A STUDY OF THE ECOTOURISM POTENTIAL OF THE PELWATTE SUGAR PLANTATION AREA.

By

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DECLARATION

The work described in this thesis carried out by me at the department of zoology Faculty of Science, University of Colombo under the supervision of Prof. S. Kotagama and Miss. Enoka P. Kudavidanage. A report on this has not been submitted to another University for another Degree.

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ABSTRACT

A concept of developing an ecotourism plan for Pelwatte Sugar Industry (PSI) had been conceived in order to reduce the social, ecological and economical problems arising from monoculture plantation and to make sustainable utilization of the available natural resources. To implement the concept, it is essential to identify the ecotourism potential of the area, which is the major objective of this study. The objective was achieved by identification of the unique features and Ecological, economical and socio-cultural values of the plantation area.

The identification phase covered the mapping of the site, the preparation of faunal and floral checklists, extracting information through discussions and personal communication and making necessary field observations. In the designing phase numbers of suitable sites were identified and ecotourism packages were designed. In the evaluation phase the sites were ranked based on the MCDM method to develop a hierarchy of sites. The next phase covered the valuation where the site was given an economic value through CV method. Finally, a SWOT analysis was carried out with the PSI management to identify the strengths, weaknesses, opportunities and threats for the development of an ecotourism plan.

Faunal and floral diversity included 129sp of birds, 13 reptiles, 27mammals, 36 butterflies and 62 plant species were identified. 11 different habitat types were located within the study area. The total number of activities proposed was 17. Four ecotourism packages were derived; namely relaxing, educational, adventure and nature activities. Evaluation of the blocks of the PSI was carried out using a numerical method that quantified each block based on the sites available for each ecotourism activity. This categorization put Pelwatte section three in the top position. Although it was the overall results, each block is unique in terms of different activities suggesting the potential of the whole area. The economic valuation revealed that majority of the people is willing to pay Rs. 1600 initially for the entrance to the site. The regression analysis showed the relationship between the willingness to pay and the income level. Finally the SWOT analysis concluded that the PSI area holds a high potential to development of a successful ecotourism program. Defining, implementing and monitoring a strategy plan can be recommended from this study supported by future studies suggested.

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Abbreviation

PSI	Pelwatte Sugar Industry (Pvt.) Ltd
IUCN	International Union of Conservation Nature
WTO	World Tourism Organization
SLTB	Sri Lanka Tourism Board
SEDZ	South East Drug Zone
WTTC	World Travel and Tourism Council
TIYE	The International Year of Ecotourism
CV	Contingent Valuation
MWTP	Mean Willingness To Pay
WTP	Willingness To Pay
CRMP	Costal Resources Management Project
MPPI	Ministry of Policy Planning and Implementation
UNDP	United Nation Development Program
EPMD	Environmental Profile of Monaragale District
WCED	World Commission for Environment and Development
NGOs	Non Government Organizations
CSD	Commission on Sustainable Development
IFC	International Finance Corporation
EU	European Union
WWF	World Wildlife Fund
WAB	Man and Biosphere
GPS	Geographical Position System
MCDM	Multi Criteria Decision Making

CHAPTER 1

1.1 INTRODUCTION

Ecosystems are dynamic and are constantly changing over time. Nevertheless, human beings are nature's foremost agents of change. Interventions by human beings have greatly impacted the ecosystems of the continent. It is essential to ensure that ecosystems do not become stressed beyond a threshold at which irreversible undesirable changes occur. Approaching the third millennium, all human activity needs to become more sustainable; tourism is no exception. (Richardson, 1999).Sustainable tourism in natural areas; may even become a vital tool for conserving natural and cultural heritage, and for increasing the living standards of many inhabitants of Sri Lanka, particularly those in the less developed rural areas.

There is an increasing tendency for interest to be directed towards an alternative form of tourism that apparently has emerged in response to the growing dissatisfaction with mass tourism and its associated negative impacts on host nations (Fennel and smale, 1992). In response to this increasing appreciation of nature experiences, a new travel ethic has arisen which is now called Ecotourism. This term has become increasingly popular in both conservation and travel circles. This new phenomenon, which has been broadly termed "Alternative Tourism" has evolved as a popular response to the emphasis on consumerism and the exploitation associated with mass tourism especially in developing nations (Cohen, 1987).

Defining ecotourism in practice has been problematic (Mowforth, 1992; Brandon, 1996). At least 35 terms related to ecotourism have been identified. Among the best-known of these are ; nature tourism, nature - based or nature - oriented tourism, wilderness tourism, adventure tourism, green tourism, alternative tourism, sustainable tourism, appropriate tourism, nature vacations, study tourism, scientific tourism, cultural tourism, low- impact tourism, agro - tourism, rural tourism, geotourism, and soft tourism (Butler, 1992; wall, 1994)

The world conservation union (ICUN) in adopting the following definition of Ecotourism. "environmentally responsible travel and visitation to relatively

undisturbed natural areas, in order to enjoy and appreciate natural (and any accompanying cultural features - both past and present) that promoted conservation, has low visitor impact, and provides for beneficially active socio - economic involvement of local populations " (Ceballos - Lascurain, 1996).

Ecotourism has attracted increasing attention in recent years, not only as an alternative to mass tourism, but also as a means of economic development and environmental conservation. Being a nature based tourism: it takes into account the natural ecological attraction, their conservation and development. Its main aim is to safeguard the environment making it beneficial to the local people by generating revenue and education and pleasure for the tourist. The demands of increasingly affluent western consumers for "remote", "natural " and "exotic" environments have created an upsurge in ecotourism ventures, particularly in third world countries. Of concern is the fact that it is precisely these more remote, less developed tourism areas that ecotourists seek which are most vulnerable to cultural disruption and environmental degradation (Cater, 1994)

Ecotourism is of the fastest growing sectors in the tourism industry at present, with an estimated growth rate of 10-15 percent (Panos, 1997). In 1993, the world Tourism organization (WTO) has estimated that nature tourism generates 7 per cent of all international travel expenditure, where the total annual global earning from tourism is nearly US $ 3 trillion and 213 million people are employed (Eagle, 1997).

Asia, home to over half of the worlds populations, possesses tremendous tourism potential with a broader range of tourism resources compared to other regions. Home to some of the world's oldest cultures and civilizations, Asia is attracting a growing number of visitor arrivals. Every Asian country recognize the importance of tourism as a major social and economic development instrument which helps generate foreign exchange earnings, Jobs and income for people outside the main cities. In 2000, global visitors totaled 698.8 million (an increase of 7.4% over 1999), generating tourism receipts of US$ 476 billion (up 45 %).Asia (including Oceania) attracted a total of 138.9 million visitor arrivals in 2000, an increase of 14.22% over 1999. That was the highest growth compared to other regions. By for the largest majority of visitors (79%) were traveling within the Asia Pacific religion (Intra - region) while South Asia and the Middle East welcomed more visitors from other regions. (Inter - region) (Lindberg et al. 2003).

Sri Lanka is an Island with a rich Cultural heritage, diverse landscapes, and a significant number of wildlife reserves. Increasing tourist activities are perceived as a means to bring in much- needed foreign exchange to improve the quality of life of local people. The tourism sector ranks 4th in support of the national economy in Sri Lanka. In 2000 it was the country's fourth highest foreign exchange earned sector, and employed over 90,000 workers directly and indirectly (Central Bank Annual Report, 2000)

The total number of tourist arrivals peaked in 1999 at 436,440, but has essentially stagnated at or below 400000 for the last two decades. Similarly, foreign exchange earnings have also stagnated. Even so, there are significant national benefits from tourism, including an approximately 70% foreign exchange retention. (SLTB, 2003)

Sri Lanka's diverse landscapes and rich cultural heritage present a wide range of tourism opportunities, ranging from "sun and beach" holidays, wildlife excursions, and cultural tours. Sri Lanka has a long- standing reputation as a popular "sun, sand and sea" holiday destination. Generally, Sri Lanka's tourism resources are relatively under exploited. Although "sun and beach tourism" remains the main attraction for most foreign visitors, alternative tourism (that is ecotourism, nature tourism, and cultural/ heritage tourism) on a smaller scale has been promoted as a sustainable alternative to avoid the negative social , economic, and environmental impacts often associated with mass tourism development.(Tsung- Weilai, 2000) .

Tourism mainly depends on natural resources and it provides more benefits to human aesthetic enjoyment and recreation. The ecotourism concept began as a result of the haphazard development of tourism. Sri Lanka is blessed with a magnificent natural environment characterized by unusual biological diversity. This also paves the way to ecotourism development in Sri Lanka. During the last decade the ecotourism segment of travel has increased significantly than the traditional tourism. According to pacific Asia Travel Association the ecotourism market has grown by an annual rate of 30% during the period between 1990-1995 whereas during the same period, the growth of the traditional tourism sector has only increased by 8% (Abeywardhana and Jayawardana, 2001).

Ecotourism can contribute positively towards maintaining and managing Sri Lanka's system of protected areas and to the central economy. Developing protected areas and other natural habitats for high value low impact ecotourism to make them

economically viable, will bring in valuable foreign exchange, help to develop the tourist industry, and provide jobs both locally and nationally. In addition to providing a method of economically exploiting the forests and protected areas compatible with conservation, such tourist traffic will also deter illegal logging and proaching and thus help police the forest and protected areas. A well designed system of trails will also define park boundaries and prevent encroachment. Again, local residents can find employment in helping to conserve Sri Lanka's wildlife (Wickramanayake, 1992).

Although ecotourism is a popular and increasingly attractive component of tourism in many counties (Costa Rica, Laos, Kenya) Sri Lanka has yet to develop and promote this form of tourism. A primary advantage for Sri Lanka is that there is easy access to a number of different ecosystems within a short space of time. Sri Lanka is a small country but it has a diverse array of easily accessible ecosystems which are only two to four hours from each other by motor vehicle. Thus tourists can visit several different ecosystems and see more wildlife quickly and easily (Vidanage et al.1995)

Although there is a growing market for tourism in Sri Lanka, most cases tourism activities have not been able to ensure that attractive sites have been properly managed in order to provide maximum satisfaction to the tourists. In the Sri Lankan context, is largely oriented on mass tourism at selected attractive sites. For example, tourist visits to the Hikkaduwa coastal area has had an adverse impact on the marine sanctuary where damage to coral reef, sea water pollution, the garbage problem, collecting of rare fish species and the breaking of corals, for sale have occurred (CRMP,1994). Sigiriya is another example. Here, the number of tourist visits has far exceeded the carrying capacity of the existing facilities resulting in the degradation of the stone steps and archaeological assets with increasing numbers of tourists intent on enjoying natural areas and wildlife, historical, cultural and religions sites, and the coastal areas of Sri Lanka, the implications are that there will be a corresponding increase in pressure on these attractive sites. Establishing site specific strategies is one way of managing the increasing number of tourists in a sustainable manner. The other option is the diversion of tourists to unexplored tourist sites which provide a large potential for tourism and which can reduce the pressure on existing attractive sites.

In the other hand most of the older generations possessing traditional knowledge have not been able to transfer it to the younger generation. In such a situation,

ecotourism appears to be a viable option for sustainable development and conservation of rich culture and environment of this region.

Recently, there has been a changing pattern in tourism resulting from the high concentration of visitors in famous, conventional, crowded places. More tourists are beginning to visit the countryside and seek vacation in rural areas and these new destinations are receiving more attention. (Sharpie and Sharpley, 1997)

This phenomenon also stems from the desire of city inhabitants to escape from the busy, unfriendly and stressful life of cities, the increase in leisure time, the rising disposable income, better education, and rapidly improving transport and communication.

Rural areas with their distinctive characteristics, such as pristine environment, beautiful landscape, wild varieties of flora and fauna, village communities and their cultures provide unique experiences for visitors. These special attributes will help extend the diversification of tourist product thus reducing the degree of touristification and the sense of placelessness.

The income gap between farmers and urban workers has become a major problem in the Asian and Pacific region. To maintain their present standard of living farmers will have to find new ways of earning money. In favorable areas agricultural tourism can became an important source of farm income (Bramwell, 1999)

Considering the above characteristic sustainable ecotourism program, builded remote area in Sri Lanka very successfully. The South East Dry Zone (SEDZ) is considered to be the birthplace of one of the ancient civilization of the country (MPPI, 1985). There is historical evidence of human settlements, large irrigation systems, ancient paintings and monasteries that existed in the SEDZ in ancient times which suggest that this area had been a well developed region in Sri Lanka (WTO/UNDPa, 1993). Even today, SEDZ is well endowed with large areas of natural forest cover, rivers, wildlife, and other natural vegetation, which offer potential for tourism activities. However, it should be recognized that tourism activities should not be allowed to become another calamity of natural areas and wildlife, natural environment and the local community. Any strategy aiming at making use of these resources for development in the area should ensure that proper attention is paid to the conservations of the natural areas while these are being tailored in to

development strategies. If not the balance between human activities and the continuance of the existence of natural areas will be lost and the sustainability of the tourism activity cannot be assured (Fennel and Smale, 1992).

The Pelwatte Sugar industries Limited (PSIL) is located in the Monaragala district of Uva province, about 225 km by road east of Colombo near the intersection of the A4 east west highway and the A2 highway linking the south coast with the highlands. Traveling time by road to Colombo is approximately 6 hours. The estate lies on the boundary of the intermediate and dry rainfall zones of Sri Lanka, immediately south-east of the central mountain massif at an altitude of 175m above sea level. The total area surveyed, over 9000ha. (PSI, 1992) Before establishment this area was mainly covered with natural forest. The forest cover was mainly concentrated which is described as tropical, dry evergreen, mixed forest and is mainly a secondary climax developed after a long period of earlier civilization based on irrigated agriculture. Since then the forest area has been disturbed by Chena agriculture and in more recent times by large scale illicit telling. The natural forest is divided into tree vegetation classes, high forest, reverine or gallery forest and dry scrub (EPMD, 1992)

The Pelwatta Sugar plantation area can be sub divided in to 2 parts, the nucleus estate and settler estate. The Manik gaga and Kuda Oya are main streams of water which transects the plantation from north to south. Its southern and eastern boundary is located next to Yala National parks.

Considering sustainable tourism indicator such as species demographics, water quantity, quality and use, air quality, waste production and recycling programs, efficiency or resource use, site protection, endangered species, percentage of protected are, distribution of income, jobs opportunity and travel intensity. PSI displays signs of ecotourism potential.

1.2 Scope of the study

The study site Pelwatta Sugar plantation area is a combination of natural and industrial system; therefore it developed, particular areas for the successful sustainable Ecotourism program it will increase the economic stability of the people in the area. This is a solution of reducing the income gap between farmers and urban workers. On the other hand, solution of reduced pressure of the tourism in selected attractive sites and viable potion for transfer traditional knowledge in the present generation.

Recently, the Pelwatte Sugar plantation project was classified under the monoculture large-scale plantation. This type of industry consumes natural resources, such as land, water and forest, for only one purpose, causing several environmental and social problems in the area. Successful Ecotourism program is ideal tool for the utilization of above natural resources sustainability.

Human elephant conflict is a main ecological problem in this area where elephants usually occur outside the protected area. (Yala National park, Handapanagala Reservoir and Lunugamwehera National park). Expanding agricultural areas in this region has increased elephant densities and intensified the elephant human interface. As a result of heightened conflicts many elephants have habituated to elephant crop raiding deterrents. Main cause for human elephant conflict are reducing and fragmentation of habituates, lack of natural resources, overlapping of land use of elephant and human hindrance of free migration. As a result of human elephant conflicts there are many out comes. Some of that is destruction of houses and properties, crop depredation, loss of human lives and death of elephants. Successful sustainable Ecotourism program it developed in this area, it will be a viable option for reducing the above problem and an ideal tool for the conservation of Asian elephant, particular Handapanagala elephant population.

The Pelwatte Sugar plantation area is suggested as a suitable and probably the best location in between Tissamaharama and Elle for the promotion of Ecotourism. (Market side) The unique combination of natural flora and fauna, plantation, industrial area and social culture back ground and domestic settings makes it an ideal for such a purpose. The high degree of variation in the kinds of environmental settings enables the combination of designs of Ecotourism models. In addition the presence

of Yala National park, Lunugamwehera National park, Maligawila and Buduruwagala heritage site, Bandarawela season and Kataragama festival and different type of geomorphologic features in adjacent enhance the suitability. However, to initiate and implement such program a well stratified potential evaluation study is essential.

1.3 Objectives of the study

1. Identification of the unique features of Pelwatte Sugar plantation area to promote Ecotourism.
    a) Ecological potential
    b) Social-culture potential
    c) Recreational values

2. To design the Ecotourism base activity.

3. To evaluate and assess the Ecotourism potential in this area.

CHAPTER-2

2 Ecotourism Theory and Practice

2.1 Defining Sustainable Tourism and Ecotourism -The Evolution of Theory.

Sustainable tourism is defined by the World Travel and Tourism Council (WTTC), World Tourism Organization (WTO), and the earth council as tourism that, "meets the needs of present tourists and hosts regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, Social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life-support systems (WTTC/WTO and earth council, 1999).

The WTTC definition builds on the world Conservation Strategy (IUCN, 1980) and the World Commission on the Environment and Development report, "Our Common Future (WCED, 1987). These two publications have served as the foundation for the global sustainable development movement over the last decade and advocate the need for integration of conservation and development strategies in order to "meet the needs of the present without compromising the ability of future generations to meet their own needs"(WCED, 1987).

