

ESTABLISHMENT OF DULHAZRA SAFARI PARK TOWARDS THE PROTECTION AND CONSERVATION OF THREATENED BIOTA OF BANGLADESH ON THE BASIS OF SOUTHASIAN SAFARI PARK CONCEPT MODEL

Amir Hossen^{1*}, M.F. Ahsan² and M.Kamruzzaman³

¹Department of Zoology, Jagannath University, Dhaka-1100, Bangladesh

²Department of zoology, University of Chittagong, Chittagong-4331, Bangladesh

³Center for Environmental and Geographical Information services (CEGIS) Gulshan, Dhaka

Abstract

The main focus of this research was to analyze potentiality of safari park regarding the concept of protection and conservation of threatened species in accordance with Southasian Model. This model was considered to flourish a full feature of safari park in order to necessitate it. During our work, the positive and negative factors have been assessed to identify issues on the purpose for feasibility. The main objectives of establishment of safari park are protection, rehabilitation and conservation of biodiversity. In addition, release of rehabilitated fauna to the nature for a viable population and creating recreation opportunities were broadly considered behind the establishment of 'Southasian Model' safari park in the country.

Key words: *Safari Park, Southasian Model, Flora, Fauna, Visitor, Rehabilitation, Threatened, Ecotourism*

Introduction

Safari park concept was developed from the zoo concept considering animal welfare how can keep animal in nature like environment with stress free condition. This concept also totally different from other parks as well as protected areas like national park where animal enjoyed entirely natural environment but visitors get access to nature for sightseeing and other recreational activities. The 'Safari' is a very common and popular word which means enjoy and pass time with expedition, excursion, tour or journey to specific destination with definite purposes (Hossen *et al.*, 2014). Safari May be different types such as wildlife safari, desert safari, night safari, extreme nature safari, river safari, water-based safari, island based safari, heritage and culture safari. Of these, wildlife and nature based safaris are the most popular compared to others.

The 'safari park' concept was developed at the beginning of the 21st century after extension of recreational and conservation activities from the frame of zoo. Now, new ideas and well planning technical and scientific supports are being explored and dynamics this concept in different

* Corresponding author, Email: aahossen@gmail.com

regions over the globe. The safari park concept is totally different from zoo concept where animal can move freely and live and breed in nature and semi-natural environment but in zoo animals confine in small place with stress and unhealthy situation. Charismatic large mammals both endemic and exotic are the main recreational sources in the safari park along with other recreational activities (Heming, 1953).

The concept of wildlife safari is more diversified and nature oriented than other safari park. Many African countries like Tanzania, Kenya, South Africa main destination is to get many wildlife and nature lovers. It happens due to easy sightseeing charismatic wildlife in the savanna forest (Western *et al.*, 2009). Australia is famous for endemic wildlife safari and South America for riverine sightseeing incredible and a unique Amazon wildlife safari as well. Wildlife safari is much more exciting, expanding and enormous enjoyment but risky and expensive along with physical and access barriers. On the other hand, safari park is a most suitable place for endemic and exotic charismatic wildlife sightseeing with negligible risk and low cost in nature and semi natural environment (Hossen *et al.*, 2014). All kinds of people can get easy access in safari park but wildlife safari is not suitable for all for this reason, the safari park concept is being popular in many countries day by day and Safari park model vary continent to continent even region to region due to meteorological factors (Pforr, 2001).

Safari park model in tropical region will vary than temperate region regarding the coldness, shortage of sunlight, low fauna and flora diversity and low rainfall as well as less seasonal diversity (Mtahiko, 2004). If any tropical and subtropical animal introduce in temperate regional safari park then have to take extra care and provide more manmade suitable habitat to ensure survivability. Although safari park concept develop from zoo but now safari park concept more mature along with different dynamic forms such as safari world and marine park (Bangkok), wildlife zoo and sea life aquarium (Sydney), zoo safari park (Arizona, USA), Wildlife park (Sydney), safari world and water park (Malaysia), zoological garden (UK) and night safari world (Bali, Indonesia). Now people can easily enjoy diversified magnificent wildlife from different continents in home country by establishing environment friendly safari park by avoiding waste money and risk (Hossen *et al.*, 2014).

