

**EVALUATION OF SUSTAINABILITY OF A TOURISM
DESTINATION: CASE OF PIGEON ISLAND IN
TRINCOMALEE**

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Master of Spatial Planning, Management & Design (2014/2016)

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Dissertation submitted in partial fulfillment of the requirements for the
Master of Spatial Planning, Management & Design degree

Department of Town & Country Planning

University of Moratuwa
Sri Lanka

May 2018

DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement of any materials previously submitted for a Degree or Diploma in any other University or institute of higher learning and best of my knowledge and belief, it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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CERTIFICATION

I certify herewith that D. M. T. Dillhara Dissanayake (Index No: 148701C) of the 2014/2016 group has prepared this research study under my supervision.

.....
Signature of the Principle Supervisor
Date..... /..... /.....

.....
Head of the Department
Town & Country Planning
Date..... /..... /.....

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ABSTRACT

Tourism industry is a fast-growing industry in the world and in Sri Lanka. To meet the growing demand, a large number of destinations are being exposed and developed rapidly without proper planning and management harming the natural environment and excluding local communities and local content – the very foundation and uniqueness of the Sri Lankan travel experience. Hikkaduwa tourism destination, where 75 % of live corals have been destroyed due to overcrowded tourists visits and unplanned activities and also Pigeon Island Marine National Park (PIMNP) at Trincomalee which indicate same threats to the live corals are major examples of damages to environment and host communities due to disregard of sustainability aspects in planning and management of tourism activities in Sri Lanka.

Although Sustainable tourism is a huge concern, its practical applicability has limitations due to lack of a method to evaluate the implications of sustainable principles. This study attempts to develop a framework of indicators to evaluate sustainability in a tourism destination based on three pillars of sustainable tourism; economic, environment and socio-cultural which were selected as the mandates of the framework. Components of three base pillars in terms of tourism presented by WTO in 2004 were selected as the expressions of each mandate. The indicators of each expression were initially developed based on existing indicators of sustainable tourism and further narrowed down as appropriate for Sri Lankan context. Then the proposed framework was applied to PIMNP at Trincomalee. The data was collected through past records, field surveys, perception surveys, analyzed using quantitative and qualitative methods and presented using a descriptive method. After quantifying all indicators based on a scaling method and weighted sum method was used to derive overall and thematic sustainability levels. The results indicated; overall sustainability level of PIMNP as 42% composing of 47% of economic, 35% of environmental and 44% of socio-cultural thematic sustainability levels. PIMNP has relatively high economic sustainability and lower environment sustainability. Since PIMNP is a tourist attraction based on natural asset, the environment sustainability plays a major role in making the overall venture a sustainable tourism venture.

Key words – Sustainability, sustainable tourism principles, framework of indicators

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LIST OF ABBREVIATION

World Tourism Organization (UNWTO)
Pigeon Island Marine National Park (PIMNP)
International Hotel Environment Initiative (IHEI)
World Travel and Tourism Council (WTTC)
The United Nations Educational, Scientific and Cultural Organization (UNESCO)
Regional Bureau for Science and Culture in Europe (BRESCE)
Pinnawala Elephant Orphanage (PEO)
The National Environmental Act (NEA)
Return of Investment (ROI)
Pigeon Island Marine National Park Conservation Project (PIMNPCP)
Fisheries and Aquatic Resources Act (FARA)
Department of Wild Life Conservation (DWLC)
Indicators of Sustainable Development for Tourism Destinations (ISDTD)

CHAPTER ONE

INTRODUCTION

1.1. Background of the Research

Over the past six decades, tourism has experienced continued expansion and diversification to become one of the largest and fastest-growing economic sectors in the world. Many new destinations have emerged in addition to the traditional favorites of Europe and North America (UNWTO, 2015). This explains the fast growth of tourism industry all over the world, and the situation of Sri Lanka tourism industry also aligns with the international trend of tourism development. Sri Lanka is now an increasingly popular destination for international travelers, as well as for expatriates returning home to visit friends and relatives. Sri Lanka being nominated as one of destination in the world to visit by Lonely Planet in 2013 and being ranked among the “top ten coolest countries to visit” by Forbes Magazine in 2015 are some of the evidences which confirm the above fact. (Sri Lanka Tourism Strategic Plan 2017 - 2020)

As per the records of Tourism Development Authority, tourism in Sri Lanka has reached to a new limit of over 2 million (2,050,832) arrivals in 2016 which is an increase of 14 percent over previous year's 1,798,380 arrivals. The foreign exchange earnings increased by 18.5 percent from 450,492 million in 2015 to Rs. 512,293 million in 2016. In 2016, the tourism sector ranked as the third level in one of the main sources of foreign exchange earners of the national economy and the employment generated in the tourism sector (both direct and indirect) has increased from 319,436 in 2015 to 335,659 with a growth rate of 5.1%.

However, with the rapid growth of tourism industry, comes the concerns of sustainability as rapid growth suggests the over consumption and gradual depletion of large amounts of resources and destruction and ignorance of socio-cultural values and systems. It can already be seen in certain areas that the rush to develop and expand tourism in Sri Lanka is harming the natural environment and excluding local communities and local content – the very foundation and uniqueness of the Sri Lankan travel experience. (Sri Lanka Tourism Strategic Plan 2017 - 2020).

In Sri Lanka, there are some tourism projects and destinations which have been planned based on sustainable tourism principles which perform well balanced with high economic and social benefits and proper environment management. Kandalama Hotel project which is a private sector tourism venture can be taken as a good example of a tourism project which has been designed and planned valuing sustainable tourism principles whereas the hotel has been designed and built well integrated with natural environment without being a disturbance. Thus, this hotel is designated as an Eco-friendly hotel and also been awarded with several green certificates and awards due its attempts in mechanisms for energy saving, long term reduction of energy expenses, water saving and management and waste management adopting 3R waste management strategy etc.

However, at the same time there are many tourism destinations and projects in Sri Lanka, where the sustainability aspects are not considered and incorporated in planning and management which has resulted in huge damages to environment and host communities. One of such examples is Hikkaduwa tourism destination, where the recent surveys have indicated that around 75 % of live corals have now been destroyed due to overcrowded tourists' visits and due to unplanned activities and coral visits without management. The studies on Piegion Island Marine National Park at Trincomalee also indicate the same threats to the live corals there. Apart from these two examples, there are many developed and developing tourism destinations, which have already faced and are beginning to face environmental and social challenges due to unplanned and short-term benefits driven tourism activities which do not consider sustainable tourism principles as a mandatory. Sometimes, even though some tourism destinations are planned incorporating these principles, yet there is no proper mechanism to measure the attempts and the level of sustainability of these destinations which would in return provide a guide for the management of them.

1.2. Problem Statement

Even though sustainable tourism is viewed as a mandatory practice, in many instances the practical implication of sustainability aspects in the tourism industry has not yet been completely achieved. (Lai, 2006) stated that the influx of visitors and uncontrolled growth accompanied by mass tourism development, has generated a number of negative economic, social and environmental effects on the host communities. The reality of the present situation in most of the developing countries, tourism development often proceeds in an ad hoc way as unplanned tourism is of uncertain value to nations in search of quick and extensive economic gains instead of sustainable development. In this background, management of tourism is essential for better conditions of destinations and host communities and more broadly the sustainability of futures of ecosystems, regions and nations.

During the decade since 1992, Rio Conference, the planners and academics in many nations and specific destinations have been working to develop indicators suitable for their management needs. (WTO, 2004) further states that these indicators have focused both on issues of impacts.

However, there has not been any of such methodological framework developed so far to assess the sustainability of a tourism destination which could be helpful in management of tourism industry activities associated with the particular destination.

1.3. Research Objective

The objective of this research study is to review the existing principles and indicators of sustainability and to develop a framework of indicators aligned with tourism principles and check the applicability of proposed framework as for a Sri Lankan case study; using the case of Pigeon Island Marine National Park (PIMNP) in Trincomalee.

1.4. Method

This research first explores the evolution of sustainability as a concept, its implications in tourism industry and various interpretations of underlying principles of sustainable tourism through a literature review. Secondly it explores the existing methods and tools which can be used for multi criteria evaluation framework and limitations associated

with them. In the next stage, the study attempts to develop a new framework of indicators strongly based on the principles of sustainable tourism while addressing the limitations identified in the existing indicators of sustainable tourism.

The expressions of sustainable tourism principles on which the whole framework of indicators are built upon are selected through the comprehensive literature survey. Then several indicators used in different contexts are listed down under each expression of sustainable tourism principle and used evaluation method to identify the most appropriate indicators suitable for the selected case study. (Method discussed later on Research Design Chapter)

The proposed framework consists of main principles of sustainable tourism, their expressions (which were picked from the literature review), and indicators of each expression (which were selected from a list of indicators identified through evaluation method). There are both qualitative and quantitative indicators which are evaluated using simple quantitative analysis tools and descriptive qualitative analysis methods which are later converted into quantitative figures adopting a scaling system. The weighted sum method is adopted to quantify both qualitative and quantitative data of different nature against each indicator by standardizing them in a uniform scale and evaluate the overall level of sustainability while assigning weights for each indicator based on its importance in evaluating the level of sustainability.

Further, the study attempts to check the applicability of proposed framework as for a Sri Lankan case study; using the case of Pigeon Island Marine National Park (PIMNP) in Trincomalee. The proposed framework is composed of both qualitative and quantitative indicators, and the respective data of each indicator are gathered in terms of research methods such as field observations, perception surveys, interviews, focused group discussions, photographic surveys and secondary data collection based on availability. There has not been any of such methodological framework developed so far to assess the sustainability of a tourism destination and methodology to properly evaluate the level of sustainability.

1.5. Research Flow

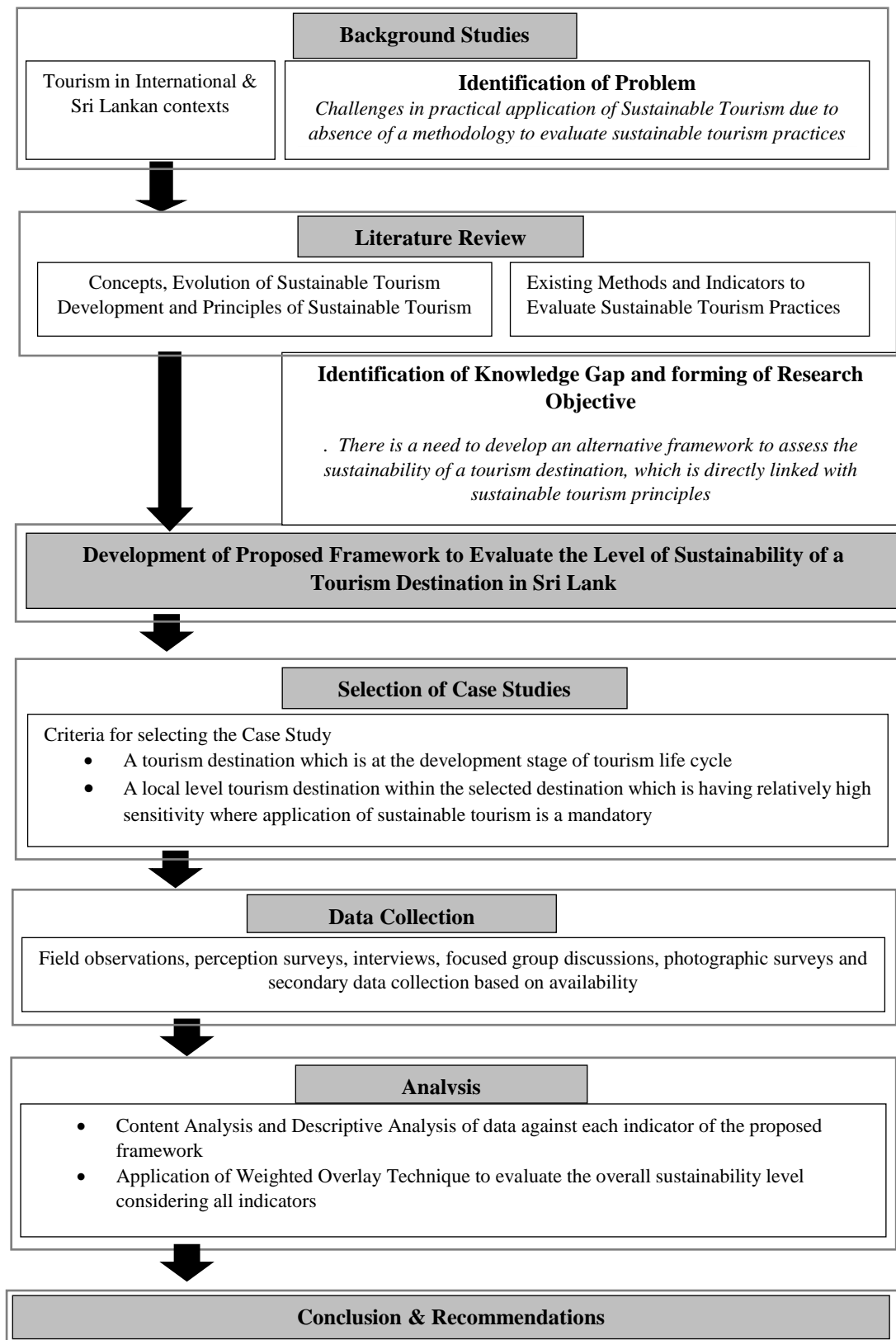


Figure 1: Research Flow

1.6. Justification

Theoretically, the proposed framework of indicators introduces a new alternative methodology to evaluate sustainability of a tourism destination. Having a methodologically derived framework of indicators which are directly aligned with the principles of sustainable tourism will help evaluating the status of sustainability of a particular tourism destination or project. The knowledge of the status of sustainability and its lacking indicators will be helpful to remedy the damages and re-direct the tourism process into the sustainable path.

The framework will allow the comparison of sustainability status of similar tourism destination/projects and to learn from each other's experiences. It will also be helpful to easily identify the limitations in the tourism process and the points to be intervened in order to make it a sustainable process. Awareness on current sustainability level of a particular tourism destination helps the decision makers to understand the prevailing risks on different perspectives such as economic, socio-cultural and environmental and to manage the resources wisely and to maintain harmony between different components of tourism industry.

1.7. Scope and Limitations

This research attempts to develop a framework of indicators to evaluate the sustainability of a tourism destination or project operating. The particular tourism destination /project can be either private or state governed or a collaboration of both. The particular tourism destination/project can be associated with a certain tourist destination, attraction or an activity of natural, cultural, aesthetic or archeological importance or value. The proposed framework only considers the tourism components, activities and actors which/who are directly involved and tangible within the tourism system of concerned context but do not consider the hidden indirect involvements which are common for most tourism ventures and whose field of operations are beyond the concerned context. For example, the framework evaluates the sustainable aspects of the operation of local scale hoteliers but do not consider the influence of tour operators and travel agents who are operating within the system but are coming out of the context.

One of the limitations, attached to the proposed framework, it may still lack some parameters when considering different other perspectives. Another limitation attached is that the evaluation of sustainability of a particular destination/project is subjective as some of the indicators are qualitative thus can be subjective based on the evaluator and the context. As there are no universal baseline indicators of sustainable tourism, when applying the framework, each indicator is evaluated in reference to an average baseline indicator value determined comparatively as suits with the specific case.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

The main theme of this research is the sustainable tourism and the key objective is to develop a framework of indicators to evaluate the sustainability of a local tourism destination in the Sri Lankan context. Sustainable tourism is an evolving concept thus needs a comprehensive understanding about the concept and its principles before proceeding to develop a framework to evaluate the sustainability of a particular local tourism destination. Therefore, this chapter presents a summary of literature reviewed on tourism and tourism industry, sustainability in tourism, principles of sustainable tourism, existing methods to evaluate sustainable tourism and a critical review of latter two parts.

2.2. Tourism and Tourism Industry

World Tourism Organization (UNWTO), defines tourism as ‘the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes’. (UNWTO Annual Report – 2015). According to this definition, it can be observed that tourism includes main five components such as tourists, destinations, travelling, accommodation and tourism activities at destinations. Accordingly, the tourism industry has developed to cater the above main components and their subordinate activities. Tourism industry can be identified as the individuals, businesses and organizations that are working to provide products or services to tourists. Tourism industry is also referred to as an umbrella industry which support a large number of sub industries varying in a vast spectrum of fields. (Roy, Laura, & Joseph, 2002) However, in order to achieve sustainable tourism, it is important to adopt sustainability practices in all types of tourism activities at all scales.

The Integrated Model of Tourism introduced by Roy, Laura, & Joseph, 2002 Tourism: well elaborates the components of tourism industry and their interrelationship between the travelers (tourists) and the external environment. (Tourism: The Business of Travel, 2002)

As per the Integrated Model of Tourism, there are mainly four components such as travelers (the core of the model), tourism promoters (travel agents, tour operators, marketing planners, tourist boards and direct marketing), tourism service suppliers (in the sectors of accommodation, food & beverages, transportation, attractions and entertainment) and the external environment (including the environment, economy, society/culture and policies). This model summarizes the comprehensive system of tourism industry, thus can be used as a supportive model when deriving a methodology to evaluate the sustainability practices of tourism at any scale of national, regional, local or project level.

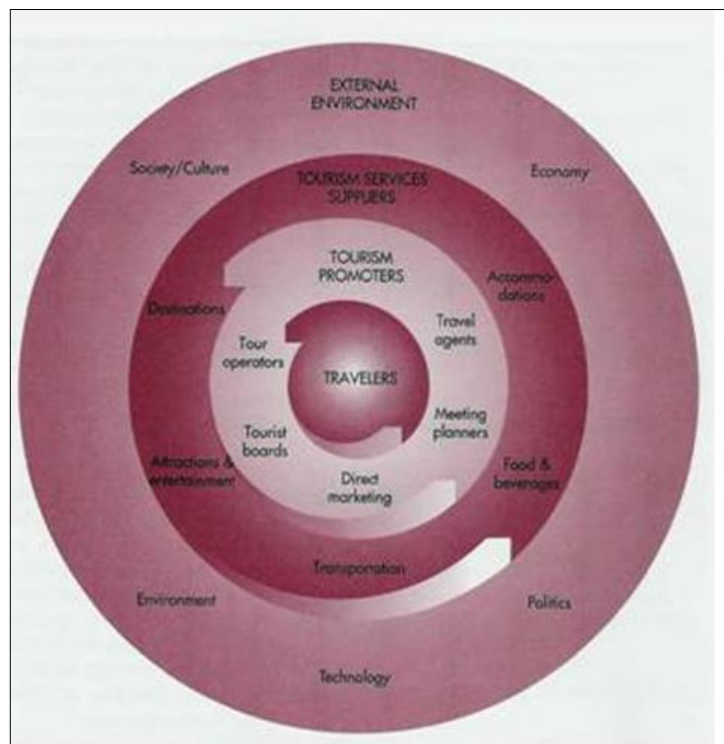


Figure 2: Integrated Model of Tourism

Source: Roy A. Cook, Laura J. Yale, Joseph J., 2002

2.3. Sustainability Concept in Tourism

Over the past six decades' world tourism has experienced continued expansion and diversification and has become one of the largest and fastest-growing economic sectors in the world (UNWTO, 2015). The impact of tourism largely varies as it plays certainly positive role in the socio-economic and physical development in destination countries creating new employment and enterprises opportunities, increasing foreign

revenue, attracting large foreign investments, leading to large scale infrastructure developments and contributing to share and experience diversities of culture and ways of life. Tourism industry creates foreign currency, creates employment opportunities and small business opportunities for local community, forms socio-cultural development in the destinations establishing human values, behavior and good lifestyles, brings joy, comfort and leisure opportunities and enhances quality of life. (Rhaman, 2016)

But at the same time, tourism also brings negative impacts upon environment, culture and way of life especially when sustainability aspects are not considered in tourism practices but driven with the motives of high profits and short-term benefits. Sustainability is a concept derived in late 20th century in the background where rapid socio-economic development based on the use of natural resources such as space, mineral resources and water degraded environment to such an extent where it became necessary to revise the rules for the use of environment. (Niedziolka, 2012).

