

Ecotourism and Environmental Sustainability- An Evaluative Study on Kuruva Island in Wayanad, Kerala

Binoy T A*

Abstract

Kuruvadweep (Kuruva Island), a 950-acre protected river delta on the Kabini River in Wayanad district, Kerala, is a well-known ecotourism destination in the world. Kuruva Island is an evergreen forest with many streams making many islands within an island. This uninhabited island is an abode of many rare species of flora and fauna, especially Wild Orchids, Birds, Amphibians and many herbs. It has been declared as one of the Biodiversity hotspots of the World. This paper, theoretically, aims to evaluate the ecotourism activities organized in Kururva Island and their impact of these activities in environmental sustainability and biodiversity protection. The primary data has been collected from representatives of various stakeholders of both the tourism industry and organizations involved in environmental protection.

Keywords: Ecotourism, Eco-tourist, Sustainable Development, Biodiversity, Habitat Destruction

* Kuvempu University, Shimoga, Karnataka, India;
binoyta@kuvempu.ac.in, binoymta@gmail.com

Introduction

Kerala has been recognized worldwide as one of the premiere destinations of India and even declared as one of the must-see destinations in one's life time. Kerala, as a whole, has been branded as God's own Country with a wide variety of tourism resources ranging from archaeological heritage sites to many biodiversity spots like the Western Ghats.

Foreign Tourist arrivals in Kerala in the year 2015-16 was 9,77,479 with an increase of 5.88% over the year 2014-15. The foreign exchange generated during 2015-16 was 6,950 crores with an increase of 8.61% over the previous year. Domestic Tourism growth in Kerala has also significantly improved during this period. Kerala has witnessed 6.59% growth over the previous year with an arrival of 1,24,65,571 tourists. According to the statistics revealed by the Ministry of Tourism, Government of Kerala, the overall revenue generated from the tourism industry is 26,689.63 crores from direct and indirect sources.

The table shows the domestic and international tourists arrivals and corresponding growth for the last 7 years (2009-10 to 2015-16).

Year	Domestic Tourist Arrivals	% of Change	International Tourist Arrivals	% of Change	Foreign Exchange in Crores
2009-10	79,13,537	4.25	5,57,258	-6.96	2,853.16
2010-11	85,95,075	8.61	6,59,265	18.31	3,797.37
2011-12	93,81,544	9.15	7,32,985	11.18	4,221.99
2012-13	1,00,76,854	7.41	7,93,696	8.28	4,571.69
2013-14	1,08,57,811	7.75	8,58,143	8.12	5,560.77
2014-15	1,16,95,411	7.71	9,23,366	7.60	6,398.93
2015-16	1,24,65,571	6.59	9,77,479	5.88	6,950.00

Source: Ministry of Tourism, Government of Kerala

The above statistics shows that both domestic and international tourist arrivals in Kerala are increasing every year with an average of 7% and the foreign exchange earnings from tourism is also showing an upward growth. So, the government of Kerala should improve facilities and amenities that are available to tourists at the destination by 7% annually to accommodate the growing number of tourists.

Literature Review on Ecotourism

Ecotourism is a fast-growing niche market within the larger tourism industry with annual sales of billions of US Dollars across the world. It is a real industry that seeks to take advantage of market trends (Wood, 2002). Ecotourism, as an alternative tourism, involves visiting natural areas in order to learn, study, or carry out environmentally friendly activities; that is, a tourism based on nature experience, which enables the economic and social development of local communities (Kipar, 2013). Eco tourism has been developed with a novel idea to enhance the living standards of the local population as an alternative livelihood in a sustainable way. Ecotourism envisages employment opportunities for the local population, providing business opportunities for the local community, creating a market for local produce such as handicrafts, souvenirs, food products, agricultural products etc. The primary concern of ecotourism development is to educate the tourists about the ecology and ecosystem and also to educate the people about the need for environmental conservation and preservation. All the ecotourism activities at the ecotourism destination must aim at environment education tied with environmental protection. The sustainable consumption of all resources is also a motto of ecotourism activities. Use of green energy, use of biodegradable materials, ecofriendly accommodation and transportation, environmental friendly and responsible tourist behavior etc. are very significant to ensure sustainable ecotourism. Many authors have a common opinion that the ecotourism activities are nature based, ecologically sustainable and community based.