In Asia, safari park concept has been bloom due to suitable environment and more people outgoing activities as well as good landscape planning and suitable forest condition (Hossen *et al.*, 2014; Chowdhury *et al.*, 2004). It is true that many Asian countries suffer from deforestation due to unsustainable use of forest resources. It is possible to establish a safari park in fragmented and degraded forestland to restore forests in order to recreation, learning and research through good plans and proper management system. The safari park received attention as recreation spot to mass people and the biologists. It is one of the learning spots and it has become Safari Park and Zoo.

Material and Methods

The Study Area

This park is situated near the Bay of Bengal under Chakoria Upazila of Cox's Bazar district 107 km away from port city Chittagong. The park is encircled by Fasiakhali forest range of the Cox's Bazar North forest division at 21°40'6.7" to 21°40'6.9" N latitudes and 92°46'8.4" to 92°46'8.4" E longitudes (Map 1). The altitude is almost 9 meter from the sea level. The topographic feature of Dulahazra Safari Park is undulated hilly with green and semi-green coverage as well as water depressions (Chowdhury, 1967). Not only many depressions, narrow valleys and perennial natural streams flow inside the park but also contain good quality of water. This landscape also ensures support of feeding, breeding and resting to the wildlife.



Figure 1. Dulhazara Safari Park in Cox's Bazar, Bangladesh.

Of the total 1,360 visitors which were divided into 144 groups. Each month, 12 groups were observed at 6 groups twice a month each group was selected randomly in considering group size and gender equality specifically, juvenile and others also considered in male and female category. A total number of vehicles 14,626 divided under four categories: motorbike, car, micro-bus and jeep. Visitors and vehicles data has been collected from park authority as a means of secondary data sources. Data on biodiversity, problems, threats, conflicts, mismanagement related information was gathered through random field visits. All data were collected via semi-structured questionnaires to support analysis as well.

Results and Discussion

Suitable location and availability of diversified flora and fauna

The safari park is located in the evergreen and semi-evergreen forest of Bangladesh in the northeastern part of this country and near to the Bay of Bengal. This suitable location ensures the favorable meteorological condition throughout the year which helps flourish to flora and fauna in this area (Khan, 1990). The safari park is a part of reserve forest and surrounded by Fasiakhali Range of Cox's Bazar North Forest Division. The safari park area is rich by native diversified plants and animals. A total of 161 plant species (tree, shrub, herb, climber and orchid) and 150 wild species except 63 captive species has been noted (Hossen *et al.* 2014). According to Hossen *et al.* (2014), Mijanuddin (2005), Rahaman (2007), and Ramatullah (2007) a detail account on plants and animals of this study area is given in the Table 1. Information received from Wildlife Management and Nature Conservation division in Chittagong, a comparison of faunal species diversity between the DSP and Bangladesh is given in (Table 2).

Table 1. Group-wise distribution of flora and fauna in the Dulahazra Safari Park

Kingdom	Group	Number of family	Number of species
Plant	Herb	12	18
	Shrub	12	20
	Climber	17	24
	Orchid	6	17
	Tree	29	80
Animal	Amphibian	4	9
	Reptile	8	17
	Avifauna	42	103
	Mammal	14	21

Table 2. Comparison of wildlife species diversity between Dulahazra Safari Park and Bangladesh

Group	Species in Bangladesh (n)	Species in the DSP (n)	Species diversity in the DSP compared to Bangladesh (%)
Amphibian	23	6	26.08
Reptile	154	20	12.98
Avifauna	632	58	9.18
Mammal	123	35	28.45

Beholding extinct from wild and endangered species

Three most valuable wildlife species namely Sambar, Hog Deer and Freshwater Crocodile almost extinct from the wild but Safari Park holding them with good survival stock as well as successful

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breeding rate in the semi-natural environment (Hossen *et al.*, 2014). A limited number of Sambar species surviving in captive condition throughout the country but a large number is in the DSP with better growth and breeding rate. In 2008, the Sambar population size was 30 but Hog Deer already extinct from the wild and a very limited number exist in captive condition in very few zoo and private ownership with restrictions. Currently, 8 Hog Deer include 2 males, 3 females, 1 juvenile and 2 infants are surviving with good growth and breeding rate in the DSP. There is no recent record on Freshwater Crocodile in Bangladesh. The wildlife biologists assume that they went extinction in the wild.

