Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective

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(2015-A-1059-M)

Faculty of Agriculture

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Thesis

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DEDICATE TO MY

"PARENTS"

Someone who holds us in arms as we enter this world

Someone who encourages all our efforts and appreciate us wholeheartedly

Someone who listens patiently to our never ending doubts

Someone who's eyes shine with pride and happiness at our every little achievement

Someone who helps us to smile instead shedding a tear

Someone who is our life-long friend

"The light which lit up every nook and corner of my life"

"MY SWEETEST MOTHER"

And

"To serve whom was my dream and

dream of serving him remain forever"

"MY BELOVED FATHER"

Sher-e-Kashmir
University of Agricultural Sciences & Technology of Kashmir
Faculty of Agriculture

Certificate – I

This is to certify that the thesis entitled, " **Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective**" submitted in partial fulfilment of the requirements for the award of the degree of Master of Science in Agriculture, to the Faculty of Agriculture, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir is a record of bonafide research work carried out by Mr. Mohammad Mubashir Kachroo (Regd. No. 2015-A-1059-M) under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

It is further certified that any help or information received during the course of investigation has duly been acknowledged.

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We, the members of the Advisory Committee of Mr. Mohammad Mubashir Kachroo (Regd. No. 2015-A-1059-M), a candidate for the degree of Master of Science in Agriculture have gone through the manuscript of the thesis entitled, "**Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective**" and recommend that it may be submitted by the student in partial fulfillment of the requirements for the award of the degree.

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ABSTRACT

The present investigation entitled "Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective" was based upon both primary and secondary data. The secondary data was collected from published/ unpublished records of Forest Department GoJK. The primary data includes information collected from sample respondents selected from four forest sites viz., Dodhpathri, Thajiwas, Pahalgam and Gulmarg. In accordance with the objectives and data availability Compound Growth Rate, Trip Generating Function Method, Expenditure Partition Method, and Functional Form were employed to analyze the data during the year 2016-2017.

Results revealed that the total forests cover of the state declined from 20800 Sq. kms. to 20230 Sq. Kms (20.23 lakh hectares) between 1950-51to 2012-13. Recently forestry sector (FNDP) has contributed about 10 per cent to the agricultural net domestic product and 2 per cent of state net domestic product. FNDP has increased significantly over the years at an annual growth rate of 5.14 per cent. The total extraction of timber was 86.59 (000 m^3) in 2012-13. The estimates of compound growth rates indicated that the area exploited for extraction has decelerated at 6.33 per cent per annum, while the quantity extracted for it by 3.81 per cent. Consistent with declining extraction, the totals out-turn has been consistently declined over the years and has reached to just 73.92 (000m^3) in recent years. The government has invested 408 lakh rupees in forest and logging sector during 2013-14 though it has declined drastically since 2005-06 that led to the decline of investment intensities to this sector over the years. Estimates of Forest Growth Model revealed that rural literacy, public investment in forestry, plantation and export value has contributed positively in forest development while proportion of urban population, rural poverty has negative impact on it. The

findings of micro-study revealed that major portion of the visitors were from Kashmir region itself followed by other states of India in all the forest sites, though a good number of them were from abroad as well. Majority of visitors fall in the age-group between 30-60 years. The occupational distribution of tourists revealed that majority of them were found engaged in various business activities or other specialized occupations. Majority of the visitors were seen to have attained graduation or above educational level. Tourists visited in Pahalgam and Gulmarg fall in high income category which indicated that the amenities provided by these two forest sites provide attraction to high income class of the society and these amenities need to be enhanced and created in other forest sites. Gender classification of tourists indicated that male visitors out-numbered females in their visits to selected forest sites thereby indicating a possibility of attracting female visitors through specific campaigns. Majority of visitors have visited to the selected forest sites through self arranged trips though 42 per cent of the visitors came through package in Pahalgam. Maximum visits were performed by tourists in Pahalgam and Gulmarg because of the distinct amenities provided in these areas and owing to the fact that these sites are known across India and world. Among the various motivations tourists have expressed different factors for different forest sites, the tourists coming for business purpose has got less response. Presence of water feature, lush green view and pleasant breeze has shown maximum response as forest specific attribute motivating tourist towards forests. The attitudes of tourists towards forests revealed that they consider it as a national treasure and were of the opinion that this resource needs to be preserved on sustainable basis. Estimates of trip generation function revealed that forest specific attributes and ecological/scenic concerns of tourists have significantly determined visits to the forest sites.

Based upon the findings of the study, forest policy/schemes laws should be strictly implemented for prevention of conversion of forest land, prohibition of illegal operation and up scaling of afforestation programmes. There is a need to enhance investment to forest sector in view of its important role in growth of forest sector and its intensities should be increased manifold to have desired results from this sector. The study concluded with number of specific policy suggestion for preservation of forest ecosystem and to further encourage visits to the forest sites of the state.

Keywords: Forest; investment; growth; afforestation; tourist; campaign; amenities

Signature of Student Signature of Major Advisor

Dated : _____ Dated: _____

بِسْمِ اللهِ الرَّحْمٰنِ الرَّحِيْمِ

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Mohammad Mubashir Kachroo

Place: SKUAST, Srinagar

Dated:

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Chapter--1

INTRODUCTION

''The main concept is that an environment which appears to offer satisfaction of biological needs will be perceived as most attractive for a man'' .

Natural resources are capital endowments that determine nation's wealth and its status in the world economic system. A natural resource is characterized by amounts of bio-diversity and geo-diversity existing in various ecosystems. Considering the necessity of these resources, the major concern is to operate an economy within the ecological constraints of earth's natural resources. Among various natural resources, forests are of immense importance as they account for 75 per cent of the gross primary productivity of the earth's biosphere, and contain 80 per cent of the earth's plant biomass (Anonymous, 2011). Forests and woodlands occupy about 38 per cent of the Earth's surface and they are more productive with great biodiversity than other types of terrestrial vegetation. In India forests spread over an area of 79.42 million hectare and satellite imagery has shown an increase in area over the years, though the increase were primarily in northern, central and southern Indian States, on the other hand, north-eastern States witnessed a net loss in forest cover between 2010 and 2012 (Anonymous, 2015). It has played a major role to influence patterns of economic development, supporting livelihoods, helping structure economic change, and promoting sustainable growth. For millennia prior to industrial revolution, forests were the source of land for cultivation, settlement, construction materials, fuel/energy and indeed of food and nutrition (Williams, 2002). Forests grow in a wide variety of climates; from steamy tropical rain forests to frigid arctic mountain slopes and from arid interior mountains to windy rain drenched coastlines. The kind of forest in a given place results from a complex of factors including micro-climate, seed source, soils, slope, insects/pathogens and history of human influence.

Forest biodiversity interact with each other and with other living and non-living component of environment to make up a "forest ecosystem". A forest ecosystem consists of many components that can be broadly divided into biotic (living) and abiotic (non-living) component. The living parts include trees, shrubs, vines, grasses and other herbaceous (non-woody) plants, mosses, algae, fungi, insects, mammals, birds, reptiles, amphibians, and microorganisms living on the plants, animals in the soil while the non-living part of the environment including the soil, water, and minerals, etc.

Forests are the dominant terrestrial ecosystem of earth, distributed across the globe and undoubtedly represent valuable environmental resource with consequently high preservation, conservation and utilization value. Forest ecosystem plays a vital role as a part of environment in creating and maintaining microclimate within and around them. Besides, various goods having market value, forests provide numerous ecosystem goods and services. Its goods include timber, poles, pulp and matchwood, fuel wood, seeds, gums and resins, bamboo, grass and fodder, spices and condiments, medicinal herbs, tannins, etc. Many of them form important items of trade. The woodland in forest ecosystem provides support to various forest based ventures which include eco-tourism, turpentine and resin industry, willow industry, joinery, ply and other wood based industries. Besides pharmaceuticals, woodlands provide amenity services which attract people to visit forests specifically, and to highland areas more generally, where the presence of trees and woodland contributes to the amenity value of the landscape (Anonymous 2011). These visits necessarily involve expenditure which provides income to local businesses, supports employment and economic output and a proportion of these visits can be classified as 'tourism' visits.

Tourism sector is an important tertiary activity which has shown a steady progress over the years in the State. Recently State has received 13.12 lakh tourists of which 35.29 per cent were foreigners (Anonymous 2012, Appendix-II).

It has been observed that the tourist inflow has shown a significant increase over the years, though their numbers has increased at yet more paces with some political stability in the State. Since Kashmir valley as a whole is in the rejuvenation phase of its tourism cycle, the graph of tourist arrivals is rising with each passing year and is expected to increase its contribution to the economic development of the State. Therefore, it is necessary to develop tourism in a manner that its negative impacts are far too little than its positive outcomes. Apart from Dal Lake and religious places, forest resorts are crucial in attracting tourism from various States of India and other parts of the world. Despite environmental values, forest ecosystem however, is not being managed sustainably.

In accordance with this, it is necessary to examine tourist behavior, carrying capacity of the forest ecosystem and its attractiveness so that the tourism benefits permeate to the far and inaccessible areas and its negative impacts are diluted. To this effect the user's evaluation of specific elements of recreational experience in forests may help to understand overall satisfaction to be derived from this ecosystem. Moreover the valuations of ecosystem are important for applying correct models for development (Zhang *et al.,* 2008). The quality of the environment, both natural and man-made, is essential for tourism development. However, the relationship of tourism with the environment appears complex as it involves many activities that can have adverse environmental effects. Many of these impacts are linked with the construction of general infrastructure such as roads and logistics for tourism facilities, including resorts, hotels, restaurants, shops, golf courses etc. The negative impacts of tourism development can gradually destroy environmental resources on which it depends (Ugur Sunlu, 2003).The outing for recreation to forests or other resorts has been considered as vital human activities and has received considerable attention of environmental economists. However this part of research has not been given due attention in India (Marothia 1979, 1981, 2000, 2001; Hadher *et al.*, 1995; Chopra, 2011) which made it imperative to assess forest values in relationship with tourism.

Although few attempts have been made to analyze forest ecosystem in the State but no study has comprehensively dealt with the management of forests for enhancing its ecosystem value for attracting tourism. Accordingly, this study was a humble endeavor to examine the role of forests in tourism growth by way of providing enriched ecosystem goods and services. The study was conducted with following specific objectives:

- To examine the growth in forest sector in Jammu and Kashmir,
- To analyze the impact of forest ecosystem on development of tourism in the State, and
- To study the visitors attitude towards forest environment.

Chapter--2

REVIEW OF LITERATURE

The outcome of previous studies and their implications form the base of any scientific enquiry. Moreover review of related studies help us to conceptualize our research theme. Accordingly the ensuing section gives brief amount of various studies conducting at national and international level relating to the theme.

Kishore (1992) in his paper describes the policies and programmes of the State Forest & Wildlife Department of Goa. The common impression that forest conservation activities hamper economic growth and development is challenged to demonstrate that there is no conflict between the goals of conservation and development, but that they are complementary to each other.

Chavez (1993) studied visitor perceptions of crowding and discrimination, to determine favourite activities, and to determine the potential of visitor displacement from recreational sites. He observed that the visitors to southern California National Forests are urban dwellers and groups are culturally diverse. All respondents reported crowding at forests and the enjoyed activities differed only slightly between ethnic groups. Members of minority groups were more likely to report discriminatory acts. He highlighted the role of improving interaction and communication between resource managers and the visiting public, reducing depreciative behaviors and better signs and emphasized upon management actions.

Norini and Rashid (1996) studied that forestry, a sub-sector and a major component of the primary sector has traditionally been known to provide the main growth impetus to the Malaysian economy. Its importance to Gross Domestic Production (GDP), however, declined after efforts to promote the development of other industries, especially manufacturing, were undertaken in 1971. To sustain

the contribution by the forestry sector, development strategies as well as investment incentives such as the Industrial Master Plan (IMP) and the Promotion Investment Act (PIA) were proposed and implemented. The development of any sector could also be further enhanced by better understanding of the sector's relationships with other sectors or by striving for its industries that have potential for future development.

Obua (1997) in his study observed that development of camp-sites in the Kibale National Park of Uganda that involve much vegetation removal and accounts for loss of woody species and reduces species composition in protected areas and researched that early evaluation of the potential of natural areas should be carried out using ecological information, the removal of vegetation during campsite development should take into account the need for ecological preservation of protected areas; and woody species composition in the recreation area should be monitored regularly.

Cessford and Dingwall (1998) in their research observed the tourism industry absolutely affects the environment. Its negative impact is very dangerous for the environment and the future generation and for this reason planning and sustainable tourism industry is very essential for every country.

Andrada (2000) studied Visitors attitudes toward urban forests**.** He found that about two-thirds of the study participants strongly agreed that urban forests make the city more relaxing and interesting to visitors. The respondents also strongly agreed that the city is much better to visit because of the urban forest (57.8 per cent) leading to a more satisfying visit or stay (57.2 per cent). Finally, more than half (52.8 per cent) said that they would recommend visiting the city's parks and gardens to their friends and relatives. The study showed that the study participants were aware of the impacts that the urban forests have on the appearance of the city. In addition, 45.6 per cent enjoyed taking pictures of the urban forest while 44.9 per cent said that the urban forest enhanced their visitor

experience. It is worth noting that 43.1 per cent of the respondents strongly agreed that the urban forest is part of the city's appeal for tourists.

Swaminathan et al. (2000) conducted a study in Sathyamangalam Forest Division and Indira Gandhi Wildlife Sanctuary (IGWS) in Tamil Nadu, India to assess and compare the potential and realized use values of forests (tourism and extraction of produces) at forest gate prices using secondary data on the flow of revenues for the period 1989-99. The study showed that by virtue of better incomes and economic linkages, low ecological externalities, potential community stakes, and absence of alternative sources, essential non-wood forest products (NWFPs) deserve a greater role in sustaining forest conservation. It was suggested that individual incentives and community proprietorship have proven potential to economize and sustain the ethos of conservation.

Shi et al. (2002) studied three scenic spots (Golden Whip Crag, General Rock, and Treasure Box for Celestial Books) of Zhangjiajie National Forest Park, China. The results indicated that trees located along the sides of roads are seriously cut by visitors, especially in Yellowstone Village and Gold Whip Stream areas. The wounded degree was mainly related to tree species, smoothing degree, and the distance from tree to the edge of roads. They confirmed the degree of impact of tourism activities on vegetation by Impact Vegetation Index (IVI). On the three most visually impacts sites, the range of IVI value varied from 59.4 to 87.5 per cent which indicated that the vegetations of the sides of the trails were impacted seriously. To these problems, some suggestions were proposed for the park's management on visitors.

Monica and Anssi (2002) studied the role that nature, particularly forests, play in tourism and recreation and also to illustrate the potential contribution of nature based tourism in forests to rural development in the European context. The results suggested that well-managed and organised tourism in forested rural areas can obviously enhance the economic, environmental and social development.

However there is a need for a holistic approach to the nature tourism, consideration of regional conditions, participation and collaboration of the various stake holders, education and entrepreneurial encouragement in tourism.

Pieter et al. (2002) studied visitors profile, perception and expectation in forests from a gradient of increasing urbanization in central Belgium. They found that most of the visitors were male and the travel distance is a determinant factor. This factor is primordial in multi-criteria selection procedures for new forest sites. They suggested that the forest structure particularly heterogeneity in structure as preferred by visitors should be introduced in the management plans.

Gulzade et al. (2003) examined Ecotourism and sustainable development of forests and forest villagers in Turkey to introduce the ecotourism situation and activities from Turkish Forestry and to discuss, to learn experiences in projects of other countries. In that study, firstly ecotourism understanding of the Turkish foresters and related publics are introduced regarding the relation among ecotourism, sustainable forest management and rural development. Then, expectations of the ecotourism activities are discussed and some projects that are implementing or in formulation stages are explained concerning their aims, activities and constraints. In order to develop an effective ecotourism management in Turkey they suggested that a feasibility study should be realized which identifies potential ecotourism development areas, including mountain, forest, wetland, coastal and island environments.

Ugur (2003) in his study describes the effects of tourism on natural resources, environmental pollution and physical environment. He found that negative impacts from tourism occur when the level of visitor use is greater than the environment's ability to cope with this use within acceptable limits of change.

