# Identification of Evaluating Criteria for Sustainable Visitor Management of National Parks in Sri Lanka

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## Abstract

*With the booming of Tourism industry,eco-tourism has been popularized and improved in the world. The places which are practicing eco-tourism attract increasing number of visitors day by day by exceeding their carrying capacity. Therefore, the environment of most of national parks in Sri Lanka adversely affected due to over visitation by local and foreign visitors. Adaptation of mechanism on sustainable visitor management for the national parks in other countries has been addressed this problem. Yet, there is no proper way to manage visitors for National parks in Sri Lanka and most are highly over visited. Sustainable visitor management is dependent on related set of criteria which are varying from country to country. In the Sri Lankan context, suitable criteria for sustainable visitor management are not yet identified. This study is supposed to fill this gap by identifying suitable criteria for sustainable visitor management in national parks in Sri Lanka. Sixty nine criteria were identified through literature review under category of fifteen factors and four attributes such as physical, environment, tourism demand management and operational capacity management. Sixty two criteria were prioritized based on how frequently they are used in various literatures and they were ranked. Multivariate technique was applied to prioritize the above sixty two criteria based on compatibility and usability between each criterion and relevant indicator. The sixty two criteria were short listed up to twenty four criteria considering criteria value more than 1516. These twenty four were applied to evaluate the current visitor management of Yala National Park as it is the highest over visited national park in Sri Lanka. Evaluation was done considering the perception of the expertise in tourism industry of Sri Lanka. Results indicate that Yala national park has moderate level of sustainable visitor management. And also there are more criteria have to be taken in to account in order to reduce over visitation of Yala national park while managing its environment in a sustainable manner.*

***Keywords:*** *tourism, sustainable visitor management, national parks*

## 1.0 Introduction

One of the world's largest and fastest growing industry is tourism and it is a crucial contributor to the economy of world's poor countries (PATA Tourism Forecast/ UNWTO). Tourism industry of Sri Lanka has contributed as 5th earner of the GDP of Sri Lanka in year 2010. After the 30 years of civil conflicts in Sri Lanka, tourism has been tremendously recovered from its lapses.The tourist arrivals have been gradually increased during post war period. In year 2009 tourists arrivals were 454,900 and in year 2010 it increased up to 654,398. Sri Lanka Tourism Development Authority has divided Sri Lanka into 7 tourism regions. Mainly high occupancy rate is available in South region and Greater Colombo region.

Tourism sites can be divided into two parts as popular and potential sites such as national parks, zoological gardens, botanical gardens, cultural places and coastal areas. Popular tourism sites have

a problem of over visitation due to marketing and booming tourism in Sri Lanka, which makes exceed the carrying capacity of the site. This leads to reduce the tourism value of the site while it is harmful to the environment. Many countries practice the mechanism of sustainable visitor management for dual purpose, i.e., protecting the tourism sites while gaining the profit. Scotland introduced a sustainable visitor management system to heritage sites, As Scottand Barrow(2002) sited; sustainable visitor management is a cyclical, iterative planning and management process. It is presented as a menu of procedures, processes and tools that can be used at a range of visitor sites according to their management needs. They enjoy the high quality environment, rich cultural heritage, as well as direct and indirect economic benefits. Higginbottom, Carterand Moore (2010) studied that national parks of Australia has long been concerned with monitoring visitor impacts and experiences, the efforts have largely been site and activity specific, with consistent methodological approach.

Although there are studies done on destination management system and sustainable tourism development in Sri Lanka were by Sri Lanka Tourism Development Authority and there is a special division for the visitor management in Department of Wildlife Conservation, there is no proper sustainable visitor management mechanism for Sri Lanka to address the problem of over visitation as a whole and for destination wise. This gap must be filled. This study identifies suitable evaluating criteria for sustainable visitor management in Sri Lankan National parks.