Ecotourism also envisions the promotion and appreciation of culture and traditions of the indigenous community. Ecotourists are exposed to the culture and traditions of the local community to understand the synergy between environment and human life. Even though, Ecotourism centers are located in protected areas such as national parks and wild life sanctuaries, the local people, especially the indigenous community must be involved in all tourism activities and provisions must be developed to exhibit their culture and traditions for tourists' appreciation in a responsible manner. Therefore, ecotourism is understood and developed as an

alternative way of sustainable development. Ecotourism development is the most viable and effective method for local community development and environmental protection. There is enough evidence that many ecotourists have been voluntarily participating in many environmental conservation programs by way of sponsorships, donations and adoptions. The fund raised from ecotourism activities must be reinvested for environmental conservation and preservation activities. Most of the countries are finding it difficult to invest money for environmental protection programs. Ecotourism development is the better alternative for raising fund and creating awareness about biodiversity protection. Moreover, it can also bring socio economic progress specifically for the local community and the nation at large.

According to various researchers, Ecotourism guarantees the sustainable use of environmental resources, while generating economic opportunities for the local people (Farell & Runyan, 2001; Bhattacharya, Chaudhary and Sarkar, 2011). They have also observed that it could be treated as one of the potential sustainable developmental tools for nature conservation and community development. Ecotourism developments must be operated very systematically and scientifically since nature has been used as the most important component of ecotourism activities. The very existence of life on this earth is completely dependent on natural protection. Nature and ecosystems are very vulnerable and fragile. Unplanned human activities may destroy the biological equilibrium and it may lead to environmental hazards. So, the tourists who participate in ecotourism activities need to be systematically monitored and regulated towards environmental protection and local community development. Ecotourism destinations are typically located in pristine and fragile ecosystems; it is therefore possible to destroy the assets and resources in which it is dependent on if it is not managed effectively."Ecotourism is nature based tourism that involves education and interpretation of the natural environment and is managed to be ecologically sustainable. This definition recognizes that 'natural environment' including cultural components and 'ecologically sustainable' involve an appropriate return to the local community and long-term conservation of resources" (The National Ecotourism Strategy (1994), Quick Start Guide to a Tourism Business, (2006)). According

to the World Conservation Union, environmentally responsible travel and visitations to relatively undisturbed natural areas, in order to enjoy and appreciate nature that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local population (Brandon, 1996).

According to (Chesworth, 1995), Ecotourism has six characteristics. These are:

- Ecotourism involves travel to relatively undisturbed natural areas and/or archeological sites;
- It focuses on learning and the quality of experiences;
- It economically benefits the local communities;
- Ecotourists seek to view rare species, spectacular landscapes and/or the unusual and exotic;
- Ecotourists do not deplete resources but even sustain the environment or help undo damage to the environment; and
- Ecotourists appreciate and respect local culture, traditions, etc.

"Ecotourism focuses primarily on experiencing and learning about nature, its landscape, flora, fauna and their habitats, as well as cultural artifacts from the locality. A symbiotic and complex relationship between the environment and tourist activities is possible when this philosophy can be translated into appropriate policy, careful planning and tactful practicum" (Rahman, 2010). "The relationship between the environment and the ecotourism activities at the destination must have a symbiotic relationship with a win-win strategy by ensuring the implementation of ecotourism policies and practices in the right perspective" (Rahman, 2010).

The involvement of local population in all aspects of ecotourism development is quite essential for maximizing ecotourism benefits to the local community. The members of the indigenous community are the real environmental experts. The ecotourism development plan must incorporate the directions of the local people. They are able to guide the ecotourism policy makers during the planning stage for improved environmental protection measures and also to protect the emotional and sensational feelings

of the host population. If the tourism developmental plans are suggested by the "local experts", the socio-economic benefits of ecotourism development will reach the maximum impact on the local community. Ecotourism policies require a win-win strategy for both the local population and the natural resources in which it depends.

