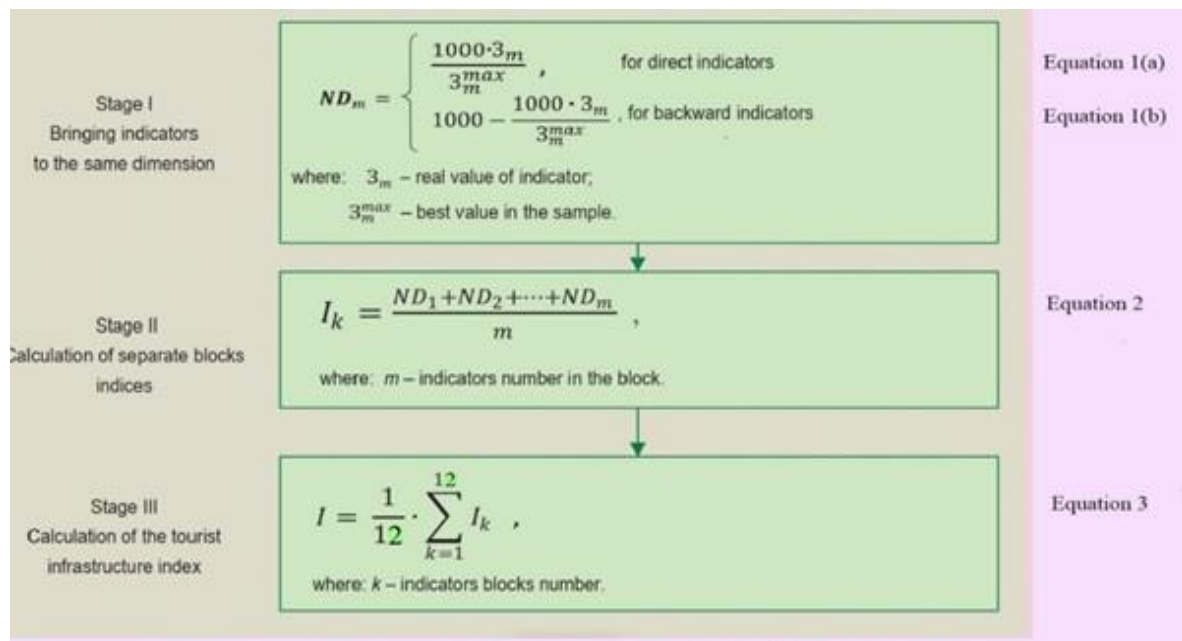
For enlisting the tourism infrastructure, a methodology named 'Tourism Infrastructure Index' has been adopted from the study of Velenchikina (2014). This methodology calculates the measurable values of tourism infrastructures in order to assess their comparative developmental

levels. This value is called Tourism Infrastructure Index (TII) of a region. Application of this methodology could give a comparable output of tourism infrastructure of different regions. The output values show that how much the scored units have region in compare to the most developed infrastructure of that very region.

This methodology calculates the tourism infrastructure index in 3 stages as hierarchical order. In the first stage each indicator of a component will be calculated through multiplication of their original value to 1000 and further it will divide by the best value of the sample (for direct indicators). The value of direct indicator will subtract from 1000 for calculating backward indicators. Each indicator of a separate block will calculate in this stage. Second stage calculates the mean values of each indicator of particular block indices. The value of a block index calculates to the sum of all values of the indicators and further divide them by the total number of indicators in the block. The third stage calculates the aggregate values of all tourism infrastructure components of that particular region. The index value of a region will inculcate through submission of the value of all components divided by the number of all components. Through inculcate the value of different region will provide a comparative view of tourism infrastructure developmental level.

The elements and terms used in the methodology has been systematically described. Equation 1 (a) has used to calculate the direct indicators. The direct indicators are related with value output in positive side of the indicator. Equation 1 (b) use to calculate the backward indicators. The backward indicators are related with the negative dimension of the component. Different model of equations will use according to the nature of the indicators. It is generally uses for making the data value unidirectional. ' ND_m ' symbol used in the equation for particular indicator. Here ' 3_m ' is used for the real value and $3m \text{ Max}$ for the best value of the indicators. In Equation 2 the symbol ' I_k ' has been used, where 'I' represent the component and 'k' for the serial number of the components of tourism infrastructures. In this equation, the m denotes the numbers of indicators in the block indices. In Equation 3 The ' E_{ik} ' symbol has been used to denote submission value of the all components and 'k' represent the number of total components.

Figure 3.2: Methodology for calculating tourism infrastructure index



Source: Adopted from “The assessment of the regional tourism infrastructure development (Velichkina,2014)”

4.3 RESULT AND DISCUSSION

Regional analysis of the Tourism Infrastructure Index has been done to understand the development of particular type of components in each regional. The regional study is followed by the comparative study of each region to another.

4.3.1 Regional analysis of each Components of Tourism Infrastructure Index

4.3.1 Analysis of Tourism Infrastructure Index of Diglipur Tehsil

Table 4.1: Components of Tourism Infrastructure Index in Diglipur Tehsil

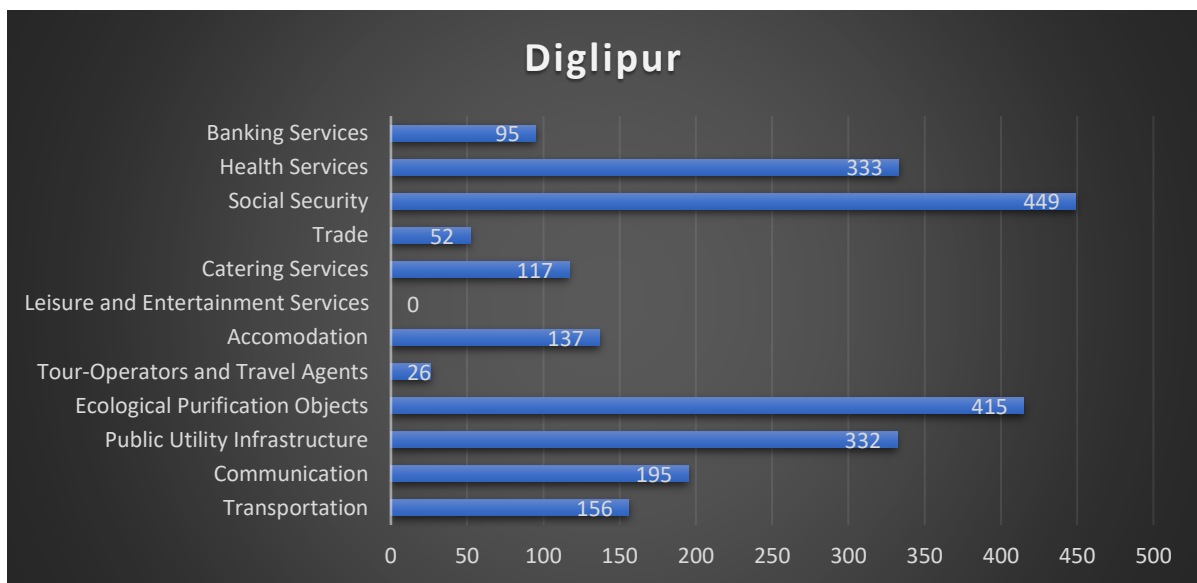
Components	Index Value
Transportation	156
Communication	195
Public Utility Infrastructure	332

Ecological Purification Objects	415
Tour Operators and Travel Agents	26
Accommodation	137
Leisure and Entertainment Services	0
Catering Services	117
Trade	52
Social Security	449
Health Services	333
Banking Services	95
Tourism Infrastructure Index	192

Application of the methodology on available tourism infrastructures data for Diglipur Tehsil (Appendix 4) is showing that the leisure and entertainment services (0), tours and travel operators (26), and trade (52) and banking (95) components of tourism infrastructure are very poor. Most of the tour operator is based in the municipal area of Port Blair Tehsil. In Diglipur Tehsil the tour operators are working under them and they also depend on the tourists sent by the tour operators of Port Blair. Because it is the only gateway to enter the tourists in these islands. The tour operators are depending to get tourists on the main tour operators of Port Blair. There is no place for entertainment like parks or theatres because of less arrival of tourists in this Tehsil. So, the local bodies have not developed any means of entertainment here. Apart from this the poor conditions of the local people are unable to afford the cost to enjoy the means of entertainment. Shopping complexes are lacking modern amenities and special products for tourists. The population and bank amenity ratio are also very low. SBI is the largest banking branch in this locality. The local people are getting banking services in this branch after waiting their turn in a long queue. Tourists may face many problems getting the basic facilities over here. The solution to the infrastructural hindrances is through the tie-up of local tour operators with the national and regional travel agencies, establishing modern amenities and tourist attractive goods in local shopping complexes, establishing of means of leisure for the local residents, and inviting the banking firms. The tourism infrastructure index value for transportation, communication, public utility infrastructure, accommodation, catering facilities and health services is ranging from 117 to 333 points (in a lower moderate range). Only ecological purification objects (415) and social security (449) having efficient numbers of infrastructure. It indicates that the Rangat tehsil is comparatively safe for tourist and more

environmentally concern. Here, trade is the most developed and tour operators-travel agents are the least developed components. The overall tourism infrastructure index of the Diglipur Tehsil is 192. It is 727 points below than best overall tourism indicator index (Port Blair, 919) and 147 points below the average tourism infrastructure index (339). Only social security and ecological purification objects are more than the average tourism infrastructure index.

Figure 3.3: Tourism Infrastructure Index in Diglipur Tehsil



3.3.2 Analysis of Tourism Infrastructure Index of Mayabunder Tehsil

Table 3.2: Components of Tourism Infrastructure Index in Mayabunder Tehsil

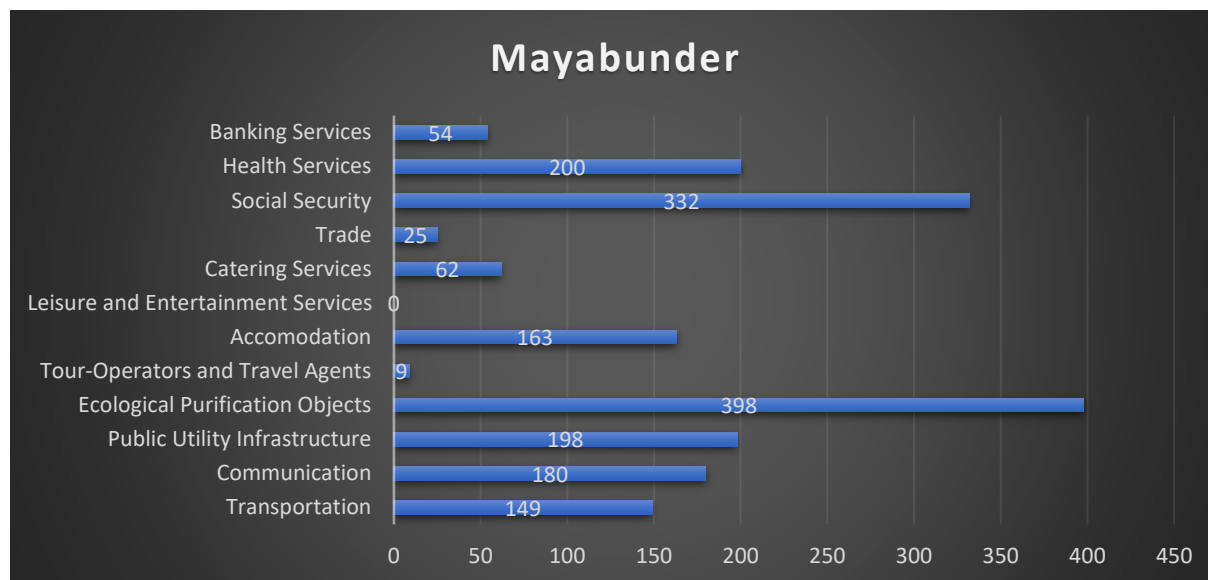
Components	Index Value
Transportation	149
Communication	180
Public Utility Infrastructure	198
Ecological Purification Objects	398
Tour Operators and Travel Agents	9
Accommodation	163
Leisure and Entertainment Services	0
Catering Services	62

Trade	25
Social Security	332
Health Services	200
Banking Services	54
Tourism Infrastructure Index	147

Through the analysis of different indicators of tourism infrastructure index component, it has found that, the tour operators and travel agents (9), leisure and entertainment services (0), catering services (62), trade and banking (54) components are very poor. The local agents are working under the tour operators of the Port Blair Tehsil because the tourists are usually come via Port Blair only. There is no chance to get any direct tourists to the tour operators in the Mayabunder Tehsil. It is the main reason for having very a smaller number of tour operators and their agencies in this tehsil. The field study and the statistics have not found any specific infrastructure for leisure and entertainment like theatre and parks here. According to Census of India-occupation data, 2011 most of the resident are belongs to the primary sector of occupation and also belongs to the low economic group. They are unable to afford the means of entertainment if it were made available by any private firm. The government should arrange the low-cost source of entertainment that capital and material should available in this tehsil only. These things will be accessible by the local residents as well as by the tourists in future. The tehsil is also lack of the cuisine's variety. The local market does not have modern amenities and interesting element for the tourists. The government can open a unit of Khadi Gram Yudyog and help to produced handicrafts by the local SHGs for the tourists. The banking facilities are limited and only concentrated in the market area. People of the remote area does not have access the services nor the tourist will get this facility near to the tourist site that is located far from the market area. There is a requirement to provide banking service outlet proximity to the maximum number for tourist sites. The tourism infrastructure index value for transportation, communication, public utility infrastructure, accommodation, health services is ranges from 149-200, in Mayabunder Tehsil. The scores are very low. This tehsil also has only ecological purification objects (398) and social security (332) are having in efficient numbers of infrastructure but it is comparatively less than the Diglipur Tehsil. The overall tourism infrastructure index of the Mayabunder Tehsil is 147. It is 772 points below than best overall tourism indicator index (Port Blair, 919) and 192 points below than the average tourism infrastructure index (339). Here, ecological purification objects are the most developed and

tour operators-travel agents are the least developed components. Only ecological purification objects component is more than the average tourism infrastructure index.

Figure 3.4: Tourism Infrastructure Index in Mayabunder Tehsil



3.3.3 Analysis of Tourism Infrastructure Index of Rangat Tehsil

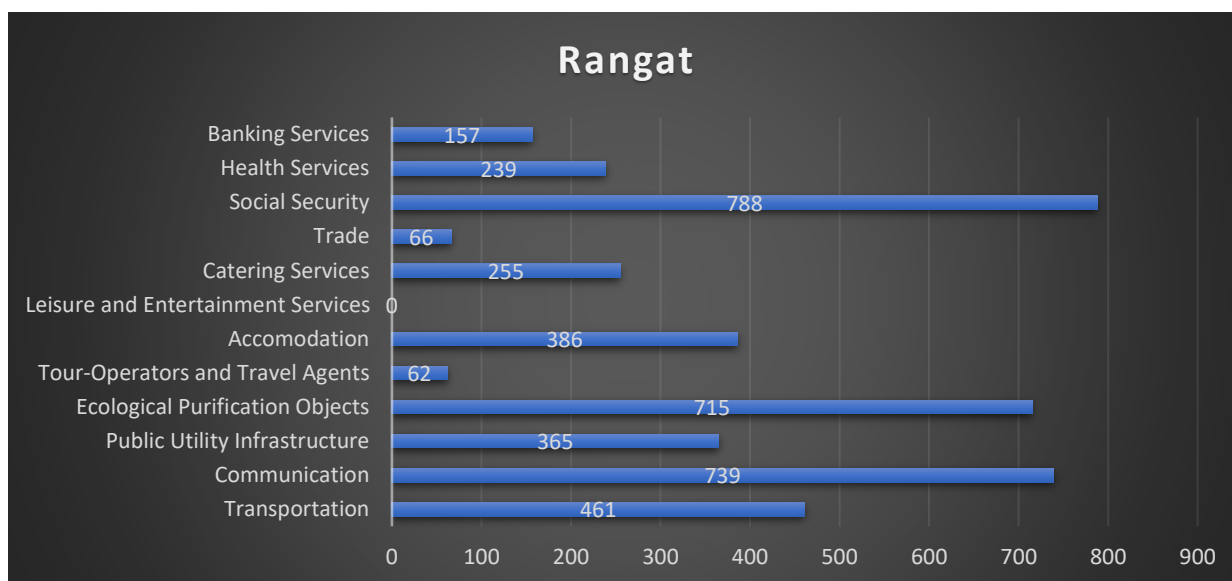
Table 3.3: Components of Tourism Infrastructure Index in Rangat Tehsil

Components	Index Value
Transportation	461
Communication	739
Public Utility Infrastructure	365
Ecological Purification Objects	715
Tour-Operators and Travel Agents	62
Accommodation	386
Leisure and Entertainment Services	0
Catering Services	255
Trade	66
Social Security	788
Health Services	239

Banking Services	157
Tourism Infrastructure Index	353

Through the analysis it has been known that the tour operators and travel agents (62), leisure and entertainment services (0), and trade (66), components of tourism infrastructures are very poor in Rangat Tehsil. Only few numbers of independent tour operators and travel agents are active in this tehsil but it is better than other tehsils of Andaman Islands except Port Blair and Ferrargunj tehsil. The people who involved in the tour travel agency, they are doing this as secondary source of income. Their primary job is business activity. Baratang Tourist Fibre Boat Owner Association (BFTBOA) is a group the local travel agents active in Baratang Island, Rangat Tehsil. This agency got their tourists sent by their other travel agency partners from the Port Blair Tehsil. The survey conducted by the researcher and the economic and statistics data, 2020-21 do not find any specific infrastructure development for leisure and entertainment. The interaction during the field study reveals that people from this tehsil visit Port Blair Tehsil for watching movies in theatre and also visit the nearby parks. These kinds of interest indicate that there is a need to make means of leisure and entertainment like theatre, parks, theme restaurant for the local community as well as for the tourist that they will visit in the future. The trade centres of the Rangat Tehsil dispersed in many places like Kadamtala Market, Long Island Market, Billyground and Bakuntala Market etc. Rangat Market is the oldest market of the tehsil but observation and statistics says that there have been taken more horizontal development than its vertical upliftment. Many shops and enterprises are remained in old structure and there is lack of modern upgradation. The tourism infrastructure index value for transportation, public utility infrastructure, accommodation, catering facilities, health services, banking services is ranges from 157- 461 in Rangat Tehsil. The overall tourism infrastructure index of the Rangat Tehsil is 353. It is 566 points below than best overall tourism indicator index (Port Blair, 919) and 14 points above than the average tourism infrastructure index (339). Transportation, communication, public utility infrastructure, ecological purification objects, accommodation, social security are more than the average tourism infrastructure index. Even this tehsil's ecological purification objects (715), communication (739) and social security (788) components are having in efficient numbers of infrastructure. The social security is the high developed component among the all tehsils. Here, social security is the most developed and leisure and entertainment services are the least developed components.

Figure 3.5: Tourism Infrastructure Index in Rangat Tehsil



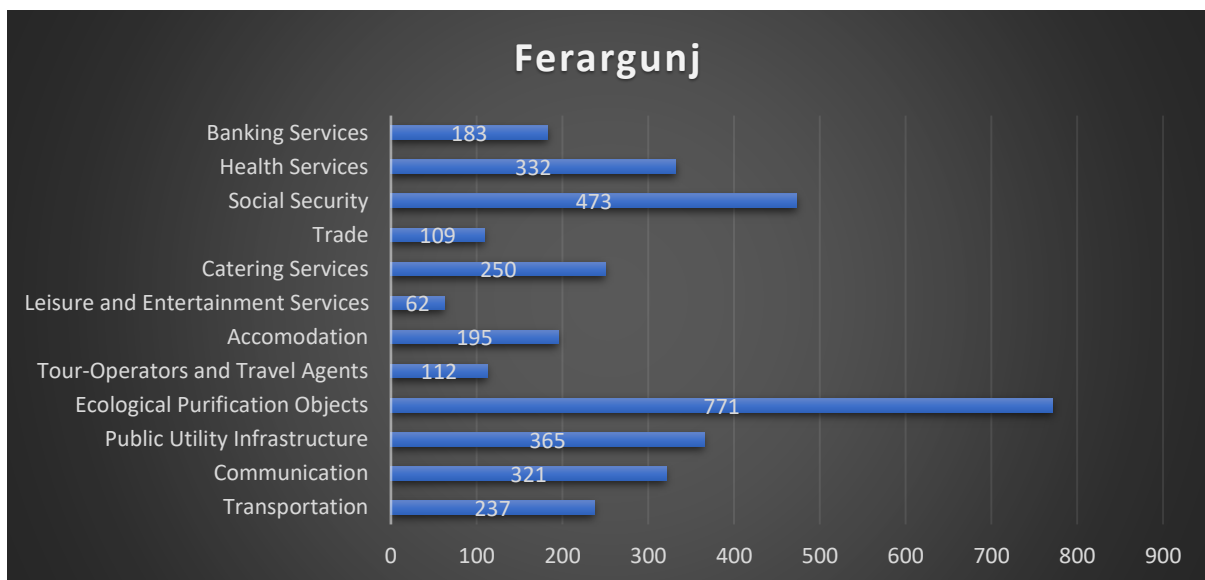
3.3.4 Analysis of Tourism Infrastructure Index of Ferrargunj Tehsil

Table 3.4: Components of Tourism Infrastructure Index in Ferrargunj Tehsil

Components	Index Value
Transportation	237
Communication	321
Public Utility Infrastructure	365
Ecological Purification Objects	771
Tour-Operators and Travel Agents	112
Accommodation	195
Leisure and Entertainment Services	62
Catering Services	250
Trade	109
Social Security	473
Health Services	332
Banking Services	183
Tourism Infrastructure Index	284

The methodology application revealed that leisure and entertainment service (62) component is very poor in the Ferrargunj Tehsil. Even though, the other tourism infrastructure components of this tehsil are better than the other tehsil of the Andaman Islands except for the Port Blair. Recent developments of Zila Parishad Children Park in Whimberligunj and Veer Sawarkar Park, Chouldari are the evidence of taking interest to develop means of leisure and entertainment. The tourism infrastructure index value for transportation, communication, public utility infrastructure, tour operators and travel agents, accommodation, catering facilities, trade, health services, and banking services ranges from 109 to 365 in Ferrargunj Tehsil. These components scored comparatively low than the other components of tourism infrastructures. In this tehsil's ecological purification objects (771), and social security (473) components are having in efficient numbers. Here, trade is the most developed and tour operators-travel agents are the least developed components. The overall tourism infrastructure index of the Ferrargunj Tehsil is 284. It is 634 points below than best overall tourism indicator index (Port Blair, 919) and 54 points below the average tourism infrastructure index (339). Only public utility infrastructure, ecological purification and social security objects are more than the average tourism infrastructure index.

Figure 3.6: Tourism Infrastructure Index in Ferrargunj Tehsil



3.3.5 Analysis of Tourism Infrastructure Index of Port Blair Tehsil

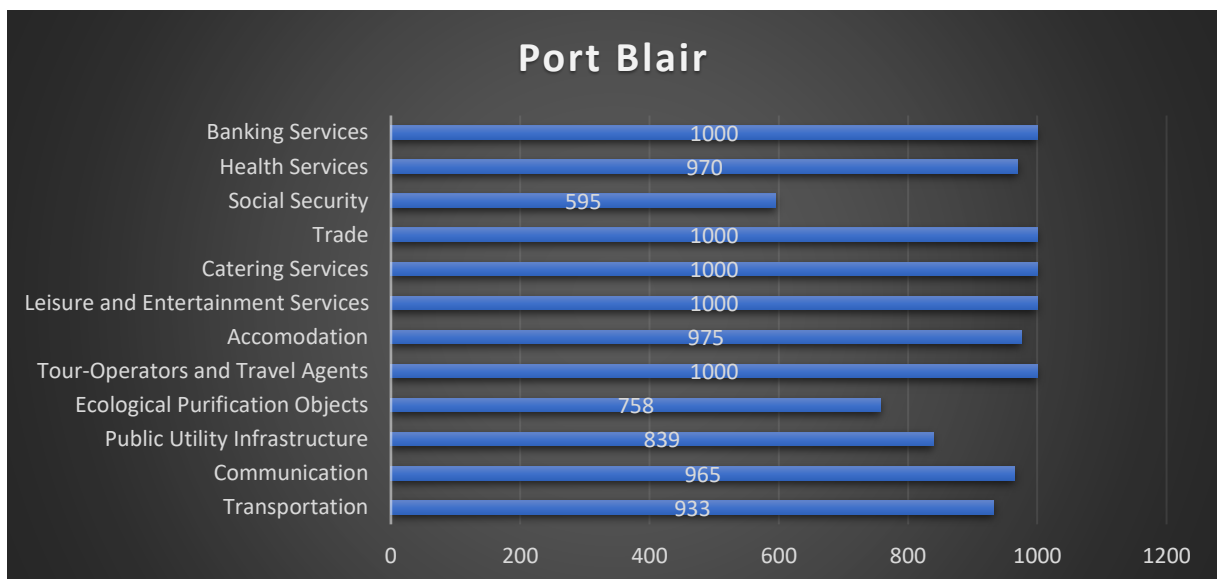
Table 3.5: Components of Tourism Infrastructure Index in Port Blair Tehsil

Components	Index Value
Transportation	933
Communication	965
Public Utility Infrastructure	839
Ecological Purification Objects	758
Tour-Operators and Travel Agents	1000
Accommodation	975
Leisure and Entertainment Services	1000
Catering Services	1000
Trade	1000
Social Security	595
Health Services	970
Banking Services	1000
Tourism Infrastructure Index	919

The application of the methodology represents that most of the components of tourism infrastructure in Port Blair tehsil is sufficient develop than the other tehsils. The Social Security is 193 points than the Rangat Tehsil and ecological protection object is 13 point low than Ferrargunj Tehsil. Here social security (595) and environmental protection object (795) is the least developed components. The police personnel and services ratio are low because the high population density and limited security infrastructure. The crime rate is also high in Port Blair tehsil as compare to other tehsils. (Economic and Statistics 2020- 21-law and order). So, there is an exclusive need to increase police personnel and service infrastructure in this tehsil. The mass mobilization and intense tourism is also created threat to the local environment. Additionally, fund comes to protect environment is also very low in compared to the other tehsils. There is a strong need to enhance the fund to ecological protection objects in this region. Banking services, trade, catering services, leisure and entertainment services in Port Blair is the most dominant component its share largest part of this infrastructure than any other tehsil of Andaman Islands. The most concentration of population has created and developed numbers of banks, financial institutions, ATMs in the urban area. The central business district of Port

Blair extent from Haddo to Bhatubasti area. The field study says that most of the tourism specific trade centres and handicraft shops located near to the tourism site of the city. It is also located near the tourist sites Swaraj and Shaheed Dweep of Port Blair Tehsil. The price of the goods observed high in these islands due to tourism. The catering service are good in both quality and quantity. It is classified as like hotel, Dhaba, restaurant, food stalls are located to the approachable distance for the tourist people. The variety of sea foods are available especially for the food lovers. Most of the elite fishing catches of different island have been import in here only because of the number of tourists purchasers as many. The Bakery and Sweet Stalls are found in very proximity to this area. The overall tourism infrastructure index of the Port Blair Tehsil is 919 that is 580 points above than the average tourism infrastructure index (339). All components are more than the average tourism infrastructure index.

Figure 3.7: Tourism Infrastructure Index in Port Blair Tehsil



3.3.6 Analysis of Tourism Infrastructure Index of Little Andaman Tehsil

Table 3.6: Components of Tourism Infrastructure Index in Little Andaman Tehsil

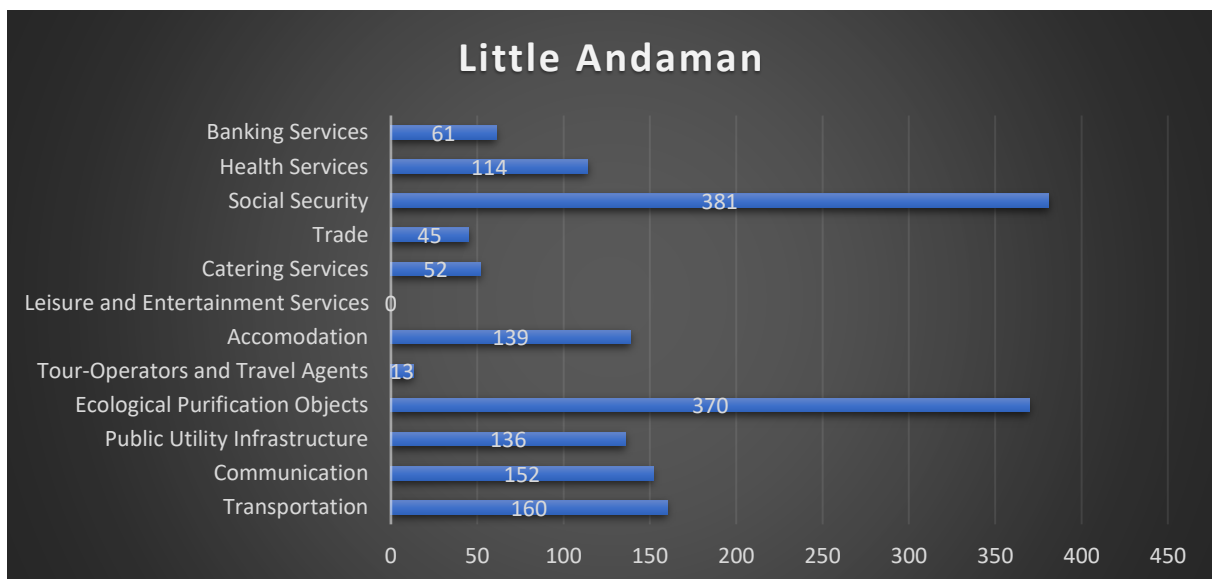
Components	Index Value
Transportation	160
Communication	152

Public Utility Infrastructure	136
Ecological Purification Objects	370
Tour Operators and Travel Agents	13
Accommodation	139
Leisure and Entertainment Services	0
Catering Services	52
Trade	45
Social Security	381
Health Services	114
Banking Services	61
Tourism Infrastructure Index	135

Application of the methodology on available tourism infrastructures data for Little Andaman Tehsil (Appendix 4) is showing that the leisure and entertainment services (0), catering facilities (52), tours and travel operators (13), and trade (45) and banking (61) components of tourism infrastructure are very poor. Tour operators of this tehsil work in tourism sector as their secondary source of income. Their main jobs are plantation and business of agricultural products. There is no means are available for leisure and entertainment. The respondents are revealed during the field study that, they enjoy their weekends only by organising picnic and cultural function activities in local sites. Even the people of this tehsil are having very less accessibility to means of leisure and entertainment than other area because this tehsil is mainly connected by ferry services to the Port Blair. The ferry schedule is irregular and their voyage can be postponed suddenly due to the extreme weather conditions and technical failures. These are the limitations of the water transportation. The catering services like hotel and restaurants are very limited in numbers. Tourists could not enjoy variety of cuisines according to their choice. Private firms should facilitate multi cuisines restaurants in business area or permanent tourist places. The trade centres are also lacking of modern facilities and goods of tourist interest. Traditional handicraft could not be seen in the shops. The local government should encourage the SHGs and youth organizations to make the handicrafts for the visiting tourists. If they not properly sold in that area, it should be sent in the market of Port Blair. Lack of banking services create crowd there in the beginning of weekends. The visiting tourist may face difficulties to get the transaction services. The ATMs are often remains out of order and out of cash. The population and police personnel ratio show that the social security is more

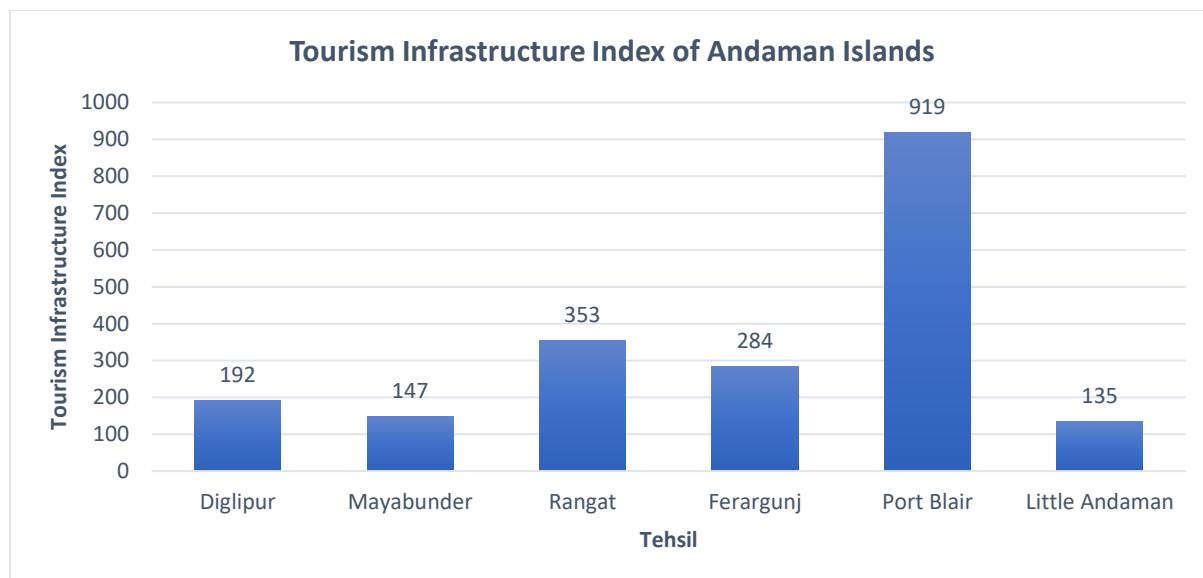
prominent infrastructure than any other components. The good social security and expenses on ecological protection show preparing a ground to develop a future ecotourism prospect in this tehsil. The tourism infrastructure index value for transportation, communication, public utility infrastructure, accommodation, and health services is ranges from 114-160 in Little Andaman Tehsil. These components are scored very low. Here, social security is the most developed and leisure - entertainment services are the least developed components. The overall tourism infrastructure index of the Little Andaman Tehsil is 135. It is 784 points below than best overall tourism indicator index (Port Blair, 919) and 204 points below than the average tourism infrastructure index (339). Only the ecological purification objects (370) and social security (381) having efficient numbers of infrastructure and scored more than the average tourism infrastructure index.