In this context, the term "Sustainable Tourism" refers to tourism based on natural or human-made resources, which contributes to sustainable development. It is a form of tourism that needs to be developed and managed in such a way that all activity that focuses on a heritage resource (natural and cultural) can continue indefinitely, (Ceballos-Luscurain, 1996; Butler, 1992; Healy, 1992). The definition acknowledges the need for a comprehensive approach to development with an understanding of the relationships between natural and cultural resources, the tourism sector, and other activities, processes, and value systems where tourism takes place (Butler, 1992).

One form of tourism that is directly dependent on the use of natural resources in an undeveloped state is nature-based tourism (Ceballos-Lascurain, 1996; Butler, 1992; Healy; 1992). Nature-based tourism, which includes such activities as bird watching,

hunting, sports fishing, off road biking, and white-water ratting, is a rapidly growing sector of the tourism economy. The global value for nature-based tourism in 1988 was estimated to have been as high as US$ one trillion (Filion et al.1992). Whether all nature-based tourist activities are sustainable is questionable because some of these activities don't use natural resources wisely (Ceballos-Lascurain, 1996).
In recent years, a specific category of nature-based tourism has developed which attempts to promote sustainability and the conservation of nature: ecotourism. Many of the early definitions of ecotourism tended to be descriptive and resulted in the proliferation of tours that were ecologically sound (Wight, 1996). As a result, more prescriptive definitions have evolved to incorporate the concept of travel that includes such factors as; positive benefits for conservation in a given locale; educational programs; minimal visitor impact; and socioeconomic benefits through small-scale, locally owned facilities (Ziffer, 1989; Richrdson, 1999; Cater, 1994; Lindberg and Mckercher, 1997). The concept has evolved to one which recognizes tourism will create change and that a managed approach is essential to avoid the "boom and bust" cycle of tourism development. In short, any rational tourism plan includes preservation or enhancement of the environment as a fundamental component (Inskeep, 1991). This managed approach is highlighted in conservation International's ecotourism definition;

"A form of tourism inspired primarily by the natural history of an area, including its indigenous cultures, ecotourism also implies a managed approach by the host country or region which commits itself to establishing and maintaining the sites with the participation of local residents, marketing them appropriately, enforcing regulations, and using the proceeds of the enterprise to fund the area's land management as well as community development. (Ziffer, 1989)

Nature based tourist activities can't be equated with sustainable tourism unless they improve environmental protection (Norris, 1992). For example, even through participants in wilderness, cultural or adventure travel may gain a deeper understanding of the places they visit, their appreciation does not necessarily protect or improve the natural or cultural environment in the areas visited. Visitors who may consider themselves to be nature tourists are not ecotourists if their visits ultimately degrade or destroy natural resources.

Some commentators distinguish between nature tourism and sustainable tourism by describing the latter as "more exclusively purposeful and focused on the

enhancement or maintenance of natural systems" (Farrell and Runzan, 1991). One can distinguish between traditional tour operators and principled tourism operators; the former frequently show no commitment to conservation or natural area management, merely offering clients an opportunity to experience exotic places and people before they change or disappear. The late, on the other hand, have begun to form partnership with managers of protected areas, and with local people, with the intention of contributing to the long-term protection of wild lands and local development, and in the hope of improving mutual understanding between residents and visitors (Wallece, 1992). The premise that underlies sustainable tourism is that the enjoyment of future generations should not be affected negatively by visitors today.

Another dimension of sustainable tourism is recognition that the causes of resource degradation must be taken into account. In a majority of situations, national and international environmental pressures are often more harmful than either tourist activity or the local use of resources (Whelan, 1991; Woodley, 1993; Brandon, 1996). Ultimately the significance of tourism as a conservation strategy depends largely on it addressing the causes of local resource degradation external to tourism activity (Brandon, 1996; Brandon and margolnis, 1996).

Holden and Kealy (1996) add and explicit economic component in their definition;

"Implicit in all the definitions is respect or friendliness for the physical and cultural environment that is developing a form of tourism that is non-damaging and non-degrading; subject to adequate and appropriate management controls, and that offers financial contributions for the protecting of indigenous cultures and environments".

Goodwin (1996) links this economic dimension directly to conservation of resources in his definition of ecotourism as:

"Low impact nature tourism which contributes to the maintenance of species and habitats either directly through a contribution to conservation and/or indirectly by providing revenue to the local community sufficient for local people to value, and therefore protect, their wildlife heritage area as a source of income.

While there is not a universal definition for ecotourism, as part of the International Year of Eco-tourism (TIYE) - 2002, the world Tourism Organization (WTO) and other agencies interested in eco-tourism have agreed that the following concept reflects what ecotourism strives to achieve:-

"All forms of tourism in which the tourists' main motivation is the observation and appreciation of nature, that contribute to the conservation of, and that generate minimal impact upon, the natural environment and the cultural heritage" (WTO, 2002) Its general characteristics can be summarized as follows:

- It contains educational and interpretation features.
- It is generally, but not exclusively organized for small groups by specialized and small, locally owned businesses. Foreign operators of varying size also organize, operate and/or market eco-tourism tours, generally for small groups.
- It minimizes negative impacts upon the natural and socio-cultural environment.
- It supports the protection of natural areas by,
- Generating economic benefits for host communities, organizations and authorities managing natural areas with conservation purposes.
- Providing alternative employment and income opportunities for local communities,
- Increasing awareness, towards the conservation of natural and cultural assets, both among locals and tourists

Over the years, it has also become clear that some concerns still need to be wholly addressed in eco-tourism, such as,

- Land tenure and control of the eco-tourism development process by host communities.
- Efficiency and fairness of the current concept of protected areas for protection of biological and cultural diversity.
- The need for additional precautions and monitoring when operating in especially sensitive areas.
- Indigenous and traditional rights in areas suitable for eco-tourism development.

2.2 Mean of the "Eco"

The separate the two parts of which the word Eco-tourism consists, there appears a contradiction between those parts. "Eco" stands for conservation of current natural environment, while the second part of the definition incorporates the development of tourist facilities, too much tourism facilities will pollute, cultivate and disturb the natural environment. On the other hand if there's too much protection, tourist activities can not take place.

On first sight both parts seem to conflict with each other. However, when we take a closer look, it appears that the two aspects rely on each other without nature, tourists will not be attracted: on the other hand conservation of the environment depends on the cash flows that are related to the commercial function of tourism.

This relationship is illuminated in the following figure 2.1

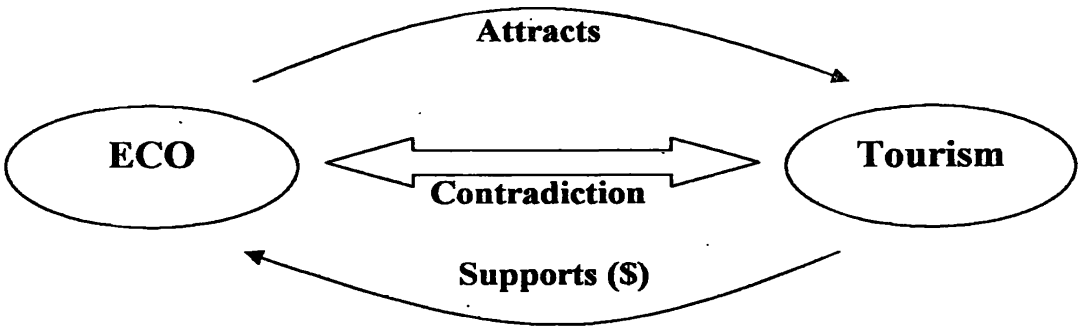


Figure- 2.1-Relationship between eco and tourism.
(**Source** - www.feweb.vu.nl.)

2.3 Eco-tourism as a Concept

Eco-tourism is a sub-component of the field of sustainable tourism. Figure 2 offers a reflection of where eco-tourism can be placed within the process of developing more sustainable forms of tourism. This figure also provides a demonstration of how eco-tourism is primarily a sustainable version of nature tourism, while including rural and cultural tourism elements. (Wood, 2002)

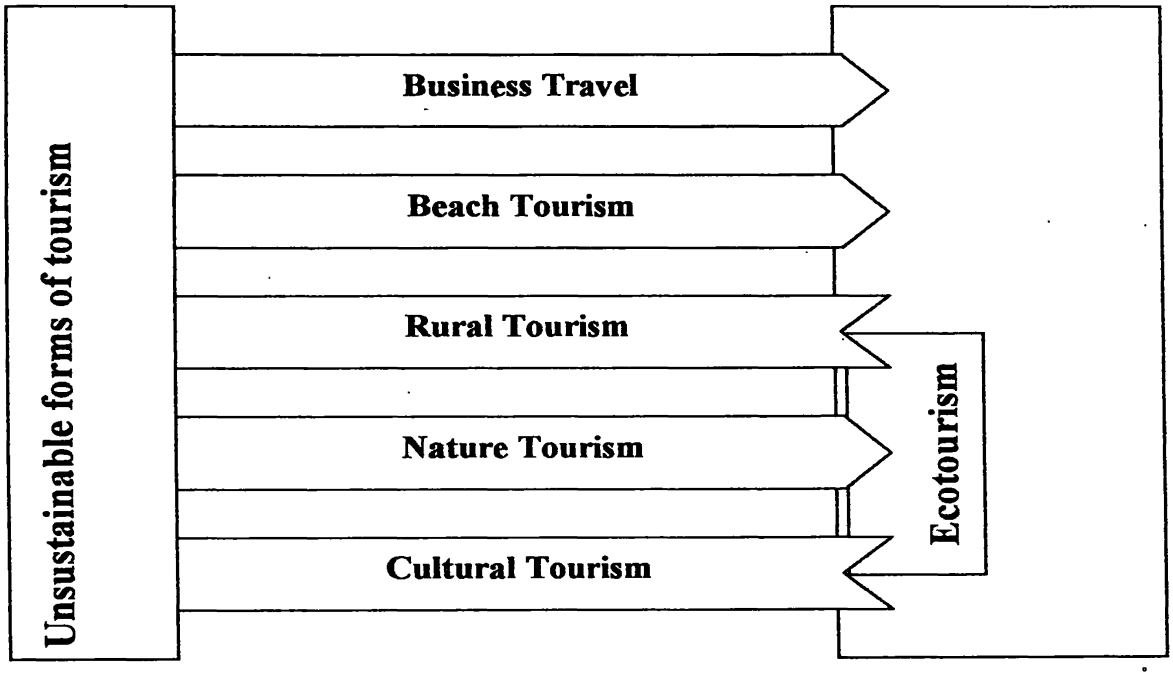


Figure 2.2: - Eco-tourism as a sustainable development concept

2.4 Origins of ecotourism

In the 1970s, the ecotourism concept emerged from conservationist in Latin America and Africa simultaneously, although for some what different reasons. In South America, scientists and environmental activists were alarmed at the rapid destruction of the world's remaining tropical forests-vital reservoirs for both biodiversity and Oxygen and came to view ecotourism as a potential alternative to logging, oil drilling, mining, and other extractive industries. In East Africa, it evolved as an alternative to a failed protectionist philosophy of wild life management based on separating local people from national parks. (Honey, 1999).

2.5 Components of ecotourism

- Contribute to conservation of biodiversity
- Sustains the well being of local people
- Includes an interpretation/ learning experience
- Involves responsible action on the part of tourists and the tourism industry.
- Is delivered primarily to small groups by small scale businesses.
- Requires lowest possible consumption of non-renewable resources
- Stresses local participation, ownership and business opportunities, particularly for rural people. (Wood, 2002)

2.6 Different of sustainable tourism and ecotourism

In essence, ecotourism must be planned and managed to successfully offer its key social and environmental objectives. This requires,

1. Specialized marketing to attract travelers who are primarily interested in visiting natural areas.
2. Management skills that is particular to handling visitors in protected natural areas.
3. Guiding and interpretation services, preferably managed by local inhabitants, that are focused on natural history and stainable development issues.
4. Government policies that earmark fees from tourism to generate funds for both conservation of wild land and sustainable development of local communities and indigenous people.
5 Focused attention on local people, who must be given the right of prior informed consent, full participation and if they so decide, given the means and training to take advantage of this sustainable development option.(Wood, 2002)

2.7 International Convention

The "distressing attractiveness of tourism" lies in its ambivalence. In recent times, this has led to tourism's greater significance in the international debate over

sustainability and nature conservation. Tourism is hardly mentioned it at all in Agenda 21, the Framework convention on climate change and the convention on Biological Diversity. However, since then, tourism has become the subject of several official, albeit non-binding, international declarations (UNEP environmental program of 1995, UNESCOs 18 –point "character on sustainable Tourism " announced in Lanzarote in 1995, the "male Declaration on sustainable Tourism Development" by the tourism and environmental ministers of the Asia Pacific area in 1997)

The most important initiative in this respect is the "Berlin Declaration – Biological Diversity and sustainable Tourism" , signed by the environment ministers of 18 nations including developing countries with a major state in tourism- at the International Tourism Exchange (ITE) in 1997 on the initiative of the German Federal ministry of the Environment. The parties', and signatory states assume that the "Central Objectives of global environmental policies, namely sustaining biological diversity, climate protection and reducing consumption of natural resources cannot be accomplished without a sustainable development of tourism".

Based on the "Berlin Declaration" and within the framework of Biodiversity convention, global directives for sustainable tourism, especially in ecologically sensitive regions, are to be drawn up. This would appear to be a logical step , since Article 10 of the convention considers sustainable use of biodiversity as a vital framework for its long-term preservation (creation of socio- economic incentives for nature conservation). According to this principle, sustainable tourism would be one possible form of use of biodiversity. For the same reason, many national strategies, action plans and national reports on application of the convention have hitherto made mention of tourism activity whenever sustained use of genetic resources has been discussed. The relationship between tourism and biodiversity is all the more significant because of the fact that major tourism destinations in tropical and subtropical regions also exhibit a high degree of biodiversity.

However, at the 4th conference of the parties to the convention on biological divers which was held in Bratislava in May 1998, the co- signatories could only agree to international exchange of information and experience in the question of tourism and biodiversity. The subject of "sustainable tourism", though, is still on the agenda of international environment and development policies, For instance, the 7th meeting of the UN commission on sustainable development. (CSD) will address the topic in April 1999. It was asked by the "special General Assembly of the united Nations on

Environment and Development" to come up with a working program for sustainable tourism by 1999. Furthermore, the 5th conference of the parties to the convention on Biological Diversity, which will meet in Nairobi in May 2000 will also examine "sustainable tourism" as a main topic.

It developing countries are to implement the letter of the "Berlin Declaration" and other similar agreements, they will in all probability require the assistance of bilateral and multilateral donor organizations. This has already taken place in some cases. Various tourism projects have been funded by major organizations such as the World Bank and its subsidiary, the International Finance cooperation (IFC), and the European Union (EU), some of the larger international NGOs such as IUCN the World Wildlife Fund (WWF) or the Nature conservancy are also partly involved in this area. (Birgit, 1999)

2.8 Guiding principles of sustainable tourism

- The environment has an intrinsic value which outweighs its value as a tourism asset. It's enjoyment by future generations and its long-term survival must not be prejudiced by short-term considerations.
- Tourism should be recognized as a positive factor with the potential to benefit the community and the place as well as the visitor.

- The relationship between tourism and the environment must be managed so that the environment is sustainable in the long-term. Tourism must not be allowed to damage the resource.
- Tourism activities and development should respect the scale, nature and character of the place in which they are sited.
- In any location, harmony must be sought between the needs of the visitor, the place and the host community.
- In a dynamic world some change is inevitable and change can often be beneficial. Adaptation to change, however, should not be at the expense of any of these principles.
- The tourism industry, local authorities and environmental agencies all have a duty of respect the above principles and to work together to achieve their practical realization (Andrew, 2000)

2.9 International Nature Tour Operator Guidelines

Ecotourism guidelines for Nature tour operators were published in 1993 by the International Ecotourism Society, setting a standard for this sector of the industry.

2.9.1 Prepare Travels

One reason consumers choose an operator rather than travel independently is to receive guidance. How can negative impacts be minimized while visiting sensitive environments and cultures, How should one interact with local cultures, what is an appropriate response to begging, is bartering encouraged.

2.9.2 Minimize visitor impact;

Prevent degradation of the environment and/or the local culture by offering literature, briefings, Leading by example and taking corrective actions
To minimize accumulated impacts, use adequate leadership and maintain small groups to ensure minimum group impacts on destination. Avoid area that are under managed and over visited.

2.9.3 Minimize nature tour company impact

Ensure managers, staff and contract employees know and participate in all aspects of company policy that prevent impacts on the environment and local cultures.

2.9.4 Provide Training

Give Managers, staff and contract employees' access to programs that will upgrade their ability to communicate with and manage clients in sensitive natural and cultural settings.

2.9.5 Contribute to conservation

Fund conservation programs in the regions being visited.

2.9.6 Provide Competitive local employment

Employ locals in all aspects of business operations.

2.9.7 Offer site sensitive accommodations

Ensure that facilities are not destructive to the natural environment and particularly that they don't waste local resources. Design structures that offer ample opportunity for learning about the environment and that encourage sensitive interchanges with local communities. (Wood, 2002)

2.10 International Ecotourism Principles

Because ecotourism was originally just an idea, not a discipline, many businesses and governments promoted it without an understanding of its most basic principles.

The international ecotourism society has tracked the results of stakeholder meetings since 1991 to develop that set of principles on page 14, which are being embraced by a growing constituency of NGOS, private sector businesses governments, academia and local communities.

