

WILDLIFE CONSERVATION CENTER FOR SCIENCE & RESEARCH

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Abstract

Wildlife conservation center with scientific foundations leads to significant growth in science and research. Thus, this work presents a proposal on the development of a wildlife conservation center for science and research at Jeddah, Saudi Arabia. For this work, three case studies related to wildlife conservation center were analysed. Based on the case studies, a net area of 54360 m² was estimated for the wildlife conservation center. This center is comprised of several zones such as admission zone, desert zone, forest zone, ice zone, marine zone, bird house, butterfly house, insect house, children zoo, flower garden, veterinary hospital, science and research center, animal food and nutrition center, education center and parking area. This wildlife conservation center will be developed at a site located in the northern side of Jeddah city. The design of the wildlife conservation center was inspired from the nature. This center is expected to be a focal point of attraction at Jeddah and it will serve the ecotourism industry of Saudi Arabia.

Keywords-- social, sports, club, community, Saudi Arabia

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INTRODUCTION

Ecotourism has generally been recognized as an essential strategic method for wildlife conservation. Ecotourism is an approach for promoting conservation and providing income to populations across nature reserves and wildlife area [1]. Wildlife conservation regions and state parks are an important element for the ecotourism industry and it dependent on local culture and natural resources available at a certain location or country [2]. Environmental activists have endorsed ecotourism as an essential instrument for the conservation of natural resources and native populations' development [3]. Furthermore, the expansion of regional economic activity through ecotourism was commonly considered an important government tool for the conservation of wildlife.

Ecotourism has led to the dual objective of eradicating poverty and preserving natural resources in several areas of the globe. In addition, embracing ecotourism creates a large number of job opportunities for local people who remain involved in a multitude of tourism-related operations [4]. Likewise, ecotourism generates important opportunities for the preservation, conservation and sustainable use of wildlife and natural regions by promoting local and aboriginal groups in guest nations and visitors alike to maintain and honour the natural and cultural heritage [5].

State parks and conservation areas make up about 10 % of Saudi Arabia's nation [6]. It provides socio-economic advantages for local groups such as controlled and equitable use of livestock, scavenging, farming, and other related leisure and tourism opportunities [7].

While these environmental regions are linked to wildlife conservation, they are also linked to social and religious principles and enhance the well-being of tourists and locals [8]. Saudi Arabia is a diversified nation with rural populations, resources and diverse wildlife. Thus, to further preserve the natural environment, conserve wildlife and boost the ecotourism industry of Saudi Arabia, this work proposes the development of a wildlife conservation center for science and research in Jeddah, Saudi Arabia.

CASE STUDIES

In this work, three case studies related to wildlife conservation center have been analysed. The details of the case studies are stated as follows.

- Biodome Montreal
- Seoul Grand Park
- Saint Louis Zoo

Biodome Montreal

Biodome Montreal is located at Montreal, Canada (Figure 1). It was designed by French architect Roger Taillibert. The Biodome is an indoor living museum of nature that contains aquarium and zoo. This facility has a huge indoor space, about 7000 m², with diverse ecosystems that differ in temperature and environment to suit animal needs. This facility is comprised of few areas such as tropical rainforest ecosystem, laurentian forest ecosystem, the Gulf of Saint Lawrence ecosystem and sub-antarctic islands ecosystem. The Biodome offers new experiences for the visitors to explore their environment. A pathway will take them in a journey from the entrance till the exit to discover the four ecosystems. There is a transitional space before entering the ecosystems. In the middle of the Biodome, there is an open space for people to rest. Furthermore, there is also a gift shop and cafeteria located within the facility.



Figure 1. Biodome Montreal

Seoul Grand Park

Seoul Grand Park is located at South Korea (Figure 2). It was designed by a team of architects, which was lead by One Landscape Design and Group Han Associates, Think well Design & Production and Bernard Harrison & Friends. This facility has an area of 196000 m² with about 3000 animals. Furthermore, there is a lake that branches through the entire space. The other facilities offered by Seoul Grand Park include amusement facilities, sports facilities, insect pavilion, bird pavilion, museum, green area, cultural center, zoological and botanical garden, flower garden and general facilities. Likewise, Seoul Grand Park provides various educational programs and services to increase knowledge and appreciation of animals and plants.