Figure 3.8: Tourism Infrastructure Index in Little Andaman Tehsil



3.3.2 Comparative Analysis of Tourism Infrastructure Index of different tehsils of Andaman Islands

Figure 3.9: Tourism Infrastructure Index in Port Blair Tehsil



The Figure No. 3.9 is showing that the Port Blair is the developed tehsil in the entire the Andaman Islands. The strong transportation and communication infrastructures had made Port Blair far developed tehsil in tourism infrastructures. Apart from that the history, direct accessability to mainland, administrative capital make Port Blair and its proximity tehsils (Rangat and Ferrargunj) are more developed in the context of tourism infrastructures. Even the three tehsils Diglipur, Mayabunder, and Rangat aggregate index (692) is less than the Tourism Infrastructure Index score of Port Blair (919) which represent the administrative negligence towards the development of infrastructural facilities and non-availability of means of transportation and communication.

Table 3.7: Tourism Infrastructure Index (TII) of tehsils of Andaman Islands.

Sl. No.	Name of Tehsil	TII (Rank)
1	Diglipur	192 (4 th)
2	Mayabunder	147 (5 th)

3	Rangat	353 (2 nd)
4	Ferrargunj	284 (3 rd)
5	Port Blair	919 (1 st)
6	Little Andaman	135 (6 th)

Port Blair, Rangat, Ferrargunj, Mayabunder, Diglipur and Little Andaman (Table No. 3.7) in ranking order as per their score in Tourism Infrastructure Index (TII). At the regional level, Port Blair tehsil is showing the highest TII score after level 3 of the methodology. While components wise analysis shows that Social Security and Environmental Purification Objects infrastructures are more in other tehsils than the Port Blair and its proximity tehsils. The main reason for this variance is a greater number of police forces and infrastructures and environmental purification objects are deployed in other tehsils. Port Blair is the urban centre of these islands having more pollution than other tehsils where ecological purification objects are less efficient while the large concentration of population as compared to social security infrastructure makes this tehsil more vulnerable to social crime. These are the reasons for the Port Blair tehsil is less scored and efficient for the components i.e., Social security and ecological purification objects more than the other tehsils.

CHAPTER-4

TRANSPORTATION FACILITIES OF THE ANDAMAN ISLANDS

4.1 Elements of Transportation Facilities

The transportation efficiency of a region could be determined through the effectiveness of the elements of all three modes of transportation (Thompson and Schofield, 2007). The performance elements of transportation determine the satisfaction level of the tourist. Even advanced countries like the US also emphasised the provision of safe, effective, and efficient access and mobility into the future while considering economic, social, and environmental needs (Ramani et al., 2009). It is seen as only a sustainable perspective but a tourist has the multi-dimensional perspective to experience transportation during his visit to the destination. Previous works of literature (Jeon et al., 2013, Mishra et al., 2012) reveal that traditional Indicators are speed, punctuality, ticket price, etc. Recently included indicators are online ticketing systems, and integrated modes of transportation (Serdar et al., 2022; Zhao et al. 2022). There is few numbers of literatures inclusion facilities and green technology. Green technology inclusion will help to reduce the carbon footprints of vehicles. While inclusion facilities case the means of transportation accessible to the person with disability. Hence, this study included the ‘environmental efficiency’ of the transportation system and ‘inclusive’ as indicator of transportation elements. After the detail study on different literatures related to measuring the efficiency of transportation performance, total 20 indicators or elements has been selected for the study (Table 4.1).

Table 4.1: Transportation Performance Elements

Sl. No.	Indicators
1	Availability
2	Quantity
3	Quality
4	Capacity
5	E-ticketing
6	Affordability
7	Regularity
8	Punctuality
9	Waiting Time

10	Swift and Fast
11	Route Condition
12	Integration
13	Allied Services
14	Safety
15	Security
16	Cosy
17	Behaviour
18	Hygiene
19	Pollution Efficiency
20	Inclusive

Availability is the first element that denotes the existence of the mean of transport to the tourist at the destination for travel. A tourist who travels always looks for means of transport which is available in proximity to his source region.

Quantity is the second element that denotes the number of available means of at the tourist destination. Its types and capacity may be varied but the number of each means of transport may consider under their quantity.

Quality is the third element that represents the installed features and service output of the transportation system. The quality of a vehicle could be determined through the included facilities like air-conditioning, music system, internet facility, drinking water, age the of vehicle, and its upgraded model etc. Mostly high-quality output inculcates a higher level of satisfaction among the tourists.

Capacity is the fourth element showing the ability to carry and contain a certain number of passengers in a particular means of transport.

E-ticketing is the fifth element it represents here for the facility of electronically registered pre-booked ticketing facilities.

Affordability is the sixth element represented here for the general and reasonable fare of transportation. The fare of transport further may vary by factors such as the quality of the vehicle, service level, travel distance etc. Most tourists choose their means of transport according to their budget and comfort requirement. Affordability could not able to influence where the means of transport is single mode.

Regularity is the seventh element refers to here terms availability of the means of transport on frequent or infrequent, daily, alternative days, weekly, fortnight, or monthly. The frequent availability of means of transport makes the tourist comfortable to visit the destination.

Punctuality is the eighth element that refers to functioning and reaching the means of transport at a designated time. In other words, punctuality can be called as arrival of means of transportation at the destination without any delay.

Waiting time is the ninth element that denotes the time to wait for the means of transportation to arrive at the terminal or boarding point. Long waiting times may lead to dissatisfaction among tourists.

Swift and fast is the tenth element representing the functioning speed of the means of transport. The optimum speed leads to great satisfaction. The means of transport also balance its speed according to the reach of the vehicle on desirable time.

Route condition is the eleventh element that represents the type of approach and its nature that affect the entire travel operation. The route may be an airway, seaway, railway track, or roadway. Inland transport quality of the road determines the journey experience. Metaled roads are more comfortable and all-weather suitable while unmetalled roads are not suitable for the most types of vehicles. Weather conditions determine the airway and sea conditions control the voyages at seaways. Suitable conditions of the routes make transportation operations smooth. This leads for a satisfied travel experience to the tourists.

Integration is the twelfth element that is represent the coordination and combination of more than one means or modes of transportation. The transportation is further supported and altered by the different means of transportation like ferry, vehicle ferry, or helicopter services. The timely availability of one another's means of transportation represents better integration of transportation.

Allied service is thirteen elements that represent the associated facilities required at the time of travel like the terminals and stops, toilet facilities, restaurants, sign boards and caution boards, mobile breakdown repair vehicles, or outlet facilities on the route.

Safety is the fourteenth element that is safety, which represents the prevention of any potential mishap, accident, injuries, or harm to passengers on their property. Transportation safety could

be created by maintaining a safe environment and following traffic norms- regulations during travel.

Security is the fifteen elements that refer protection of their well-being and belonging during the time of travel.

Cosy is the sixteen elements that represent that comfortable journey experience throughout the travel duration.

Behaviour is the seventeen elements that refer to the interaction and conduct of transportation staffs and co-passengers at the time of the journey.

Hygiene is the eighteen elements that refer to cleanliness and maintenance of the means of transportation and terminals. Hygiene is not only limited to the operator side it is also same applied to the user of the transport. Hygiene promotes general well-being and comfort.

Pollution efficiency is a nineteenth element referred to as the means of transportation that creates pollution in comparison to the amount of its work. Low pollution output denotes the high pollutions efficiency of the transportation systems.

Inclusive is the twentieth element that represents special facilities provided to physically challenged and disabled people.

5 Point Likert scale to poll out the importance and performance for each element. Here the responders' views taken to measure their polls on various elements of transportation facilities i.e., 1 denotes not agree to performance/importance, 2 represents slightly agree to performance/importance, 3 represents moderately agree to performance/importance, 4 represents normal to agree to performance/importance, and 5 represents strongly agree to performance/importance.

4.2 DATABASE AND METHODOLOGY

4.2.1 DATABASE

Both Primary and secondary data have been used to know the transportation facilities. The secondary data has been collected from department offices and their respective websites like State Transport Service, Port Management Board, Veer Savarkar International Airport, Pawan

Hans Helicopter Service LTD., and the Department of Economic and Statistics. Primary data has been collected to measure the tourist perception at transportation facilities of different tehsils of Andaman Island.

4.2.2 METHDOLOGY

The total transportation facilities have been identified through the study of existing transportation facilities and the perception of tourists about them. The performing efficiency of existing transportation facilities have been measured through the analysis of secondary data while the primary data has been collected to measure the perception of tourists on transportation facilities. Their perception has been analysed mainly through the statistical method and graphical method. The statistical method has been used for knowing the level of importance and performance efficiency of the different transportation elements (Table 5.1). There are a total of four perspectives have been used for this i.e., the high-scored performance of elements than their importance, most high-scored elements, equal scored element for both importance and performance, and elements with the highest significant difference. The graphical method has been used to select the element, which needs immediate improvement to increase the efficiency of the existing transportation system. Through the graphical method, their measured perception has been further analysed by using the 'Important Performance Analysis' aka., IPA model. This model has been adopted by (Grujicic, Ivanovic, Jovic, and Doric, 2014). The indicators of the model change according to the characteristic object transportation facilities in the Andaman Islands. Total 20 numbers of indicators have been taken as Availability, quantity, quality, capacity, affordability, e-ticketing, regularity, punctuality, waiting time, swift and fast, route condition, integration, allied services, safety, security, cosy, behaviours, hygiene, pollution efficiency, and inclusive. The perception of tourists on importance and performance have been recorded on 5-point Likert scale for each tehsil. Their perception values have been further analysed through IPA model.

The mean importance and performance of 20 transportation facilities indicators have been calculated through Equation 1(a) and Equation 1(b).

$$I_i = \frac{\sum_{j=1}^n x_{ij}}{n} \quad \text{.....Equation 1(a)}$$

$$P_i = \frac{\sum_{j=1}^n y_{ij}}{n} \quad \text{.....Equation 1(b)}$$

Where I (importance) and P (performance) values for each transportation facility indicator. This value is computed by the average grade values of responses. The symbol 'y' the grade for the performance, 'x' is the grade for importance, 'i' is the ordinal number of transportation facility indicators (i= 1,2,3, 4...20), 'j' is the ordinal number of transportation users (j= 1,2,3, 4...51) for each region, n- number of transportation users (n=300).

The indicators of IPA not only provided a detailed analysis of the difference between the importance and actual performance of the transportation facilities of an area rather it also suggests an area that needs immediate improvement to develop its efficiency.

The mean value of each attribute of performance add importance could be displayed on a two-dimensional grid. The grid is made by the central value of the elements' Importance average grid (I) on the 'x-axis and the elements' average grade (P) performance on the 'y' axis.

Mean value of all indicators for importance (to make the mean vertical axis of importance)

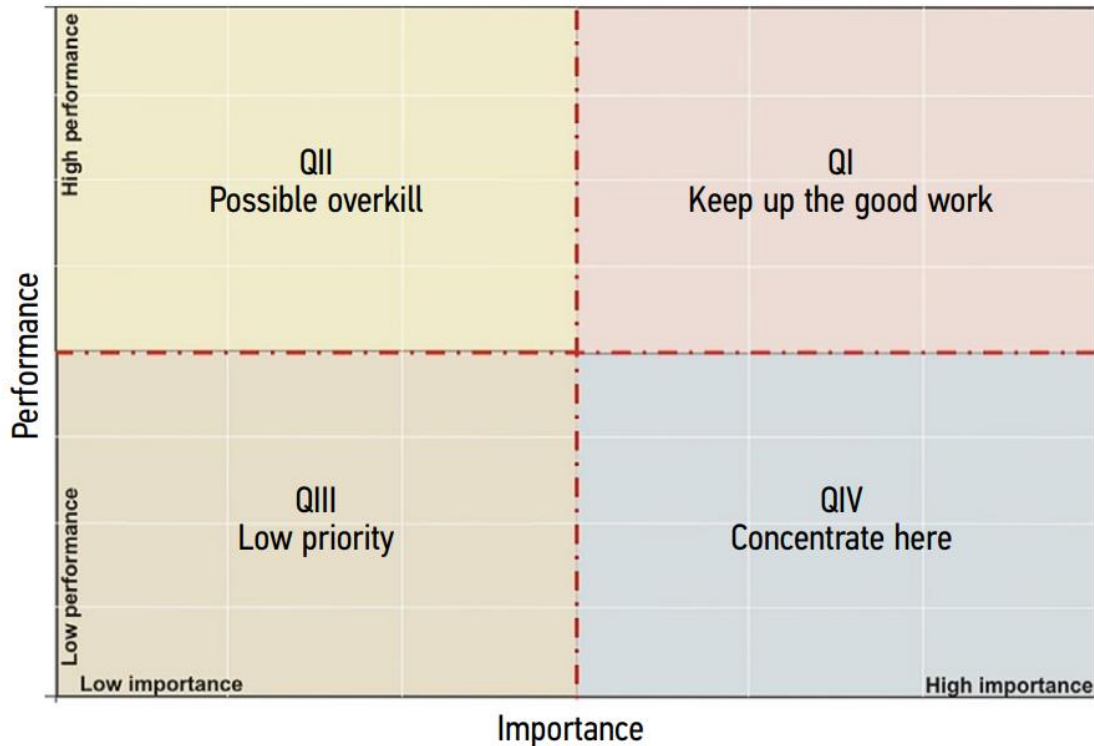
$$\bar{I} = \sum_{i=1}^k \frac{I_i}{k} \quad \text{.....Equation 2}$$

Mean value of all indicators for performance (to make the mean vertical axis of performance)

$$\bar{P} = \sum_{i=1}^k \frac{P_i}{k} \quad \text{.....Equation 3}$$

Where 'k' is the total number of elements; 'i' is the ordinal number of transportation facility indicators.

Figure 4.1: Quadrants of IPA



Source: Grujicic, Ivanovic, Jovic and Doric (2013)

The perpendicular cross of the 'x-axis (I) and 'y'-axis (P) values make Quad cell division. Each quad cell denotes by the letter 'Q'. The quadrants are referred to by the names in some literature: QI Keep up the good work, QII Possible Overkill, QIII Low Priority, and QIV Concentrate Here (James, 1977; Deng et. Al. 2008, Wu, Shieh 2009; Grujicic et al 2014). The indicators located in Quadrant I (QI) have both high importance and a high level of performance. It is the strength of the area. The functioning of the indicators should be maintained at the present level. Quadrant II (QII) contains the indicators that have high performance but low importance which indicates the resources and effort assigned to this attribute are too high quantity and it should be assigned to more important indicators. Quadrant III (QIII) contains indicators that are characterized by both low performance and importance. The investment of resources and efforts is not productive in this indicator. Therefore, indicators of QIII not required any extra effort. Quadrant IV (Q IV) contains indicators that have great importance but their performance is poor. So, these indicators consider the greatest weakness among all. It is the major finding of IPA of an area. Immediate improvement efforts and strategy-making will lead to a great

move to enhance the efficiency of the transportation system. The Confidence Interval method has been combined with the IPA to make it more effective and valid. It helps to eliminate the chances of error if the sample responders are changed. The confidence interval was introduced by Wu and Shieh (2009) to judge and validate the Gators in the 2-dimensional grid of IPA.

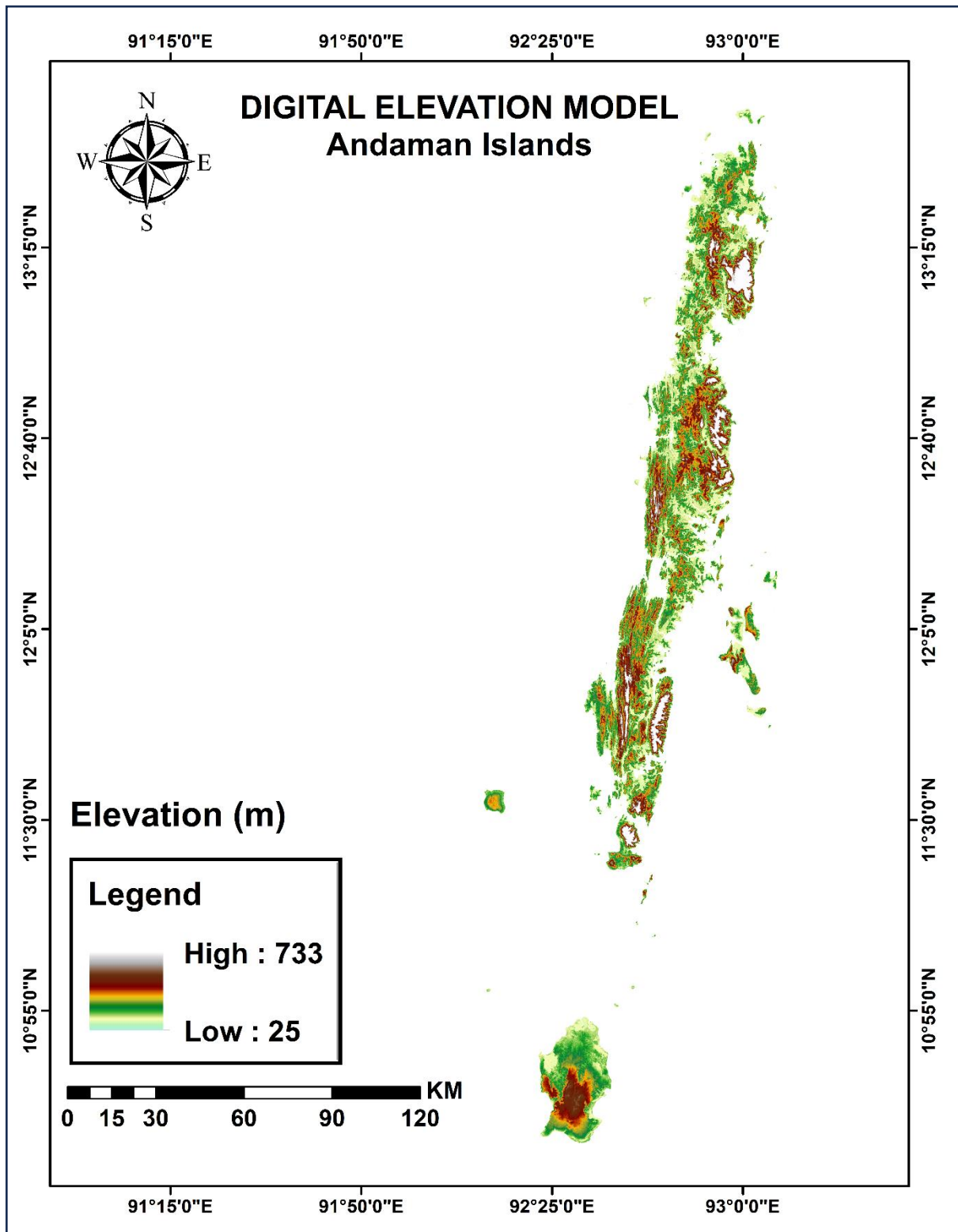
In applied practice, confidence intervals are typically stated at the 95% confidence level. The desired level of confidence please set by the researcher. It is not determined by the data. The confidence interval of 95% means that there is a 95% confidence level that the similarly constructed interval will contain the parameter that is to be estimated. It is a quantitative interval that expects to find the parameters of the basic set based on the sample parameter for a given probability and its corresponding z value (Grujicic et. al. 2014).

$$X_{\bar{}} \pm z_{d/2} D/\sqrt{n} \quad \text{..... Equation 4}$$

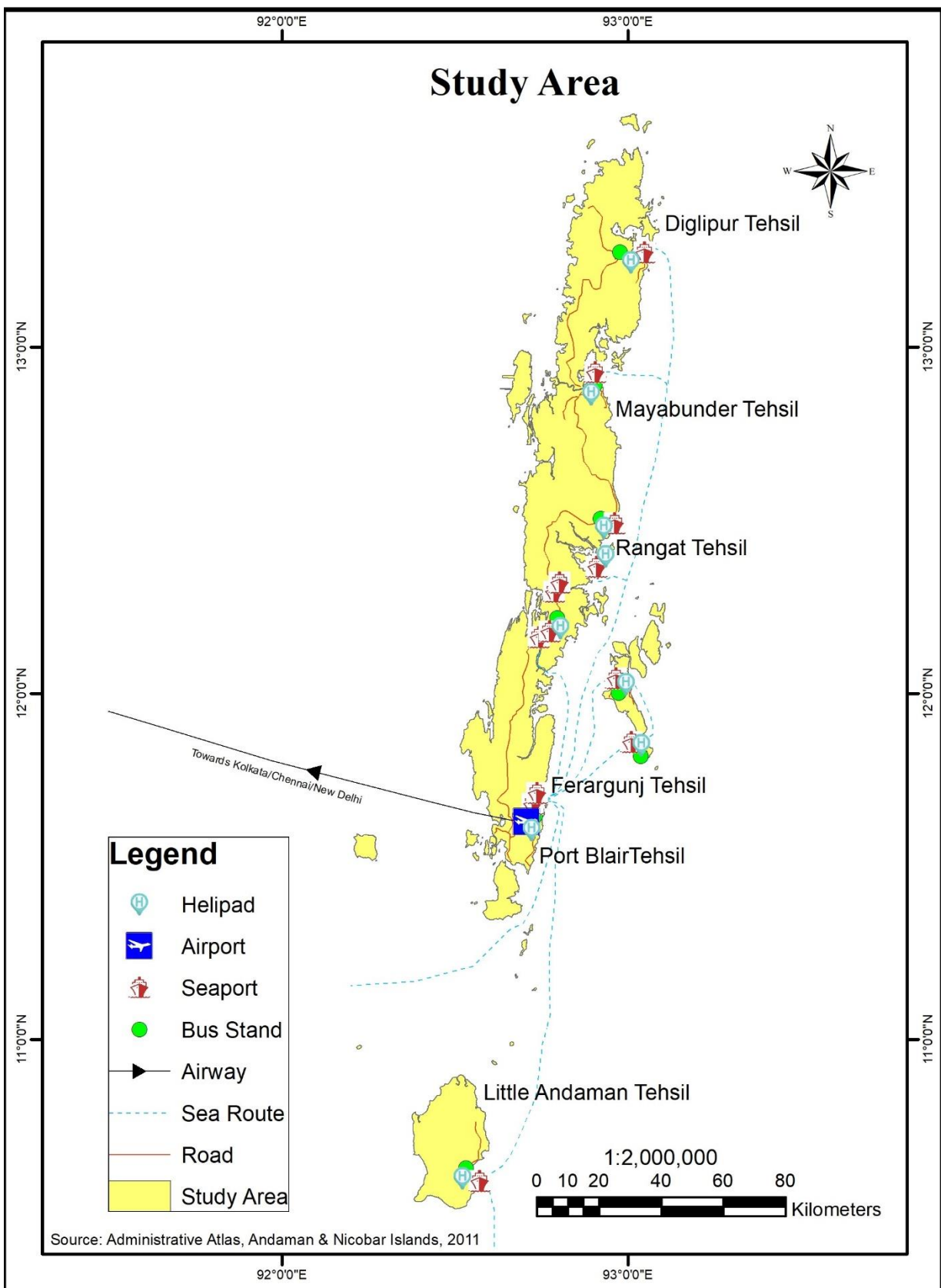
This equation is used for calculating the confidence interval. Where the value of Z/2 is dependent upon confidence level (dependent on the interest of the decision-maker); \bar{x} the sample means; D/\sqrt{n} this standard error of the mean.

The confidence interval will provide the most accurate and valid output through this methodology. The indicators that come under the confidence interval should give preference and should be primarily acted on to improve the transportation facilities of the region. IPA model will help to verify the existing transportation facilities of the tehsil and suggest important attributes of the transportation which needed immediate improvement to make better transportation in the region for tourism operations.

Map 4.1: Digital Elevation Model (DEM) of Andaman Islands



Map 4.2: Transportation Terminals of Andaman Islands



4.3 DATA ANALYSIS

4.3.1 Assessment of Existing Transportation Facilities

Table 4.2: Tehsil-wise numbers of Means of Transportation.

Sl. No.	Tehsil	Transportation Hub	Two-Wheeler	Three-Wheeler	LMV	HMV
1.	Diglipur	Subhshgarm Market	8640	430	2609	108
2.	Mayabunder	Mayabunder Market	3456	172	1043	43
3.	Rangat	Rangat Market	9504	473	2870	119
4.	Ferrargunj	Bambooflat Jetty	10368	516	3131	130
5.	Port Blair	Aberdeen Bazar	51841	2584	15658	656
6.	Little Andaman	Hutbay Jetty	2592	129	782	32
Total			86401	4304	26093	1088

Source: Directorate of Economic and Statistics, 2021

4.3.1.1 Existing Tourism Facilities of Diglipur Tehsil

Diglipur tehsil is having all three modes of transportation. Roadways are the primary mode of transportation to connect most of the tourist destinations. It is connected several unmetalled roads to the remotely located village areas. There is total 11787 numbers of vehicles functioning (Year, 2021). Among them 8640 are two-wheelers, 430 are three-wheelers, 2609 are four-wheelers, and 108 are heavy motor vehicles including buses operated on the metalled roads. Two-wheelers are available for rent while LMVs and HMVs facilities are available on a fare basis. In LMV are mostly private jeeps and cabs available. In HMVs both public and

private buses are available. The private sector buses are operated by individual private agencies and the public buses are operated by the Government transportation department known as State Transportation Services (STS). Unmetalled roads are approachable by two-wheelers, bicycles, and walk only. There is only one STS unit functioning for this tehsil i.e., STS Diglipur Unit. The STS office is in the main junction of Subhash Nagar Market but there is no bus terminus facility available at that location. Even no single bus stop is available at that very region. Some bus stops are located in far furlong villages constructed by village panchayats but not properly maintained. Many of them are damaged, abandoned, and become sheds for stray animals. All the types of above vehicles are available in all seasons through travel agencies. The punctuality of the vehicle may vary as per the road conditions, availability of fuel, and condition of the vehicle. The safety of the vehicle is sometimes affected due to the bad condition of the road. Though this tehsil is a less accident-prone region. No AC buses with the inclusive facility are operated in this area, public buses are not PwD friendly. These vehicles are available daily, and most of them are not operated after 8 pm. Their speed is normal with efficient carrying capacity. In some remote places, buses become overcrowded at office time. Most of the buses are in old condition and their hygiene is not properly maintained while private LMVs provide comparatively better facilities in terms of hygiene and maintenance of the vehicles. Pollution level is less due to the comparatively less numbers and frequency of vehicles.

Areal Bay Jetty is the major port of the tehsil located on the eastern side of North Andaman Island. It is in the natural harbour of Port Cornwallis. This jetty is connected twice a week connected with ferry boats to Mayabunder, Rangat, and Port Blair. Presently there is two ferry boats are connected to this jetty name MV Kalighat and MV Dering. These ferries are very old and hygienically not properly maintained. This ferry is having 150 seats which could not be increased in any condition. Their tickets are sometimes not available at the festival time. This mode of transport is safer than other modes because very less accident has been reported through the ferry services. Its schedule gets cancelled due to sudden technical failure that may affect its regularity. For some travellers, especially tourists, the long voyage is not comfortable. The passengers mostly prefer this mode of transportation to travel to Port Blair, only a few of them travel to Mayabunder or Rangat. Private vehicles and buses are available at the time of the ferry's arrival, so the integration of the modes of transportation is good over here. Small countrymade engine boats connect the remote locate villages connected by the streams and coastal areas like Paschim Sagar and Chatham Island. These small boats are not functioned

well occasionally, especially at the time of cyclonic conditions and rough sea conditions. Although, the from this fibre boats are operated to connect the tourist sites of Ross and Chatham Islands.

The helicopter is the only aviation service available for the local passengers. The helipad is located in Shibpur village. Helicopter service is comparatively highly expensive with the limited numbers of seats. Pavan Hans Helicopter Private Ltd. is a chopper having 6 passengers and 2 pilots' capacity. It flights twice a day. Preference is only given to officials, govt employees, and emergency patients. The ticketing process is too complex. It is rarely available to any resident or tourists. Besides, its fare is also high. No miss hap or accident has been reported via this means of transport. It is very fast, comfortable and less time taken. The helipad terminus and its chopper are well-maintained. It connected with Diglipur, Rangat, Port Blair, and Little Andaman Tehsil. However, it is the most punctual mean of transportation if all technical and administration conditions are firm.