Rescue and rehabilitation program

The safari park is playing a vital role from its inception as a rescue and rehabilitation center to injure and illegally captured wildlife from nature as well as trafficked wildlife from border areas and airports. In 2007, many spotted deer, pythons, hill mynas, monkeys and remarkable number of turtles and tortoises were released in this park from personal collection of many households. In addition, local people and forest guards sometimes rescue hurt wildlife and hand over to park authority in considering moral responsibility.

Conserve natural environment in the park area

The status of the DSP is better than outer natural reserve forest sites for providing extra care by the park management. The different types of herbs, shrubs, climbers and trees are available in the park area and canopy coverage also suitable. Many plant species reintroduced in this area which were once extinct from this region. Huge numbers of birds from different groups have been taking shelter as park is suitable to them. The wetlands with couple of the depressions attract migratory birds in the winter and they visit these depressions comfortably (Husain *et al.*, 1990). Marshlands of this are the most perfect places for other wildlife like reptiles, birds and mammals for successful breeding, feeding, resting and hiding.

Problems on the way of establishing Southasian Model of Safari Park Concept (SPC) in Bangladesh

Disturbance by visitors inside the park. Different types and levels of disturbance hamper the normal life of park animals which induce animals to be excited and angry behind visitor's tendency to do fun with animals as a recreational part but animal suffer long time depression and behavior abnormalities (Kenneth,1994). During the current study, four types of disturbance namely throwing stone, irritation, grimace, and offer food were identified through randomly selected 1360 visitors in 144 groups from June 2007 to May 2008 (Figure 1). The highest level disturbance was recorded in April 2008 and low in June 2007. Of the disturbance rate, throwing stone was highest and followed by offer food, irritation and grimace but do not like engage with disturbance activities were fewer.

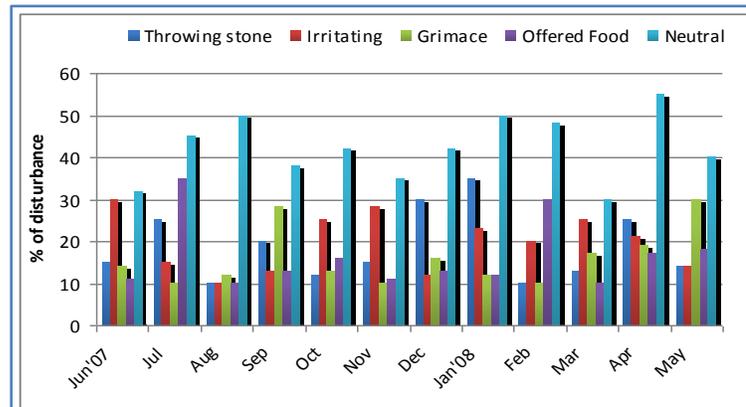


Figure 1. Yearly disturbance rate to park animals by visitors.

The disturbance was 39.5% (30-55%) against total number of visitors 1360 (Figure1). Disturbance to wild and captive animals creates negative impacts on their breeding due to environmental stress. In addition, disturbance directly influences them in taking foods behavior. The observations revealed information that a high disturbance area animal took less food and anxious more and resulted high mortality (Igoe and Choucher, 2007). The disturbance rate varied from month to month and visitor to visitor. The observation was made to male and female in considering different age groups. Of the disturbers, the female visitor was higher (34%) compared to male and others (26%) (Figure 2). This is a natural phenomenon that female shows curiosity than male in new place and new environment.

