A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty

Thesis submitted in partial fulfillment of the

DEGREE OF MASTER OF PHILOSOPHY (M.Phil)

By

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DECLARATION

I declare that the dissertation entitled **"A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty"** submitted by me for the degree of Master of Philosophy (M.Phil) in Tourism Management is the record of work carried out by me during the period from August 2018 to July 2019 under the guidance of **Dr. Bindu V.T, MTA, M.Phil, NET, PGDBA, Ph.D.**, Assistant Professor and Head(i/c) of Department of Tourism Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore and has not formed the basis for the award of any Degree, Diploma, Associate ship, Fellowship, Titles in the University or any other University or other similar institution of Higher Learning.

Kayalvizhi.

Signature of the Candidate

CERTIFICATE

I certify that the dissertation entitled **"A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty"** submitted for the degree of **Master of Philosophy (M.Phil) in Tourism Management** by **Kayalvizhi.T,** is the record of research work carried out by her during the period from August 2018 to July 2019 under my guidance and supervision, and that this work has not formed the basis for the award of any Degree, Diploma, Associate ship, Fellowship or other Titles in this University or any other University or institution of Higher Learning.

31/7/19

Signature of the Head of the Department

31/7/19

Signature of the Supervisor with designation

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INTRODUCTION

1.1 TOURISM

Tourism is travel for pleasure. Tourism may be international, as well as traveling within the country. The World Tourism Organization defines tourism more generally, in terms which go "beyond the common perception of tourism as being limited to holiday activity only", as people "traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes."

Tourism is one of the largest industries in the world. Tourism is an activity which can make a human move from one place to another, the purpose of traveling depends on religion, spiritual, natural, wildlife, monument, historical sites, which will induce human curiosity.

Tourism is now a worldwide industry involving millions of people in international as well as domestic travel every year. The World Tourism Organization estimated that *i*nternational tourist arrivals grew by 4.4 percent in 2015 to reach a total of 1,184 million in 2015, this amounts to approximately 12 percent of the world's population. Tourism is defined as a temporary movement of people from one place to other destinations which is outside of their normal places of work and residence, and the activities were undertaken during the stay in those destinations and the facilities created to cater for their needs. Tourism is also multi-dimensional and can be compartmentalized in a number of ways. There are two significant variables, such as origin-destination relationship and the motivation for travel. Tourism can be divided into four categories, such as international tourism, internal tourism, domestic tourism, and national tourism. Significant reasons for tourist travel are escape from routine, relaxation, play, strengthening family bonding, prestige, social interaction, sexual opportunity, educational opportunity, and self-fulfillment and shopping.

Today, tourism is a significant source of income for many countries and affects the economy of both the source and host countries. In some cases tourism is of vital importance, due to the income generated by the consumption of goods and services by tourists, the taxes levied on businesses in the tourism industry, and the opportunity for employment and economic

advancement by working in the industry. Travel activity of the foreign tourist brings a lot of money to the countries where they travel. Hence, tourism has become a source of income for the countries. Tourism is now developing as a significant industry.

Not only it makes a significant contribution to the foreign exchange earnings, employment, income generation and regional development but it also helps in the overall development of that area Tourism is as such a part of socio-economic development as any other related activity.

For these reasons, NGOs and government agencies promote a specific region as a tourist destination and support the development of the tourism industry in that area. The contemporary phenomenon of mass tourism results in over-development; however, alternative forms of tourism such as ecotourism seek to avoid such outcomes by sustainably pursuing tourism.

1.2 GROWTH OF TOURISM INDUSTRY

Tourism is not only an activity for passing the time and entertainment; however, it is an enriching and energizing activity. Tourism is one of the right vehicles for a developing country like India that plays a crucial role in modern economic growth through structural transformation of the economy. The value-added effect of tourism is increasing. Sustainable tourism has vast scope in India by the convergence of landscapes with finances capes, techno capes, and Mediascapes. India's tourism industry has witnessed an' upsurge in recent years, paying rich dividends to both consumers and producers.

1.3 TOURISM IN INDIA

India is one of the best and beautiful countries and one of the most popular tourist destinations in South Asia. It is noted for its generous and heartfelt treatment of all visitors, no matter from which corner of the world they come from. Tourism in India has measureless options which might be relished by tourists on their vacation within the country. Cultural, heritage, adventure, wildlife, pilgrimage, beach, backwater, nature, medical, and monsoon tourism are some of the famous tourism choices available in India which enthralls tourists from all over the world. It is said that a country is well identified by its culture and tradition. And, the

country has a rich culture, ancient civilization, glorious history, and a fascinating tradition that attracts tourists.

The role of Tourism is crucial in the economic development of a country. Tourism is the second largest foreign exchange earner in India. The tourism industry provides job opportunities for an enormous number of people, both skilled and unskilled. Hotels, travel agencies, transport together with airlines benefit a lot from this industry. It generates foreign exchange. It promotes cultural activities.

1.4 TOURISM IMPACTS

The study of the impact that tourism has on the environment and communities involved has been a part of the tourism discourse since the 1970s but has garnered much greater attention in recent years due to debates on over-tourism. Impacts aren't simply classified, having direct and indirect components. Also, tourism is often seasonal, and impacts solely become apparent after time, with varied effects, and at totally different stages of development. There are three main categories.

1.4.1 Environmental impacts: impacts that affect the carrying capacity of the area, vegetation, air quality, bodies of water, the water table, wildlife, and natural phenomena.

1.4.2 Socio-cultural impacts: related to interactions between peoples and culture background, attitudes and behaviors, and their relationships to material goods. The introduction of tourists to sensitive areas is often harmful, cause a loss of culture, or, instead, contribute to the preservation of culture and cultural sites through increased resources.

1.4.3. Economic impacts: typically seen as positive, contributing to employment, better services, and social stability. Also, it may improve in terms of cultural education, which one may not have considered. However, these impacts may contribute to high living costs within the community, pushing native business out of the areas, and raising prices for locals

1.5 ENVIRONMENTAL IMPACTS OF TOURISM

The quality of the environment, both natural and human-made, is essential for tourism. However, the relationship of tourism with the situation is complicated. It involves many activities that can have adverse environmental effects. Many of these impacts are linked with the

construction of general infrastructures such as roads and airports, and of tourism facilities, including resorts, hotels, restaurants, shops, golf courses, and marinas. The negative impacts of tourism development can gradually destroy environmental resources on which it depends. On the other hand, tourism has the potential to create beneficial effects on the environment by contributing to environmental protection and conservation. It is a way to raise awareness of ecological values, and it can serve as a tool to finance the protection of natural areas and increase their economic importance. In this paper, we describe the effects of tourism on natural resources, environmental pollution, and physical environment. In addition, we explain the ecological impacts of tourism on a global scale, industrial impacts on tourism and, finally, how tourism can contribute to environmental conservation.

Tourism can cause the same forms of pollution as any other industry are emissions, noise, solid waste and littering, releasing of sewage, oil, and chemicals, even architecture/visual pollution.

1.5.1 Depletion of Local Resources: Tourism can create pressure on local recourses like energy, food, and transport of these resources exacerbates the physical impacts associated with their exploitation. Because of the seasonal character of the industry, many destinations have ten times more inhabitants in the high season. High demand is placed upon these recourses to meet the high expectations tourists often have proper heating, hot water, etc.

1.5.2 Land degradation: Important land recourses include minerals, fossil fuels, fertile soil, forests, wetland, and wildlife. Increase in tourism and recreational facilities has increased the pressure on these recourses and scenic landscapes. Direct impact on natural recourses, both renewable and nonrenewable, in the provision of tourist facilities are caused by the use of land for accommodation and other infrastructure provision, and the use of building materials.

1.5.3 Water Pollution: Water especially is one of the most critical natural resources. The tourism industry generally overuses water resources for hotels, swimming pools, golf courses, and personal use of water by tourists. This can result in water shortages and degradation of water supplies, as well as generating a higher volume of wastewater.

1.5.4 Air Pollution: Tourism is generally considered a "smokeless industry." However, it can also result in air pollution by tourist vehicles in a particular area, especially at significant

attraction sites, that are accessible only by road. This is due to improperly maintained exhaust systems of the vehicles. In addition, pollution in the form of dust and dirt in the air may be generated from open, revegetated area if the tourism development is not properly planned, developed and landscaped or is in an interim State of construction.

1.5.5 Noise Pollution: Noise generated by a concentration of tourists road and certain types of tourist attractions such as amusement parks or car/motorcycle race tracks may reach uncomfortable and irritating levels for nearby residents and other tourists. Such loud noise can often result in ear damage and psychological stress. Noise pollution from airplanes, cars, and buses, as well as recreational vehicles, is an ever-growing problem of modern life. In addition to causing annoyance, stress, and even hearing loss for humans, it causes distress to wildlife, especially in sensitive areas.

1.5.6 Visual Pollution: It may result from several sources. These can be due to poorly- designed hotels and other facility buildings, which are not compatible with local architectural style or not well integrated into the natural environment. Other reasons can be poor maintenance of buildings and landscaping obstruction of scenic views by development use of large and ugly advertising signs. Littering of the landscape also results in visual pollution.

1.5.7 Aesthetic Pollution: Tourism development at a destination fails to integrate its changes with the natural features and indigenous architectural of the destination. The many of the resorts with its huge design look out of place in any natural environment and may clash with the unique cultural design of the location. A lack of land-use planning and building regulations in many destinations facilitated sprawling developments along coastlines, valleys, and scenic routes. The sprawl includes tourism facilities themselves and supporting infrastructures such as roads, employee housing, parking, service areas, and waste disposal.

1.5.8 Waste Disposal Problems: The most common problem in tourism areas is the littering of debris on the landscape. This is due to a large number of people using the space for picnicking. Improper disposal of solid waste from hotel restaurants and resorts generate both litter and environmental health problems from vermin, disease, and pollution. It can also lead to the degradation of tourist sites. In areas with high concentrations of tourist's activities and appealing

natural attractions, waste disposal is a serious problem, and improper disposal can be a major spoiler of the natural environment-rivers, scenic areas, and roadsides. In mountain areas of the Himalayas and Darjeeling their garbage, oxygen cylinders and even camping equipment. Such practices degrade the environment, particularly in remote areas, because they have few garbage collection or disposal facilities.

1.5.9 Sewage: Construction of hotels, recreation, and other facilities often leads to increased sewage pollution. Wastewater has polluted seas and lakes surrounding tourist.

1.6 ECO TOURISM

Ecotourism is a form of tourism involving visiting fragile, pristine, and relatively undisturbed natural areas, intended as a low-impact and often small scale alternative to standard commercial mass tourism. It means responsible travel to natural areas, conserving the environment, and improving the well-being of the local people and involves interpretation and education (TIES-2015). Its purpose is to educate the traveler, to provide funds for ecological conservation and to directly benefit to the economic development of and political empowerment of local people to provide funds for ecological conservation, to directly benefit the economic development and political empowerment of local communities, or to foster respect for different cultures and for human rights.

Ecotourism has been broadly defined as tourism, which is ecologically sustainable. The concept of ecological sustainability subsumes the environmental carrying capacity of a given area. The general principals of ecotourism guiding the initiatives of the Ministry are as under:

(a) The local community should be involved leading to the overall economic development of the area.

(b) The likely conflicts between resource use for ecotourism and the livelihood of local inhabitants should be identified and attempts made to minimize the same

(c) The type and scale of ecotourism development should be compatible with the environment and socio-cultural characteristics of the local community, and

(d) It should be planned as a part of the overall area development strategy, guided by an integrated land-use plan avoiding inter-sectoral conflicts and ensuring sectoral integration, associated with a commensurate expansion of public services.

1.7 ECO TOURISM GLOBAL SCENERIO

Ecotourism is a new concept in tourism, which was initially sparked off by the idea of making harmonious co-existence with nature a reality once again. As defined by the Ecotourism Society, it is responsible travel to natural areas, which conserves the environment and sustains the well-being of local people. Today, ecotourism is one of the fastest-growing segments of the tourism industry. Its potential for growth is virtually unlimited. Any tourism program, which is: nature – based, ecologically sustainable, where education and interpretation is a major concept and where local people are benefited can be called ecotourism. The International Ecotourism Society defines ecotourism as: "responsible travel that conserves the environment and sustains the well - being of local people". Clearly, at a time when traditional conservation through enforced protection of natural areas was being questioned for its effectiveness and social impacts, strategies such as ecotourism offered considerable potential for integrating conservation with development. (Dr.G.Vijay & Dr.Mohd Ali)

1.8 ECO TOURISM IN TAMILNADU

The State of Tamil Nadu, situated in the southern part of the Indian Peninsula has over 20 centuries of cultural heritage and historical significance. The foremost of attractions in the State are its impressive temples, which are true edifices of a great and ancient culture vibrant and lively even today. Next only to the pilgrimage and heritage locations in Tamil Nadu comes the scenic beauty of nature in and around the State in the form of forests, wildlife sanctuaries, hill stations, and the long bio-diverse coastline. These locations provide immense opportunities for sightseeing, pleasure, and leisure, to the visitors of various categories, including adventure tourists. The preparation of a perspective tourism plan for the State of Tamil Nadu, assigned by the Department of Tourism, Government of India, has been to identify development aspects of the tourism industry in the State for a long term perspective and produce a meaningful plan report covering all facets of the state tourism so that later on a perspective tourism plan at the country level can be prepared. There is a host of projects that have been identified at various destinations – already popular destinations as well as the potential ones across the State, so as to

offer the tourists more facilities and support their arrival and stay in a much better way. The sheer diversity of landscape found in Tamil Nadu, and its range of animal and plant life, makes it a favorable destination for incentive groups wishing to experience something of the State's natural wealth. Thus, Tamilnadu is selected as the study area. There are several tourist destinations that attract ecotourism in Tamilnadu, namely Ooty, Yercadu, Yelagiri, Kodaikanal, Coonoor, Kotagiri and Velliangiri Hills. Out of the seven hilly regions, three has been selected for the study purpose, that is Ooty, Yercadu, and Kodaikanal.

1.9 BOTANICAL GARDEN

A botanical garden or botanic garden is a garden which is dedicated to the collection, cultivation, preservation, and display of a wide range of plants labeled with their botanical names. It may contain specialist plant collections such as cacti and other succulent plants, herb gardens, plants from particular parts of the world, and so on; there may be greenhouses, shade houses, again with special collections such as tropical plants, alpine plants, or other exotic plants. Visitor services at a botanical garden might include tours, educational displays, art exhibitions, book rooms, open-air theatrical and musical performances, and other entertainment.

Botanical gardens are often run by universities or other scientific research organizations, and often have associated herbaria and research programmers in plant taxonomy or some other aspect of botanical science. In principle, their role is to maintain documented collections of living plants for the purposes of scientific research, conservation, display, and education, although this will depend on the resources available and the special interests pursued at each particular garden.

The early concern with medicinal plants changed in the 17th century to an interest in the new plant imports from explorations outside Europe as botany gradually established its independence from medicine. In the 18th century, systems of nomenclature and classification were devised by botanists working in the herbaria and universities associated with the gardens, these systems often being displayed in the gardens as educational "order beds". With the rapid rise of European imperialism in the late 18th century, botanic gardens were established in the tropics, and economic botany became a focus with the hub at the Royal Botanic Gardens, Kew, near London.

Over the years, botanical gardens, as cultural and scientific organizations, have responded to the interests of botany and horticulture. Nowadays, most botanical gardens display a mix of the themes mentioned and more; having a strong connection with the general public, there is the opportunity to provide visitors with information relating to the environmental issues being faced at the start of the 21st century, especially those relating to plant conservation and sustainability.

1.10 ROLE OF GARDENS IN ECO TOURISM

Gardens are typically classified into two types – scientific and non-scientific.

1. Scientific gardens include Botanical gardens and Arboreta and depict unique management maintained by the government and various allied agencies for scientific pursuit. Such gardens have a completely different perspective and offer tourism visits with certain restrictions.
2. Non-scientific gardens include ornamental" and recreational gardens. They are hospitable to locals and tourists. These gardens are specific to their origin and service.

Most of the gardens are hospitable to tourists and the public under the stipulated time and maintained frequently. They occupy more space in area and size and aesthetically pleasant looking that typically invites well mannered and old age people. Many people throng the gardens, especially for occasions, festivals and site seeing spots near to their dwellings. Often, gardens exhibit many diverse species of flora, some being exotic or local indefinite arrangement with well-organized traits. They occupy a distinctive position as ecotourism spots for people migrating within the nation.

Botanical gardens complement the goals and principles of ecotourism. Many urban-based, mostly botanic gardens, play a crucial role in the expansion of ecotourism from traditional non-urban settings into the cities. They are essential to the future of ecotourism as increasingly the world's population is being concentrated in urban centers and for many of these urban communities, city botanic gardens represent the only or at least regular opportunity to visit a natural or near-natural setting. Because of that, botanic gardens represent a crucial opportunity for tourism development in a broad perspective. Parks and gardens regionally play a dominant role in making people more nature lovers and guiding them towards making them sustainable tourists.

1.11 AREA OF STUDY

1.11.1 OOTY

Ooty or Udhagamandalam is also known as 'the queen of hill stations' is a capital town of district Nilgiris in Tamil Nadu, India. It had been originally occupied by Todas, and ruled by East India Company before Independence of India. Ooty is alleged to be one among the most popular hill station in South India, located in the Western Ghats at the height of 2240 meter. Ooty is said to be one of the most beautiful places in South India. This place is acknowledged for coffee and tea plantations, tree species like Conifers, Eucalyptus, Pine and Wattle dot. Not only modernizing, British constructed the first railway line in this hill station and made Ooty as Summer Capital of Madras Presidency. Initially occupied by the Toda, the area came under the rule of the East India Company at the end of the 18th century. The economy mainly depends on tourism and agriculture, along with the manufacture of medicines and photographic film. The town is connected by the Nilgiri Ghat roads and Nilgiri Mountain Railway. Its natural environment attracts tourists, and it is a popular summer destination. As of 2011, the town had a population of 88,430.

1.11.2 TOURIST ATTRACTIONS IN OOTY

Tourism in Tamil Nadu has assumed the role of significant economic activity having direct and indirect correlation with other sectors. Some of the major attractions found at Ooty are:

i) Botanical Garden

ii) Ooty Toy Train

iii) Dodabetta Peak

iv) Ooty Lake

v) Rose Garden

vi) Wenlock Downs and Sixthmile

vii) Tea Gardens

viii) Mudumalai and Bandipur National Park

ix) Pykara Dam and Power Station

x) Pykara Boat House

1.11.3 GOVERNMENT BOTANICAL GARDEN, OOTY

The Government Botanical Garden is a botanical garden in Udhagamandalam, near Coimbatore (Ooty), Tamil Nadu state, is one of the world's famous public gardens and attracts visitors from all over India and abroad India laid out in 1848. The Gardens, divided into several sections, cover an area of around 55 hectares and lie on the lower slopes of Doddabetta peak. The garden has a terraced layout. It is maintained by the Tamil Nadu Horticulture Department. This garden was laid out in 1897 by the Marquis of Tweedale and is spread over 55 acres. Lush green, well maintained lawns, rare trees species (like the cork tree which is probably the only such tree in India, the paperbark tree and the monkey puzzle tree-monkeys cannot climb this tree), a 20 million year old fossilized tree, an Italian-style garden bordering a clear pool, a vast variety of flowering bushes and plants in myriad hues (exotic and ornamental), fern house with a vast range of ferns and orchids, are some of the many highlights of this garden. A flower show along with an exhibition of rare plant species is held every year in the month of May at this garden.