Table 4.3: Tehsil-wise numbers of associated land transportation facilities.

Sl. No.	Tehsil	Bus Terminus	Bus Stops	STS Units	Rickshaw/ Taxi Stands	Other Vehicle Stands	Petrol pump/Petrol Outlet
1.	Diglipur	0	30	1	12	2	6
2.	Mayabunder	0	14	1	5	1	3
3.	Rangat	1	54	2	18	5	19
4.	Ferrargunj	0	17	1	7	2	11
5.	Port Blair	1	32	3	32	6	26
6.	Little Andaman	0	12	1	8	1	4
Total		2	159	9	82	17	69

Source: Directorate of Economic and Statistics, 2021

4.3.1.2 Existing Tourism Facilities of Mayabunder Tehsil

Mayabunder tehsil is served by all three modes of transportation. Roadways are the primary mode of transportation to connect most of the tourist destinations. The transportation hub i.e., Mayabunder Market. Mayabunder Market has been considered a transportation hub because this market is in proximity to the transport office, auto stand, port and other public head offices of the tehsil. There is total 4715 numbers of vehicles are functioning (Year, 2021). Among them 3456 are two-wheelers, 172 are three-wheelers, 1043 are four-wheelers, and 43 are heavy motor vehicles including buses operated on the metalled roads. Two-wheelers are available for rent while LMVs and HMTVs facilities are available on a fare basis for the tourists. Most of the private jeeps and cabs are available under LMV services. STS buses connected the locality to the metalled road while the unmetalled roads are approachable by two-wheelers, bicycles, and walk only. There is only one STS unit operated for this tehsil i.e., STS Mayabunder Unit. The STS office is located at Pokadera village which is 2 km far from the market area besides, there is no bus terminus facility available at that location. Most of the bus stops are damaged, abandoned, and become sheds for stray animals. The punctuality of the vehicle may vary as per the road conditions, availability of fuel, and condition of the vehicle. The safety of the vehicle is sometimes affected due to the bad condition of the road. The tehsil is a less accident-prone region (Appendix-X). No AC buses with the PwD inclusive facility are operated in this area. These vehicles are available daily, and most of them are available up to 6 pm. In some remote places, buses become overcrowded at office time. Most of the buses are in old condition and their hygiene is not properly maintained while private LMVs provide comparatively better facilities in terms of hygiene and maintenance of the vehicles. Pollution level is less due to the comparatively less number and frequency of vehicles.

Mayabunder Jetty is the major port of the tehsil located on the northern side of Middle Andaman Island. It is in the natural harbour of Panighat. This jetty is connected once a week connected with ferry boats to Mayabunder, Rangat, and Port Blair. Ferry boats are connected to this jetty name MV Kalighat, MV RaniLaxmi and MV Dering. These ferries are very old and hygienically not properly maintained. This ferry is having an average of 150-200 seats which could not be increased in any condition. Their tickets are sometimes not available mostly at the time of festivals. This mode of transport is safer than other modes because very less accident has been reported throughout its service period. Its schedule gets cancelled due to sudden technical failure that may affect its regularity. For some travellers, especially tourists, the long voyage is not comfortable. The passengers mostly prefer this mode of transportation

to travel to Port Blair, only a few of them travel to Diglipur or Rangat. Private vehicles and buses are connected at the time of the ferry's arrival, so the integration of the modes of transportation is good over here. Small countrymade engine boats connect the remote locate villages connected by the streams and coastal areas like village Borang and Hanspuri. These small boats are not functioned well occasionally, especially at the time of cyclonic and rough sea conditions.

The helicopter is the only aviation service available for local passengers. The helipad is located in Dhobidera village. Helicopter service is comparatively highly expensive with limited numbers of seats. Pavan Hans Helicopter Private Ltd. is a chopper having 6 passengers and 2 pilots' capacity. It flights twice a day. Travel preference is only given to officials, govt employees, and emergency patients. The ticketing process is too complex. It is rarely available to any resident or tourists. Its fare is also expensive. No miss hap or accident has been reported via this means of transport. It is very fast, comfortable and less time taken Integration of this means of transportation is weak because there are no previously available means of land transport to carry its passengers. The helipad terminus and its choppers are well-maintained. It connected with Diglipur, Rangat, Port Blair, and Little Andaman Tehsil.

Table 4.4: Tehsil-Wise Numbers of Means of Water and Air Transportation Facilities.

Sl. No.	Tehsil	Ships	Ferry	Harbour	Minor Ports	Airport	Helipad	Seaplane Zone
1.	Diglipur	0	3	1	1	1	1	0
2.	Mayabunder	0	3	0	1	0	1	0
3.	Rangat	0	12	0	6	0	2	1
4.	Ferrargunj	0	4	0	3	0	0	0
5.	Port Blair	6	32	1	5	1	3	1
6.	Little Andaman	2	4	0	1	0	1	1
Total		8	58	2	17	2	8	3

Source: Directorate of Civil Aviation, Directorate of Shipping Services, Primary Survey, 2021.

4.3.1.3 Existing Tourism Facilities of Rangat Tehsil

Rangat tehsil is also having all three modes of transportation. Roadways are the primary mode of transportation to connect most tourist destinations. It connected several unmetalled roads to the remotely located areas. There is total 12966 numbers of vehicles functioning (Year, 2021). Among them 9504 are two-wheelers, 473 are three-wheelers, 2870 are four-wheelers, and 119 are heavy motor vehicles including buses operated on the metalled roads. Two-wheelers are available for rent while LMVs and HMVs facilities are available on a general fare basis. LMV includes mostly private jeeps and cabs while in HMV both public and private buses are available. The private sector buses are operated by individual private agencies and the public buses are operated by the Government transportation department. Unmetalled roads are approachable by two-wheelers, bicycles, and walk only. There is having two STS units operated for this tehsil i.e., STS Rangat Unit and STS Baratang Unit (Table 4.3). The STS office of the Rangat Unit is on the outskirts of Rangat Market with a well-maintained bus terminus. STS Baratang Unit is in Krishna Nagar, Baratang Island and there is no bus terminus available for this unit service area. Passengers of this service area use the passenger hall of Nilambur Jetty passenger hall.

The punctuality of the vehicle may vary as per the road conditions, availability of fuel, and condition of the vehicle because of a limited number of motor garages. The safety of the vehicle is sometimes affected due to the bad condition of the road. No buses with the inclusive facility are operated in this area, public buses are not PwD friendly. These vehicles are available daily, and most of them are not operated after 5 pm. Their speed is normal with efficient carrying capacity. In some remote places, buses become overcrowded at office time. Most of the buses are in old condition and their hygiene is not properly maintained while private LMVs provide comparatively better facilities in terms of hygiene and maintenance of the vehicles. Most of the old buses are used here for local trips and long route express buses are comparatively new than other buses. Few of the private buses and cab services provide AC facilities. Pollution level is less due to the comparatively less number and frequency of vehicles.

Nimbutala Jetty is the major port of the tehsil located on the eastern side of Middle Andaman Island. It is in the natural harbour. This jetty relates to the ports of Long Island, Swaraj Dweep and Port Blair. This jetty is connected twice a week with ferry boats to Diglipur, Mayabunder, and Port Blair. Ferry boats are connected to this jetty name as MV Kalighat and MV Derring. These ferries are very old and hygienically not properly maintained. This ferry is having an

average of 150-200 seats which could not be increased in any condition. Their tickets are sometimes not available at the festival time. This mode of transport is safer than other modes because very less accident has been reported through the ferry services. Its schedule gets cancelled due to sudden technical failure that may affect its regularity. For some travellers, especially tourists, the long voyage is not comfortable. The passengers mostly prefer this mode of transportation to travel to Port Blair, only a few of them travel to Mayabunder or Diglipur. Private vehicles and buses are available at the time of the ferry's arrival, so the integration of the modes of transportation is good over here. Small countrymade engine boats connect the remote locate villages connected by the streams and coastal areas like Udaygadh and Curtberth Bay Beach. These small boats are not functioned well occasionally, especially at the time of cyclonic conditions and rough sea conditions. Apart from this fibre boats are operated to connect the tourist sites of Lalaji Beach and Mark Bay Beach (Long Island).

The helicopter is the only aviation service available for local passengers. The helipad is in Rangat village. Helicopter service is comparatively highly expensive with limited numbers of seats. Pavan Hans Helicopter Private Ltd. is a chopper having 6 passengers and 2 pilots' capacity. It flights twice a day. Preference is only given to officials, govt employees, and emergency patients. The ticketing process is too complex. It is rarely available to any resident or tourists. Besides, its fare is also high. It is very fast, comfortable and less time taken. Integration of means of transportation is strong. The helipad terminus and its chopper are well-maintained. It connected with Diglipur, Mayabunder, Port Blair, and Little Andaman Tehsil.

4.3.1.4 Existing Tourism Facilities of Ferrargunj Tehsil

Ferrargunj tehsil is having only modes of transportation. There is unavailability of a third dimension of transportation. Roadways are the primary mode of transportation to connect most tourist destinations. It also connected several unmetalled roads to the remotely located village areas. There are total 14145 numbers of vehicles functioning in this tehsil (Year, 2021). Among them 10368 are two-wheelers, 516 are three-wheelers, 3131 are four-wheelers, and 130 are heavy motor Vehicles including buses operated on the metalled roads. Two-wheelers are available for rent while LMVs and HMTVs facilities are available on a fare basis. In the LMV category, there are mostly private jeeps and cabs available while public and private buses are available as HMTVs. The private sector buses are operated by individual private agencies and the public buses are operated by the Government transportation department. STS buses

connected the locality to the metalled road while the unmetalled roads are approachable by two-wheelers, bicycles, and walk only. There is only one STS unit operated for this tehsil i.e., STS Ferrargunj Unit (Table 4.3). The STS office is on the outskirts of the settlement and there is no bus terminus facility available at that location. Even no single bus stop is available in that very transportation hub. There are only a few numbers of bus stops in a remote locations and most of them are damaged, abandoned, and become sheds for stray animals. All the types of above vehicles are available in all seasons. The punctuality of the vehicle may vary as per the road conditions, availability of fuel, and condition of the vehicle. The safety of the vehicle is sometimes affected due to the bad condition of the road. The positive point is AC buses with PwD (inclusive) facilities are operated in this locality. These vehicles are available daily, and most of them are not operated after 8 pm. Their speed is average with efficient carrying capacity. In some remote places, buses become overcrowded at office time and the time of the last trip. Both STS and private vehicles are in good condition hygiene and maintained. Pollution level is less due to the comparatively less number and frequency of the vehicles.

Babooflat Jetty is the major port of the tehsil located on the middle and eastern side of South Andaman Island. It is in the natural harbour of Port Blair. There is no interisland ferry service is available from this jetty. This jetty provides onshore passengers and vehicle ferry services to Chatham Jetty and Panighat Jetty. Vehicle ferry boats are connected to this jetty name MVF Lapathy and MVF Austin II. These ferries are very old and hygienically not properly maintained. This ferry is having an average of 150-200 seats and a vehicle carrying capacity depending upon the size of the vessel. This service is always available from 5 AM to 10 PM daily as a shortcut route to connect the Ferrargunj region to Port Blair. Private vehicles and buses are always available at the time of the ferry's arrival, so the integration of the modes of transportation is good over here. Small countrymade engine boats connect the remote locate villages connected by the streams and coastal areas like North Bay. These small boats are not functioned well occasionally, especially at the time of cyclonic and rough sea conditions. Apart from this fibre boats are operated to connect the tourist sites of Jollybouy Island and Redskin Island.

4.3.1.5 Existing Tourism Facilities of Port Blair Tehsil

Port Blair tehsil is having all three modes of transportation. This is the only tehsil connected by mainland India through water and air mode of transportation. Roadways are the primary

mode of transportation to connect most tourist destinations. It connected several unmetalled roads to the remotely located village areas. The major road name ATR begins from this tehsil at Chidiyatapu. There is total 70739 numbers of vehicles functioning in this tehsil (Year, 2021). Among them 51841 are two-wheelers, 2584 are three-wheelers, 15658 are four-wheelers, and 656 are heavy motor Vehicles including buses operated on the metalled roads. Two-wheelers are available for rent while LMVs and HMTVs facilities are available on a fare basis. In LMV are mostly private jeeps and cabs available. In HMTVs both public and private buses are available. The private sector buses are operated by individual private agencies and the public buses are operated by the Government transportation department knowns as State Transportation Services (STS). STS buses connected the locality to the metalled. There is three STS units are functioning for this tehsil i.e., STS Port Blair Unit, STS Swaraj Dweep Unit, and STS Shaheed Dweep Unit (Table 4.3). The STS office of the Port Blair Unit is located in proximity to Aberdeen Bazar and the Bus terminus is in the heart of the city. STS Swaraj Dweep and Shaheed Dweep are also located in proximity to their regional market areas name Havelock Jetty and Neil Kendra, respectively. Buses are mostly punctual and frequent. This tehsil is a more accident-prone region. The safety of the vehicle is sometimes affected due to the bad condition of the road. The positive point is AC buses with PwD-inclusive facilities are operated in this locality. These vehicles are available daily, and most of them are not operated after 8 pm. Their speed is normal with quite an efficient carrying capacity. Buses are new with advanced equipped facilities in most of the STS buses. Private buses are also frequent in the city area. Most of the rural areas are accessible through the STS buses. Pollution level is high due to the comparatively large number and frequency of vehicles.

Haddo Wharf is the major port of the tehsil located on the South-eastern side of South Andaman Island. It is in the natural harbour of Port Blair (Old Port Cornwallis). This jetty is connected twice a week connected with ferry boats to Diglipur, Mayabunder, and Rangat. Ships and ferry boats are connected to this jetty name MV Campbell Bay and MV Coral Queen. Their tickets are sometimes not available at the festival time. This mode of transport is safer than other modes because very less accident has been reported through the ferry services. Its schedule gets cancelled due to sudden technical failure that may affect its regularity. The passengers mostly prefer this mode of transportation to travel to Swaraj Dweep, Shaheed Dweep, and Little Andaman only a few of them travel to Diglipur, Long Island, Mayabunder and Rangat. Private vehicles and buses are available at the time of the ferry's arrival, so the integration of the modes

of transportation is good over here. Fibre boats and launches operated to the tourist destination of Ross Island and Viper Island.

Aircraft and helicopter aviation services are available for aviation passengers. The helipad is in the Junglighat locality proximity to the Veer Savarkar International Airport, Lambaline. Helicopter service is comparatively highly expensive with limited numbers of seats. Pavan Hans Helicopter Private Ltd. is a chopper having 6 passengers and 2 pilots' capacity. Preference is only given to officials, govt employees, and emergency patients. The ticketing process is too complex. It is rarely available to any resident or tourists. Besides, its fare is also high. The helipad terminus and its chopper are well-maintained. It connected with Diglipur, Rangat and Little Andaman Tehsil. Veer Savarkar International Airport is the airport in this tehsil. It is also the only civil airport of these islands. Transportation via aircraft is only connected with mainland Indian cities like Kolkata, Chennai, New Delhi, and others. No direct international flights are served from this airport. The major part of the airport is under the control of the Indian Navy (Defence). No miss hap or accident has been reported via this mode of transport. It is very fast, comfortable and less time taken. Integration of means of transportation is strong. However, it is the most punctual mean of transportation if all atmospheric, technical and administration conditions are firm.

4.3.1.6 Existing Tourism Facilities of Little Andaman Tehsil

Little Andaman tehsil is having all three modes of transportation within its region. Roadways are the primary mode of transportation to connect most tourist destinations. It is also connected by several unmetalled roads to the remotely located village areas. There is total 3535 numbers of vehicles functioning in this tehsil (Year, 2021). Among them 2592 are two-wheelers, 129 are three-wheelers, 782 are four-wheelers, and 32 are heavy motor vehicles including buses operated on the metalled roads. Two-wheelers are available for rent while LMVs and HMTVs facilities are available on a fare basis. LMVs are mostly private jeeps and cabs available while the HMTVs is having only from public sector. STS buses connected the locality to the metalled road while the unmetalled roads are approachable by two-wheelers, bicycles, and walk only. There is only one STS unit operated for this tehsil i.e., STS Hutbay Unit. The STS office is at the main junction of Hutbay Market but there is no bus terminus facility available at that location. Some bus stops are in far furlong villages constructed by village panchayats and are properly maintained. All the types of above vehicles are available in all seasons through travel

agencies. The punctuality of the vehicle may vary as per the road conditions, availability of fuel, and condition of the vehicle. The safety of the vehicle is sometimes affected due to the bad condition of the road. The tehsil is a less accident-prone region. No AC buses with the inclusive facility are operated in this area, even the public buses are not PwD friendly. These vehicles are available daily, and most of them are not operated after 6 pm. Their speed is normal with efficient carrying capacity. In some remote places, buses become overcrowded at office time. Most of the buses are in old condition and their hygiene is not properly maintained while private LMVs provide comparatively better facilities in terms of hygiene and maintenance of the vehicles. Pollution level is less due to the comparatively less number and frequency of vehicles.

Hutbay Jetty is the major port of the tehsil located on the southeastern side of Little Andaman Island. It lies via an arrangement of the artificial harbour of breakwater blocks. This jetty is connected twice a week connected with Port Blair. Ships and ferry boats are connected to this jetty name MV Campbell Bay, MV Chawra, MV Sentinal and MV Corel Queen. Most of the ferries are very old and hygienically not properly maintained. This ferry is having an average of 200-250 seats which could not be increased in any condition. Their tickets are sometimes not available at the festival time. This mode of transport is safer than other modes because very less accident has been reported through the ferry services. Its schedule gets cancelled due to sudden technical failure that may affect its regularity. For some travellers, especially tourists, the long voyage is not comfortable. Private vehicles and buses are available at the time of the ferry's arrival, so the integration of the modes of transportation is good over here. Small countrymade engine boats connect the remote locate villages connected by the streams and coastal areas like the mouth of the river locality. These small boats are not functioned well occasionally, especially at the time of cyclone and rough sea conditions.

The helicopter is the only aviation service available for the local passengers. The helipad is located in Hutbay village. Helicopter service is comparatively highly expensive with limited numbers of seats. Pavan Hans Helicopter Private Ltd. is a chopper having 6 passengers and 2 pilots' capacity. It flights twice a day. Preference is only given to officials, govt employees, and emergency patients. The ticketing process is too complex. It is rarely available to any resident or tourists. The fare is also high. No miss hap or accident has been reported via this means of transport. This mean of transport is very fast, comfortable and less time taken. The helipad terminus and its chopper are well-maintained. It connected with Diglipur, Rangat, Port Blair,

and Little Andaman Tehsil. However, it is the most punctual mean of transportation if all technical and administration conditions are firm.

4.3.2 Tourists' Perception on Transportation Facilities

Respondents Profile:

The study has taken a total of 300 samples of respondents. These respondents are those tourists who visited the different tourist destinations of the Andaman Islands. The respondents are overall consisting of 72 % male and 28 % female. Data collected from the transportation hub of each tehsil i.e., Subhashgram Market (Diglipur Tehsil), Mayabunder Market (Mayabunder Tehsil), Oralkatcha Jetty and Rangat Market (Rangat Tehsil), Bambooflat Jetty and Market Area; Wondoor Beach (Ferrargunj Tehsil); Atlanta Point, Aberdeen Bazar, and Middle Point (Port Blair Tehsil), and Hutbay Market (Little Andaman Tehsil). Most of these transportation hubs are selected as market areas, nearby are vehicle terminus, ports, jetties (small ports), airfields and aviation grounds. These areas are the ideal place for gathering data because most of the tourists travel from here to their respective tourist sites.

Table 4.5: Demographic profile of responders

Demographic Indicators	Total	
	N	%
Gender		
Male	216	72
Female	84	28
Age		
18-30 Years	160	53
35-50 Years	104	35
Above 50 Years	36	12

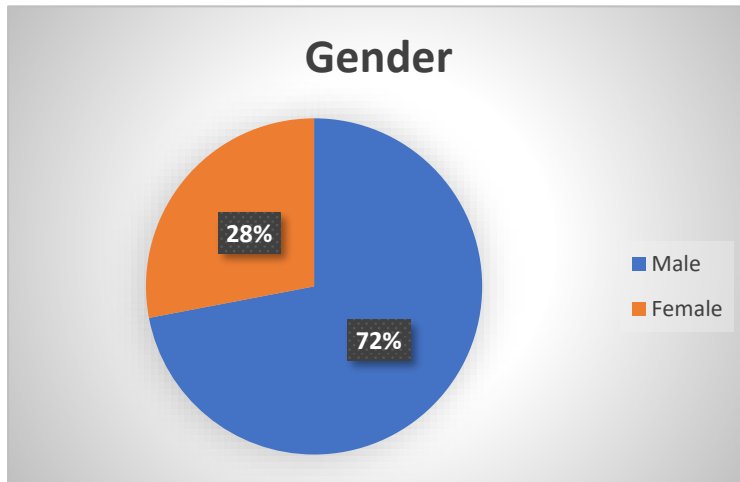
Marital Status		
Unmarried	103	34
Married	165	55
Widow/Divorcee	32	11
Level of Education		
Under-Graduate and Below	175	59
Graduate	103	34
Post-Graduate and Above	22	7
Others	00	00
Monthly Household Income		
Below Rs. 50,000	194	65
Rs. 50000-1,00,000	91	30
Above Rs. 1,00,000	15	5
Nature of Job		
Government Job	68	23
Private Job	150	50
Semi-Government Job	36	12
Others	46	15

Gender

Among the 300 respondents, there were 216 males and 84 females constituting 72 per cent and 28 per cent respectively (Figure 4.1). Thus, male respondents are near about 3 times more in numbers than female respondents. The reason is male respondents are more educated, highly

qualified, affluent and they are mostly the head of the family. The shy nature of females checks them to participate in the survey study.

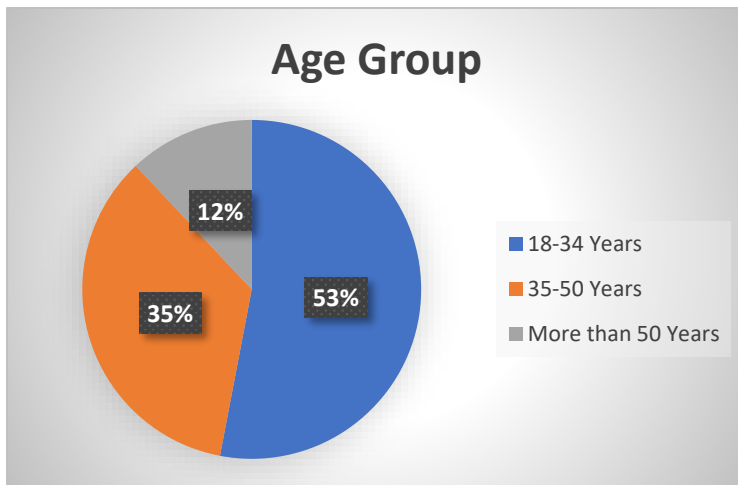
Figure 4.2: Gender Profile of Responders



Age Groups

Respondents were taken from different age groups like ranging from 18-30 years (Young Adults), 31-50 years (Middle-aged Adults), and above 50 years (Old Adults). 160 respondents were in the age group of 18-30 years, 104 respondents were in the age group of 31-50 years, and 36 respondents were belonging to the age group of above 50 years constituting 53 per cent, 35 per cent and 12 per cent respectively (Figure 4.2). Thus, the maximum number of respondents was in the age group of young adults (18-34 years) because most of the tourists are honeymoon couples and adventure seekers. The middle-aged adult group people are the next number of respondents mostly come with their families. Old adult people travel rarely due to their health issues and travel sleekness.

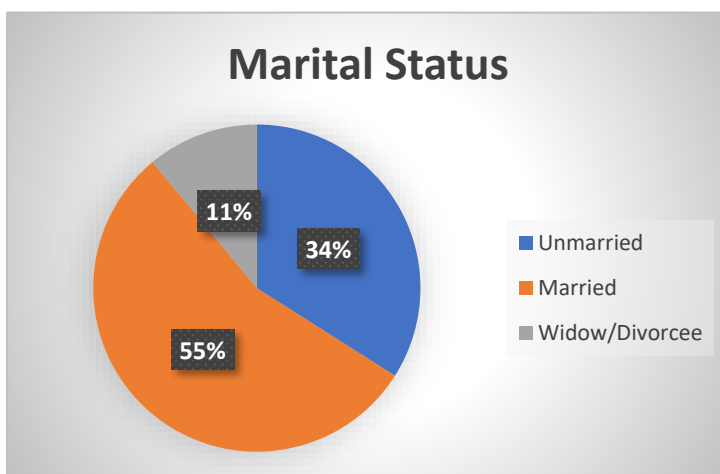
Figure 4.3: Age Group Profile of Responders



Marital Status

103 respondents are unmarried, 165 respondents are married and 32 respondents are widows and divorcees constituting 34 per cent, 55 per cent, and 11 per cent respectively (Figure 4.3). Thus, the maximum number of respondents were married because the married couples select the Andaman Islands for their honeymoon destination. Unmarried respondents are another largest group that visit this destination for adventure activities, educational tours and visits along with their families. The other group belongs to widows and divorcees, who visit very less in number. Most of them come here in search of mental peace and rest in the abode of natural surroundings.

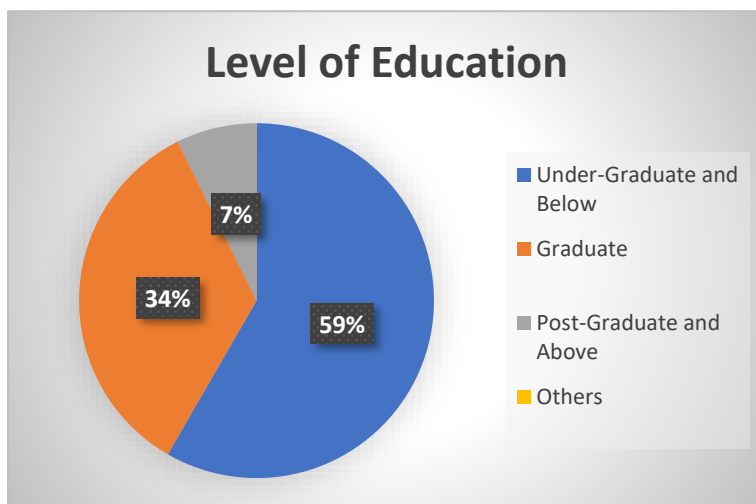
Figure 4.4: Marital Status Profile of Responders



Educational Level

There is a total of three categories namely undergraduate and below, graduate and postgraduate and above took to measure the educational level of the response. Out of the total respondents 175 were undergraduate and below, 103 were graduates and 22 were post-graduate and above constituting 59 per cent, 34 per cent, and 7 per cent respectively (Figure 4.4). There is no respondent found with any other educational qualification. Thus, the maximum number of respondents were undergraduates and below. This survey has also found that they also belong to the private sector of jobs and they are not interested in getting higher educational qualifications.

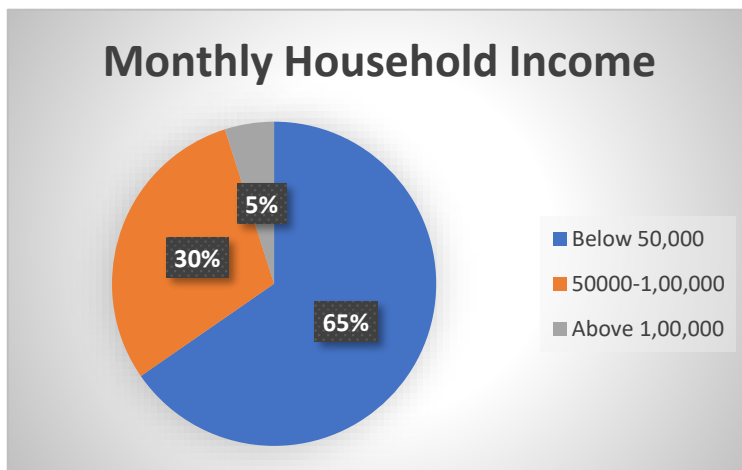
Figure 4.5: Educational Profile of Responders



Household Income

194 respondents are having a monthly income of less than Rs 50,000, 91 respondents are having monthly income of Rs 50,000 to 1,00,000, and only 15 respondents are having more than Rs 1,00,000 as their monthly income constituting 65 per cent, 30 per cent, and 5 per cent respectively (Figure 4.5). Thus, the maximum number of respondents were having a monthly income of less than Rs 50,000 because this destination is mostly attracting the low-income group of tourists. Most high-income tourists prefer to visit other international tourist destinations equipped with better amenities.

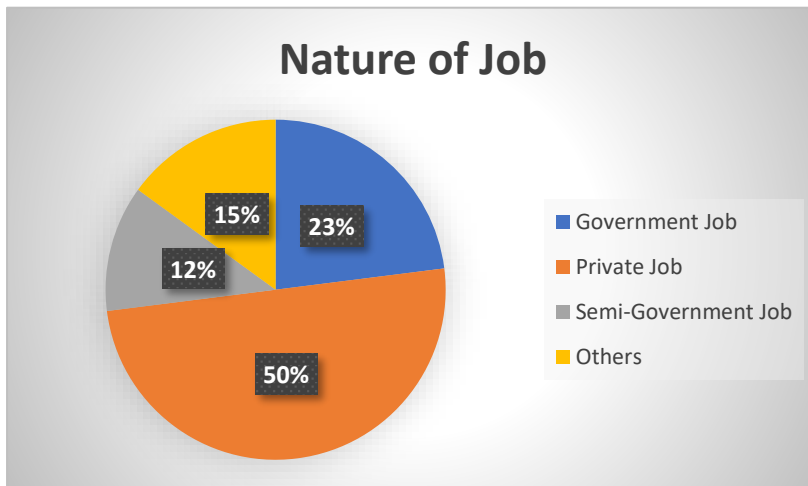
Figure 4.6: Monthly Household Income Profile of Responders



Nature of Jobs

Four categories have been created on the basic nature of jobs namely, government jobs, private, semi-government jobs and others. The other category involves housewives, students, and the unemployed. 68 respondents are having government jobs, 150 respondents are having private jobs, 36 respondents related to semi-government jobs and 46 respondents are belonged to the others category constituting 23 per cent, 50 per cent, 12 per cent, and 15 per cent respectively (Figure 4.6). Thus, the maximum number of respondents are belonging to the private job occupation. The private job respondents of the urban region mostly prefer to visit this kind of nature-based tourism destination. Government servants are the second populous group of this category visit through the Leave Travel Concession (LTC) through their service to visit these islands. The other group of respondents are dependent population belonging to students, housewives, unemployed etc.