Figure 2. Seoul Grand Park

Saint Louis Zoo

Saint Louis Zoo is located at United States of America (USA) (Figure 3). It was designed by architect David McGuire. The site about 200 acres and has about 18000 animals. The zoo has six distinctive areas, such as river edge, discovery corner, lakeside crossing, the wild area, historical hill and red rocks. Each of these area has designated animals living in it. Furthermore, there is a research center and veterinary hospital complex, and animal food and nutrition center within the zoo. Likewise, the other facilities of this zoo includes children zoo, 3d show rooms, camping area, theater, bird house, butterfly house, administration area, railroad stations and other related facilities.



Figure 3. Saint Louis Zoo

PROGRAM ASSUMPTION AND SPACE DETAILS

For the proposed wildlife conservation center for science and research, the estimated net area for the conservation center is 54360 m². Table 1 shows the details of area for each zone. This wildlife conservation center is comprised of few zones, such as admission zone, desert zone, forest zone, ice zone, marine zone, bird house, butterfly house, insect house, children zoo, flower garden, veterinary hospital, science and research center, animal food and nutrition center, education center and parking area.

Furthermore, based on Table 2, the overall area of this project is estimated to be 79365 m².

Table 1. Space details

Zone	Area (m ²)
Admission zone	791
Desert zone	2029
Forest zone	4733
Ice zone	1622
Marine zone	17512
Bird house	600
Butterfly house	400
Insect house	1000
Children zoo	2672
Flower garden	1112
Veterinary hospital	1440
Science & research center	1980
Animal food & nutrition center	398
Education center	1261
Parking area	16810
Total	54360

Table 2. Total area of the project

Zone component	Area (m ²)
Total net area	54360
+6% constructor	3261
+30% circulation	16308
+10%HVAC system	5436
Total	79365

PROPOSED SITE AND ANALYSIS

For this work, the site is located in the northern side of Jeddah city (Figure 4). The two main highway roads surrounding the site are Almadinah Almonawwarah Road from the west and Alharamain Expressway from the east. It is a massive site with an area of approximately 10769422 m². Ubhor is the main landmark in Jeddah city's northern region. It is the main attraction for tourists that can be a positive point for this project. Another landmark is the Bateerjee Medical College, BMC as it is an educational building that could interact with the two projects. The airport is also a major landmark. Jeddah temperature in winter range from 15 °C (59 °F) at midnight to 25 °C (77 °F) in the afternoon. Summer temperatures are very hot, 40 °C (104 °F) in the afternoon to 30 °C (86 °F) in the evening. Furthermore, rainfall in Jeddah is generally light, and usually occurs in small amounts in December. Heavy thunderstorms are common in winter. The zoning of the site is shown in Figure 5.



Figure 4. Site location



Figure 5. Site zoning

PROJECT DESIGN

The proposed design of the wildlife conservation center is shown in Figure 6 to Figure 9. The design of this center is inspired from the nature by creating an entire ecosystem on land. This center has an artificial lake in the middle of the site and conservation zone is scattered around, to resemble natural rock distribution. Furthermore, other zones are formed on top of each other as a mountain to reflect its importance and steady nature. Likewise, the mountain like structures were constructed with few void underneath it to allow cross ventilation.