1.11.4 VISITORS

Every year about 20 lakhs tourists, including Foreigners, visit the garden. Besides this Botany and International students from India & abroad visit the garden for updating their knowledge. The Historical Building was constructed as a plant conservatory in the beginning. At present this beautiful pair of a building is popularly known as a heritage building. Earlier the building served as a sales counter for ornamental plants & seeds. In 1912 this building had been renovated to present in an aesthetic look during the Centenary flower show festival in 1995.

The 'Queen of Hills' has seen a significant increase of nearly 50% in footfall of tourists in three years. While 23.4 lakh tourists visited Ooty in 2014, around 32.69 lakh visited in 2017, according to official records. Also, the increase in the number of tourists in 2017 is about 1.5 lakh compared to 2016.

1.11.5 SECTIONS

The present Botanical Gardens are divided into six sections namely Lower Garden, New Garden, Italian Garden, Conservatory, Fountain Terrace, and Nurseries.

1.12 NEED FOR THE STUDY

Ooty is also known as Udagamandalam which is a major hill station for tourism in the Indian State of Tamil Nadu. It is one of the fastest-growing tier-II cities in India. Ooty is a hub of a mixture of a variety of culture people and has a variety of attractions. The study is based on Tourists perception about Environmental Impacts and Visitors Satisfaction of Botanical Garden, Ooty, Tamilnadu. Botanical Garden of Ooty is one of the most visited attractions of Ooty. Sustainable planning is highly essential for the garden. The study of current practice is necessary for the sustainable development of the garden. The research primarily focuses on Tourists perception about Environmental Impacts and satisfaction level, which is based on service provided and features of Botanical garden at the ecotourism destination. The study helps the stakeholders in better planning and management of the Botanical Garden. Not much of the study has been done on Visitors Perception about Environmental Impacts and Visitor Satisfaction of Botanical Garden in Ooty. Thus this study has been undertaken to find out the Environmental Impacts and Visitors Satisfaction of Botanical Garden in Ooty.

1.13 OBJECTIVES OF THE STUDY

(a) Primary Objectives:

- Study the Environmental impact and visitor satisfaction of Botanical garden, Ooty.

(b) Secondary Objectives:

- To understand the visitor's profile of Botanical garden, Ooty.
- To Study the tourism activities in the Botanical garden. Ooty.
- To identify the relationship of demographic variables with Environmental Impacts and Visitor Satisfaction.
- To predict the critical factors General Management and Visitor Satisfaction of Botanical garden, Ooty.
- To display tha zones of Botanical Garden with QGIS.

1.14 SCOPE FOR THE STUDY

Generally, this study focuses on to understand tourist's perception of tourism impacts and visitor satisfaction and service quality of Botanical Garden in Ooty. Botanical garden in Ooty is one of the most visited attractions in Ooty. Hence sustainability is at higher risk in the garden. The present study can be considered as a step for periodical monitoring of the garden on the perception of tourists. Future study can involve locals and other service providers to collect a wholesome review of the botanical garden. The results of this study can be used for further researches and to reduce the negative impacts of tourists and tourism and also to improve the quality of services in Botanical Garden, Ooty.

1.15 LIMITATIONS FOR THE STUDY

Although the study was carried out with extreme enthusiasm and careful planning, there are several limitations, which handicapped the research.

The limitations that could restrict the accuracy of the research finding are as follows:

- The research was carried out in a short period with a limited sample size of 520 respondents.
- Respondent had marked the questionnaire, which may be socially incorrect irrespective of the actual feeling cannot be accurate since the survey is subjected to the bias and prejudices of the respondents.
- Due to the confidentiality of some accurate information, the response was not revealed by some of the respondents.

1.16 CHAPTERIZATION

The following chapter and content analysis will be applicable to the research study:

CHAPTER 1- INTRODUCTION

In this chapter, a holistic perspective is provided of the proposed research. The chapter provide brief of introduction about tourism industry, growth of tourism industry, tourism in India, ecotourism global scenario, ecotourism in Tamilnadu, Ooty, Tourist attractions in Ooty,

Botanical Garden, Role of Botanical Garden in Eco Tourism, area of study, Tourism Impacts, objective of the study, need for the study, scope of the study, limitations of the study in Government Botanical Garden, Ooty.

CHAPTER 2- REVIEW OF LITERATURE

In this chapter review of related literature is conducted on Tourism, Eco-tourism, Botanical Garden, Botanic Tourism, Visitor Satisfaction, Tourist Perception, and Tourist Perception on Tourism Impacts, Environmental Impacts and GIS in Tourism.

CHAPTER 3- METHODOLOGY AND AREA OF THE STUDY

In this chapter, briefs on data collection, sample, and various tools used in the analysis. It also gives a detailed account of the locations of the study area.

CHAPTER 4- ANALYSIS AND INTERPRETATION OF RESULT

In this chapter, data is analyzed in detail and interpreted in terms of the primary theme of the dissertation. The results of the analysis and its discussion are given to the proposed research problem.

CHAPTER-5 FINDINGS, SUGGESTION, AND CONCLUSION

In this chapter, the research is concluded. The finding of the study is summarized. It also proposes various suggestions for **"A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty**."

CHAPTER - 2

REVIEW OF LITERATURE

A literature review is a text written by someone to consider the critical points of current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources and as such, do not report any new or original experimental work. Also, a literature review can be interpreted as a review of an abstract accomplishment. A literature review overviews articles, books and other sources (e.g.: dissertation, conference proceedings) relevant to a particular issue, area of research, or theory, providing description, summary, and critical evaluation of each work. The purpose is to offer an overview of significance literature published on a topic. The chapter review the existing literature put forward by different scholar and personalities on **"A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty"**

2.1. ECO TOURISM

McMinn, 1997 in his study states that Ecotourism has the potential to seriously impact local communities, largely due to the tendency of eco tourists to have a greater interest in the culture and nature of the areas they visit, as compared to mass tourists. David and Fennell (2000) explain Ecotourism the need to promote the right kind of tourism, that is, quality and eco-friendly tourism, so that maximum benefit can be connected without disturbing and changing physical and social quality. Jennifer Hil and Timgale (2000) observed that relationship between tourism and the environment is a complex one to evaluate. Tourists are increasingly searching for more experiential types of tourism and ecotourism is one such example. Ecotourism has been discussed in terms of other modified settings, including artificial reefs, agricultural lands and surface mines and quarries. Anil Reddy (2000) in his paper holds the view that ecotourism is entirely a new approach in tourism. It is reserving travel to natural areas to appreciate the cultural and natural history of the environment. He reviews various issues and information about ecotourism. Rathandeep Singh (2003) explains the Indian environmental rule in detail. Indian environmental rules and regulations are discussed very deeply. In his words "biodiversity conservation has become an essential qualification for successful ecotourism inside a national park or sanctuary in India". Similarly, public participation and local community's part in benefits due to ecotourism activity is not covered.

Colin Hunter and Jon Shaw (2004) tells that academic interest in ecotourism has grown fast in recent years, fuelled by the increasing popularity of ecotourism holidays. This paper accepts ecological foot print (EF) analysis as a means of estimating the potential net EF of proposed international ecotourism situations involving air travel. Ramesh Chawla (2006) states that eco-tourist visits to relatively undeveloped areas in the life of appreciation, involvement and sensitivity. The eco-tourist follows a non-consumptive use of wildlife and natural resources and contributes helping the conservation of the site. Andrew Wallace (2006) states that The Environmental Protection Agency currently highlights formal environmental education but informal environmental education (e.g. visiting a National Park) may also be an effective method of environmental education. This study explores the influence of visiting National Parks, National Recreation Areas, and National Monuments during different school grades on environmental attitude and behaviour, together termed awareness. Mohd Nawayai Yasak (2007) made an effort to review the ecotourism in Malaysia. Local people are involved actively in ecotourism activities in Malaysia. National ecotourism plan was developed to provide a more united approach to achieve specific national ideas. Ravi Shankar Kumar Singh (2008) comments that ecotourism activities have been increasing rapidly worldwide over the past two decades and further growth is expected in the years coming fast. Prabha Shastri Ranade (2008) analyses a number of issues rising in trying to control what creates successful ecotourism and how to balance conservation with development. he also makes an attempt to highlight broad issues related to the concept and principles of ecotourism. His book focuses on ecotourism experiences and plans of various countries, including island nations. It highlights ecotourism and local economic development. It considers how ecotourism can make economic benefits and provide other employment and income opportunities for the local communities. Geoffrey Wall (2014) describes that Ecotourism is an agent of change. Measurement of the impacts of tourism is troubled with similar challenges to those involved in calculating impacts in general and tourism in specific. He also states that Research on the influences of tourism has not been increasing because of the approval of an inappropriate example and insufficient attention to the contexts in which impacts occur. It is suggested that collected information is more useful than immediate actions and the features of useful indicators for measuring impacts and monitoring change are described.

2.2 BOTANICAL GARDEN

The study by Kohlleppel et al. (2002) conducted at three botanic gardens in Florida found that botanic gardens could be places for coping with the effects of stress. The literature on the curative impacts of exposure to green spaces and plants continues to grow with meaningful advances in relation to cognitive health, mental health, depression and recovery from surgery. Ballantyne and all, (2008)Gardens' visitors were found to be less interested in and committed to conservation issues, and less motivated to learn, than visitors to other free-choice learning settings such as museums, zoos, aquariums, heritage sites, natural areas and wildlife tourism activities. The implications for interpretive practice in botanic gardens were discussed in the study. Kneebone (2006); Jensen (2014).Education activities in collections-based institutions, such as botanic gardens and zoos, can take many different forms, with many gardens coordinating workshops, guided tours and activities for the public to learn about the natural world. Donaldson (2009).Traditionally botanic gardens have focused on developing the fields of taxonomy and horticulture but have more recently begun to address wider conservation issues, with particular strengths in ex situ conservation and education. As shown by He and Chen (2012), botanic garden visitor centers can positively influence visitor enjoyment, but conclude that the influence of botanic gardens on ecological knowledge requires further investigation. Indeed, little is known about how much knowledge botanic garden visitors acquire from their visits and how this affects their environmental attitudes.

2.3 BOTANICAL TOURISM

Many Australian plant species and communities appear to be threatened by tourism (Kelly et al., 2003). A review of management plans, recovery plans and a survey of experts found that tourism was considered to be a direct or indirect threatening impact for 72 plant taxa. This is one fifth of threatened species for which threats have been identified.Another study was implemented by Pickering and Hill (2007) in Australia. This paper reviews recent research into the impact of recreation and tourism in protected areas on plant biodiversity and vegetation communities. Australia's unique flora is of international significance and this has significantly contributed to increasingly high levels of tourism and recreation use of protected areas. The review highlights the need for more recreational ecology research in Australia. There are many threats to vegetation in Australian protected areas from tourism. Greater recognition needs to be

given by protected area managers. Kumble and Houston (2009) studied the status and importance of ecotourism in Belize Botanic Garden. The garden is one that evolved in response to the conservation desires and requirements of local cultures. This paper discusses the role of a conservation botanic garden, and specifically how it can function as a destination for eco tourists. The paper proposes planning and design guidelines that demonstrate the principles of a conservation botanic garden. Another study on sustaining visitor use in protected areas was accomplished by (Monz et al. (2010). Recreation ecology is a relatively new field of scientific study having emerged over the last 50 years. Most studies have focused on vegetation and soil responses to recreation-related trampling on trails and recreation sites using indicators such as percent vegetation cover and exposed mineral soil. Then, based on the authors' perspective of research in the USA and North America, several research directions are suggested as essential for continued progress in this field, including theoretical development, broadening scale, integration with other disciplines, and examination of synergistic effects.This paper discusses the role of a conservation botanic garden, Another study was presented by Olimpia and Filimon (2013), who analyzed six counties of Romania that have rich and valuable natural and anthropic potential. The aim of this work is to identify the main touristic resources in the central region of where the adequate types of tourism that can be turned to good account.(Olafsdottir (2013) defines bird watching, hiking, fishing, and beachcombing activities as nature based tourism. In the study, leisure travel is undertaken largely or solely for the purpose of enjoying natural attractions and engaging in a variety of outdoor activities. Machnik (2013) studied is on tourist preferences of spending time during the holidays, opinions on nature, natural tourist resources and values, nature protection, nature-based tourism and ecotourism is presented by. The principle aim of this paper is to present some attitudes towards nature, its protection and nature-based tourism discovered among tourist questioned in some landscape parks in Poland. The paper attempts to sketch out some models of developing nature-based tourism and ecotourism.

2.4 VISITOR SATISFACTION

Advocating a transactional perspective, Williams (1989) suggested that visitor satisfaction is influenced by the settings provided by park and outdoor recreation managers, but that the ways in which these settings are perceived and evaluated by visitors may be equally as

important. According to Floyd, (1997), research in satisfaction in outdoor recreation has focused on two areas:

(1) Providing indicators of the quality of experiences and outcomes of leisure involvement and

(2) Providing recreation managers with information regarding the physical, social, and managerial conditions of outdoor recreation settings. The identification of manageable predictors of park visitor satisfaction is a vital component of the second area. As Manning (1999) suggested, satisfaction is such a multi-dimensional concept that overall satisfaction measures may be too broad to be useful to either managers or researchers and may not be sensitive enough to detect changes in the variables of interest.

2.5 VISITOR IMPACT MANAGEMENT

(Wagar 1964; Stankey et al. 1985) Its principles include integrating visitor impact concerns into agency planning and management processes, basing management actions on scientific understandings of impacts and other factors affecting site conditions, understanding relationships between use and impact, and maintaining a principle of non-degradation. Visitor impact management incorporates recreation ecology knowledge and tools with decision-making frameworks like carrying capacity and the Limits of Acceptable Change. (Graefe et al. 1990) Visitor impact management is the process of identifying unacceptable changes related to visitor use (visitor impacts) and selecting one or more impact management actions or strategies. (Marion and Rogers 1994) Recreation ecology and visitor impact management are areas of knowledge that can be used by protected area managers to identify, assess, monitor and minimize visitor-related natural resource impacts and their consequences, and direct the selection of management strategies. Recreation ecology seeks to describe the types, amounts and rates of ecological changes resulting from recreational use, including relationships with use-related, environmental and managerial factors that influence these changes. (Ceballos-Lascurain 1996) Visitor impacts are important management concerns because protected area mandates and other legislation commonly require managers to protect natural resources and provide for certain visitor experiences, ecotourists and other visitors may desire interaction with undisturbed resources, and because impacts may adversely affect local populations. (Leung and Marion 1996; Hammitt and Cole 1998)Natural resource impacts are of particular concern because they may occur at initial or low levels of use, result in increased degradation of resources over time or

create additional impacts, result in intense impacts in localized areas, affect larger landscape scales, decrease the functionality of facilities like trails and sites or increase safety concerns. (Marion and Farrell 1998) Other visitor impact management concerns include increased conflict between visitors and/or local people, reduced aesthetic enjoyment, increased management costs, and ultimately, the possibility that visitation might diminish if impacts are severe enough, reducing local economic benefits. (Borrie et al. 1998; Marion and Farrell 1998)Visitor use will inevitably result in some degree of natural resource impact, regardless of type of visitor, ecotourist or tourist, requiring management of visitors and recreation resources.

2.6 TOURIST PERCEPTION

Zurlinia (2006) describes that A person's socio-economic status, cultural ties, and past experiences influence how people perceive environmental quality. In the case of tourism, people using protected area scan differ in many ways, including their personal characteristics and perception about the recreation environment. This research addresses the general problem of tourist perception in a marine protected area (MPA), focusing on tourists' awareness of being in a MPA, tourists' opinion on management activities, the importance of natural attractiveness components, tourists' satisfaction with recreational experience and willingness to come back, and on tourists' awareness of their environmental impacts. This research put in evidence that a different perception can be due to environmental and park related attitudes, but also to the profile of visitors who frequent protected areas. In this respect, we stress the importance of a better identification of visitors' profile, for a better management of tourism development in a MPA. Lyncha et al., 2009) Other scholars further indicated a focus on cultural tourism's ability to educate both tourists and the residents on the host culture as well as provide economic opportunities for host communities. R Rajesh (2014) describes that the objective this of his study is to develop a destination loyalty theoretical model by using tourist perception, destination image and tourist satisfaction. This study analysed the components like attributes, factor influencing the destination image and examine the tourist satisfaction and determinants of destination loyalty and evaluating recent empirical on destination image, tourist satisfaction and loyalty. Tourist Perception constructs have been influenced by factors like Historical and Cultural Attractions, Destination, Affordability, Travel Environment, Natural Attractions, Entertainments and Infrastructure.

2.7 TOURIST'S PERCEPTION ON TOURISM IMPACTS

Sharpley, (2000) A considerable amount of research has been undertaken into the desires, motivation, and behavior of tourists in relation to their impact on host societies. Blamey, (2001); Weaver, (2001) Likewise, while reviewing ecotourism in terms of minimizing the tourism impacts, there is considerable neglect in assessing the impact of tourism activity on tourists themselves. However, the tension between the need for financial profits and the original perspective of 'hard' ecotourism as a complete opposite to mass tourism has been compromised by the perspective of 'soft' ecotourism. Croes, (2006) On the other hand, because of limited competing opportunities, cultural tourism jobs can be low-paying and could introduce unwanted lifestyle changes. Further, because of its geographic concentration, it might contribute to environmental degradation. Therefore, many researchers suggested that future tourism development in cultural and heritage tourist sites should be contextual and take into account the specifics of the destination to be developed, including its already existing character and image.
(Dyer et al., 2007) Historically, the economic impacts of tourism have received the most attention because of the positive effects they can have on destinations and communities, both directly and indirectly, and their relative ease of assessment. (Lyncha et al., 2009; Moyle, Croy and Weiler, 2012) During 1990s, tourism impact studies were an integration of the effects of the previously determined impacts that demonstrated a clear shift from Mass tourism to Sustainable tourism in the form of Ecotourism , Heritage tourism , and Community tourism . Cultural tourism has received greater research attention recently. (Andereck, 2009) Since the negative social and environmental implications of tourism have become increasingly evident in many destinations, a more critical view of tourism impacts has emerged. While much of the literature has found tourism to have negative socio-cultural impact, some studies have also found that tourism has positive social impacts or that there are both positive and negative social impacts. Besides this, Tasci and Boylu (2009) explored tourists' perception of the safety and security of a destination in relation to the level of satisfaction with their trip using visiting destination image and its visitors as a case in point. (Chen, Chen and Lee, 2010) These visitors' expectations and reactions are increasingly seen as important because these primarily affect tourists' cognitions, satisfaction and emotional reactions to a specific tourist venue. A study also found that a destination's unique tourism characteristics too can be the most important variable for destination

competitiveness and therefore emphasized on developing the destination's brand image. Further, a very recent study by Morakabati (2011) too found out that people have become more aware and concerned with respect to the risk issues when they travel as tourists. Hence, behavior of tourists could be directly influenced by making them aware of the negative impacts of some forms of tourism.