Figure 4.7: Job Profile of Responders



4.3.2.1 Perception Analysis on Transportation Facilities of Diglipur Tehsil

Table 4.6: Importance and Performance of transportation elements in Diglipur Tehsil

Sl. No.	Indicators	Importance	Performance	Mean Difference
1	Availability	4.05	3.11	-0.94
2	Quantity	3.21	2.86	-0.35
3	Quality	3.13	2.65	-0.48
4	Capacity	3.93	3.13	-0.80
5	E-ticketing	3.97	3.23	-0.74
6	Affordability	4.08	2.28	-1.80
7	Regularity	4.00	2.40	-1.60
8	Punctuality	3.52	2.39	-1.13
9	Waiting Time	3.62	2.54	-1.08
10	Swift and Fast	3.35	2.55	-0.80

11	Route Condition	3.91	2.43	-1.48
12	Integration	2.59	3.45	0.86
13	Allied Services	3.43	3.05	-0.38
14	Safety	3.27	4.13	0.86
15	Security	3.33	4.06	0.73
16	Cosy	3.53	2.86	-0.67
17	Behaviour	3.58	4.03	0.45
18	Hygiene	3.96	3.97	0.01
19	Pollution Efficiency	3.9	4.14	0.24
20	Inclusive	3.88	2.62	-1.26
	Mean	3.61	3.09	-0.51

Table 4.7: Paired t-test between the Importance and Performance of transportation in Diglipur Tehsil

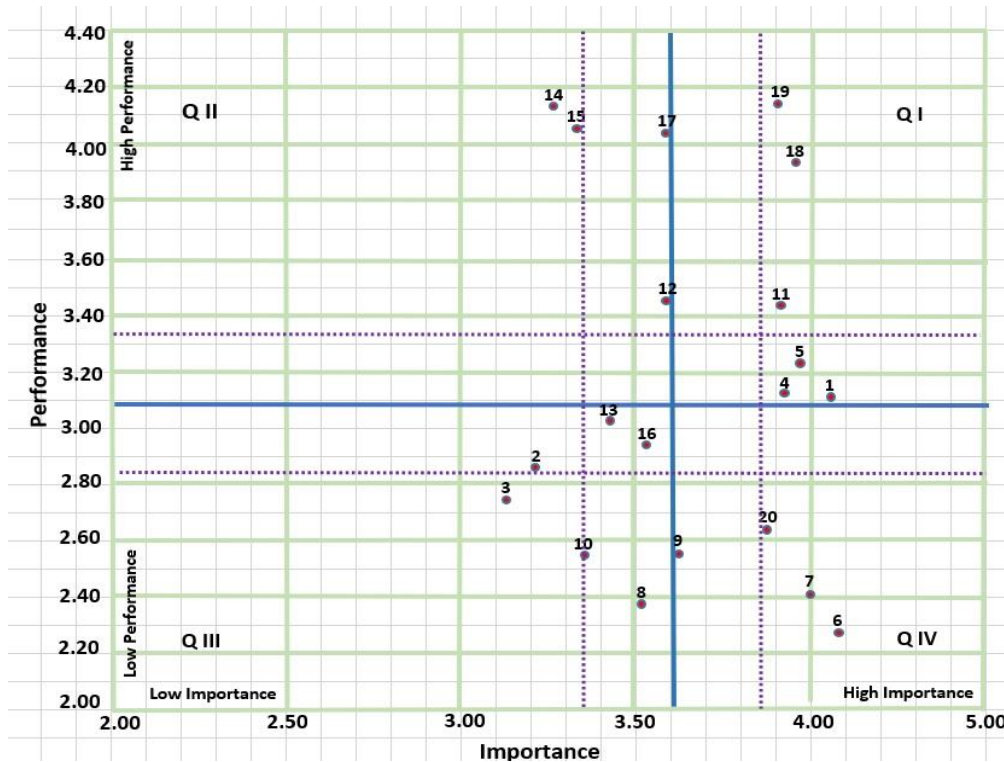
Sl. No.	Indicators	T	Df	Sig. (1-tailed) p-value
1	Availability	-15.05	299	.000
2	Quantity	-4.58	299	.000
3	Quality	-6.05	299	.000
4	Capacity	-12.32	299	.000
5	E-ticketing	-9.93	299	.000
6	Affordability	-28.41	299	.000

7	Regularity	-22.84	299	.000
8	Punctuality	-19.94	299	.000
9	Waiting Time	-17.23	299	.000
10	Swift and Fast	-10.53	299	.000
11	Route Condition	-23.45	299	.000
12	Integration	8.93	299	.000
13	Allied services	-5.90	299	.000
14	Safety	14.94	299	.000
15	Security	9.64	299	.000
16	Cosy	-9.58	299	.000
17	Behaviour	6.29	299	.000
18	Hygiene	0.12	299	.900
19	Pollution Efficiency	3.16	299	.002
20	Inclusive	-16.87	299	.000

The analysis of the data revealed that for six elements of transport facilities performance was better than its importance i.e., integration, safety, security, behaviour, hygiene, and pollution efficiency. The high importance was found for the element's availability, affordability, and regularity while the high performance was found in safety, security, behaviour, and pollution efficiency, these elements scored more than 4 on the 5 points Likert scale (Table 4.6). There was a significant difference in the importance and performance of transportation facilities found in availability (.000), quality (.000), affordability (.000), regularity (.000), punctuality (.000), swift and fast (.000), route condition (.000), hygiene (.000) (Table 4.7). The overall importance mean for transportation facilities was 3.61 and the performance mean was 3.09,

thus low-performance score than importance shows that tourists are not satisfied with the overall transportation facilities of Diglipur tehsil.

Figure 4.8: Importance Performance Analysis of transportation facilities in Diglipur Tehsil



The Important performance analysis has selected the elements i.e., affordability, regularity, and inclusive (elements no. 6, 7, and 20 respectively). These elements are poor in performance and very important as per the perception of the tourist visited in this tehsil.

4.3.2.2 Perception Analysis on Transportation Facilities of Mayabunder Tehsil

Table 4.8: Importance and Performance of transportation elements in Mayabunder Tehsil.

Sl. No.	Indicators	Importance	Performance	Mean Difference
1	Availability	4.05	3.22	-0.83
2	Quantity	3.21	2.35	-0.86

3	Quality	3.13	2.17	-0.96
4	Capacity	3.93	2.95	-0.98
5	E-ticketing	3.97	3.25	-0.72
6	Affordability	4.08	2.58	-1.50
7	Regularity	4.00	2.78	-1.22
8	Punctuality	3.52	2.43	-1.09
9	Waiting Time	3.62	2.42	-1.20
10	Swift and Fast	3.35	2.66	-0.69
11	Route Condition	3.91	3.05	-0.86
12	Integration	2.59	3.79	1.20
13	Allied services	3.43	3.38	-0.05
14	Safety	3.27	4.12	0.85
15	Security	3.33	4.06	0.73
16	Cosy	3.53	3.21	-0.32
17	Behaviour	3.58	4.05	0.47
18	Hygiene	3.96	3.65	-0.31
19	Pollution Efficiency	3.90	4.19	0.29
20	Inclusive	3.88	3.06	-0.82
	Mean	3.61	3.16	-0.44

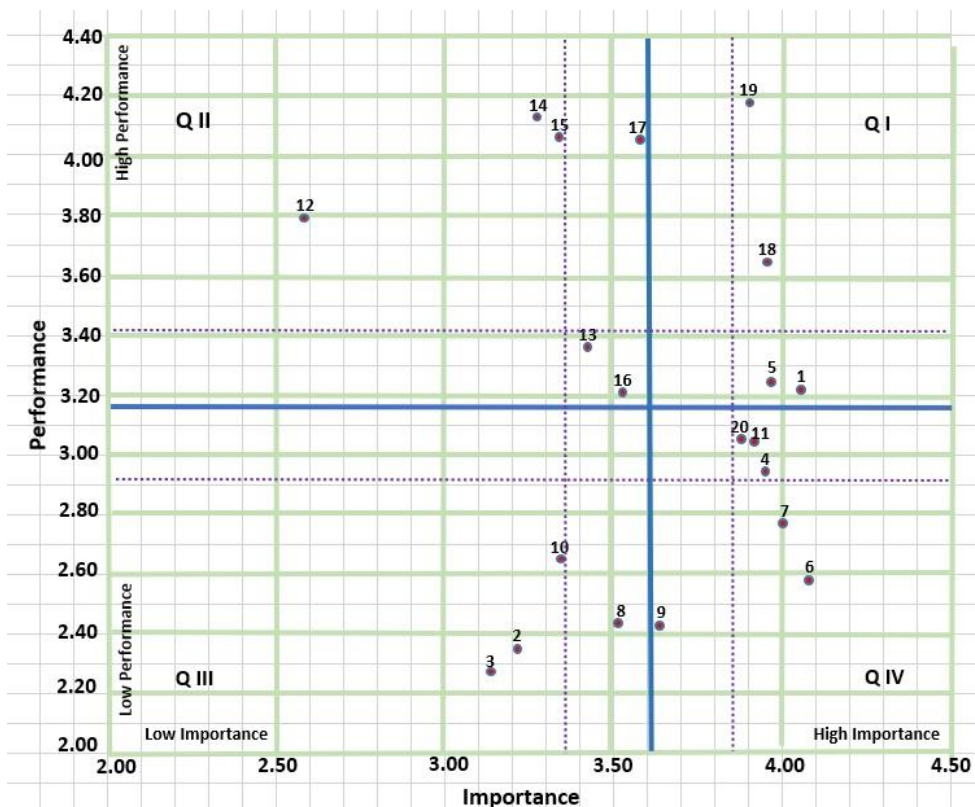
Table 4.9: Paired t-test between the Importance and Performance of transportation in Mayabunder Tehsil

Sl. No.	Indicators	T	Df	Sig. (1-tailed) p-value
1	Availability	-12.51	299	.000
2	Quantity	-11.06	299	.000
3	Quality	-13.50	299	.000
4	Capacity	-16.67	299	.000
5	E-ticketing	-9.20	299	.000
6	Affordability	-17.64	299	.000
7	Regularity	-16.86	299	.000
8	Punctuality	-15.92	299	.000
9	Waiting Time	-15.72	299	.000
10	Swift and Fast	-8.42	299	.000
11	Route Condition	-12.30	299	.000
12	Integration	13.46	299	.000
13	Allied services	-0.73	299	.463
14	Safety	14.31	299	.000
15	Security	9.86	299	.000
16	Cosy	-5.07	299	.000
17	Behaviour	7.48	299	.000
18	Hygiene	-5.14	299	.000

19	Pollution Efficiency	4.30	299	.000
20	Inclusive	-10.70	299	.000

The analysis of the data revealed that for five elements of transport facilities performance was better than its importance i.e., integration, safety, security, behaviour, and pollution efficiency. High performance was found in safety, security, behaviour, and pollution efficiency, these elements have scored more than 4 on the 5 points Likert scale (Table 4.8). There was a significant difference in the importance and performance of transportation facilities found in availability (.000), quality (.000), capacity (.000), affordability (.000), regularity (.000), punctuality (.000) swift and fast (.000), and pollution efficiency (.000) (Table 4.9). The overall importance mean for transportation facilities was 3.61 and the performance mean was 3.16, thus low-performance score than importance shows that tourists are not satisfied with the overall transportation facilities of Mayabunder tehsil.

Figure 4.9: Importance Performance Analysis of transportation facilities in Mayabunder Tehsil



Important performance analysis has selected the elements i.e., affordability, and regularity (elements no. 6, and 7 respectively). These elements are poor in performance and very important as per the perception of the tourist visited in this tehsil.

4.3.2.3 Perception Analysis on Transportation Facilities of Rangat Tehsil

Table 4.10: Importance and Performance of transportation elements in Rangat Tehsil

Sl. No.	Indicators	Importance	Performance	Mean Difference
1	Availability	4.05	3.54	-0.51
2	Quantity	3.21	3.21	0
3	Quality	3.13	3.67	0.54
4	Capacity	3.93	2.32	-1.61
5	E-ticketing	3.97	2.56	-1.41
6	Affordability	4.08	3.29	-0.79
7	Regularity	4.00	3.78	-0.22
8	Punctuality	3.52	3.23	-0.29
9	Waiting Time	3.62	3.13	-0.49
10	Swift and Fast	3.35	2.66	-0.69
11	Route Condition	3.91	2.63	-1.28
12	Integration	2.59	3.79	1.20
13	Allied Services	3.43	3.17	-0.26
14	Safety	3.27	4.12	0.85

15	Security	3.33	4.32	0.99
16	Cosy	3.53	3.28	-0.25
17	Behaviour	3.58	4.05	0.47
18	Hygiene	3.96	3.87	-0.09
19	Pollution Efficiency	3.90	4.28	0.38
20	Inclusive	3.88	3.13	-0.75
	Mean	3.61	3.40	-0.21

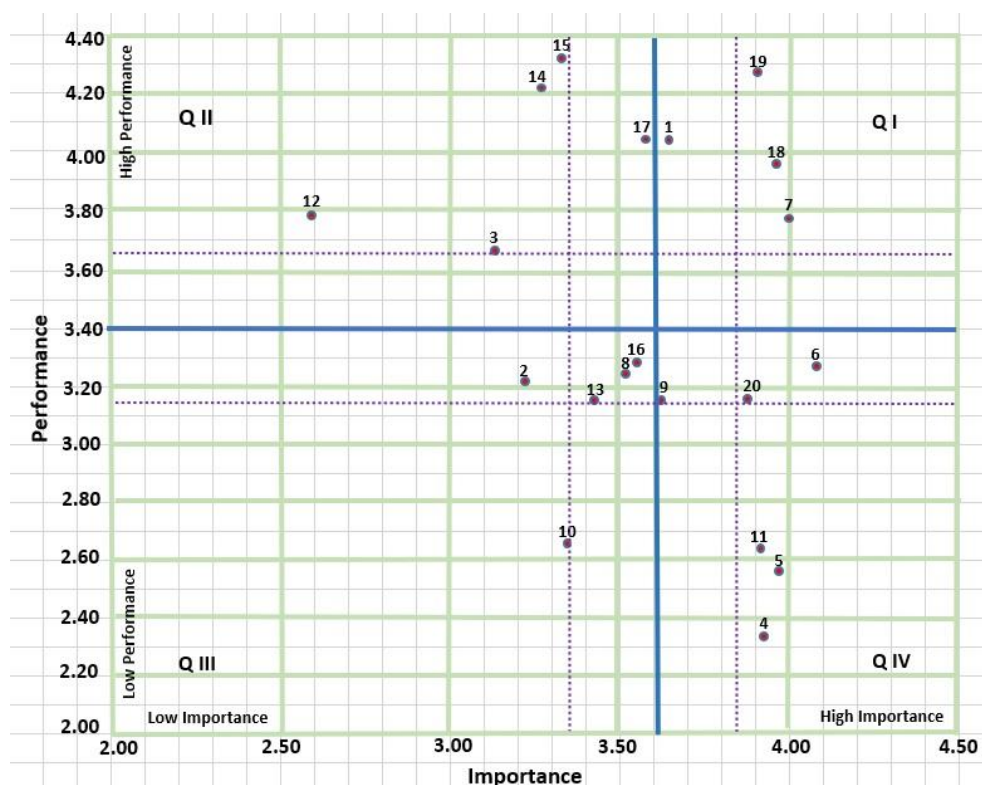
Table 4.11: Paired t-test between the Importance and Performance of transportation in Rangat Tehsil

Sl. No.	Indicators	T	Df	Sig. (1-tailed) p-value
1	Availability	-7.44	299	.933
2	Quantity	0.084	299	.000
3	Quality	6.321	299	.000
4	Capacity	-22.84	299	.000
5	E-ticketing	-19.76	299	.000
6	Affordability	-12.43	299	.000
7	Regularity	-2.67	299	.008
8	Punctuality	-4.22	299	.000
9	Waiting Time	-7.15	299	.000
10	Swift and Fast	-8.63	299	.000
11	Route Condition	-21.56	299	.000

12	Integration	13.32	299	.000
13	Allied Services	-4.34	299	.000
14	Safety	13.06	299	.000
15	Security	12.10	299	.000
16	Cosy	-4.18	299	.000
17	Behaviour	7.77	299	.000
18	Hygiene	-1.47	299	.140
19	Pollution Efficiency	5.72	299	.000
20	Inclusive	-11.28	299	.000

The analysis of the data revealed that for six elements of transport facilities performance was better than its importance i.e., quality, integration, safety, security, behaviour, and pollution efficiency. The performance was found in safety, security, and pollution efficiency elements have scored more than 4 on the 5 points Likert scale (Table 4.10). The quantity element's performance is at par with its importance (3.34). There was a significant difference in the importance and performance of transportation facilities found in capacity (.000), ticket facility (.000), route condition (.000), security (.000), and pollution efficiency (.000) (Table 4.11). The overall importance mean for transportation facilities was 3.61 and the performance mean was 3.40, thus low-performance score than importance shows that tourists are not satisfied with the overall transportation facilities of Rangat Tehsil.

Figure 4.10: Importance Performance Analysis of transportation facilities in Rangat Tehsil



Important performance analysis has selected the elements i.e., capacity, e-ticketing, and route condition (elements no. 4, 5, and 11 respectively). These elements are poor in performance and very important as per the perception of the tourist visited in this tehsil.

4.3.2.4 Perception Analysis on Transportation Facilities of Ferrargunj Tehsil

Table 4.12: Importance and Performance of transportation elements in Ferrargunj Tehsil

Sl. No.	Indicators	Importance	Performance	Mean Difference
1	Availability	4.05	3.12	-0.93
2	Quantity	3.21	3.55	0.34

3	Quality	3.13	3.87	0.74
4	Capacity	3.93	4.33	0.40
5	E-ticketing	3.97	3.67	-0.30
6	Affordability	4.08	3.56	-0.52
7	Regularity	4.00	4.14	0.14
8	Punctuality	3.52	3.52	0
9	Waiting Time	3.62	3.55	-0.07
10	Swift and Fast	3.35	3.72	0.37
11	Route Condition	3.91	2.87	-1.04
12	Integration	2.59	3.79	1.20
13	Allied services	3.43	3.43	0
14	Safety	3.27	4.18	0.91
15	Security	3.33	4.15	0.82
16	Cosy	3.53	3.53	0
17	Behaviour	3.58	4.15	0.57
18	Hygiene	3.96	3.62	-0.34
19	Pollution Efficiency	3.90	3.45	-0.45
20	Inclusive	3.88	3.33	-0.55
	Mean	3.61	3.67	0.06

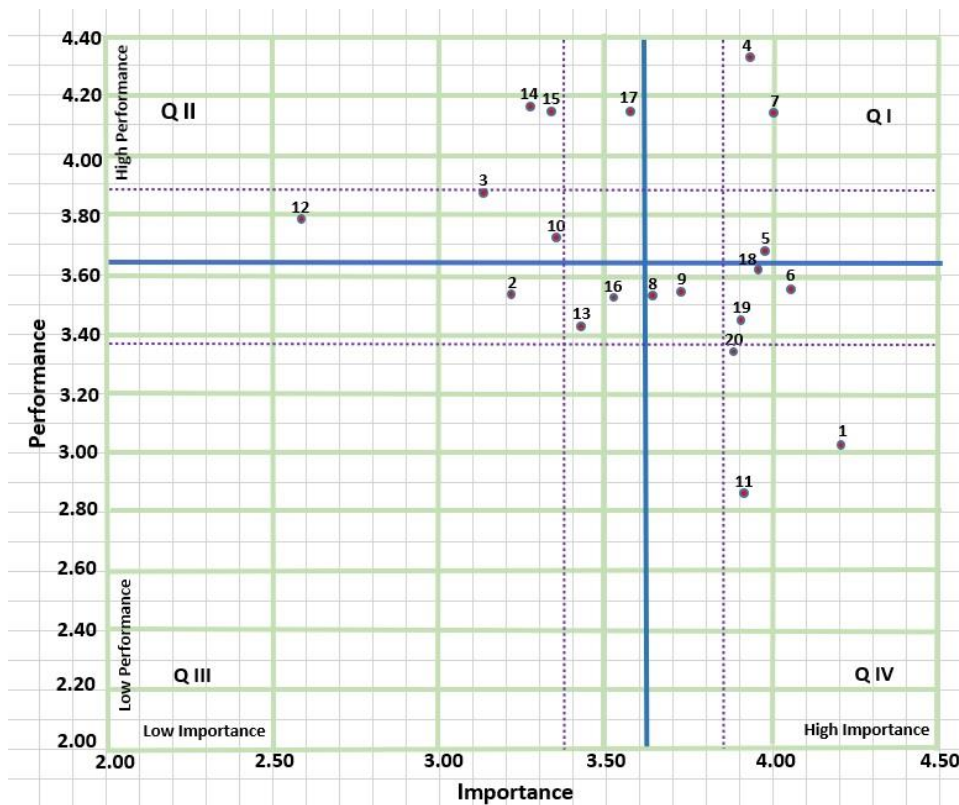
Table 4.13: Paired t-test between the Importance and Performance of transportation in Ferrargunj Tehsil

Sl. No.	Indicators	T	Df	Sig. (1-tailed) p-value
1	Availability	-13.53	299	.000
2	Quantity	4.58	299	.000
3	Quality	9.47	299	.000
4	Capacity	6.09	299	.000
5	E-ticketing	-4.16	299	.000
6	Affordability	-7.01	299	.000
7	Regularity	2.20	299	.028
8	Punctuality	0.04	299	.963
9	Waiting Time	-1.13	299	.259
10	Swift and Fast	4.79	299	.000
11	Route Condition	-16.02	299	.000
12	Integration	11.95	299	.000
13	Allied services	0.00	299	1.000
14	Safety	14.72	299	.000
15	Security	10.70	299	.000
16	Cosy	-0.09	299	.926
17	Behaviour	7.88	299	.000
18	Hygiene	-5.05	299	.000
19	Pollution Efficiency	-6.60	299	.000

20	Inclusive	-8.01	299	.000
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The analysis of the data revealed that for eight elements of transport facilities performance was better than its importance i.e., quantity, quality, capacity, swift and fast, integration, safety, security, and behaviour. High performance was found in availability, capacity, route condition, integration, and safety, these elements have been scored more than 4 on the 5 points Likert scale (Table 4.12). Punctuality, allied services and cosy element's performance are par with its importance (3.52, 3.43 and 3.53 respectively). There was a significant difference in the importance and performance of transportation facilities found in availability (.000), capacity (.000), route condition (.000), integration (.000) and safety (.000) (Table 4.13). The overall importance mean for transportation facilities was 3.61 and the performance mean was 3.67, thus high-performance score than importance shows that tourists are satisfied with the overall transportation facilities of Ferrargunj Tehsil.

Figure 4.11: Importance Performance Analysis of transportation facilities in Ferrargunj Tehsil



Important performance analysis has selected the elements i.e., availability, route condition and inclusive (elements no. 1, 11, and 20 respectively). These elements are poor in performance and very important as per the perception of the tourist visited in this tehsil.

4.3.2.5 Perception Analysis on Transportation Facilities of Port Blair Tehsil

Table 4.14: Importance and Performance of transportation elements in Port Blair Tehsil

Sl. No.	Indicators	Importance	Performance	Mean Difference
1	Availability	4.05	4.13	0.08
2	Quantity	3.21	4.26	1.05

3	Quality	3.13	3.86	0.73
4	Capacity	3.93	4.32	0.39
5	E-ticketing	3.97	3.75	-0.22
6	Affordability	4.08	4.19	0.11
7	Regularity	4.00	4.00	0
8	Punctuality	3.52	3.78	0.26
9	Waiting Time	3.62	3.47	-0.15
10	Swift and Fast	3.35	4.20	0.85
11	Route Condition	3.91	3.86	-0.05
12	Integration	2.59	3.82	1.23
13	Allied services	3.43	3.83	0.40
14	Safety	3.27	4.29	1.02
15	Security	3.33	4.27	0.94
16	Cosy	3.53	3.94	0.41
17	Behaviour	3.58	3.98	0.40
18	Hygiene	3.96	3.69	-0.27
19	Pollution Efficiency	3.90	2.67	-1.23
20	Inclusive	3.88	3.07	-0.81
	Mean	3.612	3.869	0.257

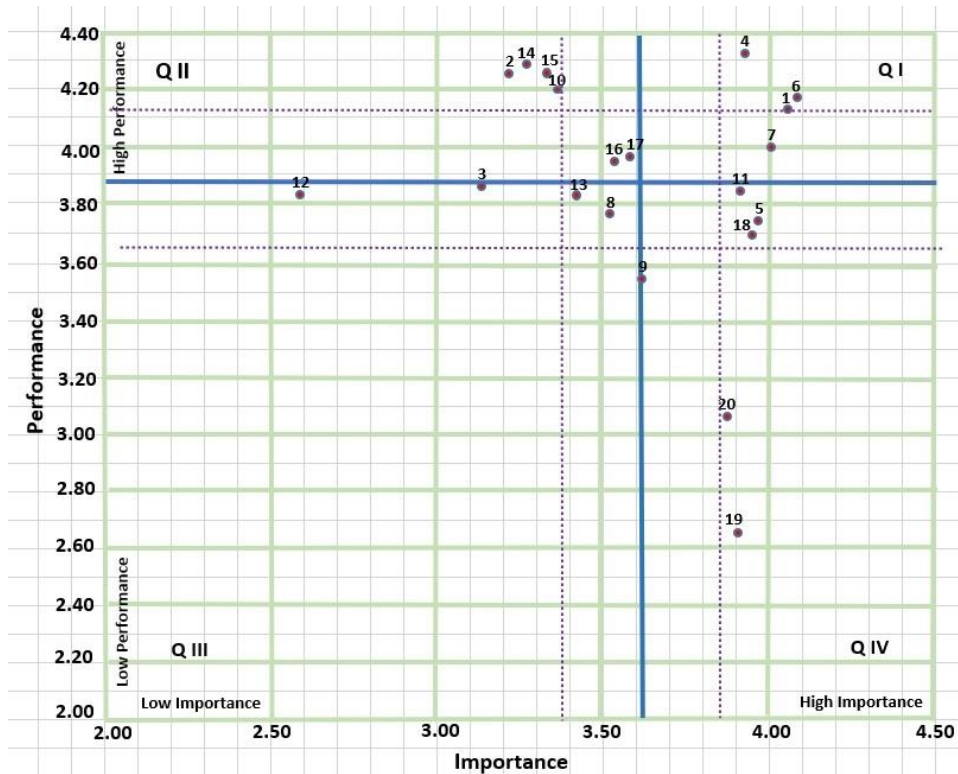
Table 4.15: Paired t-test between the Importance and Performance of transportation in Port Blair Tehsil

Sl. No.	Indicators	T	Df	Sig. (1-tailed) p-value
1	Availability	1.06	299	.000
2	Quantity	13.41	299	.000
3	Quality	9.38	299	.000
4	Capacity	6.48	299	.000
5	E-ticketing	-3.03	299	.003
6	Affordability	1.67	299	.095
7	Regularity	0.00	299	1.000
8	Punctuality	4.20	299	.000
9	Waiting Time	-2.23	299	.026
10	Swift and Fast	14.75	299	.000
11	Route Condition	-0.79	299	.428
12	Integration	13.24	299	.000
13	Allied services	6.94	299	.000
14	Safety	17.38	299	.000
15	Security	12.28	299	.000
16	Cosy	6.75	299	.000
17	Behaviour	5.01	299	.000
18	Hygiene	-3.79	299	.000
19	Pollution Efficiency	-14.07	299	.000

20	Inclusive	-10.58	299	.000
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The analysis of the data revealed that for thirteen elements of transport facilities performance was better than its importance i.e., availability, quantity, quality, capacity, affordability, punctuality, swift and fast, Integration, allied services, safety, security, cosy, and behaviour. The high performance was found in availability, quality, capacity, affordability, swift and fast, safety and security, these elements have been scored more than 4 on the 5 points Likert scale (Table 4.14). There was a significant difference in the importance and performance of transportation facilities found in quantity (.000), capacity (.000), integrated (.000), safety (.000), and pollution efficiency (.000) (Table 4.15). The overall importance mean for transportation facilities was 3.61 and the performance mean was 3.86, thus high-performance score than importance shows that tourists are satisfied with the overall transportation facilities of Port Blair tehsil.

Figure 4.12: Importance Performance Analysis of transportation facilities in Port Blair Tehsil



Important performance analysis has selected the elements i.e., pollution efficiency and inclusive (elements no. 19, and 20 respectively). These elements are poor in performance and very important as per the perception of the tourists visited in this tehsil.

4.3.2.6 Perception Analysis on Transportation Facilities of Little Andaman Tehsil

Table 4.16: Importance and Performance of transportation elements in Little Andaman Tehsil

Sl. No.	Indicators	Importance	Performance	Mean Difference
1	Availability	4.05	3.09	-0.96
2	Quantity	3.21	3.55	0.34
3	Quality	3.13	2.95	-0.18

4	Capacity	3.93	3.57	-0.36
5	E-ticketing	3.97	2.50	-1.47
6	Affordability	4.08	3.12	-0.96
7	Regularity	4.00	2.12	-1.88
8	Punctuality	3.52	2.53	-0.99
9	Waiting Time	3.62	2.32	-1.30
10	Swift and Fast	3.35	2.56	-0.79
11	Route Condition	3.91	3.23	-0.68
12	Integration	2.59	4.02	1.43
13	Allied services	3.43	2.98	-0.45
14	Safety	3.27	4.32	1.05
15	Security	3.33	4.02	0.69
16	Cosy	3.53	3.50	-0.03
17	Behaviour	3.58	4.29	0.71
18	Hygiene	3.96	2.41	-1.55
19	Pollution Efficiency	3.90	4.24	0.34
20	Inclusive	3.88	3.72	-0.16
	Mean	3.612	3.252	-0.36

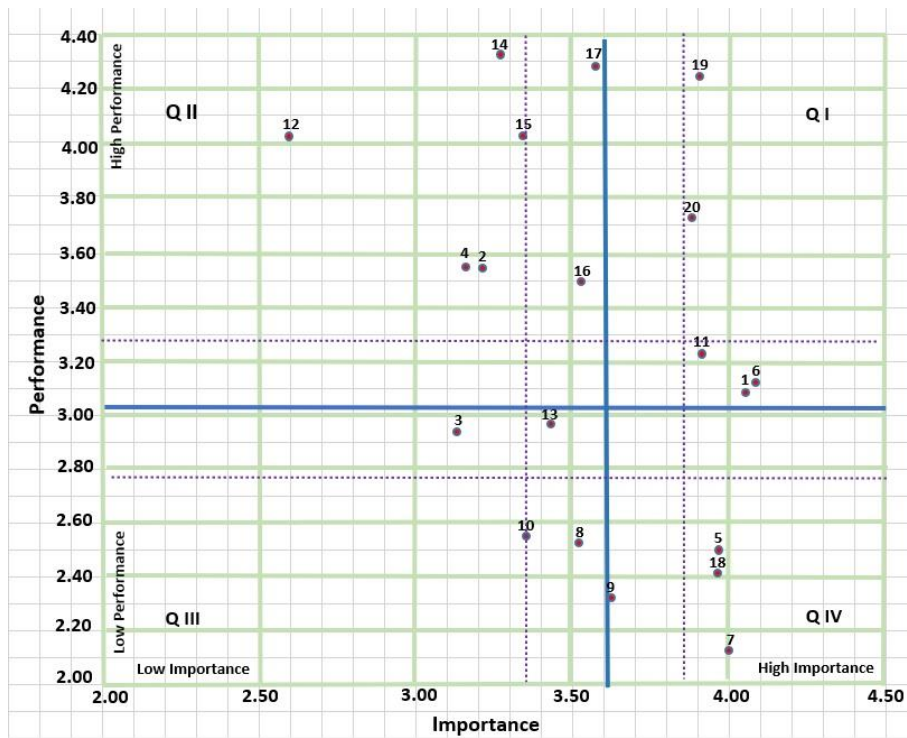
Table 4.17: Paired t-test between the Importance and Performance of transportation in Little Andaman Tehsil

Sl. No.	Indicators	T	Df	Sig. (1-tailed) p-value
1	Availability	-12.54	299	.000
2	Quantity	4.138	299	.000
3	Quality	-2.10	299	.036
4	Capacity	-5.23	299	.000
5	E-ticketing	-19.71	299	.000
6	Affordability	-13.47	299	.000
7	Regularity	-27.05	299	.000
8	Punctuality	-14.31	299	.000
9	Waiting Time	-20.10	299	.000
10	Swift and Fast	-9.06	299	.000
11	Route Condition	-7.84	299	.000
12	Integration	15.35	299	.000
13	Allied services	-5.80	299	.000
14	Safety	17.11	299	.000
15	Security	8.99	299	.000
16	Cosy	-0.49	299	.619
17	Behaviour	10.52	299	.000
18	Hygiene	-24.66	299	.000
19	Pollution Efficiency	4.79	299	.000

20	Inclusive	-2.00	299	.046
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The analysis of the data revealed that for seven elements of transport facilities performance was better than its importance i.e., quantity, capacity, integration, safety, security, behaviour and pollution efficiency. The high performance was found in Integration, safety, security, behaviour and pollution efficiency these elements have been scored more than 4 on the 5 points Likert scale (Table 4.16). There was a significant difference in the importance and performance of transportation facilities found in availability (.000), e-ticketing (.000), regularities (.000), punctuality (.000), waiting time (.000), swift and fast (.000), hygiene (.000), and pollution efficiency (.000) (Table 4.17). The overall importance mean for transportation facilities was 3.61 and the performance mean was 3.25, thus low-performance score than importance shows that tourists are not satisfied with the overall transportation facilities of Little Andaman Tehsil.