## 2.0 Criteria of Sustainable Visitor Management System

### 2.1 Sustainable Visitor Management System

Sustainable visitor management is much different from any other related concepts. As Scott and Barrow (2002) explained that sustainable visitor management system is resulting a repeated, iterative planning and management process. It is presented as a menu of procedures, processes and tools that can be used at a range of visitor sites according to their management needs.Understanding visitor use and its effect on biophysical resources is an important part of the sustainable management (Thorsell, 2002). There should be a concern on identification and use of indicators to report on the sustainability of visitor use and management of tourism protected areas (McCool and Stankey, 2004). Tourism development should be carefully planned by considering the carrying capacity of the site with regard to environmental, social and economic impacts (Scott, and Barrow, 2002). Such integration of environmental concerns the conservation of natural and cultural heritage in development plans are essential to encourage sustainable and high quality forms of tourism (Majorca, 1999).

### 2.2 Application of the Sustainable Visitor Management

Application of sustainable visitor management system is significance in the tourism planning and in spatial planning. and Manente, Minghetti, Celotto (1993) introduce that the principles and practices of visitor management have been acquired ever-increasing importance in the last decade, especially in popular tourism destinations characterized by large or unusual tourist flows. As highlighted, each destination is characterized by a consistent or a rising volume of visitor flows, in relation to tourism mobility patterns and city functions (McCool and Stankey, 2004). Sustainable visitor management ensures sustainable development, and then limitsthe dramatic pressure of demand. It requires the adoption of an integrated set of strategies that combine tourism, transport and land-use related measures. This is an adaptive management and application of the precautionary principles as the foundation of protected area management to resource status and threats, and visitor use (Higginbottom, et al, 2010). This system is used to protect tourism sites and as a solution for overcome the over visitation of sites.

### 2.3 Criteriafor Sustainable Visitor Management

To develop the system of sustainable visitor management, there are many criteria and framework to pursue. Eagles ,McCool , Haynes , (2002) identified four criteria which can be used to reduce

the negative impacts of visitors on protected areas as managing the supply of tourism or visitor opportunities, demand for visitation, resource capabilities and managing the impact of use. Manning (2002) introduced eight criteria that should be taken into account when managing visitors of protected areas and reducing use of the entire protected area, problem areas, modify the location of use within problem areas, the timing of use, type of use and visitor behavior and visitor expectations, increase the resistance of the resource and rehabilitate resources. Donk and Cottrell (2002) have developed a set of criteria and indicators which come under the sustainable visitor management as visitor management philosophy, interpretation, minimizing impacts, visitor experience/recreation opportunities, managing and monitoring risk, partnership co-operation, providing training and financial management.

There are fifteen 'factors' introduced by World Tourism Organization and World Commission on Protected Areas (WCPA) as improve the site access, area closures, managing the impact of use, special modes to travel on site, local traffic management, local infrastructure management, managing the resource capabilities, site hardening, visitor centers, promotion of low season travel, attraction and events, complementary sites, limiting group size, managingvisitor movement patterns, responsive measures for peak periods and administrative measures. Sixty nine criteria which were identified as a main finding of literature review and they were categorized under fifteen factors and four attributes namely physical, environmental, tourism demand management and operational capacity management.

## 3.0 Research Methodology

This research claims that there should be suitable criteria for sustainable visitor management in the context of Sri Lanka. All identified sixty nine criteria from the literature review were prioritized considering the number of frequency of mentioning of each criterion in all referenced research articles and rank value of the research paper which was given considering the number of criteria introduced or mentioned. Then using following two formulas, sixty two criteria were selected.

$$\frac{\textit{Value of the Criteria} \times \textit{Ranked value of relevant research paper}}{\textit{Total value of the criteria} \times \textit{Total value of the relevant factor}}$$

In order to apply those criteria practically, there should be relevant indicators that support to measure those criteria. It was identified forty nine indicators which were given below by referring the above literature and considering opinions of expertise who are involved in tourism industry of Sri Lanka.