2.8 ENVIRONMENTAL IMPACTS

(Batta, 2000; Manning, 1992) Moreover, economic activities besides tourism use up and modify environmental resources quality available for tourism purposes. Because of this linkage, the tourism sector needs increasingly to become a knowledge participant in the planning as the use of the environment and its impacts. (Tangi, 1977, Bavd-Bovy and Lawson, 1977) The study of the Environment Impacts of Tourism is currently in a growing stage and more research is expected to appear. The first effort towards environmental Impacts Assessment was directed basically to Impacts of Leisure activities and especially outdoor recreation. The first group of studies concerning the environmental impacts of tourism appeared after the mid-seventies followed by more research activity in the 1980s. (Inskeep, 1991)The tourism industry has had an enormous impact on the natural environment at several destinations where the consequences of tourism have not been considered before the tourism destinations were developed. Nevertheless, there seem to be both positive and negative impacts on the natural environment resulting from the development of the tourism industry. (Buckley, 2001) Impacts on biodiversity are particularly severe for large new tourism developments in relatively undisturbed areas, such as those in and around conservation reserves and other Protected Areas. These developments involve clearing vegetation, major disturbance to fauna through loss of habitat, noise, barriers etc. (Buckley, 2002)In some destinations, tourism can produce a local economic boom leading to uncontrolled high impact private development, high resource consumption, waste generation beyond the capacity of local waste treatment disposal systems, if any, and land clearance and harvesting with major impacts on biodiversity. In addition, infrastructure built for tourism may be used for illegal collection of endangered plant and animal species. (Christ et al. 2003) Ecotourism or nature- based tourism is promoted to maintain some of the positive effects of tourism, and eliminate or reduce the negative environmental impacts. This type of tourism is promoted by environmental organizations (such as Conservation International, World Wild

Foundation, and The Nature Conservancy) to educate visitors, finance conservation work and provide income to local communities. (Tzatzanis et al. (2003) stated that landscapes in the Mediterranean have evolved under constant, intensive, human impact. This has resulted in a highly differentiated mosaic of landscape types, ranking from semi natural to highly artificial ones. Demand for tourism exaggerates the pressure on coastal areas of high natural and visual value, and is becoming a major concern in the Mediterranean. (Goeldner& Ritchie, 2006) The great variety of combination of natural resources can create environments that are attractive to tourism development. The quality of the natural resources must be maintained to sustain tourism demand, and when planning to develop a tourist destination, proper levels of quality must be considered. In this case ecological and environmental considerations are important in order to maintain sustainability and at the same time keep it attractive for the tourist.

2.9 GIS (GEOGRAPHICAL INFORMATION SYSTEM) IN TOURISM

Harris at al. (1995) used GIS for a research in the Colorado National Forest. They compared the movement of tourists and the movement of mountain sheep. They assumed that sheep competed with tourists for the same land. Bahaire and Elliot- White (1999) related these categories to the basic applications in tourism, as well as, to GIS functions. GIS can provide a set of tools, which can be used for tourism planning and development. Walsham and Sahay (1999); Geogiadou et al. (2005); Singh (2005). Indians have been enthusiastically and rapidly adopting GIS and remote sensing technology over the past 15 years. In this adoption, technical expertise in the geomatics fields has tended to be concentrated in scientific research centers, and the related initiatives and programs have been top town and data centric. David McAdam, (1999) A study on the value and scope of geographical information system in tourism management the main objective were to overcome the short term management strategies or an ignorance of more sustainable form of tourism. Most importantly it is necessary to clearly understand the nature, scope and impact of the TDA when evaluating the relevance and benefits of a GIS. Farsari and Prastacos(2004) reported, most applications of GIS in tourism relate to identifying suitable areas for developing tourism activities in the future (land suitability analysis) while the use of GIS in already developed (mature) tourist destinations has been avoided. They suggested that there are a number of ways in which GIS can benefit the study of tourism and implementation of sustainable practices in destination areas. Tremblay (2005) founded out that a large part of GIS applications has developed by combining information about land and other spatial characteristics with

ecological data to produce multilayered maps. These models played an important role in early tourism applications. Moreover, multilayered maps allow an integration of data e.g. about habitat for wildlife species and data about recreational uses or special preferences to identify overlaps and potential conflict areas. Chen (2006) proposes the use of GIS in tourism planning in the following points: Visitor flow management (to identify principal tourist activities within a destination or amo52+5528ng destinations).Facility inventory and resources use (to identify issues of environmental justice, to identify conflicts, complementary land uses, tourist activities, natural resources). Assessing impacts of tourism development (to demonstrate tourism impacts on its surrounding).

According to Chen (2007) there are the following opportunities for GIS application in tourism planning:

- Visitor flow management – to identify the main tourist activities within a destination or among destinations.
- Facility inventory and resources use – to identify issues of environmental justice and conflicts, complementary land uses, tourist activities, natural resources.
- Assessing impacts of tourism development – to determine tourism impacts on its surrounding.

V. Jovanović, A. Njeguš (2008) argues GIS technology offers great opportunities for the development of modern tourism applications using maps. This technology integrates common database operations such as query with the unique visualization and geographic analysis benefits offered by maps. GIS is used for bringing the geo referenced data (spatial and non spatial) of geographic location Zlatibor and Zlatar into digital maps. Each object is assigned to a thematic layer. Each layer combines related objects like roads, building, protected areas or watercourses. In this research the authors used GIS in three types of applications such as inventory, analysis and evaluation of plan based on tourism development. Wu and Carson (2008) point out that GIS should be used in the analysis and visualization of the trips that include visiting various different destinations. They stress that the visit to multiple destinations include spatial aspect (destinations themselves) and the time aspect (the duration of the visit), and the type of transport between destinations and characteristics of supply and demand in all destinations. These variables can be effectively and efficiently analyzed using GIS. Tomczyk (2010) used GIS for the similar purposes. He modeled environmental sensitivity of recreational trail in the Gorce National Park

in Poland. The model combined data about topography, soil properties and vegetation. The GIS allowed dealing with such an amount of data. He states the main advantages of this method could be seen in the capability to study spatial diversion and the distribution of environmental sensitivity and also in the possibility to assess which factors are the most important for environmental sensitivity in selected areas. Fadahunsi, (2010) stated Geographic Information Systems (GIS) are computer systems that records, stores, and analyzes information about the features that make up the earth's surface. According to Wei (2012), the GIS applied to the tourism management are an imperative solution for an effective touristic development and for efficiency, as the expansion of modern information technology constantly presents new challenges to this domain. Shyty and Kushi (2012) considered that, if people used GIS system in the tourism industry, then questions about locations, conditions, modeling, trends etc. would always be easy to answer. These questions are most likely very important for all decisions that a tourist or an investor takes in order to plan a trip, or respectively to make a tourist investment. Wei Wei (2012), in his study suggests that The geographic information system applied to tourism management is the preferred platform of tourism information. On the basis of introducing the concepts of Geographic Information System (GIS) and Travel Geographic Information System (TGIS), Tourism has a strong geographical attributes. And GIS itself is information system offering services to geographic research and decision-making, which can play a role in tourism management. In particular, possessing the functions, such as data collection, storage, processing, and spatial analysis and so on, GIS directly provides services for tourism management. The roles of GIS in tourism management are mainly in the following areas: conducting tourism information management; being able to produce a comprehensive thematic map. The paper analyzes the existing problems of GIS applications in tourism management. GIS applied in tourism management also need to improve according to the development of information technology to adapt to the information technology development.

CHAPTER-3

Research Methodology and Profile of the Study Area

3.1 Methodology

Research methodology defined as the activity of research is how to proceed and how to measure progress and what constitute success. The dictionary defines research as a studious inquires or examination, especially an investigation or experimentation aimed at the discovery and interpretation of fact or practical application of such a new or revised theory or law. The purpose of research is to discover and answer the question through the application of scientific procedure. Research methodology is a way to systematically solve the research problem. Why the research has been undertaken and what research problem has been identified. What data has been used and such question are answered when a well structured methodology concerning the research problem is devised.

3.1.1 Definition

According to Waltz & Bausell(1981) "Research is a systematic, formal, rigorous and precise process employed to gain solution to problems (or) to discover and interpret new facts and relationships.

Kothari(2006) defines "Research is the pursuit of truth with the help of study, observation, comparison and experiment; the search for knowledge through objective and systematic method of finding solutions to a problem.

3.2 Research Design

Research design stands for planning of the methods to be adopted for collecting the relevant data and technique to be used in the analysis. Descriptive research design is used for the study where the questionnaire was given to the respondents to gather information systematically. For a better understanding, concerning the behavioral styles of the respondents, analytical research is also we utilized for the study where hypothetical relation between the variables could be established.

3.3 Source of Data

The researcher had used primary and secondary data for the study. Questionnaire has been designed as a primary research instrument. Questionnaire was distributed to respondents for their feedback. Further coding and analysis was done for each question's responded to reach the finding suggestion and finally to conclusion of the topic.

3.3.1 Primary Source

The primary data are those which are collection of fresh and for the first time and thus happen to be original in character, the questionnaire is considered to collect the survey opinion. The primary data has been collected through a structured questionnaire and multiple choice questions. Thus the sample includes tourists in Botanical Garden, Ooty.

3.3.2Secondary Source

The secondary data are those which have already been collected by someone else and which have already been passed through the statistical process such as published books, articles, journals, internet, and published survey reports of various countries on Eco Tourism, Tourist and Tourism Impact, and Visitor Satisfaction.

3.4 Questionnaire

A questionnaire consists of a number of questions printed or typed in a definite order or set of form. The respondents filled the multiple choice questions especially on five point likert's scale questions are used to collect the attitudinal measures. The scaling technique used in the research method for the questionnaire is five point likert's scale. It is considered of the points like strongly agree, agree, neutral, disagree, strongly disagree ranging from 5 to 1.

3.5 Testing the Reliability of Data

Reliability refers to the level of dependability of the items in the Research Instrument. The reliability was measured using Cronbach – Alpha Coefficient. The Questionnaire consisted of 51 items from the factors of General Management, Tourist Routes, Rest Camps and Campsites, Trails, Tourist Facilities, Garden Maintenance, Garden Personnel, Garden Information, Garden Annoyances, Garden Facilities and Visitor Satisfaction and the

coefficient is 0.930. The result indicated that the instruments were reliable as the reliability coefficient was more than 0.700.

Table 3.1

Test of Reliability

Reliability Statistics	
Cronbach's Alpha	N.o of Items
.929	56

3.6 Research Instrument

For the purpose of studying the objectives and testing the hypotheses, structure questionnaire was used as an instrument to collect the data. The questionnaire for the tourists has been divided into three aspects so as to fulfill the objectives of the respondents. The first section captures the demographic characteristics and second section captures about the tourism impacts. and the third section captures the visitor satisfaction of Botanical Garden, Ooty.

3.7 Sampling Design

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or a procedure the researcher would adopt in selecting item for the sample. Sample design deals with the method of selecting item to be observed with the given study. Sample design is determined before data are collected.

3.8 Sample Size

The sample size refers to the number of items to be selected from the universe to constitute a sample. The sample size for the study is 520. The people who were visiting the botanical garden were considered for the study.

3.9 Sampling procedure

The present study followed convenient sampling; those who were willing to co-operate and participate in the survey were alone approached and questionnaires were distributed.

3.10 Period of the Study

The data used for the purpose of analysis in this study was collected from Jan 2019 to May 2019.

3.11Tools used for Analysis:

3.11.1 Frequencies

A frequency distribution is a tabular representation of a survey data set used to organize and summarize the data. It is a list of either qualitative or quantitative values that a variable takes in a data set and the associated number of times each value occurs. The frequency distribution is the basic building block of statistical analytical methods and the first step in analyzing survey data. It helps researchers (a) organize and summarize the survey data in a tabular format, (b) interpret the data, and (c) detect outliers in the survey data set.

3.11.2 Mean

Mean, also known as arithmetic average, is the most common measure of central tendency and may be defined as the value which we get by dividing the total of the values of various given items in a series by the total number of items can be worked out as:

$$\text{Mean (or } X)^{*} = \frac{\sum Xi}{nn} = \frac{X1+X2+\ldots..+Xn}{}$$

Where X = the symbol we use for mean (pronounced as X bar)

$\sum$= Symbol for summation

Xi = Value of the ith item X, i = 1, 2… n

n = total number of items

Mean is the simplest measurement of central tendency and is a widely used measure. Its chief use consists in summarizing the essential features of a series and in enabling data to be compared. It is amenable to algebraic treatment and is used in further statistical calculations. It is a relatively stable measure of central tendency.

3.11.3 FACTOR ANALYSIS

Factor analysis seeks to resolve a large set of measured variable in term of relatively few categories known as factors. This technique allows to group variables into factors so derived may be treated as new variables and their value derived by summing the values of the original variables which have been grouped into the factor.

3.11.4 ANOVA

Analysis of variance (ANOVA) is an extremely useful technique concerning researches in the fields of economics, biology, education, psychology, sociology, business or industry and in researches of several other disciplines. This technique is used when multiple sample cases are involved. The basic principle of ANOVA is to test for differences among the means of the populations by examining the amount of variation within each of these samples, relative to the amount of variation between the samples. In terms of variation within the given population, it is assumed that the values of (Xij) differ from the mean of this population only because of random effects i.e., there are influences on (Xij) which are unexplainable, whereas in examining differences between populations we assume that the difference between the mean of the jth population and the grand mean is attributable to what is called a 'specific factor' or what is technically described as treatment effect.The one-way ANOVA, we consider only one factor and then observe that the reason for said factor to be important is that several possible types of samples can occur within that factor.All factors other than the one or more being tested are effectively controlled. This, in other words, means that we assume the absence of many factors that might affect our conclusions concerning the factors to be studied. In short, we have to make two estimates of population variance viz., one based on between samples variance and the other based on within samples variance. Then the said two estimates of population variance are compared with F-test, wherein we work out.

$$F \sum \frac{\text{Estimate of population variance based on between samples variance}}{\text{Estimate of population variance based on within samples variance}}$$

We then determine if there are differences within that factor. The technique involves the following steps:

(i) Obtain the mean of each sample i.e., obtain

X1, X2, X3, ..., Xk

when there are k samples.

(ii) Work out the mean of the sample means as follows:

$$X=\frac{X_1+X_2+X_3+\ldots\ldots+X_K}{\text{No.of Samples (k)}}$$

3.11.5 REGRESSION

Regression is the determination of a statistical relationship between two or more variables. In simple regression, we have only two variables, one variable (defined as dependent) is the cause of the behavior of another one (dependent as dependent variable). Regression can only interpret what exists physically i.e., there must be a physical way in which independent variable X can affect dependent variable Y. The following formula is used for calculating regession

Y=a+Bx

Where as

Y=Dependent variable

X= Independent variable

a= Constant variable

b=Constant variable

3.12 LOCATION OF THE STUDY AREA:

Ooty or Udhagamandalam known as 'the queen of hill stations' is a capital town of district Nilgiris in Tamil Nadu, India. It was originally occupied by Todas, and ruled by East India Company before Independence of India. Ooty is the most popular hill station in South India, located in Western Ghats at the height of 2240 meter. Ooty is said to be one of the most beautiful places in South India. This place is well known for coffee and tea plantations, tree species like Conifers, Eucalyptus, Pine and Wattle dot. Not only modernizing, British constructed the first railway line in this hill station and made Ooty as Summer Capital of Madras

Presidency. Originally occupied by the Toda, the area came under the rule of the East India Company at the end of the 18th century. The economy is based on tourism and agriculture, along with the manufacture of medicines and photographic film. The town is connected by the Nilgiri ghat roads and Nilgiri Mountain Railway. Its natural environment attracts tourists and it is a popular summer destination. As of 2011, the town had a population of 88,430.

3.12.1 ATTRACTION TAKEN FOR THE STUDY:

3.12.1.1 GOVERNMENT BOTANICAL GARDEN, OOTY:

The Government Botanical Garden is a botanical garden in Udhagamandalam, near Coimbatore (Ooty), Tamil Nadu state, India laid out in 1848. The Gardens, divided into several sections, cover an area of around 55 hectares, and lie on the lower slopes of Doddabetta peak. The garden has a terraced layout. It is maintained by the Tamil Nadu Horticulture Department.

It ascends the slopes of the hill at an elevation of 2250–2500 meters above Sea Level. The garden enjoys a temperate climate, with an average rainfall of 140 cm, the most of which is received during south-west monsoon, with frosty nights from November to February. The maximum and minimum temperatures are 28 °C and 0 °C respectively.

3.12.1.2 COLLECTIONS

The Gardens have around thousand species, both exotic and indigenous, of plants, shrubs, ferns, trees, herbal and bonsai plants. In the centre of the Gardens lie a fossilized tree trunk estimated to be 20 million years old. Garden consist of several lawns with flowering plants, ponds with lilies, beds of flowers and ferns laid out in an Italian style, several plots of flowering plants, a variety of medicinal plants.

3.12.1.3 SECTIONS

The present Botanical Gardens are divided into 6 sections namely Lower Garden, New Garden, Italian Garden, Conservatory, Fountain Terrace and Nurseries.

3.12.1.4 LOWER GARDEN

The lower garden comprises the entrance and the lower lawns. The entrance of the garden leads into an extensive lush green lawn of Kikiyu grass (Pennisetum Clandestinum) which is known for its springy vigour. A fern house with 127 species of ferns is situated on the left along

the road leading to Raj Bhavan amidst another expanse of lawns and historic gatehouses. The prime attractions in this section are the carpet-bet design of the map of the Indian Union laid out with selective plants and the fossil trunk of 20 million years old, erected on a pedestal.

Tree species of botanical interest such as Hymnosporum flavum, Cordylline australlis, Cedrus deodara, Cupressus funebrils, Araucaria bidwillii, Cupressus macrocarpa, Cryptomeria japonica, Eucalyptus maculate, Eucalyptus citriodora, Salix babylonica, Salix heterophylla, Podocarpus taxifolia, Dracena lanuginosa, Pinus patula, Rhododendron arboreum, Quercus Montana, Quercus cerris, Quercus Serrata, Quercus grilffithi, Quercus illex, Magnolia grandiflora etc., can be seen alongside the lawn.

3.12.1.5 NEW GARDEN

The New garden developed recently, comprises the area between the front garden and the crescent-shaped pond at the bandstand. This section consists of:

- A rose garden with three hundred varieties of hybrid tea roses, Floribunda and polyanthas rose varieties.
- Large number of flowerbeds designed to match the slopes and contour of this area.
- Carpet-bed emblems of the Government of Tamil Nadu and the Government of India.
- Natural ponds with aquatic plants.