- Minimize the negative impacts on natural and culture that can damage the destination.

- Educate the traveler on the importance of conservation.

- Stress the importance of responsible business, which works cooperatively with local authorities and people to meet local needs and deliver conservation benefits.

- Direct revenues to the conservation and management of natural and protected areas.

- Emphasize the need for regional tourism zoning and for visitor management plans designed for either regions or natural areas that are slated to become eco-destinations.

- Emphasize use for environmental and social base line studies, as well as long term monitoring programs, to asses and minimize impacts.

- Strive to maximize economic benefit for the host country, local business and communities, particularly people living in and adjacent to natural and protected areas.

- Seek to ensure that tourism development does not exceed the social and environmental limits of acceptable change as determined by researchers in cooperation with local resident.

- Rely on infrastructure that has been developed in harmony with the environment, minimizing use of fossil fuels, conserving local plants and wildlife, and blending with the natural and cultural environment.(wood, 2002)

2.11 Dimension of ecotourism

Activity- tourism which is based upon experiencing natural and cultural resources
Business- Tour operators who provide ecotourism tours
Philosophy- A respect for land, nature, people and cultures
Strategy- A tool for conservation, economic development and cultural revival
Marketing Devise- For promoting tourism products with an environmental emphasis
Handle- Convenient umbrella name for a number of tourism related concepts such as "responsible or either travel", "low important tourism", "educational travel", "green tourism" and so on.
Symbol- Of the debate about the relationship between tourism and the environment
Principles and goals- Defining the symbiotic and sustainable relationship between tourism and the environment(Andrew, 2000).

2.12 characteristic of a good ecotour

- Provide information prior to the trip on the culture and environments to be visited
- Offers guidelines on appropriate dress and behavior in writing before departure and verbally during the tour
- Offers in depth briefing upon tourist's arrival of the destination's geographical, social and political characteristics, as well as is an environmental, social and political challenge.
- Offers in depth guiding throughout the with well trained local guides.
- Offers the opportunity to meet and interact with local communities in a setting that is clearly not just a commercial venue for shopping or sales
- Develops as understanding of both the local people's daily life and traditions, and the type of issues that are appropriate to discuss, well in advance of community interactions.
- Provides opportunity for contributions to local NGOS.
- Ensures that all park entry fees are paid in full.
- Offers site sensitive accommodations (Wood, 2002).

2.13 Ecotourists:

Just as there is no definitive definition of eco-tourism, similarly there are different opinions on the characteristics of eco- tourists, and who eco-tourists actually are. Given the difficulty in defining eco-tourism, it is unsurprising that it is subsequently difficult to categories the "eco-tourist", which leads to confusion over the type of behavior that eco-tourists could be expected to display. As cater (1994) comments: "There is an inherent risk in assuming that the ecotourists is automatically an environmentally sensitive breed. Although small, specialist, guided groups of eco-tourists may attempt to conform to this identify, the net has now been cast sufficiently wide to include less responsible behavior".

It would therefore be mistaken to think that being labeled an "eco-tourist" will necessarily mean that a tourist will particularly desire to be environmentally educated and have a minimal impact upon the environment. According to Richardson (1999), the tourist industry divides eco-tourisms into three distinct categories, of the big "E" little "E" and soft adventure types. The most popular group is the little "E", in which

tourists' environmental concerns are characterized by a wish to know that the hotel, airline or tour operator they intend to use has acceptable environmental standards. Big "E" travelers are willing to travel into new, "Undiscovered areas, and accept the standards of accommodation and services offered by local people or camp in the wilderness. The "soft adventurer" also wishes to visit wilderness area, but wishes to visit them in comfort, however, without a sense of feeling that the nature or culture of the area they are visiting is being "exploited" through tourism.

A further categorization of tourists into different types relating to their level of interest in the environment is shown in figure 2.3, based upon the work of (Leverdon, 1999). The level of demand for each typology is reflected in the width of the base of each segment, that is, demand decreases upwards from the base of the pyramid to its apex. The model suggests that the largest segment of the tourist market, the "loungers", has a low level of interest in the environment beyond its providing pleasant surroundings. The focus of the holiday of this typology is likely to be based upon relaxing and enjoyment. The second typologies of tourist, "the users", are interested in the environment having the special features that are required for the type of holiday they wish to pursue. The types of environment required for this typology are therefore specialized and limited.

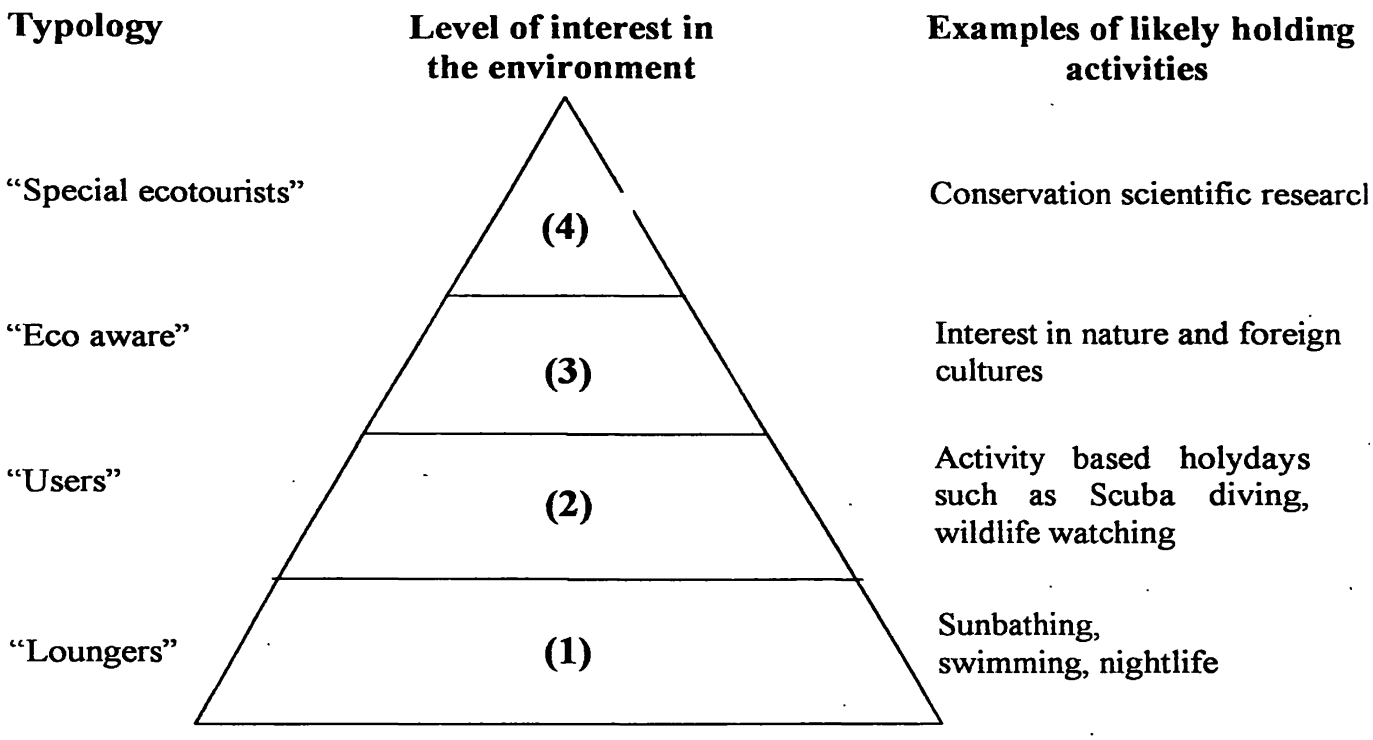


Figure 2.3: Types of tourists based upon their level of interest environment

(1) Low Emphasis is placed on recreation and enjoyment. Therefore there is no requirement apart from it looks pleasant

(2) Interested in the environment to the extent that it possesses the special characteristics to pursue a particular type of activity.

(3) Interested in the environment for its own value rather than how it can be used.

(4) High, want to be involved with and protect nature.

Empirical studies of eco-tourists are limited, however research based upon demographic (age, gender, occupation, income) Characteristics and psychographics (values, attitudes and motivation) characteristics has been attempted. Generally, suggests that eco-tourists have higher than average incomes and level of education, and are also willing to spend more than the normal tourists, (Andrew, 2000)

2.14 Benefits of Sustainable Tourism

Table 2.1: Economic Benefits

2.14.1 Economic benefits	
Visitors	**Host**
• Competitive enterprises and tourism • Quality Product(value for money)	• Job creation and a diversified economy. • Economic cohesion and wealth (high yield/revenue)

(Source: SLTB, 2003)

Table 2.2: Environment Benefits

2.14.2 Environmental Benefits	
Visitor	**Host**
• Unspoilt scenery and nature, access to cultural heritage • Activities compatible with nature/culture	• Conservation/management of natural and cultural resources • Environmentally friendly production and consumption patterns

(Source: SLTB, 2003)

Table 2.3: Social Benefits

2.14.3 Social benefits	
Visitor	**Host**
• Pease, relaxation, well being , intellectual stimulation • Personal contact and intercultural exchange (Leading to • peace knowledge education)	• Job supply (e.g.; inclusion equal opportunities) • Social cohesion and social justice

(Source: SLTB, 2003)

2.15 Ecotourism as a market segment

Ecotourism is a small but rapidly growing industry working within a niche market that is governed by market forces and regulations. Ecotourism is primarily advertised as being equivalent to nature tourism in the market place. Some countries companies and destinations have social and environmental policies and programs, while others do not. This has led to confusion worldwide about the meaning of the term ecotourism as it is applied in the market place. Figure 2.4 provides a reflection of how ecotourism fits into larger tourism market place. Both adventure tourism and ecotourism are shown as subcomponents of nature tourism, while ecotourism has stronger links to rural and cultural tourism than adventure tourism.

In ecotourism the prime motivation is the observation and appreciation of natural features and related cultural assets, whereas in adventure tourism it is rather the physical exercise and challenging situations in natural environments.(Wood, 2002).

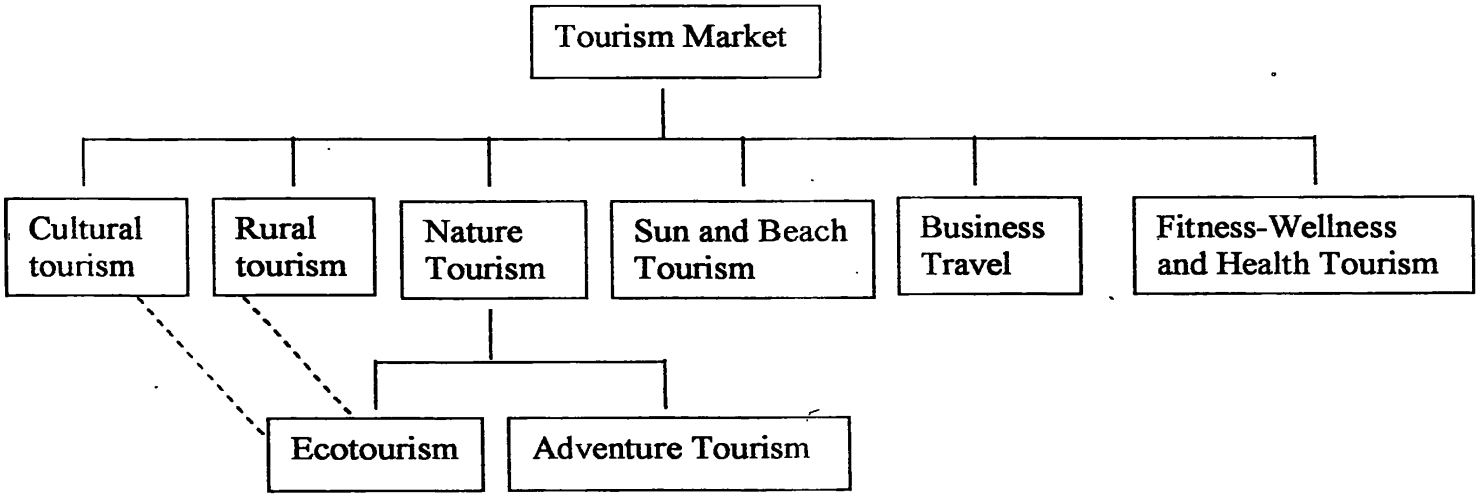


Figure2.4: Ecotourism as a market segment

2.16 Nature Tourism Market Profile (International)

Age- 35-54 years old, although age varies with activity and other factors such as cost.

Gender- 50% female and 50% male, although differences by activity were found.

Education- 82% were college graduates

House hold composition- No major differences were found between general tourist and experienced nature tourists

Party composition- A majority (60%) of experienced nature tourist respondents stated they prefer to travel as a couple, with only 15% starting they prefer to travel with their families, and 13% preferring to travel alone.

Trip duration- The largest group of experienced nature tourist (50%) preferred trips lasting 8-14 days.

Expenditure- Experienced nature tourists were willing to spend more than general tourists, the largest group (26%) starting they were preferred to spend $1001-$1500 per trip.

Important elements of a trip

Experienced nature tourists top three responses were a

1. wilderness setting
2. wild life viewing
3. hiking/trekking

Motivations for taking Next trip- Experienced nature tourist's top two responses were

1. To enjoy scenery/nature
2. new experiences/places (Wight, 1996)

Ecotourism markets are not homogenous There is a spectrum of interest and types of markets. Some are "committed" or highly "specialized" (planning a vacation around a natural experience, participating in educational courses, etc.) Some are "interested" (but not committed, usually also having a high level of environmental and social awareness). Some are "casual" (not planning a more general and vacation, but influenced by the product offerings once they are at their destination). Some ecotourists may have a multitude of other non ecotourism interests. They may be part of a tour group or be independent travelers. They may be on an ecotourism vacation, or simply interested in a day trip to an ecotourism destination. Figure2.5

show that market interests may range along a spectrum, ranging from hard to staff. (SLTB, 2003)

General Interest Ecotourists E.g. General Nature	Special Interest ecotourists E.g. Birds
Tour Group	Independent Travelers
Day Tripper	Long Stay
SOFT ⟷	HARD

Figure 2.5: Spectrum of Ecotourism Market Interests

2.17 Magnitude of International ecotourism market

The world tourism organization (WTO) estimates that there were more than 595 million international travelers in 1997. Spending by these tourists was estimated at more than US$425 billion. Tourist arrivals are predicted to grow by an average 4.3% a year over the next two decades, while receipts from international tourism will climb by 6.7% a year (Wood, 2002).

Filion et al. (1992) identified, through an analysis of inbound tourist motivations to different worldwide destinations that 40-60% of all international tourists are nature tourists and that 20-40% are wild life related tourists.

Table –2.4: International ecotourism arrivals

Total International Tourism Arrivals	Nature Tourists	Wild Life Relate Tourism
1988; 393 million 1994; 528.4 million	157-236 million 211-317 million	79-157 million 106-211 million

(Source: Wood, 2000)

Table-2.5: Estimated range of economic impacts

Total International Direct Economic Impact*	Nature Tourists	Wildlife Relate Tourists
1988-US$ 388 billion 1994-US$ 416 billion	US$ 93-223 billion US$ 166-250 billion	US$ 47-155 billion US$ 83-166 billion

(Source: Wood, 2000)

*Total International Direct Economic Impact=Money spent by tourists traveling abroad

2.18 Current Tourism in Sri Lanka

Table 2.6: Current Tourism in Sri Lanka

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Int.Arrivals	393,669	392,250	407,5111	403,101	302,265	366,165	381,063	436,440	400,414	336,794	393,171
US$ Millions	201.4	208	230.7	225.4	173.0	216.7	230.5	247.9	252.8	211.1	253
% Growth	28	3	11	-2	-23	25	6	19	-8	-19.8	19.8
ADE* (US$)	49.70	50.10	54.20	56.10	57.9	58.6	59.5	61.4	62.3	63.12	63.1

(Source-SLTB, 2003)

ADE= Average Daily Expenditure

A number of recent studies, and indeed the Tourism Master plan of 1993, have pointed out the need for diversification, Community- based tourism, and increased value- added for the tourism sector.

2.19 Sri Lanka Ecotourism Appeal

It this great diversity on which Sri Lankan eco tourism can draw. Sri Lanka has a tremendous variety of topography and natural features, plant and wildlife species. This is found on many island destinations, globally. However, there is great biodiversity in such a small island, and it is, in fact considered a conservation international "hotspot" of bio diversity. It has 435 species of birds (of which 23 are endemic), 107 species of fish, and many more species of amphibian, reptiles, snakes and others. The level of diversity of flora is also high, with over 3000 species of flowering plants, besides many other types. It is also no table that 5 of the 7 species of turtle in the world beach in Sri Lanka. This level of diversity is rare in an island of Sri Lanka's size. However, when the cultural diversity is added to this mix, Sri Lanka stands apart from most other such destinations in its potential appeals. (SLTB-2003)

Sri Lanka has designated 13% of its land area for wildlife and natural conservation, and has 7 world Heritage sites, which are of tremendous international tourism appeal. In addition, one of these heritage sites Sinharaja Forest Reserve, which is a biodiversity hot spot, covering 12,000 ha of lowland rainforest, and which was also declared a Man and Biosphere (MAB) in 1989. Sri Lanka also has some of the more desirable animal species to view, such as elephants, Leopards, Bear, and Turtles. In addition, there are a range of soft and hard adventure activities based in natural areas which appeal to various categories of ecotourists (e.g.:- trekking, camping, wildlife safaris, elephant safaris, bird watching, white- water ratting, scuba diving, snorkeling, cycling, mountain climbing, canoeing). While it is the protected areas of Sri Lanka which attract most ecotourists or nature tourists markets at present, yet only about 10% to 12% at visitors actually visit national parks or other areas with eco tourism opportunities.(SLTB-2003)

2.20 National Ecotourism Policy

Ecotourism can become a reality only if the state implements ecotourism through a set of clear policies.