The Stockholm conference held in early 1970s which is considered as the first United Nations conference on Human Environment was the first landmark towards the pathway to the concept of sustainability. (Bac, 2008) The second landmark is the Brundtland Report on the theme 'Our Common Future' in 1987 provided by World Commission on Environment and Development called Brundtland Commission. (Bac, 2008) The Brudtland report adopts the definition that "Sustainable Development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs". (Report of the World Commission on Environment and Development: Our Common Future, 1987)

The Conference on Environment and Development, which is known as the Earth Summit held in Rio de Janeiro in 1992 is considered as the most influential international conference on environment protection and sustainable development. (Bac, 2008). The key events of this conference are the broad action strategy known as Agenda 21 and the Rio Declaration which presents 27 principles defining the rights and duties of nations in terms of sustainable development. Even though, either the Brundtland report or the Agenda 21 do not specifically refer to sustainability in

tourism, the industry's planning and development have been heavily influenced by their recommendations (Holloway, 2009).

In 1992, the hospitality industry launched its International Hotel Environment Initiative (IHEI) which was designed to reduce the impact of staying visitors on the environment. (Niedziolka, 2012). This event can be considered as the application of sustainability concerns in the hospitality industry for the first time in a formal intervention. In the same year, a UK-based pressure group set out its own guidelines in regard of tourism concerns which influenced the private sector to take more account of the need of sustainable planning in tourism. (Niedziolka, 2012). The guidelines included; using resources sustainably, reducing overconsumption and waste, maintaining diversity, integrating tourism into planning, supporting local economies, involving local economies, consulting stakeholders and the public, training staff, marketing tourism responsibly and undertaking research.

Holloway (2009) states that principles behind these guidelines appear to achieve more balance between socio-cultural and environmental elements. However, it can be observed that these fundamental principles have been incorporated in various modes within the principles of sustainable tourism which were developed in years later.

Kyoto Protocol of 1997 which aims at reducing greenhouse effect by limiting Carbon dioxide emissions also played an influential role in sustainable tourism concept as far as it is concerned, travel for leisure which is a core part of tourism is not a fundamental necessity but contributes largely to emission of Carbon dioxide whereas transport causes around 75% of the Carbon dioxide emissions generated by tourism with aviation responsible for around 40% (Niedziolka, 2012).

Sustainable tourism became more popular at the beginning of 21st century. The United Nations Environmental Program introduced its initiative for Sustainable Tourism which basically aimed at tour operators. Following to that, the year 2002 was declared as the International Year of Eco-tourism. Later on, at the World Summit on Sustainable Development (Rio+10) held at Johannesburg, the importance of sustainable development in tourism was stressed for the first time. Parallel to that the world eco-summit was held in Quebec in the same year. World Tourism Organization (UNWTO)

and World Travel and Tourism Council (WTTC) are the main organizations which operate internationally in monitoring and evaluating the world tourism industry.

The concept of Sustainable Development is based on three pillars: economic development, environmental protection and socio-cultural development whereas Sustainable Tourism is defined as "Sustainable tourism development meets the needs of present tourists and host 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 system." (WTO, Guide for Local Authorities on Developing Sustainable Tourism, 1998) In other words, sustainable tourism development is ecologically sustainable, economically viable as well as ethically and socially equitable. It respects the fragile environmental balance that characterizes many tourism destinations, particularly in environmentally sensitive areas; and it is based on a long-term perspective. (BRESCE, 2009)

The World Tourism Organization (1996) defines Sustainable Tourism as the "Tourism which leads to management of all resources in such a way that economic, social and aesthetic needs can be filled while maintaining cultural integrity, essential ecological processes, biological diversity and life support system". Both these definitions highlight the importance of managing all resources and safeguarding three pillars of sustainable development, when meeting the needs of tourism.

As per the above definitions, it is clear that almost all of them highlight on the importance of achieving economic development while ensuring the protection of the environment and socio-cultural integrity as a base principle in achieving sustainability in tourism. Therefore, the same is considered as the base in this study when developing the proposed framework to evaluate the sustainable tourism practices in a particular local destination.

2.4. Principles of Sustainable Tourism

The principles of sustainable tourism and sustainable tourism development are mostly the elaborations of their basic definitions which are derived based on the three pillars of sustainability. But in addition, the principles focus on the need to fulfill the needs of tourism as well.

United Nations Environment Program, (2004) elaborated the implementation of sustainable tourism principles requires to address the following aspects.

- Environment – Making optimal use of environmental processes that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and bio-diversity
- Socio-cultural – Respecting the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values and contribute to inter-cultural understanding and tolerance
- Economic – Ensuring viable, long term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed including stable employment and income-earning opportunities and social services to host communities and contributing to poverty alleviation

All these aspects which are elaborated in the means of three pillars of sustainable development explains how the sustainability of the external environment (as defined in the integrated model of tourism) related to tourism should be maintained. But this explanation of sustainable tourism principles, does not address the need to satisfy the requirements and desires of tourists. As explained in the Integrated Model of Tourism, tourists are at the core of the system thus the satisfaction of tourists is a must in sustainable tourism. Economic and socio-cultural aspects widely address most of the needs of the tourism promoters and service providers who are the other two major components of the tourism system.

UNESCO Regional Bureau for Science and Culture in Europe (BRESCE) provides the following elaboration on sustainable tourism principles as a summary of different declarations of principles of sustainable tourism made by different institutions and

codes over time.(BRESCE,2009)This elaboration talks beyond the three pillars of sustainability and tries to capture the components such as needs of tourists and the importance of proper management and monitoring for sustainable tourism development practice.

1. Enhancing the well-being of communities

Sustainable tourism development supports and ensures the economic, social and cultural wellbeing of the communities in which tourism takes place.

2. Supporting the protection of the natural and cultural environment

Sustainable tourism allows the use of natural and cultural resources for gaining economic profit while at the same time guaranteeing that these resources are not deteriorated or destroyed. Additionally, tourism is expected to be a driving force with regard to the establishment or the enhancement of nature protection and the maintenance of cultural values.

3. Recognizing product quality and tourist satisfaction

The quality of tourism products offered by a region is a key factor for the economic success of tourism. It is not only characterized by material criteria like the quality of transport, accommodation and food, but also by non-material criteria like hospitality or the quality of experiences.

4. Applying adaptive management and monitoring

To ensure that tourism is developed in a way which is ecological, economic and socially sustainable, adequate management and monitoring must be established following the basic principles of sustainable use of resources. It is important to note that different stakeholders involved in the tourism business are responsible for the implementation of different parts of the principles. Governments, tourism businesses, local communities, NGOs and the tourists can all contribute to make tourism more sustainable. In order to achieve the goals of sustainable tourism, the different actors should cooperate and stimulate each other to put the principles into practice.

Although these four components of sustainable tourism development highlight the need of ensuring the tourist satisfaction and the importance of having an adaptive management and monitoring mechanism without being bound to the conventional

three pillars of sustainability, it does not highlight one of the core objectives of tourism; the economic profitability. Even though it highlights the importance of supporting the economy of the host community, it does not describe about the sustainability in overall economic gain of the tourism destination / project.

Based on the initial study of Panasiuk in 2011, Niedziolka (2012) summarized the following aims of sustainable development in the same three aspects as in the three pillars of sustainable development.

- i) Economic aspects of sustainable tourism including *economic profitability*; ensuring the viability and competitiveness of regions and businesses to achieve long term viability, *local prosperity*; maximizing the economic benefits of tourism to the local community including the expenditure of tourists in the area, *quality of employment*; increasing the quality and quality of jobs related to tourism in the local community, including wages, work environment and employment opportunities without discrimination, *social equity*; ensuring fair and equal distribution of social and economic benefits coming from tourists
- ii) Environment aspects of sustainable tourism including *physical integrity*; maintaining and building quality of the landscape, in both urban and rural areas and preventing ecological and visual pollution, *biological diversity*; promoting and protecting environment, natural habitats and wildlife as well as minimizing the impact of tourism on the environment, *effective waste management*; minimizing the use of rare and non-renewable resources in the development of tourism, *clean environment*; Indirect contribution for clean environment by adopting solar energy and other renewable energy
- iii) Socio-cultural aspects of sustainable tourism including *welfare of the community*; building welfare of the community including social infrastructure, access to resources, environmental quality and avoidance of social corruption and the exploitation of resources, *cultural wealth*; maintaining and developing cultural heritage, local culture, customs and the exceptional nature of the host community, *meeting expectations of visitors*; providing safe and enjoyable tourist experience which will meet

the needs of tourists and will be available to all, *local control*; authority for planning and decision making in the management of tourism by local communities

The above interpretation of sustainable tourism can be considered as a holistic one with compared to the above two sets of interpretations, as it covers the aspects related to three pillars of sustainability and as well as highlight the importance of meeting tourism satisfaction as one of the components of socio-cultural sustainability.

Even though different literature interprets principles of sustainable tourism in different modes, majority of them are aligned with the above-mentioned basic principles of sustainable tourism. However, it is important to consider the visitor satisfaction and the need of planning, management and monitoring of tourism activities in order to maintain the sustainability of tourism industry as a whole.

In that case, the components of sustainable tourism described by Niedziolka (2012) can be considered as a holistic interpretation of sustainable tourism which covers the aspects of three pillars of sustainability and as well as the need to ensure the tourist satisfaction. Thus, the components of sustainable tourism presented by Niedziolka in 2012 is taken as the expressions of three pillars of sustainability selected as the base for the proposed framework to evaluate sustainable tourism practices.

2.5. Existing Methods to Evaluate Sustainable Tourism

It has been argued by scholars and practitioners that the development of an evaluation framework using sustainable tourism indicators may be used as an effective means for measuring the sustainability of tourism activities taken place in different scales and contexts (Mearns et al. 2010).

WTO (2004) states that Sustainability indicators are essential tools for providing information, and constitute fundamental building blocks in tourism planning, management and monitoring processes and that they help to identify and measure the impacts of tourism development and operations on the environmental and socio-cultural conditions of destinations, as well as on the progress made as results of management actions.(Yunis, 2004) WTO further explains that good sustainability

indicators must be easy to understand, as well as economically and technically feasible to measure. WTO highlights that some of the benefits from good indicators include:

- Better decision-making, in order to lowering risks or costs
- Identification of emerging risks and or conflictive issues, thus allowing prevention
- Identification of impacts, to allow for timely corrective action when needed
- Performance measurement of the implementation of development plans and management actions, i.e. evaluating progress in the sustainable development of tourism
- Reduced risk of planning mistakes, thus identifying limits and opportunities
- Greater public accountability; i.e. providing credible information for the public and other tourism stakeholders fosters accountability for its wise use in decision-making
- Constant monitoring can lead to continuous improvement.

Various indicators of sustainable tourism have been introduced in different literature and the set of indicators introduced by WTO in 2004 have been used as a base for many indicators developed thereafter.

According to the Indicators of Sustainable Development for Tourism Destination: A Guidebook by WTO, 2004 identified a very large number of indicators (over 700) across to 13 issues. But too many indicators in turn could overwhelm users and the collection of information's for the numerous indicators could become a more complex and time consuming. As a result, WTO identified 12 of prioritized issues and the indicators that correspondent to them. The list of baseline indicators covers a rage of social, economic and environmental issues like to be found in most destinations.

Table 1: Indicators of Sustainable Tourism presented by WTO in 2004

Baseline Issue	Baseline Indicator
Local satisfaction with tourism [social]	<ul style="list-style-type: none"> - Local satisfaction level with tourism - Local community complaints
Effects of tourism on communities [social]	<ul style="list-style-type: none"> - Percentage who believe that tourism has helped bring new services or infrastructure - Other effects of tourism on the community
Sustaining tourist satisfaction [economic]	<ul style="list-style-type: none"> - Level of tourist satisfaction - Perception of value for money - Percentage of return visitors - Perception of sustainability - Tourist complaints
Tourism seasonality [economic]	<ul style="list-style-type: none"> - Tourist arrivals by month (throughout the year, mean and peaks) - Occupancy rates for accommodation by month - Percentage of tourist industry jobs which are permanent or full-time (compared to temporary/seasonal jobs)
Economic benefits of tourism [economic]	<ul style="list-style-type: none"> - Number of local people (and ratio of men to women) employed in tourism - Revenue generated - Revenue spend in area
Energy management [environmental]	<ul style="list-style-type: none"> - Per capita consumption of energy (per person day) - Energy-saving measures - Percentage of energy consumption from renewable resources
Water availability and conservation [Environmental]	<ul style="list-style-type: none"> - Water use (total water volume consumed and liters per tourist per day) - Water conservation measures
Drinking water quality [environmental]	<ul style="list-style-type: none"> - Water treated to international potable standards
Sewage treatment [environmental]	<ul style="list-style-type: none"> - Sewage treatment systems
Solid waste management (garbage) [environmental]	<ul style="list-style-type: none"> - Waste volume produced - Waste disposal (landfill, recycling, etc.)
Development controls [crosscutting]	<ul style="list-style-type: none"> - Existence of a development planning process including tourism
Controlling use intensity [environmental]	<ul style="list-style-type: none"> - Number of tourists per square meter of the site

Source: (WTO, Indicators of Sustainable Development for Tourism Destinations: A Guide book, 2004)

The above set of indicators developed by WTO in 2004, these indicators do not address some important aspects of sustainable tourism as conservation of natural and cultural assets, values or heritages which mostly act as the catalysts of tourism development within the concerned tourist destination. The main problem associated with this set of indicators is that they are developed more in a common basis addressing the tourism industry as a whole rather than addressing the tourism activity in a particular case (destination) or a context. Thus, it ignores some very specific aspects of sustainable tourism when applying these indicators to evaluate the level of sustainability of a certain tourist destination or tourism industry of a certain context.

By adopting a similar approach, Mearns (2010) presents a set of indicators of sustainable tourism in the form of issues vs. indicators.

Table 2: Indicators of Sustainable Tourism presented by Mearns in 2010

Issue	Indicator
Social Issues	Social Indicators
1. Local satisfaction with tourism	1.1 Local satisfaction level with tourism 1.2 Local community complaints
2. Effects of tourism on communities	2.1 Percentage who believe that tourism has helped bring new services or infrastructure 2.2 Other effects of tourism on the community
3. Education	3.1 Education of tourists 3.2 Education of community 3.3 Training and skills development of staff members
4. Community decision making	4.1 Community decision-making structures
5. Community benefits	5.1 Community benefits from tourism
6. Culture	6.1 Cultural appreciation and conservation
Economic issues	Economic indicators
7. Sustaining tourist satisfaction	7.1 Level of tourist satisfaction 7.2 Perception of value for money 7.3 Percentage of return visitors 7.4 Perception of sustainability 7.5 Tourist complaints
8. Tourism seasonality	8.1 Tourist arrivals by month 8.2 Occupancy rates for accommodation by month 8.3 Percentage of tourist industry jobs which are permanent or full time (compared to temporary/seasonal jobs)
9. Economic benefits of tourism	9.1 Number of local people (and ratio of men to women) employed in tourism 9.2 Revenue generated 9.3 Revenue spent in area

Environmental issues	Environmental indicators
10. Energy management	10.1 Per capita consumption of energy (per person day) 10.2 Energy-saving measures 10.3 Percentage of energy consumption from renewable resources
11. Water availability and conservation	11.1 Water use (total water volume consumed and liters per tourist per day) 11.2 Water conservation measures
12. Drinking water quality	12.1 Water treated to international potable standards
13. Sewage treatment	13.1 Sewage treatment systems
14. Solid waste management	14.1 Waste volume produced 14.2 Waste disposal (landfill, recycling, etc.)
15. Controlling use intensity	15.1 Number of tourists per square meter of the site
16. Biodiversity and conservation	16.1 Local community involvement in conservation projects in area
Crosscutting issues	Crosscutting indicators
17. Development controls	17.1 Existence of a development planning process including tourism
18. Networking and collaboration	18.1 Partnerships and collaborations

Source: (MEARNS, 2010)

The set of indicators introduced by Mearns in 2010 can be considered as a comprehensive and a further developed version of sustainable tourism indicators presented by WTO in 2004. These set of indicators address most of the aspects such as cultural appreciation and conservation and biodiversity and conservation which were missing in the indicators presented by WTO, but yet the weight it has on evaluating the real threat to the natural eco-systems and biodiversity cannot be considered as sufficient. Under the issue of biodiversity and conservation, the only indicator used is the local community involvement in conservation projects in area, thus it does not incorporate indicators such as threatened species, carrying capacities of certain eco-systems and disturbances to natural environment etc.

2.6. Existing Sustainable Tourism Implications and Evaluation Methods in Sri Lanka

Gunewardhana M.D & Sanjeevani H.L.G (2009) have attempted to evaluate the sustainable implications in Benthota and Hikkaduwa tourism destinations in Sri Lanka through a comparative assessment which is based on the Trio-fundamental requirements of sustainable development developed by Silva, S. (2002). The main

objective of this comparative assessment is to identify the appropriate planning strategies to address the prevailing issues which act as barriers to fulfill the trio-fundamental requirements of sustainable development. In doing that, they have first selected priority issues within each area and investigated them in detail using various indicators. The important part of this methodology is the initial identification of issues which act as barriers to fulfill the trio-fundamental requirements of sustainable tourism development.



Figure 1
Trio-fundamental requirements of sustainable development adopted from Silva, S. 2002.

Figure 3: Trio-fundamental Requirements of Sustainable Tourism

Source: Silva S., 2002

Even though this method is based on the principles of sustainable tourism, the limitation is that it mainly focuses on the case specific issues which have been identified subjectively. Therefore, there can be many other important aspects which directly constraint the sustainable approach which have not been identified or interpreted in this assessment. Further, this method does not assess the economic sustainability of the discussed tourism activities.

Tisdell C. & Bandara R. (2004) also have attempted to evaluate the contribution of one of the famous tourism attraction points in Sri Lanka; Pinnawala Elephant Orphanage (PEO), to the overall development of Sri Lanka. Even though, it does not directly in

the focus of sustainable development, the authors have developed few criteria which also interpret the sustainability aspects of the selected tourism venture. The analysis attempts to assess the fundamental characteristics of the businesses in the area, their dependency on the PEO, the nature of their backward economic linkages, and their ability to generate employment.