1. No. of entries to the park
2. No. of visitors
3. No. of providers and operators
4. Different prices of tickets
5. Available Signage
6. Area of protected Areas
7. Available barriers
8. Area with problems
9. No of Tour operators
10. Fragile and sensitive areas
11. Risk assessment
12. Locations to see in site
13. carrying capacity of the area
14. No. of park vehicles
15. No of vehicles

16. Type of vehicles
17. Existing policies for using vehicles
18. area of parking
19. path ways for differently abled people
20. Road Network
21. Public bus route
22. potential routes (roads)
23. No. of retail shops and Food outlets near to the park
24. No. of retail shops and food outlets in the park
25. Space of them
26. type of them
27. Building capacity
28. Types of Resources
29. Soil types
30. Vegetation cover
31. trial routes
32. No of visitor centers
33. Services of visitor centers
34. pre reservations methods
35. Events
36. potential sites
37. new attractions
38. Group Sizes
39. Regulations for groups
40. Safety regulations
41. Routes in the site
42. Peak periods
43. congestion issues
44. administrative structure
45. Tourism Operator Licenses
46. Existing visitor management plan
47. available admin resources
48. Available training programs
49. Capacity of the entry

Multivariate technique was applied to prioritize the above sixty two criteria considering compatibility and usability between each criterion and relevant indicator. Compatibility index which shows neutral (0), Low (1), moderate (2) and high (3) was used to give values for above each indicator against each criterion. Each value in Matrix was multiplied by the rank value of criteria. With those values, sixty two criteria were reduced up to twenty four criteria shown in Table 1 considering criteria which have total value more than 1516 (base value) that is the value when a criterion gets at least low compatibility value against all indicators.

| Criteria | Total | Rank |
|---|---|---|
| Pre-assignment of recreation site | 4488 | 1 |
| Improve Visitor Movement Patterns around Site | 3225 | 2 |
| Expand the Range of Attractions | 3193 | 3 |
| Establish Consultative Mechanisms for Tourism Congestion Issues | 3168 | 4 |

| | | |
|---|---|---|
| Establish a plan that identifies the maximum number of people that will be allowed in different locations | 3080 | 5 |
| Tourism marketing | 3034 | 6 |
| Develop Low Season Attractions and Events | 2812 | 7 |
| Different Options for Site Entry | 2520 | 8 |
| Improve Tour Guide Management on Site | 2430 | 9 |
| Introduce a Comprehensive Communications Policy | 2409 | 10 |
| Establishing the location and timing of individual group use | 2304 | 11 |
| Prevents sightseeing access for private vehicles, especially to sensitive areas of the site. | 2301 | 12 |
| Restrict access to certain areas except by guided tour | 2280 | 13 |
| Improve Peak Activity Management of Special Events | 2048 | 14 |
| Risk assessment techniques to crowd management | 1972 | 15 |
| Encourage Promotion of Low Season Travel | 1860 | 16 |
| Safety regulations concerning activities and the use of facilities | 1836 | 17 |
| Improve Arrivals and Departure Area | 1820 | 18 |
| Differential pricing | 1800 | 19 |
| Improve Visitor Movement Past Viewing Locations | 1702 | 20 |
| Ensure that additional, overflow movement pathways are available for use in peak periods; | 1675 | 21 |
| Restrictions by group characteristics | 1656 | 22 |
| Group size limit | 1584 | 23 |
| Park information | 1536 | 24 |
| Establish Administrative Responsibility for Congestion Management | 1470 | 25 |
| Enhance Physical Influences on Tourism Demand | 1462 | 26 |
| Implementation, monitoring and evaluation of effectiveness of visitor management plan | 1403 | 27 |
| Include Congestion Issues in the Management Plan | 1386 | 28 |
| introduction of special sightseeing vehicles on the site | 1260 | 29 |
| Training program is element of visitor management | 1260 | 30 |
| Introduce pre-reservation systems for groups or individuals, including internet, pre-purchase and telephone reservations | 1248 | 31 |
| Consider limiting visitors to riding in special purpose vehicles in order to access remote or difficult areas of the site | 1220 | 32 |
| Improve Responsive Measures for Peak Periods | 1188 | 33 |
| Focal gateways | 1120 | 34 |
| Manage the Movement of Visitors in Sensitive Areas | 1040 | 35 |
| Guide the management of crowd flow and movement in a range of public assembly venues | 1026 | 36 |
| Barriers | 954 | 37 |
| Distribute outlets around the site to spread the flow of visitors | 840 | 38 |
| Market trial routes | 840 | 39 |
| Develop Tourism Operator Licenses | 736 | 40 |
| Signage to the site on primary access routes | 703 | 41 |
| Encourage Expanded Travel Periods in Source Markets | 693 | 42 |
| Regulations to problem areas | 689 | 43 |
| Encourage Joint Promotion with Complementary Sites | 627 | 44 |
| Improve Access for the Physically Impaired | 580 | 45 |