XinLiang et al. (2003) studied the mechanism of eco-tourism's impact on forest resources. Non-renewable degradation, controllable but unstoppable

degradation, controllable and unstoppable negative effect, and indirect positive effect were some of the impacts of eco-tourism. They noticed that intensity of the impact of ecotourism on forest resources is dependent on the quality of forest resource system, intensity of resource exploitation and facilities building, social and economic circumstances of ecotourism, and the inherent rule in tourism economy development. They suggested that, to control and adjust the impacts of ecotourism on forest resources, we should make the design of ecotourism exploitation scientifically, control the quantity of eco-tourists, civilize their actions, and harmonize the relationship among ecotourism management, local social and economic development.

Marshall and Newton (2003) examined the importance of NTFPs to rural income among El Terrero, a highland community in the Sierra de Manantlan Biosphere Reserve, Jalisco-Colim, western Mexico. The communities identified 9 plants used as NTFPs, including fruits, firewood, fence posts, medicinal purposes, etc. Some NTFPs are both consumed and sold, with women noting the importance of NTFPs to both household nutrition and income. They found that women were the main collectors and sellers of NTFPs though they were frequently helped/accompanied by their children. They also found that the most important NTFPs for cash income are blackberries, tila, tejocote, and capulin. They suggested that NTFPs are important for both the informal and the formal economy with some of the same products being used for both consumption and sale.

Gary et al. (2003) examined the economic significance of forest-related tourism day visit expenditures, the economic significance of forests in attracting tourists to the countryside as well as the link between attitudes towards forests and forest visiting behavior. The study showed that forests play an important role in attracting people to the countryside, even where they don't visit forests specifically. They suggested that there is a need of close integration of woodland and forestry policies with those on tourism, recreation and land use also there is a

need for further development and promotion of multi-purpose forestry by public and private organizations.

David and Laura (2004) studied visitor attitude towards tourism development and product integration in an Australian Urban-Rural Fringe following a cluster analysis involving 1244 visitors to six popular recreational sites has been done. Significance differences between the clusters were identified by site, motivation, age, group size, repeat visitation, duration of visit, residence and education. The results indicated distinct dynamics in the urban-rural fringe and will potentially assist the sustainable tourism and recreation development of such areas.

Tiwari and Tiwari (2004) studied the environmental and economic impacts of ecotourism, as well as the potential of ecotourism as a specialty travel market. The need for planning for environmental control and conservation in the context of ecotourism is emphasized. The study provides an overview of the ecotourism resources in India (wildlife resources, endemic animal species, diverse ecosystems, national parks and wildlife sanctuaries, native vegetation, and rehabilitation of endangered species) and suggested that strategies for ecotourism management and tourism development in Developing Countries, as well as marketing of travel destinations should be provided.

Mitra (2005) described that Bangladesh does not have enough effort to promote the country as a tourist destination. He argued that Bangladesh has to make aware the tourists about what to see, where to stay and what to eat. He emphasized for the development of tourism industry, Bangladesh need to develop the infrastructure like hotels, resorts, promoting more places and there should have a link of the Government tourism organization with the private sector to boost up the promotional activities for the same. So a coherent interdepartmental support and effective promotional campaigns are advisable to boost up the sector.

Wang et al. (2007) examined the relationship between socio-economic and demographic attributes of local residents and their attitudes toward tourism in Washington, NC, a small community where tourism is in its development stage. Resident's attitudes toward tourism were measured by adapting 20 items from the Tourism Impact Attitude Scale. Factor analysis resulted in a 2- factor solution. Findings indicate that age, gender, and community attachment do not have relationships with the two factors, but education is associated with one of the factors, and perceived personal benefit has strong positive relationships with both factors. The study reinforced the need for further research on factors influencing residents' attitudes toward tourism during a destination's preliminary development stage. The findings support previous assertions that educating local residents about the potential benefits of tourism is critical in obtaining their support for tourism, enhancing their involvement in the industry, and achieving sustainable community development.

*Outi and Marja (*2007) in their study combined the perspectives of sociological study of nature-based tourism and environmental psychology to examine tourists' experiences and expectations concerning landscapes. The study illustrated that spaciousness helps people understand the composition of landscape, increases feelings of security, and helps orientate in a strange environment. Research information was produced in a localized form and could be implemented in land use planning. They suggested that by recognizing tourists' role in formulating landscape objectives for planning, the development of tourism resorts can be conducted in more sustainable way.

Dominique (2008) examined people's attitudes towards the role of forests and their perception of forest diversity in China and Switzerland. The results show that culture influences people's landscape perception and their attitudes towards nature. He suggested that culture should be taken into account when dealing with

the conservation and restoration of forests around the world and conservation strategies will be more sustainable if they are sensitive to cultural preferences.

Jenni et al. (2009) examined how natural characteristics of a park, the recreation facilities and services inside a park and tourist services in surrounding communities, and park's location, are related to the number of visits. The results of the classification approach show that both natural values and good provision of recreation facilities are related to a high number of visits. The regression modelling showed that recreation opportunities, number of biotopes, provision of trails and the park's age, increased the number of visits, while the park location in relation to population has a minor effect.

Kevin and Diekmann (2010) studied the intersection of tourism and forest management in India. The study demonstrated that there are major conflicts between the Ministry of Tourism and Culture and the Ministry of Environment and Forests at both discursive and material levels. The network of power relations between and within tourism and forestry as distinct parts of the State apparatus in India is, thus, conceptualized. He concluded that one part of the Indian State apparatus, in particular the Indian Forest Service, ultimately has control over and limits tourism development strategies in rural areas, especially in Indian national parks.

Lohchab (2010) carried out a perception survey on various socio-economic and environmental issues in Bhimtal area to assess the environmental and socio-economic impacts of tourism at Bhimtal based on people perception. The results suggested that all the groups of respondents are in favour of tourism and feel that there is modernization of villages/city, betterment of roads, transportation and communication facility and growth in employment but no improvement in medical facility at Bhimtal. Similarly, he indicated that due to growth of tourism, there are adverse impacts in terms of pollution of water and lake, solid waste, and noise apart from negative effects on forest, biodiversity and land use at Bhimtal.

Nagendra (2010) conducted a meta-analysis in South Asia to examine whether current drivers of reforestation explained forest change pathways (2 in Bangladesh, 6 in India, 14 in Nepal, 1 in Pakistan, 1 in Sri Lanka). Scholar conclude in its planting and protection primarily drive reforestation and re-growth, often as a result of forest product scarcity, strong conservation ethics and decentralization reforms. While noting that some proponents of the environmental Kuznets curve suggest wealthier countries are more likely to reforest areas as a result of conservation awareness, he highlights evidences that poor communities also care strongly enough to protect their forests, even when it means they temporarily experience reduced access to forest products

Adhikari and Katsuhiko (2011) examined the influences of forest environment on human mind. In order to show that forest environment is more effective on our moods than urban one, only comparison of moods after staying in each environment is not enough. The results revealed that just staying in the forest environment without exercising and without communicating with others has more positive effect on our mind than similar staying in the urban environment. It is considered that the difference was caused by attention restorative components of each environment. That suggests possibilities of applying forest environment to not only healthy people but also physically or verbally challenged.

A study was carried out by *Marina et al.* (2012) on aesthetic value of forest landscapes which aims at finding possible explanations for the public preferences on forest landscapes with special regard to young forests. The results showed that the image of recreational forest differed to a great extent from the image of forest in general. Attractiveness of young forest, i.e. perceived aesthetic beauty, was mostly correlated with sense of easy access and safety. Thus, presence of deadwood, understory and high stand density were the most important factors towards negative attitude about the forest. Single tree characteristics (height, diameter) showed a small but significant positive correlation with

aesthetic quality, which contradicts with previous studies, where those variables are the main predictors of the forest scenic beauty. Standing and total volumes had a very small negative relationship with scenic beauty. The results also indicated a correlation between aesthetic and ecological values within the group of respondents, who were not educated in forest ecology. The findings suggested the influence of good-looking appearance of forest on the overall public attitude towards sustainability of forest management practices.

David et al. (2012) studied the public preferences for structural attributes of forests. The objectives of study were to explore the extent to which generalization can be made about preferences of forests as sites for recreational use. Indicative explanations were proposed, focusing on combinations of cultural and biophysical factors, and drawing on the literature on forest preferences, place attachment and cultural landscape.

A study was conducted by *Sathya and Sekar* (2012) to analyze the direct and indirect benefits of Pitchavaram Mangrove Forests (PMF) in the south east coast region of Tamil Nadu, India, where the concentration of mangrove biosphere is substantial. About 75 per cent of the respondents depended mangrove area for fishing while coastal area was the source of fish catch for only 25 per cent of sample respondents. Among the tourists respondents, only 3.3 per cent were foreigners, 10 per cent were from other States and the rest were domestic visitors. Most of tourists were young and middle aged and about 43 per cent had a monthly income between Rs.15001 and 30000. It is understood that high income and educated people showed more interest in visiting places of natural origin. People who travelled by own vehicles had higher visitation rate of 50 per cent than those travelling by hired vehicles owing to the high cost of hired vehicles. Further the major products collected by local stakeholders were firewood, fodder and timber. The Individual Travel Cost Method (ITCM) was used to estimate the recreational value and the determinants of visitation. It was found out that bachelors had made

more frequent trips to PMF than the families. The monthly income and travel cost was significant determinant of frequency of visits.

Uniyal and Singh (2012) quantified and reviewed the natural resource use in the Himalayan State of Himachal Pradesh (HP). The available forest bio-resources in HP not only support the livelihood of nearly 6 million people but also fulfill the forage requirement of 5.2 million livestock, thus, dependence on these resources is manifold. The direct use of forest resources was represented by extraction of timber, fuel wood and fodder, and the second represented indirect resource use from the forest that is represented by activities related to agriculture, tourism and industry. Amongst the direct resource use, annual timber requirement of the local people works out to be 310,063 m3. On the other hand, annual fuel wood and fodder requirement of local people is to the tune of 36.8 lakh and 1.5 crore tons, respectively. They found that extraction of fodder appears to be one of the main reasons for forest degradation in HP as opposed to timber and fuel wood extraction. However, compared to direct resource use, indirect resource use and pressures have far more pronounced effect on the forests. Of the indirect pressures, shifts in agriculture patterns and increased tourism seem to be the most prominent.

Szell (2012) conducted a survey in and near Retezat National Park, Romania to elicit attitudes and perceptions, as well as willingness of tourists towards forests and protected areas. The results indicated that tourists have higher awareness of the importance of the protected areas and exhibited greater appreciation of its existence and are willing to pay higher entrance fees to support conservation efforts when compared to local residents. Although considerable differences do exist between local residents and tourists, a more successful functioning and management of protected areas can be achieved by understanding both tourists' and local residents' attitudes and perceptions of nature conservation and by integrating them into future conservation policies.

Georgios and Nikolaos (2013) in their research studied the relation between fire catastrophes and tourism development, to identify if and how State authorities take into account tourists in the planning and management of appropriate measures. A comparative study between Greece and Cyprus is presented. They found that planning and suppression is complicated with a number of actors involved in various stages; national tourism organizations in both countries do not take part in the information or planning process. There is an emerging need for the provision of useful, comprehensive, practical information aimed at tourists.

Mahdi et al. (2013) in their study examined eco-tourists attitudes towards conservation and evaluate Iran's national parks (NPs) economically for which 2,121 respondents answered an online questionnaire conducted in summer 2012. The majority of respondents had visited at least one of Iran's 26 national parks. The survey revealed the weak condition of NPs both in status and conservation activities. Almost all respondents were willing to voluntarily participate in projects related to nature, environment and biodiversity conservation; pay for protection; increase the area of protected areas; visit NPs in the future; and they were mostly young. They believed that the conservation of biodiversity is not only the responsibility of the Government but also society in general. Furthermore, most answerers highlighted ecotourism activities as a tool to benefit local people. The paper concludes that the Government should elevate environmental awareness and consciousness, build community capacity for biodiversity management, resurrect the conservation movement, promote ecotourism and sustainable investment, strengthen the capacity of NGOs, look for synergisms, and build opportunities for participatory, cooperative science and stewardship.

Rabbany et al. (2013) studied the effects of tourism on natural resources, environmental pollution, physical environment and tourist activities in the

national park. They concluded that tourism creates catastrophe situation all over the world and this collapse condition can extinguish regional collaboration and communication. They suggested that everybody should be conscious about the negative impact of tourism and take the proper steps to lessen the problem specially each Government of each country and international authority in regarding of tourism industry.

Petra et al. (2013) studied Attitudes toward forest diversity and forest ecosystem services and conducted a cross-cultural comparison between China and Switzerland. Overall, 640 people in China and Switzerland were interviewed with the help of a standardized questionnaire. The results found that overall; participants had different preferences for species-rich forests versus monocultures and for Chinese versus Swiss forests. They recommend communicating the possible link between biodiversity and the supporting services of forests, which were regarded as highly beneficial in both cultures. This should help people to realize that human well-being, wealth and environmental quality may be more closely linked than previously.

Hilsendager (2014) examined the relationships between forestry and tourism and the impact that forestry can have on tourist perceptions. Based upon finding he suggested that forest industry impacts have the potential to have a negative effect upon the perception of visitors in destinations that promote natural landscapes. However, the degree to which perceptions are affected appears to be dependent upon observed kind and degree of impact of forestry.

It is very clear from the above discussion that though various studies regarding "relationship of forest ecosystem and tourism" were conducted at National and International levels, however, no comprehensive study has so far been conducted in Jammu and Kashmir relating to forest ecosystem and its relationship with tourism. Accordingly, this study will be a humble endeavor to examine to examine the overall relationship of forest ecosystem and tourism in Kashmir.

Chapter--3

MATERIALS AND METHODS

The reliability, precision and validity of the research findings of any investigation depend upon the selection of appropriate techniques. This chapter cogently elaborates the methodology that includes selection of study area, sampling design, data collection and analytical framework perused in the study. The present investigation entitle *"Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective"* was conducted during the 2016-17 under the ambit of Discipline of Agricultural Economics, SKUAST-Kashmir and the methodology which was followed in the study is being discussed in the ensuring section.

3.1 Selection of the study area

The present study pertains to Kashmir as a whole and intends to investigate the relationship between forest ecosystem and tourism in Kashmir, using both primary and secondary data. Since Kashmir is known for its tourism activity across the world, therefore, primary data for the present study was collected for this study in four famous tourist sites viz. Pahalgam, Gulmarg, Dodhpathri, and Thajiwas of Kashmir selected by following a well structured sampling design.

3.1.1 Sampling design

Multi-stage sampling technique was employed for collection of the sample respondents (Figure 1) with an appropriate interview schedule (Appendix-I). The selection of region, forest sites, blocks and respondents form different stages of sampling plan.

A. Selection of region

In the first stage of sampling, Kashmir region was selected purposively on the basis of maximum proportion of geographical area under forest and maximum proportion of tourist inflow in Jammu and Kashmir. Recently State has received 13.12 lakh tourists of which 35.29 per cent were foreigners (Anonymous 2012, Appendix- II). The forest area in Kashmir division alone accounts for 50.97 per cent of the total geographical area of the State. Interestingly, the division provides variety of resorts that attracts tourists from within and outside the country.

B. Selection of forest sites with brief description

In the second stage of sampling, four different forest sites viz. Pahalgam, Gulmarg, Dodhpathri and Thajiwas were selected purposively on the basis of amenity and distinguished services provided by them.