1. Ecotourism must confirm with the economic sustainable development of the country
2. Ecotourism development will confirm to the environmental and natural resource conservation lows of the country.
3. Ecotourism should be permitted only if it contributes to conservation of the natural resources involve the community as partners and provide tangible benefits.
4. Ecotourism programs/enterprises will strive to achieve the highest standard set by the "Guidelines for Ecotourism "approved by the government of the Sri Lanka.
5. Ecotourism programs/enterprises will strive to achieve the highest recognition by way of conforming to international World Tourism Organization recognized standards (Kotagama, 2003).

2.21 National Ecotourism Guiding Principles

Summarized as follows;

2.21.1Resource;

The ecotourism "facility" (including the ecolodge) should be located only where it is appropriate and ecologically sustainable.

2.21.2 Community benefits

The ecotourism enterprises should involve the community and provide tangible benefits to the community.

2.21.3 Conservation Contribution

The ecotourism enterprise must provide tangible contributions to conservation both environment and culture.

2.21.4 Interpretation

The ecotourism enterprise will ensure the availability of highest levels of interpretation, interpretative personnel (interpreters) and material.

2.21.4 The Facility (ecolodges)

The ecotourism enterprise will ensure that the facilities (ecolodges) will conform to achieve the highest ecological and cultural integration of the country by following strict adherence to ecological, environmental and cultural standards and requirements.

2.21.6 Consumer Satisfaction and Marketing

The ecotourism enterprise will work to provide the highest consumer satisfaction through truthful and ethical marketing.

2.21.7 Social responsibility

The ecotourism enterprise will ensure that the social concerns of the community and country are not violated, strive to archive socially acceptable "Best practice" codes and provide continues staff training and upgrading (Kotagama, 2003).

2.22 Eco-tourism Activities:

One could recognize a significant overlap between eco-tourism and adventure, natural and cultural tourism, although there are also significant differences. While many of the latter experiences (adventure, nature and culture) are not considered as pure eco-tourism, eco-tourists are interested in many of these experiences.
Sri Lanka approach includes the widest range of eco-tourism markets possible.

2.22.1 Nature/culture observation and interaction

- Natural and cultural environments
- Visiting mediation centers
- Staying with Sri Lanka family
- Geology/landscapes study
- Traditional medicinal use of plants and herbs
- Other nature/culture interpretation
- Caving and fossils

2.22.2 Water Adventures/Eco-tourism

- Rafting, kayaking
- River/lagoons/coastal expeditions
- Sea kayaking
- Underwater safaris and scuba diving
- Stilt fishing experiences and trying it out
- Snorkeling and swimming trail
- Boating-based interpretation
- Surfing, wind-surfing

2.22.3 Land & Adventures/eco-tourism

- Walking, hiking and trekking
- Mountain/peak wilderness climbing
- Forest trekking
- Cycling
- Gemming and mining experiences
- Mountain biking and trail riding
- Jeep excursions

2.22.4 Wildlife viewing and understanding

- Elephant watching
- Bird watching
- Turtle Watching, nesting and hatching
- Other wildlife viewing (crocodile, deer, hear, water buffalo, etc)
- Leopard watching and habitat interpretation
- Whale/marine mammal watching

2.22.5 Community - Based Eco-tourism/Eco-Agro tourism

- Guiding and other services
- Providing food, crafts, and other products (direct to tourists or to intermediaries)
- Home- stays, guest houses, community ledges

- Transportation service
- Demonstrating and trying out traditional housing, Landscaping, building, activities, crafts, agricultural practices etc.
- Village tour, meeting blacksmith, carpenter, fisherman, chena cultivators, meet school children and role play in English
- Participation in traditional way of life of the people
- Study tours or stays
- Cultural performances (watching dance, music, masking)

Besides the related forms of tourism mentioned figure & also includes community-based tourism (CBT) or community - based eco-tourism (CBET) or Eco-agro tourism. This is strongly linked tot he social values of eco-tourism. This responds to the increasing demand for tourism in which tourists can observe and participate in local events and daily activities in a meaningful or authentic way (SLTB, 2003)

CHAPTER – 03

3. Materials and Methodology

3.1. Relative study area

The relative study area is located in GPS (Geographical Position System) Locations between the northern latitudes 6^0 34' and 6^0 44' and between eastern longitudes 81^0 08' and 81^0 14'. The soils are mainly well draining red-brown earths (RBE) on the higher ground, with low humic clays (LHC) and alluvial soils along the river course. The total area surveyed over 9000ha of land suitable for sugar cane cultivation has been identified within the project area.

Climatic characteristics based on mean observation to five meteorological stations in the vicinity are as follows.

Table 3.1: Average Climatic Characteristics of PSI

	Unit	**Maximum**	**Minimum**	**Mean**
Rain Fall	mm/Yr	1957	1313	1635
Mean day temp.	C^0	33	20	27
Evaporation	mm/Yr	-	-	1900

(Source: PSI, 1992)

The area has two distinct wet seasons, the Maha in October/ November and the Yala rains in March / April.

The project area consists of a Nucleus state, a settlement scheme and a sugar factory together with the associated infrastructure. The project plan envisaged the clearing and developing of over 8000 hectares of land which was leased to the company for an initial 30 year term, renewable for a further 30 years.

The project area is made up of Devale and state land. The extent of the Devale land is 4302ha. The state land which covers approximately 3300ha. The net area under

cane was to be 6933ha. The balance being roads, terraces, tanks and dwelling areas.

The Nucleus Estate is bordered by Menik Ganga on the East, By Kuda Oya on the west and both rivers joining together, Demodara on the south. The Nucleus Estate comprises at 3631 hectares at land. The company manages the entire cultivation on this land. Nucleus estate divided into 3 sections.

The setter area consists of 4024ha.The land is divided into plots of 1.75ha. Which are leased to individuals settlers. There are 1381 permanent employees, 7500 causal workers and 1000 setters as well as 7500 out grower farmers directly benefit from this plantation. There is also indirect employment to nearly 1000 tractor operators and transport vehicle (Lorries, buses, and trucks) drivers in the settler and out grower can grow areas. In all, nearly 20 000 families gain part or most of their livelihood as a results of the project.

As a key activity within the planned project development. PSI will assist the settlers to established and cultivate their cane through the provision of land preparation, seed cane, fertilizer and agricultural extension services. It was envisaged that this role would progressively be handed over to an associated organization. The Pelwatte setters' organization. (PSO)

The factory was designed for an initial through put of 2800 tones of cane per day (equivalent to 47000 tones sugar per year). The company was incorporated in Sri Lankan on 19 February 1981 as a private company under the company's ordinance. The primary objective of the company is to cultivate sugar cane and manufacture sugar in Sri Lanka.

The area in which the estate now is located was a natural habitat for mainly elephants, chena cultivations were in constant conflict with the elephants. With opening up of lands for cane cultivation at Pelwatte, the usual habitats of the elephants were destroyed and since then elephants have tried to return to these area, damaging the sugar cane cultivation. Elephant have acquired a taste for sugar cane and try to migrate in to the cane fields in the dry season.

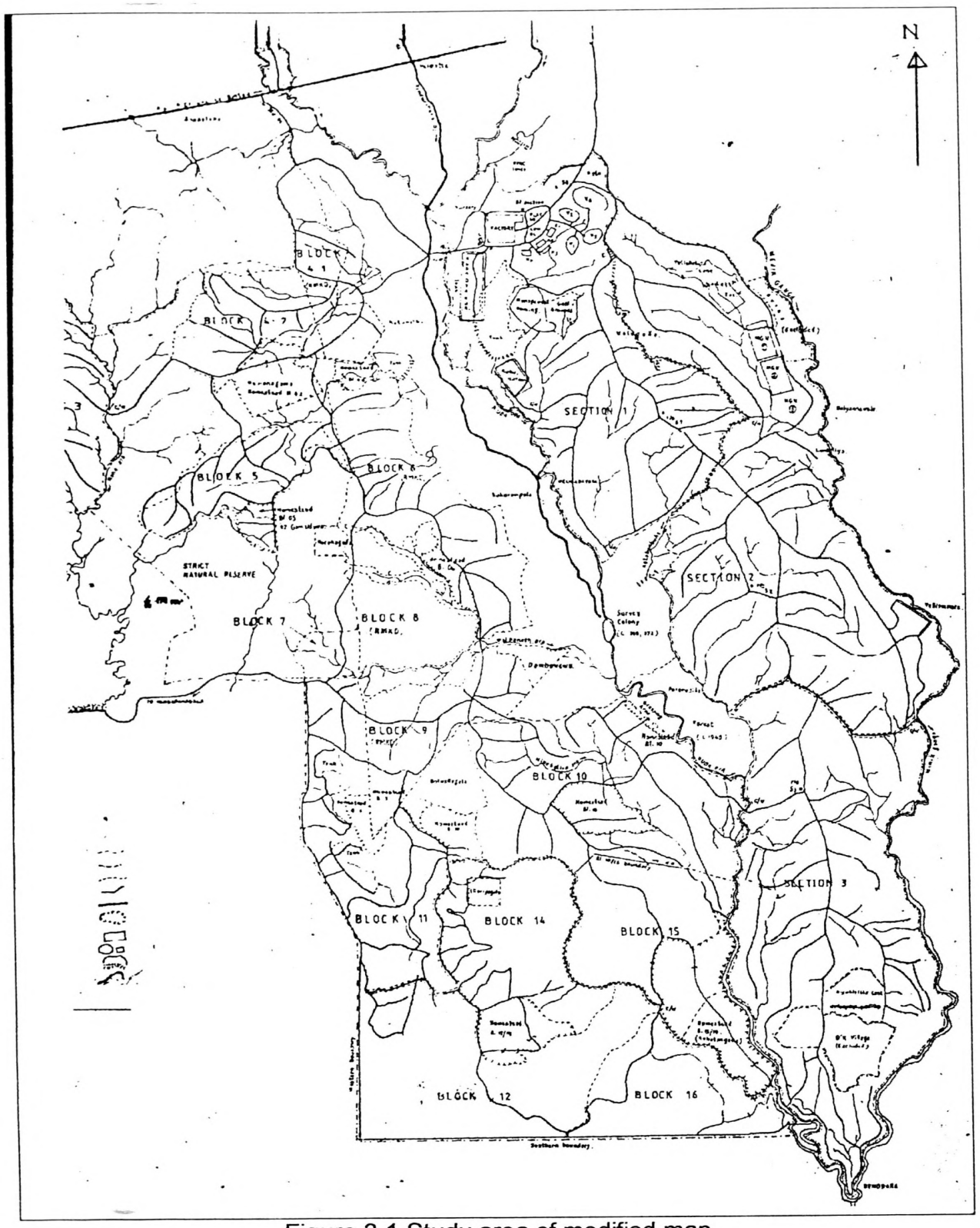


Figure 3.1 Study area of modified map

3.2.1 Field activity

In the study period there were full day field visits to identify the area and the feature important to judge to the potential. The following parameter uses were denoted. The end was fully mapped for study purpose.

Table 3.2: Eco potential related Parameters

Potential	Parameter
Ecological-	- Birds species - Butterfly species - Reptilian species - Snake species - Mammals species - Trees species - Grass species → Habitat type o Grass land o Plantation o Revering o Mature forest o Aquatic (tank, river, stream) o Shrubs land o Marshy type land o Home garden o Paddy field o Chena land o Mountain and rocky area → Nesting site area of bird, Mammals
Socio-cultural	- Historically important site o Mountains o Temples o Rock - Religiously important trees o *Ficus religiosa*(Bo) - Traditional dance ,music and cultivated related activity - Important folk tales of this area and features related - Agriculture activities - Life styles

The fauna and flora were identified using the common guides such as "Harrison Bird Field Guide" , "Trees and Shrubs of Sri Lanka" plant guide , "A selection of the Animals of Sri Lanka" mammal guide "Butterfly of Ceylon" and expert knowledge. The fauna was identifying using indirect technique such as foot print, Dung sample and vocalization.

The socio-cultural potential was identified by discussions made with people and direct observation. Folk tales was also collected from people.

A telephone survey was conducted for the evaluation of the site using randomly picked telephone numbers, sample size was 50.

3.2.2. Data Analysis

The noted GPS (12 channel Gaming) location was mapped to base of 1:50000 geographical map of this region. Collected data in this study was marked in base map as created roads, tank, river historically important site, different habitat types, land use pattern, and identified Eco-tourism potential map. Using this some sites were selected and trails were designed.

The identified suitable Eco-tourism events were applied to selected location using multi criteria decision making technique. This identified best location for each activity to be promoted in study area. This method ranked site from the best to the poorest.

In addition the ranking evaluated the whole area for its potential and then each site differently.
The assessment Eco-tourism potential this site economically was done using direct environmental evaluation techniques of contingency evaluation under method of biding game. These data analysis techniques were carried out using Mini Tab (13.2) Software.

For final assessment of the potential of this site, SWOT analysis technique was used. The management of the PSI was invited where the strengths, weakness, opportunities and threats for the development of tourism was discussed in a brainstorm session.

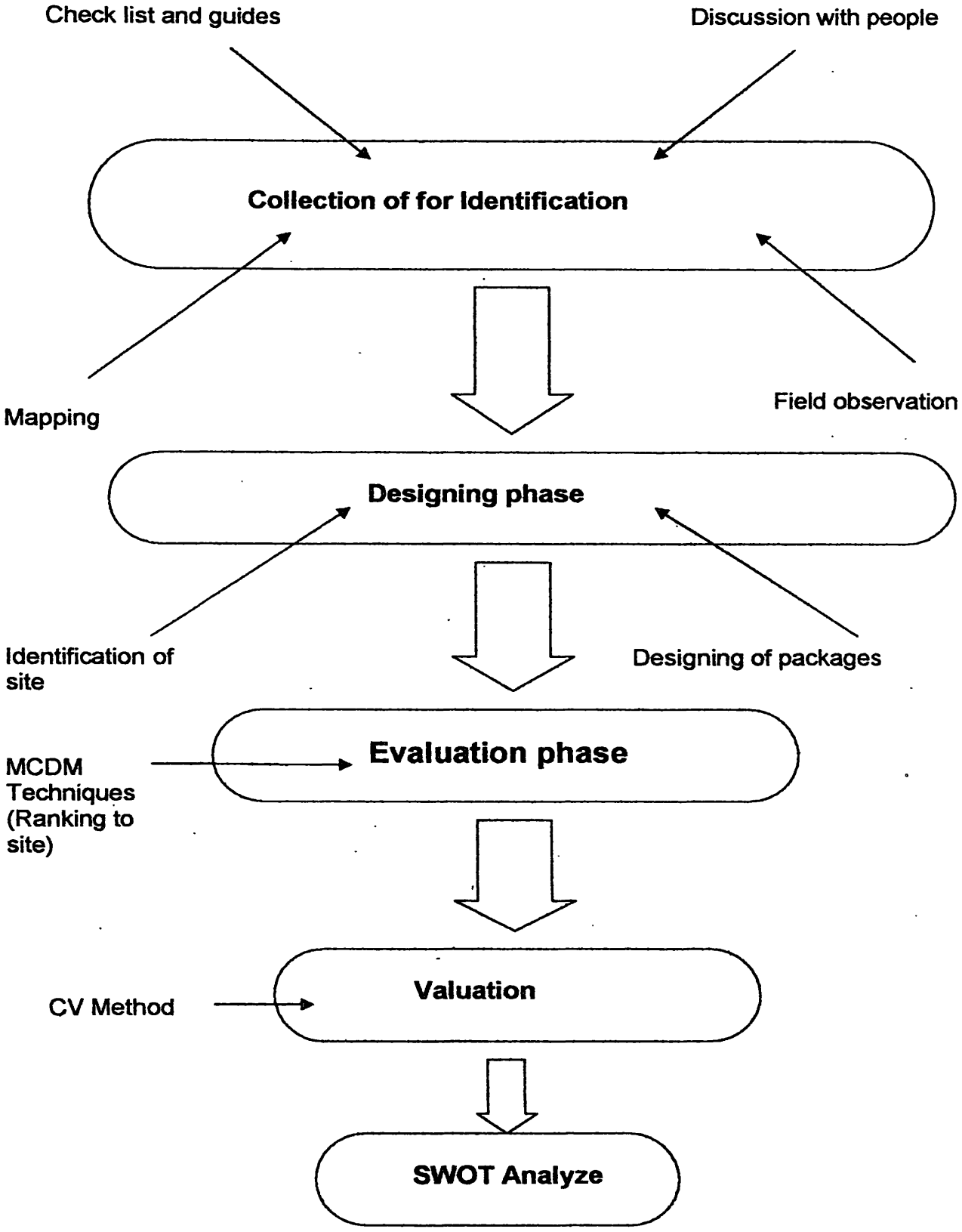


Figure 3.2 Flow Chart of Methodology

CHAPTER 04

4: Results and Discussion

4.1. Collection of Data for Identification of potential

The suitable places for Birds watching and generally identified bird species special nesting site and location of uncommon birds, were identified (See Appendix III.). In this area common Butterfly species (APPENDIX II), Reptile species (APPENDIX V), Mammals species were identified. (See Appendix IV). There were common plant species as well. (See Appendix VI).