| | | |
|---|---|---|
| Sufficient parking area for private vehicles | 552 | 46 |
| Adequate resources for implementation of visitor management plan | 437 | 47 |
| food and retail outlets are located and have sufficient space with ensuring no disturbances to the visitors and park | 414 | 48 |
| Choose the appropriate ticketing system | 400 | 49 |
| Improve Coordination of Arriving Groups | 335 | 50 |
| Improve Physical Capacity of Local Infrastructure | 324 | 51 |
| Regulations to the entire protected area | 294 | 52 |
| Area protection through the restrictions | 288 | 53 |
| Improve Physical Capacity of Local Road Systems | 256 | 54 |
| Restrictions on the use of fire | 222 | 55 |
| reduce the impact of visitors on sensitive soils and vegetation | 164 | 56 |
| Increase the resistance of the resource | 100 | 57 |
| Improve range of public transport provision | 87 | 58 |
| Maintain/ rehabilitate resource | 84 | 59 |
| Improve Local Traffic Management | 61 | 60 |
| Managing the resource capabilities to handle use | 41 | 61 |

## Table 1 Prioritized Criteria

Those prioritized criteria are more suitable for sustainable visitor management which can be applied to overcome the over visitation issue of national park in any country. To distinguish the acceptability and applicability of those criteria for sustainable visitor management in national parks of Sri Lanka, the experts in the tourism industry in Sri Lanka and the officers of the Department of Wildlife Conservation in Sri Lanka were interviewed cross checking the criteria. It was mainly discussed about the acceptability and compatibility of Criteria to the Sri Lankan context. Other than those criteria some of the expertise mentioned new criteria as measuring method for vandalism of National parks and having visitor feedbacks continuously.

## 4. Application of Evaluating Criteria for the National Parks in Sri Lanka

There are 21 national parks in Sri Lanka. Among them, only 18 national parks are opened for visitors. To apply the above identified twenty four criteria, there should be a proper way to select one or few national parks. Since over visitation of the main problem which is focused in this study, it was selected 5 major national parks in the Sri Lanka which more visitors get attracted during the last 8 years (more than 300,000 visitors). Current visitor management mechanism which was practiced by these five national parks were evaluated by applying the above derived suitable criteria and related indicators. Non-probability judgment sampling method was used to interview the field officers, mangers of these national parks, officers of Sri Lanka Tourism Development Authority, Department of Wildlife Conservation and few visitors of national parks were interviewed.

They were instructed to mention whether each criterion is applied or not in terms of index of availability as not available (0), low available (1), Moderate available (2), high available (3). The values of the availability index under each criteria were multiply with the rank of value of the criteria which got under the application of Multivariate Technique. Final values were categorized into three level high, moderate and low using following methods.

