



Bio Diversity depletion in Ambuluwawa Nature Reserve due to tourists arrivals and the effectiveness of Bio diversity complex

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ජෛව විවිධත්වය යනු ස්වභාවික පරිසරයේ ගුණාත්මකභාවය විදහා දක්වන මිනුමක් වේ. සාමාන්‍යයෙන් එය ජාන විද්‍යාව විශේෂ සහ පරිසර පද්ධති වල විවිධත්වය ලෙස වර්ග කල හැකි වේ. අම්බුළුවාව යනු සැඟවුණු සම්පතක් වන අතර එය ඉතා වටිනා ජෛව විවිධත්වයකින් යුක්තය. එහි පර්යේෂණ බොහෝමයක් සිදු කෙරෙන අතර අම්බුළුවාව කඳුකර වනාන්තරයේ මුළු ප්‍රමාණය අක්කර 927 ක් පමණ විය. සමරසිංහට අනුව වර්තමානයේදී අම්බුළුවාවේ සාපේක්ෂ ස්වභාවික වනාන්තරය හෙක්ටයාර හතරකට සීමා වේ. වර්තමානයේදී ජෛව විවිධත්වය විවිධ ආකාරවලින් හායනය වෙමින් පවතින අතර අම්බුළුවාව රක්ෂිතය තුළ ප්‍රධාන වශයෙන්ම සංචාරක කටයුතු හා සම්බන්ධ ප්‍රවාහන, නවාතැන්, අවිධිමත් කසළ බැහැරලීම සහ අනෙකුත් ක්‍රියාකාරකම් හඳුනාගත හැකිය. අම්බුළුවාව ජෛව විවිධත්ව සංකීර්ණය ප්‍රචලිත සංචාරක ගමනාන්තයකට පරිවර්තනය වී ඇති අතර මෙම ක්‍රියාවලිය ස්වභාවික පරිසරයට තර්ජනයක් වී තිබේ. මෙම අධ්‍යයනයෙහි මූලික පරමාර්ථය වූයේ අම්බුළුවාවේ සංචාරකයන්ගේ පැමිණීමේ සාමාන්‍යම ක පාරිසරික බලපෑම් හඳුනා ගැනීමයි. තවද ජෛව විවිධත්වය පිළිබඳ ජනතාවගේ ආකල්ප හා හැසිරීම් හඳුනා ගැනීම සහ සංචාරකයන්ගේ පැමිණීම් වල සාමාන්‍යම ක බලපෑම් හඳුනා ගැනීම සහ ජෛව විවිධත්වය හායනය වැලැක්වීමේ හා පාලනය කිරීමේ ක්‍රම යෝජනා කිරීම මෙහි අනු අරමුණු වේ.

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ගුණාත්මක හා ප්‍රමාණාත්මක දත්ත එක් රැස් කර විශ්ලේෂණය කරන ලද අතර ප්‍රතිඵල වලට අනුව අම්බුළුවාව රක්ෂිතයේ ජෛව විවිධත්වයට සංචාරකයන්ගේ පැමිණීම විශාල තර්ජනයක් වී තිබේ. තවද සංචාරකයින්ගේ ආකල්ප ජෛව විවිධත්වය නැරඹීම හෝ අධ්‍යනය කිරීම කෙරෙහි යොමු වී නැති අතර සංචාරකයින්ගේ බලපෑම පාලනය කිරීම සඳහා විධිමත් කළමනාකරණයක් සහ නීති රීති රෙගුලාසි නොමැතිකම තත්වය වඩාත් අහිතකර වීමට හේතු වී තිබේ. සංචාරක ව්‍යාපාරය මගින් නිසි ආදායම් ලැබිය හැකි අතර එමගින් ජෛව විවිධත්ව සංකීර්ණය තුළ ස්වභාවික සම්පත් තිරසාරව කළමනාකරණය කළ හැකි අතර සම්පත් වල ගුණාත්මකභාවය ඉහළ නැංවීම සහ සංචාරක ව්‍යාපාරය ප්‍රවර්ධනය කිරීම ද සිදු කළ හැකිය.

ප්‍රමුඛ පද: ජෛව විවිධත්වය, ස්වභාවික පරිසරය, සංචාරක කර්මාන්තය, ජෛව විවිධත්ව හායනය, තිරසාර බව

Introduction

Sri Lanka is considered as a country in Asia which has the richest biodiversity in a single area. A Tropical environment has inherited to Sri Lanka and the mid country hills occupy a significant place in biodiversity. Ambuluwawa peak is situated in the center of Gampola Kingdom. Height of the peak from the mean sea level is 365 feet. Bio Diversity is a highlighted component in Ambuluwawa. Experiments on the diversity of vegetation at Ambuluwawa are still in progress. According to the research work so far done, there are about 200 varieties of plants belonging to 80 plant families. Rich soil resources are also belonged here.