The indicators used are;

- (1) The distribution of businesses based on the number of persons employed
- (2) The dependency of the businesses on PEO
- (3) Use of locally/regionally produced or supplied products and materials by the businesses
- (4) The generation of employment by the businesses

Even though, these indicators assess the PEO's contribution to the economic development they do not well represent the sustainability of these economic aspects.

When studying the existing sustainable tourism evaluation methods, it can be understood that there isn't any systematic method developed so far to assess the overall sustainability of a tourism venture in the Sri Lankan context. Even though there are some methods which indirectly or partially assess the sustainability aspects of a certain tourism venture or destination point, they do not provide a holistic framework based on principles of sustainable tourism.

2.7. Conclusion

When studying above sets of sustainable tourism indicators, it is obvious that neither of them can be considered as complete and universal sets of indicators as they have limitations when considering certain aspects of sustainable tourism. One of the key points is that neither of the indicator sets do refer to the principles of sustainable tourism directly but are derived based on different issues related to sustainable tourism. There is a need to develop an alternative framework to assess the sustainability of a tourism destination, which is directly linked with sustainable tourism principles.

Since the sustainable tourism principles are elaborated in different ways as discussed above, the set of principles which are elaborated analytically along with sub

components was selected to be used as the base for proposed framework. In that case, the set of principles introduced by Panasiuk in 2011 and summarized by Niedziolka in 2012 based on three pillars of sustainable development, was adopted as its detailed structure of presentation is useful in developing the framework of indicators to evaluate the sustainability of particular tourism destination. Therefore, the components of three basic pillars of sustainable tourism; economic, environment and socio-cultural as presented by Panasiuk in 2011 was taken as the expressions of three major pillars of tourism sustainability. **Then a comprehensive review of three sets of indicators was carried out to formulate indicators of proposed framework based on existing indicators of sustainable tourism. (Annexure 01)**

In addition, the needs and concerns of different components and respective actors of tourism industry as explained in the integrated model of tourism were also considered as a major input when developing the proposed framework to evaluate sustainability of a particular tourism destination.

Expressions of Sustainable Tourism Principles Proposed Indicator & Indicator Assessment Methods Adopted as the Base for the Proposed Framework

Baseline economic aspects

1. Economic Profitability
2. Local Prosperity
3. Quality of Employment
4. Social Equity

1. Economic profitability

Tourism provide economic benefits in many ways by bringing investments in public sector infrastructure and services, creating both direct and indirect employment opportunities at destinations, resulting revenue earned from tourist spending, taxes earned from tourism business and by increasing asset value (land and infrastructure prices). Revenue earned by tickets and other activities is an indicator of economic profitability.

Increase length of stay as well as the availability of spending opportunities and visitors' awareness of them also contribute to increase economic profitability. Longer the visitor stays, higher the economic profitability. This can be achieved by promoting longer stay markets and encouraging existing visitors to stay longer, at the time or on return visits.

Table 3: Proposed Indicator & Indicator Assessment Methods based on Economic Profitability

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

Proposed Indicator	Assessment Method
Annual growth of direct revenue generated at the considered tourist attraction (Total fees collected by community for access to the destination)	Past Records/ Interviewing Permit Issuing Officers
Tourist spending	Tourist Perception Survey
Number of tourism business increase/decrease & percentage owned locally	Local community Perception Survey/Field survey

2. Local prosperity

Ensuring that economic benefits are secured at the place where costs are incurred is an important principle of sustainable development. Generally, local communities have to meet a number of external costs associated with tourism. Thus, it is important to maximize the economic returns to the community. As all services related with tourism industry make a very large number of purchases from a range of suppliers (tour operators, food producers, transport services, guides, etc.) there are ample opportunities to strengthen the level of income retained locally.

When businesses are locally owned, a higher proportion of profits is likely to be retained within the community. At the same time, the tourism industry is ready to purchase raw materials and other supplies from local products, it gives higher opportunity for many people in the community to gain indirect benefits from the tourism industry. Encouraging tour operators to use locally based service providers and products, maximizing the proportion of local suppliers in hotel chains, restaurants, providing local community to sell their local products such as handicrafts, textile and etc. directly to tourists are some means how local prosperity can be maintained while engaging local community in the direct tourism market. Using local products can greatly enhance the authenticity of the tourist offer and the multiplier effect of tourism in local economies. Local prosperity can be assured by having a large share of locally supplied goods and services in the tourism market. Thus, the proportion of community benefited directly and indirectly from tourism activities can be considered as an indicator of local prosperity.

Table 4: Proposed Indicator & Indicator Assessment Methods based on Local Prosperity.

Proposed indicator	Assessment Method
Supply of goods and services to tourism enterprises	Local community Perception Survey /Field Survey
Percentage of families economically benefited from tourism activities fully and partially	Local community Perception Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

3. Quality of employment

Reinforcement the number and quality of local jobs created and supported by tourism, including the level of pay, conditions of service and accessibility to all without discrimination by gender, race, disability or in other ways is an important aspect to ensure long term economic sustainability of a tourism destination.

Providing employment opportunities can contribute to the quality of life in host communities. However, usually the tourism jobs are often quite low paid, with poor conditions and little security of employment due to seasonal, part-time and often family-based employment nature of tourism-based employment. Sometimes, tourism service industry jobs are regarded non-professional or casual work. By improving conditions for workers, it can lead to better performance, increased staff retention, and greater efficiency and productivity leading to fine staff-customer relationships and greater tourists' satisfaction. It ultimately contributes to ensure the long-term economic sustainability of the tourism destination.

Table 5: Proposed Indicator & Indicator Assessment Methods based on Quality of Employment.

Proposed indicator	Assessment Method
Satisfaction level of people who are engaged in tourism related job activities in terms of wages, work environment, quality of job and equity	Local community Perception Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

4. Social equity

Providing economic and social benefits to the local community alone is not sufficient if they are not shared equally. In tourism industry, there is a higher probability that people with economic capabilities and social power are to get more benefits than the under privileged people of lower income. Thus, it is mandatory to ensure that both economic and social benefits are shared equally to ensure long term economic sustainability. Tourism policies concerned with social equity should seek to benefit disadvantaged people by delivering economic and social benefits to them as well as strategic measures should be taken to realize it practically. Especially, tourism industry

can be seen as a potential to tackle poverty, which is given high prominence in international declarations and related agendas for sustainable development

Table 6: Proposed Indicator & Indicator Assessment Methods based on Social Equity.

Proposed indicator	Assessment Method
The percentage of community who believe that both economic and social benefits of tourism are shared equally	Local community Perception Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

Environment Aspects

1. Physical Integrity
2. Biological Diversity
3. Effective Waste Management
4. Environmental Cleanness

1. Physical integrity

Maintaining and enhancing the quality of landscapes, both urban and rural, while avoiding physical and visual degradation of the environment is important for the physical integrity and the long-term environment sustainability.

This indicator emphasizes about the physical structure of places and their aesthetic quality and appearance. It is an important fundamental requirement in the environmental perspective, as well as affecting the wellbeing of local people. It contributes for the long-term health of the tourism industry as the physical attractiveness of destinations is a key to attract visitors.

With regard to visual impacts, usually it is focused on the quality of rural landscapes and how they affect o attract tourists, and are affected (changed) by, tourism.

The integrity and aesthetic quality of built as well as natural environments in rural and urban areas associated with any destination makes a significant contribution to the long-term environment sustainability.

Table 7: Proposed Indicator & Indicator Assessment Methods based on Physical Integrity.

Proposed indicator	Assessment Method
Visitor satisfaction of quality of landscape within the tourism area	Tourist Perception Survey
Visitor satisfaction of visual quality and character of the area	Tourist Perception Survey
Local community satisfaction interaction with tourist	Local community Perception Survey
Local community satisfaction regarding the Tourism contribution to preservation of cultural wealth	Local community Perception Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

2. Biological diversity

Conservation of natural areas, habitats and wildlife, and minimize damage to them is essential to ensure long term environment sustainability. This is a factor which reveals both positive and negative impacts of tourism. The sensitivity of this indicator is that it evaluates the possibilities of how the very environments which attract visitors become the most vulnerable.

For instance, the development of coastal zones has caused much loss of habitat and dune destruction, marine environments, such as coral reefs, have been seriously damaged by over use or poor practice linked to diving operations, boats and shore-based facilities have also caused extensive damage through physical destruction and pollution. All ecosystems; mountains, deserts, rainforests, wetlands or inland waters, have their own special sensitivities which need to be considered when planning for tourism activities. Utilizing the income from tourism is a critically important component of funding for conservation in many national parks, reserves and other protected areas.

Preventing destruction of biodiversity by tourism and its related activities is also very important as maintaining physical integrity, to ensure the visitor appeal and interest at many destinations.

Table 8: Proposed Indicator & Indicator Assessment Methods based on Biological Diversity.

Proposed indicator	Assessment Method
Complaints and threats for natural habitats	Records in Local Authorities/Previous Studies /Field Survey
Tourists satisfaction on special eco-systems and natural species within the area	Tourist Perception Survey
Community satisfaction on the conservation of natural habitat and wild life within tourism area	Local community Perception Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

3. Environmental cleanness

Maintaining environmental cleanness which is regarded as an important aspect in ensuring environment sustainability refers to reducing waste and harmful emissions to the environment in order to preserve the quality of the air, water and land that sustain life, health and biodiversity.

Pollution prevention and control throughout the lifecycle of tourism development, during and after the use of facilities is important for the safety of ecological systems as well as to avoid negative impacts on tourists themselves.

Promoting resource efficiency, waste and pollution control can be achieved by changing the consumption patterns of tourists and tourism enterprises. Significant levels of energy are consumed by the tourism sector both through fixed assets (buildings etc.) and mobile assets (trains, motor vehicles and ferries etc.). Reductions in energy consumed have positive impacts on operational costs of enterprises while reducing pressure on utilities and have major environmental benefits, primarily through reducing consumption of natural resources and lowering associated greenhouse gas emissions. Thus, use of solar energy which is an alternative energy source is an indicator that a tourism destination is contributing to environment cleanness in broader picture.

Table 9: Proposed Indicator & Indicator Assessment Methods based on Environmental Cleanness.

Proposed Indicator	Assessment Method
Percentage of renewable energy uses	Field Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

4. Effective waste management

The management of liquid waste (sewage) is a key concern for tourism as tourism related activities generate large amounts of liquid waste and solid waste. There are many examples where tourism industry has caused large environment damages by contamination of its key resources as beaches, rivers and lakes. Pollution can take place in many ways, both from resorts themselves and from local communities and industries degrading the destination, and contributing to diseases and damages to wildlife and natural resources. Contaminants can nearly close down destinations and harm the image and tourism arrivals for years. There are examples, contamination has resulted in closure of resorts.

The right management of solid waste is essential to ensure environment sustainability. The ‘out of sight, out of mind’ solution is not seen as a wise solution as there are now modern concepts of hierarchy for minimizing waste: reduce, reuse, recycle, residual treatment and disposal. Quantification of waste volumes and identification of sources and destinations to ensure effectiveness in waste management is an indicator of environment sustainability.

Table 10: Proposed Indicator & Indicator Assessment Methods based on effective waste management.

Proposed indicator	Assessment Method
Volume of waste produced at the destination & Method of disposal)	Local Authority records (get information of their system)

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

Social Aspects

1. Welfare of The Community
2. Cultural Wealth
3. Meeting Expectations of Visitors
4. Local Control

1. Welfare of the community

To make sure social sustainability at a certain tourism destination, it is important to maintain and reinforce the quality of life in local communities, promoting equal access to resources, amenities and life support systems, education while avoiding any form of social or environmental degradation or exploitation.

Tourism can impact the social wellbeing of communities in many ways, both positively and negatively. Providing jobs, additional investments and spending brought by tourism can support a wide variety of amenities that add to the quality of local people's lives. These include essential services such as water, energy, roads and transport services, health services, shops, garages, leisure and entertainment facilities, and outdoor amenities.

Sometimes, the presence of visitors can make a negative impact by putting pressure on facilities and services, adding to the cost of their provision and maintenance, discouraging the enjoyment of them by local people and making access to them difficult or even impossible. Tourism developments and activity also sometimes interfere with other sources of livelihood and disrupt access to them. Thus, it is important to measure the community's satisfaction on existence of tourism within the area to evaluate the balance between the costs and benefits resulted for local community.

At the same time, high quality loyal labour force is a great asset to an enterprise and to the reputation of a destination. This can be achieved through investment in skill development and vocational training, and reinforced by occupational development and opportunities for promotion and advancement which again contributes to the improvement of local community in education, skills and sharing experiences.

Table 11: Proposed Indicator & Indicator Assessment Methods based on welfare of the community.

Proposed indicator	Assessment Method	
Local community's satisfaction on the existence of tourism within the area	Local community Perception	Survey
Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge	Local community Perception	Survey

Source: MEARNNS, 2010 & ISDTD: A Guidebook by WTO, 2004

2. Cultural wealth

Cultural wealth is an expression of social sustainability of a particular tourism destination as it emphasizes the need to respect and enhance the historic heritage, genuine culture, traditions and uniqueness of host communities.

Understanding and respect of, cultural diversity between nations and peoples is a basic principle of sustainable development. Tourism can be a substantial force which demands the conservation of historic and cultural heritage and can encourage arts, crafts and other creative activities within communities. By given that a source of income based around local culture, tourism can encourage communities to value their cultural heritage more highly. However, it is important to avoid the possibilities of distortion and degradation of culture and heritage in the way they are promoted to tourists.

Cultural changes are unavoidable when people from different socio-cultural background come together in some degree of interaction. Thus, the local community's and tourists' satisfaction of interactions, and experiences cultural heritage values and customs can be a good indicator of preserved cultural wealth in a particular destination.

Table 12: Proposed Indicator & Indicator Assessment Methods based on Cultural Wealth.

Proposed indicator	Assessment Method
Tourists satisfaction level regarding the experience of cultural heritage, values and customs of the host community	Tourist Perception Survey
Tourists satisfaction on interaction with local community	Tourist Perception Survey
Local community satisfaction interaction with tourist	Local community Perception Survey
Local community satisfaction regarding the Tourism contribution to preservation of cultural wealth	Local community Perception Survey

Source: MEARNS, 2010 & ISDTD: A Guidebook by WTO, 2004

3. Meet the expectation of visitor

Higher tourist satisfaction represents the higher possibilities of tourists returns and recommendation of the destinations to other travelers thus it is an indicator of long term overall sustainability of a destination. Tourist satisfaction is based on many different factors, including the range of attractions of a destination, its market positioning, the quality of services, the expectations of tourists, and the experiences of each tourist during his/her stay. The percentage of tourists who return is an indicator of their levels of satisfaction in previous visits.

Providing a safe, satisfying and fulfilling experience for visitors which is available to all without discrimination by gender, race, and disability or in other ways is an important aspect of both economic and social sustainability of a particular tourism destination. The social dimension and equity principles associated with sustainable development are applicable to tourists as well as to the host population. A tourist destination should not be limited for the experience of tourists of certain income and cultural groups or particular nationalities but it should be affordable and open for all types of tourists without discrimination.

The great recreational and educational benefits brought by tourism should be respected and made as widely available as possible without discrimination. This indicator

coming under social sustainability emphasizes the importance of viewing visitor satisfaction and fulfillment as an aim in its own right, rather than simply as a means of economic benefit. It is also about the responsibilities that destinations have towards the wellbeing of their guests.

Table 13: Proposed Indicator & Indicator Assessment Methods based on expectation of the visitor

Proposed indicator	Assessment Method
Level of Tourist satisfaction on overall tourism experience in the area.	Tourist Perception Survey
Percentage of return visitor	Tourist Perception Survey
The percentage of tourist who believe the particular tourism destination is sustainable	Local community Perception Survey/Previous records

Source: MEARNNS, 2010 & ISDTD: A Guidebook by WTO, 2004

4. Local control

Giving to people responsibility and control over their lives is a fundamental principle of sustainable development. Furthermore, tourism projects that engage local communities directly in their planning and implementation are much more likely to be successful as it avoids the actions of pressure groups who act against the tourism activities of the area. It is not only about engagement through consultation processes; it is also about give power to communities to influence decisions about the developments and activities of the area that will directly affect their future.

Table 14: Principles Proposed Indicator & Indicator Assessment Methods based on local control.

Proposed indicator	Assessment Method
Local community's satisfaction on their participation in decision making related to tourism in the area	Local community Perception Survey

Source: MEARNNS, 2010 & ISDTD: A Guidebook by WTO, 2004

CHAPTER THREE

RESEARCH DESIGN

3.1. Introduction

This chapter presents the research design adopted when developing the framework to evaluate the sustainability of tourism venture/project operating at a local scale. The research questions are formulated first and then the proposed framework is presented in terms of sustainable tourism principles and respective expressions and indicators. The latter part of the chapter describes the case study selection and data collection and analysis methods used in conducting the research.

3.2. Research Questions

The study attempts to develop a methodological framework of indicators which is directly interlinked with sustainable tourism principles in order to evaluate the sustainability of a tourism destination. As the second stage of the study, it tries to apply the developed framework to a case study in Sri Lankan context and test the applicability of the framework. In this process, the research attempts to answer following specific questions.

- 1) What is the most appropriate set of sustainable tourism principles that can be adopted as the base to develop the framework?

(This question is answered based on the comprehensive literature review done on available different interpretations of sustainable tourism principles.)

- 2) What are the indicators that should be used under each sustainable tourism principle in order to evaluate the sustainable tourism practices adopted in a tourism destination?

(The indicators to evaluate sustainable tourism practices were first selected based on the set of indicators introduced by Mearns in 2010 can be used as a comprehensive and a further developed version of WOT in 2004 (Identified 12 baseline Issues and their associated indicators.) The list of baseline indicators covers a range of social, economic and environmental issues like to be found in most destinations. The baseline indicators leave some certain gaps with

respect to the selected case study, as a result it was important to include additional and relevant indicators which relate more specifically to the characteristic of PINP. Thirteen baseline aspect with 40 associated indicators were identified and it was narrow down based on evaluation method to identify the most appropriate indicators suitable for the selected case study

3) How is the selected case study (tourism destination) in terms of indicators presented in the proposed framework? *(The proposed framework of indicators was applied to a selected tourism destination and it was evaluated under each indicator to find its level of sustainability)*

3.3. The Proposed Framework to Evaluate the Sustainability of a Tourism Destination

The proposed framework is constructed based on the three aspects of sustainable tourism; economic, environment and socio-cultural. Expressions of each thematic aspects of sustainable tourism are derived based on the Making Tourism More Sustainable: A Guide for Policy Maker by UNEP & WTO in 2005 and Indicator of Sustainable Development for Tourism Destinations: A Guide Book ,2004. The set of sustainable tourism development was selected for the framework based on the initial literature review on sustainable tourism principles which is discussed under the second chapter of this report. The indicators of each expression were developed based on the existing indicators presented by WTO in 2004 and Mearns in 2010.