"Carefully planned and operated ecotourism sites, especially if they are village-based and include local participation, are able to provide direct benefits that might offset pressure from other less sustainable activities that make use of natural and cultural resources. Ecotourism in natural and cultural areas are carried out with a number of elements in their natural landscape and cultural landscape (water, vista, topography, vegetation, clean air), as well as in the variety of recreational activities suitable for all kinds of environments. Therefore, ecotourism and its natural assets and raw materials to create, as well as to direct people to travel become an attractive force." (Report of Ecotourism Society)

Ecotourism ensures sustainable community development by extending an alternate source of revenue to the local community. Ecotourism aims in conservation of natural resources, especially biological diversity, and upholding sustainable utilization of various resources, which provide "ecological experience" to travelers, preservation of the ecological environment and increase of economic benefits to the local community. However, the achievement of the novel idea of ecotourism is highly dependent on whether the ecotourism activities planned at the ecotourism destination are socially, environmentally and economically sustainable or not. So, a careful planning is necessary before the finalization of ecotourism activities at the destination. Experts' opinion must be considered, analogous examples must be evaluated and Environmental Impact Assessment must be conducted for every tourism activity before implementation. "Ecotourism helps in involving local community for the conservation of the ecology and biodiversity of the area and biodiversity in return provides the economic incentives to the local community" (Brandon, 1996).

Literature Review on Principles of Ecotourism

The International Ecotourism Society (TIES) is a pioneer in the conceptual development of the ecotourism concept. International Ecotourism Society (TIES) has been revising the conceptual idea of ecotourism regularly. It has come up with the Ecotourism principles in the year 2015. The TIES came up with small changes and additions to both the principles and the definition to provide more clarity, eliminate the ambiguity to avoid and reduce green washing and wrongful interpretations.

Ecotourism is now defined as responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education (TIES, 2015). Education is meant to be inclusive of both staff and guests.

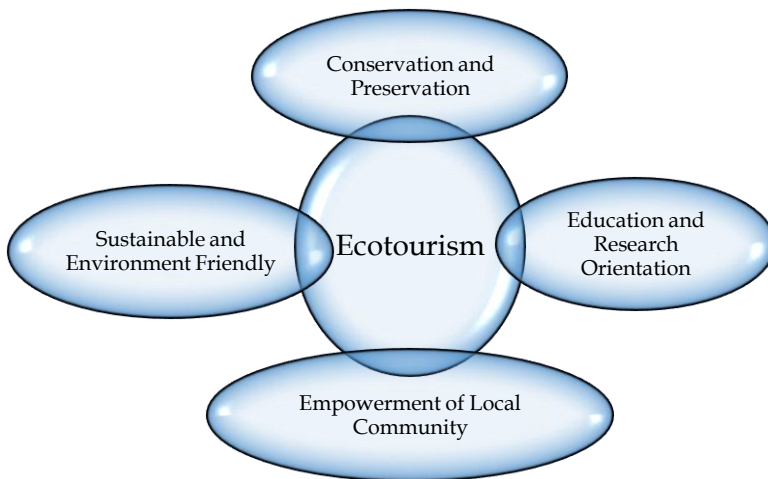
According to TIES, “Ecotourism is about uniting conservation, communities, and sustainable travel. This means that those who implement, participate in and market ecotourism activities should adopt the following ecotourism principles:

- Minimize physical, social, behavioral, and psychological impacts
- Build environmental and cultural awareness and respect
- Provide positive experiences for both visitors and hosts
- Provide direct financial benefits for conservation
- Generate financial benefits for both local people and private industry
- Deliver memorable interpretative experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates
- Design, construct and operate low-impact facilities
- Recognize the rights and spiritual beliefs of the Indigenous People in the community and work in partnership with them to create empowerment”

The Concept of Ecotourism

The ecotourism concept is developed in four strong pillars and they are termed as the essential components of ecotourism development. These pillars are:

1. **Conservation and Preservation Component:** Conservation and preservation of natural and cultural resources of the ecotourism destination.
2. **Environmental Education Component:** Environmental education and awareness about the ecotourism destination
3. **Sustainable Development Component:** All the tourism activities at the destination must be socially, environmentally and economically sustainable.
4. **Empowerment of Local Community:** Ecotourism tourism activities must bring economic prosperity to the local community.