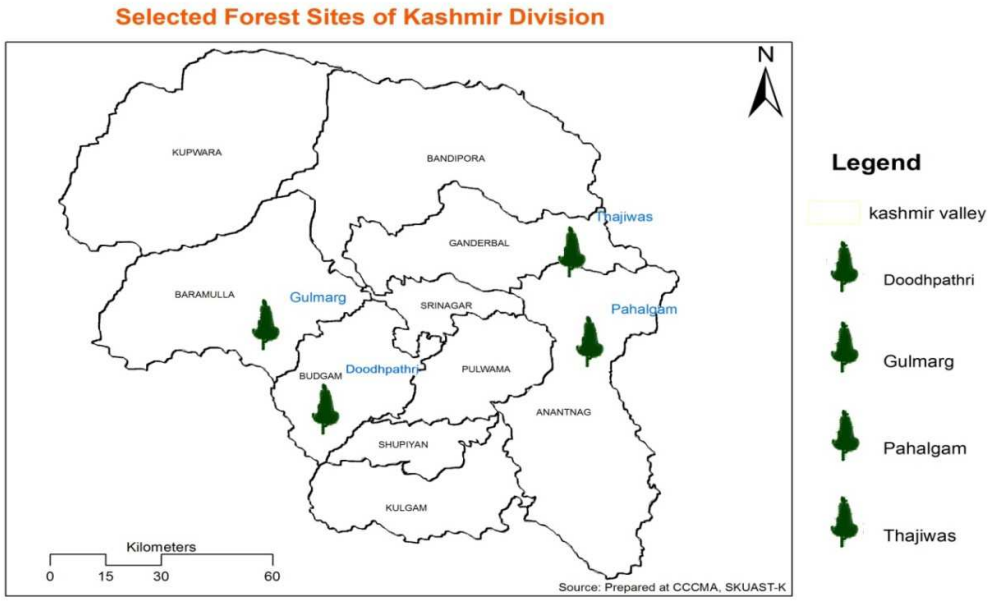


Plate 1: Selected forest sites of Kashmir region

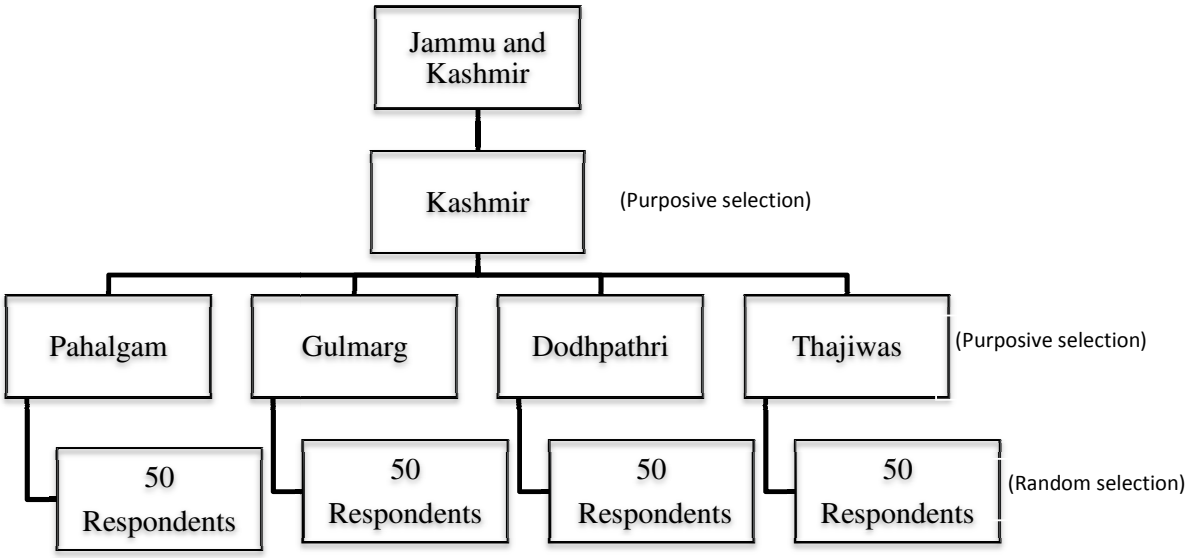


Figure 1: Sampling design followed for the selection of areas and sample respondents

Pahalgam

Pahalgam, a tourist destination of Jammu & Kashmir is located 45 kilometres (28 mi) from Anantnag district on the banks of Lidder River at an altitude of 7,200 feet (2,200 m). Pahalgam is associated with the annual Amarnath Yatra and attract tourists. The area holds a rich cover of vegetation and has habitation of rare and endangered fauna species. Pahalgam with a dense forest cover spread over its entire area is characterized by abundance of water resources and Alpine/ Coniferous type of forests. The forest site provides attraction to visitors for mountaineering, Polo, Golf course and visit to famous Betaab Valley surrounded by forests.

Gulmarg

Gulmarg a hill station, is a popular skiing notified area committee in the Baramula district of Jammu and Kashmir. Gulmarg lies in a cup shaped valley in the Pir Panjal Range of the Himalayas, at an altitude of 2,650 m (8,694 ft), at a

distance of 56 km from Srinagar. The meadows are interspersed by parks and small lakes, and surrounded by forests of green pine and fir. According to CNN, Gulmarg is the "heartland of winter sports in India" and was rated as Asia's seventh best ski destination. Gulmarg site has been selected owing to various services like skiing, gondola, tobogganing etc, provided to the visitors within its forest ecosystem.

Plate 2: A view of forest site Pahalgam (FS-III)

Plate 3: A view of snow covered forests site Gulmarg (FS-IV)

Dodhpathri

Dodhpathri, a tourist destination located in Budgam district of Jammu & Kashmir, lies at a distance of 42 km from State summer capital Srinagar and 22 km from district headquarter Budgam. Doodhpathri lies in a bowl shaped valley in the Pir Panjal Range of the Himalayas, at an altitude of 2,730 m (8,957 ft) above sea level. It is an alpine valley covered with snow clad mountains and the meadows of Pine Fir and Deodar. Main attraction of Doodhpathri is Tangnar, Mujpather, Dophkhal, Sochilpather, Palmaidan and Parihas. Dodhpathri has not been fully explored till date, however, efforts are under way to bring this beautiful destination under the tourism mainframe.

Thajiwas

Thajiwas, a forest ecosystem with glacier, is the primary tourist attraction in Sonamarg during the summer months and is located just 3 Kms from the main town. Thajiwas glacier, at an altitude of 9,186 feet is a striking silvery scene set against emerald meadows and a clear blue sky and is the major attractions to tourists during the summer months.A great asset to Jammu & Kashmir tourism, the glacier entails delight to adventure seekers and nature lovers alike. The campsite on the foot of the glacier makes it an idyllic base for trekkers. It would not be wrong to consider it to be among the most accessible glaciers as one can easily walk to its base or reach there by hired ponies.

C. Selection of respondents

In the third and final stage of sampling 50 respondents from each site were selected randomly forming a total sample of 200 respondents for the study. Besides, appropriate number of residents residing around each forest site were selected for the collection of required information.

Plate 4: A view of visitors in forest site Dodhpathri (FS-I)

Plate 5: A view Thajiwas glacier (FS-II)

3.2 Data collection

The study is based upon both primary and secondary data.

3.2.1 Primary data

The primary data were collected from the sample respondents on the following items:

- Socio-economic indicators,
- Family structure,
- Motivation,
- Forest attributes,
- Trip/Visitor characteristics,
- Expenditure, and
- Attitude towards forest ecosystem, etc

The primary data were collected from sample respondents.

3.2.2 Secondary data

The secondary data perused in the study and was collected from the Digest of Forest Statistics, Forest Department, Government of Jammu and Kashmir (GoJK) consisted of the following information:

- Status of forests in Jammu and Kashmir,
- Forests net domestic product,
- Export of forest products,
- Extraction of timber and non-timber forest products,
- Government interventions for forest development, and
- Illegal operations.

3.3 Analytical framework

In accordance with the objectives and the data collected for the purpose; following analytical tools were employed for the analysis/interpretation.

3.3.2 Statistical tool

Following statistical/mathematical tools were employed for analysis of data.

3.3.2.1 Estimation of Growth Rate

Function of following exponential form was employed to find out the growth trends in indicators of forest development in the State.

$$Y_t = ab^t$$

Where, Y_t is area/production, etc. in the year (t), a is the intercept indicating Y in the base period (t=0), b is the regression coefficient indicating the extent to which dependent variable changes with respect to change in time, t is time in years (1,2,3,…)

3.3.2.2 Trip generating function method (TGFM)

To analyze the determinants of frequency of visitation to forest site, trip generating function method was employed in which number of individual visitation to a particular forest site was put as dependent variable and different variables were specified as independent variables**,** while few independent variables were used for socio-economic indicators of a visitors and few were used to capture the impact of forest ecosystem attributes. This basic model takes the form:

$$V_i = f(I_i, FS_i, E_i, A_i, TT_i, TC_i, EC_i, SC_i, FTREE_i, SPCFE_i, U)$$

Where,

V_i		The number of visits made by i^{th} visitor to forest site,
I_i	:	Income of i^{th} visitor (▪ /month),
FS_i	:	Family size of i^{th} visitor (number),
E_i	:	Education of i^{th} visitor (0 for Illetrate,1 for primary, 2 for high, 3 for higher, 4 for above),
A_i	:	Age of i^{th} visitor (years),
TT_i	:	Travel time incurred by i^{th} visitor to reach site to and fro (hrs/ visit),
TC_i	:	Travel cost faced by i^{th} visitor to reach site to and fro (▪ /visit),
EC_i	:	Ecological concern of i^{th} visitor (0 for No, 1 for Yes),
SC_i	:	Scenic concern of i^{th} visitor (0 for No, 1 for Yes),
$FTREE_i$	:	Tree specific characters of i^{th} visitor (0 for No, 1 for Yes),
$SPCFE_i$	:	Space specific characters of i^{th} visitor (0 for No, 1 for Yes), and
U	:	Error term

When applying TGFM there are several other issues to resolve in addition to the issue as to whether the TGFM should take a zonal or individual approach. One of such issues is the type of visitation decision to be modeled. However, there are a number of other visitation decisions that may be influenced by site attributes and which may also affect expenditure rates (Loomis 1995). One of these factors is the decision over length of stay at the site. (Bell and Leeworthy, 1990), for example use a TGFM to assess factors influencing the length of stay (in days) at a beach site. Since the data of visitation to a particular forest site was not available therefore, this study considers individual day visitation to a forest site in study.

This approach was provided by (Willis and Benson, 1989). Their model attempted to predict visitor numbers from particular zones to Forest Commission sites using the following variables: travel cost, the average income of residents in each zone, various socio-economic characteristics of residents in each zone, and variables representing various wildlife attributes of each site. This is an example of a zonal TGFM, i.e. the model attempts to predict the number of visitors from each of a selection of zones around the site to the site itself. The alternative is to adopt an individual TGFM. The latter attempts to estimate the number of trips any one person may make to the site in question over a given time period

3.3.2.3 The Expenditure Partition Method

Expenditure Partition Method was employed to assess the effect of forest existence and/or forest qualities on visitor expenditure levels. Visitors were asked to rank the importance of forest attributes at a site for which standard ranking scale was used to rank the importance of various components. In the absence of more refined methods, the expenditure partition method has been widely employed in studies to assess the role of various non-market factors in explaining the behavior of visitors and/or assigning expenditures to these non-market factors. For example, (Crabtree *et al.,* 1994) asked visitors to wildlife sites how important wildlife was in attracting them to those sites. Where wildlife was the main reason for a visit to the area, 100 per cent of expenditure was attributed to wildlife, whereas if wildlife was very important or quite important, 50 per cent and 25 per cent respectively was apportioned to wildlife.

Response	**Rank**
Main reason	4
Very important	3
Important	2
Not important	1

According for rank 4, 100 per cent of expenditure was attributed to forest and in similar way for rank 3, only 75 per cent expenditure incurred by tourist to and fro from his residence and back was attributed to forests.

3.3.2.4 Forest Growth Model

To capture cause and effect of forest development, function of following structural form has been employed and estimated in linear form:

$NDP_f = f$ (REV, $PINV_f$, PTN, MKRT, RLIT, Upop, PVRT, EXPV, PDEN, AREA, ADP, EMP, U)

where,

REV	:	Revenue from forests (lakh ₹),
$PINV_f$	:	Public investment in forests (lakh ₹),
PTN	:	Plantation (lakh no.),
MKRT	:	Market rate of major forest specie (₹ /m^3),
RLIT	:	Rural literacy (%),
Upop	:	Urban population (%),
PVRT	:	Rural poverty (%),
EXPV	:	Export value of market produce (000 m^3),
PDEN	:	Population density (persons/ sq. km of geographical area),
AREA	:	Forest area (Sq. Kms),
ADP	:	Average price of deodar (₹ /m^3),
EMP	:	Employment in forest sector (000 man days), and
U	:	Error

The model was estimated with all specified exogenous variables but only those variables which gave best fit to the model were kept in its final form. Elasticity of significant variables was estimated by employing following formula to calculate their marginal impact on forest growth.

$\square$ = $b_i \cdot \bar{X}_i / \bar{Y}$

Where,

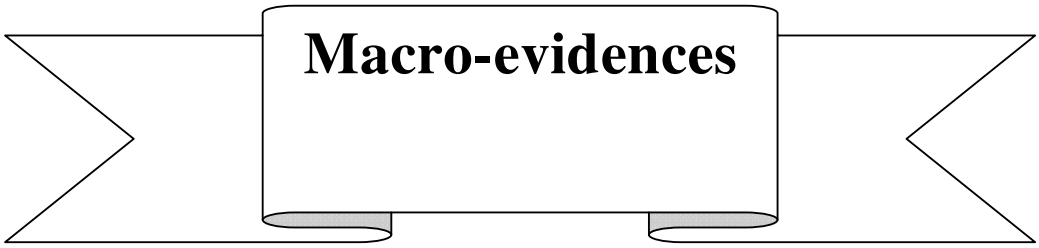
$\square$: Elasticity,

b_i : Regression coefficient of i^{th} significant explanatory variable

$\bar{X}_i$: Average of i^{th} significant explanatory variable,

$\bar{Y}$: Average of dependent variable.

Besides, tabular analysis was exclusively employed to work out averages, ratio and percentage for data analysis and their logical interpretation.


Macro-evidences

Chapter--4

EXPERIMENTAL FINDINGS

Forests, woodlands, and trees provide "amenity services". These attract people to visit forests specifically and generate a significant level of expenditure. The study aims to provide information on the role of various forest characteristics and attributes in relationship with tourism.

4.1 Status of Forests in Jammu and Kashmir

Forests are the world's most valuable renewable natural resource and also repositories of terrestrial biological diversity. The total forest cover in the State spreads over an area of about 20.23 lakh hectares and constitutes about 20 per cent of the total States geographical area. The total forests cover of the State declined from 20800 Sq. kms. to 20230 Sq. Kms (20.23 lakh hectares) between 1950-51 to 2012-13 and have lost almost 500 sq. km area to degradation.

Table 1: Status of forest area in the State (Sq. kms)

Year	Area	%age of geographical area
1950-51	20,800*	20.52
1960-61	20,800*	20.52
1970-71	20,857*	20.57
1980-81	20,174	19.89
1990-91	20,182	19.90
2000-01	20,230	19.95
2010-11	20,230	19.95
2011-12	20,230	19.95
2012-13	20,230	19.95

* Includes forest area under administrative control of Wildlife Department, GoJK.

4.1.1. Region-wise distribution of forests

The region wise allocation of forest area as depicted in Table 2 indicates abundance of forest area in Jammu, however in proportionate terms it is maximum in Kashmir region. It could be seen from the Table 2 that Kashmir region occupies about 51 per cent of the total forest area of the State followed Jammu region (45.89 per cent) and Ladakh region (0.06 per cent). Apart from regional variation in the distribution of forest area, State has diversity with respect to forest fauna. Various forest types of Jammu & Kashmir include Sub-Tropical Dry Deciduous Forests, Sub-Tropical Pine Forests, Himalayan Moist Temperate Forests, Himalayan Dry Temperate Forests, Alpine Forest, and Forest in cold arid zone while mountains of Ladakh and Kargil have abundance of medicinal and aromatic plants.