*Highest level of sustainability Visitor Management =(Average Rank x No. of Criteria) x 3*
*Moderate level of sustainability Visitor Management =(Average Rank x No. of Criteria) x 2*
*Lowest level of sustainability Visitor Management =(Average Rank x No. of Criteria) x 1*

According to the final total availability value, Horton plains, Udawalawe, Minneriya and Wasgamuwa national parks are in moderate level on application of sustainable visitor management while Yala national park is being lowest. Therefore, Yala national park was selected for further studies.

Yala national park is the most visited national park in Sri Lanka which is located in between Southern Province and Uva Province. This national park was named as Ruhuna National Park with adjoining Kumana National Park. It was declared in 1938 February 25 as a National Park which designated as wildlife sanctuary in year 1900. Total area of the Yala National Park is 978.81sq.km. This park was called as a heaven for leopards while there are many spices, mainly such as Sri Lankan elephant, Sri Lankan sloth bear, Wild water buffalo and aquatic birds. Also eco system of the park is varying. There are variety of moist monsoon forests, dry monsoon forests, semi deciduous forests, thorn forests, grasslands, fresh water and marine wetlands, and sandy beaches. After the civil war conflict in Sri Lanka number of visitors and revenue has been increased. In year 2008 total number of visitors was 43,368 and it was increased to 253, 545 by 2010 (Refer Figure 1 and figure 2)
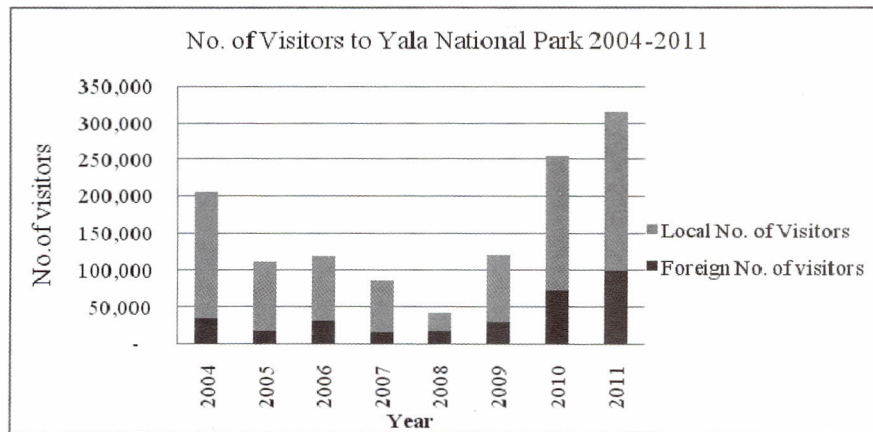


**Figure 1-Numberof Visitors to Yala National Park from 2004-2011**
*Source*: SLTDA

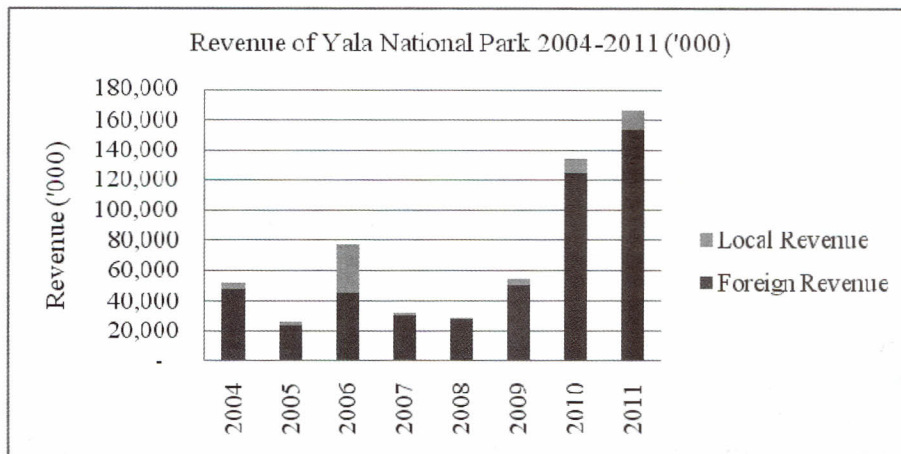Furthermore the revenue of the park also increased. Figure 8



**Figure 2 Revenue of Yala National Park 2004-2011 ('000)**
*Source:* SLTDA

There are many threats to fauna and flora in the national parks. Main problem is the over visitation and the carrying capacity is exceeded in the Yala National Park It will lead to arise impacts on wildlife, violate the road network due to high usage, waste, noise and air pollution (Miththapala, 2012).