Literature Review on Ecotourism and Biodiversity

According to the Fifth Meeting of the Conference on Biological Diversity, the value of a healthy environment and biological biodiversity may only be taught to the travelers through ecotourism. However, ecotourism development needs proper planning and development as it otherwise might threaten the biological diversity upon which it depends.

Ecotourism and biodiversity relationship is a widely discussed area of ecotourism development. Many researches were carried out in the area of biodiversity and ecotourism development. According to Tisdell & Wilson (2002), "Ecotourism is largely perceived to safeguard natural areas and thereby to contribute to the conservation of biodiversity. It focuses primarily on experiencing and learning about nature, its landscape, flora, fauna and their habitats, as well as cultural artifacts from the locality. In ecotourism planning the first issue that emerges is the environment and its conservation". All natural and cultural resources of an ecotourism destination are very vital for tourism development. The natural components of the ecotourism destination such as water resources, flora and fauna, the climatic factors, the geographic formations etc. and the resources of the local community such as art and artifacts, the traditions and rituals, the cuisine and culinary, the fairs and festivals, the folk arts and folklore etc. form important motivators for the ecotourists who visit the destination. All these resources are very vulnerable and sensitive. "Ecotourism has the potential to seriously impact local communities, largely due to the tendency of ecotourists to have a greater interest in the culture and nature of the areas they visit, as compared to mass tourists" (MC Minn, 1997). "Ecotourism destinations are always environmentally sensitive because ecotourism activities directly involve various environmental phenomena including bird watching, trekking, mountaineering, horse riding and elephant riding within the forest wilderness trail, staying in natural caves, studying about flora and fauna, simple bush walking, fishing, animal behavior and ecological studies" (Rahman, 2010).

Literature Review on Environmental Sustainability

Ecotourism and environmental sustainability are very significant since ecotourism development is completely based on the natural resources existing at the destination. The eco-tourists visit a destination solely to appreciate its natural elements. The consumption of natural elements of an environment can threaten the environmental sustainability. "Ecotourism is a component of sustainable tourism. In many ways, sustainable tourism exemplifies the relationship between ecotourism and sustainable development" (Bansal & Kumar, 2011).

Sustainable tourism will focus on three areas:

- Quality – valuable experience for visitors and increased life quality for host communities through cultural identity, poverty reduction and environmental quality;
- Continuity – exploitation is made at the optimum level that allows the preservation and regeneration of the natural resources; and
- Balance between the needs of the tourism industry, environmental protection, and local communities by an equitable distribution of benefits among stakeholders

(Bansal & Kumar, 2011)

"Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts" (IISD, 2011). Van der Merwe (1999) added that "Sustainable development is a program for changing the process of economic development so that it ensures a basic quality of life for all people and at the same time protects the ecosystems and community systems that make life possible and worthwhile". "Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them" (World Tourism Organization, 2011). "Tourism activities generally can create various negative impacts on the surrounding environment. Increased human interference in ecologically fragile areas can cause irreversible change in the existing ecological processes. These problems can be reflected in degrading natural resources, vegetation structure and the size of the habitat patch, increasing deforestation and decreasing upstream water flow" (Tourism Queensland, 2002).

The Impact of ecotourism on various natural resources are,

Natural Resource	Possible Impact
Ecosystems	The construction of accommodation, visitor centers, infrastructure, and other services has a direct impact on the environment, from vegetation removal, animal disturbance, elimination of habitats and drainage.