Important tree species such as Taxodium mucronatum, Pieris ovalifolia, Juniperus virginiana, Eucalyptus eugenoides, Pinus wallichiana, Photinia lindleyana, Pinus canaariensils, Ginkgo biloba, Araucaria cunninghammi and Cupressus lawsoniana are planted all over the section.

3.12.1.6 ITALIAN GARDEN

This garden was first laid out by Italian prisoners of World War I, who were shifted to Ooty. They were placed under the control of the military station in Ootacamund Ootacamund. Asters, ageratum, balsam, begonia, petunia, pansy, phlox, cosmos, zinnia and perennial flowers like salvia, delphinium, larkspur, and dahlia are the main attraction in this garden.

The informal landscape of the garden from the entrance, merge into the formal fashioned beds laid out in an Italian pattern, surrounding the centrally situated octagonal bandstand. This part of the garden looks attractive with several varieties of colourful annuals. In the foreground,

is a crescent-shaped lily pond for growing several varieties of aquatic plant species. The tree species grown in this part of the garden are Prunus cerasoides, Saurauja nepaulensis, Grevillea hilliana, Aesculus punduana, Pinus sabineana, Cupressus torulosa, Syncarpia glomulifera, Pinus roxburghii, Albizzia julibrissin etc.

3.12.1.7 THE CONSERVATORY

The public conservatory was constructed in 1912 with the objective of grouping various flowering plants. Colorful annuals and perennials like Cineraria, Schizanthus, Calceolaria, Balsam, Cyclamen, Gloxinia, Tuberousbegonia, Coleus Geranium, Chrysanthemum, Primulas, Tydea, Achemenes etc., find a place in this conservatory. The bog garden lies towards the east of this conservatory and forms an adjunct to provide a good site for marsh loving plants such as the Weeping willow, Hedychium, Arum, Hydrangea etc.

3.12.1.8 THE NURSERIES

The nurseries which are about 300 feet above the lower lawns consist of eight glass-houses and a series of terraces for introduction and breeding of exotic plants. The glass-houses are utilized for growing Begonias, Ferns, Cacti, Succulents, Orchids and Bulbous plants for providing a continuous supply of potted plants to be grouped periodically in the conservatories. The terraces are utilised for growing plants for cut flowers, seed and also for trial purposes.

3.12.1.9 THE FLOWER SHOW

The first Flower Show was organised in the year 1896 by the Chairman of Nilgiris Agri-Horticultural Society, Mr.J.H.Tremenhere, the then Collector of Nilgiris. The Government has taken over the flower show from the Nilgiris Agri-horticultural society in 1980 by forming a committee called the Nilgiris Flower and Fruit Show Committee. The flower show attracts about 150,000 tourists each year from all over the world.

The flower show is held for two days. The inauguration of the show is held on the first day and on the second day, prizes are distributed to winners of various competitions held in connection with flower show. About 250 exhibitors participate in different categories on the day of flower show. Several government departments and voluntary agencies also display their activities for the benefits of the flower lovers and tourists.

More than 50 varieties of potted plants, 150 varieties of cut flowers, various kinds of tropical and temperate vegetables and tropical and temperate fruits are exhibited by the competitors. The Floral decorations, Indian and Japanese flower arrangements, Vegetable carving, Flower Rangoli, Bonsai etc., are the major attractions during the show days. The exclusive cut flower stalls from large private and public gardens are also an attraction during the show days. 59 rolling cups, 250 cups and cash prizes are awarded to the best competitors and exhibitors.

A garden competition is also held involving Estate Gardens, Private Cottage Gardens, Public Gardens and various other categories of gardens, to create greater awareness among flower growers. On an average, about 200 gardens compete in the event. Garden competition is held prior to the flower show and best gardens are awarded prizes and cups.

OOTY BOTANICAL GARDEN –DISTANCE, ENTRY FEE, TIMING, ADDRESS, OFFICIAL WEBSITE

Table 3.2

Distance from Coimbatore :	84 kms or 52.2 miles or 45.4 nautical miles
Address:	Vannarapettai, Ooty, The Nilgiris, Tamil Nadu - 643002
Entry Fee:	Entry fee for Adults : 40 Rs. Entry fee for Children : 20 Rs.
Timing:	Visiting Hours - 8.00 AM - 6.30 PM
Official Website:	http://nilgiris.nic.in/bot_garden.html
Photography allowed or not:	Allowed
Photography:	30 Rs.
Videography:	100 Rs.
Nearest railway station:	Lovedale Train Station
Best time of the year to visit	April, May & Sept.

CHAPTER - 4

ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the collected primary data. The analysis is based on the quantitative and qualitative data collected by the researcher. Convenience sampling method was adopted to collect the needed primary data. A well-structured questionnaire was issued to all the 520 respondents and finally found to be valid in every respect of the study. Thus the response rate was at 90 per cent. The sample for the study is 520 respondents the tourists who visit's Ooty, Botanical Garden were taken for primary data collection. The analysis was carried out using IBM Statistical Package for the Social Sciences (SPSS) 21 version for windows. Frequencies, Mean, Factor analysis and ANOVA have been used appropriately. QGIS software has been used to represent the zones in botanical garden in the form of maps.

The results of the present study entitled **"A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty"** are discussed and presented under the following heads:

1. Demographic profile of the tourists in frequencies shows their socio-economic profile.
2. Mean scores on the factors of Attributes, General management, Tourist routes, Rest camps and campsites, Trails, Tourist facilities, Garden maintenance, Garden personnel, Garden information, Garden annoyances, Garden facilities, and Visitor satisfaction.
3. Factor Analysis to find the various dimensions of environmental impacts.
4. ANOVA: Demographic factors (age, place of origin, education, occupation, family members working, No. of children, monthly income, mode of travel, source of information, reason to visit, accompanied by, before visit, timing of visit, part visited, frequency of visit and activities engaged) Vs. Attributes, General management, Tourist routes, Rest camps and campsites, Trails, Tourist facilities, Garden maintenance, Garden personnel, Garden information, Garden annoyances, Garden facilities, and Visitor satisfaction.
5. Regression analysis: Environmental impacts of tourism and visitor satisfaction for sustainable development of botanical garden.

Table 4.1 Demographic Profile of the Respondents (Tourists)

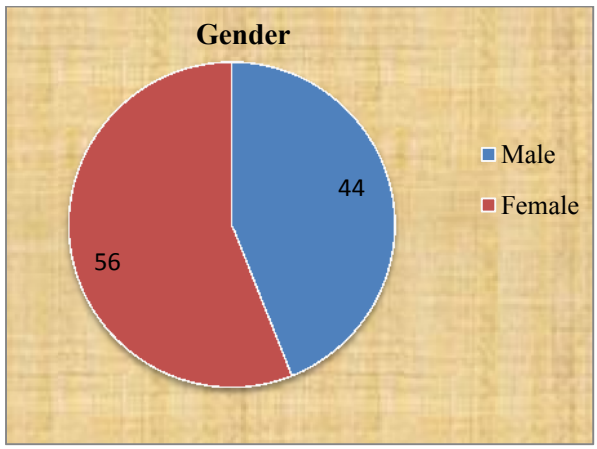
Variables	Particulars	Percentage
Gender	Male Female	44.0 **56.0**
Age Group	16 to 25 years 26 to 35 years 36 to 45 years 46 to 55 years above 55 years	**41.5** 41.2 11.2 2.3 3.8
Place of Origin	Tamilnadu Kerala Andhra Pradesh Karnataka North India North East Foreign Country	**41.3** **41.1** 7.7 2.9 1.5 4.2 1.0
Education	Up to SSLC HSC Graduation Post Graduation	13.7 **34.2** 37.1 15.0
Occupation	Student Government Private Self-employed Unemployed Retired	**31.0** 16.9 18.8 14.8 15.0 3.5
Marital status	Single married	46.2 **53.8**
Other Family Member Working	Spouse father mother others	19.8 **46.0** 20.8 13.5
Family type	Nuclear family	**52.1**

Variables	Particulars	Percentage
	joint family	47.9
No of Children	One two more than two none	10.2 20.8 22.9 **46.2**
Monthly Income	below 20,000 20,000-40,000 41,000-60,000 60,000-1,00,000 1,00,000 above	23.7 **43.1** 13.1 5.4 14.8
Mode of Travel	Car Bus Toy train Others	31.9 **33.8** 32.1 2.1
Know about Tourist Destination	the internet friends and relatives Media travel agency Others	24.8 **65.4** 6.2 3.3 .4
Accompanying with Tourist Destination	no one family and /or relatives Friends business partners Other	10.8 10.4 **30.8** 23.3 24.8
Times Visited the Destination	first time visitor visited 2-5 times 5 times and more	13.8 **69.4** 14.6
Reason for Visiting the Destination	rest and relaxation leisure business reason others	45.2 **50.8** 2.9 1.2

Variables	Particulars	Percentage
Part Visited in the Attraction	lower garden	20.6
	new garden	**55.8**
	Italian garden	8.7
	fountain	5.0
	conservatory	3.1
	terrace and nurseries	6.9-
Visiting Other Attractions	yes	**76.0**
	no	24.0
Frequently Visiting Other Attractions	once in a month	11.2
	once in 3 months	35.2
	once in 6 months	7.5
	once in one year	11.5
	not frequently or only occasionally	**34.6**
Frequency of Revisiting Botanical Garden	yes	**64.4**
	no	22.1
	maybe not sure	13.5
Activities engaged in Botanical Garden	sightseeing	23.1
	natural education	**53.5**
	photography	20.2
	picnic	2.1
	others	1.2
Tourists Presence Having any Negative Impacts in Botanical Garden	yes	22.3
	no	**60.0**
	maybe not sure	17.7

Source: Primary data

Fig 4.1



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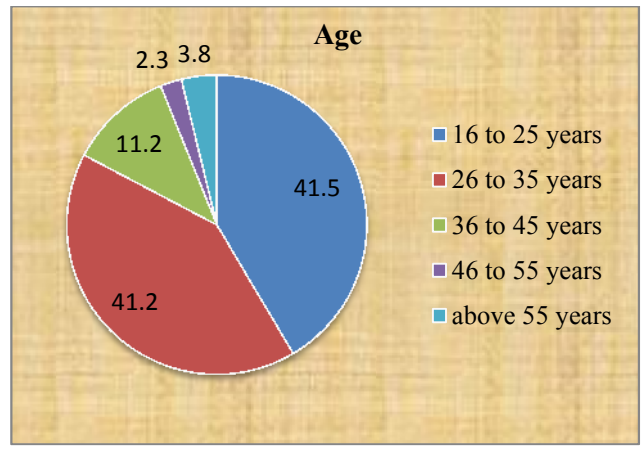

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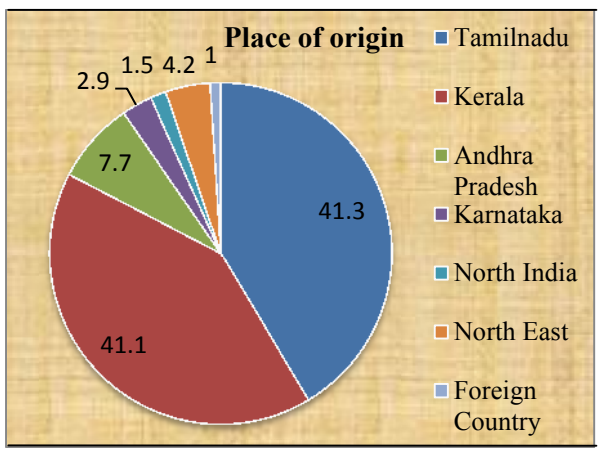

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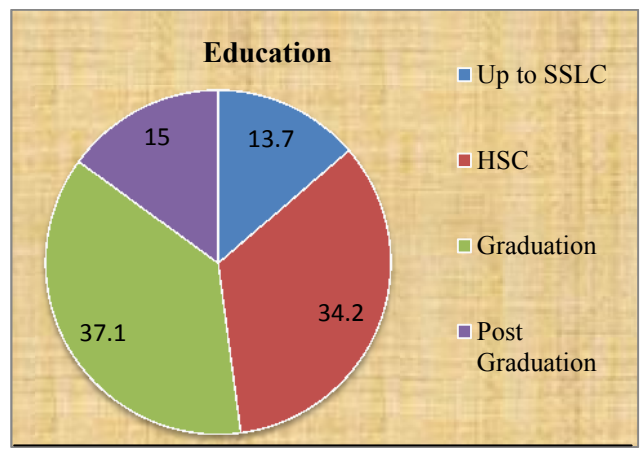

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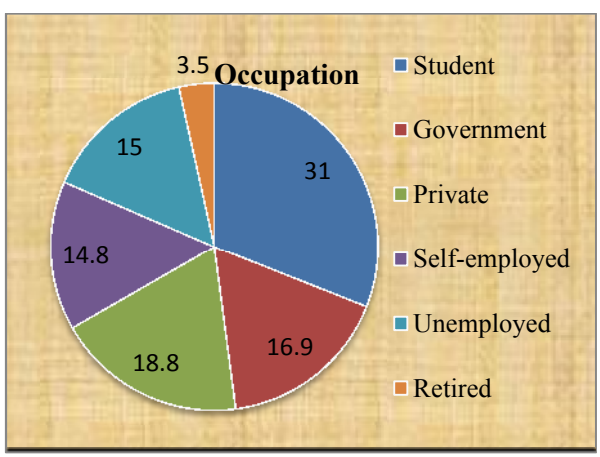

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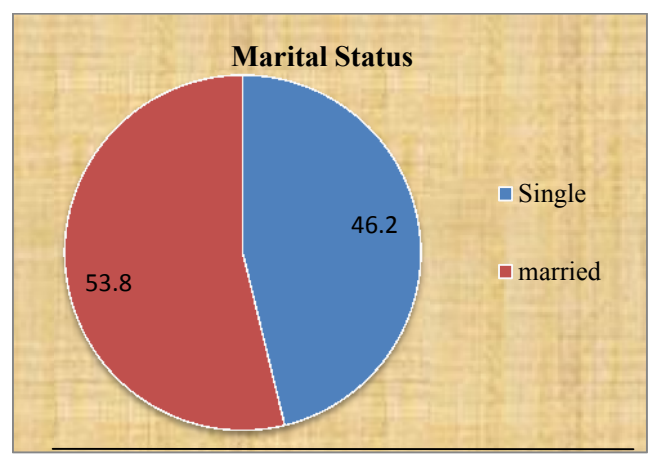

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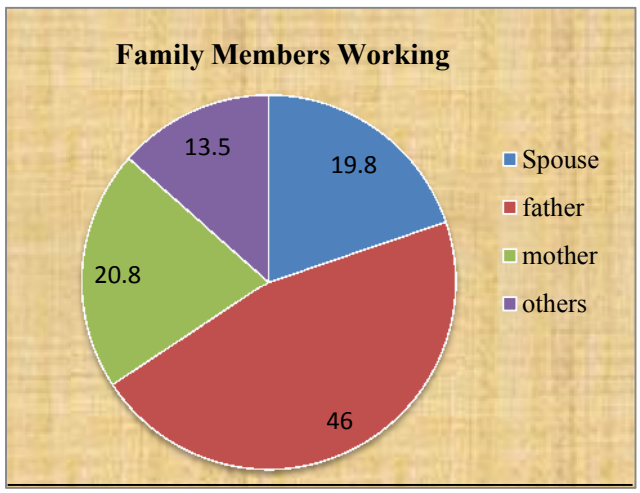

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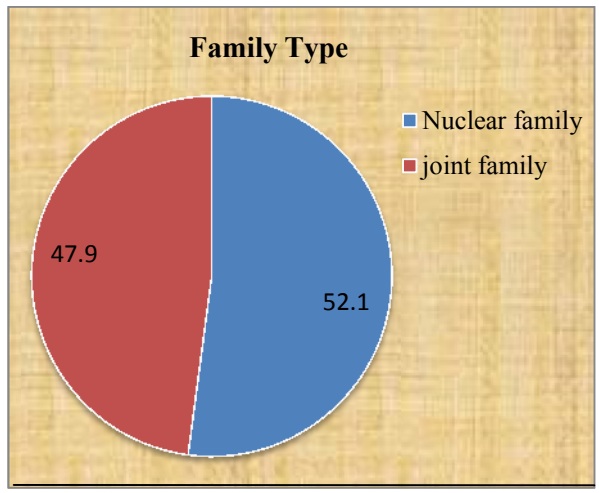

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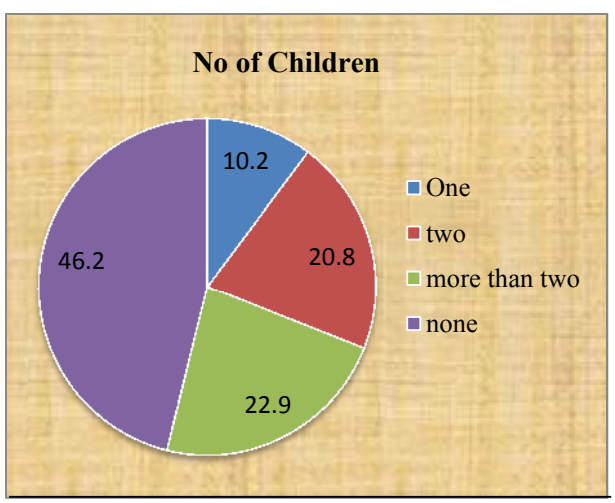

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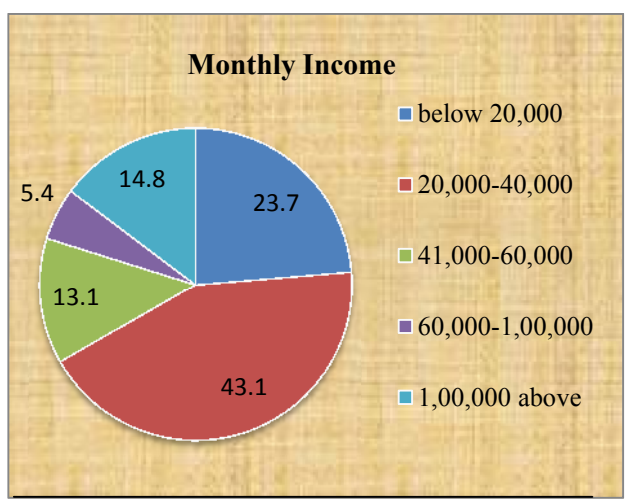

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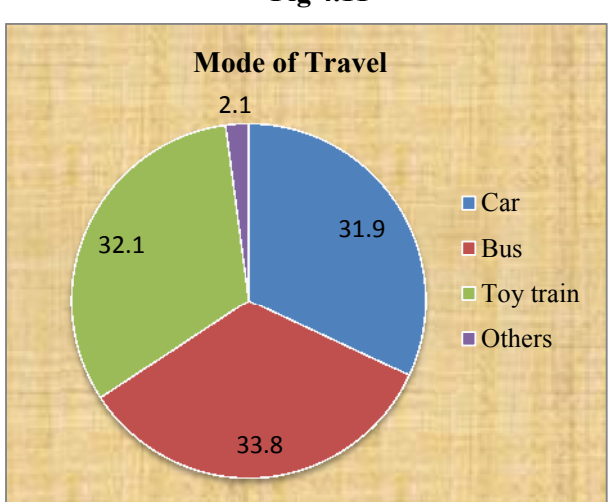