As the final stage of this study, it was found that the availability of the Sustainable Visitor Management in Yala National Park using selected very best twenty four criteria with comparing values of availability index.
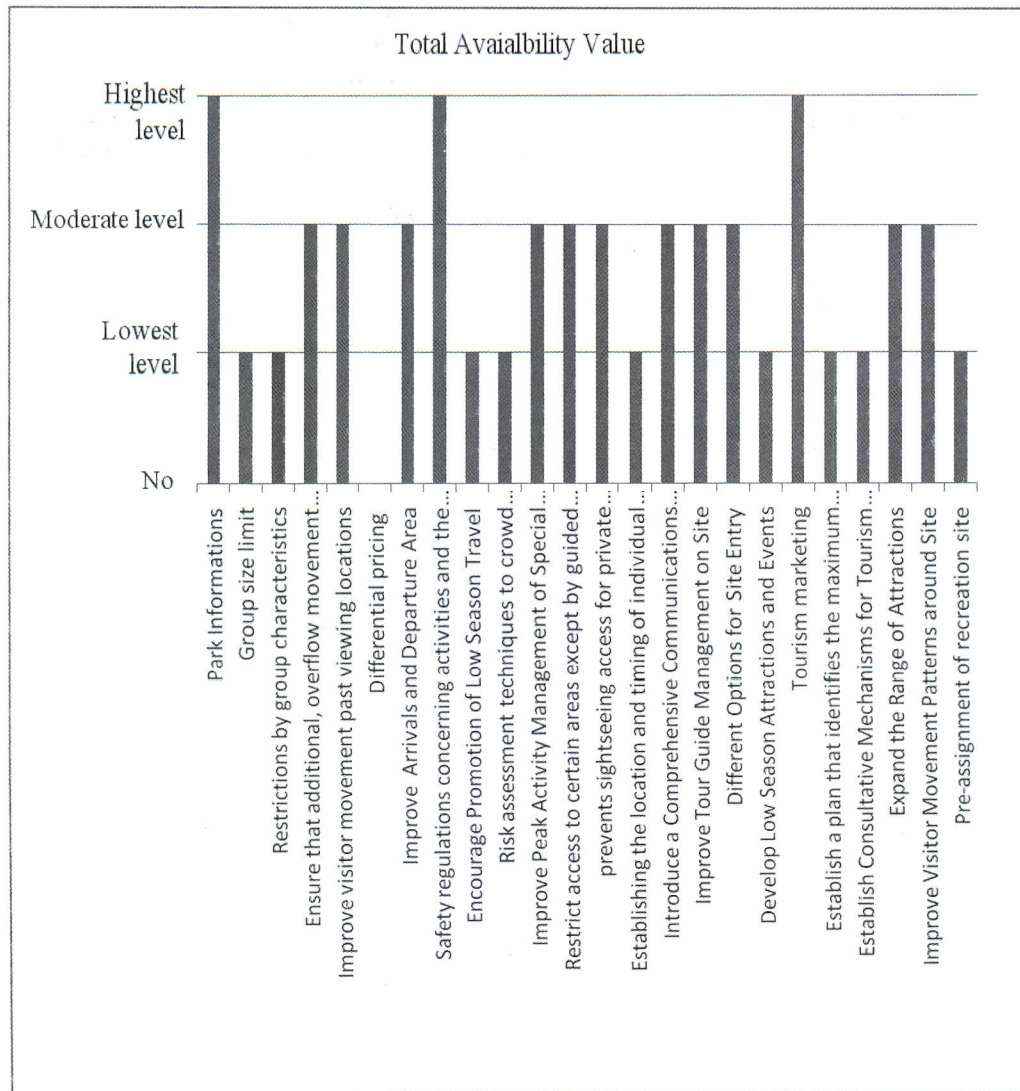