Vegetation	Wildlife habitat may be significantly changed (travel routes, hunting areas, breeding areas, etc.) by all kinds of tourist development and use. Concentrated use around facilities has a negative effect on vegetation. Transportation may have direct negative impacts on the environment (e.g. vegetation removal, weed transmission, animal disturbance etc.). Fire frequency may change due to tourists and park tourism management.
Water	Increased demands for fresh water. Disposal of sewage or litter in rivers, lakes or oceans, release of oil and fuel from ships and smaller craft, propeller-driven watercraft may affect certain aquatic plants and species.
Air	Motorized transportation may cause pollution from emissions (from plane, train, ship or automobile).
Wildlife	Hunting and fishing may change population dynamics. Hunters and fishers may demand the introduction of foreign species, and increased population of target animals. Impacts occur on insects and small invertebrates, from effect of transportation, introduced species, etc. Disturbance by visitors can occur for all species, including that are not attracting visitors. Disturbance can be of several kinds: noise, visual or harassing behavior. The impact can last beyond the time of initial contact (e.g. before heat-rate returns to normal, or before birds alight, or mammals resume breeding or eating). Marine mammals may be hurt or killed by boat hits or propeller cuts. Habituation to humans can cause changed wildlife behavior, such as approaching people for food.

(*Tourism Queensland, 2002*).

Tourism in Wayanad

Wayanad is one of the smallest districts in Kerala having 2,131 Km² area with a population of 8,16,558 (4,01,314 Male and 4,15,244 Female) 2011 Census. The district, which forms an edge of the Deccan plateau of South India has a luxuriant forest cover and receives the maximum amount of annual rainfall compared to other

regions of the State. Wayanad offers very unique tourist attractions for the visitors. The lush green wild life resources, Wayanad with wide variety of flora and fauna provide great biodiversity that attract millions of eco-tourists towards the small piece of land. The geographic diversity provides a kaleidoscopic and panoramic scenic beauty to its guests. Tribal life is one among the very unique and nostalgic tourist motivation. Wayanad has the largest population of aborigine people in Kerala. They belong to different distinctive tribes, of which the principal ones are Adiyar, Kurichyar, Paniyar, Kurumar and Kattunaikar. Many of the tribes are traditionally forest dwellers, and as such have perfected ways of living in harmony with nature. Some tribes are also proficient in techniques of organized farming. Of particular mention are their indigenous streams of holistic herbal medicine which is getting increasing attention in recent years. The Adivasis also have a rich legacy of arts and crafts. This includes music, dances, ornamentation and handicraft that draw inspiration from natural themes, motifs and material.

The Table shows domestic and international tourism arrivals in Wayanad from 2010-11 to 2014-15:

Year	Domestic Tourist Arrivals	% of Change	International Tourist Arrivals	% of Change	Foreign Arrivals in Kerala	Share of Foreign Tourists
2010-11	4,08,151	10.29	6,620	23.46	6,59,265	1.04%
2011-12	4,51,184	10.54	7,567	14.31	7,32,985	1.03%
2012-13	4,80,125	6.41	9,541	26.09	7,93,696	1.20%
2013-14	5,19,306	7.54	10,844	13.66	8,58,143	1.26%
2014-15	5,64,274	8.66	11,795	8.77	9,23,366	1.27%

Source: Ministry of Tourism, Government of Kerala

The above table shows that both domestic and international tourism arrival in Wayanad is increasing every year. The growth rate of domestic tourists is either reduced or has a marginal growth compared to the previous years, but the growth rate of international tourist arrivals are fluctuating. But the share of Wayanad in international tourist arrivals in Kerala is very less (Around 1 %). But this share also shows a positive growth.

Study Area: The Ecotourism Destination of Kuruva Island

Kuruva Island (Kuruva Dweep) is a 950-acre (3.8 km²) protected river delta on the Kabini River in Wayanad District, Kerala.