Figure 4.13: Importance Performance Analysis of transportation facilities in Little Andaman Tehsil



Important performance analysis has selected the elements i.e., e-ticketing, regularity and hygiene (elements no. 5, 7, and 18 respectively). These elements are poor in performance and very important as per the perception of the tourist visit in this tehsil.

4.3.3 Demographic Profile of Tourists and their Perception of Transportation Facilities

Table 4.18: Analysis of demographic indicators of responders and their arithmetic mean of responses on importance and performance on different transportation facilities.

Demographic Indicators	Importance	Performance
Gender		
Male	3.59	3.39
Female	3.65	3.43
Age		
18-30 Years	3.59	3.36
31-50 Years	3.62	3.45
Above 50 Years	3.64	3.44
Marital Status		
Unmarried	3.61	3.46
Married	3.60	3.39
Widow/Divorcee	3.53	3.41
Level of Education		
Under-Graduate and Below	3.59	3.38
Graduate	3.65	3.45

Post-Graduate and Above	3.57	3.42
Monthly Household Income		
Below 50,000	4.02	3.44
50000-1,00,000	4.08	3.48
Above 1,00,000	4.26	3.44
Nature of Job		
Government Job	4.02	3.43
Private Job	4.14	3.39
Semi-Government Job	3.94	3.44
Others	3.89	3.41

Respondent's Gender and their Response on Importance and Performance of Transportation Facilities

It was observed that the importance of transportation facilities is high than their performance among both male and female respondents. It was also found that the mean value of female's responses on the importance and performance of transportation facilities is high than the male (Table 4.19) As per their response, affordability (mean 4.18) for males and e-ticketing (mean 4.00) is a most important element for transportation facilities for female respondents. Both male and female respondents found that the performance of the safety element (mean 4.18 and 4.22 respectively) is best among all other elements of transportation facilities. While integration is the least important element (mean 2.64 and 2.44 respectively) and road condition is the least performing element (mean 3.00 and 3.03 respectively) for both male and female respondents (Appendix 5).

Respondent's Age Groups and their Response on Importance and Performance of Transportation Facilities

It was observed that the importance of transportation facilities is high than its performance for all age groups (young adult, middle-aged adult, old adult) respondents. It was also found that

the old adult age group response mean value is more than another age group for importance and middle-aged adult respondents' high for performance. While young adult respondents were given a low mean value of responses regarding both the importance and performance of transportation facilities (Table 4.19). As per their response affordability (mean 4.12) for young adult respondents, and e-ticketing for both middle-aged adults (mean 4.24) and old adults (4.25) respondents are important elements for transportation facilities. All age group respondents found that the performance of the safety element (mean 4.15, mean 4.24 and 4.22 respectively) is best among all other elements of transportation facilities. While integration is the least important element (mean 2.48, mean 2.73 and 2.66 respectively) for all age groups. Road condition is the least performing element for young adult and middle-aged adult respondents (mean 3.02 and 3.00). Old adult (mean 2.83) respondents indicate waiting time is the least performing transportation element (Appendix 5).

Respondent's Marital Status and their Response on Importance and Performance of Transportation Facilities

It was observed that the importance of transportation facilities is high than its performance for all kinds of marital groups (married, unmarried, widow or divorced) of respondents. It was also found that the unmarried respondents mean value is more than marital respondents for both importance and performance. While widow or divorced respondents were given a low mean value of importance and married respondents were for the performance of transportation facilities (Table 4.19). As per their responses e-ticketing (mean 4.05) for unmarried respondents, availability element for both married (mean 4.12) and widow/divorced (4.12) respondents are important elements for transportation facilities. All groups of respondents found that the performance of the safety element (mean 4.22, mean 4.22 and 4.17 respectively) is best among all other elements of transportation facilities. While integration is the least important element (mean 2.66, mean 2.72 and 2.43 respectively) and waiting time is the least performing element of transportation facility for all kinds of marital groups of respondents (mean 2.90, mean 2.90 and 2.91 respectively) of respondents (Appendix 5 & 6).

Respondent's Level of Education and their Response on Importance and Performance of Transportation Facilities

The table is showing that the importance of transportation facilities is high than its performance for all levels of education respondents (undergraduate and above, graduate, postgraduate and above). It was also found that the mean value of graduates is more than other levels of education

respondents for both importance and performance of transportation facilities. While postgraduate and above respondents are given a low mean value to importance and undergraduates to the performance of transportation facilities (Table 4.19). As per their responses affordability (mean 4.14) for undergraduate-below, ticket facility for graduates (mean 4.21) and regularity (4.08) respondents are important elements for transportation facilities. Undergraduates-below and graduates found that the performance of the safety element (mean 4.16, and mean 4.22 respectively) and postgraduates-above found security element (mean 4.26) is best among all other elements of transportation facilities. While integration is the least important element for undergraduates-below and graduates (mean 2.50, and mean 2.66 respectively) and quality for postgraduates-above (2.82). Waiting time is the least performing element of transportation facility for all levels of educational background groups of respondents (mean 2.88, mean 2.96 and 2.81 respectively) respondents (Appendix 6).

Respondent's Monthly Household Income and their Response on Importance and Performance of Transportation Facilities

The table is showing that the importance of transportation facilities is high than its performance for all levels of income respondents i.e., low-income (Below Rs. 50,000,); medium-income (Rs. 50,000 to 1,00,000); and high-income (Above Rs. 1,00,000). It was also found that the mean value of high-income respondents is more than both other income group respondents for importance and medium-income group respondent for the performance of transportation facilities. While low-income group respondents gave a low mean value to the importance and high-income group respondent to the performance of transportation facilities (Table 4.19). As per their responses affordability (mean 4.07) for low-income respondents, ticket facility for medium-income respondents (mean 4.14) and availability (4.26) for the high-income respondent are important elements for transportation facilities. Low-income and medium-income respondents found that the performance of the safety element (mean 4.18, and mean 4.23 respectively) and high-income respondents found behaviour and hygiene element (mean 4.17, and mean 4.17 respectively) is best among all other elements of transportation facilities. While integration is the least important element for all kinds of income groups of respondents (mean 2.61, mean 2.52, and mean 2.66 respectively). Waiting time is the least performing element of transportation facility for all income groups (mean 2.90, mean 2.93 and 2.84 respectively) respondents (Appendix 6).

Respondents' Nature of Job and their Response on Importance and Performance of Transportation Facilities

The table is showing that the importance of transportation facilities is high than its performance for the respondents belonging to all mentioned natures of job (government job, private job, semi-government job, other i.e., housewife, students, and retired person). It was also found that the mean value of private job respondents is more than other nature of job responders for importance and semi-government job respondents for the performance of transportation facilities. While another group of respondents gave a low mean value to the importance and private job respondents to the performance of transportation facilities (Table 4.19). As per their responses ticket facility (mean 4.19) for government job respondents, availability (mean 4.14) for private job respondents, hygiene (mean 4.05) for semi-government job respondents and affordability (4.26) for another group of respondents are important elements for transportation facilities. All nature of job respondents found that the performance of safety element (mean 4.23, mean 4.21, mean 4.11 and 4.15 respectively) is best among all other elements of transportation facilities. While integration is the least important element (mean 2.63, mean 2.55, mean 2.86 and 2.43 respectively) and waiting time is the least performing element of transportation facilities for all natures of job respondents (mean 2.96, mean 2.87, mean 2.87 and 2.96 respectively) respondents (Appendix 5 & 6).

4.4 RESULT AND DISCUSSION

All three modes of transportation are functioning in these islands whether it is connected by part of mainland India through water or aerial mode. Their main terminal points are located in Port Blair only. It is the capital city and also the main hub to connect the other parts of the islands. This city comes under the administrative boundary of Port Blair tehsil itself. Port Blair tehsil is having the greatest number of means of transportation as compared to others (Table 4.2). In other words, it could be said that Port Blair tehsil is the principal transportation hub for connecting the rest of the tehsils of the Andaman Islands. The analysis shows that the availability and function of the means of transportation vary from one tehsil to another. To understand these variations and similarities the analysis of these transportation facilities has been done from different perspectives.

Responders provide their responses on the importance and performance of facilities. The first perspective of analysis shows that there are fewer number transportation elements which have a high score of performance than their importance. A tehsil-wise glimpse shows that their numbers are ranges from five to thirteen among the tehsils. It found that integration, safety, security and behaviour are the most common element found in all the tehsils. It denotes that the responders are fully satisfied only with the elements of transportation in each part of islands. The reason explained here is that good integration among means of transportation performance is lacking in the variety of means of transportation creating alternative and co-operation among other available means of transportation. The terminals are well connected and supported with light motor vehicles and three-wheelers. The physiographic location and vigilant police administration made this place safe and secure. The low population density (46 person/Kilometres) low crime rate and peaceful environment pose a positive impact on tourists and motivate them to revisit the destinations. Pollution efficiency is also another element of excellent performance except in the Port Blair Tehsil. Most of the tehsils are not affected by transportation including pollution but the responders found that Port Blair Tehsil is not efficient to take environmental measures in the transportation sector. Unplanned and uncontrolled transportation development creates a negative impact on the environment. A large number of its capacity and non-eco-friendly measure degrade the environment quality and it happened in the Port Blair Tehsil. On the other side e-ticketing, regularity, waiting time and inclusion are the four transportation elements never found their performance greater than imports. Responders are not satisfied with the performance of any of these elements at any tehsil. The problems like limited numbers of tickets and irregularity prevail in remote parts of the islands. They await a long time to get their respective means of transport. Many terminals lack the shed facility. Passengers face difficulties during the rainy season. The transportation system failed to provide any special facility to a person with disability. Only a few of the government buses are having reservation seats in front but most of the vehicles are not accessible by them. These are very common but severe transportation problems in most of the tehsils.

The second perspective of analysis is based on extremely high (more than 4 mean points) and extremely low score (less than 3 mean points) for the importance and performance of transportation facilities. It presents availability, affordability and regularity as the most important element as their score is the highest among all the tehsils. The responders expect regular availability of transport should be available at a feasible price. It further shows that safety is the only high-scored element that performs best among all of the tehsils. It denotes

that the transportation system at all tehsils is safe. The staffs care about the safety measures of the vehicle operation. Security is another high-performing element among all tehsils except in the Ferrargunj. The Ferrargunj tehsil is an exceptional case for this element because of the rush ferry boat operation performed in Chatham to Bamboo flat Jetty (It's a shortcut way to connect the Ferrargunj tehsil to Port Blair tehsil) that may lead to security issues for the rush of people and their vehicle happen in both sides of the ferry terminals. At that rush people often ignore the safety rules and even the safety and capacity level but another tehsil does not have this kind of issue. Integration is the least scored importance given element (less than 3 points) by the respondents. They considered the number of their integration. From this perspective, they ignore the environmental consequences of the increased number of vehicles. However, another aspect of this element shows that its performance is quite good and its importance among the all tehsils. Apart from this element route condition is another least-scored performing element. It shows that the condition of the roads is not good on most of the tehsil. Poor road condition leads to consequences like a delay in transport mean, breakdown, accident and damage to vehicles.

The third perspective analysis is based on the equal performance score of the element with its importance. The responders found the performance of these elements exactly matches their expectations of the respondents. These elements are quantity in Rangat Tehsil, punctuality in allied services, cosy in Ferrargunj tehsil and regularity in Port Blair tehsil. It denotes that Rangat Tehsil is having a sufficient number of transports. Increasing a further number of means of transportation could lead to environmental consequences and issue for transportation safety. At Ferrargunj tehsil means of transportation function on proper time and are efficiently facilitated with other associated facilities. The responder also feels the entire transportation process is comfortable over here. In Port Blair tehsil the best thing is regular availability and functioning of means of transportation at working hours. Exactly matching transportation performance with its importance also shows that the responders are satisfied with these elements. Another important observation is that tehsil like. Diglipur, Mayabunder and Little Andaman do not have any equal scored elements.

The fourth perspective of the analysis is based on the highest significant difference in transportation elements' performance concerning its importance. The analysis also views the negative significant difference. Safety, security and behaviour are the elements found to have positive significant differences among all tehsils. The responders found that elements are performing significantly better than their expectations. The common negative significant

difference elements are e-ticketing and waiting time. These elements are the worst-performing transportation elements in most of the tehsils. Passengers face difficulties to access the bus and ferry tickets and have to wait for a long time for their arrival at the departure point. Affordability and route condition is another element in this category in all tehsil except in Port Blair. Port Blair tehsil does not have a problem with those elements because it has sufficient numbers and frequency of buses, which are normally affordable as compared to other tehsils. The road conditions are far good and well connected to most tourist destinations.

The fifth perspective of analysis was based on the graphical selection of the weakest performing as well as the important element through the IPA model. The general observation of its analysis shows that regularity and inclusion are the most frequent elements found in this model. The model output indicates that these elements are requirements required to update in their respective tehsil. The most frequent element like regularity comes in Diglipur, Mayabunder, and Little Andaman tehsil while inclusion comes under Diglipur, Mayabunder, and Port Blair Tehsil. As these elements found are most frequent so it is needed to improve in all of the tehsils irrespective of their specially selected elements through the IPA model (Table 4.20).

Table 4.19: Selected elements through IPA Model in different tehsils.

Sl. No.	Tehsil	Selected element no.	Selected elements
1.	Diglipur	6, 7, and 20	affordability, regularity, and inclusive
2.	Mayabunder	6, and 7	affordability, regularity
3.	Rangat	4, 5, and 11	capacity, ticket facility, and route condition
4.	Ferrargunj	1, 11, and 20	availability, route condition, inclusive
5.	Port Blair	19, and 20	pollution efficiency, inclusive
6.	Little Andaman	5,7, and 18	e-ticketing, regularity, hygiene

Apart from the analysis of their responses, the demographic profile shows that respondents belonging to the male, young adult, married, postgraduate and above, high income and private job have the most dominant response as their aggregate response result also very low about the performance of the transportation system. These categories of responders are significantly less scores in transportation system performance than other groups of responders. While female, middle-aged adult, unmarried, and graduate responders were more satisfied. The profile analysis also reveals that females are more satisfied with the transportation facilities than their male counterparts. These analyses also reveal that income level positively controls the importance given to transportation and private job responders are having high expectations for the performance of the transportation system.

Overall Satisfaction analysis on transportation facilities

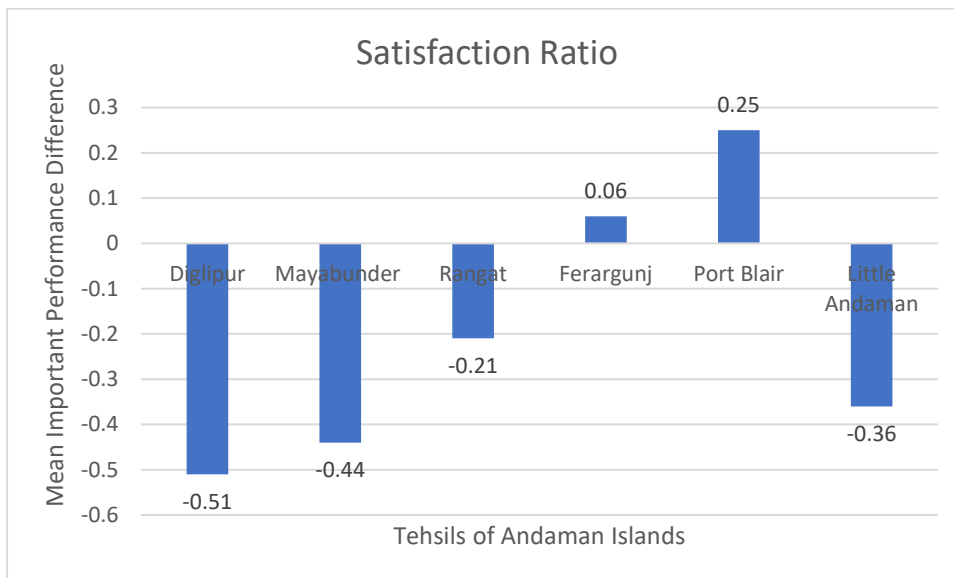
A high (0.25) positive mean difference is found in the Port Blair tehsil as it is the gateway for the tourists to visit tourist places of the islands. All tourist who wishes to travel has to come first in this tehsil only. The seaport and airport that connected it to the Indian mainland are located here. The other tehsil is mainly connected by the transportation hub of this tehsil i.e., Aberdeen Bazar lies a distance of 26 km from the transportation hub of Ferrargunj, 158 km from Rangat, 198 km from Mayabunder, 333 km from Diglipur, and 340 km from Little Andaman tehsil. Table 5.18 shows the important performance differences which arranged in descending order i.e., Port Blair (0.25), Ferrargunj (0.06), Rangat (-0.21), Mayabunder (-0.44), Diglipur (-0.51), and Little Andaman (-0.36). Here it has been found that tourist's satisfaction with transport facilities ratings is decreasing with increasing the distance from Port Blair. Through the analysis, it has been found that transportation satisfaction and distance from main transportation hub is having an inverse relationship.

Table 4.18: Tehsil-wise importance performance difference of transportation facilities

Tehsil	Mean Differences
Diglipur	-0.51
Mayabunder	-0.44
Rangat	-0.21
Ferrargunj	0.06

Port Blair	0.25
Little Andaman	-0.36

Figure 4.14: Overall transportation importance-performance mean differences



The overall view on the performance of transportation elements presenting the tehsil in descending order as Port Blair (3.86), Ferrangunj (3.67), Rangat (3.40), Little Andaman (3.25), Mayabunder (3.16), and Diglipur (3.09). The group of tehsils like Diglipur, Mayabunder and Little Andaman representing themselves as the least develop tehsils in respect of transportation facilities. This is justified by the following facts:

- No element was found in these tehsils that their performance score was at par with its importance.
- Except for integration, safety, security, behaviour and pollution efficiency all elements of transportation facilities' performance score low than their importance.
- Their average performance score is below the aggregate tehsils mean performance score (3.40).
- Their average mean difference between the importance and performance of transportation facilities was found below the aggregate mean difference (-0.22) of all tehsils.
- Common elements found in both positive and negative significant difference analysis in these tehsils

CHAPTER 5

REVIEW OF TOURISM POLICIES ON THE ANDAMAN & NICOBAR ISLANDS

5.1 DEVELOPMENT OF TOURISM POLICIES

The plans and policies indicate a direction for the development process to achieve the desired objectives. They provide guidance for decision-making an action throughout the organization (Hunger and Wheelen, 2003; Lessard, 1998). Policies and provisions for tourism development in India have been initiated from the Second Five Year Plan (FYP, 1956-61) by the Government of India (GoI). This FYP is mainly based on heavy industrial development but it has also recognized tourism as a significant part of the industrial sector. According to this plan, a central tourism department has been established and modest allocation of Rs. 3.36 crores have been given for the development of tourism infrastructures. For the development of tourism industry this FYP is followed by numbers of national and regional tourism policies.

The national tourism policies suggest the trend and direction of tourism development for the entire country while the regional policies are made for special provisions and schemes as per the special need of the particular region. This chapter is based on the review of major plans, policies and their frameworks pertaining to India in general and A&N Islands specifically. The official step for tourism development has been taken with the introduction of first National Tourism Policy (NTP-1), is introduced in 1982. These NTP have been taken for review to develop a firm understanding for the proceeding other regional tourism policies. The Andaman Islands has come into the limelight of the tourism sector in very recent years (Department of Economics and Statistics, 1981). The growth of tourists has also emerged at the beginning of the Twenty-First century (Tourists Trend 1991 to 2021, Directorate of Information, Publication, and Tourism).

NTP-1 had been prepared covered the tourism development for the pan India region. It is first nationwide planning for the tourism, which has been made to introduce general type of tourism that could be prevail in different parts of India. After the NTP, **Developmental Strategy for Environmentally Sustainable Tourism (DSEST)** has been introduced in 1997. It is the first regional level initiative taken for tourism development for these islands. It is also the first of

its own kind of tourism policy which include the sustainable development for these Islands. In the year 2000, the Ministry of Tourism & Culture (MoT&C) had brought **Carrying Capacity based Development Planning (CCDP)** to identify the existing tourism operation and the carrying capacity of each island to receive the incoming tourists. After the two years on 2002 Ministry of Tourism and Culture (MoT&C) presented **NTP-2** to introduce the new dimension of tourism for the country. This national policy discussed the role of government bodies and private entrepreneurs for the tourism planning, operation, and management. Apart from the policies there some special projects have been launched to developed the Island Tourism Industry. The government allocated the task to make tourism development plans to A.F. Ferguson Co., as **Perspective Plan for Tourism Development in Andaman & Nicobar Islands (PPTD)** and in addition the Federation of Indian Chambers of Commerce and Industry (FICCI) plans for **Tourism Development Plan (TDP)** in the year 2002. These studies were mainly launched to suggest appropriate method to develop tourism development as per to the regional need and feasibility at different part of the islands. The study findings have been further used to make upcoming tourism policies for the islands. Among them one of the policies is named as **Tourism Policy for Andaman & Nicobar Islands (TPANI)** introduced in the year 2003. For achieving it goals, a tourism development vision has been developed for the year 2003-2007. Another **Draft of Tourism Policy (DTP)** for the islands has been prepared and presented by Directorate of Information, Publicity & Tourism (DIP& T) in 2009. Subsequently a gazetteer has been published by MoT&C as **Eco-Tourism Policy Guidelines for Andaman & Nicobar Islands (ETPG) 2015**, especially for sustainable tourism development through eco-tourism. Later on, Government of India (GoI) focused also on integrated development in many fields of possibilities because dependence on one form of economic activity for a region could be created vulnerable for economic issues. Which has been seen in the year of 2009 caused due to the global economic crisis. In addition, with these tourist specific policies a section of the tourism development plan has included with development of other allied economic activities as the named **Incredible Islands of India (Holistic Development)** in the year 2018. This framework has prepared by NITI (National Institutions for Transforming India) Ayog. It is further updated with revised objectives in 2019 as the name Transforming of the Islands through Creativity and Innovation. Which not only based on integrated economic development vision but also develop similar infrastructure for the regions having same potentials and challenges i.e., Andaman & Nicobar Islands and Lakshadweep Islands. An environmental regulation law also taken for the review of the islands as it having 7516.6 km of long coastal area and its very sensitive for any unnecessary

development. To evade its repercussion here the **Coastal Regulation Zone (CRZ) 2019** has been reviewed and check any unscientific development at its coastal regions. As the most of the tourism sources are related to the coastal area so it is very crucial to examine the CRZ. As the most **NTP-3** has come in 2022 with a large framework of tourism prospects with upgraded potentials of tourism development. These all policies have been taken for the review and implemented in the duration of 40 years period from 1982 to 2022. Ministry of Tourism and Culture (MoT&C) and Andaman & Nicobar Administration are the main policymakers for the tourism industry for these islands. Moreover, other ministries as the Ministry of Home Affairs (MoHA), Ministry of Environment, Forest & Climate Change (MoEF&CC) also made policies that implicate the tourism development process. Private agencies and other government bodies i.e., NEERI, NITI Ayog, FICCI, A.F. Fergusons studied these islands and suggested applicable aspects for tourism development. The tourism industry is a multi-sector industry and it overlapped and worked with the venture of different departments. Hence, the policies those are closely related to island tourism have been included for the review. The features and contribution of all of these policies further has been explained and reviewed through the following methodology.

5.2 DATA SOURCE AND METHODOLOGY

There are a total of 13 plans, policies and developmental strategies (Table 5.1) have been taken for the review. The review has been done by the experts of different aspects who having deep knowledge expertise and information about the Andaman Islands. The experts are belonging to different backgrounds tourism departmental officials, academician from the higher educational department of tourism, environmentalist, social scientists and community leaders. The data and information have been gathered from those experts by using questionnaire tool (Appendix-X). The questionnaire consisting of questions and perception queries about economic, social and environmental perspectives of the policy implementation on these islands. Among these 13 policies there are 3 national tourism policies, 6 national tourism studies, 2 regional tourism policies, and 2 related allied policies. These policies have been reviewed to understand all aspects of the tourism breeding ground for these islands. The content analysis method has been used on the basis of development, characteristics, positive-negative aspects and impact of policy implementation upon the tourism industry of these islands.

5.3 REVIEW OF THE TOURISM POLICIES

Table 5.1 Tourism Policies, Plan on A&N Islands.

Year	Name of the Policy	Policy Framing Body
1982	National Tourism Policy	Ministry of Tourism and Culture
1997	Developmental Strategy for Environmentally Sustainable Tourism in Andaman Islands	Directorate of Publicity & Tourism; Ministry of Tourism and Culture; World Tourism Organization (WTO)
2000	Carrying Capacity based development Planning for Implementation of Master Tourism Plan in the Andaman Islands	National Environment Engineering Research Institute (NEERI); Ministry of Tourism & Culture (MT&C); World Tourism Organization (WTO)
2002	Perspective Plan for Tourism Development in Andaman & Nicobar Islands	A.F. Ferguson and Co.
2002	Tourism Development Plan	Federation of Indian Chambers of Commerce and Industry (FICCI)
2002	National Tourism Policy	Ministry of Tourism and Culture
2003	Tourism Policy for Andaman & Nicobar Islands	Directorate of Information, Publicity, and Tourism
2003	Tourism Vision (2003-2007) Andaman & Nicobar Islands	Directorate of Information, Publicity, and Tourism
2008	Draft Tourism Policy for Andaman & Nicobar Islands	Directorate of Information, Publicity, and Tourism
2015	Eco-Tourism Policy Guidelines for Andaman & Nicobar Islands	Government of India

2018	Incredible Islands of India (Holistic Development), 2018; and Transforming of the Islands through Creativity and Innovation	NITI (National Institute of Transforming India) Aayog, Ministry of Home Affairs (MoHA)
2019	Coastal Regulation Zone	Ministry of Environment and Climate Change (MoECC)
2022	National Tourism Policy	Ministry of Tourism and Culture

The **NTP-1** describe the potentials of different types and dimensions of tourism in all over India. The social expert expressed that it's also endeavoured the importance of the tourism to inculcate the values like national integration, community understanding, cultural exchange and environmental conservation through the domestic tourism. In addition to achieving the values it's also help to grow the economic aspects of the tourist destination to create job opportunities, self-employments and through earning foreign exchange. However, this policy mainly concentrates over the domestic tourism and gave less importance to attract foreign tourists to the country. Along with the entire country this national policy also initiated tourism in little extend for the islands. It could be considered as an approach to begin tourism development over here.

Directorate of Publicity and Tourism, (IP&T), Ministry of Tourism and Culture (MoT&C); and United Nation World Tourism Organisation aggregately launched a developing long-term **Master Plan** to initiated tourism in these Islands. This project has started in April 1997, and it was funded by United Nation Development Programme (UNDP). As per the perspective of economic expert review, along with tourism development scope, it also discussed the need to development of supporting amenities mainly the infrastructure facility to assist the tourism operation. This project was the first kind of task which based on the sustainable tourism concept, but for this plan further requisite for the relaxation to explore new areas of the islands which could be led towards mass environmental destruction as well as it could disturb the lifestyle of the aboriginals. The major physical construction works regarding island's tourism industry could lead to disturb the coastal ecosystem. It also asked for de- reservation of dense forest land in the protected region for tourism development, that is not feasible for the perspective of sustainability. Apart from this, the policy also demands direct entry of foreigners

in a restricted area which may be a threat for strategic security as well as vulnerable to the aboriginal folk. The environmentalist opined by this perspective this policy is not sustainable as it will harm to the fragile environment and sensitive local community. In addition, as per the perspective of the expert of social development, this doesn't contain any plan for the local community welfare. The plan of tourism development emphasises private sector participation but the benefits of local communities and aboriginal people have been literarily ignored. It is also suggested replica of tourism development of these islands as other international islands tourism destinations model. However, the environmental expert also opined that this policy also suggests some perspective like development plan of high-value and low volume tourism which is most feasible for the island tourism industry. It will maintain the tourism quality of the destination and enhance the economic potential of the tourism industry.

In order to the same purpose on October, 2000 National Environmental Engineering Research Institute (NEERI) assigned by MoT&C and WTO combinedly prepared a **Carrying Capacity-Based Development Planning for Implementation: Master Tourism Plan** in these Islands. It focused on the assessment of the tourist holding capacity of maximum tourists to these islands' tourism destinations. The policy also include that the faster and standard mode of transportation services could make tourism spots more accessible and developed. This the master plan claimed to control the haphazard development of tourism which leads to check the environmental degradation. However, in other side it's not much concerned about the welfare of local communities, discoursed by the social science expert.

Further GoI has provided a task the A.F Fergusons and Company to suggest a strategy as **Perspective Plan for Tourism Development in Andaman & Nicobar Islands, 2002**. According to the feasibility of the company had done a detailed analysis on existing limitations and challenges of islands tourism and suggested an appropriate development strategy. But despite the Andaman and Nicobar Islands (Protection of Aboriginal Tribes) Regulation, 1956 this strategy is proposed the most of the part of Nicobar district for tourism development. This shows the ignorance of the regulation and aboriginal's welfare. The foreign tourist's entry to these regions makes more disturbance to their original's ethnic culture and their sustainability. Whether, their methods to improve suggestive plans are innovate the tourism development. The positive aspect of the study is it has been followed the principle of regional development and suggested the strategy according to the specific needs and potentials of the different regions

of the islands. The economic expert found that the zone wise tourism development is the best part of this policy to implement.