40 indicators were developed initially under each expression. These 40 indicators were narrowed down to 24, by evaluating those under four criteria such as;

- a) Relevance to the expression & elaboration
- b) The level of holistic interpretation of the expression
- c) Effectiveness as a measurable indicator
- d) Availability of data (Possibility of extracting or collecting the data with related to the general Sri Lankan tourism context)

The evaluation of each indicator under above four criteria was conducted by scoring them in a scale of 1 – 5. The composite value of all 04 scores under each indicator which was presented as a percentile was used to select the final indicators. Accordingly, indicators which scored equal or above 75% were selected as the final indicators. The selected indicators were given weight 1-5 based on their final score (75 to 1, 80 to 2, 85 to 3 90 to 4 and 95 to 5). The evaluation table of indicators is presented in the **Annexure 02** and the final framework is presented in the table below.

Measuring of indicators

According to the literature on selected indicators, quantitative measurement methods based on formulas can be used to evaluate the indicators. But due to practical limitations such as non-availability of statistical data, cost of data and complexity in calculation methods time limitations it was attempted to measure the indicators based on both quantitative and qualitative methods depending on the data availability. In order to overcome the problems with data availability, the indicators were attempted to be measured in terms of perceptions of community and tourists who are the main stakeholders (agents) of a tourism destination. The perceptions were surveyed using a structured questionnaire which aimed to get the perceptions as a quantitative data as much as possible using indicators such as level of satisfaction and agreements. Indicators for which secondary and field information are relevant were analyzed both qualitatively and qualitatively as suitable.

Table 15: Proposed Framework to evaluate sustainability of a tourism destination

Baseline Economic Aspects	Selected Indicator	Assessment Method
Economic Profitability	(1) Annual growth of direct revenue generated at the considered tourist attraction(s) (revenue from tickets, donations)	Past Records/ Interviewing Permit Issuing Officers
	(2) Increase in number of hotels, restaurants, shops and other tourism service activities in the area	Records in Local Authority / Field Survey
	(3) No. of days stay at PIMNP are by tourists	Tourists Perception Survey

Local Prosperity	(4) The share of supply of locally produced goods and services	Records in Local Authority / Field Survey
	(5) Percentage of families economically benefitted from tourism activities fully and partially	Records in Local Authority / Field Survey
Quality of Employment	(6) Satisfaction level of people who are engaged in tourism related job activities in terms of wages, work environment, quality of job and equity	Community Perception Survey
Social Equity	(7) The percentage of community who believe that both economic and social benefits of tourism are shared equally	Community Perception Survey
Environmental Aspects	Selected Indicator	Assessment Method
Physical integrity	(8) Visitor satisfaction of quality of landscape within the tourism area	Tourists Perception Survey
	(9) Visitor satisfaction of visual quality and character of the area	Tourists Perception Survey
Biological diversity	(10) Complaints on threats for natural habitats and natural species in the area as perceived by environment specialists and the level of effort made by responsible bodies to mitigate them	Records in Local Authority / Previous Studies / Field survey
	(11) Tourists satisfaction on special eco-systems and natural species within the area	Tourists Perception Survey
	(12) Community satisfaction on the conservation of natural habitat and wild life within tourism area	Community Perception Survey

Effective Waste Management	(13) Volume of waste produced at the destination & Method of disposal (recycling, land filling, used for energy etc.)	Records in Local Authority
Environmental Cleanness	(14) Percentage of renewable energy uses (solar energy and other renewable energy)	Field Survey
Social Aspects	Selected Indicator	Assessment Method
Welfare of the community	(15) Local community's satisfaction on the existence of tourism within the area	Community Perception Survey
	(16) Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge	Community Perception Survey
Cultural Wealth	(17) Tourists satisfaction on the cultural heritage, cultural values & customs	Tourists Perception Survey
	(18) Tourists satisfaction on interaction with local community	Tourists Perception Survey
	(19) Complaints on any threat to cultural heritage, culture and customs as perceived by local community and expertise of relevant fields and the level of efforts to mitigate them	Records in Local Authority / Previous Studies
	(20) The percentage of local community who believe tourism has helped to preserve cultural wealth	Community Perception Survey
Tourist Satisfaction	(21) Level of tourist satisfaction on overall	Tourists Perception Survey

	tourism experience in the area	
	(22) Percentage of return visitors	Tourists Perception Survey/Previous Records
	(23) The percentage of tourists who believe the particular tourism venture is sustainable	Tourists Perception Survey
Local Control	(24) Local community's satisfaction on their participation in decision making related to tourism in the area	Community Perception Survey

Source: Compiled by Author

3.4 Case Study

As the proposed framework above is designed to evaluate the sustainability of a particular tourism destination. Out of many tourism destinations of Sri Lanka, Trincomalee was selected as it is one of the blooming tourism destinations which is at the development stage of tourism life cycle with compared to other destinations. Following the end of 30 years' conflict, Trincomalee's tourism industry is rapidly developing as it holds numerous tourism attractions which were hidden before without much popularity but which are now sought after by both national and international tourists due to increasing publicity.

As there are a few popular tourism sub destinations within Trincomalee area which operate in terms of separate tourism destination, a sensitivity analysis was conducted to select the most sensitive tourism sub destination in Trincomalee. The reason for considering the sensitivity as one of the concerns in selecting the case study is because, highly sensitive tourism destinations generally deal with considerable level of challenges in meeting sustainability thus it was required to test the applicability in the proposed framework in capturing and interpreting these challenges.

3.4.1. Selection of case study

Out of many tourism attractions within Trincomalee area, Pigeon Island, Koneshwaram Temple, Fort Fredric, Trico Town beach, Uppuveli Beach, Kanniya Hot Springs, Marble Beach and Velgam Viharaya are comparatively more popular among tourists.

The National Environmental Act (the part IV C of the NEA No. 47, of 1980, the Gazette Extraordinary No. 772/22 of 24th June 1993 as amended by the Gazette Extraordinary No. 859/14 of 23rd February 1995) has identified several areas which are considered as ‘sensitive areas’ based on their declaration as special zones under different acts and ordinances. **(Annexure 03)**

Accordingly, it was identified that most of the above tourist attractions in Trincomalee area are considered as ‘sensitive areas’ as mentioned in the below table.

Table 16: Acts / Ordinances in effect for the Trincomalee area

Particular Act / Ordinance	Tourist Attraction (s)
The National Heritage Wilderness Act No. 3 of 1988	Pigeon Island National Park
Coastal Zone -Coast Conservation Act, No. 57 of 1981	Nilaweli Beach, Trinco Town beach, Marble beach, Uppuweli Beach
Any archaeological reserve, ancient or protected monument - Antiquities Ordinance (Chapter 188)	Fort Fedric, Koneshwarm temple, Vilgam viharaya

Source: Compiled by Author

Even though, most of the tourist attractions considered within Trincomalee area are declared as sensitive areas as per the National Environment Act, they can be classified based on the level of sensitivity (high, moderate & low) as specified in the Eastern Province Physical Structure Plan (2004 – 2007) prepared by National Physical Planning Department. **(Annexure 04)**

Table 17: Sensitivity Classification of EPPSP - 2004

Level of Sensitivity	Tourist Attraction (s)
Highly environmentally sensitive areas (fragile ecosystems)	Pigeon Island National Park
Moderately sensitive areas (forests and coastal ecosystems)	Nilaweli Beach, Trinco Town beach, Marble beach, Uppuweli Beach
Less sensitive areas (catchment and riparian areas)	Kanniya hot springs, Velgam viharaya

Source: National Physical Planning Department, 2004

As per the above classification, it can be identified that Pigeon Island National Park is containing a high level of sensitivity as it is coming under fragile eco-systems. Accordingly, Pigeon Island National Park was selected as the case study to apply the proposed framework and determine the level of sustainability.

3.4.2. Selected case study - Pigeon Island National Park – Trincomalee

The Pigeon Island National Park is one of the two marine national parks of Sri Lanka. The national park is situated 1 km off the coast of Nilaveli, a coastal town in the Eastern Province, encompassing a total area of 471.429 hectares. The island's name derives from the rock pigeon which has colonized it. Pigeon Island was designated as a sanctuary in 1963. In 2003 it was re designated as a national park.

This national park is the 17th in Sri Lanka. The island was used as a shooting range during the colonial era. Pigeon Island consists of two islands; large pigeon island and small pigeon island. The large pigeon island is fringed by a coral reef, and is about 200 m long and 100 m wide. Its highest point is 44.8 m above mean sea level. The small pigeon island is surrounded by rocky islets.

3.5. Study Area

The study area was selected considering the settlements of the immediate host communities of Pigeon Island Marine National Park. Accordingly, two villages naming Nilaveli and Gopalpuram falling within 2km long beach stretch from Nilaveli Beach hotel to Nilaveli Beach road at south end with an approximate average width of 1.5km were selected as the main study area.



Figure 4: Study area

Source: Compiled by Author

3.6 Data Collection

Collection of data under each indicator of the proposed framework was done by adopting various research techniques such as field observations, photographic surveys, focused group discussions, formal and informal interviews, perception surveys by using questionnaire. The information required for the 24 indicators were selected using above methods, based on the nature of the data. The main data collection method adopted in here was the Perception Surveys where two perception surveys were undertaken namely Community Perception Survey and Tourists Perception Survey.

3.6.1. Community perception survey

The sample of community perception survey included 50 of households located within the study area. The sample selection method applied here was the Random Sampling Method. 50 households were randomly selected from the list of households located within the study area. Then each of them were visited separately and a member of a household was interviewed for the perception survey. At instances where the households refused to take part in the survey and were not present at house at the moment of visit, some other households were randomly selected in place of them. The assistance of Tamil – Sinhala translator was used during the survey for the convenience in communication.

Part of Nilaveli & Gopalpuram village



Figure 5: Community perception survey areas

Source: Compiled by Author

3.6.2. Tourists perception survey

The sample size selected for the survey was 50 tourists. The sample selection method applied for the Tourists Perception Survey was again the Random Sampling Method. Accordingly, 25 local tourists and 25 foreign tourists were surveyed. The surveys were conducted mainly at the Pigeon Island and at two boat launching points.

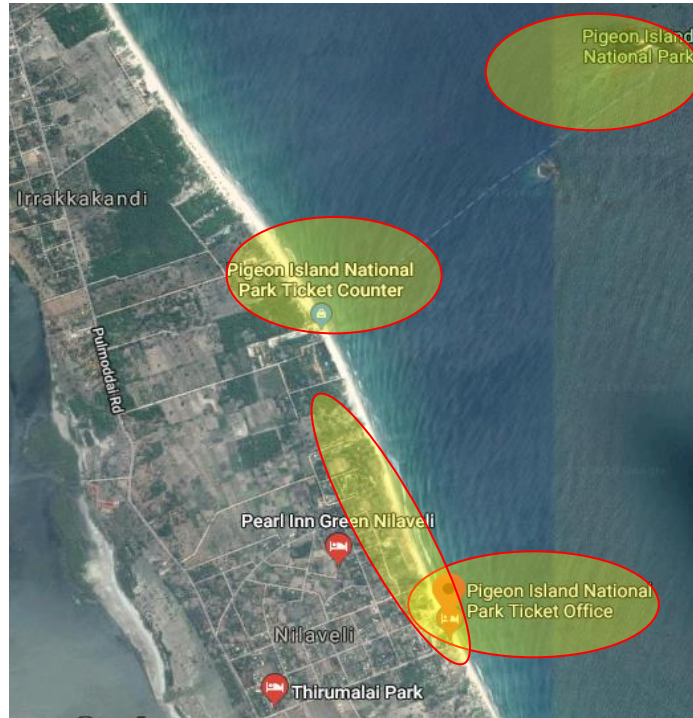


Figure 6: Tourist perception survey areas

Source: Compiled by Author

3.7. Data Analysis

24 indicators selected were evaluated based on the filed data, secondary data and survey findings. Initially, the descriptive method was used to present the qualitative and quantitative results under each indicator. However, in the latter stage, the weighted sum method was used to quantify the overall economic, environmental and socio-cultural sustainability.

In the weighted sum method, the formula used is based on weighted sum model. Weighted sum model is a simple method for evaluating a number of alternatives in terms of a number of decision criteria. However, since some of the indicators in the proposed framework are qualitative indicators, these results were first quantified in to a percentage value based on the severity of the indication. All the percentage values

(x) gained under each indicator were then multiplied by its weight percentage (ratio) (w). The summation of all (xw) values of indicators under each thematic sustainability components gave the overall sectoral sustainability levels. The average of three sectoral sustainability levels was used to indicate the overall sustainability level of the PIMNP area.

CHAPTER FOUR

ANALYSIS & RESULTS

4.1. Introduction

This chapter presents the main analysis of the research study which is the evaluation of tourism sustainability in Pigeon Island Marine National Park (PIMNP) in terms of the proposed framework in third chapter. The chapter first presents a detailed description of the PINP including its location, environment, legal status and its current operational details. As the proposed framework consists of 24 indicators, the chapter evaluates sustainability of PINP as a tourism destination under each indicator based on qualitative and qualitative data analysis respectively.

4.2. Pigeon Island Marine National Park in Trincomalee

4.2.1. Location & environment

Trincomalee, which is located on the east coast of Sri Lanka is well known tourist destination because of many natural attractions such as deep-water natural harbor, abundant fish resources, large marine fauna such as whales and dolphins and attractive coral reef habitats. Pigeon Island and Nilaveli area are places in Trincomalee where large coral patches are located, thus they have been major destination of tourists who are fond of coral reefs.

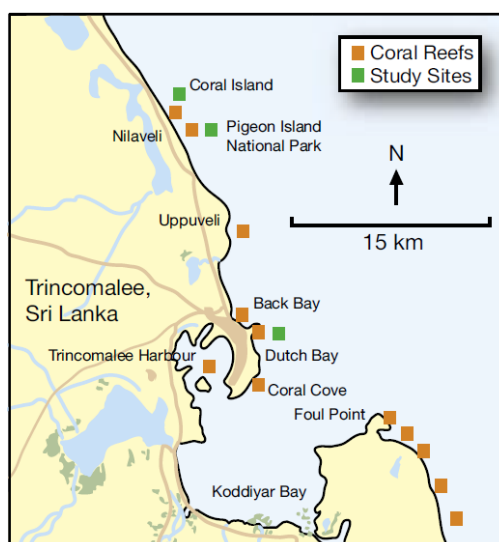


Figure 7: Coral reef areas in Trincomalee

Source: Status of Coral Reefs in Trincomalee

Sri Lanka - NARA

Pigeon Island Marine National Park is located in Trincomalee District (N 8° 43' 0" and E 81° 9' 0" to N 8° 36' 0" and E 81° 14' 0") of Sri Lanka. It is located approximately 1km off shore from Nilaveli Beach. There are several rock outcrops ranging about 300 m – 500m towards south and south-east of Pigeon Island and the one on the south is known as “Salabalas Rocks”. Pigeon Island consists of two small beaches on the south-western and northern flanks of the island. The main coral reef is located in front of the south-west beach and it is about 200m long and 100m wide and its depth ranges from 1m to 6m. Pigeon Island consists of two islands, where the coral patches are mainly located within the large island. At present the large island is known as the “Pigeon Island” or “Pura Malei” in Tamil and the small island is known as the “Crow Island”. Pigeon Island is an elongated island in shape which is about 530m in length and about 175m in width at its broadest point. Crow Island which is circular in shape has approximately 115m diameter. There are few rocks present in these islands and the largest of them is called as the “Knife rock”. The most of the surrounding area of the two islands consists of rocky reef habitats interspersed with old limestone reef structures and sandy patches.



Figure 8: Satellite Image of Pigeon Island

Source: Preparation of Comprehensive Land Use Map for
Pigeon Island – Awarana Env. Mgt. Services

4.2.2. Legal status of Pigeon Island

Both Pigeon Island and Crow Island having an extent of approximately 4.6 ha were declared as a ‘sanctuary’ under Fauna and Flora Protection Ordinance in 1974 with the objective of protecting the nationally endangered wild rock pigeons that colonize the rocky cliffs of the islands in large numbers. Later, in 2003 the Islands together with the surrounding sea area within a one-mile radius was declared as a ‘Marine National Park’ by the Extraordinary Gazette No. 1291/16. The National Park is officially named as “Pigeon Island Marine National Park”. The PIMNP area is a dumbbell shaped area, which radiates nearly 1km from the center points of both islands. Accordingly, the total area of the PIMNP is 471.429 ha and it is currently governed by the Department of Wildlife Conservation under the regulations of the Flora and Fauna Protection Ordinance. A part of Nilaveli beach which is a world-famous tourist destination, also falls within the boundaries of PIMNP.

Even though the islands were declared as a marine national park in 2003 with the objective of conserving the existing marine biodiversity of the area, the conservation activities were not properly launched until 2010 due to the conflict and other issues prevailed in the area.

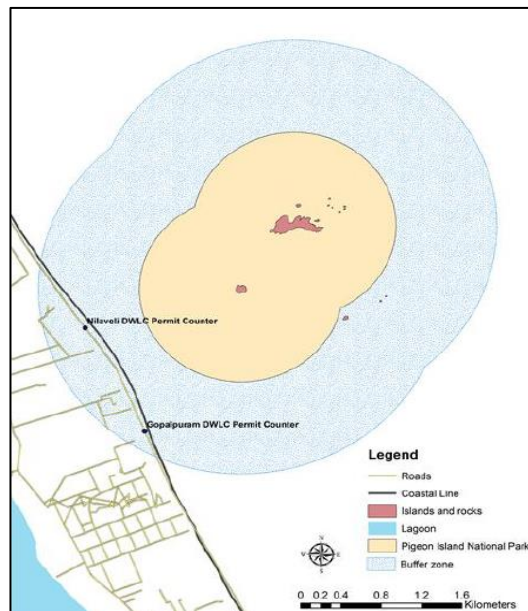


Figure 9: PIMNP Boundary

Source: Recommendations for Co-existence of
Coral Reef Conservation and Tourism at PINP

4.2.3. Pigeon Island marine national park conservation project

Pigeon Island Marine National Park Conservation Project (PIMNPCP), 2012 – 2013 is a project implemented by the Green Movement in Sri Lanka under UNDP funds. This project conducted a comprehensive study and presented a conservation scheme for the PIMNP. As per the study, it has divided the main coral reef on the Pigeon Island into four sections A, B, C and D as shown in the image.

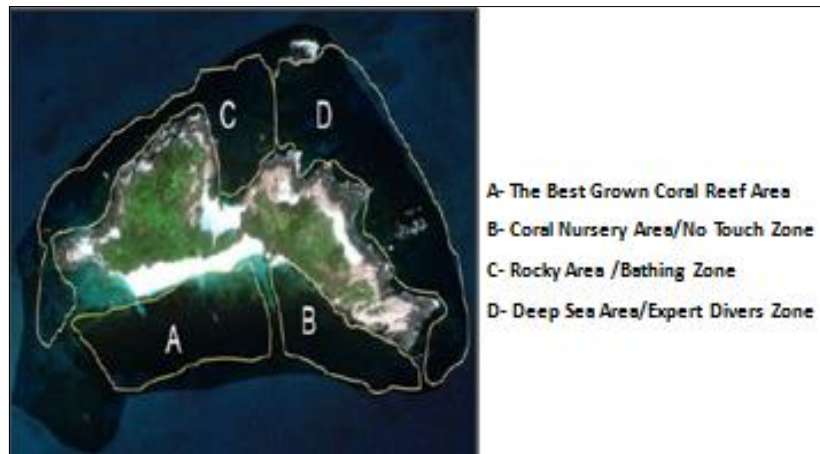


Figure10: Main Zones of Pigeon Island

Source: PIMNPCP, 2012 - 2013

The study has identified that the zone A has the best-grown coral reef area and reef grows up to 2m in some locations. Hence the fish population is also higher in this zone. However, the study points out that the threat from invasive species and butterfly fishes also is considerably high in this zone.