Kuruwadweep is the only island surrounded with naturally purified water source in Kerala. It is under the control of the Range Forest Office, Chedeth Range under the Divisional Forest, South Wayanad. Kuruva Island is located 17 km east of Mananthavady and 10 km North West of Pulpally town. The Kuruva Islands comprise of three uninhabited islands and a few submergible islands covering an area of 146.01 hector in the middle of the Kabini River. The climate is moderately hot and humid with temperature varying from 18°C to 28°C. Average annual rainfall received here is below 5000mm as the tract receives both the south west and northeast monsoons. The region comprises of tropical evergreen forest.

Being a part of the Western Ghats, one of the 34 biodiversity hotspots in the World, the forest of Kuruva has immense floral and faunal significance. The island represents unique vegetation with rich biodiversity. Kuruva is the only compact protected uninhabited island in Wayanad. Astonishing variety of Butterflies will accompany the tourists while trekking. It is also known for varieties of fungi community. It is an abode of more than 160 varieties of birds including migratory birds from various parts of the world. Asian Paradise Flycatcher, White Numped Shama, Blue Winged Parakeet, Malabar Whistling Thrush, Ceylon Frogmouth, Malabar Trogon, Nilgiri Wood Pigeon, Indian Hanging Parrot, Velvet Fronted Nuthatch, etc. are some of the unique birds that attract the bird watchers to this paradise. This island is also famous for a wide variety of wild orchids and many amphibians.

The unique geographical characteristics makes it a place where not only the leaves but also silence is evergreen, as it is located away from the cities and thus has become a place of attraction. Most recently, it has been identified as the most visited place in the district by tourists drawn from all over the globe. The island surrounded by streams and rivers can be accessed using rafts or fiber boats run by the Kerala Forest Department. Entrance to the island is restricted and monitored by Vana Samrakshana Samiti, a Department of Forest of Kerala initiative to protect the forest. It is also famous for its bamboo canopy which provides a glimpse into the natural treasure of the confluence of the rivulets. This island is close to the Begur Wildlife Sanctuary, which is home to varied wild

animals and birds. Boating facilities are provided by the District Tourism Promotion Council.

Some of these islets of Kuruva have massive trees, the boughs of which at some places stoop down and caress the river water. The whole of Kuruwadweep has a unique eco-system worth exploring for nature lovers. Those who venture into these islets need to refrain from actions that could hamper the environment.

The young researchers, Aneesh EM, Thasmia Chandran and Lakshi (2014), have identified that the Kuruava Island has various species of vectoral mosquitoes that can cause vector diseases such as Malaria, Filariasis, Dengue fever, Chikungunia etc. Usually these kinds of mosquitoes are not seen in the forest ecosystems but the ever-increasing number of tourists and unhygienic conditions cause the growth of these types of insects. This is also an alarming issue in Kuruva Islands.

Research Problem

Kuruva Island has been promoted as an ecotourism destination by the Government of Kerala and thousands of domestic and many foreign tourists visit Kurauva Island every day during the season ranging from October to May. It is a biodiversity hotspot located in the very fragile Western Ghats with lots of unique flora and fauna. Most of the animal and plant species abode here are either endangered or potentially endangered. Ecotourism is a novel and divine concept that aims at the fulfillment of the educational needs of humankind coupled with environmental protection and local community development. It is imperative that while developing ecotourism in such biologically sensitive areas, there is a need to evaluate whether the ecotourism principles and practices are strictly followed. The following research questions are very pertinent and imperative to ensure environmental sustainability, habitat protection and community development in Kuruva Island.

The main research question is: "Whether the tourism activities at Kuruva Island patronizing for the protection of the environment and preservation of the biodiversity, aid the local community for their socio-cultural and economic empowerment and educate tourists?"

- a) How do they conserve natural resources for environmental sustainability and biodiversity protection?
- b) What do they do to help and empower the community?
- c) What ecotourism activities do they offer?
- d) How do they educate the tourists about the nature, culture and environment?