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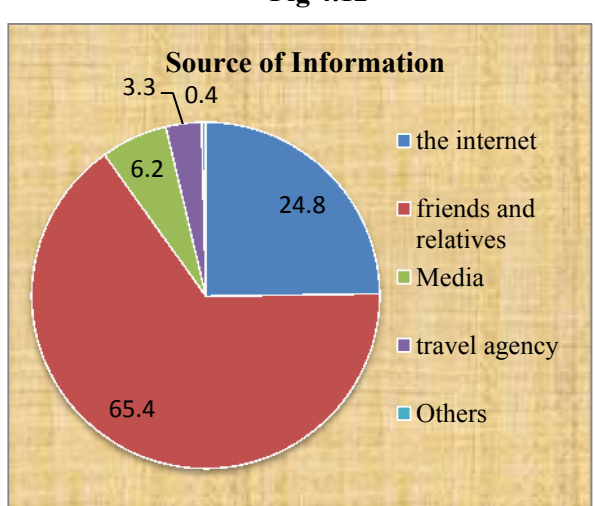

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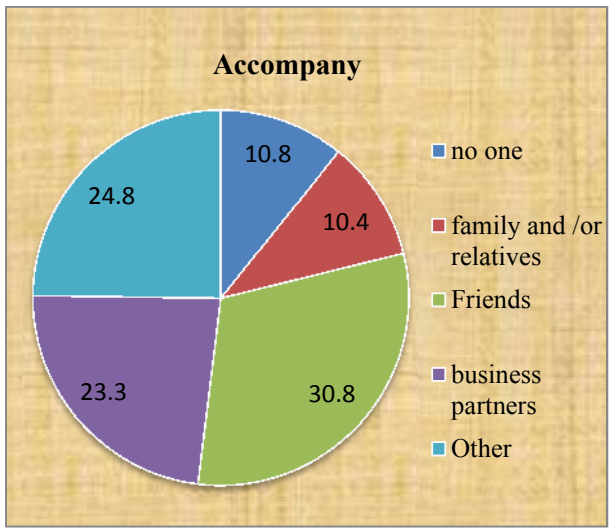

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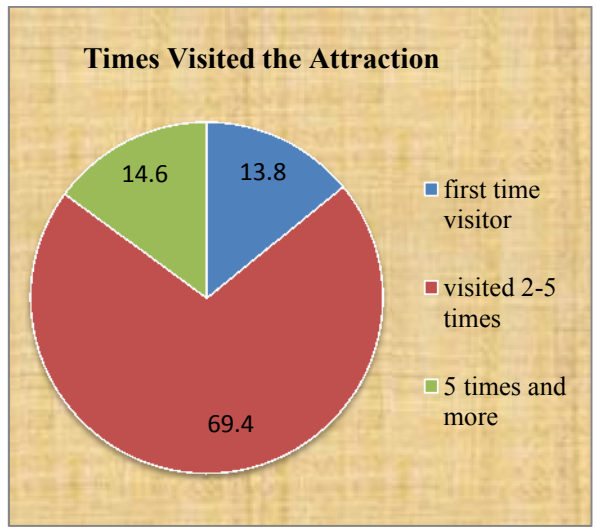

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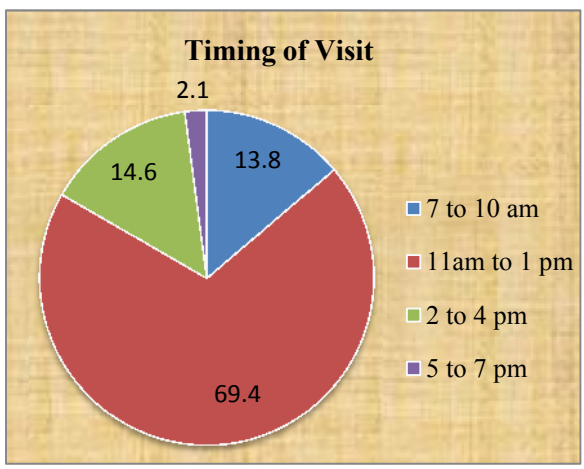

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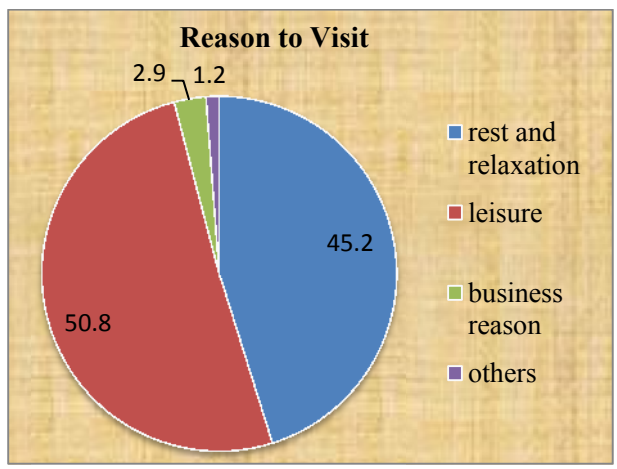

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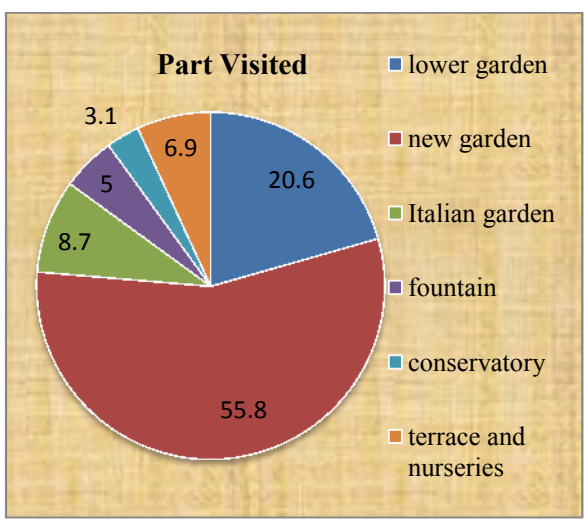

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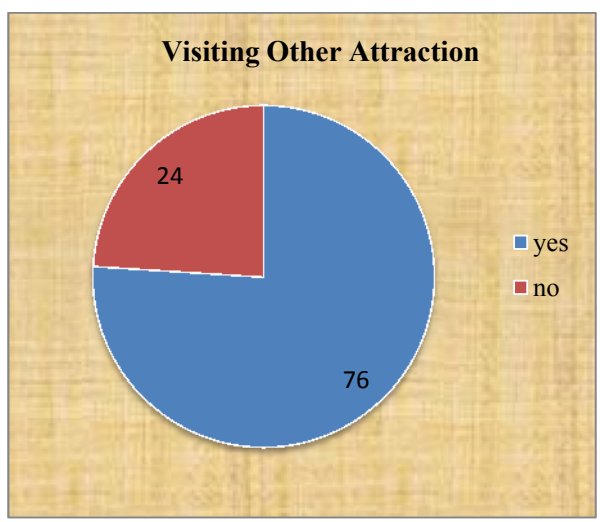

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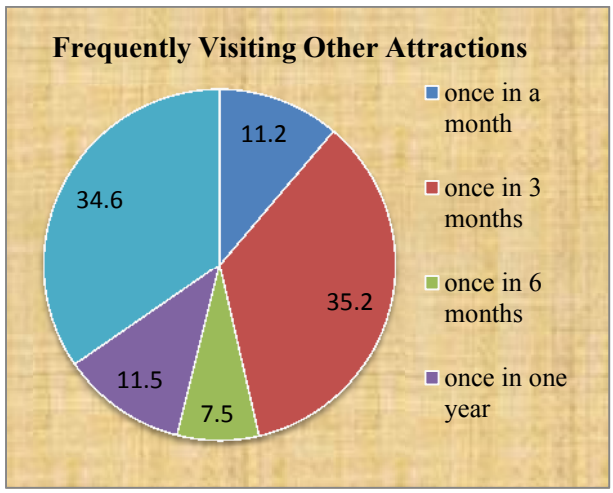
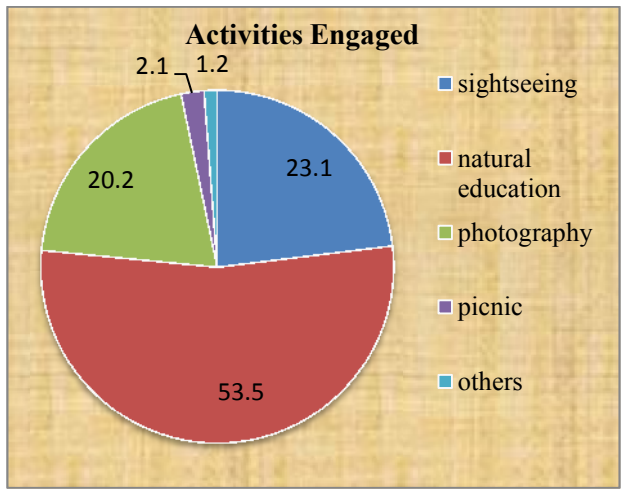


Fig 4.20



The above table depicts that 56.0 percent of the visitors were female. It is also interpreted that 41.3 percent of the visitors were from Tamil Nadu. Table inferred that 34.2 percent of the visitors have completed Higher Secondary. From the occupation wise distribution, it can be inferred that 31.0 of the respondents were students. It is also interpreted that 53.8 percent of the respondents were married. It is inferred from other family members working that 46.0 percent of the respondent's fathers were working. It is also interpreted that 52.1 percent of the respondents were living in a nuclear family. It is also inferred that 46.2 percent of the respondents were having no children. It is also interpreted that, monthly income of the visitors 43.1 percent of the respondents were earning 20,000-40,000. Table also depicts that 33.8 percent of the visitors travelled to the destination through bus. It is also interpreted that 65.4 percent of the respondents came to know about this attraction through friends and relatives. From the table it is identified that 30.8 percent of the visitors are accompanied by their friends to the attraction. It is also inferred that, timing of visit to the garden 69.4 percent of the visitors visits the garden during 11am to 1pm. The above table also depicts that 50.8 percent of the visitors primary purpose were leisure. It is also inferred that 55.8 percent of the visitors spend more time in new garden in botanical garden. From the visit to the other attractions in Ooty 76.0 percent of visitors will visit other attractions. From frequent visit to other parks 34.6 percent of the visitors will visit not frequently or occasionally. It is also interpreted that 64.4 percent of the respondents will revisit the garden. It is inferred that 53.5 percent of the visitors were engaged in natural education activity in botanical garden. It is also interpreted that 60.0 percent of the visitors said that their presence will not have any negative impacts in botanical garden.

4.2 Descriptive Statistics

Table 4.2.1 Descriptive statistics for Attributes

Attributes	N	Minimum	Maximum	Mean
Nature and Ecology	520	1.00	5.00	**4.75**
Small Number of visitor	520	1.00	5.00	3.77
Free entrance into the garden	520	1.00	5.00	**3.73**
Recreation activities	520	1.00	5.00	3.88
Facilities provide in the garden	520	1.00	5.00	3.97

Source: Primary data

The above table shows the Descriptive statistics on the factors of Attributes. The values range from 4.75 to 3.73. Which shows that the visitors perceive the nature and ecology, small number of visitors, free entry, recreation activities and facilities in the garden are important. Nature and Ecology has the highest mean value of 4.75 were as free entrance in to the garden has the lowest mean value of 3.73. This shows that the Attributes, Nature and Ecology are considered as important with respect to environment of their visit to the botanical garden.

Table 4.2.2 Descriptive statistics for General Management

General Management	N	Minimum	Maximum	Mean
Level of Litter is minimum	520	1.00	5.00	**4.45**
Insufficient management of waste(for eg: lack of recycling measures)	520	1.00	5.00	3.64
Lack of energy saving measures(for eg:solar panels)	520	1.00	5.00	3.68
Inadequate water saving measures	520	1.00	5.00	**3.30**
Level of noise in the garden is low	520	1.00	5.00	3.69
The general management of the garden is good	520	1.00	5.00	3.77
Inappropriate waste management- absence of recycling waste bins	520	1.00	5.00	3.58
Too many tourists in the garden at a given time	520	1.00	5.00	3.65
Not printing brochures and information booklets on recycled paper	520	1.00	5.00	3.46

Source: Primary data

The above table shows the Descriptive statistics on the factors of General Management. The values range from 4.45 to 3.30. Level of litter is minimum has the highest mean value of 4.45 were as inadequate water saving measures has the lowest mean value of 3.30. This shows that in General Management, visitors feels that there is medium level of maintenance in the garden.

Table 4.2.3 Descriptive statistics for Tourist Routes

Tourist Routes	N	Minimum	Maximum	Mean
Damage to natural vegetation due to uncontrolled tourist behavior	520	1.00	5.00	**4.28**
Erosion along routes due to tourists	520	1.00	5.00	3.64
Impacts of plant collecting along tourists routes	520	1.00	5.00	3.68
Introduction of alien plants and species due to tourism	520	1.00	5.00	**3.46**
Interference of breeding of wildlife due to tourism	520	1.00	5.00	3.69
Lack of environmental-friendly transport	520	1.00	5.00	3.77

Source: Primary data

The above table shows the Descriptive statistics on the factors of Tourist Routes. The values range from 4.28 to 3.46. Damage to natural vegetation due to uncontrolled tourist behavior has the highest mean value of 4.28 were as introduction of alien plants and species due to tourism has the lowest mean value of 3.46. This shows that Tourist Routes are damaged due to uncontrolled tourist behavior in the garden.

Table 4.2.4 Descriptive statistics for Rest Camps and Campsites

Rest Camps and Campsites	N	Minimm	Maximum	Mean
Damage to natural vegetation (in tourist areas) due to trampling	520	1.00	5.00	**4.32**
Erosion due to tourism development	520	1.00	5.00	3.60
Human made structure that are not eco-friendly	520	1.00	5.00	3.76
Wildlife attracted to rubbish bins (fir ex: baboons)	520	1.00	5.00	**3.55**
Camp layout not fitting into natural setting of the environment	520	1.00	5.00	3.65

Source: Primary data

The above table shows the Descriptive statistics on the factors of Rest Camps and Campsites. The values range from 4.32 to 3.55. Damage to natural vegetation (in tourist areas) due to trampling has the highest mean value of 4.32 were as wildlife attracted to rubbish bins (fir ex: baboons)has the lowest mean value of 3.55. This shows that in Rest Camps and Campsites there is damage by tourists in the garden.

Table 4.2.5 Descriptive statistics for Trails

Trails	N	Minimum	Maximum	Mean
Speeding of tourists on routes	520	1.00	5.00	**4.32**
Dust caused by tourist vehicles along routes	520	1.00	5.00	3.74
Tourists using too much artificial lights	520	1.00	5.00	3.68
Erosion along trails	520	1.00	5.00	3.69
Impacts of flower collecting by tourists	520	1.00	5.00	3.60
Introduction of alien plants and species (by tourists)		1.00	5.00	**3.54**
Design of track and trail does not fit into the surrounding and natural environment		1.00	5.00	3.57

Source: Primary data

The above table shows the Descriptive statistics on the factors of Trails. The values range from 4.32 to 3.54. Speeding of tourists on routes has the highest mean value of 4.32 were as introduction of alien plants and species (by tourists) has the lowest mean value of 3.54. This shows that in Trails, speeding of tourists on routes is agreed by the tourists regarding impacts of tourism and tourists on the environment.

Table 4.2.6 Descriptive statistics for Tourist Facilities

Tourist Facilities	N	Minimum	Maximum	Mean
Waste spillage around waste bins by tourists	520	1.00	5.00	**4.25**
Interference of wildlife due to noise, cars, people	520	1.00	5.00	3.68
Overcrowding of people	520	1.00	5.00	3.71
Visual Pollution (for ex: signs and directions)	520	1.00	5.00	3.54
Use of non-renewable sources (for ex: plastics) by tourists.	520	1.00	5.00	**3.51**

Source: Primary data

The above table shows the Descriptive statistics on the factors of Tourist Facilities. The values range from 4.25 to 3.51. Waste spillage around waste bins by tourists has the highest mean value of 4.25 were as use of non-renewable sources (for ex: plastics) by tourists has the lowest mean value of 3.51. This shows that in Tourist Facilities, waste spillage by tourists has impacts of tourism and tourists on the environment.

Table 4.2.7 Descriptive statistics for Garden Maintenance

Garden Maintenance	N	Minimum	Maximum	Mean
The garden is clean and well maintained.	520	1.00	5.00	**4.59**
The garden does not show sign of Vandalism.	520	1.00	5.00	3.96
Restrooms are clean and in proper working order.	520	1.00	5.00	**3.87**
The natural environment of this garden is being protected.	520	1.00	5.00	3.92

Source: Primary data

The above table shows the Descriptive statistics on the factors of Garden Maintenance. The values range from 4.59 to 3.87. The garden is clean and well maintained has the highest mean value of 4.59 were as restrooms are clean and in proper working order has the lowest mean value of 3.87. This shows that in Garden Maintenance, the garden is clean and well maintained is agreed by the tourists regarding the satisfaction in botanical garden, Ooty.

Table 4.2.8 Descriptive statistics for Garden Personnel

Garden Personnel	N	Minimum	Maximum	Mean
The staff members were prompt and helpful.	520	1.00	5.00	**4.30**
The staff members were courteous and friendly.	520	1.00	5.00	3.83
The staff members were available.	520	1.00	5.00	**3.75**

Source: Primary data

The above table shows the Descriptive statistics on the factors of Garden Personnel. The values range from 4.32 to 3.54. The staff members were prompt and helpful has the highest mean value of 4.30 were as the staff members were available has the lowest mean value of 3.75. This shows that in Garden Personnel, the staff members were prompt and helpful is agreed by the tourists regarding the satisfaction in botanical garden, Ooty.

Table 4.2.9 Descriptive statistics for Garden Information

Garden Information	N	Minimum	Maximum	Mean
The garden has enough direction signs (i.e., restrooms, parking).	520	1.00	5.00	**4.36**
There is enough available information (e.g., brochures about the garden at the entry station).	520	1.00	5.00	**3.86**

Source: Primary data

The above table shows the Descriptive statistics on the factors of Garden Information. The values range from 4.36 to 3.86. The garden has enough direction signs (i.e., restrooms, parking) has the highest mean value of 4.36 were as there is enough available information (e.g., brochures about the garden at the entry station has the lowest mean value of 3.86. This shows that in Garden Information, the garden has enough direction signs (i.e., restrooms, parking) are agreed by the tourists regarding the satisfaction in botanical garden, Ooty.