In this study period identified the distribution of the following habitat type in whole study area designed map for habitat using GPS location (Appendix IV).

- Sugar cane
- Rivering forest
- Mature forest
- Grassland
- Shrubs land
- Marsh type land
- Home garden
- Paddy field
- Chena land.

The location of mountain and the rocks (APPENDIX VIII), all the tanks (Appendix VII). and historically important places (APPENDIX IX) in the whole area were identified

Figure 4.1: Growing site of PSI

Figure 4.2: Lake Site of PSI

Figure 4.3: Plant life of PSI

4.2 Designing Ecotourism program event and identification suitable place.

4.2.1 Proposed activities and suitable places

4.2.1.1 Suitable sites for Camping:-

site(1) Demodara(06^0 35' 469", 81^0 14' 836")
site(2) Ihala manikwewa middle island (06^0 40' 105", 81^0 14' 994")
site(3) Pahala manikwewa middle island(06^0 39' 251", 81^0 15' 253")
site(4) Poramadilla forest patch,clearing of land near kudaoya (06^0 39' 863", $81^0$13'237")
site(5) Cleared land Arakgoda mountain range basing (06^0 40' 950", 81^0 10' 750")
site(6) Bolwelagala mountain range basin(06^0 38' 950", 81^0 11' 850")
site(7) Grazing area nearest the Kudaoya river bank(06^0 39' 550", 81^0 12' 900")

Above campsites were identified on field visits and by comparing with other suitable places. To select best camp sites from those, general characteristics of camp sites were used. Then selected camp sites were ranked from high potential site to poor potential site, using following criteria.

Accesses		**Drinking water**	
No road	0	No suitable supply	0
One road	1	poor condition	1
Two road	2	good condition limited	2
More than two road	3	good condition not limited	3

Distance to water bodies	
High distance (higher than 1km)	0
Middle distance(less than1/2km)	1
Low distance (less than1/2km)	2
Close (less than 1/4km)	3

Fire safety	
Close to the sugar cane but not separate	0
Close to the sugar cane but separate	1
Not closed to the sugar cane completely separate	2

Surrounding beauty and diversity (On habitat diversity)

One type of habitat	0
Two types of habitats	1
Three types of habitat s	3
More than four types of habitat	4

Distance to nearest community area

Closed to community area	0
Separated from community area-nearest village less than 1km	1
Separated community area-nearest village more than 1km	2

Table 4.1: Suitable site for Camping

Criteria	**Site(1)**	**Site(2)**	**Site(3)**	**Site(4)**	**Site(5)**	**Site(6)**	**Site(7)**
Accesses	3	1	1	2	1	2	1
Drinking water	3	1	1	2	2	2	2
Distance for the water body	3	3	3	2	1	0	2
Fire safety	1	1	1	2	2	2	1
Surrounding beauty & diversity	4	1	2	3	4	2	3
Distance to nearest community area	1	2	2	0	2	1	1
Total	**15**	**9**	**10**	**11**	**12**	**9**	**10**

Considering this analysis criteria the most suitable campsite area was site(1).The second scored campsite area was, site(5).The third campsite area was site(4).The site(3) and site(7) were not scores. That means both having same suitable conditions of a campsite. The less suitable campsite area was site (2) and site (6).These sites were represented whole area visited to identify most suitable places as campsites. In the best campsite (site (1)), accessibility, drinking water facility, distance for the nearest water body and surrounding beauty and diversity is better, compare to the other sites.

But fire safety distance of nearest community area was poor than in other sites.

4.2.1.2 Sites suitable for Hiking / Trekking

Site(1) -Konahela-06^0 40' 050",81^0 11' 100"
Site(2) -Arackgoda-06^0 41' 100",81^0 10' 900"
Site(3)- Mattahela-06^0 40' 700",81^0 10' 050"
Site(4)- Blocks mountain-06^0 40' 345",81^0 10' 441"
Site(5)-Thunkemahela-06^0 43' 200",81^0 10' 600"
Site(6) -Wadinahela-06^0 41' 550",81^0 08' 500"

The suitability for Hiking /trekking identification was based of the field observation and comparing to other suitable places. This site categorizing is from most suitable place to less suitable place using following criteria.

Height

Above 1500ft	3
Above 1000ft	2
Above 900ft	1
Below 900ft	0

Forest cover

100% cover mature forest:	3
Over (1/2)50% cover mature forest:	2
Over (1/4)25% cover mature forest:	1
Lesser 25% or not mature forest:	0

View of the peak

Full view of the surrounding area	1
Semi-covered view of surrounding area	0

Safety

Records of elephants	0
No records of elephants	1

Archeological sites

Recorded archeological sites	1
No archeological sites records	0

Table 4.2: Suitable site for Hiking/ Trekking

Criteria	Site(1)	Site(2)	Site(3)	Site(4)	Site(5)	Site(6)
Height	1	2	1	1	1	3
Forest cover	2	3	0	2	2	3
View of the peak	1	1	0	0	1	1
Safety	1	1	1	1	0	1
Archeological sites	1	0	0	0	1	1
Total	**6**	**7**	**2**	**4**	**5**	**9**

According to above results the best place for hiking Trekking is site (6).This mountain setting actually of the boundary of the block 3 that is North West boundary of the Pelwatte sugar plantation area. The second scored suitable place is site (2).This site consists high biodiversity. There was only one large scale mature forest patch in this project area. But there were no Archeological sites on that area. The 3rd place is scored by site(1).In comparison to site(2) archeological sites were presented here, but diversity was low than site(6).In the site(5) on archeological features were high. But forest cover in this area have a low density covered to site(6) and site(2).This site is not safe for hiking., because wild elephants were recorded in high frequencies on this site. In the site (4), there were no archeological sites and also have not a full view of surrounding area, as it covered by other mountains. The lowest score recorded by site (3) there were no forest cover to be seen and it was fully covered with grasses and some places covered with rocks. There were no archeological sites and also no suitable view on surrounded area as it was covered by other mountains. The site (1),(2)and(3) are situated along the range of mountains. The site (4) was an isolated mountain but nearest to site (2).The site (6) was the highest mountain and it was spredded on a large area.

Considering site (5), this actually was contained 3 hills and very high amount of archeological sites of an Ancient civilization was situated there. This three mountain hills are called as "Ralahamihela", "Medahela" and "Thunkemahela".

4.2.1.3:-Kayaking/Canoeing

Several locations have been identified for this purpose. Paddle on calm and beautiful tanks, encircled by picturesque surroundings and sightings of wild animals is and good tourist attraction. This location was identified base on the field observation compared to whole water body in this project area.

Site(1) -Management complex large Tank-06^0 42' 360",81^0 12' 161"

Site(2)- Survey colony Tank- 06^0 40' 455",81^0 13' 369"

Site(3)- Diyakiritha wewa-06^0 36' 959",81^0 14' 846"

Site(4)- Thalakola wewa -06^0 39' 554",81^0 11' 191"

Site(5)- Para wewa-06^0 35' 932",81^0 11' 765"

The selection of most suitable water body was done using following criteria.

Size of the water body

Covered surface lesser than the 20 acres (<20)	0
Covered surface lesser than 30 acres (20-30)	1
Covered surface lesser than the 40 acres (30-40)	2
Covered surface lesser than the 50 acres (40-50)	3
Covered surface more than 50 acres (>50)	4

Quality of water

Full 100% covered aquatic weed	0
Over 50% covered aquatic weed	1
Over 25% covered aquatic weed	2
Below 25% covered or not aquatic weed	3

Surrounding beauty and diversity

One type of habitat	0
Two types of habitats	1
Three types of habitats	2
Four types of habitats	3
More then four type of habitat	4

Safety

Presence of Crocodile and mud	0
Presence of Crocodile not mud	1
No Crocodiles mud present	2
No Crocodile or mud	3

Change of water amount

Dry season no water or 75% reduction	0
Dry season reduction 50%	1
Dry season reduction 25%	2
All year generally not changed	3

Table 4.3: Suitable sites for Kayaking/ Canoeing

Criteria	**Site(1)**	**Site(2)**	**Site(3)**	**Site(4)**	**Site(5)**
Size of the water body	2	3	1	1	4
Quality of water	3	2	0	2	3
Surrounding beauty and diversity	1	2	3	4	4
Safety	3	1	2	0	1
Change of water amount	2	2	1	1	3
Total	**11**	**10**	**7**	**8**	**15**

According to the above scores the most suitable place for the kayaking/Canoeing is site (5).This is a large water body compared to all other water bodies and diversity is very high; especially bird diversity. The main weakness here is crocodiles. All other criteria's have a high scores. The second suitable site is site(1) this is the nearest to the sugar factory but surrounding beauty has a low score compared to others, the change of water level actually depend on the depth of the tank. Water quality determined by comparing to the presence or absence of aquatic weeds, this weed purification was a very bad smell. Surrounding diversity is mainly dependent on the number of various habitat types.

Thirdly highest score recorded by site(2).This is a larger one compared to site(1),but there water quality is lower than the site(1)or(5).

The site(4) has high diversity of surrounding area but size and depth of the water body is lower than site(1),(2)and (5).This is not a safe place because of mud and crocodiles.

The lowest score recorded by site (3).This has comparatively high diversity and but the water is highly polluted .therefore there was a very bad smell; also this water body depth has a lower compared to others.

4.2.1.4 Other water related activity

During the rainy seasons water level increases so it's a good time to take a ride on a tube down the river. Tropical birds and gallery forest plant life can be seen while a person enjoys a ride. This activity can be done only on two suitable rivers, Manik ganga and Kuda oya; but most suitable one is Manik ganga .Because diversity and habitat types are higher than kuda oya.

The other water related popular activity is river bath. The most suitable places for this activity is Demodara; because this place is like a swimming pool.

For swimming competition or to practice swimming, the most suitable place is site (1). (Management complex large Tank).This is considering owing to quality and safety compared to other water bodies.

For the primary practices there are two swimming pools (management club and nearest to play ground) these are man made, and they have high quality maintenance.

4.2.1.5 Rock climbing

This activity can be promoted only in one suitable place of this whole area. That is in Location-Block Mountain-06^0 40' 345",81^0 10' 441"
In visitor can enjoy the sheer thrill of overcoming obstacles by climbing mountain heights by taking up the challenge armed with a rope and necessary equipment.

4.2.1.6 Ballooning

Visitors can explore the nature beauty land use pattern agriculture activity of this project area on a hot air balloon. It is possible to watch the environment in there natural habitat without disturbing them by flying over the placid lakes or taking a bird eye view. One can cover the full area without disturbing the landscapes and with least impact on the environment in a very short time period

4.2.1.7. Elephant related activities

A person can observe human elephant conflict, elephant drives, traditional method of controlling human elephant conflict, wild elephants feeding on sugar cane .PSI wild elephant control method, and several behavior patterns of wild Elephant.
Suitable places to build the watching huts and tree huts, elephant drives are,

- Demodara-06^0 35' 469",81^0 14' 835"
- Section 3-06^0 36' 320",81^0 14' 479"

Suitable places to study about the wild Elephant behavior and there nature habitat

- Handapanagala Tank (Block 3 boundary)-06^0 35' 469",81^0 69' 196"
- Porumedilla forest patch-covered surrounded GPS location,
  06^0 39' 043",81^0 14' 139"
  06^0 38' 541",81^0 14' 105"
  06^0 39' 667",81^0 13' 760"
  06^0 39' 863",81^0 13' 237"
- Thalakolawewa-06^0 39' 691",81^0 11' 402"

The other possible elephant related activity is the wild elephant watching night safari. This can be facilitated by using PSI fire control unit, heavy vehicles and the expert knowledge people. This unit can be used as an indirect way to cover the cost of the

unit. On the other hand people interested this activity automatically adds a value to wild elephants. Therefore of the attitude of the people on this area will change ethically to conservative wild elephants, because of their indirect economic benefits.

Proposed sites for night safari trail,

- Porumedilla
- Thalakolawewa
- Demodara
- Ayakapolla
- Arakgoda mountain
- Teak plantation between block 3 and 4-2

The other wild elephant related activity is high attractive "jungle or domestic tracks on the elephants back". Trouble causing and adapted elephants in this plantation can be domesticated and can be used for this, or domestic elephants of the Katharagama can be used.

Most suitable places this activity promoting are the,

- Porumedilla forest patch and
- Teak plantation area between block 3and 4-2

This activity is a high attractive event in the tourism industry. There are direct and indirect benefits, directly earning money and indirectly conserving wild Elephants in this area.

4.2.1.8 Botany Tour/Plant life

Intermediate zone vegetation types are found this area and several plant species were identified. (See appendix VI)The mature forest, gallery forest, grassland, scrubland, marshland, aquatic plant and cultivated species are some of those this tour mainly including given areas,

- Arackgoda mountain(mature forest, grass, medicinal species such as bimkohomba)
- Porumedilla forest patch
- Riverinring (Manik ganga and Kuda oya)
- Diyakiritha Tank
- Teak plantation area between block 4-2 and 3
- Kuda oya grassland

4.2.1.9 Butterfly watching

This plantation area is a butterfly trail and a crossing. The problem is this trail is only seasonally several butterfly species can be identify in this area. (See appendix II)
This trail include particularly,

- Arackgoda mountain
- Porumedilla
- Demodara area
- Teak plantation area
- Block 12 grassland area(see appendix-habitat map)
- Kudaoya grassland

4.2.1.10 Bird Watching Tours

The abundance of bird in this area high because of several habitat types change rapidly. In the study period generally 127 species were recorded. (See appendix III) There is high opportunity of promoting this event. The amount of bird species actually should be higher than this, .because not a complete transect coverage was not done. There was only general identification on field visit; not full survey of identification of bird species.

Suitable places for bird watching

(1) Paraluwewa(06^0 35' 066",81^0 11' 385")
(2) Porumedilla
(3) Katupothawewa(06^0 43' 264",81^0 11' 142")
(4) Diyakiritha wewa(06^0 36' 959",81^0 14' 846")
(5) Arackgoda
(6) Kukurampola padyfield(forest patch)(06^0 42' 121",81^0 11' 718")
(7) Rivering forest Manik and Kuda oya particularly Demodara

When designing a bird watching trail necessary include above location. The special nesting sites were identified for,

Bayaweaver (Nest approximately over 25)-06^0 41' 889",81^0 10' 978"
Spot hilled pelican nesting site-06^0 38' 099",81^0 11' 765"
Eagle nesting site-06^0 38' 099",81^0 10' 853"

Large flock of Bayaweaver-06^0 39' 424",81^0 11' 118"
Streaked weaver and Bayaweaver same location nesting sites-06^0 39' 424",81^0 11' 118"
Malabar pied hornbill nesting site-06^0 39' 575",81^0 10' 850"
Red face Malkoha-in rivering forest (Manik gaga) Demodara
The other bird species are generally distributed in whole study area, when designing a bird watching trail above special locations should be fully covered.
The suitable places for the designing of bird watching huts,.

(1) Walbokkuwa Tank-06^0 41' 708",81^0 14' 428"
(2) Paraluwewa-06^0 35' 066",81^0 11' 385"
(3) Diyakiritha Tank island-06 36^0' 959",81^0 14' 846"

4.2.1.11 Cycle Tours/Mountain Biking

There is a high potential to promoting this actives several trails can be design in this area; because of good road networking system, and relatively good road condition. When using road network system in Settler state area, rapid habitat change can be seen. The main problem in promoting this activity is dusty environment. Air pollution is caused by dust particles created by heavy vehicles activities of this plantation. Other problem is there are no shady places mostly along the road. Suitable places to cover in designing the trail,

Demodara
Kudaoya
Manikganga
Porumedilla
Teak Plantation
Arackgoda, Konhela, Wadinahela, Thunkewa helaand Wadinakele area
Thalakolawewa Tank, paralu wewa, diyahiritha tank, survey colony tank, block 10and south boundary.

4.2.1.12 The Tour of Cattle Carts (Thirikkale)

To cross cut the area using cattle carts (Thirikkale) will be a new experience and also they can have a chance to drive the cart as it is a new experience too. Also Visitor can see surrounding habitat such as bird spp, animal spp, plant spp, land use pattern

agricultural activity and community life style and their activities. To design a trail for this activity following areas should be used.

(1) Demodara
(2) Porumedilla
(3) Block 10 village
(4) Block 6 village
(5) Kukurampola village
(6) Teak plantation
(7) Arackgoda
(8) Southern boundary

4.2.1.13 Golf Course

Golf Ground	N 06^0 42 772
	E 81^0 12 895

It is possible to promote excellent golf using this gold ground. But this needs to be developed. This activity will support to increase the market of Eco-tourism.

4.2.1.14 Jungle Gym

This gym is specially designed for children but it is highly enjoyable for adults as well. The individual timings will be recorded and the challenge is to record the lowest time. Can be done individually or group wise to promote this activity only one place was identified

Arakgoda kanda basing	N 06^0 40' 959"
	E 81^0 10' 750"

Other suitable events under this activity could be identified such as crossing the river using a rope.

Suitable location:-Demodara

4.2.1.15 Eco-Agro-tourism travel

Several events and suitable places for them are identified

(1)Traditional "chena" cultivation system

Location: Poramedilla

South boundary (vandama)

The most suitable place to this activity was the South boundary of the plantation (vandama), Chena cultivation can be seen in high frequency in this area. Visiting of Chana hut on this area will be a new experience.