Federation of Indian Chambers of Commerce and Industry (FICCI) launched a **Tourism Development Plan** on 2002 to make Andaman & Nicobar Islands an international tourism brand. Again, this plan is also including the parts of Nicobar districts as a thrust area for developing tourism, as it is not feasible due to the tribal protection act. It also suggests requirement of a good transportation system for the growth of island tourism and that could be implemented through the developing adequate air transportation and shipping services. The experts added that as suggested the cruise tourism and business tourism by this plan for these islands having future potentials as it's had the large Exclusive Economic Zone (660,000 square kilometres). Along with this its strategic position provide the multiple economic opportunities.

The **NTP-2** has been proposed by the MoT&C in 2002. It includes significant characteristics of NTP 1982 and along with upgraded features for the development of tourism industry. This policy has shifted its focus from conventional (mass) tourism to MICE (Meeting, Incentives, Conference, and Exhibition) tourism. It is the emphasis on pilgrimage and cultured tourism with ecological concerns because mass tourism become a reason for harsh-environmental consequences. On the other side, the policy also focused on the multiplier of domestic tourism as well as it emphasised to attract the foreign tourists at different parts of the country. It had tried to make tourism in India a global brand with the name of "India Tourism" and called a tourism campaign with the name of "Incredible India". It has also acknowledged the critical role of the private sector in association with government support. SWOT analysis revealed that before 2000 the government was less concerned about the tourism sector and allocated very little share of the budget. This policy enforced the GoI to provide an adequate budget and facilities for infrastructure development for the tourism industry. The experts found the policy is having some objectives among one of them describe a provision of 'tourism police' in tourism destination in its second objective. "Tourist Police" is available only in the major tourist destination of the islands like Port Blair, Swaraj Dweep and Shaheed Dweep in these Islands. But there most of the other tourist destinations does not having this tourist police services. In addition, the policy develops strategy of sustainable beach and coastal tourism resorts in the southern states of India. The Andaman Islands are also having the immense potential of sustainable beach and coastal resort as it having long coastlines but these islands are only suggested for international Cruise Tourism. The implication of this strategy could create

pressure on the limited resources of these islands and its sustainability. As per the it's further suggestions the rural tourism and eco-tourism have immense possibilities and potentials for these islands as the great cultural milieu present a unique glimpse of rural lifestyle. Moreover, the diverse vegetation, and beaches could provide world-class eco-tourism destination.

A year later of the national policy, a regional **Tourism Policy** to for Andaman & Nicobar Islands has been suggested by the Directorate of Information, Publicity and Tourism. The policy shown the significance interest to develop tourism with the great care of environmental protection. This policy becomes the base for the upcoming tourism developmental policies for these islands e.g., ecotourism guidelines, 2015. This policy has been prepared to make the Andaman Islands a quality eco-tourism destination in the world and generate revenue for the government.

A separate **Vision of Sustainable Tourism** for these islands has been adopted in 2003 for the period of the next 25 years. According to the vision the tourism industry was identified as a thrust for developing the island's economy. The vision declared sustainability itself for these islands but as per the environmentalists its main focused strategy is based on opening new islands for tourism in spite of improving the existing tourism facility in the already established island. This step required environmental clearance and restricted area permission suggested in the "master plan proposed by the UNDP/ WTO" report. The experts suggested that at place of opening new islands for development some already open low population island could be develop as new tourism destination i.e., Long Island, Aves Island, and Smith Island. They agreed with the plan of making and promoting the water sports complex in these islands suggested creating the Andaman Islands as a world-class tourism destination for promote a special kind of tourism product.

Along with the incorporation of tourism vision led to the Directorate of Information, Publicity, and Tourism; Andaman & Nicobar presents a local **Tourism Policy** on 26 November 2008 by suggesting the promotion of these islands as an eco-friendly tourism destination as these islands are having numbers of natural attractions. To encourage for saving the government expenditure the policy turns for investment of private sector in the tourism industry. Privatization of infrastructure facilities also could be vulnerable for unsustainable tourism and it could ignore the welfare of local people. The policy determines the vital role of the private sector as a service provider but it is also required to specify the role of different government agencies to monitor

over it. In the beginning, it's discussed as what holds good for the country as a whole hold equally true for these islands but it is not true for always. On that context the experts opined that all kind of tourism facilities like railways and mega manufacturing industries are not possible in these islands henceforth all tourism models could not replicate for these islands. This policy states both international and domestic tourism is having prospects to earn long term revenue but these islands are not having that world-class international tourist infrastructure. Hence, despite the immense potential of tourism resources, the islands are not able to earn enough revenue without the adequate infrastructure facilities. They added that the low crime level is one of the positive sides of these islands but drug abuse is increasing among tourists and it is also affecting the social fabric of the islands. Objectives of this policy are having in excessive in numbers and repeated several times. It also advocates encouraging traditional artisans but it has not specified that community. The policy suggested taking the assistant of consultancy service for making tourism strategy but taking consultation service from the outside agency may ignore the welfare of the local community and their issues. There is a strong need for consultation agencies should incorporate and take suggestions from the local community to identify the ground reality. The government supervise their suggested model and should construct as well as make available their tourism facilities and give them for lease to private bidders' and its preference for the local entrepreneurs. For responsible tourism, there is a requirement to train human resources. So, there is a need to the establishment of a hospitality training institute to train the local aspirants. The primary concern of the local tourism department is to regulate tourist traffic and determined the caring capacity of the islands. The best part of this policy is its all strategies are further classified as the goal of policy; based on their time of implementation. This classification makes the goal mere comprehensive and applicable. The policy supports the rationalizing the shipping lines for inter islands and mainland connectivity but the economic experts suggested present time liberalization of air transportation play a vital role to island tourism more accessible to tourists.

MoTC is associated with the Directorate of Information, Publicity, and Tourism, Andaman & Nicobar Administration published in an extraordinary gazette on 10 February 2015 as **Ecotourism Policy Guidelines for Andaman and Nicobar Islands**. According to this policy wide range of biological diversity and high endemism along with 9 national parks, 96 wildlife sanctuaries and 1 biosphere reserve in these islands give the immense potential of eco-tourism development. However, the major part of the suggested area comes under tribal reserved forest which could not be used for an economic activity like tourism. It could be vulnerable for

aboriginal tribes. Further, the policy suggests an attractive eco-tourism could be practised in non-tribal reserved areas. Ecotourism should regulate and monitored by the Department of Environment and Forest (DoE&F) through their working plans with a sustainable approach. In the objectives of this policy, wilderness areas are should be used separately from the natural area for the tourism purpose. The cultural understanding, appreciation and conservation tendency of tribal and local communities should inculcate in ecotourism related activities without disturbing their traditional lifestyle. There is a very good objective has been set to distribute the tourists from popular destinations to nearby less famous tourist destinations by suggest new tourism products. This kind of approach could help to shift the excess tourists to another area. This could lead the maximizing of economic benefit that could get the local community and people residing nearby area. This thing should need to monitor by a government body. Tourism infrastructure and tourist facilities should be developed through environment friendly materials instead of concrete. The experts further suggested there is a need to study and use the indigenous people's method to develop ecological based products and infrastructure i.e., making of Nicobari hut near creeks will enhance cultural appreciation and less impact on the destination's milieu. There is a need for coordination among stakeholders and governmental agencies. Ecotourism promotion has been suggested in parts of North and Middle Andaman, Little Andaman and Great Nicobar Island. Here the transportation would become the major hurdle for the tourism development at the Great Nicobar Island which is located excessive far from the other tourism destinations of Andaman Islands. This remote locality and poor transportation connectivity makes tourism development more difficult to this island. The policy has included the topic of the budget for eco-tourism development but here a detailed estimation of a budget is required for develop these eco-tourism destinations. The policy has been also shared some guidelines for service providers, tourists and researchers to visit eco-tourism sites. Along with this there is a need to develop guidelines for trekking, water sports, videography and photography in the restricted area as these islands expose many strategic and the sensitive locations.

Tourism is not a separate industry whether it is agglomeration of multiple services and infrastructures. One agency and type of plan could not develop a destination. Hence, the NITI Ayog frame a holistic approach strategy titled as “Incredible Islands of India”. Its report has been presented by NITI Ayog introduced by the MoHA on June 10, 2017, to develop a sustainable inclusive eco-tourism project for the islands. The main focus of this project was tourism and its infrastructure development. Islands of ANI and Lakshadweep were the study

area. In ANI, the Smith Island, Aves Island, Long Island and Little Andaman Island have been selected for special Eco-Tourism Development. For eco-tourism development, there has been suggested to construct a treehouse, glamping and eco-friendly resort. The experts found that the policy did not specify the period for developing these islands. Hence, this project has been further updated and presented as titled "Innovation" on 24 April 2019 through adding the new objectives to improve the economic productivity of these islands. It has planned to improve these island's economies with tourism and other allied activities like fisheries, construction and household industries. The main strengths of this policy have presented a detailed estimated budget, structural plan, estimated capacity, and enlisting the responsibility of different tourism stakeholders. But this policy has not suggested any detailed estimation of tourism and their carrying capacity as a tourism destination. Its People Public-Private Partnership (P4) model encouraged employment generation for the local community, economic profit for a private entrepreneur, revenue generation for administration and guaranteed satisfaction for the visitors. The success of this tourism model could be replicated in the other parts of the islands and regions of India. The economic expert explains the policies public-private partnership scheme is suitable for contemporary tourism development. But then again, this kind of policy while practised on the ground the few private bidders get most of the benefits and get control the entire function of the tourism resources. The experts provide hints that lack of government monitoring and intense privatization could lead towards marginalization of the welfare of the local community. However, they found it is the most adequate regional policy among all because it integrated economic activities of allied services, budget, structural plan, and estimated capacity for tourism development for these islands. A clear and detailed policy always more applicable in ground.

The islands are having sun, sea and sand (beach) tourism due to its extensive presence of coastline. The Andaman Islands are having 7516 km lengthy coastline. The coastlines are transitional zone between the land and sea. It is also vulnerable for the global threat like climate change and sea level rise. To deal with these kind of threat GoI launched **Coastal Regulation Zone (CRZ)** in February 1992 under section 3 of the Environment Protection Act, 1986 for the check of different economic and developmental activities along with the coastal area. The CRZ has been amended from time to time as 2011, and 2018. Thereafter related to some sustainable updates and amendments has been made in CRZ, 2018 to permit to make the temporary tourism facilities like changing rooms, shacks, toilet blocks and drinking water facilities could be permissible in the No Development Zone of CRZ-III areas. It is permissible for public welfare

purposes only. However, a minimum distance of 10 m from HTL should be maintained (The New Indian Express, 2018). Andaman & Nicobar Islands coastal stretches come under CRZ IV. Such activities like sand extraction for any construction is not permitted over here. It makes safeguards of the coastal sustainability. However, the social and economic experts described that, many tourism developments have been restricted due to the CRZ rules. They suggest there is need of alternate and compensate place should be excluded to develop some important coastal related developments like eco-friendly beach resorts, temporary washroom facilities, approach road, water sports and sea plane landing zone. These kinds of development also must maintain the ecological stability of the place. Only the 'blue flag beaches' have been relaxed CRZ by the Ministry of Environment and Climate Change to construct infrastructural development. So, the fulfilment of CRZ plays a major role in making tourism strategy in these islands. Along with this the environment experts opined that the CRZ not only help to direct for the environmental protection of the studies whether, it also makes safe from the vulnerability of climate change, sea level rise and hydrological disasters. As per the views of local communities, they believe that some relaxation of Coastal Regulation Zone (CRZ) rules is needed to develop community or Self-Help Group (SHG)-based eco-friendly structures. These structures would facilitate tourists near coastal tourism destinations and create livelihood opportunities for the community. This perspective is valid, as it also aligns with the second aim of CRZ 2011, which is to ensure livelihood security for fishing and the local community by protecting their traditional rights and providing them with access to resources.

The **NTP-3** updated its framework along with different government missions to explore the new dimension of the tourism. It not only suggests the type of tourism whether functioning structure of various national, regional, and local level agencies for tourism. This tourism policy mainly emphasis on the synergy and unifying function of different level and functional ministries together for successful tourism operations. For none of the above policies, and even for this latest national tourism policy, no suggestions and views regarding tourism development have been taken from the local communities.

5.4 RESULT AND DISCUSSION

Here it has been found that all national tourism policies become an ideology for successive regional tourism policies. The experts have discussed that Andaman Islands are having the potential in rural tourism, business tourism, MICE tourism, and also the cruise tourism through port circuits and sea connectivity to neighbouring countries. Most of these policies emphasise

economic development activities by earning foreign capital, employment supply, revenue generation and updating infrastructures. The review reveals that policymakers are aware of the environmental fragility and haphazard development of tourism in these islands. Meanwhile in some cases the policymakers are literally ignore the wellbeing of the local communities and preserve the aboriginals of the islands. The experts of social science opined that earlier periods policies like PPTD 2002, TDP 2002, TV 2003, mostly emphasised to allowing the tourist population to allow for visit the area of aboriginal tribal inhabited. Those kinds of steps are vulnerable for them and the also violation of Aboriginal Protection Regulation, 1956. Even DSEST 1997 asked for relaxation for foreign tourist to direct entry in these islands and that kind of act is not only dangerous for the tribe but also a threat to the national strategic security. Whether, the policies like CCDP 2000, HD & TI 2018-19 and CRZ 2019 on concern with environmental conservation. Beside this they also opined that these policies are made by the bureaucrats, who are lacking ground information about the particular field of tourism. Even they do not involve the local people, professionals and relevant stakeholders at the time of policymaking. Among them non-inclusion of local communities of the tourist destination is the major blunders of the policymakers as the local people not only know the problems and prospects of tourism in grassroot level but also, they also could guide and sustainably participate to conserve through degradation generate through the tourism activities. The local communities play a lead role for them to conserve the destination resource. They not only engage in different tourism whether they also encourage the local traditional artisans could also earn through involvement in the tourism industry. Along with their active participation few policies are also raise some concerns as during peak tourism system should also take care the wellbeing of the communities along with the facilitation of the tourist people and service providers. P4 model of HD&TI 2018-19 includes all stakeholders like Public, Private and People Partnership in the tourism but it also needs government monitoring to inclusion of all sector of the community. Except this one, most of the regional policies did not provide a complete budget, structural plan and estimate the capacity regarding tourism development in the islands. The social science and economic experts discoursed that too much rigidity of the regulation specially CRZ often become a constraint in tourism development because in these islands' tourism potentials are majorly belongs to its coastal areas, so there is a need of special relaxation in few places of islands coast for tourism developments. Most of the policies are having flaws to implementation on ground. The findings shows that main reasons for the failure of most of the policies is not included in local communities and service providers in the process

of policymaking. There were no policies have mentioned any guideline about working under single window system for a new tourism startup.

CHAPTER 6

CONCLUSION AND SUGGESTIONS

6.1 CONCLUSION

The tourism industry became an emerging sector in the world of economy. Apart from its economic value, it inculcates aesthetic, integration, social, and emotional values in tourists. This industry is not a single functional entity rather it's an agglomeration of resources, activities, services, and sectors that aggregately provide the tourism experience as an outcome. The key reason resources are the attractions, amenities, and activities on available on the tourist sites. It motivates tourists to visit the site and experience it's all features. Whether the tourism infrastructures remain the supportive framework make eases the process to visit them. The transportation infrastructure plays a significant role to determine the potential tourist who visits a destination. This study is a quest to assess the transportation facilities and tourism potentials in different parts of the Andaman Islands. The islands are major parts of India's union territory named Andaman and Nicobar Islands. These islands are located approximately 1200 kilometres far from the Indian mainland and located in the Bay of Bengal. The study is only has taken the Andaman group of islands because the other large part of the Nicobar Islands comes under the tribal reserved area. Their tourism activities are not possible. The Andaman Islands are administratively classified into two districts that are North and Middle Andaman and South Andaman. These districts are further classified into three tehsils or blocks for each Diglipur Tehsil, Mayabunder Tehsil, Rangat Tehsil (North and Middle and Andaman district), Ferrargunj tehsil, Port Blair Tehsil and Little Andaman Tehsil (South Andaman district). These blocks are made of the base for regional analysis for this study.

The first objective has been achieved through identification of the tourism resources. The tourism resources are the sites mentioned in the official website of directorate of tourism information and publicity. Few of them also suggested by the tourism experts and stakeholders. These tourism resources have been classified into different categories suggested by the study of Knegevic (2009) to identify the category wise potentials of these queries and resources. To assess the tourism potential of these resources decision tree model has been taken. This model helped to select the appropriate tourism resources and also determined there of tourism potential. The response of different tourism experts has been analysed. This model has been selected total 85 tourism resources. Most of them are natural tourism resources, which indicate

the potential of ecotourism in most of the tehsils. The Rangat Tehsil does not have any cultural tourism resources. On the other side, Port Blair and Mayabunder Tehsil is having good numbers of cultural tourism resources. The Port Blair Tehsil is only having total 35 tourism resources, highest among all of the tehsils. The analysis model of DTM also interpreted that cultural attributes like proximity, facility and accessibility also play a significant role to determine the site for developing a proper tourism destination but in some cases, it is not applicable, especially in adventure tourism like Jungle trailing, hiking, mangrove canopy walk, coastal trek, etc. where limited accessibility allures the adventure tourism. A site cannot be developed as tourism destination without the amenities even if it is highly attractive. Total 10 sites have been rejected and 90 sites have been selected through this model among them 38 are excellent, 52 are good, and 10 are having poor tourism potentials. The fewer numbers of site amenities made little and less potential for tourism development despite it is having good numbers of tourism resources. No tourism resources of this tehsil scored up to the level of excellent. There is a strong need to develop the cultural amenities for enhance the tourism potential of the respective resources.

The second objective has been achieved through the enumeration of the tourism infrastructures. These infrastructures are the moderators, it provides to make the entire tourism operation smooth and comfortable. The tourism industry promotes operating through the help of general as well as special kinds of infrastructure. The tourism infrastructures have been broadly categorised into twelve types i.e., transportation, communication, banking, public utilities, social security, health services, trade, ecological purification objects, tour operators and travel agents, accommodations, catering facilities, leisure and entertainment services. This classification has been adopted from Kathirvel (2007). The sustainability and efficiency of these tourism infrastructures are comparatively assessed through the 'Tourism Infrastructure Index' (TII) methodology. This methodology provides the index values of their respective type. These index numbers helped to calculate the values of different tourism infrastructures in a single standard. It makes regional comparison easy among all tehsils of the Andaman Islands to assess the efficiency and available quantity of tourism infrastructures. The study founds that the TII is highest in Port Blair Tehsil and lowest in Little Andaman Tehsil. Port Blair Tehsil is far advanced to having the tourism infrastructures because of its geographic location, historical heritage, business district, and administrative capital. However, the lower share in the social security and ecological protection objects make it makes the tehsil more vulnerable to become less ecological concern and peaceful area for tourism activities. The Little Andaman Tehsil is

less tourism developed because lack of transportation is hinderance to development of other infrastructures. Although the other tehsils are very less TII score as compare to Port Blair Tehsil but then their social security and environmental protection objects are far good in general. These findings also indicate the ecotourism potential for those tehsils. Whether the development of the other infrastructures is directly depended on the development and efficiency of transportation infrastructure.

The third objective has been achieved through the identification of transportation facilities and measures their efficiency in the different tehsils of the Andaman Islands. The efficiency of transportation facilities has been measured through the enumeration of existing numbers of means of transportation and their performance efficiency. The perception of tourists has been taken to measure the efficiency of different elements of transportation i.e., availability, quantity, quality, capacity, e-ticketing, affordability, regularity, punctuality, waiting time, swift and fast, route condition, integration, allied services, safety, security, cosy, behaviour, hygiene, pollution efficiency, and inclusion. Their perception has been further analysed trough statistical tools i.e., t-tests and graphical method like importance performance analysis (IPA). The statistical tools identified the highest and weakest performing elements while the IPA helped to inculcate the element which needs immediate improvement to develop the transportation efficiency of the tehsil. The finding denotes the safety, security, and pollution efficiency is the most efficient transportation elements in all tehsils except the Port Blair. This result is also found similar to tourism infrastructure efficiency. It is also suggested that the Port Blair, Ferrargunj, and Rangat Tehsil are having sufficient numbers of transport further increment of their quantity in these tehsils could lead to environmental consequences and issues for transportation safety. Apart from the IPA model presents that ‘regularity’ and ‘inclusion’ are the most frequently selected elements and these elements should be need to improve in all of the tehsils irrespective of their specially selected elements through the IPA model. The overall view on the performance of the transportation elements presents the tehsils in descending order i.e., Port Blair, Ferrargunj, Rangat, Little Andaman, Mayabunder, and Diglipur.

The fourth objective has been achieved through the review of different plans, policies and studies related to tourism. A total of 13 national and regional policies have been reviewed to assess their development, characteristics, aspects, impacts and implications on the island’s tourism industry by the experts. The review found that the national tourism policy was very less concerned about any specific tourism development for the islands. Whereas, the regional tourism policies for these islands make specific measures for tourism development like island-

specific tourism activities, support local artisans, indigenous tourist's products and opening new tourism sites. But some of them also suggest the tourism development in tribal reserved areas and unchecked entry of foreign tourists, which may be vulnerable for the indigenous people and national security. The new tourism policy for the country i.e., NTP, 2022 has some significant features to eliminate the earlier mistakes and include innovative strategies to develop efficient tourism. As this policy is based on the linkage of tourism development with the different national developmental missions, specific budget allocations, pros-cons and centralised-decentralised bodies (national, regional, local level) to synergy and function for tourism development. The major faults of the policies have been identified by the tourism experts that the policymakers do not include the local community field experts and stakeholders in the process of policy-making.

The fifth objective has been achieved by suggesting the appropriate tourism development strategy, which have been given as per the flaws and requirements emerged during achieving the other objectives of this study. There is specific tourism development strategy has been suggested for each tehsil of the Andaman Islands.

The Andaman is the core part of the UT i.e., Andaman & Nicobar Islands which holds strategic position for the country but this region does not have significant sector of economic development due to the remoteness from Indian mainland and fragile environment. Here, the tourism industry is emerging as new source of economy and the keeping view of its fragility the sustainable tourism is the need of the time for these islands in all aspects. This study is also consist on progressive view for the country. As India is hosting the G 20 summits and it abide to fulfil the Sustainable development Goal to become global economic super power. In this context this study is a small attempt to achieve certain goals and attain the sustainable development though the tourism industry. This study addresses the all aspects (economic progress, environmental conservation, and social inclusion) of sustainable development as following means:

Economic Progression: Tourism is an emerging sector of these islands economy provide new scope of entrepreneurship, job opportunity, infrastructural development.

Environmental Conservation: It's protected the natural and cultural resources having tourism potentials.

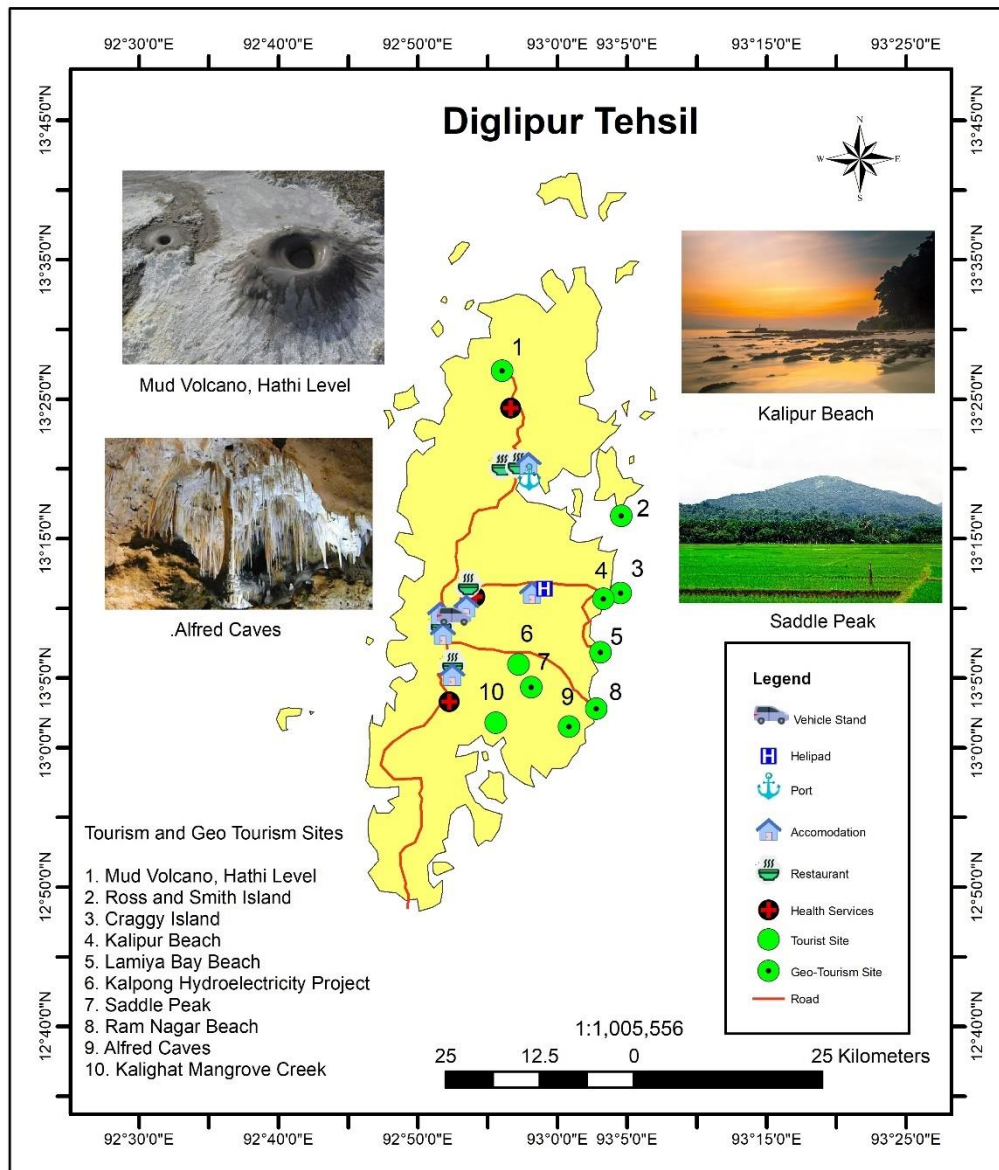
Social Inclusion: Inclusion of local people and experts in tourism planning and decision-making address the local problems and their ultimate solution.

6.2 SUGGESTIONS

Suitable tourism plan for each tehsil has discussed here on the basis of the gaps found from each previous chapters and its findings. It is the one part of the policy makers and administration to consider these suggestions to increase tourism potentials in different tehsils of the Andaman Islands:

6.2.1 Tourism Development Strategy for Diglipur Tehsil

Map 6.1: Tourism Development Strategy Map for Diglipur Tehsil



- Promote the potential tourism sector like scuba diving in Ross and Smith Island. Include the heritage sites like temples, churches and places related to the celebration of local festivals. The northeast part of this tehsil has the potential to develop the water sports activities. There is a need to improve the tourism site attractiveness and indicate the information board and notice as some places of this tehsil are also having the threat of wildlife. There is a need to install a cautionary board about the danger of elephants, crocodiles, jellyfish and sharks in the deadly animal-prone zone. Identify the neighbouring tourism resources and make a circuit to visit them all in systematic order.

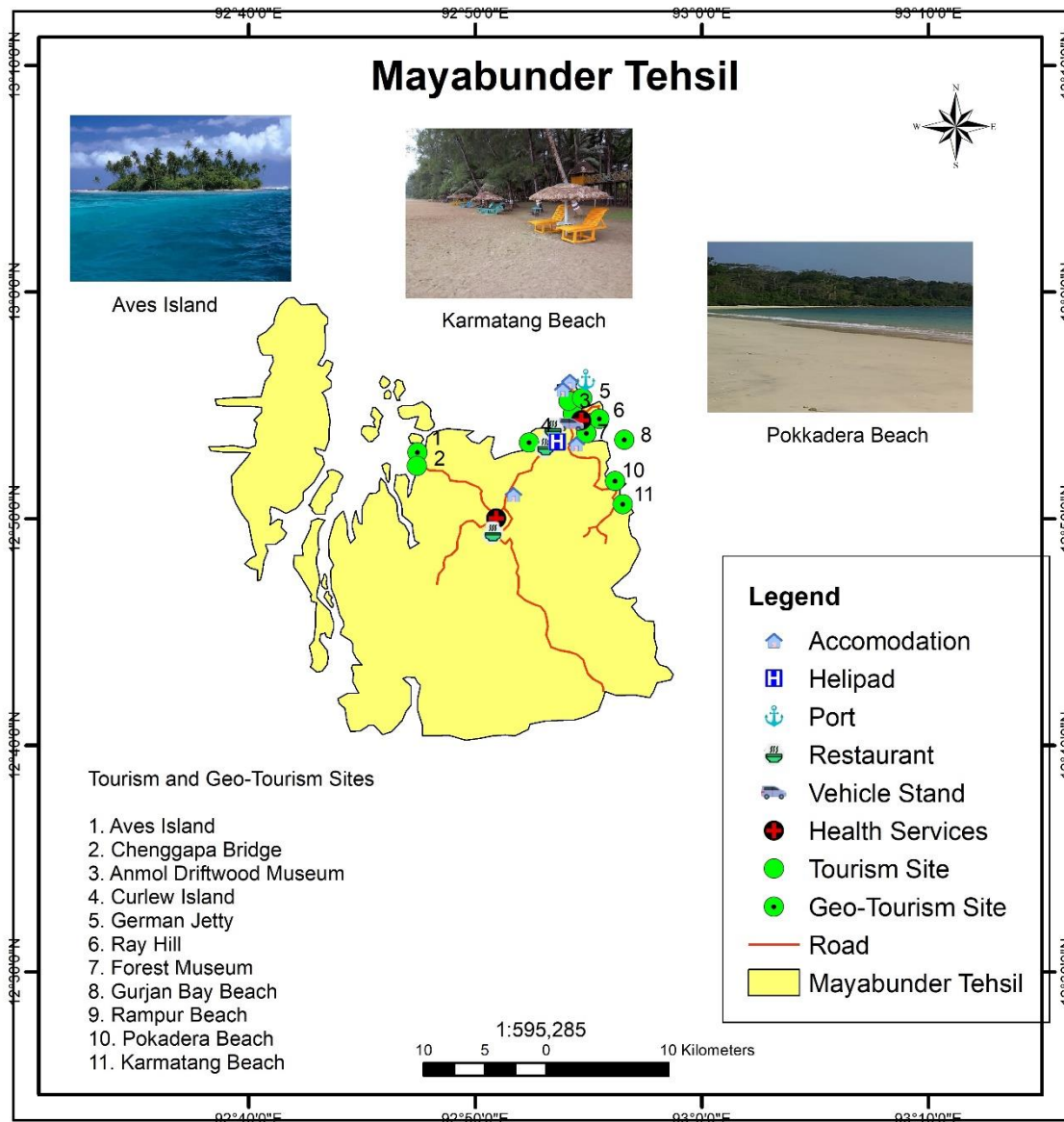
- Make proper timing and arrangement of the means of transportation with their integration support to other means of transportation. Establishment of a tourism information outpost in Subhshgaram Market. This tehsil needs another State Bank of India branch near Arial Bay as this place is nearby to harbour area and approach to visit many tourists site. Provide the arrival and departure of the means of transportation at those centres through pamphlets, schedule boards, and social media platforms. Each tourist site and information centre should have suggestions and a complaint box. There is a need for immediate improvement of the communication system at remotely located tourism sites i.e., Mud volcano, Hathi Level; Ross and Smith Island, Saddle peak and Alfred caves. Tourists who visit the sites also need food facilities. There is a need to promote local cuisines and multicuisine restaurants at Subhashgram Market. The quality and price of food should be properly checked by the Food Corporation of India (FCI) from time to time. The concept of theme restaurants like rural environment, jungle theme, beach theme, coastal theme, underwater theme, etc. could be developed to display the uniqueness of this region. This tehsil is not having any source of entertainment so there is a need to develop parks, shopping complex, food court, and activity centres. These places should be budget friendly so the local people could also afford the facilities on their weekends. Activities like trekking facilities, at Saddle Peak and water-based activities could be develop at Ramnagar beach. Kalipur beach is not suitable for water sport activities as this could be disturb the nesting turtles at the site. The adventure activities should also be facilitated along with the first aid box and life guards. Arrangement of souvenir shops should sell local handicrafts and seasonal fruits it will also help the local communities to get the income. The local women and the self-help groups (SHGs) could own this petty business as their additional source of household income. They could also provide budget-friendly homestays and bed-breakfast like culturally friendly accommodation. It is an excellent move for the social inclusion of the local community. Along with this the tourist police should protect the site by regularly patrolling and guarding the major tourist sites.
- The bus terminus is the core need of the transportation of this tehsil. The traveller faces difficulty during rainy season. An all-season bus terminus should made proximity to the transport office at Subhashgram Market. It should be equipped with garage

facilities, passenger seating area, display board, departure announcement system, computerised ticketing counter, washroom and drinking water facility. The bus operated from this terminal and the other terminals should be PwD friendly. At least there should be arrangement of a low height, AC buses with average frequency up to cover the most of the tourist sites at this tehsil. The use of public and multiple passenger vehicle is eco-friendly option. For all these purposes the e-vehicle like GoGo buses is most suitable. This bus should also connect with the Arial Bay port and helipad. The seaplane is the suitable tourist aviation mean of transportation for high end tourist. In addition, there is requirement to develop a seaplane infrastructure at this tehsil. The site near the Arial Bay port is the most suitable to develop the infrastructure for seaplane landing. As the road transport is the major mode to connect this tehsil to connect the other parts of the islands. The increasing frequency of the ferry operation as alternative option for people who don't like long vehicular journey and wanted to enjoy voyage through the sea route.