As per the study, the zone B includes a coral nursery or a reef that is re-growing. Therefore, the study suggests that this zone should be restricted to scientific researchers only and should be preserved as a 'No Touch Zone'. The reef found here is not much older and the depth is around 1m. It has been recorded that previously this reef had been completely destroyed. The reef could be damaged by even a small incident as the growing corals are relatively weak. Fish diversity in this area is at a minimum level and invasive species are not reported in the zone.

The rocky area in the zone C is the most suitable area for bathing activities. Due to the geological features and the relatively low biodiversity found in this zone, the study suggests that this area is suitable for bathing activities. Visitors who cannot dive can

use this zone for leisure activities. The depth of zone increases from 10 to 20 feet towards the sea. However, there is a considerable threat of reduction of coral diversity due to bathing activities in this zone.

The zone D is a deep-sea area and it is suitable for expert divers as well as the diving learners. The depth of the zone between 6-10m and there are few large colonies of coral in few locations. The study recommends that this area is suitable for visitors with a sound diving ability.

4.2.4. Current operational pattern in PIMNP

4.2.4.1. Issue of permits

The Pigeon Island is usually visited by Tourists via boats. There are local boat operators who provide boating services to the tourists, and there are two points from which the boat tours are launched. There are two counters at these points which issue permits to the visitors of PIMNP. These two points are located at Nilveli about 2.2km away from the island and at Gopalpuram which is about 3.2km away from the island.



Figure 11: The boat launching points to PINP

Source: PIMNCP, 2012 - 2013

The breakdown of the permit charges is as follows for both local and foreign tourists.

Table 18: Breakdown of Permit Charges at PIMNP

Category of Allocation	Local	Foreign
Park fees for entry (tourist)	40	1,280
Local adult (boat drivers)	-	40
Service charges	300	1024
Charges for parking vehicle (boat)	125	125
15% Vat	69.75	296.28
Total for 1 individual	520.80	2,765.28
Total for 8 individuals (including the boat driver for foreign tourists)	834.40	11,366.88

Source: Recommendations for Co-existence of Coral Reef Conservation and Tourism at PINP

Even though, soon after the end of conflict in 2009, the Pigeon Island was visited by tourists, it was not properly managed at that time. Therefore, records reveal that in 2010, the Pigeon Island was visited by tourists without any permit to view wildlife as stipulated by Fauna & Flora Protection Ordinance. However, PIMNP was re-opened for public in May, 2011 and the issue of permits was implemented from there onwards. The issue of permits to tourists to observe wildlife within PIMNO is regulated based on Extraordinary Gazette No. 1612/37 of 31st July 2009. The permit issuing procedure is quite different from usual procedures as it promotes “group tourism” rather than individual options. According to the above table, it is evident that a considerably large revenue is generated by issuing permits to foreign tourists rather than locals.

4.2.4.2. Boating services to PIMNP

There are around 50 boats which transport tourists to the PIMNP. From these 50 boats, around 33 belongs to the Nilaveli Tourist Board and Service Co-operative Society Ltd, which is registered in the Provincial Economic Ministry since 2014. Around 06 boats are operated by the hotels located within Nilaveli Beach stretch and other boats are operated by the dive centers. Around 05 boats enter the PIMNP from other parts of

Trincomalee and other than that Sri Lanka Navy uses their boats to transport their staff members who are stationed at the islands for security purposes. Around 15 boats are launched from Nilaveli Beach and around 18 boats are launched from Gopalpuram. Most of these boats are operated by locals whereas majority of the boats launched from Gopalpuram are operated by Tamils and Nilaveli by Muslims as Trincomalee is a diverse cultural city with multi-ethnic groups.

4.2.4.3. Visitor arrivals at PIMNP

PIMNP is visited both by local and foreign tourists. Annually there are two peak visitor seasons which coincide with school holidays and international tourist arrival season to the country. In April, the PIMNP is mostly visited by locals and in August it is visited by both locals and foreigners. Higher foreign tourist arrival is recorded usually from July to September.

4.2.4.4. Activities within PIMNP

The main tourist activity within PIMNP is the coral watching which needs to be done through dive tours. However, mostly this activity is dominantly carried out by foreign tourists rather than locals as they get pre-ready for the activity and it is relatively high costly. The main activity of the locals at PIMNP is the viewing the pigeons in the island and bathing at a natural bay at the island.

The diving season is from April to September or mid-October and there are eight diving centers within the vicinity of PIMNP. This diving center not only offers diving expeditions, but also the opportunity to obtain PADI Diving license. However, the park is not a preferred diving site due to two reasons; entrance fee and the shallowness of the area. Yet the park is used for training PADI divers as well as for snorkeling and many dive centers utilized sea areas just adjoining the park boundary for diving. But diving is a requirement at PIMNP when it comes to coral watching.

Due to conservation measures, the island is not allowed with any structures thus there isn't any type of shelters, shops or any other activities to facilitate the tourists.

4.2.4.5. Host community and tourism services

The host community of the PIMNP are mostly from the Kuchchaveli DSD within which the two boat launching points are located.

Recently, it has started to begin homestay tourism in small scale within this area, bringing many economic benefits to the local community. Other than that, the high-end hotels are located within the Nilaveli beach stretch, which also deploy a considerable number of foreign tourists to the PIMNP.

There are small boutique shops operated by local community around both boat launching points at Gopalpural and Nilaveli beach which act as the hosts to the tourists visiting PIMNP.

4.3. Application of the Proposed Framework of 24 Indicators

As explained in the chapter 03, the data required for each indicator were selected based on four methods such as interviews, field surveys, reviewing of past records and previous studies, local community perception survey and tourists' perception survey. The gathered data and information were first organized in aligned with 24 indicators. Thereafter, the information was analyzed adopting both quantitative and qualitative methods as it suits with each and every indicator. A summary of the analysis of information against each indicator is presented below.

4.3.1. Economic sustainability

Economic profitability

(1) Annual growth of direct revenue generated at the considered tourist attraction(s) (revenue from tickets)

The direct revenue of the PIMNP is earned by issuing of permits to the visitors as explained in the 4.2.3 paragraphs of this chapter under the subsection of Issue of Permits. Therefore the growth of revenue is directly linked with the increase of number of tourists at PIMNP over years.

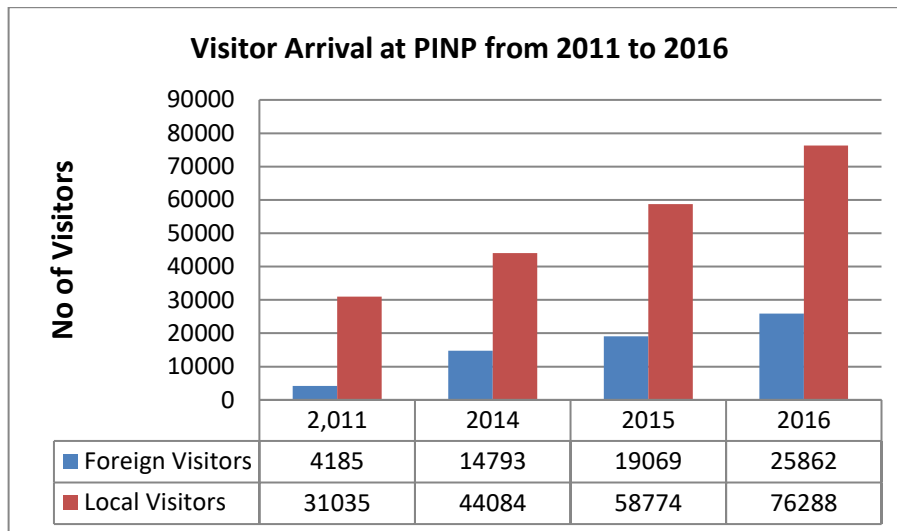


Figure 12: Visitor Arrival at PINP from 2011 to 2016

Source: SLTDA Annual Reports – 2011,2014,2015,2016

As per the above graph, it is evident that the Visitor Arrival at PIMNP has rapidly increased over time increasing the number of foreign tourists in 2015, approximately five times than the number recorded in 2011. It is also evident that the number of local visitors has doubled in number during the same period. With parallel to this, it can be observed that the revenue earned form issuing permits has also increased from 2011 to 2016.

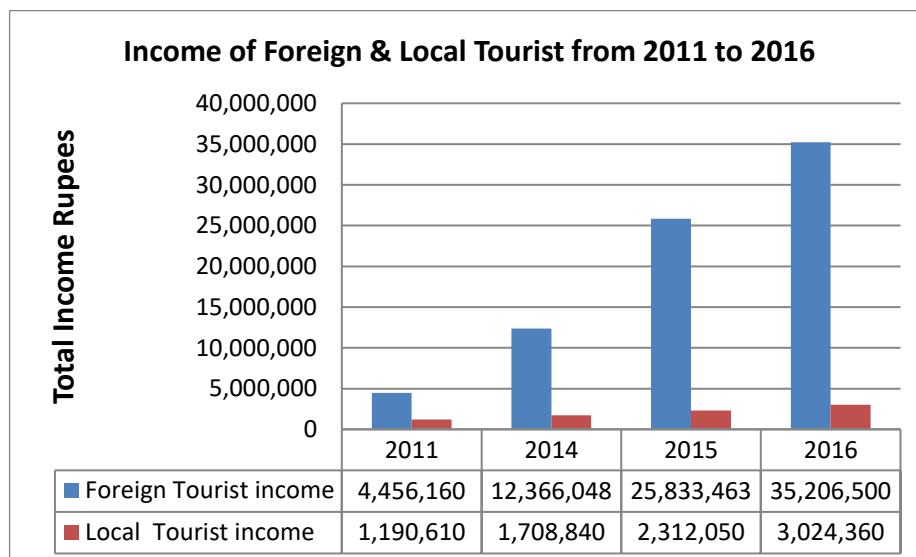


Figure 13: Income of Foreign & Local Tourist from 2011-2016

Source: SLTDA Annual Reports – 2011,2014,2015,2016

As per the above graph, the growth of revenue earned from foreign tourists is 177% and from local tourists, it is 43%. However, the overall growth of income from 2011 to 2014 is nearly 150% and it is a considerably a higher growth rate of income during a short period time. When calculating the average annual growth rates, the foreign tourist income has increased from 60%, local tourist's income has increased from 15% while the annual growth of overall income is 50%.

When calculating the ROI (Return on Investment) based on the tickets revenue, it was found that the ROI is 2.33 with a 30% of cost of operation from the total revenue.

Total Foreign Tourists income in 2016 = Rs. 35,206,500

Total Local Tourists income in 2016 = Rs. 3,024,360

Total income in 2016 = 38,230,860

Total expenditure in 2016 (PIMNP Maintenance & Management Cost)

= Rs. 11,469,258

ROI = (Total income – Cost of operation)/Cost of operation

ROI = (38,230,860-11,469,258)/11,469,258

ROI = 2.33 or (233%)

The second major revenue earning activity of the PIMNP are is the boat service which is dominantly operated by local community.

This suggest there is a relatively high growth of annual income in PIMNP thus positively contributes to the overall economic sustainability of the destination. But it is important to note that the annual growth of income from local tourists is relatively lower than that of foreign tourists. This suggests that the PIMNP has relatively higher attraction of foreign tourists than local tourists. But in order to assure the economic sustainability of the PIMNP during the whole year irrespective of foreign tourist seasons, it is important to maintain the consistency local tourists' arrivals. However, the reason for having relatively lower number of local tourists could be that there aren't much effective activities for locals to engage at PIMNP. However, the reason for income from local tourists to be lower than that of foreign tourists also may be due to the relatively low permit charges of locals.

(2) The increase in number of hotels, restaurants, shops and other tourism service activities in the area

At present there are around 43 hotels including 39 two star hotels, 03 three-star hotels and 01 four-star hotels, 12 restaurants and around 40 guest houses, villa or homestay accommodations within the study area. These hotels are located within nearly 6km long beach stretch from Irakkakandy Bridge from north end to Nilaveli Diving Centre at south end with an approximate average width of 1.5km. In 2013, there had been only 05 number of both hotels, including 02 two-star hotels and 03 three-star hotels and it was revealed that nearly 70% of tourism related developments have been increased within 04 years. Thus, it is evident that there had been a rapid growth of hotels, restaurants and gust houses within this short period of time. Therefore, it can be observed that the number of tourism activities are rapidly growing within this area. However, since both PIMNP and the Nilaveli Beach are located in close proximity, the accommodation facilities cater both the tourist attractions, thus cannot be specifically separated under each of them.

Once of the important observation is that there is an increasing trend of emerging home stay accommodation facilities and small-scale facilities such as guest houses and villas. This means that there is a growing interest in the local community to participate in the tourism activities which in return provide them with economic benefits.

However, due to seasonal functioning of PIMNP area based on seasonality in overall tourists' arrival to Sri Lanka, most of the local hotels, restaurants and guest houses get closed during the off season limiting the economic benefits to the owners and operators. Not only the accommodation facilities, but also boat operators, street vendors and other service providers also lose their economic gain during off season period.

However, it can be concluded that at present there is a considerably high economic profitability associated with PIMNP tourist destination as there is a relatively high direct income generated through issuing of permits and there are many interest groups continuously get engaged with the tourism activities in the area as there is a

considerably high demand for such activities and at the same time a significantly high economic profitability.

(3) No. of days stay at PIMNP area by tourists

When questioned about the length of stay at PIMNP area, it was revealed that nearly 96% of local tourists did not stay any nights there while only 4% of them stay just one day. But the situation is different when it comes to foreign tourists as 52% of the foreign tourists stated that they stay above one nights at PIMNP. It was revealed that nearly 28% of them stay overnight at PI area.

When studying the background, it was found that majority of local tourists visiting Trincomalee town and village area to get accommodation facilities due to high prices of PIMNP and Nilaweli. Since, local tourists do not stay nights at PIMNP area, the economic gain from them to the area is limited. Even during their visit at time, most of them do not spend much money within the area as it was found that they are used to either prepare food by themselves or bring from home rather than buying from the local food stalls. It was found only 10% of the local tourists buy food from local food shops while 40% of them bring food along with them and another 50% prepare them by themselves.

However, due to majority of the foreign tourists staying above one nights at PIMNP area that results in a high economic gain. At the same time, they fulfill them food requirements from local restaurants and hotels further increasing the economy generated within the area.

(4) The share of supply of locally produced goods and services

When considering the supply of good and services in the tourism market in PIMNP area, it was discovered that the locally products and services are used in terms of providing food, home stay accommodation, boat services, fresh water bathing facilities and by supplying of agriculture and fishery products to the restaurants /hotels and it was revealed that only 40% of local communities have an opportunity to provide goods

and services and 60% of local farmers and fishermen do not have any opportunity to supply their product to the market.

From the field survey, it was revealed that all-star class and other hotels use both agriculture and fishery products from outside areas such as Dambulla and Colombo while only some of the hotels and guest houses use products from local areas. There is an ample fish production within the area which can be contributed to the tourism market, but it doesn't happen so due to the absence of a mechanism to incorporate local agriculture and tourism industry with tourism market.

In addition to this, it was also found that there is not a proper market for the locally made handicrafts and other items which can be promoted and made an income generation method for the locals in the area.

Other than these, local community earn by providing fresh water bathing facilities where an individual is charged Rs. 40/= for a fresh water bath. There are nearly 10 fresh water bathing facilities, operated by local community. The other income generation activity is the providing parking space for tourists where Rs. 100/= is charged for a single vehicle. There are 4 parking areas within Gopalpuram which are operated by local community.

Based on above facts it can be concluded that the local community should be given more opportunities to be engaged with the tourism market in PIMNP area without being confined to the above-mentioned income generation activities. There should be a mechanism to incorporate local products more in the tourism market rather than depending on the products from outside the area.

(5) Percentage of families economically benefitted from tourism activities fully and partially

According to the Community Perception Survey, it reported that from 50 persons interviewed who are mostly coming from different individual families, there were around 15 persons who are engaged in tourism related job activities resulting a percentage value of 30%.

Table 19: Engagement of the tourism related activities

	Tourism related activity	No. of families
a)	Boat Operation (Boat owners, boat operators & helpers)	06
b)	Shop/ boutique owners	01
c)	Shop/ boutique workers	02
d)	Guest house/ Restaurant owners	02
e)	Guest house/ restaurant workers	02
f)	Hotel workers (unskilled labor)	02
g)	Fishermen	14
h)	Farmers	13
I)	Freshwater Bathing Facilities Providers (Temporary/indirect)	3
J)	Parking Providers (Temporary/contract)	2
k)	Other(driver/labour/carpenter)	3
	Total	50

Source: Field Survey

Since there are only 25% of families in the community are involved in tourism related activities, it suggests that there is comparatively less amount of community engagement in the tourism sector. And even from those who are involved in the tourism sector, majority of them are engaged with self-employment ventures rather than being employed in high end hotels and restaurants. In the background study, it was revealed that majority of the community living in both Nilaveli and Gopalpural villages had been affected both by war and Tsunami thus many of the elders had not obtained formal education in their childhood. Due to this reason, they find it difficult to get employment opportunities in high end hotels and restaurants operating in the area. Most of the time, the local community who are employed at such hotels and restaurant are recruited as cleaners, security guards and for other unskilled labor activities.

In addition, the number of local families conducting shops and boutiques is also relatively low as most of the shops/ boutiques in the area are operated by migrant

community. However, there is a considerable number of boat operators who have the origin in the local community.

It can be concluded that the local prosperity is relatively low when considering the overall participation of local community in the tourism activities within the area.

(6) Satisfaction level of people who are engaged in tourism related job activities in terms of wages, work environment, quality of job and equity

During the Perception Survey of Local Community, it was revealed that there is a considerable low satisfaction level of those who are engaged in tourism related job activities. The overall satisfaction level of 15 persons who are engaged in tourism related job activities on different components of jobs are as follows.