Table 2: Region-wise allocation of forest area in the State (Sq. Kms)

S.No	Region	Forest Area	%age of geographical area
1.	Kashmir	8128	50.97
2.	Jammu	12066	45.89
3.	Ladakh	36	0.06
	TOTAL	**20230**	**19.95**

4.1.2. Specie-wise distribution of forest

The increase in forest area from 20182 Sq. kms. (1987) to 20230 Sq. Kms. (2013) was due to rampant plantation and reclamation programme implemented in the State. Forest type mapping using satellite data, undertaken by Forest Survey of India revealed that the State has 38 forest types which belong to six forest type groups, viz. Sub-Tropical Deciduous Forests, Sub-Tropical Pine Forests, Sub-

Tropical Evergreen, Himalayan Moist Temperate Forests, Himalayan Dry Temperate Forests, Sub-Alpine Scrub and Dry Alpine Scrub Forest and their percentage allocation has been depicted in diagram. It could be seen from the diagram that there is dominance of dry alpine/ moist alpine dry alpine scrub category in the State which alone occupy about 51 per cent of total forest area. Sub-tropical pine is another type having occupied about 24 per cent of area and in contrary Himalayan moist temperate forests are meagre in the State

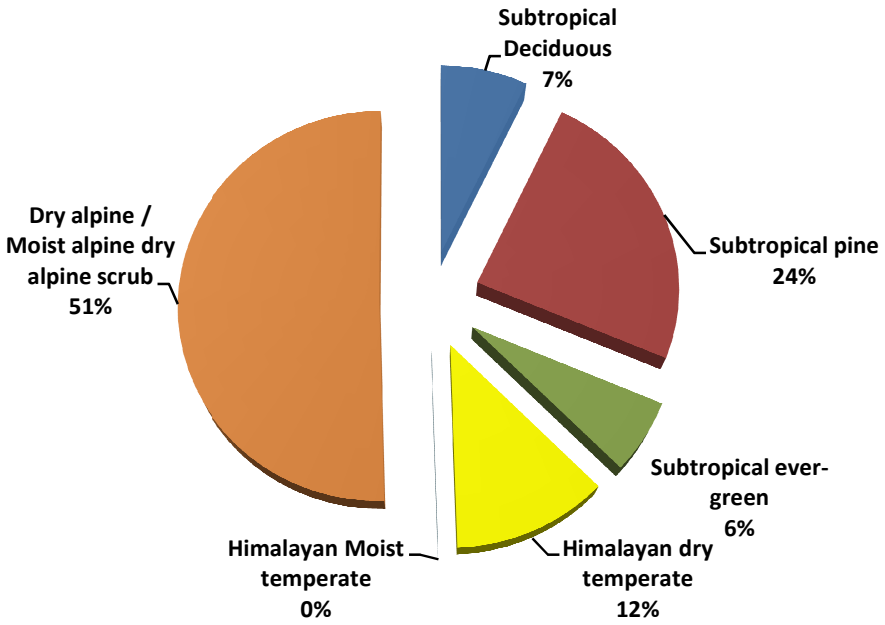


Figure. 2: Specie-wise distribution of forest area

4.2. Forest net domestic product

The trend in the development of forest sector in Jammu and Kashmir has not been encouraging and lagging behind most of the States in regard to the growth of Net State Domestic Product (NSDP) (Anonymous, 2015).

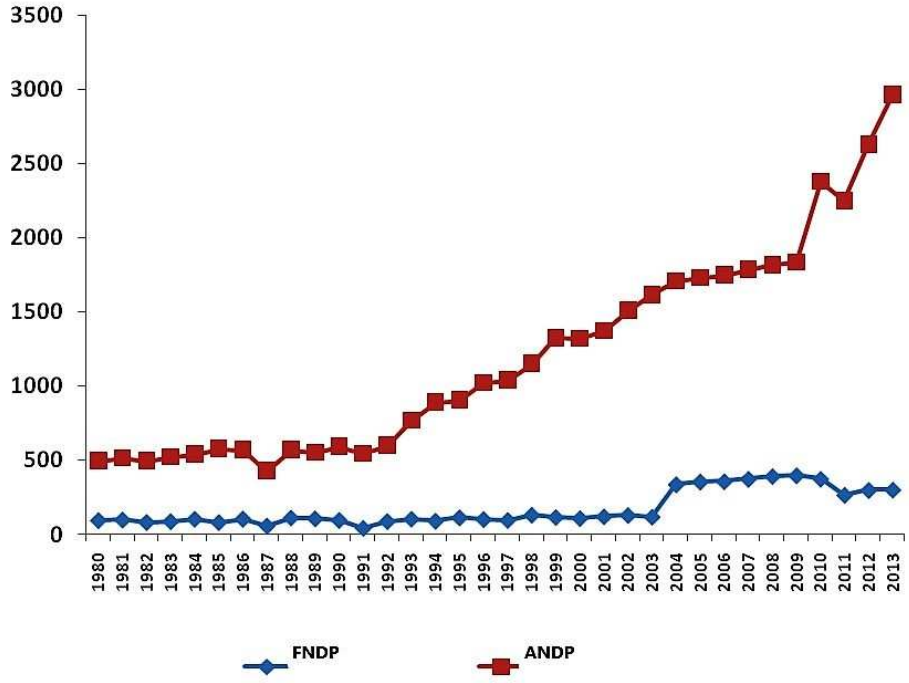


Figure 3: Absolute net domestic product in forestry and agriculture Sector (crore ₹)

A glance at the Fig. 3 revealed that net domestic product has shown a steady increase in agriculture sector (ANDP) as a whole though the growth was more prominent in recent years. Contrary to this, domestic product for forestry has shown an increase between 2003-04 and 2005-06 and remained stagnant for following year, however, later it has marginally declined.

4.2.1. Estimates of compound growth rate

The net domestic product generated in forestry sector (at 1980-81 prices) presented in Table 3 revealed that there was a gradual increase in FNDP up to 2010, however, it has decreased toward recent year. The recent decline in net product generated in forest compared to agriculture sector as a whole may be due to the decline in the attention it deserves in the form of investment and Government interventions.

In order to observe the pattern of domestic product generated in forestry sector, its percentages were estimated out of agriculture, primary and total State domestic product. Forestry sector has contributed about 10 per cent to the agricultural net domestic product and 2 per cent of State net domestic product during 2013-14. The FNDP as per cent of ANDP has shown a decline over the years, though it exhibited few intra year upward and downward swings. The declining share of forest sector in ANDP and SNDP is really a matter of concern and has to be augmented with afforestation programmes with enhanced institutional support.

Table 3: Contribution of forest net domestic product in the State economy at 1980-81 prices.

Year	FNDP (₹ in crore)	FNDP% of		
		ANDP	PNDP	SNDP
1980-81	94	19.0	18.9	9.0
1985-86	81	14.0	13.9	5.7
1990-91	95	16.1	16.1	7.0
1995-96	112	12.4	12.3	4.7
2000-01	108	8.2	8.1	2.7
2005-06	357	20.6	20.5	5.9
2010-11	375	15.8	15.6	3.9
2013-14	301	10.1	9.6	2.0

FNDP= Forest Net Domestic Product, **ANDP=** Agriculture Net Domestic Product, **PNDP=** primary Net Domestic Product, **SNDP=** State Net Domestic Product

In order to find out the growth of FNDP in different periods, compound growth rates were estimated and presented in the Table 4. Simply for clarity and comparison of growth, the entire period 1980-2013 has been categorized into two

periods viz, 1980-1997 period I and 1998- 2013 period II. Further there was sharp distinction among these periods with respect to severity of ban on extraction of forest resources.

Table 4: Compound growth rates of forestry, agricultural and State net domestic product (%)

Period	Forest	ANDP	SNDP
All (1980-2013)	5.14*	5.76*	8.28*
	(0.65)	(0.24)	(0.31)
Period I (1980-97)	0.19	3.89*	4.94*
	(1.32)	(0.73)	(0.75)
Period II (1998-2013	9.05*	5.45*	9.59*
	(1.71)	(0.35)	(0.39)

*Significance at 5 per cent or better probability levels.
Figures within parentheses indicate standard errors

It could be seen from the Table 4 that FNDP has increased significantly over the years at an annual growth rate of 5.14 per cent. The period-wise estimates of compound growth rate indicated that FNDP grew at increasing rate towards period II, though in absolute terms, it has shown a decline in recent years. In terms of growth though forest sector has exhibited a significant growth compare to agricultural sector in period II, however, its growth is much lower compared to SNDP. Efforts are to be made to contain this growth on long term basis.

4.3. Extraction from forests

Timber is being used by all strata of society in variety of ways, though it mostly used for construction purposes, making furniture and decoration items. A good quantity of timber is also used to make novelty products. It could be seen from the Table 5 that the total extraction of timber was 86.59 thousand cubic meters in 2012-13 and the Fir specie has been predominantly extracted for timber in area as well as in

quantity terms followed by Kail and Deodar. It is important, however to note that the unit price of different species may vary and may affect the total value of extraction.

Table 5: The total extraction of timber-2012-13

Species	Area exploited (Km^2)	Quantity Extracted ($000m^3$)	Value (Lakh ₹)
Deodar	2.79 (10.42)	22.99 (26.50)	3938.48 (37.30)
Chir	2.16 (8.07)	5.51 (6.40)	192.52 (1.82)
Kail	8.07 (30.15)	24.11 (27.84)	3116.01 (29.51)
Fir	13.75 (51.36)	33.98 (39.24)	3310.44 (31.36)
Total	**26.77 (100.00)**	**86.59 (100.00)**	**10557.45 (100.00)**

Figures within parenthesis indicate percentage of total

Timber is being provided to the local population on concessional rates through Timber Sale Depots administered by Forest Department and this practice has to be taken up regularly so as to prevent over exploitation of these resources.

4.3.1 Status of forest extraction

The trends in the species–wise extraction as depicted in the Table 6 has shown a declining trend between 1985-2012. The area exploited for extraction has decelerated at 6.33 per cent per annum, while the quantity extracted from it by 3.81 per cent from 1985-2013. It is encouraging that the value of extraction grew at 1.66 per cent per annum though the figure was statistically insignificant. Of different species Fir has exhibited more decline while the decline was less in Chir. The Government ban up to 1996 on extraction could be the major reason for this decline.

Table 6: Status of forest extraction (%)

Species	All (1985-2012)			Period I (1985-1998)			
	Area	Quantity	Value	Area	Quantity	Value	A
Deodar							
CGR	-2.35	-3.48*	1.98	-13.69*	-16.01*	-6.05	-3
SE	1.42	1.50	1.46	4.43	4.61	4.67	1
CV	0.67	0.79	0.52	0.76	0.79	0.62	0
Chir							
CGR	-1.23	-0.79	0.1	-12.50*	-17.66*	-8.63	-0
SE	1.83	2.23	1.86	6.57	7.46	6.59	1
CV	0.90	1.14	0.89	0.97	1.23	1.05	0
Kail							
CGR	-3.20*	-2.53	3.52*	-11.49*	-17.10*	-3.25	-4
SE	1.74	2.3	1.78	6.46	8.24	6.61	1
CV	0.80	2.57	0.53	0.83	2.38	0.78	0
Fir							
CGR	-6.75*	-5.43*	0.28	-8.45*	-8.35	-1.5	-3
SE	0.98	1.33	1.61	3.56	5.05	6.5	1
CV	0.84	0.78	0.60	0.66	0.69	0.75	0
Total							
CGR	-6.33*	-3.81*	1.66	-11.62*	-9.92*	-8.17	-3
SE	1.03	1.37	1.57	3.5	5.07	5.31	1
CV	0.83	0.71	0.49	0.68	0.71	0.71	0

*Significance at 0.05 or better probability level.

CGR= Compound growth rate, SE= Standard error, CV= Coefficient of variation

4.3.2. Out-turn of major forest produce

In terms of total production the totals out-turn has been consistently declined over the years from 154.73 (000 m^3) in 1990-91 to just 73.92(000 m^3) in recent years.

Table 7: Out-turn of major forest produce

Year	Production (000m^3)
1990-91	154.73
1995-96	110.27
2000-01	110.58
2005-06	63.15
2010-11	52.61
2012-13	73.92

Accordingly we have made an attempt to categorize different NTFP's on the basis of kind of product (Table 8). We categorized NTFP's into three categories of which the extraction from third category has reached almost zero while the production of second category has reached to under normal State. It again calls for rampant afforestation programme to come up with the growing demands from specific NTFP's.

Table 8: Species-wise average production and present status of NTFP's in J&K

Species	Present Status	Range (Qtls.)
Anardana, Katha, Resin, Tez Patter , Harar, Bamboo Dry, Guchies, Dioscoea, Bazar Bang	Normal	300 to 19600
Barain, Kour, , Rasount, Chir Waste Wood, Kail Cones, Brahmibooti, Hericulum, Dhoop.	<Normal	0.22 to 90
Deodar Oil, Overlay Brinji, Willow Clefts, Rosin, Cutch, Cedar Oil, Tarpin Oil, Gul Banafsha, Kakar Singhi.	=Zero	0

4.4. Export of forest produce from Jammu and Kashmir

The export of timber had been increasing progressively until private forest lessees were banned in 1985. It again started increasing with expiry of ban till 1996; however, by and large there has been a quantitative decline in the export of this major forest produce from the J&K State. In recent year, State was exporting timber to the extent of 0.2054 thousand m^3 on the other hand the export of minor forest produce have shown a consistent decline over the years and State could export only 41 thousand quintals of it outside the State. This scenario emphasis upon afforestation programme so that the minor forest products could be harnessed on continuous basis.

Table 9: Export of timber and Non-timber forest produces from 1980 to 2013

Year	Timber (000m^3)	Non-timber (Qtls.)
1980-81	257.47	636647
1990-91	53.39	321526
2000-01	25.1	19013.41
2010-11	0.529	86482.59
2012-13	0.2054	41216.44

In this matter, the State Government should take up the responsibility of collection and trade of forest products so that the forest products could be optimally utilized.

4.5. Government Interventions towards forest development

4.5.1 Schemes

J&K Forest Department has been taking up the task of conservation, development and sustainable management of the Forest treasure of the State. The Government with its specified Department is very much proactive towards the development of these resources by way of enacting bans and implementation of

central/State sponsored schemes and externally aid projects etc. Few of these schemes have been briefly discussed under:

Scheme	Year	Major Objectives
Rehabilitation of Degraded Forests	2000	Rehabilitation of degraded forests in the State and rehabilitate denuded forest land on scientific lines.
Research Education and Training	2000	To keep pace of development and management of forests and environment at par. Education and training for skill up gradation and capacity building.
Working Plan and Research	2000	To manage forests on regular basis and digitalization of forest maps on GIS platform.
Consolidation and Demarcation	2000	To save forests and forest crops from damage and demarcation of forest boundaries.
Development of Minor Forest Produce including Medicinal Plants	2009-10	Development and sustainable management of medicinal plants.
Eco Task Force	1988	To rehabilitate the ruie catchments of Jammu province and providing manpower and planting material for conservation and protection of forests.

Eco-restoration of degraded catchments	2002-03	Rehabilitation of catchments by Afforestation and soil water conservation
Urban Forestry	2000	Mass plantation in Urban areas
Pasture and Fodder Development	2000	To provide adequate availability of fodder for livestock
CM's Participatory Afforestation Scheme	2000	Regeneration of degraded forests and increasing tree cover. To raise plantation on open forest lands, vacant lands and other Government lands.
Forest Protection	2002-07	Prevention from forest fires besides providing infrastructural facilities to achieve the objectives of eradicating illicit timber trade and damage due to livestock.
Participatory Grazing Land Development Programme	2000	To regenerate forests and improve grazing areas on participatory basis.
Compensatory Afforestation Fund Management and Planning Authority	2010	To regulate the indiscriminate diversion of forest lands for non-forestry purposes.

The Government has launched number of programmes recently to preserve and develop forest resources, however, there has been deterioration of these resources which calls for their effective implementation with strict institutional and policy support.

4.5.2. Plantation

An important tool to cover denuded and degraded land is to go for its plantation. Government has provided green cover to this class of land by planting trees within and outside forest specified area. The figure for plantation as depicted in the Fig. 4 revealed that the plantation programme has shown a gloomy picture over the years. This discouraging trend has to be reversed to achieve better vegetative cover of degraded land to have variety of benefits to environment and human life.

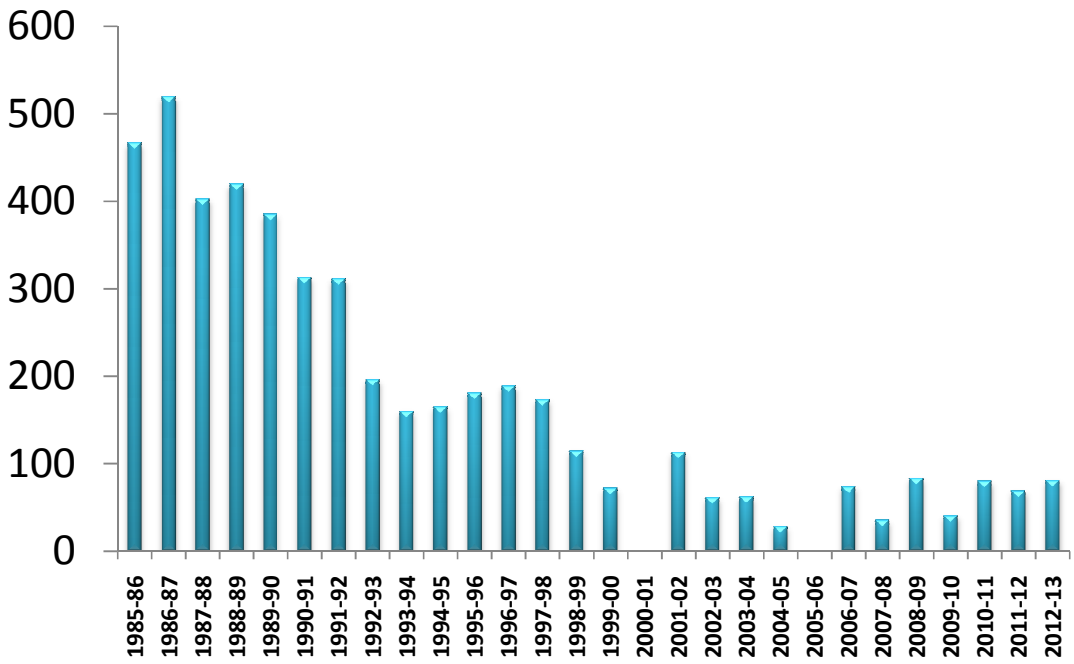


Figure 4: Number of Plants Planted (lakh no.)