Table 4.2.10 Descriptive statistics for Garden Annoyances

Garden Annoyances	N	Minimum	Maximum	Mean
I was not bothered by pets that other visitors brought to the garden.	520	1.00	5.00	**4.32**
I was not bothered by inconsiderable people (rowdy, noisy)	520	1.00	5.00	3.85
The garden was not too crowded	520	1.00	5.00	**3.72**
I was not bothered by nuisance wild animals in the garden such as squirrels, insects were not a bother.	520	1.00	5.00	3.78

Source: Primary data

The above table shows the Descriptive statistics on the factors of Garden Annoyances. The values range from 4.32 to 3.72. I was not bothered by pets that other visitors brought to the garden has the highest mean value of 4.32 were as the garden was not too crowded has the lowest mean value of 3.72. This shows that in Garden Annoyances, visitors feels that there is minimum disturbances in botanical garden, Ooty.

Table 4.2.11 Descriptive statistics for Garden Facilities

Garden Facilities	N	Minimum	Maximum	Mean
There is adequate parking.	520	1.00	5.00	**4.20**
Trash containers are available.	520	1.00	5.00	3.77
Recycling containers are available.	520	1.00	5.00	3.95
Telephones are convenient.	520	1.00	5.00	**3.64**

Source: Primary data

The above table shows the Descriptive statistics on the factors of Garden Facilities. The values range from 4.20 to 3.64. There is adequate parking has the highest mean value of 4.20 were as telephones are convenient has the lowest mean value of 3.64. This shows that in Garden Facilities, there is adequate parking facilities in botanical garden, Ooty.

Table 4.2.12 Descriptive statistics for Visitor Satisfaction

Visitor Satisfaction	N	Minimum	Maximum	Mean
Overall, I am satisfied with my garden visit.	520	1.00	5.00	**4.44**
I would like to visit this garden again.	520	1.00	5.00	**4.12**

Source: Primary data

The above table shows the Descriptive statistics on the factors of Visitor Satisfaction. The values range from 4.44 to 4.12. Overall, I am satisfied with my garden visit. has the highest mean value of 4.44 were as i would like to visit this garden again has the lowest mean value of 4.12. This shows that in Visitor Satisfaction, is really good in botanical garden, Ooty.

Table 4.3

Factors of General Management

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.772
Bartlett's Test of Sphericity	Approx. Chi-Square	731.828
	df	36
	Sig.	.000

Source: Primary data

The KMO measures the sampling adequacy which is more than 0.5 where the researcher can proceed with the factor analysis. Bartlett's Test of Sphericity shows the strength of relationship among variables. The Bartlett's Test of Sphericity is significant which means the null hypothesis is rejected.

Table 4.3.1

Total Variance Explained									
Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.849	31.660	31.660	2.849	31.660	31.660	2.027	22.521	22.521
2	1.190	13.222	44.882	1.190	13.222	44.882	1.781	19.783	42.305
3	1.040	11.560	56.442	1.040	11.560	56.442	1.272	14.137	56.442
4	.872	9.692	66.133						
5	.786	8.731	74.865						
6	.660	7.334	82.199						
7	.574	6.373	88.571						
8	.538	5.982	94.553						
9	.490	5.447	100.000						
Extraction Method: Principal Component Analysis.									

Source: Primary data

From the above table it is understood that it has been separated into three factors where the first factor has the eigen value of 31.660, second factor has an eigen value of 13.222and third factor has an eigen value of 11.560.

Table 4.3.2

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	2.849	31.660	31.660
2	1.190	13.222	44.882
3	1.040	11.560	56.442
4	.872	9.692	66.133
5	.786	8.731	74.865
6	.660	7.334	82.199
7	.574	6.373	88.571
8	.538	5.982	94.553
9	.490	5.447	100.000
Extraction Method: Principal Component Analysis			

Source: Primary data

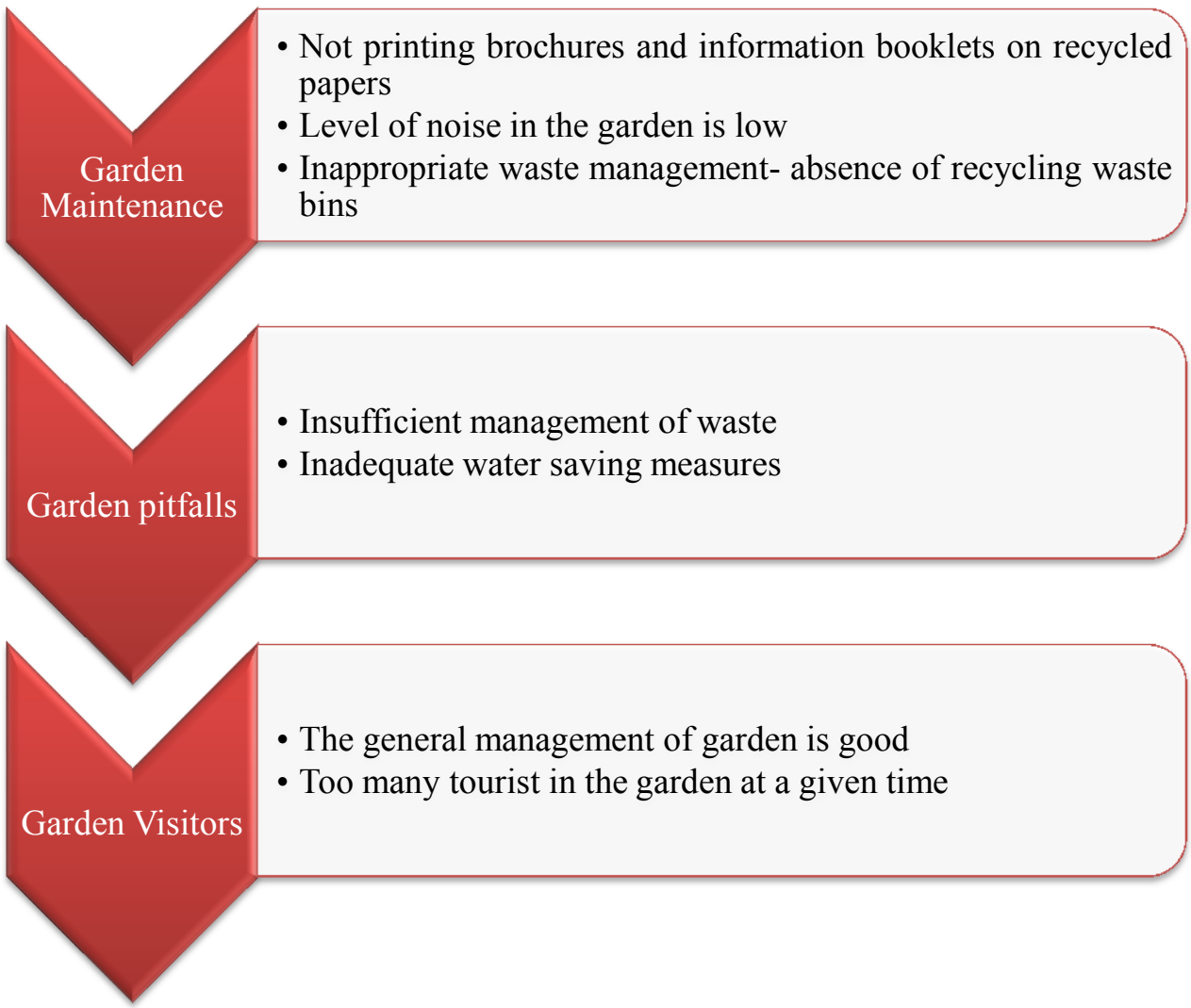
The about table shows the Eigen value. The first component has an Eigen value of 2.84 and the percentage of variance is 31.66. The second component has an Eigen value of 1.19 and the percentage of variance is 13.22. The third component has an Eigen value of 1.04 and the percentage of variance is 11.56 .The fourth component has an Eigen value of .872 and the percentage of variance is 9.69. The fifth component has an Eigen value of .786 and the percentage of variance is 8.73.The sixth component has an Eigen value of .660 and the percentage of variance is 7.33 .The seventh component has an Eigen value of .574 and the percentage of variance is 6.37. The eighth component has an Eigen value of .538 and the percentage of variance is 5.98.The ninth component has an Eigen value of .490 and the percentage of variance is 5.44.

Table 4.3.3

	Rotated Component Matrix[a]			
		Component		
		1	2	3
Garden Maintenance	not printing brochures and information booklets on recycled papers	.724		
	level of noise in the garden is low	.690		
	inappropriate waste management-absence of recycling waste bins	.679		
Garden pitfalls	insufficient management of waste		.840	
	inadequate water saving measures		.780	
Garden Visitors	the general management of garden is good			.763
	too many tourist in the garden at a given time			.631
	Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			

Source: Primary data

Fig:4.21



Source: Primary data

The above table it is found that garden management has been separated into three factors. First factor is named as garden maintenance which consists of components such as not printing brochures on recycled papers, level of noise is low, inappropriate waste management and absence of recycling waste bins. Second factor is known as garden pitfalls which consist of components such as insufficient management of waste, inadequate water saving measures. Third factor is known as garden visitors which consist of components such as general management of garden is good and too many tourists in the garden at a given time.

4.4 ANOVA Analysis- Demographics characteristics Vs Environmental Impacts and Visitor Satisfaction

4.4.1 Place of Origin Vs Environmental Impacts and Visitor Satisfaction

H_{0}- There is no significant difference between the factors of Rest camps with the place of origin of the respondents.

Table 4.4.1 Place of Origin Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	6	33.217	3.681	.001	Rejected**
	Within Groups	513	9.024			
	Total	519				
General management	Between Groups	6	115.127	4.287	.000	Rejected**
	Within Groups	513	26.852			
	Total	519				
Tourist routes	Between Groups	6	40.292	2.742	.012	Rejected**
	Within Groups	512	14.697			
	Total	518				
Rest camps	Between Groups	6	14.047	1.242	.283	Accepted
	Within Groups	513	11.312			
	Total	519				
Trails	Between Groups	6	98.007	4.674	.000	Rejected**
	Within Groups	513	20.969			
	Total	519				
Tourist facilities	Between Groups	6	30.528	2.347	.030	Rejected**
	Within Groups	513	13.006			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden maintenance	Between Groups	6	23.948	4.167	.000	Rejected**
	Within Groups	513	5.747			
	Total	519				
Garden personnel	Between Groups	6	13.800	2.776	.012	Rejected**
	Within Groups	513	4.972			
	Total	519				
Garden information	Between Groups	6	4.958	2.503	.021	Rejected**
	Within Groups	513	1.981			
	Total	519				
Garden annoyances	Between Groups	6	21.491	2.903	.009	Rejected**
	Within Groups	511	7.402			
	Total	517				
Garden facilities	Between Groups	6	24.795	3.147	.005	Rejected**
	Within Groups	513	7.879			
	Total	519				
Visitor satisfaction	Between Groups	6	5.375	3.565	.002	Rejected**
	Within Groups	513	1.508			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level

From the above table, it can be interpreted that the factors such as Attributes, General management, Tourist routes, Trails, Tourist facilities, Garden Maintenance, Garden personnel, Garden information, Garden Annoyances, Garden Facilities and Visitor Satisfaction has reported F values that are significant. Therefore, the hypothesis $H_{0\ is}$ rejected which implies that there is a significant difference in mean values of the above mentioned factors with place of origin. Therefore it is clear that there is a difference among the group with different place of origin on their opinion on the above factors.

4.4.2 Education Vs Environmental Impacts and Visitor Satisfaction

H_{0}- There is no significant difference between the factors of Attributes, General management, Tourist facilities, Garden personnel, Garden information and Visitor Satisfaction with the Educational of the respondents.

Table 4.42 Education Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	3	15.065	1.625	.183	Accepted
	Within Groups	516	9.270			
	Total	519				
General management	Between Groups	3	98.312	3.580	.014	Rejected**
	Within Groups	516	27.463			
	Total	519				
Tourist routes	Between Groups	3	159.983	11.307	.000	Rejected**
	Within Groups	515	14.149			
	Total	518				
Rest camps	Between Groups	3	95.308	8.780	.000	Rejected**
	Within Groups	516	10.856			
	Total	519				
Trails	Between Groups	3	192.768	9.238	.000	Rejected**
	Within Groups	516	20.866			
	Total	519				
Tourist facilities	Between Groups	3	34.142	2.609	.051	Accepted
	Within Groups	516	13.086			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden maintenance	Between Groups	3	5.588	.938	.422	Rejected**
	Within Groups	516	5.959			
	Total	519				
Garden personnel	Between Groups	3	20.046	4.020	.008	Accepted
	Within Groups	516	4.987			
	Total	519				
Garden information	Between Groups	3	3.024	1.505	.212	Accepted
	Within Groups	516	2.010			
	Total	519				
Garden annoyances	Between Groups	3	45.667	6.219	.000	Rejected**
	Within Groups	514	7.343			
	Total	517				
Garden facilities	Between Groups	3	46.653	5.943	.001	Rejected**
	Within Groups	516	7.850			
	Total	519				
Visitor satisfaction	Between Groups	3	3.892	2.529	.057	Accepted
	Within Groups	516	1.539			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level

From the above table, it can be interpreted that the factors such as Tourist Routes, Rest Camps, Trails, Garden Maintenance, Garden Annoyances and Garden Facilities has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with Education. Therefore it is clear that there is a difference among the group with different educational on their opinion on the above factors.

4.4.3 Occupation Vs Environmental Impacts and Visitor Satisfaction

H_{0}- There is no significant difference between the factors of Attributes and Visitor Satisfaction with the Occupation of the respondents.

Table 4.4.3 Occupation Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	5	17.570	1.905	.092	Accepted
	Within Groups	514	9.223			
	Total	519				
General management	Between Groups	5	142.269	5.316	.000	Rejected**
	Within Groups	514	26.760			
	Total	519				
Tourist routes	Between Groups	5	91.408	6.415	.000	Rejected**
	Within Groups	513	14.249			
	Total	518				
Rest camps	Between Groups	5	58.771	5.401	.000	Rejected**
	Within Groups	514	10.882			
	Total	519				
Trails	Between Groups	5	73.316	3.433	.005	Rejected**
	Within Groups	514	21.359			
	Total	519				
Tourist facilities	Between Groups	5	64.717	5.093	.000	Rejected**
	Within Groups	514	12.707			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden maintenance	Between Groups	5	21.049	3.623	.003	Rejected**
	Within Groups	514	5.810			
	Total	519				
Garden personnel	Between Groups	5	13.548	2.714	.020	Rejected**
	Within Groups	514	4.991			
	Total	519				
Garden information	Between Groups	5	10.980	5.694	.000	Rejected**
	Within Groups	514	1.928			
	Total	519				
Garden annoyances	Between Groups	5	26.574	3.601	.003	Rejected**
	Within Groups	512	7.380			
	Total	517				
Garden facilities	Between Groups	5	28.452	3.613	.003	Rejected**
	Within Groups	514	7.876			
	Total	519				
Visitor satisfaction	Between Groups	5	3.283	2.138	.060	Accepted
	Within Groups	514	1.535			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level

From the above table, it can be interpreted that the factors such as General Management, Tourist routes, Rest Camps, Trails, Tourist facilities, Garden Maintenance, Garden personnel, Garden information, Garden Annoyances and Garden Facilities has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with Profession. Therefore it is clear that there is a difference among the group with different Occupation on their opinion on the above factors.

4.4.4 Purpose of visit Vs Environmental Impacts and Visitor Satisfaction

H_0- There is no significant difference between the factors of General management, Tourist Routes, Trails, Tourist facilities, Garden maintenance, Garden personnel and Garden annoyances with the purpose of visit.

Table 4.4.4 Purpose of visit Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	3	47.474	5.228	.001	Rejected**
	Within Groups	516	9.081			
	Total	519				
General management	Between Groups	3	46.673	1.681	.170	Accepted
	Within Groups	516	27.763			
	Total	519				
Tourist routes	Between Groups	3	9.063	.603	.613	Accepted
	Within Groups	515	15.028			
	Total	518				
Rest camps	Between Groups	3	8.910	.784	.503	Accepted
	Within Groups	516	11.358			
	Total	519				
Trails	Between Groups	3	35.298	1.621	.184	Accepted
	Within Groups	516	21.781			
	Total	519				
Tourist facilities	Between Groups	3	9.499	.718	.542	Accepted
	Within Groups	516	13.230			
	Total	519				
Garden maintenance	Between Groups	3	6.304	1.059	.366	Accepted
	Within Groups	516	5.955			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden personnel	Between Groups	3	8.548	1.691	.168	Accepted
	Within Groups	516	5.053			
	Total	519				
Garden information	Between Groups	3	9.633	4.886	.002	Rejected**
	Within Groups	516	1.971			
	Total	519				
Garden annoyances	Between Groups	3	7.305	.965	.409	Accepted
	Within Groups	514	7.567			
	Total	517				
Garden facilities	Between Groups	3	26.248	3.294	.020	Rejected**
	Within Groups	516	7.968			
	Total	519				
Visitor satisfaction	Between Groups	3	6.676	4.385	.005	Rejected**
	Within Groups	516	1.523			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level

From the above table, it can be interpreted that the factors such as Attributes, Rest Camps, Garden Information, Garden Facilities and Visitor Satisfaction has reported F values that are significant. Therefore, the hypothesis $H_{0\ is}$ rejected which implies that there is a significant difference in mean values of the above mentioned factors with purpose of visit. Therefore it is clear that there is a difference among the group with different purpose of visit on their opinion on the above factors.

4.4.5 Companionship Vs Environmental Impacts and Visitor Satisfaction

H_0- There is no significant difference between the factors of Attributes, Tourist Routes, Tourist facilities; Garden personnel, and Visitor satisfaction with companionship of the respondents.

Table 4.4.5 Companionship Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	4	19.951	2.164	.072	Accepted
	Within Groups	515	9.221			
	Total	519				
General management	Between Groups	4	107.445	3.942	.004	Rejected**
	Within Groups	515	27.255			
	Total	519				
Tourist routes	Between Groups	4	32.038	2.156	.073	Accepted
	Within Groups	514	14.861			
	Total	518				
Rest camps	Between Groups	4	52.192	4.733	.001	Rejected**
	Within Groups	515	11.027			
	Total	519				
Trails	Between Groups	4	130.079	6.189	.000	Rejected**
	Within Groups	515	21.019			
	Total	519				
Tourist facilities	Between Groups	4	19.155	1.455	.215	Accepted
	Within Groups	515	13.162			
	Total	519				
Garden maintenance	Between Groups	4	44.239	7.816	.000	Rejected**
	Within Groups	515	5.660			
	Total	519				
Garden personnel	Between Groups	4	9.966	1.979	.096	Accepted
	Within Groups	515	5.036			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden information	Between Groups	4	8.115	4.123	.003	Rejected**
	Within Groups	515	1.968			
	Total	519				
Garden annoyances	Between Groups	4	24.539	3.301	.011	Rejected**
	Within Groups	513	7.433			
	Total	517				
Garden facilities	Between Groups	4	43.489	5.576	.000	Rejected**
	Within Groups	515	7.799			
	Total	519				
Visitor satisfaction	Between Groups	4	4.217	2.753	.028	Rejected**
	Within Groups	515	1.532			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level,

From the above table, it can be interpreted that the factors such as General management, Rest Camps, Trails, Garden maintenance, Garden information, Garden Annoyances, Garden facilities and Visitor Satisfaction has reported F values that are significant. Therefore, the hypothesis $H_{0\ is}$ rejected which implies that there is a significant difference in mean values of the above mentioned factors with companionship. Therefore it is clear that there is a difference among the group with different companionship to visit on their opinion on the above factors.