Table: 20 Satisfaction level of Boat Operators (06 persons)

Job Component	Average Satisfaction level (%)
Wages	70%
Work Environment	70%
Quality of job	80%
Equity in recruitment and in maintenance	70%
Overall satisfaction level	73%

Source: Compiled by Author

Table: 21 Satisfaction level of Shop/ boutique/ guest houses & restaurant owners (03 persons)

Job Component	Average Satisfaction level (%)
Wages	70%
Work Environment	80%
Quality of job	70%
Equity in recruitment and in maintenance	80%
Overall satisfaction level	75%

Source: Compiled by Author

Table: 22 Satisfaction level of high end hotel/ restaurant /guest house workers (04 persons)

Job Component	Average Satisfaction level (%)
Wages	70%
Work Environment	70%
Quality of job	70%
Equity in recruitment and in maintenance	30%
Overall satisfaction level	60%

Source: Compiled by Author

The above figures explain that from those who are engaged in tourism activities, majority of them are mostly satisfied with their job opportunities in terms of wages, work environment, quality of job and regarding equity. However, it can be observed that of those who are employed as workers at hotels and restaurants, they have stated that their satisfaction regarding the equity in recruitment and maintenance is only 30%. This fact again emphasizes the less opportunities given for local communities within high end tourist activities due to their lack of education, knowledge and required skills.

However, it can be concluded that the quality of employment with related to the tourism related activities is recorded above average as the overall average satisfaction level is recorded to be 69%. However, it has many limitations which need further improvements.

(7) The percentage of community who believe that both economic and social benefits of tourism are shared equally

From 50 number of persons interviewed, around 50% disagreed to the fact that both economic and social benefits of tourism are shared equally where as 25% stated that they strongly disagree with the fact. Therefore, altogether 75% if the community believed that both economic and social benefits are not shared equally. Around 10% of the community agreed to the fact whereas around 15% stated that they do not have any idea about it.

However, the background study which consisted of focused group discussions with a few community groups revealed the reason for this disagreement stating that due to many reasons local community is much neglected in the tourism activities happening

in the area. Many reasons such as not having a market for the local products in the tourism sector, limitation of job opportunities due to lack of knowledge and skills, lack of capital to initiate tourism related small scale ventures, dominance of migrant population and external investors within tourism sector of the area were emphasized by the community in this regard.

When looking at these statistics and reasons behind them, it can be concluded that the PMINP tourism destination has not yet reached economic sustainability in terms of social equity, as the benefits of tourism are not equally shared within local community. It can be predicted that if this situation keeps continuing, it might lead to future conflicts aroused by local community challenging the sustainability of the tourism destination.

Overall economic sustainability

When considering the results obtained for the five indicators of economic sustainability, it was realized that ***economic profitability*** of PIMNP as a local tourism destination is relatively low and that it can be further developed as to increase the economic profitability by introducing other income earning activities within the PIMNP area. Regarding the ***local prosperity***, it can be observed that a very low percentage of community is benefitted from the tourism activities as many are not either directly or indirectly engaged with the tourism activities. This needs to be well addressed in future to avoid any possible conflicts or rejection of the tourism activities by local community. Even though there are various methods to link the local community with PIMNP tourism activities, it had not been realized so far due to missing integration between local community and relevant authorities, relatively low encouragement within local communities, and lack of proper management to within the overall system to equally share the economic benefits of PIMNP associated tourism activities to the local community. ***Quality of employment*** as perceived by those who are engaged with tourism related job activities is in considerably high level. But there are many suggestions pointed out by the community how it can be further enhanced. With regard to the maintenance of ***social equity*** in the share of economic benefits coming from tourists, majority of the local community believe that economic and

social benefits are not shared equally. The reasons are that, there is less opportunities within the system to local community to engaged with the activities and even though they attempt to get into the system they face challenges due to lack of education and awareness, lack of economic resources such as capital to initiate and due to non-recognition of their valuable inputs within the tourism system within the area.

Therefore, when considering the status of all above components of economic sustainability as per the proposed framework, it can be concluded that the economic sustainability of PIMNP associated tourism activities are relatively low and needs to be improved further in future.

4.3.2. Environment sustainability

Physical integrity

(1) Visitor satisfaction of quality of landscape within the tourism area

Table: 23 visitor satisfaction levels of quality of landscape within the tourism area

Satisfaction Level	Percentage of foreign tourists (Total – 25)	Percentage of local tourists (Total – 25)	Overall Satisfaction
Highly satisfied	10%	15%	13%
Moderately satisfied	25%	30%	27%
Not satisfied	40%	40%	40%
No idea	15%	15%	15%

Source: Compiled by Author

When questioned about the level of satisfaction regarding the quality of the landscape within tourism area from tourists, it was revealed that majority of both foreign and local tourists are having a low satisfaction level as only 40% of total population is recorded to be satisfied. From the background study, it was revealed that the reasons for dissatisfaction regarding the quality of landscape within the area are due to sight of garbage around the beaches, unpleasant odor in some places, non-availability of landscaping maintenance program, non-availability of light landscaping tools on-site such as shelters, decks, trails, and stools etc. which blends with nature but facilitate the

tourists. Further comments regarding this has emphasized the need of landscaping attempt on site to enhance the natural scenic beauty, ensure the protection of natural resources while facilitating the tourists.

(2) Visitor satisfaction of visual quality and character of the area

Table: 24 visitor satisfaction level of visual quality and character of the area
Source: Compiled by Author

It was revealed that there is a considerably high visitor satisfaction on the visual quality and character of the area, and around 80% of foreign tourists and 75% of local tourists

Satisfaction Level	Percentage of foreign tourists (Total – 25)	Percentage of local tourists (Total – 25)	Overall Satisfaction
Highly satisfied	35%	30%	32%
Moderately satisfied	45%	45%	45%
Not satisfied	15%	15%	15%
No idea	5%	10%	8%

are either moderately or highly satisfied regarding the visual quality and character of the area. Altogether nearly 77% of both foreign and local tourists are satisfied in this regard.

The main reason behind these considerably high statistics is the natural scenic beauty within the area. However, those who stated their dissatisfaction pointed out that the environmental visual qualities could be further enhance with landscaping interventions within the area, as many of visually important places and sites within PIMNP are hidden and might get deteriorated with time.

When considering environment sustainability in terms of physical integrity, it can be observed that the level of physical integrity based on visitor satisfaction on environmental quality and character is reported to be above average limit thus positively contributes to upgrade the environmental sustainability.

Biological diversity

(3) Complaints on threats for natural habitats and natural species in the area

Existing Bio-diversity within PIMNP

According to a sensitivity analysis undertaken by NPPD, PIMNP is located in a highly sensitive area. There are over 100 pieces of corals and 222 species of reef fish identified within PIMNP area and among them three of the species are globally endangered marine turtles naming *Eretmochelys imbricata*, *Chelonian midas* & *Lepidochelys olivacea*. (Journal of Tropical Forestry & Environment, 2016)

However, a recent study has been undertaken by Green Movement of Sri Lanka during the period of 2012 – 2013 under PIMNP Conservation Project which provides more updated and accurate information on the bio-diversity of PIMNP. As per their study, it has been identified 208 fish species in the ocean around PI and 102 coral species and 3 turtle species also have been identified. Regarding the terrestrial bio-diversity, the study had revealed that there are 4 reptile species, 3 butterfly species within island. In addition, the study had recorded 16 bird species within and surrounding the PI.

(a) Threats to Coral Reefs Ecosystem of PIMNP

In depth scientific studies on coral reefs ecosystem of PIMNP are fairly lacking but a research conducted by Rajasuriya and Karunaratne in 1999 had concluded that the live coral was 40% by that time. However, a study undertaken by EML Consultants in 2013 has revealed that there is only 21% of live coral cover is available at PIMNP.

As per expert opinion, threats such as visitor pressure, COTs infestation, accelerating growth of *Halimeda* sp., solid waste and coral bleaching are presently affecting the health of coral reefs at PIMNP (Perera & Kotagama, 2016) Rajasuriya in 2012 had pointed out that there had been a severe bleaching of coral reefs in the area, but this situation has somewhat recovered by now. Perera & Kotagama has conducted a comprehensive study on PIMNP and has published a paper titled – ‘Recommendations for Co-existence of Coral Reef Conservation and Tourism at Pigeon Island National Park’ in 2016. The study has conducted an expert opinion analysis regarding the threats to coral reefs at PIMNP and their opinion on change of magnitude of the issue over time.

Table: 25 Threats to coral reefs at PIMNP

Threat	Ranking of threat		Reasons for damage / general comments
	10 years ago,	Present condition	
Threats related to visitor pressure	5	3	Collection of coral as souvenirs had reduced, yet visitor pressure had increased with incidents of reef trampling and boat damage to corals - this pressure is localized
Crown of thorn	4	3	Increase of COTS had been reported, which could change with season. Ad hoc removal takes place.
Starfish infestations Destructive fishing activities including blast fishing	2	3	Applies to fish populations in the adjacent areas, to NP. But serious impact on fish populations and to tourism in the longer run
Accelerating growth of calcareous algae (<i>Halimeda sp.</i>)	4	3	The bleaching event in May 2010 have led to a phase shift occurred where other species benefitted, which included calcareous algae.
Invasion by corallimorpharians	3	4	Corallimorpharians invaded parts of the reef in 1999 – 2000 period. The areas carpeted by this species have not increased significantly.
Cyclones	-	-	Not aware of damage by cyclones.
Tsunami	4	-	Low damage to PINP medium damage to coral island.
Coral bleaching	5	3	Sever bleaching in 210, but all corals did not die and recovery is taking place.
Sedimentation	5	5	There is not much sediment here.
Solid waste	5	4	The degree of waste from visitors has decreased due to awareness, yet marine debris that drift with the current get accumulated on the island edges.
Coral diseases	4	4	?
Nutrient inputs	?	4	Sewage pollution along the shoreline water in Nilaveli.

Source: Recommendations for Co-existence of Coral Reef Conservation and Tourism at PINP

Threats due to boat anchoring

Boat anchoring is human activity which cause a considerable damage to coral reefs including coral breakage and fragmentation. As per the study undertaken by Pigeon

Island Marine National Park Conservation Project (PIMNPCP), 2012 – 2013, it has divided the beached of PI into four zones; A, B, C and D as follows. Accordingly, the study has evaluated the magnitude of damages to coral reefs in each zone along with reasons for damages.

The study emphasizes that anchoring of boats between the zones A & B has seriously affected the coral reefs in this zone. Experts have pointed out that no more coral can grow on the area where boats are anchored. The pollutants from boats such as oil and other waste flow towards the most productive part of the coral reef in zone A with water currents. As per the study, the zone A has the best grown coral reef in the area where coral grows up to 2m in some locations. Hence, the fish population is also comparatively high in this zone.

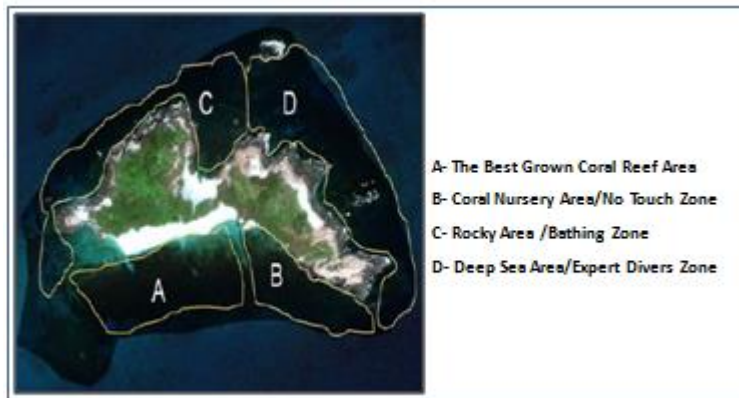


Figure 14: Main Zones of Pigeon Island

Source: PIMNPCP, 2012 - 2013

The zone B includes a coral nursery or a reef that is re-growing. Thus, it is recommended by the study to declare it as a ‘No Touch Zone’ and be restricted for scientific researchers only. An area coming under this zone and has started to grow recently can be seen to the right-hand side of the boat route. Since the growing corals are weak and delicate, the reef could be destroyed even by a small incident. Thus, the study recommends to re-route boat rides and to provide alternative boat anchoring places in replace of highly sensitive coral areas.



Figure15: Boat anchoring on coral reefs at PIMNP

Source: Photographed by Author

Threats due to visitor activities

Visitor pressure and disturbances due to bathing and walking on corals is also another cause of coral damage. In this regard, since zone A is a considerably high sensitive area, the study suggests that it should be restricted for the visitors with a sound diving ability and their activities must be monitored thoroughly. The study recommends that people who act in disturbing and damaging the coral reef and marine life forms should be promptly removed from the area.



Figure 16: Visitor activities in zone A

Source: Photographed by Author

This fact was further justified from the information gathered in field surveys as the Wild Life Office in charge of the site also stated that there are considerable damages to the coral reefs due to overcrowding and their activities such as walking and bathing on coral reefs, disposal of garbage and collection of coral as souvenirs etc. Also, the officer highlighted that there is shortage of human resources to manage the visitor activities within PIMNP area.

However, the study recommends zone C as the most suitable area for bathing activities as it consists of rocky area. Due to the geological features the area is having relatively low bio-diversity thus is suitable to be declared as a 'Bathing Zone'. This area is much suitable for visitors who cannot dive but oriented in bathing as a leisure activity. Since the depth of this zone varies from 10 to 20 feet towards the sea, marking of the depth prominently is important to ensure the safety of visitors. Anyhow, it cannot be denied that bathing activities have caused a considerable level of reduction of coral diversity in this zone.

Threats due to fishing in PIMNP area

According to Perera and Kotagama as stated in 2016, the pressures from destructive fishing including dynamiting, although reduced within the park limits are still practices in the vicinity and thereby influence the biological diversity, with serious impact on populations of mobile and mid-sized schooling species like snappers, sweetlips, trevally etc. Setting of fish traps in shallow reef areas is also another threat recorded. Although PIMNP is a strictly "no take zone", under the provisions granted in FFPO, yet prohibited fishing activities are still reported periodically. As per information obtained by DWLC office at PINP reveals that during the last three-year period (January 2012 – September 2014) DWLC had filed six cases against 10 fishermen who were involved in illegal fishery activities within the park boundaries. The offenders are prosecuted under two offences; entering the park without a permit, remaining and catching fish. It is encouraging to note that the fishery permit issued under the Fisheries and Aquatic Resources Act (FARA) by the Fishery Inspector of Trincomalee north clearly stipulates that fishing is prohibited within PINP limits. This stipulation has made it easy to prosecute the offenders.

Regarding the terrestrial environment, there is a considerable variation in the bio-diversity but there are comparatively less disturbances to inland bio-diversity as they are not much interaction with large number of tourists.

When considering all these reported threats caused within PIMNP environmental area, it can be concluded stating that the severity of the issue is scaled at 3 in a 1-5 scale. The level of effort made by authorities to mitigate the problem can be concluded as 50%.

(11) Tourists satisfaction on special eco-systems and natural species within the area

When questioned regarding the level of satisfaction on special eco-systems and natural species within the area, it was revealed that foreign tourists have a high level of satisfaction regarding eco-systems and natural species as they have special interests on them. But when it comes to local tourists, it seemed that they are not much aware on the available special eco-systems and natural species within PIMNP and therefore, their response to the question was not very effective.

Table: 26 Level of tourists’ satisfaction on special eco-systems and natural species within the area

Satisfaction Level	Percentage of foreign tourists (Total – 25)	Percentage of local tourists (Total – 25)	Overall Satisfaction
Highly satisfied	30%	10%	20%
Moderately satisfied	50%	20%	35%
Not satisfied	15%	30%	22%
No idea	5%	40%	23%

Source: Compiled by Author

The above statistics reveal that nearly 80% of foreign tourists are satisfied about special eco-systems and natural species within PIMNP but only 30% of local tourists

are satisfied on the same. One of the main reasons for the reduction of local tourists' satisfaction level could be that most of the local tourists do not actually enjoy these sights of special coral reefs and other fish species due to not being trained and equipped for diving thus do not see the importance and value of such eco-systems in depth. However, not being aware on the value and importance of special eco-systems in PIMNP could result in much disturbances to natural systems caused by them and future reduction in local tourists. The overall percentage of all tourists who are satisfied is recorded to be 55%.

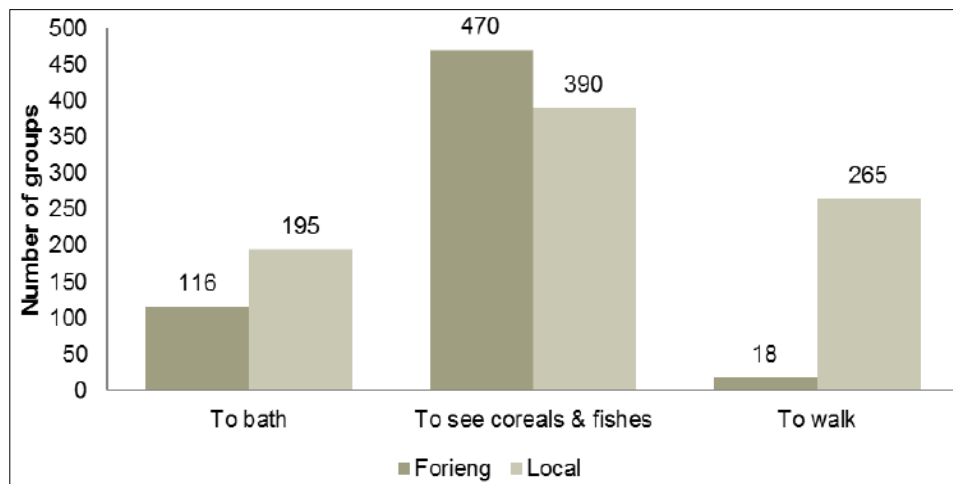


Figure 17: Visitor expectations during their visit

Source: PIMNPCP, 2012 - 2013

The above fact is further supported from the study undertaken by PIMNP Conservation Project, which reveals that majority of the foreign tourists visit PI with the main objective of seeing corals and fishes instead of bathing or walking whereas, a considerable number of local tourists visit PI with the objective of bathing and walking just as watching corals and fishes.

(12) Community satisfaction on the conservation of natural habitat and wild life within tourism area

The community satisfaction regarding the conservation of natural habitat and wild life within PIMNP tourism area is as follows.

Table: 27 Level of community satisfaction on the conservation of natural habitat and wild life within tourism area

Satisfaction Level	Percentage
Highly satisfied	10%
Moderately satisfied	40%
Not satisfied	20%
No idea	30%

Source: Compiled by Author

The above statistics reveal that nearly 50% of local community is satisfied about the conservation initiatives undertaken at PIMNP. It is important to note that nearly 30% of community has no idea about these initiatives thus did not provide an effective response.

In conclusion, it can be stated that even though, there is a very rich bio-diversity within PIMNP, and at the same time there are considerable level of threats due to several tourism and fishing activities within the area. However, the authorities have taken several initiatives to mitigate these threats, but yet there is much improvement needed regarding these initiatives as perceived by the experts in the field. With regard to environment sustainability in terms of bio-diversity, it can be concluded that at present PIMNP maintains an average level of sustainability.

Effective waste management

(13) Waste disposal method adopted (recycling, land filling, used for energy etc.)

Information related to this indicator was explored during field surveys and interviews etc. According to the interviews with Local Authority, it was found that the average daily solid waste generation rate from hotels, restaurants, guest houses and other tourism activities were 10 tons per day and collected waste dumped the site at Nilaweli area. The particular waste dumping site is supported with a waste recycling center thus it can be stated that the waste generated within PIMNP tourism area is well managed. However, there is a problem associated with the collection process of solid waste where the solid waste dumped at common areas are not properly collected by Pradeshiya Sabha.