“Modern development project” in Ambuluwawa has converted it in to a great tourist destination and recently the richness of the bio diversity in Ambuluwawa is being degrading.

This research is going to be exposure how this tourism related activities have affected the bio diversity in the research area. Ambuluwawa is an environmental resource center with a valuable biodiversity. Its’ nature has created a large tourists attraction in to Ambuluwawa. But recently, it is witnessed that the tourists do not care about the environmental importance despite enjoying their leisure.

So the existing endemic flora and fauna have become endangered. Natural environment has converted in to modified and constructed environment and it has also caused for disasters such as landslides. Therefore, this research is clearing the path to minimize the tourists' impacts on Ambuluwawa for its future survival.

Background

The variety of life on Earth, its biological diversity is commonly referred to as biodiversity. The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, the different ecosystems on the planet, such as deserts, rainforests and coral reefs are all part of a biologically diverse Earth. (Pickering, Hill, 2007).

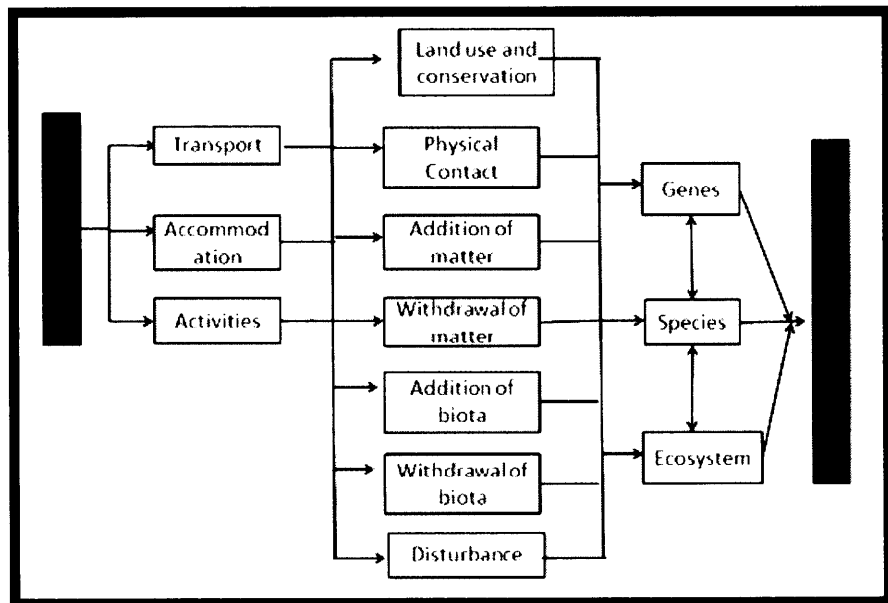
Biodiversity is really important because biodiversity boosts ecosystem productivity, provisions of biological resources- food, medicines, flora, fauna, maintaining balance of the ecosystem, social benefits- Recreation, tourism, cultural value, education, and industrial help.

In Ambuluwawa seven specific locations have identified as unique sites along the area. A study of the biological diversity along the trail and more particularly at the selected locations documented 65 plant species in 32 families. The flora of the trail comprised 69% indigenous and 20% endemic species. The trees of the upper canopy consisted of a mixture of indigenous and endemic species while the sub canopy comprised mostly of endemic species. Fauna recorded comprised 202 morph species. Among them 157 morph species of invertebrates, arthropod diversity was the highest followed by land snails. Thirty species of birds frequented the trail. Endemic snails, butterflies, amphibians, birds and mammals were also recorded. The forest tree canopy, ground vegetation and leaf litter were the habitats mostly occupied by the fauna of the nature trail. (Kusumawathi, Edirisinghe, 2002).

Impact of tourism related activities on bio diversity

The major threat to biodiversity in Sri Lanka is the ever-increasing demand for land for human habitation and related developmental activities. Poor land use planning, indiscriminate exploitation of biological resources, weak enforcement of legislation and the absence of an integrated conservation management approach are other threats to biodiversity. (First National Report on the Implementation of Article 6 of the Convention on Biological Diversity SRI LANKA).

Conceptual Model of the Ecological Impacts of Tourism on Bio Diversity



Sources- *Annals of Tourism Research (2002)*

Figure 01

According to above flow diagram Tourism related activities are directly or indirectly effecting natural environment. So it can be happened through following sections such as, Transport,

Accommodation, and Activities. Affecting the natural environment and obviously it effects bio diversity because; each and every part in nature is related to bio diversity. Here it is the case of bio diversity in Ambuluwawa and it is affected before the constructions of the complex through road clearings and after the constructions through tourism impacts.