(2) Paddy cultivation system

Location: Diyakiriththa

: Servey colony

: Thalakolawewa

(3) On Lush green carpet like sugar plantation, visitor can have an experiences on,

- Harvesting method
- Land Preparation system
- Land use pattern
- Sugar manufacturing process, by your self
- Location- nucleus state

(4) There are Unbelievable varieties of tropical fruits on the village gardens allowing visitor taste

Location: Diyakiriththa

: Walngolla

: Survey colony village

: Block 10 village

: Block 6 village

: Kukurampola village

(5)Those who are interested can see organic and pesticide free cultivation method, home and gardens in places like;

kukurampola

River head of the manik ganga and kudaoya

4.2.1.16 Geotourism Travel

There is a high opportunity to develop this event in this project area. Several features and its location that can be used were identified.

(1) Gully erosion –wadinahela mountain
(2) Rock escarpment(small)-above vadinahela
(3) Isolated hill- ulkanda,bahawagala
(4) Stream pattern-nucleus state
(5) Gap-aya kapolla-(between the ulgala and bandarakota hela)
(6) Mountain ranges-arackgoda,mattehela,konahela
(7) Cascadium system-ihala manikwewa,pahala manikwewa,borawewa(idiyapalassawewa)

High amount of micro scale geological features were presented in this area.

4.2.1.17 Cultural Travel

In this study area there were several important sites to travel and to learn about the ancient civilization.

Historically important site,

(1) Bolwelagala-06^0 38' 950",81^0 11' 850"
(2) Wadinahela-06^0 41' 550",81^0 08' 500"
(3) Konahela-06^0 40' 050",81^0 11' 100"
(4) Thankemahela-06^0 43' 200",81^0 10' 600"
(5) Porumedilla-
(6) Kumarika hela-06^0 40' 750",81^0 11' 700"
(7) Nagaharagala-06^0 43' 790",81^0 11' 480"
(8) Yatialthota temple-06^0 42' 992",81^0 14' 081"

Religiously important trees (130) (worshipping trees)
The locations of the trees are given below:
(1)06^0 41' 313",81^0 14' 678"

(2)06^0 42' 269",81^0 15' 569"
(3)06 39' 953",81 11' 638"
(4)06 39' 584",81 10' 790"
(5)06 38' 511",81 12' 040"

Traditional dancing

If a person visit kukurampola temple at kukurampola, can enjoy traditional dances and even there is a chance to practice those dances.
Traditional soil preperationpractices using cattle:-block 4-2 are observed in folk tales village

Traditional Music (Pelkavi and Falk talks)

Resource persons who can contribute to these were identified.

Driver mama	kukurampola
Arachchi mama	kukurampola
Kirihande aiya	kukurampola

Manik wadiya mutta-block 06
Survey colony head priest of the temple-

Traditional life style

Most suitable place to study the traditional life style is-kukurampola village

4.2.2 Ecotourism packages

Several different ecotourism packages were designed combining the described activities. These are given below;

4.2.2.1Relaxing

Included activity-

I. Bird watching
II. Butter fling watching
III. Swimming in the lake
IV. Elephant back travel
V. Golf practices

IV. Elephant back travel
V. Golf practices
VI. Ballooning
VII. Eco-agro travel
VIII. Tirikkal tour
IX. Camping
X. Cultural travel
XI. Geotourism travel

Nowadays there is a increasing trend on relaxing packages in ecotourism. In this package there are several activities that can be choosing as your preference.

4.2.2.2 Adventure

Adventure activities are more challenging and mean hard walking than relaxing.

Included activity-

(1) camping
(2) kayaking/canoeing
(3) rock climbing
(4) cycle/mountain bike
(5) Jungle Gym
(6) Bird watching
(7) Elephant related activities
    -An elephant back travel
    -Watching night safari
    -Behavior studies
(8) Eco-agro tourism travel
(9) Tirikkal tour
10) hiking/Trekking
11) Ballooning
12) Swimming in natural water body
13) Botany tour
14) Butterfly watching

There is a high opportunity to develop these packages in this area because in identified locations there were resources and better features that can be used to develop this package.

4.2.2.3 Education Tourism Packages

Visitors are allowed to learn more about the environment.

Including activity-

(1) Cultural travel
(2) Geotourism travel
(3) Eco-agro tourism travel
(4) Butterfly watching
(5) Bird watching
(6) Botany tour
(7) Elephant related activity
(8) Swimming
(9) camping

Introducing these packages in this Ecotourism program targets customer of higher education level and the cost will be higher since assistance will be provided.

4.2.2.4 Nature activities

Included packages;

(1) Cultural travel
(2) kayaking/canoeing
(3) Ballooning
(4) hiking/Trekking
(5) Elephant related activity
(6) Botany tour
(7) Bird watching
(8) Butterfly watching
(9) Cycle/mountain bike
(10) Tirikkal tour
(11) Eco-agro tourism travel
(12) Other Water related activity
(13) Camping

This package represents overall activities this Ecotourism program

All potential packages were designed only theoretically and by referring to the other ecotourism packages in Sri Lanka. Some times these packages may need to be developed further for suitability of market. These packages need to time defining.

4.3 Evaluation of Study Area

In this study PSI plantation area was basically divided into 14 Blocks, 3 section and Teak plantation area, according to PSI plantation map. These blocks and sections are used by the people in the some identification. In this step the whole area was ranked from high potentials to low potential for Eco-tourism development. This is by identifying the most suitable places for several Eco-tourism activities.

A place identified for each in above Eco-tourism related activity in each area is denoted by "/ "mark. More than one mark denoted that several location available in the site. I.e. Thala-Kolawewa is under block 9; Kukurampola and Katupotha village area (private land) are under block 6. Bolwelagala and grazing area near to kudaoya is considered under block 10. This is not considered in the event that uses Kudaoya and Manik gaga totally.

Teak plantation area and Thunkemahela mountain area that surrounds block 4-2, 4-1 and block 3 by Teak plantation.

Table 4.4: Selection of best site

B-Block S-Section T-Teak Plantation

Ecotourism activities	T	S.1	S.2	S.3	B.3	B.4.1	B.4.2	B.5	B.6	B.7	B.8	B.9	B.10	B.11	B.12	B.14	B.15	B.16
Camping			/	///						/			//					
Kayaking/Canoeing	/				/			/		///								
Hiking/Trekking		/	/	/								/			/			
Swimming/Tubing/River bath		/		/														
Rock climbing								/										
Elephant related activity	//			//////	/					/		//						
Botany Tour	/			//						/			/					
Butterfly watching	/			//						/			/		/			
Bird watching		/		///	/	/			/	/		/		//	////			
Cycle/mountain biking	//		/	///						/		/	/		//			/
Tirikkale tour	/			//					//	/			/		/			/
Golf course		/																
Gungle Gym										/								
Eco-Agro tourism travel		/	/	////					////			/	/		/			/
Geotourism travel					/					///						/		
Cultural travel	/		/	/	/	/	/		///////	//	/	/	//					
Total	**9**	**5**	**5**	**28**	**5**	**2**	**1**	**2**	**14**	**16**	**1**	**7**	**9**	**2**	**10**	**1**	**0**	**3**

According to the above scores section 3 can be determined as the most suitable location for eco-tourism program development.

The second suitable place for this program development is Block 7. By this evaluation system, places were categorized from higher suitable place to lower suitable place of the Eco-tourism program development,

1. Section 3
2. Block 7
3. Block 6
4. Block 12
5. Block 10 and Teak plantation
6. Block 09
7. Section 1, Section 2, Block 3
8. Block 16
9. Block 11/Block 4-1/Block 5
10. Block 8/Block 14/Block 4-2
11. Block 15

Considering section 3, high suitability is there to develop following:

1) Elephant related activity
2) Bird watching
3) Eco-tourism travel

Actually this is the most suitable for elephant related activity development, will high opportunities for elephant back travel, elephant drives, elephant watching and night safari. Considering section 3, the best places for Eco-tourism development are, Demodara, Poramedilla and Diyakiritha.

The second highest scores are recorded by Block 7 in the eco-tourism program development. The high quality campsite ground, Mountain Hiking and several other nature related tourist activity can be developed this area. In this area the major weakness is the lack of a suitable large water body. Although block 5 Tank is near to this area,. Here the Water level changes very rapidly. The other weakness is the absence of a mountain suitable for rock climbing. Only one suitable mountain promoting this event was near to block 7. Other hand this area is the only place with a developed Jungle gym. Considering whole study area, this area has the only large

scale mature forest patch. This site score lower than section 3 score because section 3 considering this evaluation undergo 3 subdivision such as 4-34 Demodara, Poramedilla and Diyakiriththa. One of this, there is a similar opportunity to develop eco-tourism program this both locations. The section 3 include nucleus state of the Pelwatta Sugar Industry and block 7 is located near settlers estate of the PSI.

Comparing Block 7 and section 3 this is no suitable mountain in the section 3 to introduce Hiking/Trekking event. But Block 7 has a high opportunity to develop this event because it has a large scale mountain range such as Arakgoda, Mattahale and Konahela. Other hand section 3 has a high potential on introducing eco-agrotourism event but Block 7 has no opportunity to develop this event.

The 3rd place is scored by Block 6. Cultural travel mainly contributed and to the increase of the score of Block 6. Kukurampola village is in the Block 6. This village is the oldest village in this region. Therefore there is a high opportunity to develop cultural travel in this area. On the other hand, in this area. Traditional agricultural methods and organic products are found. Therefore; there is an opportunity to develop eco-agro tourism event in this area. The main weakness in this area is poor facilities development for adventure related activities.

The 4th best place of Eco-tourism Program is Block 12 by the boundary of the south West of PSI. Located there the largest tank called Paralu wewa. This area has a particularly potential to develop Bird watching programs because, the diversity and the abundant of the birds in this area is high, compared to the whole study area. Water birds mainly contribute to this diversity and abundance.

4.4 contingent valuation methods (CVM) of the Ecotourism programs in Pelwatte

Contingent valuation (CV) studies work by construction "hypothetical markets" for non market product. This is achieved using a survey of a sample of individuals. (Often users of the resource) that survey respondent are normally asked to state the maximum willingness to pay (WTP) either to avoid the cost or receive a benefit associated with the proposed contingency. Careful sampling enables responses to to be subdivided in to values relating to use and non use which when appropriately

aggregated can generate monetary values relating to the overall benefits or costs involved in a chosen project or policy decision.

This study used the method is "iterative bidding approach". This starts by querying individuals at some initial rupees value and keeps raising (or lowering) the value until the respondent decline accepts to pay. This final rupees amount is interpreted as the respondent's WTP. This study method was used over the telephone survey randomly selected sample from the only Colombo district. (Questionnaires and data are denoted in the APPENDIX I). In early application of the CUM respondents were often asked open ended question, that might be worded as follows.

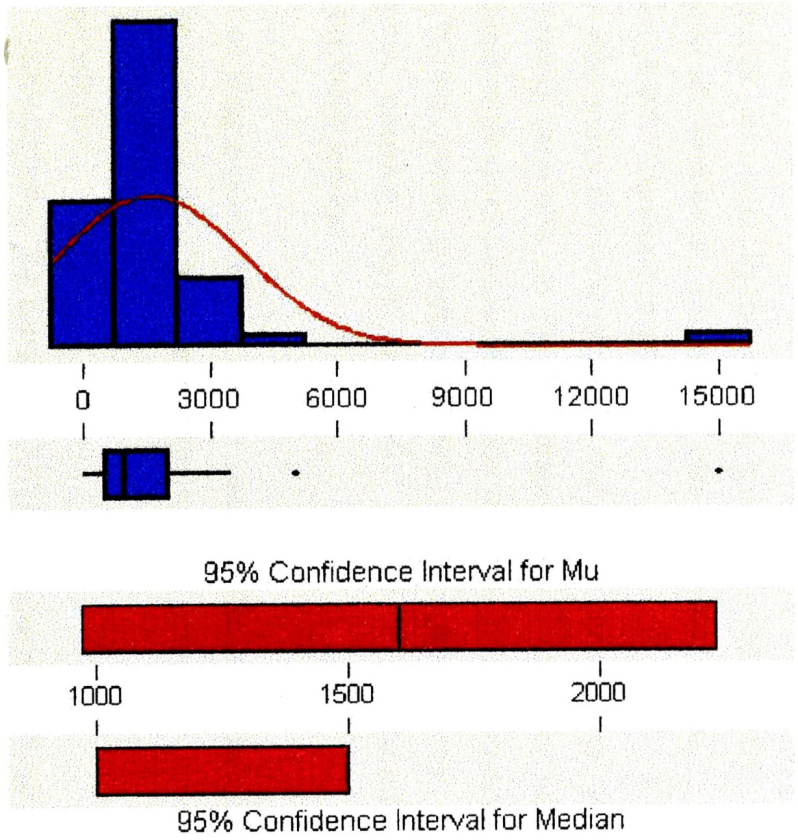
"What's the value you would be willing to pay for entry free of Pellwatte sugar industry?"

Ecotourism site and is intention to elicit a point estimate of the respondents WTP

Table 4.5: summarizing data of the WTP

WTP amount	Frequency	Percentage
0	8	16%
250	1	2%
500	4	8%
750	2	4%
1000	12	24%
1500	9	18%
1750	1	2%
2000	5	10%
2500	1	2%
3000	2	4%
3500	3	6%
5000	1	2%
15000	1	2%
Total	50	100

Descriptive Statistics



Variable: WTP

Anderson-Darling Normality Test

A-Squared:	5.481
P-Value:	0.000

Mean	1600.00
StDev	2215.44
Variance	4908163
Skewness	4.74710
Kurtosis	27.9157
N	50

Minimum	0.0
1st Quartile	500.0
Median	1000.0
3rd Quartile	2000.0
Maximum	15000.0

95% Confidence Interval for Mu

970.4	2229.6

95% Confidence Interval for Sigma

1850.6	2760.7

95% Confidence Interval for Median

1000.0	1500.0

Figure 4.4: Descriptive Statistic Values for Willingness to Pay Amount (WTP)

The purpose of the payment questions to obtain information about the respondent's WTP amount .WTP responses must be statistically analyzed to obtain an estimate of mean WTP of the entering Pelwatte sugar plantation ecotourism site.
In the payment question is open ended, the WTP figures reported by the respondents can simply be averaged to produce an estimate of mean WTP.

MWTP=1/n

Where n is the sample size and each y is at reported WTP amount. According to this equation estimated "willingness to pay amount" for Pelwatte sugar industry ecotourism site is Rs 1600/=. This value depends on mainly the sample condition. This study population is considered only within Colombo district for will people land phones. The maximum willingness to pay amount is 15000/=.This represents 2% of the sample. 16% of the population is not willing to use site. The minimum entry fee of this site is 250/= this represent 2% of the sample. The higher percentage represents a WTP amount of Rs.1000.This is 24% of this population for 18% of the sample, WTP amount is equal to1500/= for total population 16% is not willing to use recreational site and 84% is willing to use recreational site.
The average WTP amount is 1600/=
The main weakness of this analysis is the small sample size. Mean willingness to pay amount mainly depends on the population size and other hand this approach has been virtually abundant because it tends to result in starting point bias, an effect such that the biding game is systematically related questioning may among or tired respondents, causing the to say "yes" or "no" to a stated amount in hopes of terminating the interview.

The use of Regression analysis can use to determine relationship between WTP amount versus age, education level, income and gender.
The regression equation:-
(See Appendix I)
WTP= -1505+83(sex)-34.6xage+527(education) +0.14(income)*
This equation uses condition R^2 =43.9%
This R^2 denoted by Co-efficient of determination (WTP amount, How much preferable) generally this R^2 amount is higher than 75%, that means, this test is in very good condition. But in this study, using very small sample size (50) and unusual data such as WTP 5000 and 15000 reasons for lower R^2 parameter compared to general R^2 use values. These results are based on following hypothesis.

H_0 : No relationship between sex and willing to pay.

H_1 .: There is a relationship between WTP amount and Sex.

P values:-0.877

Condition: - P values <0.05 reject the H_P hypothesis and accepted the H_1 hypothesis.

At 95% confidence level

This P value =0.877

P=0.877>0.05

Therefore rejected to H_1 hypothesis can accept H_0 hypothesis. This means there is relationship between willingness to pay amount (WTP) and sex at 95% confidence level.

The relationship between age and willingness to pay amount (WTP) Hypothesis:

H_0: There is no relationship between WTP and age.

H_1: There is a relationship WTP and age.

This P values=0.201

P=0.201>0.05 Therefore reject to the H_1 hypothesis and accept H_0 hypothesis at 95 % confidence level.

This means there is no relationship between WTP amount and age.

The relationship between WTP and education level can be determined by creating following hypothesis.

H_0: No relationship between education level and WTP amount.

H_1: There is a relationship between education level and WTP amount.

P values=0.037

P=0.037<0.05 Therefore rejected the H_0 hypothesis and accepted to H_1 hypothesis at 95% confidence level. That means there is relationship between education level and WTP amount-. (Relationship between Education level and WTP is showed in APPENDIX I)

The relationship between WTP and income level can be determined by,.

H_0: There are no relationships between income and WTP amount.

H_1: There is a relationship between income and WTP amount.

P values=0.000

P=0.000<0.05, Therefore rejected to H_0 hypothesis can acceptable H_1 hypothesis.