- Maintaining of sustainability of the tourist sites should be a major responsibility along with tourism development. The sites should be plastic free and hygienic. The appearance and behavioural part of the tourist stakeholders play a major role to affect the perception of the visitors. Skilled and professional development is a core need to make efficient human resources should time to time need training and professional growth. The vocational training institute and Polytechnic college could include some courses to inculcate to make traditional handicrafts and souvenir. The interdepartmental synergy and community support is the core need of the successful tourism operation. The tourism department should conduct meeting and workshop for local tour operators and communities to update about various government schemes for tourism developments at Diglipur School Ground and multipurpose halls. Promote the tourism industry of the islands through different means of marketing and promote its special brand name of 'Incredible Andaman' as suggested by IP&T.

6.2.2 Tourism Development Strategy for Mayabunder Tehsil

Map 6.2: Tourism Development Strategy Map for Mayabunder Tehsil



- Promote the potential tourism sectors like scuba diving at Karmatang Beach and trekking at Ray Hill. Find out heritage sites like old remains like Old German Jetty and places related to the celebration of local festivals. Water sports are the major potential at Karmatang Beach. Improve the tourism site attractiveness through treehouses, Nicobari house, Karen cultural landscape. The indicative information board and notice the brief description of flora and fauna and geological resources of this tehsil. Identify

the neighbouring tourism resources and make the circuit pattern to visit them to consume less time and energy.

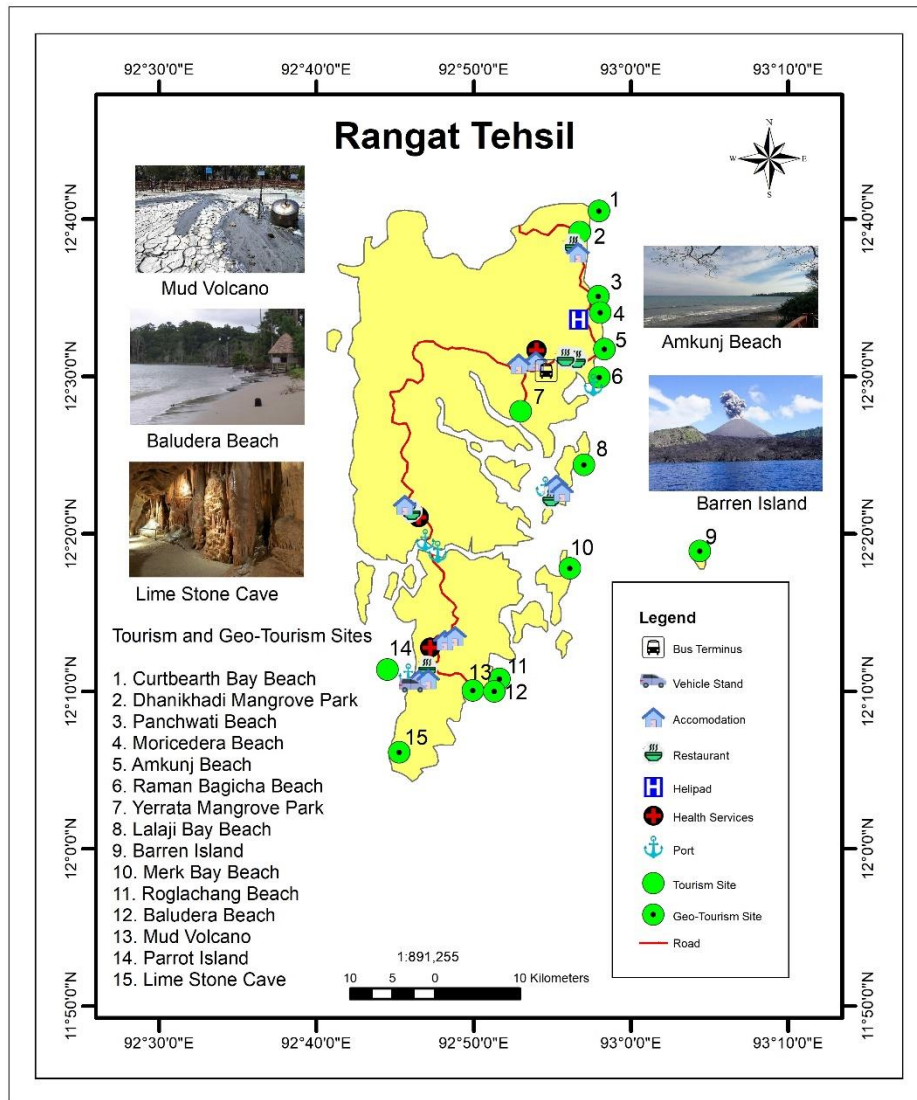
- As this tehsil comes under the most underdeveloped in terms of transportation and other associated facilities and the role of transportation determines the existence of other infrastructures. Hence, there is a need to make proper timing and arrangement of the means of transportation with their integration support to other means of transportation. It follows the need for the establishment of a tourism information box in Mayabunder Market. This tehsil needs another State Bank of India branch at Tugapur site as it will be near to other parts of this tehsil. a. Provide the arrival and departure of and side of the main approach ATR. Each tourist site and information centre should have suggestions and complaint box getting formatting feedback and their periodic review should reach the tourism authority of that area. There is a need for immediate improvement of means of improvement of the communication system remotely located tourism sites i.e., Sound Island, Ray Hill, and Austin Island. There is a need to promote local cuisines and multicuisine restaurants at Mayabunder Market. The availability of Karen foods kiosks will make a speciality of the Mayabunder region. The quality and price of food should be properly checked by the Food Corporation of India (FCI) and its mobile testing party. The concept of theme restaurants like rural environment, jungle theme, beach theme, coastal theme, underwater theme, etc. could be developed. This tehsil is not having any source of entertainment so there is a need to develop parks, shopping complex, food court, and activity centres. These places should be budget friendly so the local people could also afford the facilities on their weekends. The adventure activities should also be facilitated along with the first aid box and lifeguards. The arrangements of souvenir shop should sell the local handicrafts and seasonal fruits. The Karen community could provide budget friendly homestays and bed-breakfast like culturally friendly accommodation. It is an excellent move for social inclusion of the local community. A unit of tourist police should protect the sites like Kramtang Beach, Ray Hill, and Pokadera Beach with regular patrolling and guarding.
- The bus terminus is the core need of the transportation of this tehsil at proximity to the Mayabunder Market as most of the public-private buses and cars connection hub. The traveller faces difficulty during the rainy season. An all-season bus terminus should

made in proximity to the transport office at Mayabunder Market. This terminus should be equipped with garage facilities, passenger seating area, departure announcement system, computerised ticketing counter, washroom and drinking water facility. PwD friendly facilities are the need of the time. At least there should be arrangement of a low height, and AC bus with required frequency up to cover the most of the tourist sites. The use of public and multiple passenger vehicle is required to maintained the ecological balance. For all these purposes the e-vehicle like GoGo buses is most suitable. This bus should also connect with the Mayabunder port and helipad. The seaplane is the suitable tourist aviation mean of transportation for high end tourist. There is requirement to developed a seaplane infrastructure at near the Panighat area. The road transport is the major mode to connect this tehsil to connect the other parts of the islands. The increasing frequency of ferry operation as alternative option for people who don't like long vehicular journeys and wanted to enjoy voyage through the sea route.

- Maintaining of sustainability of the tourist sites should be a major responsibility along with tourism development. The sites should be plastic-free and hygienic. The appearance and behavioural part of the tourist stakeholders play a major role to affect the perception of the tourists. Skilled and professional development is a core need to make efficient human resources should time to time need training and professional growth. The synergy among ministries, departments community support is the core need of the successful tourism operations at the tourist circuits of this tehsil. The tourism sites of Mayabunder tehsil should promoted through social media, television and posted banner at local tourism sites.

6.2.3 Tourism Development Strategy for Rangat Tehsil

Map 6.3: Tourism Development Strategy Map for Rangat Tehsil



- The Cuthbert Bay Beach and Raman Bagicha are the most suitable place for Scuba diving. Water sports is the major potentials of the North East part of this tehsil. Improve the tourism site attractive and indicative the information board and notice. There is need to write a warning about deadly animals and mark their vulnerability. Identifying the neighbouring tourism resources and visiting them in a serial order.
- Capacity, ticket facilities and route conditions are the weakest transportation facility elements at this tehsil. There is a need to include a high-capacity public vehicle and

computer ticketing facilities for different terminals. Online ticketing facilities and their available service facility at Common Service Centres are good options to resolve the issue of ticketing. There is a need of all-weather road with well drainage facility. A quick reaction team of breakdown is the prime requirement in this road network whether it is for public and private vehicles. There is an special need to arrange a ferry trip to visit Barren Island (active volcano) from a safe distance.

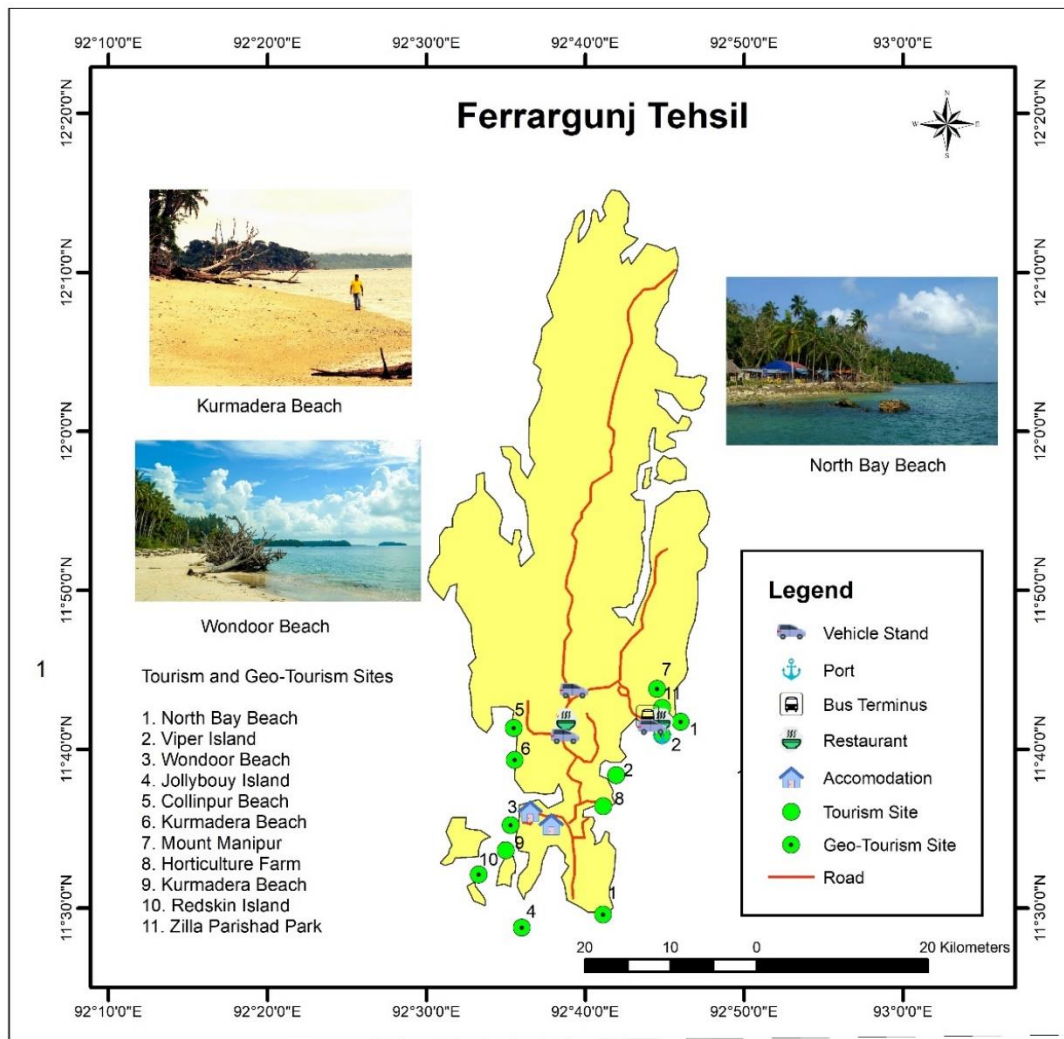
- Tourism information kiosk or outpost should be located near the Rangat Bazar in proximity to the terminal. It should be resourceful through the pamphlets, schedule boards, and social media platforms. Each tourist site and information centre should have suggestions and complaint box. This tehsil is also needing bus terminal facility at Baratang Island. There is a need of immediate improvement of means of improvement of the communication system remotely located tourist sites i.e., Mud volcano, Lime Stone Cave, Cuthbert Bay Beach; and Parrot Island. There is a need to promote local cuisines and multi cuisine restaurants at Nilambur Jetty and Rangat market as these places the tourist traveller took rest and depart for different tourism sites. This tehsil is also not having any source of entertainment so there is a need to develop parks, shopping complex, food court, and activity centres. These places should be budget friendly do the local people could also afford the facilities on their weekends. The activities like trekking facilities, at the route of mud volcano. The adventure activities should also be facilitated along with the first aid box and life guards. Arrangement of souvenir shop should sell the local handicrafts and seasonal fruits. The local women and the self-help groups (SHGs) could own this petty business as their additional source of household income. They could also provide budget friendly homestays and bed-breakfast like cultural friendly accommodation at Baratang Island. It is an excellent move for social inclusion of the local community. Tourist police should protect the site with regular patrolling and guarding the major tourist site for the tourist safety.
- The bus terminus equipped with garage facilities, passenger seating area, departure announcement system, electronic display, computerised ticketing counter, clean washrooms and drinking water facility. The entire journey should be PwD friendly and for the purpose the AC e-bus service is best. This bus should also connect with the Arial Bay port and helipad. The seaplane is the suitable tourist aviation mean of

transportation for high end tourist. There is requirement to develop a seaplane infrastructure in this at Nilambur Jetty, Long Island Jetty and Raman Bagicha Beach. Alternative ferry service could be available to Long Island, Nilambur, Uttara and Rangat Jetty to avoid any delay and vessel voyage experience to the tourists.

- Maintaining of sustainability of the tourist sites should be a major responsibility along with tourism development. The sites should be plastic-free and hygienic. The appearance and behavioural part of the tourist stakeholders play a major role to affect the perception of the visitors. The travel organisations like BFBOA (Baratang Fibre Boat Owner Association) operators and local tour guides should get the professional training. Along with this the interdepartmental synergy and community support is the core need of a successful tourism operation. There is a need to promote the unique tourism sites through different marketing strategy.

6.2.4 Tourism Development Strategy for Ferrargunj Tehsil

Map 6.4: Tourism Development Strategy Map for Ferrargunj Tehsil



- Water sports are the major potentials at the South East part of this tehsil. Improve the tourism site attractive and indicative the information board and notice. There is a need to Identify the neighbouring tourism resources and make a tourism circuit to visit them in systematic order.
- Establishment of tourism information box in Bambooflat Market. This tehsil needs another State Bank of India branch near Arial Bay as this place is nearby to harbour area and approach to visit many tourist sites. Provide the arrival and departure of the means of transportation at those centres through pamphlets, schedule boards, and social

media platforms. Each tourist site and information centre should have suggestions and complaint box. There is a need of immediate improvement of means of improvement of the communication system remotely located tourism sites i.e., Badabalu, Northbay Beach. Northbay is very famous spot for Scuba diving here other water sports facilities and paragliding could be practice on the sea water. The terrestrial adventure activities like trekking facility at Mount Harriet should also be facilitated along with the first aid box and life guards. Apart from the activities there is a need to promote local cuisines and multi cuisine restaurants at Aberdeen market and Bambooflat Market. The quality and price of food should be properly checked by the Food Corporation of India (FCI) frequently. The concept of theme restaurants like rural environment, jungle theme, beach theme, coastal theme, underwater theme, etc. could be developed. The arrangement of souvenir shops should sell local handicrafts and seasonal fruits near the tourist sites. The local women and the self-help groups (SHGs) could own this petty business as their additional source of household income. They could also provide budget-friendly homestays and bed-breakfast-like culturally friendly accommodation. Their homestay should show the theme and tradition of local cultural glimpses. Here different cultural backgrounds of the people could be used as resources. It is an excellent move for the social inclusion of the local community. Tourist police should protect the site with regular patrolling and guarding at tourist sites like North Bay and Wondoor Beach.

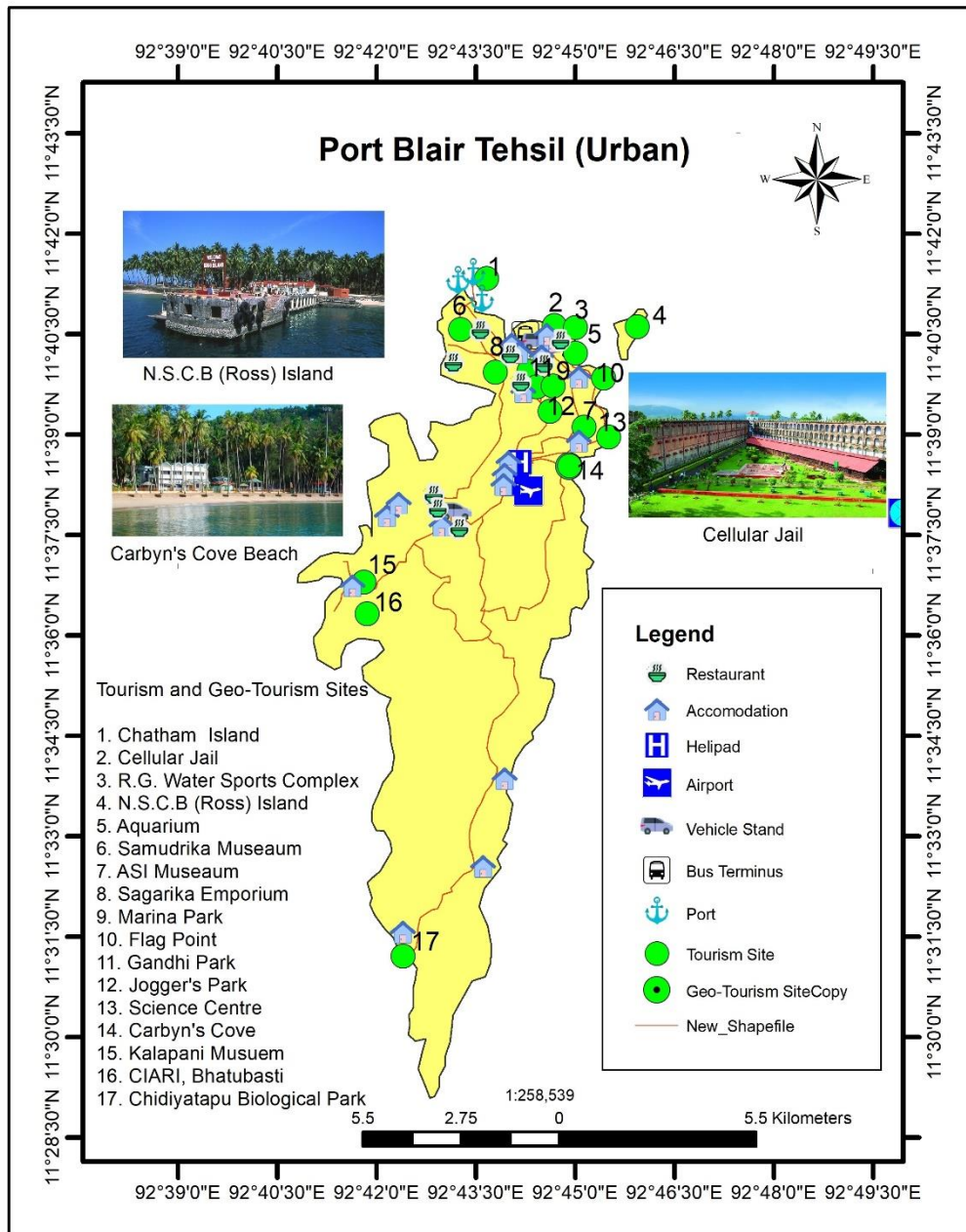
- The IPA selected the availability, road conditions, and inclusiveness elements of the transportation system of this region. There is a strong need to arrange sufficient numbers of AC buses and wide roads for their functioning. Apart from this, the bus terminus is the core need of the transportation of this tehsil. The traveller faces difficulty during the rainy season. An all-season bus terminus should be made in proximity to the transport office at Bambooflat Market. It should be equipped with garage facilities, passenger seating area, display board, departure announcement system, computerised ticketing counter, washroom and drinking water facility. The bus operated from this terminal and the terminal should be PwD friendly. The use of public and multiple-passenger vehicle is eco-friendly option for this tehsil. For all these purposes the e-vehicle like AC GoGo buses is most suitable. This bus should also connect with the Bambooflat via Wondoor Beach to Aberdeen Bazar and another approach Ferrargunj

to the Aberdeen Bazar. The seaplane is a suitable tourist aviation mean of transportation for high end tourist. There is requirement to developed a seaplane infrastructure near Bambooflat Port. Here road transport is the major mode to connect this tehsil to connect the other parts of the tehsil.

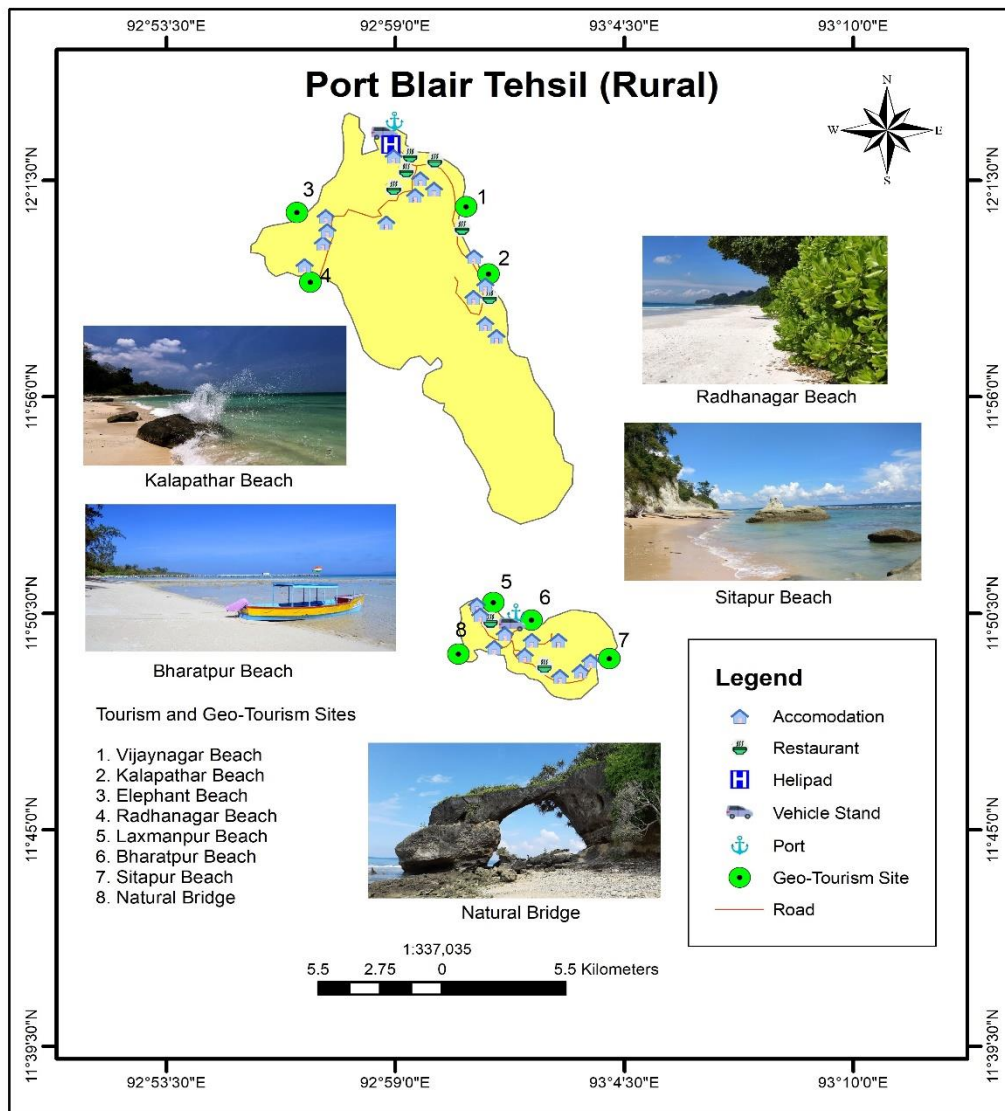
- Maintaining of sustainability of the tourist sites should be a major responsibility along with tourism development. The sites should be plastic free and hygienic. The appearance and behavioural part of the tourist stakeholders play a major role to affect the perception of the visitors. Skilled and professional development is a core need to make efficient human resources should time to time need training and professional growth at various training institutions of Port Blair. This tehsil does not need to make any new institution for staff skill development as it is very near to Port Blair Tehsil. Interdepartmental synergy and community support is the core need of a successful tourism operation. The information display about tourism sites on online portal could promote them for national and international tourism.

6.2.5 Tourism Development Strategy for Port Blair Tehsil

Map 6.5 A: Tourism Development Strategy Map for Port Blair Tehsil (Urban)



Map 6.5 B: Tourism Development Strategy Map for Port Blair Tehsil (Rural)



- Promote the potential tourism sector like scuba diving in the Badabalu Beach. Find out heritage sites like temples, monasteries, chappels and place related to the celebration of local festivals. Here Island Tourism Festival, Monsoon Festival, Beach Festival and sea Food Festivals are major events to encourage tourism activities and promote leisure among the local communities. Water sports is the major potentials Carbyn’s Cove Beach apart from Rajiv Gandhi Water Sports Complex. The beaches of the Swaraj Dweep and Shaheed Dweep is having the potential for water sports activities. There is a need to improve the tourism site’s attractiveness and indicative with an information board and notice. The caution about the dangerous creatures like snake, crocodile, jellyfish and sharks is like deadly animal-prone zone.