4.5.3. Public Investment in Forest Sector

The public investment pattern revealed that the Government has been investing a good portion of its plan budget towards forest development. It could be seen from the Table 10 that the Government has invested 408 lakh rupees in

forest and logging sector though it has declined drastically since 2005-06. The forest investment as per cent total of State investment has shown a gloomy figure indicating that it constitutes just 0.4 per cent of total State investment in recent year. The period-wise growth of investment in forestry vis-à-vis, all economic sectors has shown that it has declined in period II and contrary to this it has been increasing for all State investment. Though forest investment has been increasing at 2.28 per cent per annum from 1985-2013 but its growth has shown a declining trend in the recent decades.

Table 10: Public investment in forestry & logging at 1980-81 prices. (₹ in lakhs)

Year	Investment (lakh)	% of total State dev. Investment
1980-81	264	1.6
1985-86	686	3.4
1990-91	909	3.0
1995-96	1265	3.3
2000-01	2601	5.3
2005-06	2446	2.9
2010-11	784	0.7
2013-14	408	0.4

Table 11: Compound growth rate of public investment in forestry & logging sector and all economic sectors (%)

Period	Forestry	All
All (1980-2013)	2.28*	6.25*
	(1.17)	(0.19)
Period I (1980-97)	9.99*	6.18*
	(0.97)	(0.38)
Period II (1998-2013)	-11.12	6.58*
	(2.50)	(0.69)

Figures within parentheses indicates standard errors
*Denotes significance at 0.05 or better probability levels

In order to observe the pattern of investment in forestry, intensities were estimated which revealed that Government was investing about 3 per cent of FNDP back in this sector in 1980-81 as investment. The intensity of forest investment has consistently increased up to 2000-01 but later it has received a major setback in 2013-14. There is a need to enhance intensity of public investment in forestry and logging.

Table 12: Intensity of public investment on forestry and logging sector

Year	FNDP (₹ in lakh)	$FPINV_f$ (₹ in lakh)	$FPINV_f$ as % of FNDP
1980-81	9402	264	2.81
1985-86	8060	686	8.51
1990-91	9510	909	9.56
1995-96	11219	1265	11.28
2000-01	10779	2601	24.12
2005-06	35651	2446	6.86
2010-11	37529	784	2.09
2013-14	30081	408	1.36

FNDP= Forest Net Domestic Product, $FPINV_f$= Forest Domestic Expenditure

4.5.4. Price structure

Pricing and its discovery has always been a crucial factor towards development of any economic activity and it could be seen from Fig. 5 that the average market rate of timber has shown significant increase over the years. The declining supply, as indicated by declining extraction, in relationship with its demand has resulted in the price hike per unit of its products; however, the steepness of the curve may reduce if we deflate the price with respect to base year.

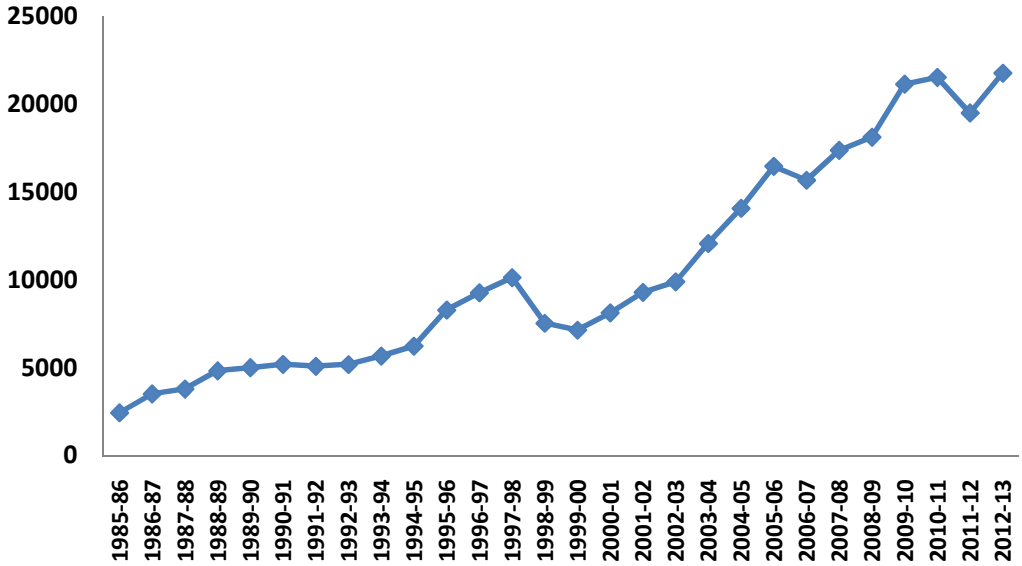


Figure 5: Average wholesale rate of timber-1985-13 (₹ /cum)

The unit price of timber varied across the species and has shown a drastic change since 1980's. The unit price of Deodar was 1713/m^3 in 2012-13 and has been gradually increased since 1980-81. On the other hand unit price of Chir has remained almost stagnant over the years.

Table 13: Species wise price structure (₹ /cum)

Year	Deodar	Chir	Kail	Fir
1980-81	200	96	133	63
1990-91	343	280	665	153
2000-01	1598	292	1011	446
2010-11	1713	349	1292	974
2012-13	1713	349	1292	974

4.6. Discrepancy across data sources

One of the major challenges for policy makers has been the discrepancy in the data with respect to social and economic parameters. Such discrepancy has been witnessed even during the present study. The satellite data revealed that the area under forest is less compared to information published by forest working plan. The area statistics for few districts like Doda, Jammu, Kargil, etc. appeared over biased while rest of the district have shown under estimated figure for area under forests. To build up a pragmatic policy for sustenance of forests, emphasis should be on improving quality of data where in consensus on common methodology would find important role.

Table 14: Discrepancy across data sources (Sq. kms)

District	Forest area By satellite	Forest area by working plan	Difference
Anantnag	1737.34	2068	-330.66
Budgam	255.74	477	-221.26
Baramulla	2469.17	2690	-220.83
Doda	5915.31	5555	360.31
Jammu	1047.99	959	88.99
Kargil	11.68	7@	4.68
Kuthua	1288.38	991	297.38
Kupwara	1562	1703	-141
Leh	0	29@	-29
Poonch	803.96	951	-147.04
Pulwama	347.14	810	-462.86
Rajouri	1317.59	1267	50.59
Srinagar	928.39	380	548.39
Udampur	2355.96	2343	12.96
Total	**20040.65***	**20230**	**-189.35**

*Includes Alpine grasslands
@Estimated figures

4.7. Illegal operations in forests

Contradictory to the role of the institutions, there has been widespread over exploitation and crimes in forest area. The Figure 6 shows illicit feeling of trees done between 2007-13 and we get a picture of tree partially or completely damaged. Although, there has been a decline in illicit practice, however, these practices are continuing as such in the State.

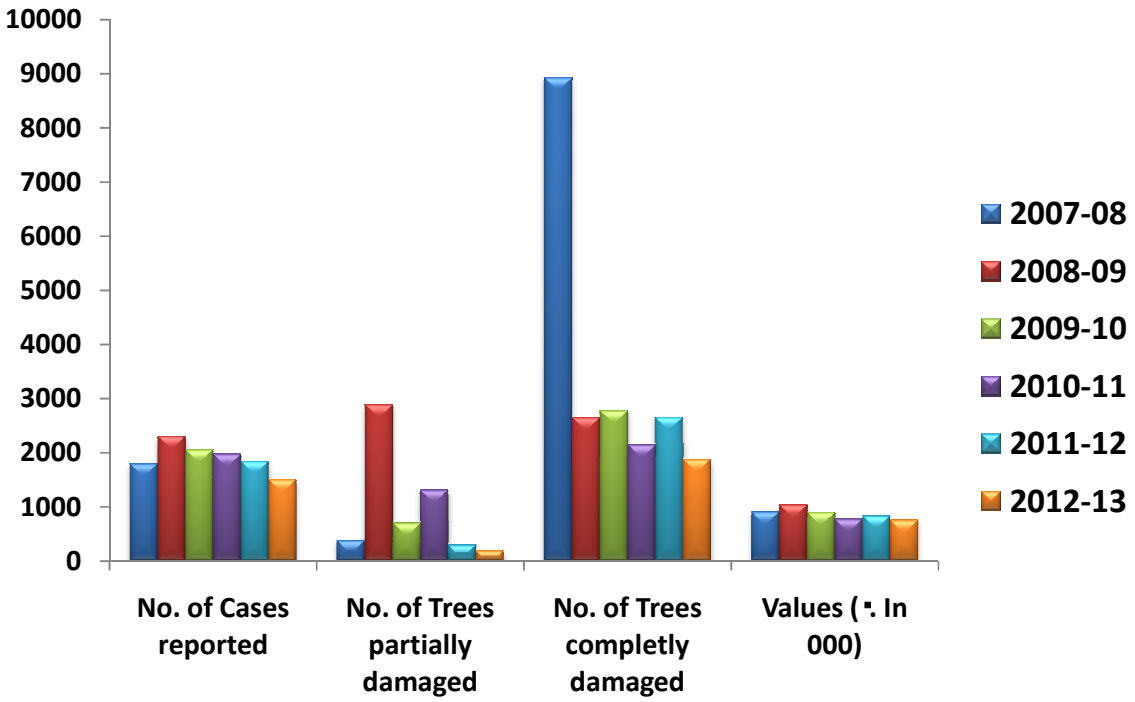


Figure 6: Illicit forest operations-2007-13

4.8. Estimates of forest growth model

An attempt has been made to capture the impact of different exogenous variables on growth of forest sector. The estimates revealed that out of 9 exogenous variables 6 appear to have significant role towards forest development. While rural literacy, public investment in forestry, plantation and export value has contributed

positively in forest development, urban population, poverty has negatively impacted on it. The estimates of R^2 and F statistics indicated the model to be a best fit wherein, specified exogenous variables explain above 70 per cent of total variation in forest growth. Elasticities were estimated to work out the marginal impact of significant variables on endogenous variables and it could be seen that the marginal value indicated that 1 per cent rise in rural literacy may develop forest GNP by 646 crore, while 1 per cent increase in urban population may reduce it by 337 crore and similarly for other significant variables. These positive and negative coefficients have to be manipulated with institutional support to have their desired impact on forest domestic product.

Table 15: Estimation of Growth function

Variable	Coefficient	Standard error	Elasticity	Marginal value (crore)
Intercept	264231	-	-	-
RLIT	1492*	424	16.50	646
UPop	-1389*	410	-8.60	-337
PVRT	-309*	176	-1.37	-54
EXPV	44*	24	0.09	4
MKRT	5	31	-	-
PTN	387*	188	0.17	7
PINV	31*	15	0.62	24
REV	27	24	-	-
Adjusted R2	0.7882			
F cal	13.7377			

*Significance at 0.05 or better probability levels


Micro-evidences

In order to ascertain the relationship between forest ecosystem and tourism, a micro-level study conducted is been discussed in following section.

4.9. Socio-economic profile of tourists

Efficiency of visits is influenced more or less by the resource availability at the command of an individual visitor and socio-economic overheads. Formulation of various developmental programmes and their implementation necessitate a critical examination of the existing resource endowments on visitation level. Keeping above in view, the present section throws light on the socio-economic status of the tourists.

4.9.1. Age-group wise categorization of tourists

The age-group wise distribution of selected tourist group heads to a particular forest site is concerned, it could be seen that majority of heads fall in the age group between 30-60 years (active section) though a handsome number of respondents also belong to 0-30 year age group. The young tourists use to be energetic to go up slopes and seem to be more curious to visit forest. It indicated that young age group tourists could schedule a trip and motivate others to visit as group members.

Table 16: Age-group wise distribution of tourist group heads (No.)

Age(yrs)	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
0-30	18 (36.00)	28 (56.00)	26 (52.00)	15 (30.00)
30-60	30 (72.00)	19 (38.00)	24 (48.00)	31(62.00)
>60	2 (4.00)	3 (6.00)	0 (0.00)	4 (8.00)
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within parentheses indicate percentage of total

In same fashion majority of members of tourist groups belong to 30-60 age-group. This scenario indicated that young age group has to be motivated to visit the forest resorts and should be the target group for tourism development campaigns.

Table 17: Age-group wise distribution of tourist group members (%)

Age(yrs)	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
0-30	10.1	5.2	8.9	10.9
30-60	88.7	92.2	89.9	72.6
Above	1.1	2.6	1.2	34.8
Total	**100 (3.57)**	**100 (3.86)**	**100 (3.39)**	**100 (7.92)**

Figures within parentheses indicate average size of the group

4.9.2. Occupation-wise categorization of tourists

The occupational distribution of tourist group heads revealed that majority of them were engaged in business activities or other specialized occupations, though a good percentage of them were dependents; indicating thereby the priority to be given to different occupational class towards attracting them to the forest sites

Table 18: Occupational distribution of group heads (No.)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Dependents	5 (10.00)	15 (30.00)	3 (6.00)	4 (8.00)
Services	5 (10.00)	6 (12.00)	14 (28.00)	6 (12.00)
Business	12 (24.00)	13 (26.00)	15 (30.00)	8 (16.00)
Others*	28 (56.00)	16 (32.00)	18 (36.00)	32 (64.00)
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within parentheses indicate percentage of total.
*Include travelers, wireless operators, photographers, fashion Designers, Management trainees

Similar scenario of occupational distribution of tourists as group members could be seen in the Table 19. Students dominate the dependents group and reflect that the tourist development campaign has to be launched from educational institutions to business hubs.

Table 19: Occupational distribution of group members (No.)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Dependents	0.7 (19.77)	0.76 (19.79)	0.54 (16.07)	1.04 (13.13)
Services	0.4 (11.30)	0.36 (9.38)	0.7 (20.83)	0.68 (8.59)
Business	1.06 (29.94)	1.26 (32.81)	0.8 (23.80)	1.74 (21.96)
Others*	1.38 (38.98)	1.46 (38.54)	1.32 (39.28)	4.46 (56.31)
Total	**3.57 (100)**	**3.86 (100)**	**3.39 (100)**	**7.92 (100)**

Figures within parentheses indicate percentage of total.
*Include travelers, wireless operators, photographers, fashion Designers, Management trainees

4.9.3. Education level of tourists

Since education widens outward horizon of person and make them to take concrete decisions like visiting to a forest resorts. Table 20 exhibited an encouraging finding that none of the group heads were illiterate. Majority of the heads were seen to have attained graduation or above educational level.

Table 20: Educational status of group heads (No.)

Education	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Primary	2 (4.00)	1 (2.00)	3 (6.00)	0 (0.00)
High	1 (2.00)	1 (2.00)	2 (4.00)	2 (4.00)
Higher	2 (4.00)	2 (4.00)	4 (8.00)	3 (6.00)
Graduation	24 (48.00)	18 (36.00)	30 (60.00)	22 (44.00)
Above	21 (42.00)	28 (56.00)	11 (22.00)	23 (46.00)
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within parentheses indicate percentage of total.

However, few tourists were seen visiting as group to the selected forest sites were illiterate, though a majority of them still have attained more than higher education indicating that educational class have to be addressed while making efforts for encouragement of tourism to these sites.

Table 21: Educational status of group members (No.)