This means there is a definite relationship between income level and WTP amount.

This overall regression analysis result is close to the real world result. But it is not very successful. Because this sample size is very small only people possessing telephone in one district were selected.

4:5 SWOT Analyses

The management of PSI has the most understanding about the PSI site. Therefore it was decided to carryout a SWOT analysis. Apart from the main objective the SWOT analysis targeted to review the perceptions of the management at the same time to evaluate then positive and negative attitudes towards an ecotourism plan.

Participation:-

(1) Mr.V.S.Halpe	Deputy General Manager plantations
(2) Dr. Sisira	Head of agronomy Department
(3) Mr.. Vidurasinghe:	Harvesting Manager
(4) Mr.Ananda:	Nucleus Manager
(5) Mr.Hewawasam:	Out grower Manager
(6) Mr. Wimalarathne	
(7) Mr.Sarath	

4.5.1 Strengths:-

Environment

(1) Geographic setting for active holidays
(2) Flora and Fauna diversity
(3) Endemic flora and fauna species
(4) Eco system types (plantation ,forest, aquatic grass ,scrub)
(5) Climatic variation
(6) Rivers and Tanks
(7) Unique and exiting heritage sites
(8) Natural beauty
(9) Proximity to other important tourism destination
(10) Close to the National parks (Udawalawa, Yala)
(11) Waterfalls (Parawiyan Ella, Diyaluma)

(12)Ecological Education Component
(13)Human Elephant Conflict
(14) Green Plantation
(15) Relatively clean Air and Water
(16)Space
(17)Recreational features
(18)Beautiful surrounding

Socio-cultural

(1) Friendly People
(2) Historical and cultural places
(3) Life style of People
(4) Religious values
(5) Prehistoric values
(6) Remoteness
(7) Rural community
(8) Traditional knowledge

Economic

(1) airport(proposed-Wellawaya)
(2) Harbor (proposed-Hambantota)
(3) Kataragama and Bandarawela seasons
(4) Absent of successful Ecotourism program this regions
(5) Supportive surrounding
(6) Different type of agricultural patterns:
    -Shifting cultivation
    -major, miner and micro irrigation systems
    -Developed Sugarcane plantation sector

Others

(1) Networking Road system
(2) Golf course
(3) Two swimming pool
(4) Play ground

(5) Gem mining system and activity
(6) Hand made products and organic products
(7) Quiet and relaxing
(8) Great history
(9) Choice of many traditional medicine practices

4.5.2 Weakness

Environment

(1) Land degradation
(2) degraded and fragmented forest
(3) monoculture plantation/not natural vegetation
(4) Cane Fire
(5) Uncertain logging practices
(6) Low amount of natural forest patch
(7) Dusty environment(Relatively polluted air)
(8) Unreliable weather change
(9) Inadequate waste management practices
(10) Noise pollution/Air pollution, odors
(11) No opportunities for extra activities (e.g.:-sea bath)
(12) Poor land use management practices
(13) Drinking water with high amount of mineral (e.g.:- calcium)
(14) Species found in this area also common in other part of the country
(15) Using high amount of fertilizer and pesticide therefore polluted food and water.
(16) Possible elephant attacks

Socio-Cultural

(1) Low education level people and this system does not promote tourism
(2) Negative thinking on tourism
(3) Undeveloped human resources
(4) Lack of trust and confidence between tourists and the community
(5) No tourist association
(6) Poor public utilities
(7) Limited at traditional knowledge and present generation not there considered

Economical

(1) need more activities and capital in the area to attract tourists
(2) Seasonality (Short)
(3) Lack of government support
(4) Poor infrastructure facilities
(5) Poor incentives provide to the private sector
(6) Lack of quality accommodation and food facilities
(7) Lack of money for research and development
(8) Lack of knowledge and coordination in government and the private section
(9)Funds

Other

1) -Public roads in poor condition
2) -This region does not have mission and objectives on tourism
3) -Inadequate tourism policy
4) -Lack of strategic plan for tourism
5) -Non availability of tourism information
6) -Lack of international perception

4.5.3 Opportunities

Environmental

(1) Reemergence of cultural values and traditions
(2) Self efficiency through agriculture
(3) Present better tourist sites around the this site
(4) Unparalleled natural beauty
(5) Wild life observation
(6) Internet information
(7) Country-style entertainment tourism for younger people
(8) Elephant drives and compensation
(9) Human elephant conflict management techniques(traditional)
(10) Ecotourism and adventure tourism program development
(11)Partial protection of resources
(12)Program to develop birding on an international level
(13)Of good eco sites in peripheral area

Socio-cultural

(1) Fascinating special interest attraction
(2) Availability of human resources for the program
(3) Kataragama festivals
(4) Education agriculture component
(5) Could expand into business of community product
(6) More opportunities for communities in special events and conferences
(7) Promote year –round activities

Economic

(1) organic agriculture product
(2) Capital asserts
(3) Employment and income generation potential
(4) Can offer any tourist package
(5) Possibility of promoting market
(6) Scenic tours by car or mini bus
(7) Improve overall economic conditions (interest rate ,resource protection)
(8) Exchange root
(9) Better support from provincial council and local governments
(10) People are willing to pay good money for top quality accommodation to closer
(11) Capitalize on exchange rate
(12) Provide funding for marketing ecotourism

Other

(1) linkage to other tourist bodies
(2) Ecotourism in the South-East of the province which has a lowest human population density
(3) Ecotourism in the mountainous area and surrounding plains
(4) Mix tourism
(5) Golf course

4.5.4 Threats

Environment

(1) Rapid growth of ecotourism and mix tourism in this regions
(2) Weather
(3) Rapid growth of holiday ,vacation trips in this regions
(4) Lake pollution
(5) Tourist pressure may have adverse effect on wildlife in surrounding National park
(6) Tourist waste damages wildlife of surrounding National park
(7) Land and forest degradation in agricultural practices may diminish the attractiveness of the landscape
(8) Removal of elephants from the areas

Socio-Cultural

(1) Cultural influences from the tourist on general society
(2) Limited understanding in business community ecotourism and its potential
(3) Unequal distribution of benefits

Economic

(1) Rapid growth of mass tourism in the region
(2) Poor economic performance
(3) Inconsistency between national and regional
(4) Other regions becoming more aggressive in marketing
(5) Industrial development
(6) New trends on tourism demand exchange rates

Other

(1) Lack of communication

CHAPTER 05

5 CONCLUSIONS AND RECOMMENDATION

5.1 Conclusion

According to the study there is a high potential to develop a successfully, sustainable ecotourism program in the studied area. Considering the results obtain the best potential site to develop an ecotourism is section 3 and Block 7.Considering to section 3 there is a high potential to introduce all nature related activities on the other hand in Block 7 there is high potential to introduce adventures activities. If an ecotourism program is developed in Block 7 all the aims of the community based ecotourism program can be achieved. The highest socio culture potential was identified in Block 6. Eco-agrotourium concept can be introduced to this site. There is a high potential for bird watching in Block 12.

Seventeen ecotourism based activities can be identified in this studied area, and can be designed into four packages.

According to economic evaluation in the studied Mean Willingness to Pay (MWTP) amount as entry fee is One thousand and six hundred rupees.
The value is not depended on gender or age but it is depend on educational level and income level.
The SWOT analysis offers a critical view of an ecotourism project highlighting positive factors and pointing also negative factors that should be mitigated.

5.2 RECOMMENDATION

1 Defining an ecotourism strategy plan
2 Implementing the ecotourism strategy
3 Monitoring results and sustainability

FUTURE STUDIES

- ✓ The economic analysis was based only on direct method. The indirect methods such as Travel Cost method can be applied to the evaluation of market for the Pelwatte Sugar Industry proposed ecotourism site.
- ✓ This study site can be analysis use GIS techniques can created,
    - An ecotourism potential map.
    - Can designed by and developed packages, trails and the time for cover this under this techniques using of a GIS model to this study was attempted, but failed due to inadequacy of facilities and lack of time.
    - Can be calculate different habitat magnitudes using this techniques

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APPENDIX-1

CV (Contingent Valuation Method)
Biding game method

Questionnaires-

(1) Introduction of me and my project (Briefly)

(2) Gender: -

(3) Age: -

(4) Education level: -

(5) Income of month(Cost of month): -

(6) Do you visit recreational sites?

(10) If you are given a chance to use Pelwatte Ecotourism site, how much are you maximum amount of willing to pay as entry fee/development fund?

(11) Why are you willing to come and willing to pay?

Data of CV method Survey

Gender 1-Male
Gender 2-Female
Education Level 1-O/L
Education Level 2-A/L
Education Level 3-Basic Degree
Education Level 4-Msc
Education Level 5-phD

Gender	Age	Education	Income	WTP
2	30	4	20000	3500
2	25	3	15000	3500
1	28	4	15000	1500
1	40	4	25000	1500
1	28	4	15000	1000
1	40	4	20000	0
1	32	4	25000	1500
2	29	4	20000	3500
2	27	4	20000	1000
1	52	3	25000	0
1	49	3	20000	1000
2	54	5	30000	2000
2	30	2	10000	1000
2	26	2	15000	500
2	31	2	10000	1000
2	26	2	11000	1750
2	28	2	15000	500
2	28	2	8000	250
2	29	2	10000	1500
1	25	2	15000	1000
1	28	2	11000	500
1	36	1	15000	1500
1	58	5	50000	15000
2	56	1	15000	0
2	42	2	50000	5000
1	28	2	10000	750
2	35	3	20000	1500
2	30	1	25000	0
1	60	1	15000	0
1	48	3	25000	1500
1	34	2	20000	1000
1	63	3	35000	1000
2	58	1	25000	500

Data of CV method Survey

Gender 1-Male
Gender 2-Female
Education Level 1-O/L
Education Level 2-A/L
Education Level 3-Basic Degree
Education Level 4-Msc
Education Level 5-phD

Gender	Age	Education	Income	WTP
2	46	3	40000	2500
2	19	1	15000	1000
2	27	2	20000	2000
2	32	2	25000	3000
2	28	2	35000	3000
2	27	2	20000	2000
2	29	2	15000	0
1	28	2	25000	2000
1	30	2	15000	1000
1	59	1	20000	0
1	48	1	30000	0
1	33	3	25000	1500
1	28	1	10000	1000
1	49	3	25000	1500
2	29	2	15000	750
2	36	3	30000	1000
1	41	3	25000	2000

Regression Analysis: WTP versus sex, age, education, income

The regression equation is

WTP = - 1505 + 83 sex - 34.6 age + 527 education + 0.140 income

Predictor	**Coef**	**SE Coef**	**T**	**P**
Constant	-1505	1474	-1.02	0.313
Gender	82.6	528.6	0.16	0.877
Age	-34.60	26.65	-1.30	0.201
Education	526.8	245.7	2.14	0.037
Income	0.13973	0.03314	4.22	0.000

S = 1732 **R-Sq = 43.9%** R-Sq(adj) = 38.9%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	105507272	26376818	8.79	0.000
Residual Error	45	134992728	2999838		
Total	49	240500000			

Source	DF	Seq SS
Gender	1	33854
Age	1	5061314
education	1	47091754
income	1	53320350

Unusual Observations

Obs	Gender	WTP	Fit	SE Fit	Residual	St Resid
23	1.00	15000	6191	889	8809	5.93R
25	2.00	5000	5247	969	-247	-0.17 X

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence.

Polynomial Regression Analysis: WTP versus income

The regression equation is

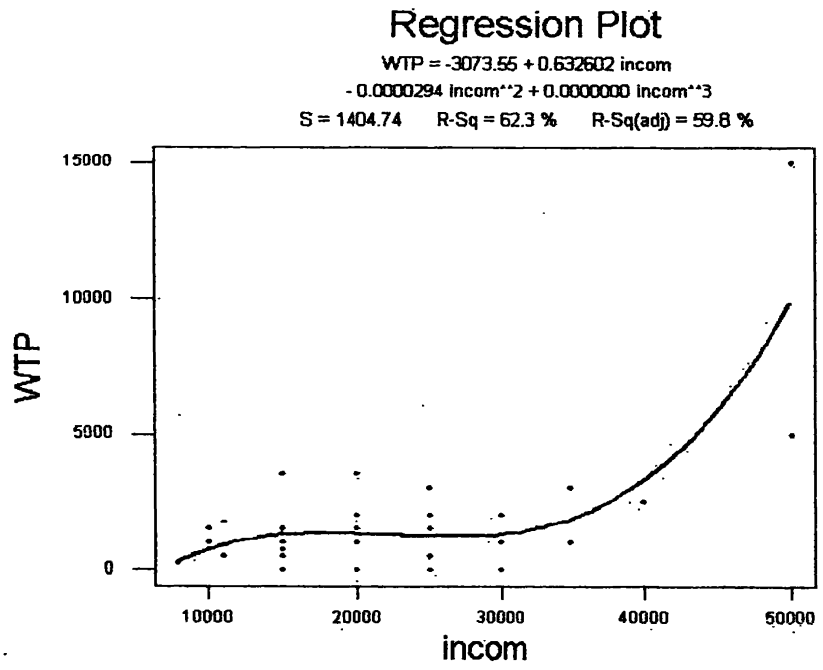
WTP = -3073.55 + 0.632602 income
- 0.0000294 income2 + 0.0000000 income**3**

S = 1404.74 **R-Sq = 62.3 %** R-Sq(adj) = 59.8 %

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	149728013	49909338	25.2923	0.000
Error	46	90771987	1973304		
Total	49	240500000			

Source	DF	Seq SS	F	P
Linear	1	83047840	25.3175	0.000
Quadratic	1	50795381	22.3838	0.000
Cubic	1	15884791	8.0498	0.007



Polynomial Regression Analysis: WTP versus Education

The regression equation is

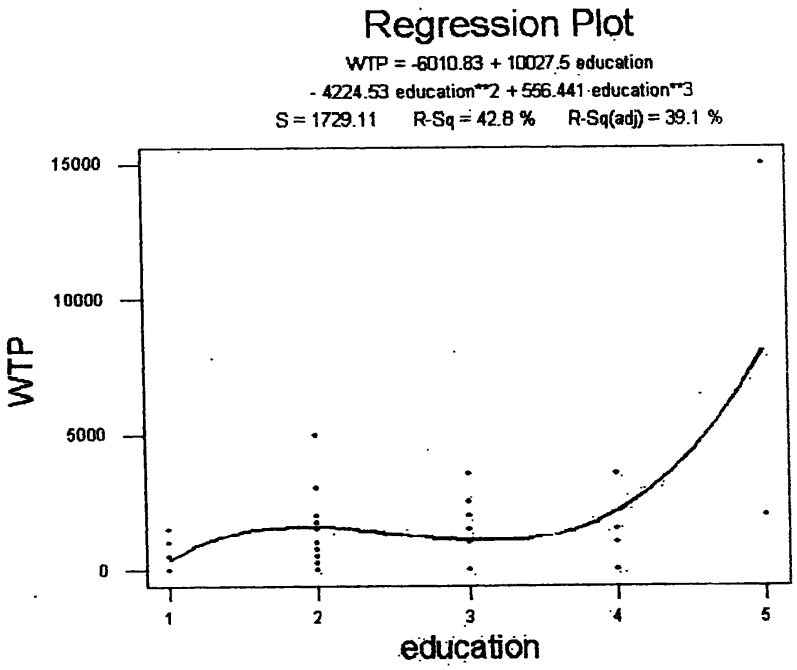
WTP = -6010.83 + 10027.5 education
- 4224.53 education2 + 556.441 education**3**

S = 1729.11 **R-Sq = 42.8 %** R-Sq(adj) = 39.1 %

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	102968032	34322677	11.4798	0.000
Error	46	137531968	2989825		
Total	49	240500000			

Source	DF	Seq SS	F	P
Linear	1	47311218	11.7550	0.001
Quadratic	1	17378922	4.6460	0.036
Cubic	1	38277893	12.8027	0.001



APPENDIX II

List of Butterflies Species

Lesser albatross	*Appias paulina*
Common gull	*Cepora nerissa*
Tamil yeoman	*Cirrochroa thais*
Lime blue	*Chilades layus*
Indian sunbeam	*Curetis thetis*
Jezebel	*Delias euharis*
Plain tiger	*Danans chrysippas*
Common tiger	*Danans genutia*
Common grass yellow	*Eurema hecabe*
Small grass yellow	*Eurema brigitta*
Common crow	*Euploea core*
Blue bottle	*Graphium surpedon*
Tailed jay	*Graphium agamemnon*
Great egg fly	*Hypolimanas bolina*
Danaid egg fly	*Hypolimanas misippus*
Lemon pansy	*Junonia lemonias*
Chocolate soldier	*Junonia iphita*
Gray pansy	*Junonia atlites*
Peacock pansy	*Junonia almana*
Common cerulean	*Jamides celeno*
Yam fly	*Loxura atymnus*
Commander	*Moduza procris*
Common sailor	*Neptis hylas*
Nigger	*Orsotriaena medus*
Crimson rose	*Pachliopta hector*
Common rose	*Pachliopta aristolochiae*
Banded peacock	*Papilio fabricius*
Lime butterfly	*Papilio demoleus*
Common Mormon	*Papilio polytes*
Spot swordtail	*Pathysa nomins*
Glassy tiger	*Parantica aglea*
Leopard	*Phalanta phalanta*
Monkey puzzle	*Rathinda amor*
Zebra blue	*Synarucus plinins*
Blue tiger	*Tirumala limniace*
Common bird wing	*Triodes dursisus*

