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

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ABSTRACT

To meet the growing demand for tourism, 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. 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 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. 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 Pigeon Island Marine National Park (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 statistics. After quantifying all indicators multi-criteria analysis framework 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.

Keywords: Sustainability, sustainable tourism principles, framework of indicators

INTRODUCTION

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.

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.

METHOD

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.

Accordingly 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.

LITERATURE REVIEW

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 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.

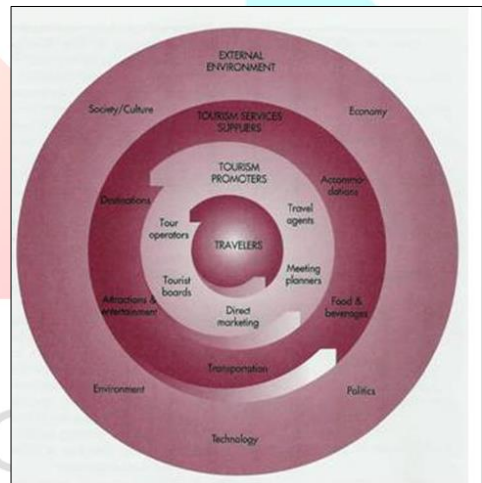


Figure 2: Integrated Model of Tourism
Source: Roy A. Cook, Laura J. Yale, Joseph J., 2002

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 Brundtland 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.

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 (Niedziolka, 2012) 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.

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.

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 range 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]	- Local satisfaction level with tourism - Local community complaints
Effects of tourism on communities [social]	- Percentage who believe that tourism has helped bring new services or infrastructure - Other effects of tourism on the community
Sustaining tourist satisfaction [economic]	- Level of tourist satisfaction - Perception of value for money - Percentage of return visitors - Perception of sustainability - Tourist complaints
Tourism seasonality [economic]	- 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]	- Number of local people (and ratio of men to women) employed in tourism - Revenue generated - Revenue spend in area
Energy management [environmental]	- Per capita consumption of energy (per person day) - Energy-saving measures - Percentage of energy consumption from renewable resources
Water availability and conservation [Environmental]	- Water use (total water volume consumed and liters per tourist per day) - Water conservation measures
Drinking water quality [environmental]	- Water treated to international potable standards
Sewage treatment [environmental]	- Sewage treatment systems
Solid waste management (garbage) [environmental]	- Waste volume produced - Waste disposal (landfill, recycling, etc.)
Development controls [crosscutting]	- Existence of a development planning process including tourism
Controlling use intensity [environmental]	- 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.

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.

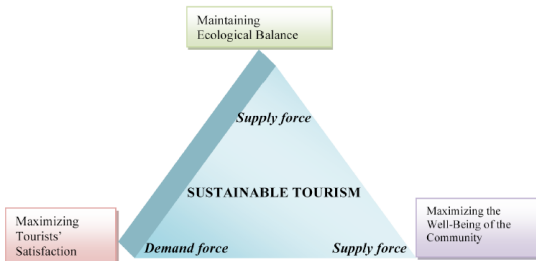


Figure 1
Trio-fundamental requirements of sustainable development adopted from Silva, S., 2002

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.

Framework for sustainability assessment

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 (Table 3).

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.

Social Principle	Category	Indicators	Assessment method
		Local community	Local community's satisfaction on the existence of tourism within the area Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge
Cultural Wealth	Cultural Wealth	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
Meeting Expectations of Visitors	Meeting Expectations of Visitors	Local community satisfaction regarding the Tourism contribution to preservation of cultural wealth	Local community Perception Survey
		Level of Tourist satisfaction on overall tourism experience in the area.	Tourist Perception Survey
		Percentage of return visitor	Tourist Perception Survey
Local Control	Local Control	The percentage of tourist who believe the particular tourism destination is sustainable	Local community Perception Survey/Previous records
		Local community's satisfaction on their participation in decision making related to tourism in the area	Local community Perception Survey