Education	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Illiterate	4 (2.29)	0 (0.00)	5 (3.01)	4 (1.01)
Primary	15 (8.57)	9 (4.76)	11 (6.63)	44 (11.11)
High	2 (1.14)	3 (1.58)	4 (2.41)	13 (3.28)
Higher	5 (2.86)	14 (7.40)	10 (6.02)	24 (6.06)
Above	150 (85.71)	163 (86.24)	136 (81.93)	311 (78.53)
Total	**175 (100.00)**	**189 (100.00)**	**166 (100.00)**	**396 (100.00)**

Figures within parentheses indicate percentage of total.

4.9.4. Income group-wise distribution of tourists

Since income level of individuals have a close bearing on their decision to come out of their residence for a visit. Accordingly, an attempt has been made to categorize group heads on the basis of their income. It was observed that the non-earners/dependents ranged from just 1 in Dodhpathri to as high as 8 in Thajiwas. Majority of earners in Dodhpathri and thajiwas fall in second income category (40000-60000), within other two forest sites major proportion fall in high income category indicated that the amenities provided by later two forest sites provide attraction to even higher income class of the society and these amenities need to be created in other forest sites and further augmented in existing resorts.

4.10. Distribution of tourists

It could be seen from the Table 23 that major portion of the visitors were from Kashmir region followed by other States of India together in all the forest sites though it was higher in FS-I and FS-IV. Among the tourists maximum tourists from abroad were seen in Pahalgam followed by Gulmarg which may be owing to distinct amenities provided by the system like Horse riding, polo, gondola service, skiing, etc. It calls for enhancing service amenities specific to each site to attract more tourists.

Table 22: Categorization of group heads on the basis of income (No.)

Income (₹ /month)	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
20000-40000	17 (34.7)	11 (26.2)	10 (20.8)	8 (17.4)
40000-60000	20 (40.8)	16 (38.1)	9 (18.8)	11 (23.9)
>60000	12 (24.4)	15 (35.7)	29 (60.4)	27 (58.7)
Total	**49 (100.00)**	**42 (100.00)**	**48 (100.00)**	**46 (100.00)**
Average income (₹/month)	**71240**	**69320**	**101480**	**91900**

Figures within the parentheses indicate percentage of total.
The total excludes the number of students/dependents.

Table 23: Distribution of tourists on the basis of their residence (No.)

Residence/location	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Kashmir	26 (52.00)	25 (50.00)	19 (38.00)	25 (50.00)
Central	11 (22.00)	13 (26.00)	9 (18.00)	12 (24.00)
North	4 (8.00)	5 (10.00)	0 (0.00)	5 (10.00)
South	11 (22.00)	7 (14.00)	10 (20.00)	8 (16.00)
Jammu and Kashmir excludes visitors from Kashmir	5 (10.00)	3 (6.00)	3 (6.00)	5 (10.00)
India	15 (30.00)	17 (34.00)	19 (38.00)	14 (28.00)
Abroad	4 (8.00)	5 (10.00)	9 (18.00)	6 (12.00)
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within parentheses indicate percentage of the total

Gender classification of tourists indicated that male visitors out-numbered females in their visits to selected forest sites. It is important to encourage family, school and societal visits so as to influence female visits to these sites.

Table 24: Gender participation in visits (No.)

Gender	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Male	2.64 (74.58)	2.96 (77.1)	2.22 (66.07)	5.36 67.68)
Female	0.9 (25.42)	0.88 (22.92)	1.14 (33.93)	2.56 32.32)
Total	**3.54 (100)**	**3.84 (100)**	**3.36 (100)**	**7.92 (100)**

Figures within the parentheses indicate percentage of total.

4.11. Individual and group visits

An attempt has been made to understand how tourists have visited to these sites and it was observed that majority of contacted tourists have visited forest sites in groups and only few were found visiting these sites as individuals. It implies the need for managing a group wherein travel operators and tour managers have to be trained to facilitate group formation at origin.

Table 25: Group structure of forest visitors (No.)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Individual				
Number	1 (2.00)	3 (6.00)	2 (4.00)	0 (0.00)
Size	1.0	1.0	1.0	1.0
Group				
Number	49 (98.00)	47 (94.00)	48 (96.00)	50 (100.00)
Average group size	3.57	3.86	3.39	7.92
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within the parentheses indicate percentage of total.

4.12. Trip arrangements

It was observed that majority of visitors have visited to selected sites by self arranged trip so that they could stop as per their own convenience and enjoy the scene they may came across. Most of the visitors coming by self-arrangements were from State itself, though 42 per cent of groups came through trip package in Pahalgam. A case of company trip visit was also seen within the sample.

Table 26: Tourist travel arrangement (No.)

Arrangements	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
	No. of visitors	No. of visitors	No. of visitors	No. of visitors
Self-Arranged	50 (100.00)	40 (80.00)	29 (58.00)	30 (60.00)
Through package	0 (0.00)	10 (20.00)	21 (42.00)	15 (30.00)
Company Visit	0 (0.00)	0 (0.00)	0 (0.00)	5 (10.00)
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within the parentheses indicate percentage of total.

4.13. Kind of trip

Tourists were asked if they have been to forest site earlier or is it their first visit. It was observed that tourist respondents in Pahalgam and Gulmarg had performed maximum visits compared to other two forest sites. In all the locations tourists have performed more than one visit giving an idea that once a visitor visits a forest site he /she is being attracted by various forest attributes for an another visit as revealed by them An exposure to micro-climatic setting made tourists aware about its ecological benefits and provide a long lasting attraction to them.

Table 27: Distribution of tourists on the basis of kind of trip

Kind of trip visits	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
More than one	12	21	24	37
First	38	29	26	13
Overnight	1	24	49	46

4.14. Motivation for forest visits

It is important to understand the various pulling factors that attract tourists to any resort so that concerted efforts could be made to sharpen those factors to have more tourists around forest sites. In accordance to this, an attempt was made to capture the perception of visitors regarding various motivating factors. For various motivating factors, tourists expressed different response to diverse factor for various sites as depicted in the Table 28, the visitors in FS-I has revealed 'being in a peaceful and tranquil surroundings as major motivation to visit this site followed by attraction by natural environment and visiting paradise on earth'. While as lower response was received for escaping urban environment and few motivation factor specified in the table were not quoted by the tourists. In similar way attraction by nature and visiting paradise on earth received a good response as main motivational pull for tourists. To sum up, it could be observed that tourists expressed their views as per the particular forest site. The motivational pull has to be strengthened by enriching forest specific attributes of various forest sites. The Chi-square estimate indicated that there is wide significant variation in tourist response to different factors across different forest sites.

Table 28: Factors motivating tourists to forest site (%)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Being in a peaceful and tranquil surroundings	86.00	8.00	78.00	86.00
Appreciating nature	60.00	72.00	8.00	82.00
Escaping the Urban environment	13.00	18	27.00	11.00
Relaxation	40.00	46.00	52.00	68.00
Seeing the scenery along the way	66.00	72.00	38.00	68.00
Seeing forests	57.00	55.00	72.00	74.00
Spending time with family/friends	56.00	76.00	56.00	18.00
Seeing wildlife	0.00	5.00	7.00	8.00
Seeing a new place	66.00	58.00	52.00	28.00
Attracted by water	56.00	26.00	86.00	2.00
Attracted by Natural environment	79.00	82.00	86.00	82.00
Learning about Nature	72.00	74.00	72.00	68.00
Self- discovery	46.00	4.00	2.00	14.00
On a date/ post marriage trip	10	8.00	12.00	18.00
Visiting paradise on Earth	74.00	78.00	80.00	88.00
Others*	0.00	0.00	12.00	4.00

*Others include: For Business purpose, Eventual purpose, Horse-riding, etc.
Chi-square= 900.84, p= <0.05

4.15. Forest specific motivation

An attempt has been made to capture the response with respect to forest specific motivational factors in different forests sites. It could be seen from the Table 29 that tourists have expressed their response to each of the listed forest specific factors though it varies across different forest sites. The response depicted within table reported maximum attraction owing to factor specific to the site. The tourists in FS-I revealed more motivation due to excellent view of forests (90 per cent) followed by pleasant breeze (90 per cent) and large trees (88 per cent). Only 6 per cent tourist revealed that spruce forests have attracted them to FS-I. Rock and Ice and excellent view were the major motivational factors to attract tourists to Thajiwas (FS-II). Since FS-III furnishes distinct motivational services, therefore tourists in this site have bought out pleasant breeze, verdant forests, and presence of water feature as most attracting forest specific motivational factors. Apart from pleasant breeze, large trees and others, tourists have reported forest shades and silence associated with forests as important motivational factor in Gulmarg. The estimate of Chi-square implies that tourists significantly vary across different forest sites with respect to their response to different forest specific motivational factors.

4.16. Visitors attitude towards forest environment

Table 30 explains how tourists have put forth their perception for the forest ecosystem and its specific attributes. By and large they consider it a national treasure and desired the resource to be preserved on sustainable basis in all the forest specific resorts. Different tourists have different perspective towards forest ecosystem, while few of the attitudes have received more response in one forest site other have received maximum response in other site. Further, there were intra-site differences in the response across factors. The negative attitude towards forests as reflected by ‘Our landscape would look just as beautiful even if there were no forests’ and ‘Forests offer me little or no opportunities for leisure

and recreation' were revealed by less proportion of tourists indicating thereby that the majority of tourists have positive attitude towards enrichment of forest environment.

Table 29: Forest specific attributes motivating tourists towards forest site(%)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Shade	74.00	7.00	76.00	84.00
Silence	84.00	64.00	68.00	74.00
Chirping of birds	38.00	10.00	10.00	22.00
Diverse tree height	64.00	68.00	78.00	78.00
Mix of Conifers and broadleaved trees	62.00	56.00	7.00	7.00
Presence of a water feature	86.00	36.00	84.00	6.00
Excellent view	96.00	94.00	84.00	86.00
Lush green view	62.00	58.00	78.00	82.00
Closed spruce forests	6.00	1.00	0.00	8.00
Rock and Ice	78.00	96.00	82.00	26.00
Verdant forests	83.00	78.00	86.00	82.00
Large trees	88.00	62.00	68.00	92.00
Presence of Campground	82.00	52.00	37.00	84.00
Pleasant breeze	90.00	86.00	92.00	92.00

Chi-square= 706.69, p= <0.05

Table 30: Attitude of tourists towards forest environment (%)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Forests are an important part of our national heritage.	86.00	80.00	78.00	82.00
Forests for recreation and leisure are important for the wellbeing of the nation.	78.00	86.00	92.00	90.00
Our landscape would look just as beautiful even if there were no forests	0.00	4.00	2.00	4.00
We should view the wildlife, water and plants in our forests as a national treasure	88.00	84.00	86.00	88.00
Forests offer me little or no opportunities for leisure and recreation.	0.00	8.00	4.00	6.00
Visiting forests is important for my wellbeing.	70.00	86.00	74.00	78.00
I feel perfectly safe when visiting forests	60.00	66.00	72.00	70.00
Forests make great holiday destinations for me and my family	54.00	68.00	70.00	72.00
Forest conservation is important	64.00	62.00	74.00	72.00
There should be pavements inside the forests	78.00	58.00	78.00	68.00
Forest creates micro-climate	90.00	78.00	86.00	80.00
Forest maintain ecological balance and may clean environment	80.00	90.00	94.00	88.00
Pure environment helps to sustain living	86.00	88.00	86.00	80.00
Contribution for creating healthy environment and forest should be the priority	78.00	80.00	82.00	84.00

Chi-square= 516.14, p= <0.05

4.17. Ranking of reason to visit forests

The categorization of tourists on the basis of their ranking of reason for visiting a forest site Table 31 revealed that in Pahalgam and Gulmarg maximum response of tourist for visiting forest as main reason of trip. Only 34 and 28 per cent to tourist expressed that forests are main reason of their visit in FS-I and

FS-II respectively. Accordingly 100 per cent of their expenditure was due to forest for tourists who revealed forest as main reason for their trip. Forest very important reason for the visit was revealed by 56 and 42 per cent of tourists in FS-I and FS-II respectively and response for this was relatively lower in FS-IV. Few respondents have expressed very less important role of forests in their visits.

Table 31: Categorization of tourists on the basis of their ranking of reasons for visiting forest sites (No.)

Rank	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Main reason	17 (34.00)	14 (28.00)	34(68.00)	36 (72.00)
Very important	28 (56.00)	21 (42.00)	12 (24.00)	10 (20.00)
Important	5 (10.00)	13 (26.00)	3 (6.00)	2 (4.00)
Not very important	0 (0.00)	2 (4.00)	1 (2.00)	2 (4.00)
Total	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**	**50 (100.00)**

Figures within parentheses indicate percentage of total

4.18. Expenditure due to forest ecosystem

Based upon ranking of reasons for visiting forests (Table 31), an attempt has been made to part out expenditure due to forest ecosystem employing 'Expenditure Partitioning Method' as presented in Table 32. The expenditure level of an individual showed that the maximum of expenditure was incurred in Pahalgam followed by Gulmarg forest resorts. The reason may be due the more amenities provided by Pahalgam and Gulmarg than other two sites and also because of the fact that Pahalgam and Gulmarg are well known tourist

destinations of the world and receives tourists from abroad as well. Relatively lower expenditure was incurred by due to tourists in FS-I.

Table 32: Average expenditure incurred due to forest attributes (₹)

Particulars	FS-I (Dodhpathri)	FS-II (Thajiwas)	FS-III (Pahalgam)	FS-IV (Gulmarg)
Travel	2176 (56.18)	2992 (49.34)	5189 (39.93)	2841 (36.82)
Entertainment	0 (0.00)	344 (5.69)	707 (5.44)	556 (7.21)
Clothing	0 (0.00)	972 (16.08)	3560 (27.40)	2487 (32.23)
Gifts/Souvenirs	0 (0.00)	0 (0.00)	893 (6.87)	451 (5.84)
Food/Drink	1697 (43.82)	1738 (28.75)	2646 (20.36)	1381 (17.90)
Total	3873 (100.00)	6046 (100.00)	12995 (100.00)	7716 (100.00)

Figures within parentheses indicate percentage of total

4.19. Trip generating function estimates

An attempt has been made to capture the impact of different forest specific variables on visitation to different forest sites. The estimates revealed that out of all exogenous variables, 5 variables appear to have significant role on visitation of an individual to a particular forest site. Income, education, ecological concerns, tree specific and space specific characters contributed positively while family size, travel and age has negatively contributed to it. The coefficients of the function indicated that forest ecosystem (as explained by forest specific attributes) have significant role in generating visits to forest sites. Moreover, ecological concerns and scenic concerns have also a significant role in increasing visits to forest. Accordingly, the positive and negative coefficients have to be judiciously taken care off to improve visitations to a particular forest site. The estimates of R^2 indicated a model to be best fit for qualifying determinants of visitation to forest.

Table 33: Estimates of trip generation function

Variable	FS –I (Dodhpathri)		FS –II (Thajiwas)		FS-III (Pahalgam)		FS-IV (Gulmarg)	
	Coeff**	SE^	Coeff**	SE^	Coeff**	SE^	Coeff**	SE^
I	0.02*	0.01	0.00	0.02	0.05*	0.01	-0.13	0.11
FS	0.01	0.04	0.23*	0.12	-0.36	0.59	-0.12	0.38
E	0.12*	0.07	0.02	0.12	0.15	0.49	0.86*	0.71
A	-0.01	0.01	0.01	0.01	-0.20*	0.11	0.23*	0.07
TT	0.07*	0.01	-0.12*	0.01	-3.49*	1.53	0.21*	0.08
TC	0.00	0.02	-0.01	0.01	-0.13*	0.08	-0.02	0.02
EC	0.33*	0.13	0.24*	0.11	0.33*	0.04	-1.92	1.60
SC	-0.12	0.12	0.48*	0.28	0.50	1.76	1.13*	1.23
FTREE	0.37*	0.16	0.63*	0.24	-0.24	1.62	1.16*	0.58
SPCFE	0.33*	0.13	-0.04	0.50	0.24*	0.11*	0.93*	0.47
Intercept	0.26	0.46	-1.12	1.01	5.08	4.91	-11.89	5.27
R2	0.8523		0.8509		0.4147		0.5052	

*Significance at 0.05 or better probability levels
** Regression coefficient, and ^ Standard error

Chapter--5

DISCUSSION

5.1. Status of Forests in Jammu and Kashmir

India, provide habitation to vast area of forests, which spreads over an area of 79.42 million hectare (Anonymous, 2015). Mountainous States occupy 1.31crore hectares of area under different species of forests. There has been a decline in the forest area of Jammu and Kashmir from 1950 to 2012 and has reached to 20.23 lakh hectares accounting for 19.95 per cent of the total Geographical area of 101387 Sq. Kms, thereby loosing almost 500 sq. km area to degradation (Anonymous, 2011). This decrease in forest cover is because of exponential increase in human and livestock population, rapid industrialization, and a spurt in developmental activities. These developmental processes have resulted in loss of forest area accompanied by an overall degradation of forest vegetation and forest soils. Earlier, forests were managed mainly for timber production. Although, commercial felling of green trees has now been discontinued, mortality of trees due to natural causes is unavoidable. Further, due to continuous and unrestricted grazing, most of the forests in the State are deficient in regeneration. Other factors like forest fires, illicit felling of trees, invasive weeds, unregulated tourist movement and lack of timely silvicultural operations also contribute towards failure of regeneration. . It was seen that there is dominance of dry alpine/ moist alpine dry alpine scrub forest category in the State which alone occupy about 51 per cent of total forest area. Sub-tropical pine is another type having occupied about 24 per cent of area and contrary to this Himalayan moist temperate forests are meagre in the State (Anonymous, 2013). Considering peculiarities of State, our forests should have an abundance of species specific to this region like Himalayan moist alpine than other forest categories.