**Figure 3 Total Availability Value for the Criteria in Yala National Park (For full criteria's name please refer grey criteria in table 1)**

According to the results (Figure 3), Yala National Park is in the moderate level on availability and application of suitable criteria. Yala National Park is in critical situation in terms of over visitation and lack of application of most of criteria of sustainable visitor management. There are twenty one criteria that need to be applied in order to enhance the sustainability of visitor management.

## 5.0 Conclusion

There is an increasing interest onthe national parks based eco-tourism. The national parks in Sri Lanka suffer from theissue of over visitation and it has caused many subsequent environmental degradations. Application of sustainable visitor management is a best solution to overcome the issue and this research paper identified suitable evaluating criteria for sustainable visitor management in Sri Lankan context.

Based on the literature review, sixty nine criteria were identified. Using multivariate technique and considering the opinions of the expertise, they were reduced to twenty fourto create Sustainable Visitor Management while acting the best criteria that address the challenge of over visitations in the national parks of Sri Lanka. All these twenty four criteria were prioritized according to the order of high level to low level using multivariate technique. Application and the availability of these criteria in five national parks of Sri Lanka were examined and finally they were applied to Yala National Park which has lowest availability of application of criteria.The final result indicates that Yala National Park is in moderate level of practicing the sustainable visitor management. There are twenty one criteria that need to be applied in order to enhance the sustainability of visitor management.

Those identified twenty four criteria are more appropriate and more useful for the sustainable visitor management of the national parks in Sri Lanka and also in other countries, but not as same as the criteria identified in this study. They can be changed based on the context of different countries with different usage. Future studies can be carried out to prepare a model to apply the sustainable visitor management system to the national parks in Sri Lanka and it can be extended to the global context. Also this can apply to the cultural and heritage sites in the world as a model.

## References

Donk,M.V.D and Cottrell,S.(2002) Developing a visitor management framework for wwf's pan parks project; Case study of a national park in france. *Netherlands: Wageningen University.*

Eagles,P.F.J.,McCool,S.F. and Haynes,C.D (2002) Sustainable tourism in protected areas: guidlines for planning and management. cambridge: *IUCN Publications Services Unit.*

Buultjensa,J.,Ratnayakeb,I.,Gnanapalab,A and Aslamb M.(2004) Tourism and its implications for management in Ruhuna National Park (Yala), Sri Lanka, *Austrailia, Elsevier Ltd*

Higginbottom, K.,Carter, R.B.,Moore, S., Rodger K. and Narayan Y. (2010) Current practices in monitoring and reporting on sustainablity of visitor use of protected. *Queenaland, Aurtralia: Sustainable Tourism Pvt.Ltd.*

Manente M.,Minghetti, V. and Celotto, E. (1993) A cross analysis of strategies, projects and practices. *Visitor and mobility management in tourism destinations.*

Manning, R. E. (2002)How much is too much; carrying capacity of national parks and protected areas. *Burlington: School of Natural Resources*, University of Vermount.

Scott P. and Barrow G. (2002) Current practices in monitoring and reporting on sustanability of visitor use of protected .

Miththapala, S. (2012. 02. 27). over visitation in yala national park.

Organization, U. N. (2004). Tourism congestion management at natural and cultural sites. *spain: world tourism organization*, madrid, spain.

Pedersen, A. (2002). World heritage manuals; managing tourism at world heritage sites. *Unesco world     heritage center.*

Sowman P. and Pearce D. Tourism, national parks and visitor management. *somerset: bookcraft(bath) ltd.*

Thorsell, J. (2002). Cattying capacity and related planning issues.