4.4.6 Timing of Visit Vs Environmental Impacts and Visitor Satisfaction

H_0- There is no significant difference between the factors of General management, Rest camps, Trails, Tourist facilities, Garden personnel and Garden annoyances with timing of visit to the tourist attraction of the respondents.

Table 4.4.6 Timing of Visit Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups		25.587	2.779	.041	Rejected**
	Within Groups	516	9.209			
	Total	519				
General management	Between Groups	3	57.382	2.071	.103	Accepted
	Within Groups	516	27.701			
	Total	519				
Tourist routes	Between Groups	3	47.642	3.218	.023	Rejected**
	Within Groups	515	14.803			
	Total	518				
Rest camps	Between Groups	3	29.048	2.584	.053	Accepted
	Within Groups	516	11.241			
	Total	519				
Trails	Between Groups	3	16.877	.771	.511	Accepted
	Within Groups	516	21.888			
	Total	519				
Tourist facilities	Between Groups	3	17.903	1.358	.255	Accepted
	Within Groups	516	13.181			
	Total	519				
Garden maintenance	Between Groups	3	22.321	3.808	.010	Rejected**
	Within Groups	516	5.862			
	Total	519				
Garden personnel	Between Groups	3	10.897	2.162	.092	Accepted

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
	Within Groups	516	5.040			
	Total	519				
Garden information	Between Groups	3	21.876	11.513	.000	Rejected**
	Within Groups	516	1.900			
	Total	519				
Garden annoyances	Between Groups	3	17.995	2.398	.067	Accepted
	Within Groups	514	7.505			
	Total	517				
Garden facilities	Between Groups	3	98.713	13.080	.000	Rejected**
	Within Groups	516	7.547			
	Total	519				
Visitor satisfaction	Between Groups	3	7.228	4.758	.003	Rejected**
	Within Groups	516	1.519			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level,

From the above table, it can be interpreted that the factors such as Attributes, Tourist Routes, Garden Maintenance, Garden information, Garden facilities and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis $H_{0\ is}$ rejected which implies that there is a significant difference in mean values of the above mentioned factors with timing of visit . Therefore it is clear that there is a difference among the group with different timing of visit on their opinion on the above factors.

4.4.7 Part Visited Vs Environmental Impacts and Visitor Satisfaction

H_{0}- There is no significant difference between the factors of Tourist facilities and Garden annoyances with part visited on the tourist attraction of the respondents.

Table 4.4.7 Part Visited Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	5	26.050	2.850	.015	Rejected**
	Within Groups	514	9.140			
	Total	519				
General management	Between Groups	5	74.849	2.730	.019	Rejected**
	Within Groups	514	27.416			
	Total	519				
Tourist routes	Between Groups	5	71.232	4.931	.000	Rejected**
	Within Groups	513	14.445			
	Total	518				
Rest camps	Between Groups	5	30.722	2.754	.018	Rejected**
	Within Groups	514	11.155			
	Total	519				
Trails	Between Groups	5	62.039	2.890	.014	Rejected**
	Within Groups	514	21.469			
	Total	519				
Tourist facilities	Between Groups	5	28.986	2.220	.051	Accepted
	Within Groups	514	13.055			
	Total	519				
Garden maintenance	Between Groups	5	27.155	4.722	.000	Rejected**
	Within Groups	514	5.751			

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
	Total	519				
Garden personnel	Between Groups	5	15.027	3.019	.011	Rejected**
	Within Groups	514	4.977			
	Total	519				
Garden information	Between Groups	5	1.517	.751	.586	Accepted
	Within Groups	514	2.021			
	Total	519				
Garden annoyances	Between Groups	5	14.400	1.920	.089	Accepted
	Within Groups	512	7.499			
	Total	517				
Garden facilities	Between Groups	5	24.264	3.065	.010	Rejected**
	Within Groups	514	7.917			
	Total	519				
Visitor satisfaction	Between Groups	5	11.001	7.533	.000	Rejected**
	Within Groups	514	1.460			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level,

From the above table, it can be interpreted that the factors such as Attributes, General management, Tourist Routes, Rest camps, Trails, Tourist routes, Garden maintenance, Garden information, Garden maintenance, Garden personnel and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis $H_{0\ is}$ rejected which implies that there is a significant difference in mean values of the above mentioned factors with part visited in attraction . Therefore it is clear that there is a difference among the group with different part visited on their opinion on the above factors.

4.4.8 Frequently Visiting Other Attractions Vs Environmental Impacts and Visitor Satisfaction

H_0- There is no significant difference between none of the factors with frequently visiting other attraction of the respondents.

Table 4.4.8 Frequently Visiting Other Attractions Vs Environmental Impacts and Visitor Satisfaction-ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	4	43.775	4.845	.001	Rejected**
	Within Groups	515	9.035			
	Total	519				
General management	Between Groups	4	159.573	5.943	.000	Rejected**
	Within Groups	515	26.850			
	Total	519				
Tourist routes	Between Groups	4	93.028	6.466	.000	Rejected**
	Within Groups	514	14.386			
	Total	518				
Rest camps	Between Groups	4	58.554	5.334	.000	Rejected**
	Within Groups	515	10.977			
	Total	519				
Trails	Between Groups	4	167.331	8.072	.000	Rejected**
	Within Groups	515	20.730			
	Total	519				
Tourist facilities	Between Groups	4	51.690	4.004	.003	Rejected**
	Within Groups	515	12.909			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden maintenance	Between Groups	4	68.062	12.432	.000	Rejected**
	Within Groups	515	5.475			
	Total	519				
Garden personnel	Between Groups	4	24.160	4.905	.001	Rejected**
	Within Groups	515	4.925			
	Total	519				
Garden information	Between Groups	4	6.105	3.077	.016	Rejected**
	Within Groups	515	1.984			
	Total	519				
Garden annoyances	Between Groups	4	33.426	4.539	.001	Rejected**
	Within Groups	513	7.364			
	Total	517				
Garden facilities	Between Groups	4	32.414	4.111	.003	Rejected**
	Within Groups	515	7.885			
	Total	519				
Visitor satisfaction	Between Groups	4	8.697	5.810	.000	Rejected**
	Within Groups	515	1.497			
	Total	519				

Source: Primary data, * significance at 5 percent level, ** significance at 1 percent level

From the above table, it can be interpreted that the factors such as Attributes, General management, Tourist routes, Rest camps, Trails, Tourist facilities, Garden maintenance, Garden personnel, Garden information, Garden annoyances, Garden facilities and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis $H_{0\ is}$ rejected which implies that there is a significant difference in mean values of the above mentioned factors with frequently visiting other attractions in Ooty . Therefore it is clear that there is a difference among the group with frequently visiting other attractions on their opinion on the above factors.

4.4.9 Activities Engaged Vs Environmental Impacts and Visitor Satisfaction

H_0- There is no significant difference between the factor of General management with activities engaged on the tourist attraction of the respondents.

Table 4.4.9 Activities Engaged Vs Environmental Impacts and Visitor Satisfaction -ANOVA

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Attributes	Between Groups	4	38.631	4.257	.002	Rejected**
	Within Groups	515	9.075			
	Total	519				
General management	Between Groups	4	56.022	2.026	.090	Accepted
	Within Groups	515	27.654			
	Total	519				
Tourist routes	Between Groups	4	71.288	4.898	.001	Rejected**
	Within Groups	514	14.555			
	Total	518				
Rest camps	Between Groups	4	73.487	6.766	.000	Rejected**
	Within Groups	515	10.861			
	Total	519				
Trails	Between Groups	4	71.628	3.336	.010	Rejected**
	Within Groups	515	21.473			
	Total	519				
Tourist facilities	Between Groups	4	62.213	4.850	.001	Rejected**
	Within Groups	515	12.827			
	Total	519				
Garden maintenance	Between Groups	4	34.821	6.074	.000	Rejected**
	Within Groups	515	5.733			
	Total	519				

Environmental Impacts and Visitor Satisfaction		Df	Mean Square	F	Sig.	Null Hypothesis
Garden personnel	Between Groups	4	52.369	11.127	.000	Rejected**
	Within Groups	515	4.706			
	Total	519				
Garden information	Between Groups	4	11.865	6.119	.000	Rejected**
	Within Groups	515	1.939			
	Total	519				
Garden annoyances	Between Groups	4	54.269	7.536	.000	Rejected**
	Within Groups	513	7.202			
	Total	517				
Garden facilities	Between Groups	4	19.284	2.414	.048	Rejected**
	Within Groups	515	7.987			
	Total	519				
Visitor satisfaction	Between Groups	4	6.169	4.068	.003	Rejected**
	Within Groups	515	1.516			
	Total	519				

Source: Primary data, ** significance at 1 percent level, *significance at 5 percent level

From the above table, it can be interpreted that the factors such as Attributes, Tourist routes, Rest camps, Trails, Tourist facilities, Garden maintenance, Garden personnel, Garden information, Garden annoyances, Garden Facilities and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with activities engaged in attraction . Therefore it is clear that there is a difference among the group with different activities engaged on their opinion on the above factors.

REGRESSION

Table 4.5

Dependent Variable: General management (Y)

Independent variable: Tourist facilities (X1), Tourist routes (X2), Rest camps (X3), Trails (X4)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726	.527	.523	3.63869
a. Predictors: (Constant), Tourist facilities, Tourist routes, Rest camps, Trails				

Source: Primary data

ANOVA

Table 4.5.1

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7574.656	4	1893.664	143.025	.000**
	Residual	6805.391	514	13.240		
	Total	14380.046	518			
	a. Dependent Variable: General management					
	b. Predictors: (Constant), Tourist facilities, Tourist routes, Rest camps, Trails					

Source: Primary data

From the above table it is clear that R square value is 50 percent, therefore it is inferred that the four factors, Tourist facilities, Tourist routes, Rest camps and Trails which is found from the factor analysis contributes to the General management of the Botanical garden, Ooty.

Table 4.5.2

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.141	1.064		7.654	.000
	Tourist routes	.451	.058	.332	7.806	.000
	Rest camps	.275	.073	.176	3.776	.000
	Trails	.166	.056	.147	2.975	.003
	Tourist facilities	.302	.058	.209	5.189	.000
a. Dependent Variable: General management						

Source: Primary data

Since the R square value is 50 percent, it is inferred that the factors , Tourist facilities, Tourist routes, Rest camps and Trails which is found from the factor analysis and regression method has contribution to improve the General management in botanical garden, Ooty and it is also found the beta values for factor one is 0.33, beta values for factor two is 0.17, beta values for factor three is 0.14, beta values for factor four is 0.20, thus it is found that botanical garden General management is dependent on the above mentioned four factors.

Table 4.6

Dependent Variable: Visitor satisfaction (Y)

Independent variable: Garden facilities(X1), Garden information(X2), Garden maintenance (X3), Garden annoyances(X4), Garden Personnel(X5)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.574[a]	.329	.323	1.02481
a. Predictors: (Constant), Garden facilities, Garden information, Garden maintenance, Garden annoyances, Garden personnel				

Source: Primary data

ANOVA

Table 4.6.1

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	263.801	5	52.760	50.236	.000[b]
	Residual	537.722	512	1.050		
	Total	801.523	517			
a. Dependent Variable: Visitor satisfaction						
b. Predictors:(Constant),Garden facilities, Garden information, Garden maintenance, Garden annoyances, Garden personnel						

Source: Primary data

From the above table it is clear that R square value is 30 percent, therefore it is inferred that the five factors, Garden facilities, Garden information, Garden maintenance, Garden annoyances and Garden personnel. Which is found from the factor analysis contributes to the Visitor satisfaction of the Botanical garden, Ooty

Table 4.6.2

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.712	.345		10.746	.000
	Garden maintenance	.043	.024	.084	1.751	.081
	Garden personnel	.139	.030	.253	4.712	.000
	Garden information	-.012	.044	-.013	-.269	.788
	Garden annoyances	.057	.021	.126	2.686	.007
	Garden facilities	.108	.021	.248	5.167	.000
a. Dependent Variable: Visitor satisfaction						

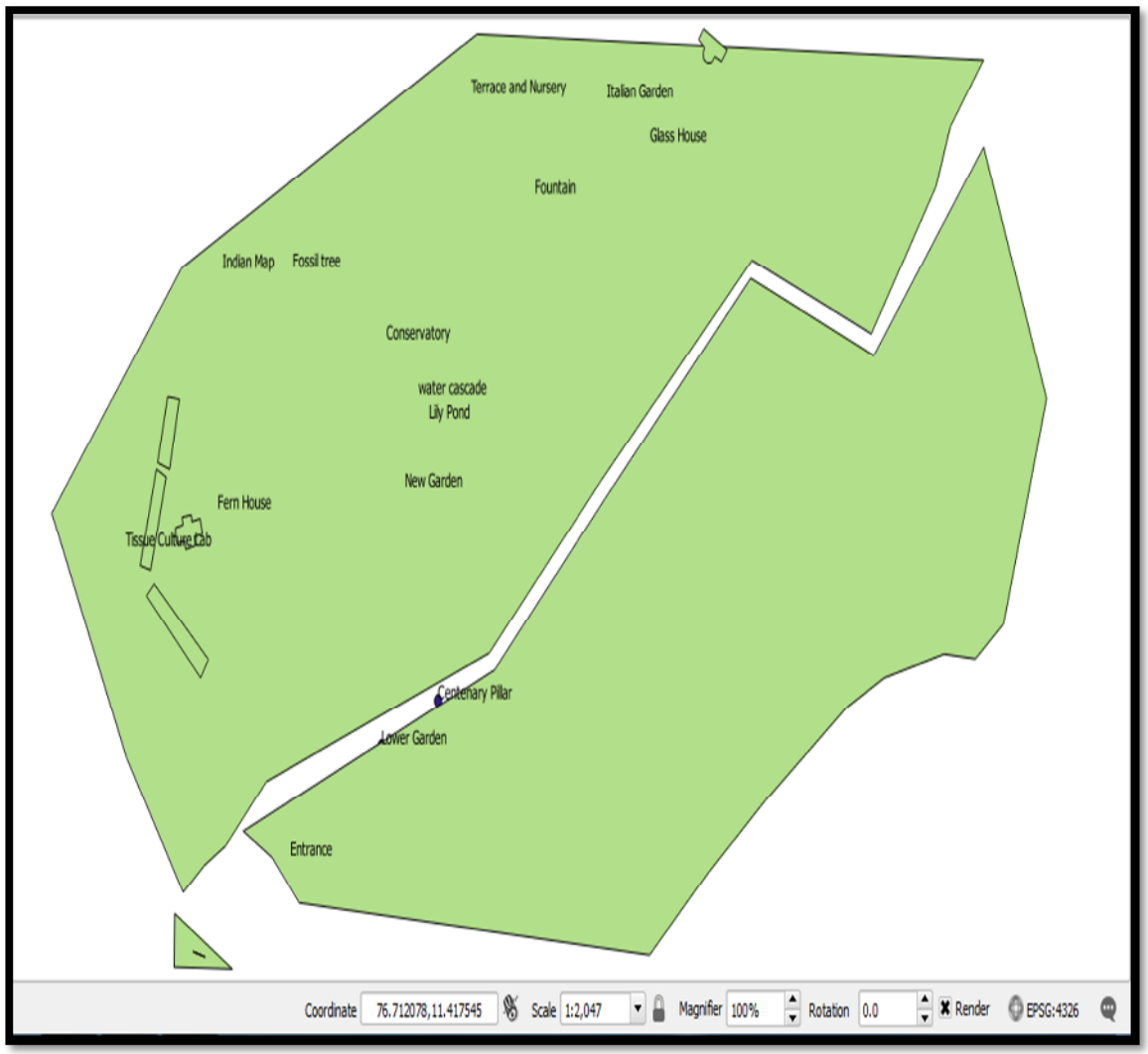
Source: Primary data

Since the R square value is 30 percent, it is inferred that the factors Garden facilities, Garden information, Garden maintenance, Garden annoyances and Garden personnel which is found from the factor analysis and regression method has contribution to the Visitor satisfaction in botanical garden, Ooty and it is also found the beta values for factor one is 0.08, beta values for factor two is 0.25, beta values for factor three is 0.01, beta values for factor four is 0.12,beta value for factor five is 0.24 thus it is found that botanical Visitor satisfaction is dependent on the above mentioned five factors.

4.6 Spatial Analysis

Fig: 4.22

Zones in Botanical Garden



By using QGIS the zones in the Botanical Garden is projected as a map. The boundary map depicts the location of zones in the Botanical Garden. This map will give a clear view among the tourists about the zones available in the Garden.

CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSIONS

This chapter summarizes and offers concluding remarks on this research. It also is broadly classified into 5 sections.

5.1 Findings

5.2 Suggestion

5.3 Scope for Future Research

5.4 Conclusion

5.1 FINDINGS

5.1.1DEMOGRAPHIC PROFILE:

Among the 520 respondents 56.0 percent were female. It is also found that 41.3 percent of the visitors were from Tamil Nadu. Most respondents have completed Higher Secondary with 34.2 percent. From the occupation wise distribution, it is found that 31.0 of the respondents were students. Most of the respondents were married with 53.8 percent. It is inferred from other family members working that 46.0 percent of the respondent's fathers were working. It is also interpreted that 52.1 percent of the respondents were living in a nuclear family. It is also inferred that 46.2 percent of the respondents were having no children. It is also interpreted that, monthly income of the visitors 43.1 percent of the respondents were earning 20,000-40,000. Table also depicts that 33.8 percent of the visitors travelled to the destination through bus. It is also interpreted that 65.4 percent of the respondents came to know about this attraction through friends and relatives. From the table it is identified that 30.8 percent of the visitors are accompanied by their friends to the attraction. It is also inferred that, timing of visit to the garden 69.4 percent of the visitors visits the garden during 11am to 1pm. The above table also depicts that 50.8 percent of the visitors primary purpose were leisure. It is also inferred that 55.8 percent of the visitors spend more time in new garden in botanical garden. From the visit to the other attractions in Ooty 76.0 percent of visitors will visit other attractions.

From frequent visit to other parks 34.6 percent of the visitors will visit not frequently or occasionally. It is also interpreted that 64.4 percent of the respondents will revisit the garden It is inferred that 53.5 percent of the visitors were engaged in natural education activity in botanical garden. It is also interpreted that 60.0 percent of the visitors said that their presence will not have any negative impacts in botanical garden.