5.2. Forest net domestic product

The trend in the development of forest sector in Jammu and Kashmir has been lagging behind most of the States in regard to the growth of Net State Domestic Product (NSDP) (Anonymous, 2015). The forest net domestic product (FNDP) generated in forestry sector (at 1980-81 prices) revealed that there was a gradual increase in FNDP up to 2010 but later it has decreased significantly toward recent year. The recent decline in net product generated in forest compared to agriculture sector as a whole may be due to the decline in the attention it deserves in the form of investment and Government interventions. The FNDP has increased significantly over the years at an annual growth rate of 5.14 per cent; however, period-wise estimates of compound growth rate indicated that FNDP has exhibited slackened growth during period-I which has spurt in recent decade. In terms of growth though forest sector has exhibited a significant growth compare to agricultural sector, but its growth is much lower compared to SNDP. Efforts are to be made to contain this growth on long term basis. The decrease in forest net domestic product generated in the north eastern States of India has been documented by (Arun *et al.,* 2013), which they described is due to the rapid growth of the global economy and faster growth of other sectors which include both Government and private organizations.

5.3. Extraction from forests

The extraction of timber in the State of Jammu & Kashmir has been a regular phenomenon owing to its utilization in all sects of the society. It has been seen that 86.59 thousand cubic meters of timber during the year 2012-13 has been extracted in quantity terms (Anonymous, 2013). The area exploited for extraction has decelerated at 6.33 per cent per annum, while the quantity extracted from it by 3.81 per cent from 1985-2013. It is encouraging that the value of extraction grew at 1.66 per cent per annum. The judicious extraction of forest products is desired owing to its role in export earnings and overcoming domestic demand, however, it should be accompanied with rampant

afforestation programme. There should be a set programme of action for scientific management and extraction of forests so as to sustain business related to this resource on long term basis. To this effort Government ban on extraction up to 1996 has played its important role. To stop over extraction of timber and rehabilitation of forests, various schemes have already been launched by the Government which should be executed strictly. It is seen that majority of the people in rural areas are illiterate and may be least educated about the bad implication of over extraction and accordingly awareness programmes should be launched in the form of capacity building programmes wherein ecological relationship of forest would have important place. Similarly, a marked reduction in population of species yielding important Non-Timber Forest Products, particularly medicinal plants, has also been noticed throughout the State. Of the 24 species, the extractions of 9 species were normal, 7 species are under normal and 8 species have reached zero status. A good proportion of the documented medicinal plant species have been recorded in high volume trade, as per the national level trade study (Shankar *et al.,* 1996). The extraction of non-timber forest products, effect the regeneration pattern of forest species by way of sweeping propagules**/** seeds and fruits which leads to the poor forest stand dynamics, although regeneration may be effected by other anthropogenic pressures such as fire, grazing and competition with weeds but collection of NTFP's is one of the major reason for it degradation (Shankar *et al*., 1996). It emphasized up strict prohibition and unscientific extraction and collection of NTFP's for which masses are to be educated towards scientific/ judicious utilization of resources. This proposition would help sustain these natural resources on long term basis.

5.4. Out-turn and export of forest produce

The total out-turn from forests came from sale of timber and NTFP's though the timber contributed its major share. In accordance with the declining forest area it was observed that the totals out-turn has been consistently declined over the years from 154.73 (000 m^3) in 1990-91 to just 73.92(000 m^3) in recent

years The less extraction due to the ban on green felling and the trees which have acquired rotation age won't be extracted or this may be owing to bad floating seasons **as** indicated by Anonymous, 1980. In order to increase the net outturn it is essential to go for plantation of fast growing species with proper possible silvicultural practices carried out through the rotation period of various species. The export of timber had been increasing progressively until private forest lessees were banned in 1985. However, by and large there has been a quantitative decline in the export of major forest products from the J&K State. The declining export rate of forest produce in the State is partly due to the depletion of forest resource due to over-exploitation of the high quality timbers in the previous decades and partly to the inability of the Forest Departments and to develop the secondary species which now constitute the main timber contents of the forest eState. This scenario emphasis upon rigorous afforestation programme so that the minor forest products could be harnessed on continuous basis. In this matter, the State Government should take up the responsibility of collection and trade of forest products so that the forest products could be optimally utilized. The dip in domestic timber production following the Hon. Supreme Court Order (1996), coupled with a growing domestic demand for timber, in the same year led GoI to liberalize its import policy of wood and wood products (ICFRE, 2010). India as a whole has become an importer of timber (ITTO, 2013). As a result, wood imports have been steadily rising since then and there had been an increase in imports quantity of timber (Bansal, 2004; Indiastat, 2015; ICFRE, 2011). The increase in import of wood volumes and shrinking the export volume may disturb trade balance. Currently Timber trade is not regulated in India; thus, there is no fixed domestic pricing pattern for timber available in the country. The shifting of attention from timber production to biodiversity conservation, due to the recognition of the multiple benefits of forests with regard to ecosystem services could be an important measure to harness much from these resources on long term basis. These changes in forest management also have been observed across the globe, as reflected in policies

and regulations with a focus on biodiversity conservation (Cashore and Stone, 2012; Le *et al*., 2012; Winkel, 2014; Raum and Potter, 2015).

5.5. Government Interventions

The Ministry of Environment & Forests, GoI is entrusted with planning, protection and coordination of environment and forestry programmes. The Ministry is involved in conservation and survey of flora, fauna, forests and wildlife, prevention and control of pollution, afforestation, regeneration of degraded areas and protection of overall environment. To accomplish these tasks, the Ministry undertakes various measures discussed at page 41.

At the State level J&K Forest Department has been taking up the task of conservation, development and sustainable Management of the Forest treasure of the State. The Government with its specified department is very much proactive towards development of these resources by way of enacting bans and implementation of central/State sponsored schemes and externally aid projects etc. There is a dire need of strict implementation of laws and acts and the time demands convergence of various schemes to have a desired result.

In order to bring maximum area under forest and tree cover, afforestation was carried out on all degraded and denuded lands in the State, within and outside forests. The number of plants planted by the forest department in the year 2012-2013 was around 80.94 Lakh. Although Government has played a vital role by way of plantation programme, however, the forest cover is yet to go long way to reach a desired status of being a mountainous State. The ruthless felling of trees and rapid urbanization demand protection of forest resources and enhancing forest cover. With the change in role from exploitation to conservation, Forest Department is no longer considered as revenue generating machinery .The Government has been increasingly investing 408 lakh rupees in forest and logging sector during the year 2013-14, though it has declined drastically since 2005-06. The forest investment as per cent total of State investment has shown a gloomy figure indicating that it constitutes just 0.4 per cent of total State investment in recent year. Though forest investment has been

increasing at 2.28 per cent per annum from 1985-2013 but its growth has shown a declining trend in the recent decades. Intensities of forest investment revealed that Government was investing about 3 per cent of FNDP in this sector in 1980-81 as investment. The intensity of forest investment has consistently increased up to 2000-01 but later it has received a major setback in 2013-14. It indicates that this sector has not received the policy support it actually deserves and demands enhanced intensity of public investment in forestry and logging. It was realized that the development of any primary sector can be achieved if investment is made equitable across regions (Baba *et al.*, 2010). Government of India, 1998 observed that while private investment has been the principal source of agricultural growth, particularly in the recent past, and will continue to be so in future, public investment is essential to correct existing infirmities and to impart added dynamism to the agricultural sector. This lesson has to be put in practice by encouraging private investment in forestry sector; of which social forestry forms an important component.

The auction held by the Forest Department reveals an annual increase in the minimum price of all the forest species. The market prices of timber of different species have registered a considerable increase during the past years. The trend in the average wholesale market rate of timber has shown a gradual increase from 1985- 2013. It was seen that the prices of Deodar is considerable higher than that of the Chir, Kail and Fir. Demand creation in the global markets for timber and NTFP's with institutional support would ensure better prices to these products.

5.6. Discrepancy across data

One of the major challenges for policy makers has been the discrepancy in the data with respect to social and economic parameters. Such discrepancy has been witnessed even during the present study. The satellite data revealed less forest area compared to information published by forest working plan. To build up a pragmatic policy for sustenance of forests, emphasis should be on improving quality of data where in consensus on common methodology would

find important role. Application of remote sensing and GIS application would find an important role in conducting surveys and digitizing forest data.

5.7. Illegal Operations in forests

Despite an important role of institutions, there has been widespread over exploitation and crimes executed in forest area. The illicit feeling of trees had been done between 2007-13 and a good proportion of trees have been partially or completely damaged. Although, there had been a decline in illicit practice but these cases are still present in the State. Strict supervision and surveillance within and around forests may keep reduce the undesired practices and in turn develop forests.

5.8. Estimates of forest growth model

It has been observed that rural literacy, public investment in forestry, plantation and export value has contributed positively in forest development, while urban population, poverty has negatively impacted on it. The significant variables have a strong marginal impact forest growth in the State.

5.9. Socio-economic profile of tourists

The present study intends to investigate into major socio-economic indicators of tourists as the frequency of visits is influenced more or less by the resource availability at the command of an individual visitor and group overheads. It had been seen that majority of tourist group heads fall in the age group between 30-60 years though a handsome number of respondents also belong to 0-30 year age group. The young tourists seem to be more curious to visit forest and could schedule a trip along with their member/friends etc to visit as group to forest site. This scenario indicated that young age group has to be motivated to visit the forest resorts and should be the target group for tourism development campaigns. The age of the tourists interviewed was between 16 and 67, with about half of them falling in the age group 26–35 (49.2 per cent), indicating the attractiveness of the island for young visitors (Stefan *et al.,* 2006)

It had been seen that the majority of the tourists were engaged in business activities or other specialized occupations, though a good percentage of them were dependents; and reflect that the tourist development campaign has to be launched wherein priority is to be given to different occupational class towards attracting them to the forest sites.

As education widens outward horizon of person and make them to take concrete decisions like visiting to a forest resorts. It was found that forest visit is related to higher educational levels which were also suggested by (Loesch, 1980 and Jansen *et al*., 1994). It was encouraging to see that none of the group heads were illiterate and were seen to have attained graduation or above educational level. The educational classes of the society have to be addressed while making efforts for encouragement of tourism to these sites. Almost 68 per cent of the tourists reported having a university degree, reflecting a generally high educational status. (Stefan *et al.,* 2006).

Since income level of individuals have a close bearing on their decision to come out of their residence for a visit. It had been observed that majority of tourists in Dodhpathri and Thajiwas fall in the income category of 40000-60000, while as in other two forest sites (Pahalgam and Gulmarg) major proportion fall in high income category (above 60000) indicated that the amenities provided by later two forest sites provide attraction to even higher income class of the society and these amenities need to be created in other forest sites and further augmented in existing resorts. Even the annual net income of the tourists is high, with 3.2 per cent earning up to 10,000, 15.1 per cent between 10,001–20,000, 20.2 per cent between 20,001–30,000, 15.5% between 30,001–40,000, 8.3 per cent between 40,001–50,000, 7.5 per cent between 50,001–60,000, and 12.7 per cent more than 60,000. Two percent of the tourists reported not to know the figure, 7.9 per cent claimed not to have an income, and 7.5 per cent refused to respond to this question. In summary, tourists in Zanzibar could thus be characterized as younger, well educated and wealthy (Stefan *et al.,* 2006).

5.10. Distribution of tourists

It had been seen that major portion of the visitors were from Kashmir region followed by other States of India together in all the forest sites though it was higher in Dodhpathri and Gulmarg. Among the tourists maximum tourists from abroad were seen in Pahalgam followed by Gulmarg which may be owing to distinct amenities provided by their system like Horse riding, polo, gondola service, skiing, etc. It calls for service amenities specific to each site to attract more tourists. This was in support to the study conducted by (David and Laura, 2004) in Australian urban-rural fringe which revealed that 93 per cent of the respondents were Australian residents and 58 per cent were from Gold Coast or Brisbane. Gender classification of tourists indicated that male visitors out-numbered females in their visits to selected forest sites. It is important to encourage family, school and societal visits so as to encourage female visits to these sites. It opened up the possibilities of encouraging female groups from variety of institutes, educational institutions and tourism development departments should move together in this regard.

5.11. Individual and group visits

It had been observed that majority of contacted tourists have visited forest sites in groups and only few were found visiting these sites as individuals. It implies the need for managing a group where in travel operators and tour managers have to be trained to make groups at origin. In contrary to this, recreational activities have mainly followed the increasing individualization of society (Roovers *et al.*, 2002).

5.12. Trip arrangements

It was observed that majority of visitors has visited to selected sites by self arranged trip so that they could stop as per their own convenience and could enjoy the scene they may came across enroute. Most of the visitors coming by self-arrangements are from State itself, though 42 per cent of groups came

through trip package in Pahalgam. Further, it was observed that tourist respondents in Pahalgam and Gulmarg had visited maximum times compared to tourists in other two forest sites. In all the locations tourists have performed more than one visit giving an idea that once a visitor visits a forest site he /she is being attracted by various forest attributes for an another visit as revealed by them. An exposure to micro-climatic setting made tourists aware about its ecological benefits and provide a long lasting attraction to them. The percentage of visitors in forest site travelling by car is likely much higher, even so being everywhere the most popular transport (AMINAL, 1993; Peltzer, 1993; SchmithuEsen and Wild-Eck, 2000) and these visitors stay significantly for longer time.

5.13. Motivation for forest visits

In order to capture the perception of visitors regarding various motivating factors tourists were asked about the various motivating factors and it was observed that for various motivating factors, different tourists have expressed different response to different factor for different sites. The visitors in Dodhpathri have revealed 'being in peaceful and tranquil surroundings as major motivation to visit this site followed by attraction by natural environment and visiting paradise on earth'. While as lower response was received for escaping urban environment and specified few motivation factors were not quoted by the tourists. In similar way attraction by nature and visiting paradise on earth received a good response as main motivational pull for tourists. The motivational pull has to be strengthened by enriching forest specific attributes of various forest sites. Some forest visitors did not specifically set out to visit a particular forest site only a few cases were seen where tourists express no role of forests in motivating them to the forests but, during the course of their outing, they decide to spend some time in a forest. Study is also available in the literature which revealed that the forest plays no role in motivating their day trip, which would be made regardless of whether or not a specific forest existed (Hill

et al., 2003). However, in this study majority of respondents have revealed existence of forests as major motivational factors to visit these sites.

5.14. Forest specific motivation

Tourists have expressed their response to all the forest specific factors though it varies across different forest sites. The tourists in Dodhpathri revealed more motivation due to excellent view of forests (90 per cent) followed by pleasant breeze (90 per cent) and large trees (88 per cent). Only 6 per cent tourist revealed that spruce forests have attracted them to Dodhpathri. Rock and Ice and excellent view were the major motivational factors to attract tourists to Thajiwas. Since Pahalgam furnishes distinct motivational service, therefore tourists in this site have bought out pleasant breeze, verdant forests, and presence of water feature as most attracting forest specific motivational factors. Apart from pleasant breeze, large trees and others, tourists have reported forest shades and silence associated with forests as important motivational factor in Gulmarg. A common over-arching factor in the motivations for visiting forests was an enjoyment of nature and the outdoors, and an awareness of the need for environmental restoration by preserving forest. These perceptions have clear links to the ways in which people value nature and the environment (O'Brien, 2008).