Objective of the Research work

The main aim of this research is to evaluate the ecotourism development in Kuruva Island with internationally accepted ecotourism guidelines and principles. The research would also suggest certain measures to the authorities to take adequate steps for correction. The main objective of the research work is to appraise the ecotourism activities at Kuruva Island and their impact on Biodiversity Protection and Environmental sustainability.

Research Design and Methodology

The data for the research work was collected from both primary and secondary sources. There was no published research work on Kuruva Island from the ecotourism and biodiversity perspective. Therefore, this study is based more on the primary data collected from the destination through personal observations and discussions with various stakeholders of tourism development in Kuruva Island. The conceptual ideas used for preparation of the research paper were collated through literature reviews of related articles and books.

Results and Discussions

1. How do they conserve the natural resources for ensuring environmental sustainability and biodiversity protection?

The first research question pertaining to the study is to evaluate efforts taken by the management and business stake holders of Ecotourism Development in Kuruva Island for conservation and preservation of the biodiversity and ecosystem. The Ecotourism activities of Kuruva Island are managed by Vana Samrakshana Samiti, a Department of the Forest of Kerala initiative to protect the forest in association with the District Tourism Promotion Council.

They have restricted the movements of tourists inside the Kuruva Island with natural walkways fenced with iron wire and, restricting the tourists to enter to the core areas of the sensitive forest. There is no visible construction inside the forest. The bridges are made of bamboo poles and wooden blocks without any nail or iron support. No concrete constructions are made inside the forest. But the tourist behavior inside the forest is not monitored by the authorities, especially as they make lots of noise and that may disturb sensitive organisms.

The trekking trail fence is very feeble and loose so the tourists can enter the core areas of the forest. Food materials are taken inside the forest and waste is thrown inside unscrupulously. The authorities use ferries made of bamboo to cross the Kabini River to access the island. It ensures pollution free and eco-friendly transportation at the destination. They collect Rs. 80 per domestic tourist and Rs. 150 per international tourist as entry fee. Users of camera have to pay Rs. 50. Students are given a concessional rate of Rs. 55 per individual. Entry is restricted from 09.30 AM to 03.30 PM. Hundreds of people visit this destination every day and the money generated from tourism has to be reinvested for conservation and well-being of the local community.

2. How do they help and empower the community?

Most of the employees working with Vana Samrakshana Samiti are members of the local community, especially tribal community. Many women employees are working as guards at the destination to monitor and control the tourists. Many small-scale entrepreneurs from the local community have come up with souvenir shops, restaurants, canteens, etc. Many local people have come up with accommodation facilities and transportation arrangements for the tourists. Home Stay accommodation units, hotels and resorts and entertainment facilities have been opened up by the local people. A few NGOs are active in arranging eco-tours and organizing cultural activities. Some of them do educate the tourists by conducting orientation programmes on their own. *Kabini Tourism Private Limited* is an NGO working in the area on ecotourism.

3. What ecotourism activities do the local communities offer?

Presently, the local community offers soft trekking inside the forest and tourists are provided ample opportunity to appreciate the wildlife. Bird watching is organized for special interest tourists. Fiber Boating facilities are arranged in the Kabini River as leisure activity.

4. How are tourists educated about nature, culture and environment?

Environmental education and research is one of the fundamental objective of every ecotourism destination. Kuruva Island offers soft trekking inside the forest so that the tourists can have personal observation. A few hoardings and boards are placed in the trekking route with information about the flora and fauna of the forest. At the entrance, there are a few hoardings on the Kuruva Island. But all the information is insufficient to educate the tourists. Majority of the tourists who visit Kuruva Island go back without any knowledge addition and most of them see the island as a leisure destination like a beach or a river bank. Kabini Tourism and Private Ltd., an NGO run by the members of the local community, is involved in tourism promotional activities and they also conduct training and orientation programmes to the tourists.

Suggestions and Conclusion

Kuruva Island is one of the most fragile and sensitive biodiversity hot spots in the Western Ghats. Ecotourism development in Kuruva Island must be well planned and systematic so as to protect the environment and biodiversity in a sustainable manner. The internationally accepted principles and guidelines on ecotourism must be strictly followed by the authorities.