Table 3: Proposed framework with measure indicators and assessment method for the evaluation of sustainability

Aspect	Indicators	Assessment method	
Economic Principle	Economic Profitability	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
	Local Prosperity	Number of tourism business increase/decrease & percentage owned locally	Local community Perception Survey/Field survey
		Supply of goods and services to tourism enterprises	Local community Perception Survey /Field Survey
Quality of Employment	Percentage of families economically benefited from tourism activities fully and partially	Local community Perception Survey	
Social Equity	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	
Environmental Principle	Physical Integrity	The percentage of community who believe that both economic and social benefits of tourism are shared equally	Local community Perception Survey
		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
	Biological Diversity	Local community satisfaction regarding the Tourism contribution to preservation of cultural wealth	Local community Perception Survey
		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
	Effective Waste Management	Community satisfaction on the conservation of natural habitat and wild life within tourism area	Local community Perception Survey
Volume of waste produced at the destination & Method of disposal)		Local Authority records (get information of their system)	
Environmental Cleanliness	Percentage of renewable energy uses	Field Survey	

RESULTS AND DISCUSSION

The applicability of the above proposed framework for measuring level of sustainability of a tourism destination was tested in Pigeon Island Marine National Park (PIMNP) in Trincomalee.

Pigeon Island Marine National Park

Pigeon Island Marine National Park is located in Trincomalee District (N 80 43' 0" and E 810 9' 0" to N 80 36' 0" and E 810 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.

Application of the proposed framework

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 in Table 4.

Table 4: Summary of the analysis

Indicator	Overall Weight (w)	Quantitative / Qualitative Final Result	Scale based on Final Result (x)	(x*w)/Σ(w)
Economic Sustainability				
(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 Economic Sustainability = $\frac{\sum(x*w)}{\sum(w)}$		$= \frac{(360+210+52+120+125+177+30)/23}{= 47\%$		
Environmental Sustainability				
(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 ecosystems 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% positive impact	20%	40/12
(14)Percentage use of solar energy and other renewable energy	1	Based on the high severity of the issue, the scale is given as 1 out of 5 meaning 20% of positive impact	20%	20/12
Overall Environmental Sustainability = $\frac{\sum(x*w)}{\sum(w)}$		$= \frac{(80+154+55+55+50+40+20)/12}{= 34\%$		

Socio-cultural Sustainability				
(15) Local community's satisfaction level with tourism	5	49% of community population is either highly or moderately satisfied	49%	200/27
(16) Percentage of local community who believe that tourism has helped them be educated on different languages, skills and knowledge	1	20% of community population partially agree to this fact	20%	20/27
(17) Tourists satisfaction level on the cultural heritage, cultural values & customs	2	28% of tourists are either highly or moderately satisfied	28%	56/27
(18) Tourists satisfaction on interaction with local community	4	68% of tourists are either highly or moderately satisfied	68%	272/27
(19) Local community satisfaction interaction with tourist	1	90% of local community are either high or moderate satisfy	90%	90/27
(20) Local community satisfaction level regarding - Tourism has helped to preserve cultural wealth	1	10% of community population partially agrees to the fact	10%	10/27
(21) Level of tourist satisfaction on overall tourism experience in the area	5	60% of tourists are either highly or moderately satisfied	60%	300/27
(22) Percentage of return visitors	2	65% of tourists stated that they are willing to visit PIMNP for the second time	65%	130/27
(23) The percentage of tourists who believe the particular tourism destination is sustainable	1	38% of tourists believe that PIMNP is a sustainable tourism venture	38%	38/27
(24) Local community's satisfaction on their participation in decision making related to tourism in the area	5	15% of local community is moderately satisfied	15%	75/27
Overall Socio-cultural sustainability = $\frac{\sum(x \cdot f)}{\sum(f)}$				$= \frac{(200+20+56+272+90+10+300+130+38+75)/27}{44\%}$

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 5: Level of sustainability

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

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.

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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