5.15. Visitors attitude towards forest environment

Viewpoints regarding forest environment of tourist from diverse socio-cultures would definitely have to be considered while formulating policy suggestions. As many areas of high biodiversity are currently under increasing pressure from tourism (Pickering, 2010) and are frequently exposed to increasing negative ecological footprints (Wackernagel and Ress, 1996). It is critical that visitors' perceptions as well as factors influencing existing perceptions of protected areas are investigated and included in future management plans to achieve conservation improvements (Jones *et al.*, 2011). Often, due to the dual nature of conservation, protected areas management is

faced with challenges that arise from meeting both conservation requirements and visitors' expectations (Suckall *et al.*, 2009). Existing conservation management instruments can be optimized by understanding the multiple differences among attitudes and perceptions (Jones *et al.*, 2011) of a heterogeneous tourist population and investigating their long term impact on conservation management (Suckall *et al.*, 2009). It was observed that tourists consider forests a national treasure and with this resource to be preserved on sustainable basis in all the forest specific resorts. Different tourists have different perspective towards forest ecosystem, while few of the attitudes have received more response in one forest site other have received maximum response in other site. Further, there were intra-site differences in the response across factors.

5.16. Ranking of reason to visit forests and expenditure due to forest ecosystem

The categorization of tourists on the basis of their ranking of reason for visiting a forest site revealed that in Pahalgam and Gulmarg maximum response of tourist for visiting forest as main reason of trip. Only 34 and 28 per cent tourists expressed that forests are main reason of their visit in Dodhpathri and Thajiwas, respectively. Accordingly, 100 per cent of the expenditure was due to forest for tourists who revealed forest as main reason for their trip. Forest as very important reason for this visit was revealed by 56 and 42 per cent of tourists in Dodhpathri and Thajiwas, respectively and response for this was relatively lower in Gulmarg. Few respondents have expressed very less important role of forests in their visits. It is remarkable that more than 50 per cent of all visitors come minimum ones a week to the Heverlee forest complex. However, comparable high rates were observed in Finland (Ven and Konijnenburg, 1994) and Germany (Volk, 1992).

Based upon employing 'Expenditure Partitioning Method', the expenditure level of an individual showed that the maximum of expenditure was incurred in Pahalgam followed by Gulmarg forest resorts. The reason may be due the more amenities provided by Pahalgam and Gulmarg than other two sites

and also because of the fact that Pahalgam and Gulmarg are well known tourist destinations of the world and receives tourists from abroad as well. Relatively lower expenditure was incurred by due to tourists in Dodhpathri because of the fact that this forest site has not been fully discovered and has yet to be promoted among the tourist resorts. Similarly the study conducted by (Hill *et al.*, 2003a) revealed that the forests of the Wye Valley had the highest level of forest-associated day visit expenditure for day visitors from home and holidaymakers staying in the area, whilst the forests of the Trossachs had the highest level for visitors staying away from home outside the area. Tourism promotion to unexplored or partially explored forest sites have to be taken rigorously in all the section of the country and abroad.

5.17. Trip generating function estimates

The estimates of trip generating function revealed that out of all exogenous variables, 5 variables appeared to have significant role on visitation of an individual to a particular forest site. Income, education, ecological concerns, tree specific and space specific characters contributed positively while as family size, travel and age has negatively contributed to it. The coefficients of the function indicated that forest ecosystem (as explained by forest specific attributes) have significant role in generating visits to forest sites. Moreover, ecological concerns and scenic concerns have also a significant role in increasing visits to forest. Accordingly the positive and negative coefficients have to be judiciously taken care off to improve visitations to a particular forest site. Awareness about good and service associated with forest environment among masses would have a dual outcome of preserving environment and attracting them to forests. Forest specific attributes are to be broadcasted so as to persuade urban/rural people to have a visit to these sites.

Chapter--6

SUMMARY AND CONCLUSION

The present investigation entitled ***"Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective"*** was carried out to study the visitors attitude towards forest environment, examine the growth in forest sector in Jammu and Kashmir and to analyze the impact of forest ecosystem on development of tourism in the State. The study has perused primary as well as secondary data to accomplish its specified objectives. The results obtained from the investigation are summarized as follows:

6.1 Finding of the study

6.1.1. Macro-evidences

- There has been a decline in the forest area of Jammu and Kashmir from 1950 to 2012 by almost 500 sq. km area to degradation and it raised a necessity to ascertain the area under forests and wildlife.
- The trend in the development of forest sector in Jammu and Kashmir has been lagging behind most of the States in regard to the growth of Net State Domestic Product (NSDP). It was observed that forestry sector has contributed about 10 per cent to the agricultural net domestic product and 2 per cent of State net domestic product in year 2012-13.
- It terms of growth FNDP has increased significantly over the years at an annual growth rate of 5.14 per cent and this growth was yet more significant in the period II (1998 to 2013).
- The total extraction of timber during the year 2012-13 has been 86.59 thousand cubic meters, of which the Forest Department extracted 33.98 thousand cubic meters and the extraction has significantly gone down over the years.
- The trends in the species–wise extraction has shown a declining trend between 1985-2012. The area exploited for extraction has decelerated at

6.33 per cent per annum, while the quantity extracted from it by 3.81 per cent.

- In terms of total production the total out-turns has been consistently declining over the years from 154.73 (000 m^3) in 1990-91 to just 73.92 (000 m^3) during recent years.
- There has been a progressive increase in the export of timber until private forest lessees were banned in 1985. About 0.2054 thousand cubic meter of timber has been exported during the year 2012-13. Minor Forest Products of the order of 16668.27 Quintals was exported from J&K State.
- Various schemes were implemented by the State Government for conservation, development and sustainable management of the forest treasures, which have best pay off.
- It was observed that plantation has been decreasing in the State which may have serious results in view of shrinking forest resources. The plantation has revealed its peak in the year 1986-87, since then it has been consistently declined.
- The Government has invested 408 lakh rupees in forest and logging sector in 2013-14 though it has been declining drastically since 2005-06. The forest investment as total percentage of State investment constitutes just 0.4 per cent of total State investment in the recent year.
- The period wise growth of investment in forest has shown a declining trend between 1998-2013, and contrary to this it has been increasing for all economic sectors.
- It was observed that Government was investing about 3 per cent of FNDP in forest sector in 1980-81 and has consistently increased up to 2000-01 however, its intensity has received a major setback in 2012-13.
- The market prices of timber have registered a considerable increase during the past years. The prices of Deodar are considerable higher than that of the Chir, Kail and Fir.

- The forest cover of State based on interpretation of satellite and working plan shows a net difference of -189.35 Sq kms.
- Estimates of Forest Growth Function revealed that rural literacy, public investment in forestry, plantation and export value has contributed positively in forest development while urban population, poverty has negatively impacted on it.

6.1.2. Micro-evidences

- It was observed that major portion of the visitors were from Kashmir region followed by other States of India together in all the forest sites, though a good number of them were from abroad as well.
- The majority of visitors fall in the age group between 30-60 years, which is considered to be active population in respect of risk bearing and decision making.
- The occupational distribution of tourists revealed that majority of them belongs to business activities or other specialized occupations.
- Majority of the visitors were seen to have attained graduation or above educational level, though a lesser proportion of illiterate were accompanying the group heads.
- Tourists to forest site in Pahalgam and Gulmarg fall in high income category which indicated that the amenities provided by these two forest sites provide attraction to high income class of the society and these amenities need to be created in other forest sites.
- Gender classification of tourists indicated that male visitors out-numbered females in their visits to selected forest sites, giving an idea of potential of encouraging female visits.
- Self arranged trip visits were more common though 42 per cent of the visitors came through package in Pahalgam.

- Tourists in Pahalgam and Gulmarg were seen to have frequently visited the forests because of the distinct amenities provided by the known forest resorts.
- Among the various motivating factors tourists have expressed different factors for different forest sites, the tourists coming for business purpose has got less response.
- Among the forest specific attributes Presence of water feature, lush green view and pleasant breeze have got maximum response in motivating tourists towards forests.
- The attitude of tourists towards forest revealed that they consider it as a national treasure and emphasized upon its preservation on sustainable basis.
- Estimates of Trip Generation Function revealed that forest specific attributes of forest ecosystem in selected resorts have significantly contributed in improving frequency of individual visits. Income, scenic concerns and education also turned to be positively significant determinants of visitation while family size and travel time has negative impact on their visits.

6.2 Policy suggestions/recommendations

- Forest policy/schemes laws be strictly implemented for prevention of conversion of forest land, prohibition of illegal operation and up scaling of afforestation programmes. There is a need of an active involvement of local masses in protection and supplementary service for prevention of illegal operations. Afforestation programme be launched in a big way to improve the density of forest trees so as to have a lush green view. Planting of trees along roads, railway lines, rivers, streams and canals, and other available lands under State, institutional or private ownership.
- There is a need to enhance investment to forest sector in view of its important role in growth of forest sector; its intensity be increased

manifold to have desired results from this sector. The investment support may favour regions with less forest cover to be a regular phenomenon.

- Since urbanization and associated erection of infrastructure and creation of facilities for tourists have negative impact on forest development, therefore, the goal of forest development could not be achieved unless we emphasized upon planned urbanization with vertical expansion than horizontal spread. The focus of policy should be on inclusive green economy especially around and within forest limitations.
- Government with its Forest and Tourism Department need to launch a campaign to impart ecological and scenic concerns among urban/rural masses. Audio-visuals with documentaries of water features, chirping birds, and other forest specific atrributes should be employed in promotion efforts. Vanity vans and 'hop on hop of' drives with playing movies exhibits forest attributes seems to have to be given to visitors on complementary basis either at entry or exit points. Publication and distribution of calendars, flyers, wall hangings with visuals of forest attributes would help to develop eagerness to visit forests.
- Efforts would be made to bridge the gap between demand and supply of timber by increasing productivity and actively facilitating import of timber. There is a need to apply science in the development of different species of forest trees, shrubs and scientific productivity augmentation of Common Property Reserves (CPR's) within and around the forests.
- Employment generation through implementation of forestry activities, schemes and programmes would essentially augment livelihood opportunities available to the local communities. To realize this imperative, all major activities, schemes and programmes will henceforth have a provision for creating a corpus as a compulsory component, and put adequate money in the same to cater to the watch and ward, fire protection and maintenance needs of the assets created, during and after the project period. Focus of the employment generation will be on youth from local community and tribal communities.

- Eco-tourism activities should be regulated in a manner that preserves the health, scenic beauty and natural attributes of the eco-tourism sites. Eco-tourism should compulsorily focus on providing eco-sustainable livelihood support to the local communities. Local communities needs be trained and motivated to be an integral part of the eco-tourism activities.
- Since majority of the tourists to selected forest sites were having attained good education, therefore, audio-visuals may be used to exhibit forest specific attributes to invite more numbers of resorts. The young age-group be targeted to attract more visitors to the forest sites. Further the campaign for attracting more visitors need to focus on female societal groups like Mahila mandals, Self Help Groups (SHG's), colleges to impart forest visit concerns among female folk.
- As the environmental impacts of tourism have become more obvious, efforts to minimize or avoid further impacts should be developed. There are existing initiatives within the tourism industry to minimize negative impacts. Potential improvements include voluntary efforts by industry sectors and Government initiatives, developers initiatives to design and build tourist infrastructure with minimal impact on the environment, and non-profit tours that expose environment friendly travel ethics.

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Appendix-I

Thesis Title**: Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective**

Interview Schedule

Schedule No:

Dated:

A. BACKGROUND INFORMATION

Name:_____
Father's Name:_____
Age: _____ Village/ Town: _____
Education: _____ Block: _____
Occupation: _____ District: _____

B. FAMILY DETAILS

Member		No.	Age	Occupation		Income	Remarks
S.No.				Main	Subsidiary	Rs/month	
1.	Self						
2.	Spouse						
3.	Son						
4.	Daughter						
5.	Daughter-in-law						
6.	Maid/ Servant						

C. MOTIVATION

S.No.	PARTICULARS	RESPONSES
1.	Being in a peaceful and tranquil surroundings	
2.	Appreciating nature	
3.	Escaping the Urban environment	
4.	Relaxation	

5.	Seeing the scenery along the way	
6.	Seeing forests	
7.	Spending time with family and friends	
8.	Seeing wildlife	
9.	Getting some exercise	
10.	For Business purpose	
11.	Seeing a new place	
12.	Attraction by water	
13.	Attracted by Natural environment	
14.	Learning about Nature	
15.	Eventual purpose	
16.	Self- discovery	
17.	Horse riding	
18.	On a date/post marriage trip	
19.	Visiting Part of paradise on Earth	
Forest attributes		
i.	Shade	
ii.	Silence	
iii.	Chirping of birds	
iv.	Diverse tree height	
v.	Mix of conifers and broadleaved trees	
vi.	Presence of a water feature	
vii.	Excellent view	
viii.	Clear-cuts	
ix.	Closed spruce forests	
x.	Rock and ice	
xi.	Verdant forests	
xii.	Large trees	
xiii.	Presence of campground	
xiv.	Lush green view	
xv.	Pleasant breeze	

***Note**: 1 for YES 0 for NO

D. TRIP/ VISITORCHARCTERISTICS

	PARTICULARS	VALUE	REMARKS
1.	Size of group		
2.	Education		
	Primary		
	High		
	Higher		
	Above		
3.	Sex		
	Male		

	Female		
4.	Age		
	0-30		
	30-60		
	Above		
First Visit			
YES			
NO			
If NO number of visits			
Overnight Visit			
YES			
NO			
If YES number of visits			
Self-Arranged			
Through package			
Company Visit			

***Note**: Indicate residence if different among numbers

E. EXPENDITURE

	Particulars	**Value**	**Remarks**
S.No	.		
1.	Travel		
2.	Parking		
3.	Toll		
4.	Petrol/Diesel		
5.	Wear and tear		
6.	Entertainment		
7.	Clothing		
8.	Gifts/Souvenirs		
9.	Accommodation		
	Self		
	Group		
10.	Food/Drink		
	i. No. of meals ii. Fast food iii. Regular meals		

F. ATTITUDE

S.No.	STATEMENT	REMARKS
1.	Forests are an important part of our national heritage.	
2.	Forests for recreation and leisure are important for the wellbeing of the nation.	

3.	Our landscape would look just as beautiful even if there were no forests	
4.	We should view the wildlife and plants in our forests as a national treasure	
5.	Forests offer me little or no opportunities for leisure and recreation.	
6.	Visiting forests is important for my wellbeing.	
7.	I feel perfectly safe when visiting forests	
8.	Forests make great holiday destinations for me and my family	
9.	Forest conservation is important	
10.	There should be pavements inside the forests	
11.	Forest creates micro-climate	
12.	Forest maintain ecological balance and may clean environment	
13.	Pure environment helps to sustain living	
14.	Contribution for creating healthy environment and forest should be the priority	

***Note**: Mark YES if Agree and NO if Disagree

Appendix-II

Tourists coming to Kashmir Valley

S.NO	Year	Indian	Non-Indian	Total
1	1980	548.49	46.03	594.52
2	1985	465.6	38.02	503.62
3	1995	0.32	8.2	8.52
4	1996	0.37	9.59	9.96
5	1997	7.02	9.11	16.13
6	1998	99.64	10.25	109.89
7	1999	199.9	15.99	215.89
8	2000	104.34	7.58	111.92
9	2001	66.73	5.86	72.59
10	2000	104.34	7.58	111.92
11	2001	66.73	5.86	72.59
12	2002	24.67	2.69	27.36
13	2003	182.21	8.96	191.17
14	2004	358.1	18.63	376.73
15	2005	585.7	19.68	605.38
16	2006	412.88	20.01	432.89
17	2007	417.26	24.58	441.84
18	2008	551.04	21.59	572.63
19	2009	577.34	23.91	601.25
20	2010	710.5	25.98	736.48
21	2011	1282.36	32.12	1314.47
22	2012	1274.67	37.17	1311.84

Source: Directorate of Tourism Kashmir/Jammu

Certificate

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This is to certify that all the modifications/corrections as suggested by External Examiner(s) during evaluation and viva-voce examination in the manuscript entitled, **"Analysis of relationship between forest ecosystem and tourism in Kashmir: An economic perspective" submitted by Mr. Mohammad Mubashir Kachroo (Regd. No. 2015-A-1059-M)** have been taken care of before final binding of the same.

Dr. S.H. Baba (SS)
Major Advisor