Sewer collected at PIMNP area is dumped in an area called Kanniya located Trincomalee which is approximately 10km away from PIMNP area. However, the dumping yard is a forest area and there isn't any proper sewer treatment process undertaken prior to dumping. Therefore, it has created a considerable environment impact to that area.

Even though the solid waste is comparatively wisely managed, the management of sewer waste is not a sustainable practice. Hence, given the severity of the problem the scale would be placed as 1 out of 5.

Clean environment

(14) Percentage use of solar energy and other renewable energy

From the field survey conducted it was revealed that only few high-end tourist hotels adopt solar power as a source of energy but instead of that there isn't any government or private initiatives to use solar energy for tourism activities.

But, when considering the climatic conditions of the area, there is a considerable potential to harvest solar and wind power for energy requirements. However, lack of such technological initiatives in the area negatively impact to reduce the environment sustainability of the PIMNP related tourism activities. Since majority of the hotels and restaurants do not use solar energy or any other alternative energy sources, it negatively

contributes to the sustainability, thus scaled as 1 out of 5 meaning 20% of positive contribution.

Overall environment sustainability

When considering each component of environment sustainability, it was realized that *physical integrity* of the PIMPNP area is now in an average level but needs further improvements. This was concluded based on two indicators which evaluated the tourists' satisfaction on the existing landscape and visual quality of the area. Even though, the existing natural environment itself has created an attractive environment with scenic beauty, several measures can be adopted to enhance the attractiveness of the area. There is a high *biological diversity* within the area, which has been identified in the legal framework of the PIMNP and has assured the protection of it in the system. But during the study, it was identified even though, policy measures have been taken to protect the biodiversity within the area, there are considerable threats to the coral reefs, natural bird habitats, beaches and other valuable eco-systems due to existing issues and conflicts within the tourism operation system of the area. As a result of this evaluation of this component, several factors affecting the bio-diversity of the area were identified and these must be immediately dealt with in order to assure a high level of environment sustainability of the area. With regard to *effective waste management* it was identified, majority of both high-end hotels, restaurants and community level home stay tourism ventures adopt proper waste management mechanisms thus there is a considerably low-level negative impact to the environment. The PIMNP area is having a relatively better clean environment, as there is a considerably small crowd within the area and the quality of waste generated is also comparatively low and manageable. Water bodies, beaches, forest areas are clean at the moment, but may need to adopt standard measures to manage them in the future. It was identified that a considerable number of hotels and restaurants use standard energy conservation methods such as solar energy and waste-to-energy methods.

4.3.3. Socio-cultural sustainability

Welfare of the community

(16) Local community's satisfaction on the existence of tourism within the area

When considering the satisfaction of host community regarding the overall existence of tourism in the area, following satisfaction levels were revealed.

Table: 28 Local community's satisfaction on the existence of tourism

Satisfaction Level	Percentage
Highly satisfied	10%
Moderately satisfied	30%
Not satisfied	50%
No idea	10%

Source: Compiled by Author

The above statistics reveal that the host community is having comparatively a low level of satisfaction regarding the overall existence of tourism in the area. From a previous indicator, it was revealed that there is nearly 25% to 30% local community engaged in the tourism activities but the rest of the local community have no any engagement with the tourism in the area.

This fact was further supported from the information gathered in the field survey where many of the local people complaint that they do not have any window to be engaged in the tourism sector of the area. As explained earlier, due to not having required knowledge and skills, not having capital to initiate a tourism venture, dominance of the tourism market by migrant community and investors and not having a proper market for local products such as fish, vegetables, handicrafts in the tourism market in the area, the local community do not get adequate opportunities to be linked with the tourism sector.

In addition, it was revealed that there hasn't been any special improvement in infrastructure within the area as a result of tourism. It could be observed that PIMNP area does not have any public utilities such as public toilets, wells, wash areas, seating

areas, waste dumping baskets, common bathing areas, and public gathering areas, shelters, seating areas and parking areas etc. which are considered as basic utilities in any tourist destination. Other than that, it could be observed that the roads in the area are also in comparatively poor condition.

In addition, the fishing communities have conflicts due to not allowing fishing within PIMNP area as well. Due to many of the above reasons, it is evident that host community has a very low satisfaction level regarding overall existence of tourism in the area.

(16) Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge

Table: 29 Local community agreement regarding the tourism benefits

Satisfaction Level	Percentage
Strongly agree	-
Partially agree	20%
No idea	10%
Disagree	20%
Strongly disagree	50%

Source: Compiled by Author

As per the statistics, it indicates that nearly 70% of the community disagree with the fact that tourism has helped them to be educated on different languages, skills and knowledge. This fact was further revealed in the background survey as well, whereas it was found there isn't any education or skill development program offered by any authority or private sector institution enhancing knowledge and skills of host community enabling them to be engaged with the tourism sector. Most of the human resources in operation within PIMNP related tourism activities are from outside areas.

In conclusion, it can be expressed that the socio-cultural sustainability associated with the PIMNP tourism venture is at a very low level in terms of welfare of the host community.

(17) Tourists satisfaction on the cultural heritage, cultural values & customs

Table: 30 Tourists satisfaction on the cultural heritage

Satisfaction Level	Percentage of foreign tourists (Total – 25)	Percentage of local tourists (Total – 25)	Overall Satisfaction
Highly satisfied	-	-	-
Moderately satisfied	30%	25%	27.5%
Not satisfied	40%	50%	45%
No idea	30%	25%	27.5%

Source: Compiled by Author

These statistics reveal that there is significantly less satisfaction of tourists regarding the experience of cultural heritage, values and customs of the host community. The reasons for this were revealed that there is considerably less attraction with the host community and tourists and that there are no opportunities for the tourists to learn the local cultural values and customs. This is an important aspect which need to be concerned in future PIMNP development programs, as the sharing of local culture can bring positive benefits to both tourists and local community.

(18) Tourists satisfaction on interaction with local community

To the question, whether the tourists had any kind of interaction with the local community, majority of the tourists (nearly 60%) said yes. The instances of interactions were mainly with boat operators, home stay, guest house owners, restaurant & boutique owners etc. It is important to note, that most of the tourists who claimed to have an interaction with host community had have a positive stand in the level of satisfaction regarding the interactions.

Table: 31 Tourists satisfaction level on interaction with local community

Satisfaction Level	Percentage of foreign tourists (Total – 25)	Percentage of local tourists (Total – 25)	Overall Satisfaction
Highly satisfied	30%	20%	25%
Moderately satisfied	40%	45%	43%
Not satisfied	20%	25%	22%
No idea	10%	10%	10%

Source: Compiled by Author

(19) Local community satisfaction on interaction with tourist

When considering the host community’s perception on regarding any threat to cultural heritage and customs due to interaction with tourists, majority’s idea was that there isn’t any such threat, as there is less interaction with local community and tourists. Even previous studies regarding social aspects of PIMNP do not report on such threats. Thus, it also positively contributes to socio-economic sustainability of PIMNP associated tourism industry activities. Since there isn’t a severe issue on this subject and there is a 90% positive impact to the overall socio-cultural sustainability.

(20) The percentage of local community who believe tourism has helped to preserve cultural wealth

When questioned the local community, whether they agree with the fact that the tourism in the area has helped to preserve the cultural wealth, majority gave neutral and negative answers.

Table: 32 local community believe regarding the preserving of cultural wealth

Satisfaction Level	Percentage
Strongly agree	-
Partially agree	10%
No idea	40%
Disagree	35%
Strongly disagree	15%

Source: Compiled by Author

The main reason for a response of this nature is because there is less exposure of cultural values of the host community to the tourists. Thus, the majority of the respondents did not have a proper idea about the meaning of the question and on the other hand there is no such share or preservation of cultural wealth due to existence of tourism in the area.

It is evident that in terms of share of interactions of each parties, the cultural wealth is secured for some extent within PIMNP tourism industry. However, it was revealed that the cultural values, customs and unique lifestyles of host community are not well shared with or exposed to tourists. This is one important aspect which needs much attention, as it is one way how the host community can be engaged with the tourism sector of the area. Thus, it can be concluded that in terms of cultural wealth, the PIMNP has only achieved the low level of socio-cultural sustainability.

Meeting expectations of visitors

(21) Level of tourist satisfaction on overall tourism experience in the area

Table: 33 Level of tourist satisfaction on overall tourism experience in the area

Satisfaction Level	Interaction with Local Tourists	Interaction with Foreign Tourists	Overall Satisfaction
Highly satisfied	20%	30%	25%
Moderately satisfied	25%	45%	35%
Not satisfied	40%	10%	25%
No idea	15%	15%	15%

Source: Compiled by Author

When considering the tourist satisfaction on overall tourism experience in the area, it is evident that foreign tourists are having a comparatively high satisfaction than local tourists. The local tourists' satisfaction is much less and there is nearly 40% of local tourists who are not satisfied with the overall tourism experience in the area. The main reasons for this are the lack of tourist activities to be engaged within PIMNP area.

Local tourists don't usually engage with diving as diving is expensive and require special equipment and skills. Thus, the major activity they can do in the PIMNP is watching births, bathing and watching corals from the surface. Due to space limitation within the island, it gets much congested thus after visiting the island, most of the local tourists return to Nilaveli to bath rather than bathing at the beaches of the island.

The other complaint from both local and foreign tourists is that there is lack of facilities at PIMNP area. The lack of seating area, shelters, relaxing area, quality bathing area and toilets, absence of boutiques or any other food outlets at the island are some of the points highlighted by the tourists.

(22) Percentage of return visitors

The percentage of return visitors was calculated based on tourists' perception survey by asking for the tourists' interest on re-visiting the PIMNP. When this was asked, it was found that 60% of the local tourists and 70% of foreign tourist are interested in re-vesting the PIMNP area. Again, it is evident that the local tourists' interest is much less than foreign tourists with regard to revisiting of the PIMNP area. Other than that, it was found from the perception survey itself that the percentage of local and foreign tourists who have visited the PIMNP area more than two times was respectively 30% and 20%.

Accordingly, it can be concluded that the overall percentage of return visitors is average in PIMNP. The background survey revealed the reasons for this relatively low percentage of return visitors is the lack of tourist activities and inner attractions within PIMNP area.

(23) The percentage of tourists who believe the particular tourism destination is sustainable

It was revealed from the perception survey that majority of the tourists believe that the tourism destination is not sustainable. The percentages of local and foreign tourists who believe that the PIMNP is a sustainable tourism destination are respectively 35% and 30%. Since both of these values are less than average, it can be concluded that in the perspective of tourists the PIMNP has not reached its overall sustainability yet.

Local control

(24) Local community's satisfaction on their participation in decision making related to tourism in the area

Table 34: Local community's satisfaction on their participation in decision making related to tourism in the area

Satisfaction Level	Percentage
Highly satisfied	-
Moderately satisfied	15%
Not satisfied	65%
No idea	20%

Source: Compiled by Author

When considering this indicator, it was evident from the host community's perception survey that the majority of the community is not satisfied about their participation in decision making related to tourism in the area. The tourism activities related to PIMNP are largely controlled by the relevant authorities, migrant merchants and high-end investors. Thus, there is a less role played by the local community and their engagement with tourism activities is much less. Thus, they do not have significant opportunities to be part of the decision-making process.

4.3.4. Evaluation of overall sustainability of PIMNP

4.3.4.1. Overall economic sustainability

Table 35: Overall economic sustainability indicators

Indicator	Overall Weight (w)	Quantitative / Qualitative Final Result	Scale based on Final Result (x)	(x * w)/∑(w)
(1)Annual growth of direct revenue generated at the considered tourist attraction(s) (revenue from tickets, donations)	4	233% of ROI 50% Growth of overall income	90%	360/23
(2)The increase in number of hotels, restaurants, shops and other tourism service activities in the area	3	No. of hotels increased from 05 to 43 within 04 years.	70%	210/23
(3)No. of days stay at PIMNP area by tourists	2	4% of local & 52% of foreign tourists stay overnight	28%	52/23
(4)The share of supply of locally produced goods and services	3	Relatively low share of supply	40%	120/23
(5)Percentage of families economically benefitted from tourism activities fully and partially	5	25%	25%	125/23
(6)Satisfaction level of people who are engaged in tourism related job activities in terms of wages, work environment, quality of job and equity	3	Overall Average Satisfaction level - 59%	59%	177/23
(7)The percentage of community who believe that both economic and social benefits of tourism are shared equally	3	10% of the community population	10%	30/23
Overall Score = $\sum(x*w)/\sum(w)$	= (360+210+52+120+125+177+30)/23 = 47%			

Source: Compiled by Author

4.3.4.2. Overall environment sustainability

Table 36: Overall environment sustainability indicators

Indicator	Overall Weight (w)	Quantitative / Qualitative Final Result	Scale based on Final Result (x)	(x * w)/Σ(w)
(8) Visitor satisfaction of quality of landscape within the tourism area	2	40% of community population is either highly or moderately satisfied	40%	80/12
(9) Visitor satisfaction of visual quality and character of the area	2	77% of all visitors are either highly or moderately satisfied	77%	154/12
(10) Complaints on threats for natural habitats and natural species in the area as perceived by environment specialists and the level of effort made by responsible bodies to mitigate them	1	The severity of the complaints is 3 in a 1-5 scale (60%). Level of effort made by authorities is 50%. Avg result – 55%	55%	55/12
(11) Tourists satisfaction on special eco-systems and natural species within the area	1	55% of all visitors are either highly or moderately satisfied	55%	55/12
(12) Community satisfaction on the conservation of natural habitat and wild life within tourism area	1	50% of total population is either highly or moderately satisfied	50%	50/12
(13) Waste disposal method adopted (recycling, land filling, used for energy etc.)	2	The severity of the issue is very high, thus the scale is placed 1 out of 5 meaning	20%	40/12

		<i>20% positive impact</i>		
(14)Percentage use of solar energy and other renewable energy	<i>1</i>	<i>Based on the high severity of the issue, the scale is given as 1 out of 5 meaning 20% of positive impact</i>	<i>20%</i>	<i>20/12</i>
Overall Score = $\sum(x*w)/\sum(w)$	<i>= (80+154+55+55+50+40+20)/12</i> <i>= 34%</i>			

Source: Compiled by Author

4.3.4.3. Overall socio-cultural sustainability

Table 37: Overall socio-cultural sustainability indicators

Indicator	Overall Weight (w)	Quantitative / Qualitative Final Result	Scale based on Final Result (x)	(x * w)/$\sum(w)$
(15)Local community's satisfaction level with tourism	<i>5</i>	<i>40% of community population is either highly or moderately satisfied</i>	<i>40%</i>	<i>200/27</i>
(16)Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge	<i>1</i>	<i>20% of community population partially agree to this fact</i>	<i>20%</i>	<i>20/27</i>
(17)Tourists satisfaction level on the cultural heritage, cultural values & customs	<i>2</i>	<i>28% of tourists are either highly or moderately satisfied</i>	<i>28%</i>	<i>56/27</i>
(18)Tourists satisfaction on interaction with local community	<i>4</i>	<i>68% of tourists are either highly</i>	<i>68%</i>	<i>272/27</i>

		<i>or moderately satisfied</i>		
(19) Local community satisfaction interaction with tourist	<i>1</i>	<i>90% of local community are either high or moderate satisfy</i>	<i>90%</i>	<i>90/27</i>
(20) Local community satisfaction level regarding - Tourism has helped to preserve cultural wealth	<i>1</i>	<i>10% of community population partially agrees to the fact</i>	<i>10%</i>	<i>10/27</i>
(21) Level of tourist satisfaction on overall tourism experience in the area	<i>5</i>	<i>60% of tourists are either highly or moderately satisfied</i>	<i>60%</i>	<i>300/27</i>
(22) Percentage of return visitors	<i>2</i>	<i>65% of tourists stated that they are willing to visit PIMNP for the second time</i>	<i>65%</i>	<i>130/27</i>
(23) The percentage of tourists who believe the particular tourism destination is sustainable	<i>1</i>	<i>38% of tourists believe that PIMNP is a sustainable tourism venture</i>	<i>38%</i>	<i>38/27</i>
(24) Local community's satisfaction on their participation in decision making related to tourism in the area	<i>5</i>	<i>15% of local community is moderately satisfied</i>	<i>15%</i>	<i>75/27</i>
Overall Score = $\sum(x*w)/\sum(w)$	$= (200+20+56+272+90+10+300+130+38+75)/27$ $= 44\%$			

Source: Compiled by Author

4.4. Conclusion

When considering the above analysis, the overall sustainability based on the three principles of sustainability and the overall average sustainability of PIMNP tourism destination is as follows.

Table 38: Level of sustainability

Description	Level of Sustainability
Economic Sustainability	47%
Environment Sustainability	34%
Socio-cultural Sustainability	44%
Overall Average Sustainability	$= (47 + 35 + 44)/3$ $= 42\%$

Source: Compiled by Author

As per the above figures, it is evident that the PIMNP is having an overall sustainability level of 42%. It is also evident that all three thematic sustainability levels are placed below average level thus represent a relatively low level of sustainability. When comparing the three thematic sustainability levels, it can be observed that the Economic Sustainability contributes to the overall sustainability than the levels of Environment and Socio-cultural Sustainability.

CHAPTER FIVE

CONCLUSION

The main objective of this research was to develop a framework of indicators aligned with sustainable tourism principles in order to evaluate the sustainability of a tourism destination. Initially, the existing principles of sustainable tourism were studied as the first stage of the study. After reviewing various interpretations of sustainable tourism principles, a one which is directly based on the three pillars of sustainable principles; economic sustainability, environment sustainability and socio-cultural sustainability was adopted as the base for the proposed methodology.

According to the selected interpretation of the sustainable tourism principles, following baseline aspects under three pillars of sustainability, were identified.

- Economic sustainability: Economic Profitability, Local Prosperity, Quality of Employment and Social Equity.
- Environmental sustainability: Physical Integrity, Biological Diversity, Effective Waste Management, Environmental Cleanness.
- Social sustainability: Welfare of the community, Cultural Wealth, Meeting Expectations of Visitors' and local control.

The above aspects of three pillars of sustainability tourism were adopted as the expressions in developing the framework to evaluate sustainability in tourism. The above expressions were based on the Making Tourism More Sustainable: A Guide for Policy Maker by UNEP & WTO in 2005 and Indicator of Sustainable Development for Tourism Destinations: A Guide Book, 2004.

Flowingly, the indicators of each baseline aspects were developed based on the indicators presented by WTO in 2005, Mearns in 2010 and relevant to the more specific to the characteristic of PINP and seventh of indicators were selected under the Economic sustainability, another seventh of indicators were selected under the Environmental sustainability and tenth of indicators were selected under the Social sustainability.

Then data collection methods were identified for indicator assessment initially based on Indicator of Sustainable Development for Tourism Destinations: A Guide Book, 2004 and as appropriate to the case study. The data was collected through past records, field surveys, perception surveys, analyzed using quantitative and qualitative methods and presented using a descriptive method. After quantifying all indicators based on a scaling method, weighted sum method was used to derive overall and thematic sustainability levels.