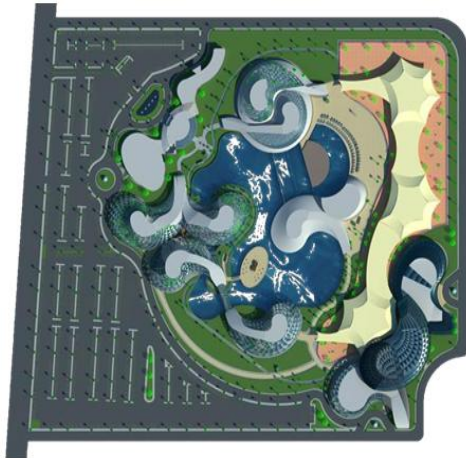


Figure 6. Top view of wildlife conservation center

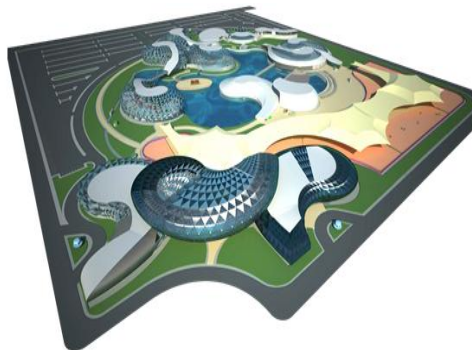


Figure 7. 3D view of wildlife conservation center

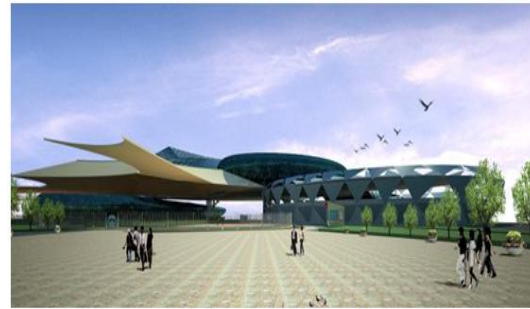


Figure 8. Side view of wildlife conservation center



Figure 9. Side view of wildlife conservation center

CONCLUSION

This work has presented a proposal on developing a wildlife conservation center for science and research at Jeddah, Saudi Arabia. The estimated net area for the conservation center is 54360 m² and it will be developed at the north part of Jeddah. This environmentally friendly wildlife ecosystem is beneficial in preserving and distinguishing animal life from diseases. Furthermore, this facility is considered an attraction place for many scientists and researchers to practice their theories and research. Likewise, it will be a great place for children to visit, learn and enjoy watching the growth and development of different wildlife animals. In addition, this center is expected to be a main point of attraction in Jeddah.

REFERENCES

1. Das M, Chatterjee B. Ecotourism: A panacea or a predicament?. *Tourism Management Perspectives*. 2015 Apr 1;14:3-16.
2. Barnett A, Payne NL, Semmens JM, Fitzpatrick R. Ecotourism increases the field metabolic rate of whitetip reef sharks. *Biological Conservation*. 2016 Jul 1;199:132-6.
3. Buckley RC, Morrison C, Castley JG. Net effects of ecotourism on threatened species survival. *PloS one*. 2016 Feb 17;11(2):e0147988.
4. Hausmann A, Slotow R, Fraser I, Di Minin E. Ecotourism marketing alternative to charismatic megafauna can also support biodiversity conservation. *Animal Conservation*. 2017 Feb;20(1):91-100.
5. Jamrozy U, Lawonk K. The multiple dimensions of consumption values in ecotourism. *International Journal of Culture, Tourism and Hospitality Research*. 2017 Mar 6;11(1):18-34.
6. Al-Tokhais A, Thapa B. Stakeholder Perspectives Towards National Parks and Protected Areas in Saudi Arabia. *Sustainability*. 2019 Jan;11(8):2323.
7. Jaouadi S, Ayachi H. Residents' Attitude Towards the Development of Ecotourism in Saudi Arabia: Evidence from Farasan Island. *International Review of Management and Business Research*. 2016 Jun 1;5(2):421.
8. Ekiz E, Öter Z, Stephenson ML. Tourism development in the Kingdom of Saudi Arabia: Determining the problems and resolving the challenges. In *International Tourism Development and the Gulf Cooperation Council States 2017* Jul 14 (pp. 124-139). Routledge.