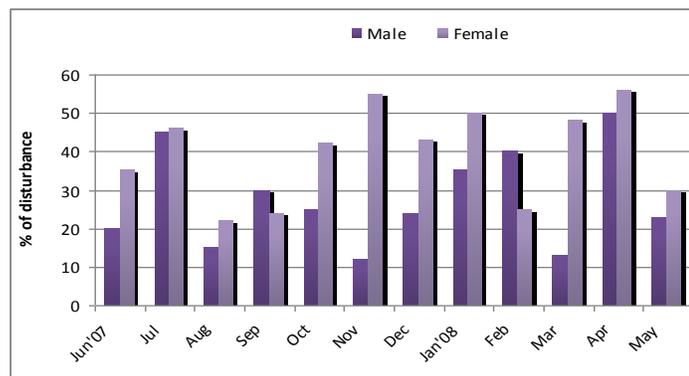


Figure 2. Monthly disturbance created by male and female visitors.

Disturbance by vehicles. Vehicular disturbance is a major issue considering other safari park in Southasian and Asian countries. Local and high personnel government and political people applied force of power to entrance of vehicles inside park regardless of their legal right and sound environment in the park. Over power exercise is an abnormality of Bangladeshi people instead to be polite and respect to surrounding environment, nature, people and animals (Hossen *et al.*,

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2014). Four types of vehicles namely motorbike, car, microbus and jeep made disturbance inside the park by ignoring the damage of nature and hamper to wildlife.

The data shown a total number of 14626 vehicles were entered in the park in June 2007-May 2008. Of the vehicles, the highest number was motorbike and followed by car, micro and jeep (Figure 3, 4). The highest disturbance made by motorbike and followed by car, microbus and jeep (Figure 3, 4). The collected data have shown that the disturbance rate gradually increased from the September 2007 to February 2008 and disturbance rate was almost moderated in the other months.

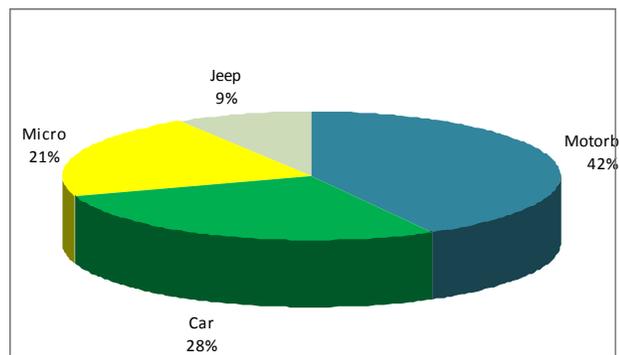


Figure 3. Different types of vehicle access inside the DSP.

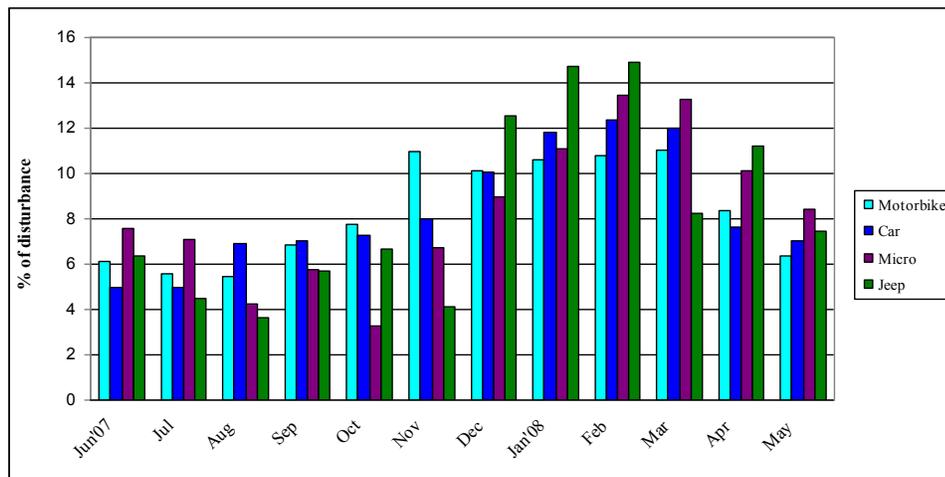


Figure 4. Monthly disturbance created by vehicles.