APPENDIX III

List of Birds Species

Shikra	*Accipiter badius*
Besra	*Accipiter virgatus*
Common Myna	*Acridotheres tristis melanosturnus*
Common Sandpiper	*Actitis hypolecos*
Oriental Dater	*Anhinga melanogaster*
Purple Heron	*Ardea purpureu*
Grey Heron	*Arden cinerea*
Indian pond Heron	*Ardeola grayii*
Asian Openbill	*Anastomus oscitans*
White-Breasted Water hen	*Amaurornis phoenicurus*
Malabar pied Hornbill	*Anthracoceros coronatus*
Blue eared kingfisher	*Alcedo meninting*
Common kingfisher	*Alcedo atthis*
Oriental Skylark	*Alanda gulgula*
Paddy field Pipit	*Anthus rufulus*
Little Swift	*Apus affinis*
Richards Pipit	*Anthus richardi*
Indian Swiflet	*Aerodramus unicolor*
Clamorous Reed Warbler	*Acrocephalus stentoreus meridionalis*
Common Iora	*Aegithina tiphia*
Cattle Egret	*Bubulcus ibis*
Great Egret	*Casmerodius albus*
Woolly-Necked Stork	*Ciconia episcopus*
Whiskered Tern	*Chlidonias hybridus*
Rock Pigeon	*Columba livia*
Greater Coucal	*Centropus sinensis*
Indian Nightjar	*Caprimulgus asiaticu seidos*
House Crow	*Corvus splendens*
Large billed Crow	*Crovus macrorhynchos*
Pied kingfisher	*Ceryle rudis*
Greater Flam back	*Chrysocolaptes lucidus tricklandi*
Indian Roller	*Coracias benghalensis*
Emerald Dove	*Calophaps indica robinsoni*
Asian Palm Swift	*Cypsinrus balasiensis*
Jerdon's Leafbird	*Chloropsis cochinchinensis*
Large Cuckoo shrike	*Coracina macei layardi*
Black hended Cuckoo shrike	*Coracina melanoptera*
Golden-Fronted Leafbird	*Chloropsis aurifrons*
White rumped Shama	*Copsychus malabricus leggei*
Oriented Magpie Robin	*Copsychus saularis*
Zitting Cistiola	*Cisticola juncidis*
Yellow-eyed Babble	*Chrysomma sinense nasale*

Pale-billed Flower Pecker	*Dicaeum erythrorhynchos ceylonense*
White-bellied Drongo	*Dicrurus caerulescens leucopygialis*
Lesser whistling-duck	*Dendrocygna javanica*
Green imperial Pigeon	*Ducula aenea*
Forest Wagtail	*Dendronanthus indicus*
Thick-billed Flower Peckr	*Dicaeum agile zeylonicum*
Little Egret	*Egretta garzetta*
Black-winged Kite	*Elanus caceruleus*
Asian Koel	*Eudynamys scolopuceae*
Sri Lanka Jungle fowl	*Gallus lafayettii*
Common moorhen	*Gallinula chloropus*
Brahminy Kittle	*Haliastur indus*
White Bellied Fish Eagle	*Haliaeetus leucogaster*
Pheasant-Tailed Jacana	*Hydrophasianus chirurgus*
Black-winged still	*Himantopus himantopus*
Stork billed kingfisher	*Halcyon caoensis*
Brown backed needle tail	*Hirundapus giganteus*
White throated kingfisher	*Halcyons smyrnensis*
Grey-rumped Tree swift	*Hemiprocne longipennis*
Bar-winged Flycatcher Shrike	*Hemipus picatus leggei*
Red-rumped Swallow	*Hirundo daurica*
Barn Swallow	*Hirundo concolor*
Grey-headed Fish Eagle	*Ichthyothaga chthyaetus*
Black Bittern	*Ixobrychus flavicollis*
Yellow Bittern	*Ixobrychus sinensis*
Brown Shrike	*Lanius cristus cristus*
White-throated Silver bill	*Lonchura malabarica*
White-rumped Munia	*Lonchura striata*
Scaly-breasted Munia	*Lonchura punchulata*
Black-headed Munia	*Lonchura Malacca*
Coppersmith Barbet	*Meglaima haemacephala*
Crimson fronted Barbet	*Meglaima rubricapilla rubricapilla*
Brown headed Barbet	*Meglaima zeylanica*
Intermediate Egret	*Mesophoyx intermedia*
Painted Stork	*Mycteria leucocephala*
Little Green Bee eater	*Merops orientalis ceylonicus*
Chestnut headed Bee eater	*Merops leschenaulti*
Blue tailed Bee eater	*Merops philippinus*
Purple-rumped Sunbird	*Nectarinia zeylonica zeylonica*
Long-billed Sunbird	*Nectarinia lotenica lotenia*
Purple Sunbird	*Nectarinia asiatica*
Black-crowned night Heron	*Nycticorax nycticorax*
Common Tailorbird	*Orthomus sutorins sutorins*
Pied Cuckoo	*Oxylophus jucobinus*
Black-hooded-Oriole	*Oriolus xanthornus ceylonensis*
Spot billed Pelican	*Pelicans plippensis*
Little Cormorant	*Phalacrocorax niger*
Indian Cormorant	*Phalacrocorax fuscicollies*
Eurasian Spoonbill	*Platalea leucorodia*
Indian peafowl	*Pavo cristatus*
Purple Swamp hen	*Porphyrio porphyrio*
Alexandrine Parakeet	*Psittacula eupatria*
Rose-Ringed Parakeet	*Psittacula krameri*
Red-Faced Malkoha	*Phaenicophaeus pyrrhocephalus*

Flame Minivet	*Pericrocotus flammeus*
Red vented bulbul	*Pycnonotus cafer cafer*
Indian Pitta	*Pitta brachyura*
Plain Prinia	*Prinia subflava insularis*
Ashy Prinia	*Prinia socialis brevicauda*
Jungle Prinia	*Prinia syleatica valida*
Grey-breasted Prinia	*Prinia hodgsonii leggei*
House Sparrow	*Passer domesticus*
Streaked Weaver	*Ploceus manyar*
Baya Weaver	*Ploceus philippinus*
White-browned Fantail	*Rhipidura aureola*
Blue-Faced Malkoha	*Rhopodytes viridirostris*
Crested serpent Eagle	*Spilornis cheela*
Changeable Hawk Eagle	*Spizuetus cirrhatus*
Potted Dove	*Streptopelia chinensis eylonensis*
Black- hacked Robin	*Saxicoloides fulicataleucoplera*
Alpine Swift	*Tachymarptis melba*
Common Wood shrike	*Tephrodornis pondicerianus*
Yellow-billed Babbler	*Turdoides affinis taprobanus*
Asian Paradise-Flycatcher	*Terpsiphone paradisi*
Green Sandpiper	*Tringa ochropus*
March Sandpiper	*Tringa stagnatilis*
Pompadour Green Pigeon	*Treron pomadora pomadora*
Sri Lanka Gray Hornbill	*Tokns gingulensis*
Black Headed Ibis	*Threshiornes melanocephalus*
Little Grebe	*Tachybaptus ruficollis*
Barred Buttonquail	*Tiurnix suscitator leggei*
Eurasian Hoopoe	*Upupa epops*
Yellow-wattled Lapwing	*Vanellus malabaricus*
Red-wattled Lapwing	*Vanellus indicus*

APPENDIX – IV

List of Mammals

Elephant	*Elephas maximus maximus*
Water Buffalo	*Bubalus bubalis*
Sambhur	*Cervus unicolor*
Spotted Deer	*Axis axis ceylonensis*
Grey Langar	*Presbytis entelius*
Wild Boar	*Sus scrofa*
Toque Monkey	*Macaca sinica*
Indian Pangolin	*Manis crassicaudata*
Indian crested Porcupine	*Hystrix indica*
Sri Lanka Jackal	*Canis aureus lanka*
Southern Indian Otter	*Lutra lutra nair* (Diya balla)
Striped necked Mongoose	*Herpestes vitticollis vitticollis* (Gal-mugatiya)
Sri Lanka ruddy Mongoose	*Herpestes smithii zeylanicus*(Hotambuwa)
Brown Mongoose	*Herpetes fucus* (Mugatiya)
Sri Lanka small Civet-cat	*Viverricula indica mayori*(Urulaeva)
Golden palm Cat	*Paradoxura zeylonensis* (kalawedda)
Common Indian palm Cat	*Paradoxyrus hermaphroditus(Uguduwa)*
Sri Lankan Giant Squirrel	*Ratufa macroura* (Dandulena)
Sri Lanka Palm-Squirrel	*Funambulus palmarum*(Lena)
Common Flying Fox	*Pteropus giganteus*(Maha-Wawla)
Painted Bat	*kirivoula pictia*(Kiri Wawla)
Sri Lanka black-naped Hare	*Lepus nigricollis singhala*(Hawa)
Mouse Deer	*Tragulus meminna*(Meeminna)
Common Sri Lanka House Rat	*Ratus ratus kandianus*(Gay- miya)
Indian House Mouse	*Mus mesculus castanus*(Kossattu miya)
Indian Bandicoot	*Bandicota indica indica*(Uru miya)
Sri Lanka Rusty Spotted Cat	*Felis rubiginosa phillipsi* (Kola diviya)

APPENDIX V

List of Reptiles

Eye Plucher	*Ahaetulla nasuta nasuta*(Ahutulla)
Hump nosed Viper	*Agkistrodon hypanale*(Kuna kotuwa)
Common Garden Lizard	*Calotes Versicolor*(Gara-kattussa)
Green Garden Lizard	*Calotes calotes*(Pala-kattussa)
Crocodile	*Crocodylus palustris kimbula*(Kimbula)
Hard Terrapin/Common Terrapin	*Melanochelys trijuga(*Gal-Ebba)
Spotted Skink	*Mabuya macularia*(Hikenela)
Cobra	*Naha naja naja*(Nagaya)
Chequered Keelback	*Natrix piscator aspersimus*(Dhiya Naya)
Buff Striped Keelback	*Natrix Stolata Stolata*(Ahara kukka)
Sri Lanka Python	*Python molurus pimbura* (Pimbura)
Rat Snake	*Ptyas mucosis maximus*(Gerandiya)
Russel's Viper	*Vipera russelli pulehella*(Thith- polanga)
Water monitor	*Varanus monitor kabaragoya*(kbaragoya)
Indian land monitor	*Varanus bengalensis bengalensis*(Talagoya)

APPENDIX VI

Trees of Pelwatte Sugar Plantation

List 1 contains tree species found in forest areas and isolated trees within the plantation. This includes only canopy and understorey species. Shrub species and lianas are not considered.

List 1

Species	Family	Sinhala name
Lannea coromandelia	Anacardiaceae	Hik
Polyalthia longifolia	Annonaceae	Ovila
Bombax ceiba	Bombacaceae	Katu imbul
Ceiba pentandra	Bombacaceae	Pulun
Cordia dichotoma	Boraginaceae	Lolu
Cordia subcordata	Boraginaceae	Lolu
Terminalia arjuna	Combretaceae	Kumbuk
Diospyros ebenum	Ebenaceae	Kaluwara
Diospyros malabarica	Ebenaceae	thimbiri
Diospyros ovalifolia	Ebenaceae	kunumella
Bridelia retusa	Euphorbiaceae	Keta kela
Drypetes sepiara	Euphorbiaceae	Weera
Alseodaphne semecarpifolia	Lauraceae	Wewarana
Bauhinia racemosa	Leguminosae	Maila
Cassia fistula	Leguminosae	Ehela
Cassia siamea	Leguminosae	Wa
Cassia roxburgii	Leguminosae	Rathu wa
Delonix regia	Leguminosae	May mal
Dialium ovoideum	Leguminosae	Gal Siyambala
Tamarindus indica	Leguminosae	Siyambala
Acacia leucophloea	Leguminosae	Katu andara
Albizia lebbeck	Leguminosae	Mara
Pterocarpus marsupium	Leguminosae	Gammalu
Azadirachta indica	Meliaceae	Kohomba
Chukrasia tabularis	Meliaceae	Hulan Hik
Ficus religiosa	Moraceae	Bo
Ficus benghalensis	Moraceae	Nuga
Ficus racemosa	Moraceae	Attikka
Ficus virens	Moraceae	
Ficus microcarpa	Moraceae	panu nuga
Ficus mollis	Moraceae	wal aralu
Syzygium cumini	Myrtaceae	Madan
Phoenix farinfera	Palmae	Indi
Adina cordifolia	Rubiaceae	Kolon
Nauclea orientalis	Rubiaceae	Bak mee
Pavetta gleniei	Rubiaceae	Pavetta
Chloroxylon swietenia	Rutaceae	Burutha

Species	Family	Sinhala name
Limonia acidissima	Rutaceae	Divul
Glenniea unijuga	Sapindaceae	Wal mora
Schleichera oleosa	Sapindaceae	Kone
Madhuca longifolia	Sapotaceae	Mee
Manilkara hexandra	Sapotaceae	Palu
Mimusops elengi	Sapotaceae	Muna mal
Sterculia foetida	Sterculiaceae	Thelambu
Berrya cordifolia	Tilliaceae	Hal milla
Grewia damine	Tilliaceae	Daminiya
Grewia orientalis	Tilliaceae	Wal keliya
Vitex altissima	Verbenaceae	Milla

List two contains species found in settlement area. These species are cultivated trees. Shrub species are not considered.

List 2

Species	Family	Sinhala name
Anacardium occidentale	Anacardiaceae	Cadju
Mangifera indica	Anacardiaceae	Amba
Terminalia catappa	Combretaceae	Kottamba
Jatropha curcas	Euphorbiaceae	Weta endaru
Manihot glaziovii	Euphorbiaceae	Gas manyokka
Ricinus communis	Euphorbiaceae	Endaru
Bauhinia variegata	Leguminosae	Koboleela
Leucaena leucocephala	Leguminosae	Ipil ipil
Sesbania grandiflora	Leguminosae	Kathuru murunga
Artocarpus heterophillus	Moraceae	Kos
Psidium guajava	Myrtaceae	Pera
Pinus carribea	Pinaceae	Pinus
Filicium decipiens	Spaindaceae	Pihimbiya
Tectona grandis	Verbenaceae	Thekka

APPENDIX VII

List of Tank

1. Management Complex (Large)	N 06 42 360 E 81 12 161
2. Management Complex (Small)	N 06 42 079 E 81 12 566
3. Walbokkuwa wewa	N 06 41 736 E 81 14 619
4. Suddage wewa	N 06 41 121 E 81 13 783
5. Servay Kolany wewa	N 06 40 455 E 81 13 430
6. Yatiyallathota Tank	N 06 42 231 E 81 13 430
7. Moragaha wewa	N 06 42 787 E 81 13 610
8. Ehala Menikwewa	N 06 40 105 E 81 14 994
9. Phale Menikwewa	N 06 39 251 E 81 15 253
10. Diyakiritha wewa	N 06 36 959 E 81 14 846
11. Dingiwewa	N 06 39 731 E 81 13 730

12. Idigahapellassa wewa (Borawewa)	N 06 38 731 E 81 14 901
13. Rambanda Iyyage Wewa	N 06 43 010 E 81 11 429
14. Katupotha Wewa	N 06 43 264 E 81 11 142
15. debewewa	N 06 39 682 E 81 12 383
16. Bolock Wewa	N 06 40 852 E 81 10 325
17. Thalakolawewa	N 06 40 669 E 81 12 175
18. Pemkuda wewa	N 06 40 669 E 81 12 175
19. Block 10 wewa	N 06 38 778 E 81 10 920
20. Medagala wewa (48 wewa)	N 06 38 778 E 81 10 920
21. 31 Wewa	N 06 38 263 E 81 11 045
22. Block 15 wewa	N 06 36 821 E 81 13 797
23. Paruluwewa	N 06 35 066 E 81 11 385

APPENDIX VIII

List of Mountain :

GPS Locations of these mountains are showed in the habitat map

1. Thunkemahela (Teak Plantation)
2. Wadinahel (Block 3)
3. Korahagala (Teak Plantation)
4. Block 5 Kandha (Block 5)
5. Arakgoda Kandha (Block 7) (Kebella hela)
6. Kumarikahela (Block 6)
7. Matta hela (Block 7)
8. Konahela (Block 7)
9. Waththegala (Block7)
10. Babaragala (Block 14)
11. Bolhidagala (Block10)
12. Alugalge kandha (Block 5)
13. Minihagala kandha (Block 4-1)
14. Hathminigala (Block 5)
15. Nagaragala (Kalupotha, Ncarest Block 4-1)
16. Diggala (Block 4-1)

APPENDIX IX

Historically and Religious Important Places.

1. Yatiallathota	N 06 42 992
	E 81 14 681
2. Poramedilla	N 06 39 863
	E 81 13 237
3. Wadinahela	N 06 41 550
	E 81 08 500
4. Kumarikahela	N 06 40 750
	E 81 11 700
5. Bolhidagala	N 06 38 950
	E 81 11 850
6. Konahela	N 06 40 050
	E 81 11 100
7. Thunkemahela	N 06 43 200
	E 81 10 600
8.Nagaharagala Aramaya	N 06 43 790
	E 81 11 480

Religious Important Trees (BO)

1. N 06 39 953
   E 81 11 638

2. N 06 39 584
   E 81 10 790

3. N 06 38 511
   E 81 12 040

4. N 06 41 313
   E 81 14 678

5. N 06 46 269
   E 81 15 569

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