5.1.2 DESCRIPTIVE STATISTICS:

- By using Descriptive statistics it is found for the factors of Attributes. The values range from 4.75 to 3.73. Nature and Ecology has the highest mean value of 4.75 were as free entrance in to the garden has the lowest mean value of 3.73.
- In the factors of General Management the values range from 4.45 to 3.30. The general management of the garden is good has the highest mean value of 4.45 were as Level of litter is minimum has the lowest mean value of 3.30.
- In the factors of Tourist Routes the values range from 4.28 to 3.46. Damage to natural vegetation due to uncontrolled tourist behavior has the highest mean value of 4.28 were as Introduction of alien plants and species due to tourism has the lowest mean value of 3.46.
- In the factors of Rest Camps and Campsites the values range from 4.32 to 3.55. Damage to natural vegetation (in tourist sareas) due to trampling has the highest mean value of 4.32 were as Wildlife attracted to rubbish bins (fir ex: baboons)has the lowest mean value of 3.55.
- In the factors of Trails the values range from 4.32 to 3.54. Speeding of tourists on routes has the highest mean value of 4.32 were as introduction of alien plants and species (by tourists) has the lowest mean value of 3.54.
- In the factors of Tourist Facilities the values range from 4.25 to 3.51. Waste spillage around waste bins by tourists has the highest mean value of 4.25 were as Use of non-renewable sources (for ex: plastics) by tourists has the lowest mean value of 3.51.
- In the factors of Garden Maintenance the values range from 4.59 to 3.87. The garden is clean and well maintained has the highest mean value of 4.59 were Restrooms are clean and in proper working order has the lowest mean value of 3.87.

- In the factors of Garden Personnel the values range from 4.32 to 3.54.The staff members were prompt and helpful has the highest mean value of 4.30 were as The staff members were available has the lowest mean value of 3.75.
- In the factors of Garden Information the values range from 4.36 to 3.86. The garden has enough direction signs (i.e., restrooms, parking) has the highest mean value of 4.36 were as There is enough available information (e.g., brochures about the garden at the entry station has the lowest mean value of 3.86.
- In the factors of Garden Annoyances the values range from 4.32 to 3.72. I was not bothered by pets that other visitors brought to the garden. has the highest mean value of 4.32 were as the garden was not too crowded has the lowest mean value of 3.72.
- In the factors of Garden Facilities the values range from 4.20 to 3.64.There is adequate parking has the highest mean value of 4.20 were as Telephones are convenient. has the lowest mean value of 3.64.
- In the factors of Visitor Satisfaction the values range from 4.44 to 4.12. Overall, I am satisfied with my garden visit. has the highest mean value of 4.44 were as I would like to visit this garden again has the lowest mean value of 4.12.

5.1.3 FACTOR ANALYSIS

- From the factor analysis it is found that garden management has been separated into three factors. First factor is named as garden maintenance which consists of components such as not printing brochures on recycled papers, level of noise is low, inappropriate waste management and absence of recycling waste bins. Second factor is known as garden pitfalls which consist of components such as insufficient management of waste, inadequate water saving measures. Third factor is known as garden visitors which consist of components such as general management of garden is good and too many tourists in the garden at a given time.

5.1.4 ANOVA

- From ANOVA, it is found that the factors such as Attributes, General management, Tourist routes, Trails, Tourist facilities, Garden Maintenance, Garden personnel, Garden information, Garden Annoyances, Garden Facilities and Visitor Satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that

there is a significant difference in mean values of the above mentioned factors with place of origin. Therefore it is clear that there is a difference among the group with different place of origin on their opinion on the above factors.

- From ANOVA, it is found that the factors such as Tourist Routes, Rest Camps, Trails, Garden Maintenance, Garden Annoyances and Garden Facilities has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with Education. Therefore it is clear that there is a difference among the group with different education on their opinion on the above factors.
- From ANOVA, it is found that the factors such as General Management, Tourist routes, Rest Camps, Trails, Tourist facilities, Garden Maintenance, Garden personnel, Garden information, Garden Annoyances and Garden Facilities has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with occupation. Therefore it is clear that there is a difference among the group with different occupation on their opinion on the above factors.
- From ANOVA, it is found that the factors such as Attributes, Rest Camps, Garden Information, Garden Facilities and Visitor Satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with reason to visit. Therefore it is clear that there is a difference among the group with different purpose of visit on their opinion on the above factors.
- From ANOVA, it is found that the factors such as General management, Rest Camps, Trails, Garden maintenance, Garden information, Garden Annoyances, Garden facilities and Visitor Satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with accompany. Therefore it is clear that there is a difference among the group with different accompany to visit on their opinion on the above factors.
- From ANOVA, it is found that the factors such as Attributes, Tourist Routes, Garden Maintenance, Garden information, Garden facilities and Visitor satisfaction has reported

F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with timing of visit . Therefore it is clear that there is a difference among the group with different timing of visit on their opinion on the above factors.

- From ANOVA, it is found that the factors such as Attributes, General management, Tourist Routes, Rest camps, Trails, Tourist routes, Garden maintenance, Garden information, Garden maintenance, Garden personnel and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with part visited in attraction . Therefore it is clear that there is a difference among the group with different part visited on their opinion on the above factors.
- From ANOVA, it is found that the factors such as Attributes, General management, Tourist routes, Rest camps, Trails, Tourist facilities, Garden maintenance, Garden personnel, Garden information, Garden annoyances, Garden facilities and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with frequently visiting other attractions in Ooty . Therefore it is clear that there is a difference among the group with frequently visiting other attractions on their opinion on the above factors.
- From ANOVA, it is found that the factors such as Attributes, Tourist routes, Rest camps, Trails, Tourist facilities, Garden maintenance, Garden personnel, Garden information, Garden annoyances, Garden Facilities and Visitor satisfaction has reported F values that are significant. Therefore, the hypothesis H_0 is rejected which implies that there is a significant difference in mean values of the above mentioned factors with activities engaged in attraction . Therefore it is clear that there is a difference among the group with different activities engaged on their opinion on the above factors.

5.1.5 REGRESSION

- From Regression it is found that R square value is 50 percent, so it is inferred that the factors , Tourist facilities, Tourist routes, Rest camps and Trails which is found from the factor analysis and regression method has contribution to improve the General

management in botanical garden, Ooty and it is also found the beta values for factor one is 0.33, beta values for factor two is 0.17, beta values for factor three is 0.14, beta values for factor four is 0.20, thus it is found that botanical garden General management is dependent on the above mentioned four factors.

- From Regression it is found that R square value is 30 percent, so it is inferred that the factors Garden facilities, Garden information, Garden maintenance, Garden annoyances and Garden personnel which is found from the factor analysis and regression method has contribution to the Visitor satisfaction in botanical garden, Ooty and it is also found the beta values for factor one is 0.08, beta values for factor two is 0.25, beta values for factor three is 0.01, beta values for factor four is 0.12,beta value for factor five is 0.24 thus it is found that botanical Visitor satisfaction is dependent on the above mentioned five factors.

5.2 SUGGESTIONS

i) Tourists and staff should receive more environmental education regarding the impacts of tourism on the environment and methods to be used to minimize these impacts. Furthermore, as a conservation priority, training and education should be offered to both staff and the tourists with regards to proper waste disposal and recycling.

ii) Effective waste management should be implemented in Botanical garden through the encouragement of recycling. The opportunity of a recycling plant in Botanical garden should be explored to manage the waste generated by tourists more effectively. Recycled waste products can then be sold to tourists in garden shops and Recycled papers can be used for printing brochures.

iii) Water consumption should be taken more seriously in Botanical garden. Leaking taps and water pipes should be repaired. Recycling systems for waste water should be installed in new developments to conserve water usage.

iv) Tourist carrying capacity limits for Botanical garden must be determined and managed accordingly.

v) Cleanliness of this entire attraction can be maintained properly and neat accessible washrooms can be provided.

vi) Many tourists are not satisfied with information details providing at entrance of the garden and many tourists are not aware of the areas inside the garden. Service providers can adopt promotional strategies like providing brochures about the garden at the entry station.

vii) Service providers should take some promotional strategies and improve their website to provide updated information about botanical garden.

viii) Low impact battery vehicles should have been available for older people to visit the place completely.

ix) General Management in Botanical Garden is influenced by Garden Facilities, Tourist Routes, Rest Camps and Trails thus these factors can be maintained properly to increase the general management.

x) Visitor Satisfaction in Botanical Garden is influenced by Garden Facilities, Garden Information, Garden Maintenance, Garden Annoyances and Garden personnel thus these factors can be taken seriously to increase the visitor satisfaction.

5.3 SCOPE FOR FUTURE RESEARCH

No research is complete in all its aspects, but a carefully designed research frame would naturally help the researcher to identify a few research issues. The present study also had identified a few research problems which deserve the attention of the prospective. This study has been concentrated on environmental impacts and visitor satisfaction only for Botanical garden in Ooty. Future research should be conducted at individual attractions in Ooty regarding the environmental impacts and visitor satisfaction. This will enable attraction in Ooty to identify tourism impacts on the environment and visitor satisfaction to the specific attractions and so to develop action plans accordingly aimed at minimizing the impacts of tourism on the environment and so ensuring a more sustainable management approach.

5.4 CONCLUSION

Ooty is no doubt a fascinating destination. People friendly approaches and beauty of Ooty keep tourist hooked towards this Queen of Hill Stations in South India. This has created much loyalty and attachment of the visitors towards Ooty resulting in the increase in tourist arrivals and the positive and negative impacts on the ecology and environment. From this present study

environmental impacts and visitor satisfaction of Botanical garden, Ooty is analyzed. To understand the positive and negative impacts of tourists and tourism on environment and visitor satisfaction on botanical garden and thus it is essential because it provides the service provider a better understanding about the impacts caused by tourists and tourism on environment of the customers need and expectation.

This research was conducted in order to study the environmental impacts of tourism and visitor satisfaction in Botanical garden, Ooty. Botanical garden is quite popular among the tourists and tourists are coming here because of its picturesque views and beautiful nature. Therefore there is a certain danger to the natural environment of the area. Different areas of impact, such as air and water quality, natural and vegetation and wildlife, as well as man-made environment, were examined in order to reveal the existing impacts. This was done to find out, what kind of influence the area experiences from the tourists and tourism.

Observation of the area was done in January to May to collect the primary data for the analysis. Pictures were taken as an evidence of the observed facts. The results of the observation showed that there were clear impacts. Among the other impacts, there were littering and damage of natural vegetation. These were negative impacts but there were positive as well. Raising awareness about nature conservation, increasing visitors' well-being, and collecting maintenance fee can be used for maintenance and protection . QGIS has also been used to project a boundary map and zones of Botanical Garden, Ooty.

During the study it was observed tourists are not satisfied with the garden maintenance and garden information facilities, restroom cleanliness and not providing enough information about the garden at the entry station. It is also concluded that, regardless of the outcome of any particular step in the VIM process, continuous monitoring is essential for understanding the current status of the environment of the site and predicting when unacceptable impacts may occur and in order to retain their Visitors in the attraction, the service providers have to ensure tourists satisfaction among their patrons. The study provides insight into the aspects of attraction which need to consider in order increasing tourists satisfaction and to support Botanical Garden to ultimately be sustainable and prosper in future.

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ANNEXURE – 1

QUESTIONNAIRE

As part of my M.Phil (Tourism & Travel Management) in Avinashilingam University, I'm doing a project on the topic **"A Study on Environmental Impact and Visitor Satisfaction of Botanical Garden, Ooty"** I will be happy if you provide any necessary information. The information provided will be used only for Research and Academic purposes and no personal information provided by the respondents will be disclosed. Thank you for participating in the survey.

Thank you…….

1) Gender:
a) Male [ ] b) Female [ ]

2) Your age is
a) 16 to 25 years [ ] b) 26 to 35 [ ] c) 36 to 45 years [ ] d) 46 to 55 years [ ]
e) Above 55 years [ ]

3) Place of origin:
a) Tamilnadu [ ] b) Kerala [ ] c) Andhra Pradesh [ ] d) Karnataka [ ]
e)North India [ ] f) North East [ ] g) Foreign Country [ ]

4) Educational qualification:
a) UP to SSLC [ ] b) HSC [ ] c) Graduation [ ] d) Post Graduation [ ]

5) Are you a
a) Student [ ] b) Government employee [ ] c) Private employee [ ] d) Self- employed [ ]
e) Unemployed [ ] f) Retired [ ]

6) Marital Status:
a) Single [ ] b) Married [ ]

7) Any other family member working:
a) Spouse [ ] b) Father [ ] c) Mother [ ] d) Others [ ]

8) Your Family Type:
a) Nuclear family [ ] b) joint family [ ]
.
9) No. of Children you have:
a) One [ ] b) Two [ ] c) More than Two [ ] d) None [ ]

10) Monthly income?
a) Below 20,000 [ ] b) 20,000-40,000 [ ] c) 41,000-60,000 [ ]
d) 60,000 – 1, 00,000 [ ] e) 1, 00,000 above [ ]

11) Mode of travel to this destination?
a) Car [ ] b) Bus [ ] c) Toy train [ ]
d) Other, Specify: _____

12) How did you know about this tourist attraction?
a). The Internet [ ] b). Friends and relatives [ ] c).Media [ ] d). Travel agency [ ]
e). Other, Specify: _____

13) Main reasons for your visit to this tourist destination?
a). Rest and relaxation [ ] b). Leisure [ ] c). Business reasons [ ]
d). Other, Specify: _____

14) In this visit you are accompanied by?
a). None [ ] b) Spouse [ ] c) Children [ ] d). Family [ ] e) Friends [ ]

15) Have you ever been to this tourist attraction before your visit today?
a) First time visitor [ ] b) Visited 2-5 times [ ] c) 5 Times & more [ ]
d) Other, Specify: _____

16) Timing of visit to the garden
a) 07 to 10 am **[ ]** b) 11 am to 01 pm **[ ]** c) 2 to 4 pm **[ ]** d) 5 to 7 pm **[ ]**

17) Which part of the botanical garden did you visit or do you intend to visit? (Select more than one alternative ifapplicable.)
a) Lower Garden b) New Garden c) Italian Garden d) Fountain e) Conservatory

f) Terrace and Nurseries

18) Do you visit other attractions in Ooty.
a) Yes [ ] b) No [ ]

19) If yes to #17 above how frequently do you visit other attractions?

a) Once in a month [ ] b) Once in 3 months [ ] c) Once in 6 months [ ] d) Once in 1 year [ ] e) Not frequently or only occasionally [ ].

20) Will you plan to comeback to visit Botanical garden in thefuture?

a) Yes [ ] b) No[ ] Why…… c) Maybe/notsure [ ]

21) During this trip, what activities have you engaged in

a)Sightseeing[ ] b) Nature education [ ] c) Photography d) picnic[ ]

e) Others please specify…….

22) Do you think your presence can have any negative impact on environmental condition of the Botanical garden?
a) Yes [ ] b) No [ ] c) Maybe/not sure [ ]

23) Please name the 3 most obvious negative impacts from tourism that you noticed during your visit at botanical garden? (If none leave it blank)

1……. 2…….. 3……

24) How important do you consider each of the below attributes with respect to enjoyment of your visit inthe botanical garden? (Please answer to each of the alternatives.)

(5 = very important, 4 = fairly important, 3 = somewhat important, 2 = of little importance, 1 = not important at all).

S.NO	**Attributes**	5	4	3	2	1
AT1	Nature and Ecology					
AT 2	Small Number of visitor					
AT 3	Free entrance into the garden					
AT 4	Recreation activities					
AT 5	Facilities provide in the garden					

25) Based on your experience and visits to the Botanical garden Ooty please indicate how you perceived the following aspects regarding Impacts of tourism and or tourists on the environment.

(5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree)

S.NO	**General Management**	5	4	3	2	1
GR1	Level of Litter is minimum					
GR2	Insufficient management of waste(for eg: lack of recycling measures)					
GR3	Lack of energy saving measures(for eg:solar panels)					
GR4	Inadequate water saving measures					
GR5	Level of noise in the garden is low					
GR6	The general management of the garden is good					
GR7	Inappropriate waste management- absence of recycling waste bins					
GR8	Too many tourists in the garden at a given time					
GR9	Not printing brochures and information booklets on recycled paper					

S.NO	**Tourist Routes**	5	4	3	2	1
TR1	Damage to natural vegetation due to uncontrolled tourist behavior					
TR2	Erosion along routes due to tourists					
TR3	Impacts of plant collecting along tourists routes					
TR4	Introduction of alien plants and species due to tourism					
TR5	Interference of breeding of wildlife due to tourism					
TR6	Lack of environmental-friendly transport					

S.NO	**Rest Camps and Campsites**	5	4	3	2	1
RC1	Damage to natural vegetation (in tourist areas) due to trampling					
RC2	Erosion due to tourism development					
RC3	Human made structure that are not eco-friendly					
RC4	Wildlife attracted to rubbish bins (fir ex: baboons)					
RC5	Camp layout not fitting into natural setting of the environment					

S.NO	**Trails**	5	4	3	2	1
TR1	Speeding of tourists on routes					
TR2	Dust caused by tourist vehicles along routes					
TR3	Tourists using too much artificial lights					
TR4	Erosion along trails					
TR5	Impacts of flower collecting by tourists					
TR6	Introduction of alien plants and species (by tourists)					
TR7	Design of track and trail does not fit into the surrounding and natural environment					

S.NO	**Tourist Facilities**	5	4	3	2	1
TF1	Waste spillage around waste bins by tourists					
TF2	Interference of wildlife due to noise, cars, people					
TF3	Overcrowding of people					
TF4	Visual Pollution (for ex: signs and directions)					
TF5	Use of non-renewable sources (for ex: plastics) by tourists.					

26) Please assess your satisfaction on the following factors in Botanical garden Ooty by ticking the number that best describes your opinion.
(5= Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree)

S.NO	**Garden Maintenance**	5	4	3	2	1
GM1	The garden is clean and well maintained.					
GM2	The garden does not show sign of Vandalism.					
GM3	Restrooms are clean and in proper working order.					
GM4	The natural environment of this garden is being protected.					

S.NO	**Garden Personnel**	5	4	3	2	1
GP1	The staff members were prompt and helpful.					
GP 2	The staff members were courteous and friendly.					
GP3	The staff members were available.					

S.NO	**Garden Information**	5	4	3	2	1
GI1	The garden has enough direction signs (i.e., restrooms, parking).					
GI2	There is enough available information (e.g.,brochures about the garden at the entry station).					

S.NO	**Garden Annoyances**	5	4	3	2	1
GA1	I was not bothered by pets that other visitors brought to the garden.					
GA2	I was not bothered by inconsiderable people (rowdy, noisy)					
GA3	The garden was not too crowded					
GA4	I was not bothered by nuisance wild animals in the garden such as squirrels, insects were not a bother.					

S.NO	**Garden Facilities**	5	4	3	2	1
GF1	There is adequate parking.					
GF2	Trash containers are available.					
GF3	Recycling containers are available.					
GF 4	Telephones are convenient.					

S.NO	**Visitor Satisfaction**	5	4	3	2	1
VS1	Overall, I am satisfied with my garden visit.					
VS2	I would like to visit this garden again.					

30) Any suggestions regarding impacts of tourism?

_____

_____

_____

ANNEXURE-II

GOVERNMENT BOTANICAL GARDEN,OOTY

TERRACE AND NURSERIES

CONSERVATORY

FOSSIL TREE TRUNK

INDIAN MAP

LILY POND