The second objective was the study to check the applicability of proposed framework for a Sri Lankan Case study. Therefore, the framework was applied to the case of Pigeon Island Marine National Park (PIMNP) in Trincomalee. After applying the proposed framework to the case study, it was revealed that PINP is having an overall sustainability level of 42% composing of 47% of economic sustainability, 35% of environmental sustainability and 44% of socio-cultural sustainability.

It is evident that even though PIMNP is having relatively high economic sustainability, its environment sustainability happens to be significantly low resulting a decrease in overall sustainability. Since PIMNP is a tourist attraction based on natural asset, the environment sustainability plays a major role in making the overall venture a sustainable tourism venture.

The methodology of the proposed framework can be used to develop new framework to evaluate the sustainability of a particular tourism destination. This proposed framework is directly based on the principles of sustainable tourism, it covers all aspects of sustainability in relation to tourism sector. Thus, the result of this evaluation gives an overall picture of the considered tourism venture and helps to identify the prevailing challenges and constraints in reaching complete sustainability. The framework also can be used to monitor the sustainability process of a certain tourism venture and its progress towards complete sustainability. It also enables the comparison of two or more tourism destination in terms of level of sustainability. The proposed framework can also be used as a guide when designing sustainable tourism destination and to monitor their sustainability changes over time with reference to each indicator.

The major limitations attached with the proposed framework is that the indicators based on each expression of three sustainable aspects cannot be designated as universal set of indicators as they can be changed based on the type, nature, context of the selected case. Also, in addition to the selected indicators, there can be many more additional and similar indicators which can be used as expressions of each sustainable tourism principle. The evaluation of indicators and the weighting method used in the study may be biased as the scoring system. There are limitations attached to the analysis process, when dealing with qualitative data which was analyzed subjectively and in the quantification of qualitative data in the final evaluation to derive overall sustainability.

The further researches can be done to test the applicability of the framework in cases of different nature and to calibrate the framework accordingly. Also, further studies can be conducted to improve the indicators used in the framework based on criteria such as ease of quantification, convenience in use, interpretation and understanding and applicability in different types of cases.

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Annexure 01

Derivation of Indicators for the proposed framework to evaluate Sustainable Tourism based on existing Indicators

Theme	Mearns, 2010		Baseline Aspect of ST (Sustainable Tourism Principles, Niedziolka, 2012)	Proposed Indicators	Indicator Ref No
	Issue	Indicator			
Economic (13 indicators)	Sustaining tourist satisfaction	Level of tourist satisfaction	Meeting expectations of visitors (Theme - Social)		
		Perception of value for money	Meeting expectations of visitors (Theme - Social)		
		Percentage of return visitors	Meeting expectations of visitors (Theme - Social)		
		Perception of sustainability	Meeting expectations of visitors (Theme - Social)		
		Tourist complaints	Meeting expectations of visitors (Theme - Social)		
	Tourism seasonality	Tourist arrivals by month (throughout the year, mean and peaks)		Total number of tourist arrivals (throughout the year, mean and peaks)	04
		Occupancy rates for accommodation by month	Economic profitability	Occupancy rates for accommodation by month	05
		Percentage of tourist industry jobs which are permanent or full-time (compared to temporary /seasonal jobs)		Ratio of low-season tourism employment to peak season tourism employment	06

Economic benefits of tourism	Number of local people (and ratio of men to women) employed in tourism	Local Prosperity	Percentage of families economically benefited from tourism activities fully and partially	07	
			Unemployment rate	08	
			Supply of goods and services to tourism enterprises (Stabilizing and improving community income/improving local employment)	09	
				Annual growth of revenue earned by local community in terms of tourist activities	10
	Revenue generated	Economic profitability	Annual growth of direct revenue generated at the considered tourist attraction(s) (revenue from tickets, donations)	01	
			Number of tourism business increase/decrease & percentage owned locally	02	
	Revenue spend in area	Local Prosperity	The revenue spending within the local area	11	
		Economic profitability	Tourist Spending	03	
		Social equity	Fair distribution of the opportunities	12	
		Quality of Employment	Local community satisfaction the quality of employment in tourism sector (Satisfaction level of people who are engaged in tourism related job activities in terms of wages, work environment, quality of job and equity)	13	

Theme	Mearns(2010)		Baseline Aspect of ST (Sustainable Tourism Principles, Niedziolka, 2012)	Proposed Indicators	Indicator Ref No
	Issue	Indicator			
Environment (12 indicators)	Energy management	Per capita consumption of energy (per person day)			
		Energy-saving measures			
		Percentage of energy consumption from renewable resources	Environmental Cleanness	Percentage of renewable energy uses	14
	Water availability and conservation	Water use (total water volume consumed and liters per tourist per day)		Water use (total water volume consumed and liters per tourist per day)	15
		Water conservation measures	Environmental Cleanness	Volume of reused water attributed to tourism	16
	Drinking water quality	Water treated to international potable standards		Available drinking Water treatment systems	17
	Sewage treatment	Sewage treatment systems	Effective Waste Management	Method of sewage disposal /recycle system	18
	Solid waste management	Waste volume produced		Volume of solid waste produced at the destination	19
		Waste disposal (landfill, recycling, etc.)		Method of solid waste disposal /recycle	
	Controlling use intensity	Number of tourists per square meter of the site		Number of tourists per square meter of the site	20
	Biodiversity and conservation	Local community involvement in conservation projects in area		Complaints and threats for natural habitats and natural species in the area (as perceived by environment specialists and the level of effort made by responsible bodies to mitigate them)	21
				Tourists satisfaction on special eco-systems and natural species within the area	22
		Biological diversity	Community satisfaction on the conservation of natural habitat and wild life within tourism area	23	
			Visitor satisfaction of quality of landscape within the tourism area	24	
		Physical integrity	Visitor satisfaction of visual quality and character of the area	25	

Theme	Mearns, 2010			Proposed Indicators	Indicator No
	Issue	Indicator	Baseline Aspect of ST (Sustainable Tourism Principles, Niedziolka, 2012)		
Social (15 indicators)	Local satisfaction with tourism	Local satisfaction level with tourism	Welfare of the community	Local community's satisfaction level with tourism	26
		Local community complaints		Local community's complaints on tourism activities in the area	27
	Effects of tourism on communities	Percentage who believe that tourism has helped bring new services or infrastructure		Percentage of local community who believe that tourism has helped bring new services or infrastructure facilities	28
	Education	Education of tourists	Meeting expectations of visitors	Level of tourist satisfaction on overall tourism experience in the area	29
		Education of community	Welfare of the community	Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge	30
		Training and skills development of staff members		Training and skills development of staff members	31
	Community decision making	Community decision-making structures	Local control	Local community's satisfaction on their participation in decision making related to tourism in the area	32
	Culture	Cultural appreciation and conservation	Cultural Wealth	Tourists satisfaction on the cultural heritage, cultural values & customs	33
				Tourists satisfaction on interaction with local community	34
				Local community satisfaction interaction with tourist	35
				Local community satisfaction level Tourism and preservation of cultural wealth	36
	Sustaining tourist satisfaction	Level of tourist satisfaction	Meeting expectations of visitors	Tourist satisfaction level on overall tourism experience in the area	37
		Perception of value for money		Perception of value for money	38
		Percentage of return visitors		Percentage of return visitors	39
		Perception of sustainability		The percentage of tourists who believe the particular tourism venture is sustainable	40

Annexure 02

Evaluation of Indicators

Baseline Aspect	Components of Baseline Aspect	Indicator	Composite Scores (Scale – 1-5**)				Overall Score (%) $(\sum (1,2,3,4)/20) * 100$	Weight Assigned(*)
			Criteria (***)					
			1	2	3	4		
Economic	Economic profitability	(1) Annual growth of direct revenue generated at the considered tourist attraction(s) (revenue from tickets, donations)	5	4	5	4	90	4
		(2) Total number of tourist arrivals (through the year ,mean and peaks)	5	3	3	2	65	
		(3) Number/percentage of local people employed in tourism sector	4	4	3	3	70	
		(4) Number of tourism business increase/decrease & percentage owned locally	5	4	4	4	85	3
		(5) Tourist spending (No of days spend at PILNP area by tourist)	5	4	3	4	80	2
		(6) Occupancy rates for accommodation by month	4	4	3	3	70	
	(7) Ratio of low season tourism employment to peak season tourism employment	4	4	3	3	70		
	Local prosperity	(8) Annual growth of revenue earned by local community in terms of tourist activities	5	5	3	1	70	
		(9) Supply of goods and services to tourism enterprises	5	4	4	4	85	3

		(10) The revenue spent within the local area	4	3	2	1	50	
		(11) Percentage of families economically benefited from tourism activities fully and partially	5	5	5	4	95	5
		(12) Unemployment rate	4	3	4	3	70	
	Quality of employment	(13) Local community satisfaction the quality of employment in tourism sector (Satisfaction level of people who are engaged in tourism related job activities in terms of wages, work environment, quality of job and equity)	5	4	4	4	85	3
	Social equity	(14) Fair distribution of the opportunities	5	4	4	4	85	3
Environment	Physical integrity	(15) Visitor satisfaction of quality of landscape within the tourism area	4	4	4	4	80	2
		(16) Visitor satisfaction of visual quality and character of the area	4	4	4	4	80	2
	Biological diversity	(17) Complaints and threats for natural habitats and natural species in the area (as perceived by environment specialists and the level of effort made by responsible bodies to mitigate them)	5	4	2	4	75	1
		(18) Tourists satisfaction on special eco-systems and natural species within the area	4	3	4	4	75	1
		(19) Community satisfaction on the conservation of natural habitat and wild life within tourism area	4	3	4	4	75	1
		(20) Number of tourist per square meter of the site	3	3	4	3	70	
	Effective waste management	(21) Method of sewage disposal/recycle system	5	3	4	4	80	2

		(22) Volume of solid waste produced at the destination & Method of disposal	5	3	4	4	80	2
	Clean environment	(23) Percentage of renewable energy uses	5	4	3	3	75	1
		(24) Level of water quality in the surrounding water bodies (sea, canals, rivers, ponds, lakes etc.)	5	4	4	1	70	
		(25) Water use (total water volume consumed and liters per tourist per day)	3	3	3	3	60	
		(26) Volume of reused water attributed to tourism	4	4	3	3	70	
Socio-cultural	Welfare of the community	(27) Percentage of local community who believe that tourism has helped bring new services or infrastructure	4	4	3	3	70	
		(28) Local community's satisfaction on the existence of tourism within the area	4	4	4	4	80	2
		(29) Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge	5	4	4	4	85	3
		(30) Training and skills development of staff members	4	3	4	1	60	
		(31) Local community's complaints on tourism activities in the area	3	3	1	4	55	
	Cultural wealth	(32) Tourists satisfaction on the cultural heritage, cultural values & customs	4	4	4	4	80	2
		(33) Tourists satisfaction on interaction with local community	5	5	4	4	90	4
		(34) Local satisfaction on interaction with tourist	5	4	2	4	75	1

		(35) Local community satisfaction level regarding Tourism and preservation of cultural wealth	4	3	4	4	75	1
	Meeting expectations of visitors	(36) Level of tourist satisfaction on overall tourism experience in the area	5	5	5	4	95	5
		(37) Percentage of return visitors	5	4	4	3	80	2
		(38) The percentage of tourists who believe the particular tourism venture is sustainable	4	3	4	4	75	1
		(39) Perception of value for money	4	4	3	3	70	
	Local control	(40) Local community's satisfaction on their participation in decision making related to tourism in the area	5	5	5	4	95	5

*** **Criteria's**

- a) Relevance to the expression & elaboration
- b) The level of holistic interpretation of the expression
- c) Effectiveness as a measurable indicator
- e) Availability of data (Possibility of extracting or collecting the data with related to the general Sri Lankan tourism context)

**The evaluation of each indicator under four criteria was conducted by scoring them in a scale of 1 – 5.

* The selected indicators were given weight 1-5 based on their final score (75 to 1, 80 to 2, 85 to 3 90 to 4 and 95 to 5).

Annexure 03

“Sensitive Areas” as per the National Environment Act

According to the National Environmental Act (the part IV C of the NEA No. 47, of 1980, the Gazette Extraordinary No. 772/22 of 24th June 1993 as amended by the Gazette Extraordinary No. 859/14 of 23rd February 1995) all tourist destinations which are considered under the environmental sensitive areas which cannot be utilized for any development purpose without the approval of the authorities responsible for the enforcement of the NEA.

Following areas has been identified as an environmentally sensitive area by the NEA

- i) Within 100m from the boundaries of or within any area declared under;
 - a. The National Heritage Wilderness Act No. 3 of 1988
 - b. The Forest Ordinance (Chapter 451)
 - c. Whether or not such areas are wholly or partly within the Coastal Zone as defined in the Coast Conservation Act, No. 57 of 1981.
- ii) Any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188).
- iii) iii. Any Flood Area declared under the Flood Protection Ordinance (Chapter 449) and any flood protection area declared under the Sri Lanka Land Reclamation and Development Corporation Act, No. 15 of 1968 as amended by the Act, No. 52 of 1982.

Annexure 04

Levels of Sensitivity as specified in Eastern Province Physical Structure Plan 2004 - 2007

NPPD has identified zones for environmentally sensitive and developmental areas and all the environmentally sensitive areas has been demarcated according to the level of sensitivity. (E.g.: High, moderate or low).

(a) Highly Environmentally Sensitive Areas

Such as fragile ecosystems, no development would be allowed.

(b) Moderately Sensitive Areas

Such as forests and coastal ecosystems, limited development activities (Eco tourism) that are less harmful to the environment would be allowed.

(c) Less Sensitive Areas

Such as catchment and riparian areas, development activities would be required to abide by the legal requirements.

Fragile ecosystem -

“**Ecosystems** those are most likely to be damaged or become extinct because of human activities. Areas with such species, communities and eco- systems may be called **fragile**, sensitive, or vulnerable.”

Eg: coral reef

“**Coastal ecosystems** are the collection of organisms that are found on the boundaries of oceans, lakes, rivers, and other forms of liquid water. The intrusion of water into the land creates unique environmental conditions characterized by a large number of habitats.”

Annexure 05

Perception Survey of Local Community of Pigeon Island Marine National Park Tourism Destination

This Perception Survey is carried out by Ms. D. Dissanayake, MSc Student of Department of Town & Country Planning of University of Moratuwa for my MSc research study titled – Evaluation of Sustainability of a Tourism Destination: Case of Pigeon Island in Trincomalee. It is assured that the findings of this survey will be used only for academic purposes.

Personal Information

GN Division -

Street name -

Economic Sustainability of Tourism Activities

(1) Are you engaged in any kind of tourism related activity? (**Indicator 4 /5**)

Yes	
No	

(2) If not, why?

.....

(3) If Yes, what is the tourism related activity you are engaged in? (**Indicator 4 /5**)

a.	Boat operator	
b.	Diving agent	
c.	Tourist guide	
d.	Shop/boutique owner	
e.	Shop/boutique employee	
f.	Supplier	
g.	Hotel worker	
h.	Rent a home stay house/room	
i.	Own or work at a restaurant	
j.	Cab/taxi driver	
k.	Any Other	

Mention any other activity

- (4) If you are engage in any of the tourism related activity , please state your level of satisfaction in terms of wages, working environment ,quality of job & equity of recruitment (**Indicator 6**)

	Highly Satisfied	Moderate satisfied	Not Satisfied	No Idea
Wages/Income				
Work environment				
Quality of the Job				
Equity in recruitment				

- (5) Do you agree that both economic and social benefits of tourism are shared equity? (Employment opportunities /Market/Revenue from Park/Infrastructure Facilities) (**Indicator 7**)

a.	Strongly agree	
b.	Partially agree	
c.	No idea	
d.	Disagree	
e.	Strongly disagree	

Environment Sustainability of Tourism Activities

- (6) Do you think that there are any considerable threats to the natural habitat and wild life within the area? If yes, please specify them

.....

- (7) What is your level of satisfaction on measures undertaken by government and other stakeholders for the conservation of natural habitat and wild life within tourism area? (Government & other group participation for protecting the natural species)

(Indicator 12)

a.	Highly satisfied	
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b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

Socio - cultural Sustainability of Tourism Activities

(8) What is your level of satisfaction regarding the existence of tourism in the area? (opportunities from tourism, infrastructure facilities /public utilities) **(15 Indicator)**

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

If you have any comments.....

(9) Do you agree that believe that tourism has helped them be educated on different languages, skills and knowledge? **(16 Indicator)**

a.	Strongly agree	
b.	Partially agree	
c.	No idea	
d.	Disagree	
e	Strongly disagree	

(10) Are you satisfied about the level and quality of interaction that you are having with local and foreign tourists? (any threat /problem from tourist) **(19 Indicator)**

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(11) Do you agree that tourism has helped to preserve cultural wealth? **(20 Indicator)**

a.	Strongly agree	
b.	Partially agree	
c.	No idea	
d.	Disagree	
e	Strongly disagree	

(12) What is your level of satisfaction regarding the opportunities provided for local community to independently express their interests and participate in the decision making related to tourism activities within the area? **(24 Indicator)**

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

Annexure 06

Perception Survey of Tourist of Pigeon Island Marine National Park Tourism Destination

This Perception Survey is carried out by Ms. D. Dissanayake, MSc Student of Department of Town & Country Planning of University of Moratuwa for my MSc research study titled – Evaluation of Sustainability of a Tourism Destination: Case of Pigen Island in Trincomalee. It is assured that the findings of this survey will be used only for academic purposes.

Personal Information

Origin Town/Country -

Economic Sustainability of Tourism Activities

(1) What did you plan to do at PIMNP? (**Indicator 11**)

.....

(2) Were you able to enjoy PIMNP as per your plan? If not what did you miss?
(Indicator 11)

.....

(3) What is your level of satisfaction regarding the quality of landscape within the tourism area? (**Indicator 8**)

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(4) What is your level of satisfaction regarding the visual quality and character of the area?(natural beauty /natural landscape of the island)

(Indicator 9)

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(5) What is your level of satisfaction regarding the special eco-systems and natural species within the area? (Have get opportunity to see coral reef and information's about coral & destination history)(**Indicator 11**)

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(6) What is your level of satisfaction regarding the experience of cultural heritage, cultural values & customs? (Opportunities to learn the local culture) (**17 Indicator**)

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(7) Are you satisfied about the level and quality of interaction that you are having with local communities? (any threat /problem from local community) (**18 Indicator**)

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(8) What is your level of satisfaction regarding the overall tourism experience in the PIMNP area?(regarding the activities to be engaged & facilities of the destination) (**21 Indicator**)

a.	Highly satisfied	
b.	Moderately satisfied	
c.	Not satisfied	
d.	No idea	

(9) Do you think this destination area operating successfully? (Overall idea of the destination, regarding the local community welcome, environment and business activities of the area) **(23 Indicator)**

Yes	
No	

(10) How many days do you hope to stay at PINP area? **(3 Indicator)**

If you have any comments
.....
.....

(11) Do you wish to visit PIMNP again? **(22 Indicator)**.....