The entire Kuruva Island must be divided into core area, buffer zone and human activity area so as to protect the floral and faunal life from human meddling. One portion of the revenue generated from tourism activities must be reinvested for conservation and preservation of the biodiversity and ecosystem. The tourists who visit the Kuruva Island may be motivated to associate with the conservation efforts of the management through various means such as sponsorship, donations and other charitable activities.

Education, natural and cultural interpretations are the most important objectives for the Ecotourism concept. The present efforts and facilities at the destination in this perspective are ineffective and inadequate to educate the tourists. Experienced and trained guides, naturalists, interpreters etc. must be appointed to educate the tourists about the ecosystem and biodiversity. An audio-visual interpretation centre must be established at the entrance to provide interpretation and education opportunity to the tourists. A small natural museum can be established with wild life photographs, and fossils or animal remains.

The employees associated with the destination must be well trained and educated about the significance of biodiversity. They must be able to guide the tourists towards responsible and sustainable consumption of the facilities.

The local community participation must be ensured at all levels. A Kuruva Island Ecotourism Development Authority may be constituted with representation from local population and experts from concerned fields so as to ensure professionalism.

Responsible business must be encouraged at the Kuruva Dweep so as to protect the very fragile and sensitive biodiversity and environmental resources, including flora and fauna, and natural resources like water bodies and other geological components. Accreditations, licensing, frequent monitoring, certifications, guidelines etc. must be introduced to regulate the business stakeholders and their activities at the destination.

A research work conducted at Kuruva Island by a group of young scientists on the increasing number of vectoral mosquitoes reveals that one of the reasons for their presence and multiplication in Kuruva Island is tourism development. So, precautions must be taken to avoid this menace and further research must be conducted to control the growth of vectoral mosquitoes at the destination.

References

- Aneesh, E. M., Thasia, C., & Laksmi, H. (2014). Diversity and vectorial capacity of mosquitoes in Kuruva Island, Wayanad District, Kerala, India. *Journal of Zoology Studies*, 1(4), 16-22.

- Bansal, S. P., & Kumar, J. (2011). Ecotourism for Community Development: A Stakeholder's Perspective in Great Himalayan National Park. *International Journal of Social Ecology and Sustainable Development*, 2(2), 31-40.
- Farrell, B. H., & Runyan, D. (1991). Ecology and tourism. *Annals of Tourism Research*, 18(1), 26-40.
- Hill, J. L., & Gale, T. (Eds.). (2009). *Ecotourism and environmental sustainability: principles and practice*. Ashgate Publishing, Ltd.
- International Institute for Sustainable Development IISD. (2012). Retrieved December 27, 2017, from <http://www.iisd.org/>
- Kiper, T. (2013). Role of ecotourism in sustainable development. In *Advances in Landscape Architecture*. In Tech.
- McMinn, S. (1997). The challenge of sustainable tourism. *The environmentalist*, 17(2), 135-141.
- Queensland Ecotourism Plan 2003-2008 - Tourism Queensland. Retrieved December 27, 2016, from <https://www.yumpu.com/en/document/view/27176119/queensland-ecotourism-plan-2003-2008-tourism-queensland>
- Rahman, M. (2010). Application of GIS in ecotourism development: a case study in Sundarbans, Bangladesh. Mid-Sweden University Master of Arts, Human Geography Focusing On Tourism, A Master's Thesis, 79 p.
- Tisdell, C., & Wilson, C. (2002). Ecotourism for the survival of sea turtles and other wildlife. *Biodiversity and Conservation*, 11(9), 1521-1538.
- Van-der-J Merwe. (1999). *Sustainable development at the local level: An introduction to local agenda 21*. Pretoria: Department of environmental affairs and tourism
- Wood, M. (2002). *Ecotourism: Principles, practices and policies for sustainability*. UNEP.
- World Tourism Organization. (2001). *Indicators for Sustainable Development for Tourism Organizations: A Guidebook*. Madrid: Spain.