- Make proper timing and arrangement of the means of transportation with their integration support to other means of transportation. Establishment of tourism information outposts at Aberdeen Bazar. The Aberdeen Bazar is accessible to most tourists so this place should have information regarding tourist attractions, amenities, accommodations, activities and all other relevant information. This tehsil needs pieces of information about arrival and departure of the means of transportation from through pamphlets, schedule boards, and social media platforms. In addition, each tourist site and information centre should have suggestions and a complaint box. There is a need of immediate improvement of the communication system remotely located tourism sites i.e., Badabalu Beach. There is a need to promote local cuisines and multicuisine restaurants near major tourist sites. The quality and price of food should be properly checked by the Food Corporation of India (FCI) regularly. The concept of theme restaurants like rural environment, jungle theme, beach theme, coastal theme, underwater theme, etc. could be developed. This tehsil is not having any source of entertainment so there is a need to develop parks, shopping complex, food court, and activity centres. These places should be budget friendly thus the local people could also afford the facilities on their weekends. The adventure activities related sites like water sports complex, scuba diving facilitated along with the first aid box and lifeguards. There should be arrangement of souvenir shop should sell the local handicrafts and seasonal fruits around the tourist sites. The local women and the self-help groups (SHGs) could own this petty business as their additional source of household income. They could also provide budget-friendly homestays and bed-breakfast like culturally friendly accommodation at Swaraj Dweep and Shaheed Dweep. It is an excellent move for the social inclusion of the local community. Tourist police should protect the site with regularly patrolling and guarding the major tourist sites.
- The IPA suggest that pollution efficiency and inclusiveness are the transportation facility elements needed for an immediate effect to improve the transportation efficiency of this tehsil and recover the environmental quality as well. The bus terminus is the core need of the transportation at Swaraj Dweep and Shaheed Dweep. The traveller faces difficulty during the rainy season. An all-season bus terminus should

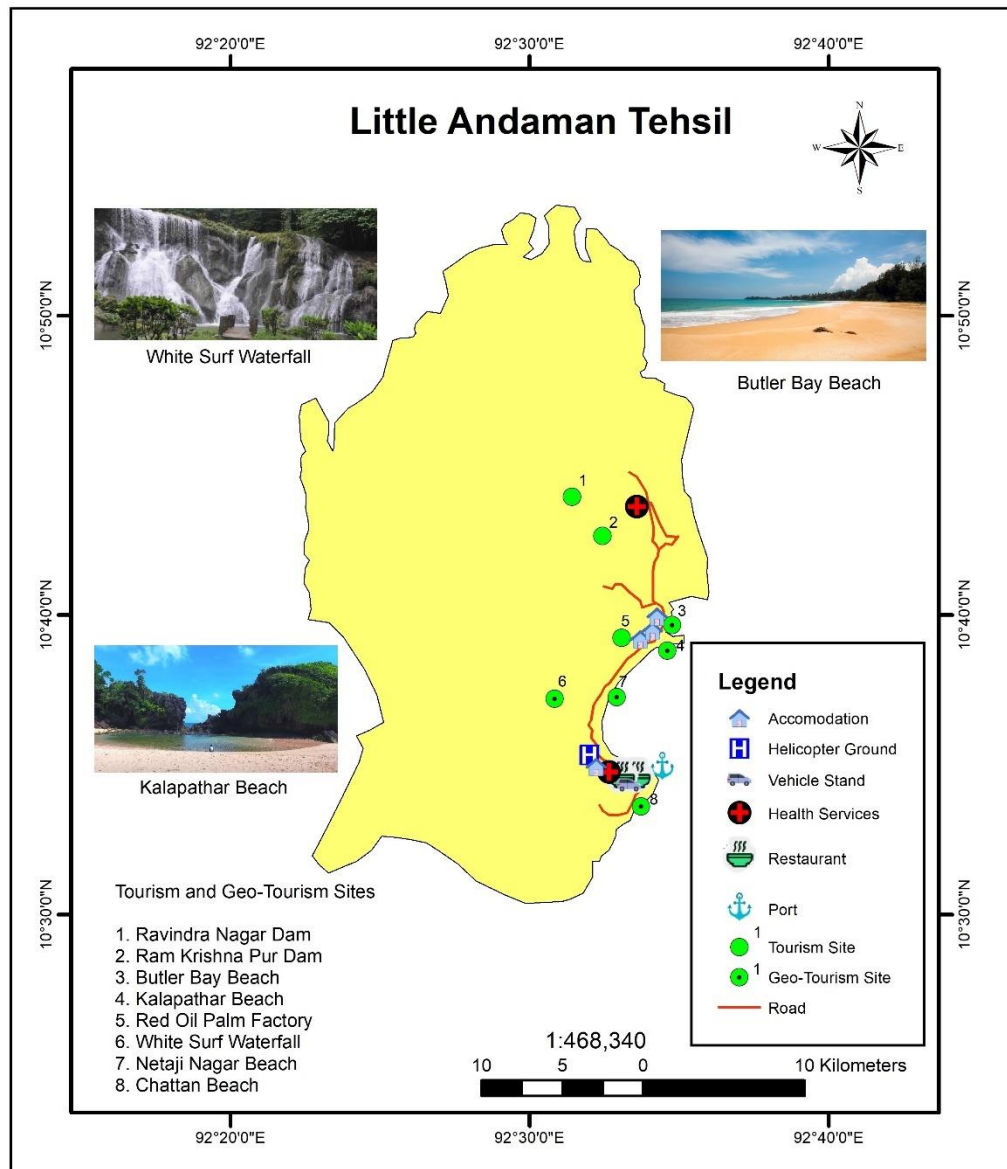
made proximity to its respective ports. It should be equipped with garage facilities, passenger seating area, departure announcement system, display board, washroom and drinking water facility. The bus operated from this terminal and the terminal should PwD friendly. At least there should be arrangement of a low height, AC bus with average frequency up to cover the most of the tourist sites. The use of public and multiple passenger vehicle is eco-friendly option. For all these purposes the e-vehicle like GoGo buses is most suitable. This bus should also use in Swaraj Dweep and Shaheed Dweep to connects with its tourist circuits. The seaplane is the suitable tourist aviation mean of transportation for high end tourist to connect the Swara Dweep- Shaheed Dweep and Port Blair. There is a requirement to developed a seaplane infrastructure near Carbyns Cove beach at Port Blair and port areas of other islands of this tehsil.

- Maintaining of sustainability of the tourist sites should be a major responsibility along with tourism development. The sites should be plastic free and hygienic. The IPA found that this Tehsil is most polluted or less environmental efficiency tehsil among all. There is a strong need to care with the ecological sensitivity of this region with tourism and transportation development. Here the local community and tourism service providers play an important role to maintain the environmental quality of these sites. The appearance and behavioural part of the tourist stakeholders play a major role to affect the perception of the visitors. Skilled and professional development is a core need to make efficient human resources should time to time need training and professional growth. Interdepartmental synergy and community support is the core need of a successful tourism operation. Promote the tourism industry of the islands through different means of marketing and promote its special brand name of 'Incredible Andaman' as suggested by IP&T.
- Most of the tourists who visit the Andaman Islands, they must visit the tourism resources of this tehsil. Apart from that the tour agency and intermediaries are mostly make arrangements the visit to only in Port Blair and its nearby sites. The Port Blair is the most populated and administrative capital city of the islands and the making of the Port Blair based tourism create more stress on the natural resources and carrying capacity of this tehsil. There is an immediate need to identify the carrying capacity of

this tehsils and also need to redistribute the tourists to tourism destinations of other tehsils.

6.2.6 Tourism Development Strategy for Little Andaman Tehsil

Map 6.6: Tourism Development Strategy Map for Little Andaman Tehsil



- This tehsil is having tourism activities scuba diving at Butler Bay Beach. Water sports are the major potential at the eastern part of this tehsil. The improvement of the tourism site's attractiveness and indication could be possible through the information board and notice. There is a need to write warnings about elephants, crocodiles, jellyfish and sharks in the deadly animal-prone zone. In addition, the identification of the neighbouring tourism resources and making the pattern to visit them in systematic order.

- Make proper timing and arrangement of the means of transportation with their integration support to other means of transportation. Establishment of a tourism information outpost at Hutbay Market as most of the tourists will move towards different tourism sites from this place. This tehsil needs another State Bank of India branch near Ram Krishna Pur Village as this place is another larger settlement of this tehsil. Provide the arrival and departure of the means of transportation at those centres through pamphlets, schedule boards, and social media platforms. Each tourist site and information centre should have suggestions and complain box. There is a need of immediate improvement of means of improvement of the communication system remotely located tourism sites i.e., Kalapthar Beach, Chattan beach and Whitesurf Waterfall. There is a need to promote local cuisines and multi cuisine restaurants at Hutbay Market. The quality and price of food should be properly checked by the Food Corporation of India (FCI) regularly. This tehsil is not having any source of entertainment so there is a need to develop parks, shopping complex, food court, and activity centres. These places should be budget friendly thus the local people could also afford the facilities on their weekends. The adventure activities like water sports area should also be facilitated along with the first aid box and lifeguards. There is a need of sell the souvenirs shop should sell the local handicrafts and seasonal fruits around this site. The local women and the self-help groups (SHGs) could own this petty business as their additional source of household income. They could also provide budget-friendly homestays and bed-breakfast like culturally friendly accommodation along with cultural touch. It is an excellent move for the social inclusion of the local community. Tourist police should protect the site with regular patrolling and guarding at Kalapather Beach and Whitesurf Waterfall.
- The bus terminus is the core need of the transportation of this tehsil. The traveller faces difficulty during the rainy season. An all-season bus terminus should be made proximity to the transport office at Hutbay Market. It should be equipped with garage facilities, passenger seating area, departure announcement system, washroom and drinking water facility. The bus operated from this terminal and the terminal should PwD friendly. At least there should be arrangement of a low height, AC bus with average frequency up to cover the most of the tourist sites. The use of public and multiple passenger vehicle

is eco-friendly option. For all these purposes the e-vehicle like GoGo buses is most suitable. This bus should also connect with the Hutbay port and helipad. The seaplane is the suitable tourist aviation mean of transportation for high end tourist. There is requirement to developed a seaplane infrastructure at near Netajinagar Beach.

- Maintaining of sustainability of the tourist sites should be a major responsibility along with tourism development. The sites should be plastic-free and hygienic. The appearance and behavioural part of the tourist stakeholders play a major role to affect the perception of the visitors. Skilled and professional development is a core need to make efficient human resources should time to time need training and professional growth. Tour operators and stakeholders should get skill training at institutions of Port Blair or frequently experts should visit this tehsil to conduct tourism skill development workshops to the local stakeholders. Interdepartmental synergy and community support is the core need of a successful tourism operation at this remotely located tehsil.

6.3 LIMITATIONS OF THE STUDY

This study is having several limitations which could not be fulfilled due to the feasibility, academic and time limitations of the study. Some of the major limitations are:

- This study has not included the Nicobar group of islands to study its transportation facilities. This district and its tehsil were excluded from this study as the maximum part of this district fall under the Tribal Reserved Area. The Andaman & Nicobar Islands Aboriginal Tribal Regulation 1956, restricts any kind of private development activities and unauthorised entry of non-tribal people restricted. However, some part of Campbell Bay Tehsil has an exception from this Act and the potential for tourism developments.
- It is taken only 100 official suggested tourism resources of the Andaman Islands to explore their tourism potential among them only 82 tourism resources have been selected for further tourism development, whether there are many other unexplored possible tourism resources available which could be explore through the further studies.

- On 23rd December 2022, the Prime Minister of India Shri Narendra Modi declare name 21 islands of Andaman on the name of all 21 Pramvir Chakra Awardees. These islands could also further assess for their tourism potential for future study.
- Transportation facility's efficiency has been assessed only on the basis of the perception of tourists. Perception of other tourism stakeholders not taken for assess the transport facility efficiency because tourist are the main users of the transportation facility in respect to visit the tourism resources of the destination. Apart from the tourist perception over the transportation facility the opinion of tourism service providers, experts, and local communities plays a major role as they observed the transportation elements very closely over a long period.

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Questionnaire

Tourism Site Selection

Name of the Tourism Site:

Locality:

Tehsil:

1. Is the tourism site come under any development restricted zone (Aboriginal Tribal Act, 1956 or Coastal Zone Regulation)?

Yes No

2. Are the authorities of the tourism site agree to develop the site for the tourism?

Yes No

Note: All the following questions have to responded in the given Likert Scale:

3. What is the surface topography score for the site?

0 Point 5 Points 10 Points

4. What is the underwater topography score for the site?

0 Point 5 Points 10 Points

5. What is the soil composition score for the site?

0 Point 5 Points 10 Points

6. What is the vegetation cover score for the site?

0 Point 5 Points 10 Points

7. What is the site orientation score for the site?

0 Point 5 Points 10 Points

8. What is the environmental impact score for the site?

0 Point 5 Points 10 Points

9. What is the landscape amenities score for the site?

0 Point 5 Points 10 Points

10. What is the transportation accessibility score for the site?

0 Point 5 Points 10 Points

11. What is the score for the site as per the proximity to another tourist site?

0 Point 5 Points 10 Points

12. What is the score for the site as per the proximity to emergency services?

0 Point 5 Points 10 Points

13. What is the score for the site as per the proximity to utility services?

0 Point 5 Points 10 Points

14. What is the score for the site as per the proximity to human settlement?

0 Point 5 Points 10 Points

Sl. No.	Transportation Elements	Very Important (5)	Important (4)	Moderately Important (3)	Less Important (2)	Not Important (1)
1	Accessibility					
2	Quantity					
3	Quality					
4	Capacity					
5	Ticket Facilities					
6	Affordability					
7	Regularity					
8	Punctuality					
9	Waiting Time					
10	Swift and Fast					
11	Route Condition					
12	Integration					
13	Allied services					
14	Safety					
15	Security					
16	Cosy					
17	Behaviour					
18	Hygiene					
19	Pollution Efficiency					
20	Inclusion					

13. How was the performance of transportation facilities in terms of following elements for this tehsil?

Sl. No.	Transportation Elements	Very Important (5)	Important (4)	Moderately Important (3)	Less Important (2)	Not Important (1)
1	Accessibility					
2	Quantity					
3	Quality					
4	Capacity					
5	Ticket Facilities					
6	Affordability					
7	Regularity					
8	Punctuality					
9	Waiting Time					
10	Swift and Fast					
11	Route Condition					
12	Integration					
13	Allied services					
14	Safety					
15	Security					
16	Cosy					
17	Behaviour					
18	Hygiene					
19	Pollution Efficiency					
20	Inclusion					

Thank You for Your valuable time and response.

Questionnaire

Review of National Tourism Policy 2022

Name: _____
 Designation: _____
 Specialization: _____
 Affiliated Institute: _____
 Address: _____

1. National Tourism Policy has suggested different types of tourism. What kind of tourism could be developed for these islands?
 - Monuments
 - Spirituality
 - Wellness
 - adventure
 - Wildlife
 - Others _____

2. The policy suggests exhibiting traditional arts as tourism products. What kind of new tourism products could be developed for the Island's Tourism Industry?

3. The policy suggests to facilitated the destination as a smart tourism destination. What indigenous features could be included in this regard?

4. The policy suggests maintaining the visitation of tourists throughout the year. What are your suggestions to make these islands a year-round tourism destination?

5. Who are the desired tourist groups for these islands?
 - Local Tourists
 - Domestic Tourists
 - LTC Based Tourists
 - Honeymoon Couples
 - High-end International Tourists
 - International Bag-packers
 - Others _____

6. How could their stay length, spending, and repeat visitation could be increased?

7. Which marketing strategy would be most effective for promoting the island tourism industry?

- Advertisement overseas market
 - Emotionally engaging
 - Inspirational
 - Informative way
 - Participation at various travel marts
 - Roadshow
 - Other Methods _____
8. Do you think transportation is the most effective determinant to grow tourism? If yes, how the means of transportation could be developed as a tourism product for the Island Tourism Industry?
 9. Up to which extent the eco-friendly vehicle usage will be successful as per the policy? Suggest your views.
 10. How the helicopter service is helpful for island tourism? Which part of these islands' immense need for helicopter service for tourism development?
 11. How the use of seaplanes could be a help to grow Island Tourism Industry? What will be their environmental consequences?
 12. Is this policy able to achieve the national integration (Ek Bharat Shrestha Bharat) campaign? How this policy is efficient to develop the lesser-known and less-developed destinations of the islands?
 13. In which part of the island is representing the Green Tourism Initiate? What are their indicators?
 14. Is there any island that is currently or potentially facing a tourism carrying capacity problem due to tourism developments? If yes, which islands immediately need to measure the carrying capacity and future restrictions on mass tourism?
 15. How the tourism industry could generate resources for the conservation of natural and cultural resources?
 16. What are the prospects of public-private partnership for the Island Tourism Industry? For which sector of tourism public-private partnership could be implemented?
 17. How communities and local NGOs could include in the tourism industry? What would be their role in tourism development?

18. What kind of challenges are faced by the local tourism stakeholders to establish their own entrepreneurship? Which kind of grants, facilities, and services should be available for them?
19. What kind of problems affect marginalized people to thrive in the tourism industry? How the marginalized people could include in the mainstream of the Island Tourism Industry?
20. Have the Atmanirbhar Bharat Mission provided any profit to the tourism industry in the present scenario? Which segment of Island Tourism could be benefited from the Atmanirbhar Bharat Mission?
21. What kind of skill development program could provide to informal and unorganized tourism workers?
22. Is the local administration making a balance between travel facilitation and caring for national security through providing an efficient VISA service system to international tourists? If not then what kind of VISA problems are faced by these tourists in these islands?
23. Is this policy efficient to achieve the SDGs (Sustainable Development Goals 2030) in the sector of tourism? Through which major steps of this policy the tourism industry of the islands will leads to achieving the SDGs benchmarks?
24. Which national tourism mission could be successfully implemented in these islands and why?

National Green Tourism Mission

National Digital Tourism Mission

National Mission on Tourism MSMEs

National Mission on Destination Management Organisation

Tourism and hospitality Sector Skill Mission

Mission Digital Marketing

Gati Shakti Scheme

25. Which segment of tourism still needs significant research on these islands?
26. What will be the implications of this National Tourism Policy on Island Tourism Industry? Kindly share your perceptions about this.

Questionnaire

Review of Tourism Policies and Tourism Activities by the Local Community

Name: _____
Gender: _____
Age: _____
Address: _____

1. Are you aware of the tourism activities and resources in your locality? If yes, what kind of activities and potentials are available in your locality?
2. As per your opinion the tourism activities causing any positive or negative impact on the locality of the different tourist destinations? Share your views about impact of tourism activities on different aspects of the tourist destinations.
3. Are the local resident suffer any problems due to the tourism development in the locality near tourist destination?
4. Do the policy makers take the opinion of local residents before framing the local, regional and national level tourism policies?
5. What specific suggestions you have for improving the quality of tourism?
6. Do the means of transportation determined the tourism potential of any tourism site?

Table: Profile wise Average Response for Importance of Transportation Facilities

Variable	Gender		Age Group			Marital Status			Level of Education		Household Income			Nature of Job				
	Male	Female	18-34 Years	35-50 Years	Above 50 Years	Unmarried	Married	Widow/Divorcee	Under Graduate	Graduate	Post Graduate	Below Rs. 50,000	Rs. 50,000 - 1,00,000	Above 1,00,000	Government Job	Private Job	Semi-Government Job	Others
Availability	4.08	3.98	4.13	3.94	4.02	4.04	4.05	4.09	4.1	3.99	4	4.02	4.08	4.26	4.02	4.14	3.94	3.89
Quantity	3.17	3.29	3.16	3.32	3.05	3.35	3.12	3.15	3.1	3.43	2.95	3.1	3.36	3.66	3.29	3.18	3.25	3.13
Quality	3.1	3.21	3.16	3	3.33	3.13	3.2	2.78	3.21	3.06	2.82	3.18	3.04	3	3.11	3.2	3.05	2.97
Capacity	3.87	4.07	3.88	4.07	3.72	4.03	3.89	3.75	3.86	4.01	4	3.95	3.91	3.66	4.01	3.9	4.02	3.8
E-ticketing	3.87	4.21	3.73	4.24	4.25	4.05	3.93	3.87	3.83	4.21	3.95	3.88	4.14	4.06	4.19	3.76	4.3	4.06
Affordability	4.11	4.01	4.12	4.03	4.02	4	4.12	4.12	4.14	3.99	4.04	4.07	4.09	4.13	4.1	4.05	4.02	4.19
Regularity	4.05	3.88	4.15	3.8	3.94	3.85	4.09	4.06	4	3.99	4.08	4	4.05	3.73	4.08	4.01	3.86	3.97
Punctuality	3.44	3.7	3.4	3.65	3.66	3.52	3.55	3.34	3.46	3.65	3.34	3.49	3.53	3.73	3.52	3.48	3.5	3.65
Waiting Time	3.59	3.69	3.71	3.45	3.72	3.16	3.65	3.5	3.64	3.6	3.52	3.68	3.48	3.66	3.54	3.71	3.63	3.43
Swift and Fast	3.35	3.35	3.38	3.31	3.33	3.25	3.41	3.34	3.36	3.35	3.52	3.33	3.38	3.4	3.39	3.34	3.13	3.5
Route Condition	3.87	4.01	3.81	4	4.13	4.01	3.85	3.9	3.88	4.02	3.65	3.82	4.07	4.07	3.98	3.93	3.88	3.78
Integrated	2.64	2.44	2.48	2.73	2.66	2.72	2.43	2.93	2.5	2.66	2.86	2.61	2.52	2.66	2.63	2.55	2.86	2.43
Allied services	3.4	3.5	3.43	3.4	3.47	3.41	3.43	3.43	3.43	3.43	3.39	3.44	3.38	3.46	3.55	3.36	3.47	3.43
Safety	3.28	3.25	3.35	3.15	3.27	3.38	3.25	3	3.27	3.43	3.39	3.27	3.29	3.13	3.29	3.23	3.36	3.3
Security	3.41	3.13	3.43	3.22	3.22	3.22	3.4	3.31	3.45	3.15	3.17	3.32	3.29	3.6	3.13	3.4	3.08	3.58
Cosy	3.54	3.51	3.6	3.41	3.58	3.52	3.56	3.43	3.55	3.49	3.56	3.6	3.46	3.13	3.44	3.62	3.36	3.54
Behaviour	3.51	3.77	3.43	3.77	3.72	3.77	3.52	3.31	3.44	3.79	3.69	3.48	3.81	3.46	3.73	3.56	3.41	3.58
Hygiene	4	3.86	4.02	3.87	3.96	4.03	3.92	3.9	3.94	3.99	4	4.01	3.85	3.93	3.94	3.94	4.05	3.97
Pollution																		
Efficiency	3.81	4.14	3.81	3.98	4.08	3.75	3.98	3.93	3.9	3.93	3.73	3.8	4.07	4.06	4.04	3.84	3.61	4.13
Inclusive	3.81	4.04	3.75	4.12	3.75	4.03	3.82	3.65	3.83	3.98	3.78	3.78	4.03	4.13	4.08	3.8	3.72	3.93
Mean Value	3.595	3.652	3.5965	3.623	3.644	3.611	3.6085	3.5395	3.5945	3.6575	3.572	3.5915	3.6415	3.646	3.653	3.6	3.575	3.613

Table: Profile wise Average Response for Performance of Transportation Facilities

Variable	Gender		Age Group			Marital Status			Level of Education			Household Income			Nature of Job			
	Male	Female	18-34 Years	35-50 Years	Above 50 Years	Unmarried	Married	Widow/Divorcee	Under Graduate	Graduate	Post Graduate	Below Rs. 50,000	Rs. 50,000 - 1,00,000	Above 1,00,000	Government Job	Private Job	Semi-Government Job	Others
Availability	3.37	3.37	3.28	3.48	3.41	3.4	3.34	3.38	3.36	3.39	3.34	3.36	3.4	3.2	3.41	3.34	3.39	3.36
Quantity	3.29	3.3	3.25	3.35	3.32	3.29	3.3	3.32	3.28	3.31	3.34	3.27	3.34	3.36	3.29	3.29	3.32	3.3
Quality	3.19	3.2	3.18	3.2	3.19	3.21	3.18	3.19	3.22	3.15	3.18	3.21	3.18	3.07	3.19	3.2	3.18	3.18
Capacity	3.41	3.49	3.44	3.43	3.44	3.43	3.43	3.45	3.43	3.44	3.49	3.4	3.5	3.51	3.48	3.43	3.4	3.41
E-ticketing	3.13	3.22	3.06	3.26	3.28	3.21	3.13	3.13	3.09	3.27	3.13	3.09	3.28	3.29	3.23	3.13	3.16	3.14
Affordability	3.17	3.15	3.19	3.12	3.19	3.16	3.18	3.13	3.19	3.11	3.25	3.17	3.15	3.2	3.22	3.14	3.14	3.19
Regularity	3.19	3.23	3.17	3.25	3.22	3.2	3.19	3.25	3.19	3.23	3.16	3.2	3.2	3.2	3.15	3.21	3.2	3.25
Punctuality	2.96	3.02	2.97	2.98	3	3.6	2.96	3.02	2.97	2.99	3.01	2.98	3	2.84	3.01	2.95	3.93	3.07
Waiting Time	2.88	2.95	2.88	2.95	2.83	2.9	2.9	2.91	2.88	2.96	2.81	2.9	2.93	2.84	2.96	2.87	2.87	2.96
Swift and Fast	3.06	3.16	2.99	3.21	3.18	3.19	3.03	3.06	3.02	3.19	3.17	3.05	3.17	3.07	3.18	3.03	3.03	3.17
Route																		
Condition	3	3.03	3.02	3	3.02	2.97	3.02	3.13	3	3.02	3.05	3.01	2.99	3.14	2.98	3.02	3.02	3.02
Integrated	3.76	3.81	3.7	3.85	3.9	3.86	3.74	3.68	3.72	3.88	3.72	3.73	3.85	3.86	3.83	3.75	3.75	3.85
Allied services	3.32	3.26	3.3	3.32	3.3	3.31	3.27	3.43	3.29	3.32	3.32	3.28	3.35	3.32	3.29	3.32	3.32	3.27
Safety	4.18	4.22	4.15	4.24	4.22	4.22	4.17	4.19	4.16	4.22	4.25	4.18	4.23	4.15	4.23	4.21	4.11	4.15
Security	4.15	4.12	4.15	4.13	4.18	4.21	4.12	4.09	4.11	4.19	4.26	4.16	4.13	4.08	4.12	4.18	4.11	4.1
Cosy	3.36	3.44	3.29	3.51	3.45	3.45	3.34	3.38	3.32	3.51	3.32	3.34	3.51	3.14	3.38	3.37	3.43	3.4
Behaviour	4.09	4.08	4.08	4.1	4.09	4.06	4.11	4.08	4.09	4.08	4.1	4.11	4.02	4.17	4.12	4.1	4.02	4.07
Hygiene	3.5	3.61	3.44	3.63	3.65	3.53	3.53	3.53	3.49	3.59	3.61	4.11	4.02	4.17	3.65	3.48	3.59	3.5
Pollution																		
Efficiency	3.83	3.82	3.79	3.89	3.8	3.81	3.81	3.86	3.8	3.87	3.8	3.5	3.61	3.46	3.83	3.82	3.77	3.89
Inclusive	3.14	3.18	3.05	3.29	3.21	3.19	3.13	3.13	3.07	3.28	3.19	3.81	3.87	3.75	3.24	3.13	3.2	3.06
Mean Value	3.399	3.433	3.369	3.4595	3.444	3.46	3.394	3.417	3.384	3.45	3.425	3.443	3.4865	3.441	3.4395	3.3985	3.447	3.417

Table: Tehsil wise distribution of different transportation components in Andaman Islands

Sl. No.	Component and Indicators	Tehsil						Total
		Diglipur	Mayabunder	Rangat	Ferrargunj	Port Blair	Little Andaman	
1	Transportation							
	Land Transportation							
	Two Wheelers	10213	6339	12223	11329	65553	3396	109653
	Three Wheelers	325	350	473	302	3241	247	4938
	LMVs	2013	1487	3067	2498	24950	1162	35177
	HMV's	53	37	80	56	915	36	1177
	Water Transportation							
	Pax-cum-Vehicle Ferry	1	1	5	3	3	1	14
	Ferry Vessel	1	1	3	0	6	2	13
	Motor Launch	0	0	0	2	3	0	5
	Frequency of Trip							
	Air Transportation							
	Helicopter Ground	1	1	3	1	4	1	11
	Frequency of Trip							
2	Communication							
	Digital Communication							
	Telephone Exchange	5	7	8	11	13	2	46
	Landline	700	501	791	1497	11659	289	15437
	Broadband	486	421	629	1109	8011	241	10897
	FTTH	652	680	860	301	8383	206	11082
	Mobile BTS	32	28	42	106	331	13	552
	Postal Facilities							
	Head Post Office	0	0	0	0	1	0	1
	Sub Post Office	2	2	7	4	8	3	26
	ED Branch Post Office	6	5	25	10	18	9	73
	Letter Boxes	18	12	26	17	34	9	116
3	Public Utility Infrastructure							
	Water Supply							
	Natural Water Sources	19	15	27	20	31	9	121
	Pipe Water Tap Connection	9810	5249	9686	6104	21204	1502	53555
	Domestic Pipe Connection	9693	5204	9503	6104	21204	1502	53210
	Commercial Pipe Connection	117	45	183	0	0	0	345

	Water Treatment Plant	9	5	29	7	17	4	71
	Dam	1	0	3	5	3	3	15
	Well	20	14	35	5	4	9	87
	Reservoir	14	5	10	15	22	9	75
	Rain Water Harvesting Project	25	10	44	10	28	12	129
	Gas							
	Domestic Gas	10898	7132	9914	18140	61600	4828	112512
	Commercial Gas	283	118	140	310	1650	57	2558
	Power							
	Village Electrified	85	73	30	75	13	18	294
	Household Electrified	11578	7352	10000	18460	56912	5857	110159
	Domestic	11578	7352	10000	18460	56912	5857	110159
	Commercial	1666	1258	1833	2604	10306	720	18387
	Industrial	43	23	39	59	255	19	438
	Street Light	64	50	70	217	278	42	721
4	Ecological Purification Objects							
	Ecological and Environment	4.1	6.1	8.1	9	5	6.1	38.4
	Forestry and Wildlife	4200	2228	5222	7237.18	5205	1225	25317.18
	Loan to ANIFPDCL	200	200	500	300	950	250	2400
5	Tour Operators and Travel Agents							
	Number of Travel Agency							
	Number of Tour Operators	3	3	14	14	189	2	225
	Number of Scuba Dive Operators	0	0	1	9	58	1	69
6	Accommodation							
	Guest Houses							
	Forest Guest Houses	1	2	5	1	4	0	13
	APWD Guest Houses	1	1	4	2	4	2	14
	Tourism Guest Houses	1	1	2	0	4	1	9
	Other Govt. Guest Houses	1	1	1	1	3	1	8
	Hotel							
	With Star	0	0	0	2	35	0	37
	Without Star	2	0	17	32	391	1	443
	Homestay	1	3	7	14	55	1	81
	Lodge	9	5	19	28	209	2	272

7	Leisure and Entertainment Services							
	Numbers of Theatres	0	0	0	0	2	0	2
	Number of Parks	0	0	0	1	8	0	9
	Number of Sport Facilities							
8	Catering facilities							
	Bakery	23	10	79	46	282	16	456
	Restaurant							
	With Bar	8	5	19	21	79	5	137
	Without Bar	52	27	75	98	304	11	567
9	Trade							
	Number of Trade Enterprises	382	181	477	789	7211	328	9368
10	Social Security							
	Number of Registered Crime	157	75	249	163	970	129	1743
	Number of Accidents	8	7	35	20	150	6	226
	Number of Police Station	2	1	5	3	7	1	19
	Number of Police Outposts	3	2	5	3	4	2	19
	Number of Look Outposts	2	1	3	2	4	1	13
	Number of Police Radio Stations	2	3	8	2	3	1	19
	Number of Fire Station	2	1	5	2	7	2	19
	Number of HF Radio Stations	1	2	9	1	3	1	17
	Number of VHF Radio Stations	4	2	9	1	2	2	20
	Number of Police Personnel	243	62	422	831	2176	182	3916
	Police Population Ratio	1/178	1/416	0001/86	001/64	001/76	001/103	1/112
11	Health Services							
	Government Health Services							
	Number of Medical Institutes	21	16	18	25	22	9	111
	Number of Beds	131	92	109	151	620	58	1161
	Private Health Services							
	Number of Medical Institutes	2	0	2	2	51	0	57

	Number of Diagonostic Centres	1	0	0	0	3	0	4
	Number of Medical Shops	6	2	6	10	113	1	138
12	Bank Services							
	Bank Branches							
	SBI	1	1	3	5	9	2	21
	Private	3	1	4	7	48	2	65
	Co-operators							
	ATMs	4	2	6	5	54	2	73

Table: Domestic tourist, foreign Tourist, total tourist flow in Andaman & Nicobar Islands 1991-2022.

Year	Domestic Tourist	Foreign Tourist	Total Tourist
1991	32242	2248	34490
1992	35817	2435	38252
1993	35000	1771	36771
1994	50737	3798	54535
1995	64490	3849	68339
1996	67958	5796	73754
1997	73558	4724	78082
1998	74732	4915	79647
1999	77448	6035	83483
2000	81432	4634	86066
2001	85866	5249	91115
2002	90629	4707	95336
2003	93899	4281	98180
2004	105004	4578	109582
2005	30225	2164	32389
2006	118580	9045	127625
2007	136015	10975	146990
2008	124439	12512	136951
2009	142045	13692	155737
2010	180781	14615	195396
2011	202221	15814	218035
2012	238699	17538	256237
2013	230733	14981	245714
2014	315910	24507	340417
2015	292233	15581	307814
2016	313265	12553	325818
2017	421846	16012	437858
2018	498473	15766	514239
2019	498784	16439	515223
2020	507528	13221	520749
2021	80326	968	81294
2022	82429	1504	83933

Field Work: Photographs

Appendix- 9



Flag Point



Near Aaynar Temple



Island Mega Fair



Prem Nagar Junction



Cellular Jail



Carbyn's Cove Beach