According to Hadunnetti, 1998 (Sunday Times) the environmental degradation of the site due to complex is explaining as follows. "Two months ago the sleepy village of Sinhapitiya in Gampola was rudely woken by the boom of dynamite and rocks crashing down the hillside, threatening its very existence. The cause: a development project on the Ambuluwawa peak where roads and buildings are being constructed without the required Environment Impact Assessment that is mandatory when building in a sensitive area. The ambitious project involves the construction of an international conference hall, govi sevana centres and a Sama chaitya. The salient features of the project include the setting up of aviaries, butterfly and reptile parks, and introduction of cable cars. The Environmental Foundation Ltd has already challenged the project's validity in a letter of demand to the Central Environmental Authority (CEA) on the grounds that the project contravenes the Soil Conservation Act."

The Concept of Ambuluwawa Bio-diversity Complex and Development Objectives

Ambuluwawa development programme focus on the following concepts.

1. Sustainable development of Ambuluwawa in order to conserve the environment and biodiversity.
2. Ambuluwawa hill to be developed as an attractive place for field education of biodiversity and environment.
3. Ambuluwawa hill to be the first of its kind in Sri Lanka where opportunities are provided for conservation, education, recreation, religious and exploration purposes.
4. Development of standard of living of the surrounding villages by the development of environment-friendly industries and other service sector industries to cater to the

demand of a diverse group of visitors and as a market place.

5. Creation of income generating opportunities to Gampola and neighboring villagers.
6. Development of infrastructure facilities like roads etc. in the neighboring villages like Rathmalkaduwa, Sinhapitiya, Hutugoda and Ambuluwawa.

Accordingly, Ambuluwawa bio diversity complex has built and many local and foreign tourists arrivals have recorded as well as the quality of the environment has reduced by the time.

Methodology

This study was done in the area which the bio diversity complex is situated. It is Udapalatha DS division located in Ambuluwawa, in Gampola. The general objective of the study was to identify the negative impacts of tourists' arrivals on Ambuluwawa biodiversity. The specific objectives of the study was to identify the environmental importance in Ambuluwawa, to identify attitudes and behaviors of people on biodiversity, to identify mitigation methods for negative impacts of tourists arrivals and to propose prevention methods. Primary and secondary data were collected and secondary data was collected through related books, magazines, newspapers, websites, existing researches. Primary data has collected by field observations, interviews and questionnaires. Questionnaires and interviews were arranged for three kinds of groups. Such as, Tourists, Officers, Villagers. Above each group is included with 10 questionnaires. Tourists and the officials were randomly selected and the most nearest 10 villagers were selected for the interviews. As the final step the researcher analyzed the collected data by descriptive analysis using MS Excel software for further suggestions through the study.

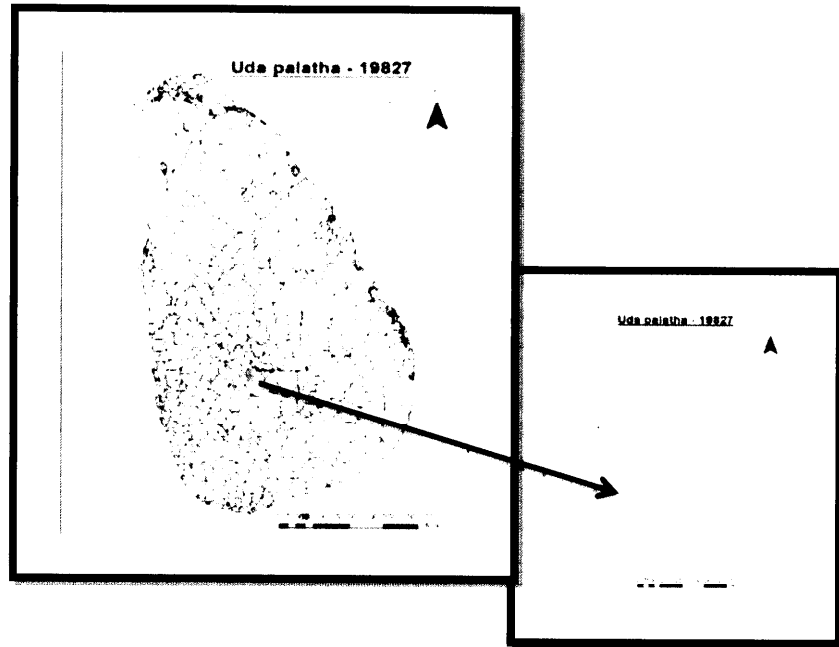


Figure 02- Study Area
Prepared by the researcher

Results and Discussion

Data analysis is done according to selected major topics as well as findings and results are mentioned below relevant to them.