Mortality rate in the Safari Park. Yearly mortality rate is a concern issue in a newly established safari park which makes barrier on the way of developing stage due to considering animal welfare

(Hutcheson, 2003). Now print, electronic and social media are more active to draw attention of people about animal welfare. Many reasons like new environment in park area, adapted in congested area, shortage of wild food and availability of supplementary food, high level of disturbance and low experience level of handling wild animal are influence to increase yearly mortality rate in a newly established safari park (Okello and Kiringe, 2004). During our research total 563 animal deaths were identified include 8 mammal species and 555 reptiles. Three Goyal (*Bos frontalis*), two Lion Litter (*Panthera leo*), one Black Fox, one Slow Loris and one Holook Gibbon were recorded from the total death of mammal species. The unpredictable high number of reptile especially Turtle and Tortoise death include 500 Star Tortoises, 15 Black Soft-shell Turtles, 10 Indian Roof Turtles, 10 Elongated Tortoises, 10 Crowed River Turtles and 10 Malayan Turtles were recorded which mostly confiscated from Dhaka International Airport (DIA) and land border. The adaptation in appropriate habitat and lack of suitable food and less experience on reptile handling are the main reasons of drastic mortality of reptile in this park.

Lastly, the park authority built a turtle aquarium inside the park and collected several species of turtle and tortoise from different parts of country even India for the purpose of breeding success and back them to nature. But this program was collapsed due to shortage of expert wildlife biologist.

Weak and unplanned management system. The wildlife management and nature conservation division of Chittagong forest department is the responsible to manage and develop the park smoothly but from the beginning, lot of known and unknown problems were fusion with the project. The park has been set up on the corridor of elephant. For this reason, wild elephant frequently attack and damage wall and enter park and create hazardous situation (Garland, 2008; Anonymous, 1995). Most of the wild animals are imprison in overall 30 big and small enclosures which not permit the characteristic of a safari park. They face stress, hygienic, crowd and stress problems which sometimes create adverse effect on pregnant animals. The quarantine facility is absent but should be installed to control disease from introduced animals to incumbent residents. Some rare and endanger species cannot breed in park due to non-availability of mating partners. The horticulture center is inadequate in case of sufficient nature based food which can be produced for herbivores (Rahman, 2007). Illegal logging, fuel wood collection and irritation to wildlife by local people are very common in the park area.

Conclusion

As safari park the source of recreation, government revenue and money flow to local economy as well as help to protect our nature and wildlife, so this concept will get priority than other conservation related concepts like sanctuary, national park and game reserve. In addition, there is a close link between ecological value and purpose of establishing safari park towards protection, conservation, education and research, culture, heritage and recreational viewpoints of nature and

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natural resources. In safari park native, rare, endangered, critically endangered biota will get special attention. In addition, safari park may be a hub of *ex-situ* conservation program on the purpose of reintroduction of flora and fauna in nature which already extinct from nature and brink to extinction. The internal and surrounded environment of park area must be silent and safe to ensure comfort zone for wildlife and nature. In park area captive animals severely affect by vehicular sound than the wild animal and lose their breeding capacity. One wildlife biologist and botanist post must be ensure along with other officers and staff for smooth running and developing the Southasian Model based Safari Park in Bangladesh. All kind of corruption, nepotism, localization and illegal interruption by higher authority have to be stopped. Good working environment in the park has to be ensured for officers and staffs. Sometimes conflicts happen between park employees and local people for their different personal interest but it has been considered a negative impact for developing a park should avoid. Most concern matter in park, carnivores several times escape from boundary and create fatalities. The park authority should not only ensure the security but also improve and repair the boundaries to avoid any kind of such unexpected events. And the safety measures suggested visitors to protect themselves from attack by wild animals they should use well netted jeep, bus and car during visit the safari park.

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