1. Attitudes of the tourists on bio diversity and the environment.

This fact is mostly important to minimize all the problems in the research area. Because attitudes can minimize or prevent problems without enacting any rule or regulation. Visiting reason is used to identify their behavior. But in the interviews the researcher couldn't identify any positive feature in tourists' attitudes on bio diversity or environment. The researcher has observed that, most of the local tourists were lovers (80%) who came with their personal reasons and it has become a lover's park than a bio diversity complex. There is only one research group

which came to observe the bio diversity. Also most of visitors came with their families also only for enjoyment and they didn't have any idea on environmental importance.

2. Transportation in the Bio diversity complex.

80% of the visitors came by their vehicles and 20% were the visitors came on foot. From this 20% a group was a research group of Peradeniya University and the next group was for physical training. So the researcher could identify that no one was ready to feel the bio diversity or nature while travelling on foot. This is also an important fact for bio diversity because; vehicles can kill fauna while they cross roads in the area. Mostly endangered species are frogs and lizards. Also it's a huge problem because Ambuluwawa is famous for endemic frogs and lizard species.

3. Perfectness of the complex

There are some kinds of facts which can be used as a measure to evaluate the perfectness of the Bio Diversity Complex. Following table is reviewing the actual status of the complex which the researcher has observed in the field.

Fact	Yes	No
1. Having an environmental section	-	✓
2. Having a guide for bio diversity importance of the area	-	✓
3. Having a proper waste disposal method	-	✓
4. Having a proper list of rules	-	✓
5. Having fine or punishments system for offenders	-	✓
6. Having quality improving criteria in the complex	-	✓
7. Maintaining a bio diversity library or a material collection	-	✓

Table 01- Source- Survey Results

So above table is giving a clear idea on the status of the complex. This data is directly related with the impacts of tourists' arrivals because maintenance of the complex has the responsibility to control tourists' activities. These facts can develop a perception on tourists that, "this place should be conserved".

4. Waste disposal and other impacts of Bio Diversity Complex.

Waste disposal in the Ambuluwawa Bio Diversity Complex is a main factor in the research. Because among tourists impacts it is the most occurring impact in the field. According to villagers ideas nearest villages are thoroughly affected by this problem. 100% of villagers in the sample have this wastes problem. Because of not having a proper waste disposal method and strict rules for tourists in the complex, visitors dump garbage everywhere in the area and after the rainy season all the wastes flow with waterways and block in the main culvert at the bottom of the Ambuluwakanda. Water scarcity, landslides, temperature increase, soil erosion also were the impacts in the study area which were experienced by the villagers. They are related with the constructions of the complex. Because of the road clearings of the complex whole area has been a threat of landslides. The researcher has observed 29 landslide incidents while travelling to the complex through the mountain road. .

Conclusion and Suggestions

It is true that Ambuluwawa is a hidden gem because its' richness of environmental quality and the bio diversity which has not revealed clearly and many researches are under writing recently. Ambuluwawa became famous admittedly due to new concept of Bio Diversity Complex with a multi religious center. Although Ambuluwawa forest was known to harbor a rich biodiversity, recent threats have influenced its present status. It happened because of the modern development project in the area. Obviously it is a new concept to Sri Lanka, if it is maintaining properly and in an eco- friendly manner.

According to the research, the researcher has identified pre and post construction impacts on bio diversity. Pre- construction impacts are briefly stated as follows. Leaf litter has been removed from several places in the natural forest. With the removal of the humus, soil erosion and landslides have increased. The natural cycle of soil renewal through the decomposition of leaf litter has been thus interfered due to road clearings. Also streams that flow during rainy seasons along the slopes of the forest are seen to cause heavy soil erosion. And introduced vegetation such as pine trees also has destructed the soil fertility and the quality of the environment badly. Also reducing water springs, is a bad effect of it. When the topic comes to the Post constructions, it is the Impacts of tourists' arrivals. So it also can be identified by several sub causes such as, Waste disposal, Effecting flora fauna by vehicles, blocking waterways by wastes, damaging trees by tourists, damaging constructed areas.

These are the impacts of tourists' arrivals. So that, flora and fauna has been disturbed. Scenic beauty and the environmental quality have degraded. According to officials, they are not hanging labels on trees, because tourists damage the plate and try to uproot and take with them. In the researchers point of view it happens due to lack of proper management and strict rules to control tourists. So under the conclusion researcher would like to suggest that before inviting tourists to get the experience of the attraction, the management should be well planned and organized to minimize the impacts. Therefore prepared strict and practical list of rules and regulations should be displayed and should be sure of they are being actuated. Because attitudes can be maintain by rules. For the environmental education of the site, Environmental Societies can be incorporated such as societies in universities. Bio diversity complex can be given a green concept than today. It will help to change attitudes on visitors.

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