

## EFFECTIVENESS OF ENVIRONMENTAL IMPACT ASSESSMENT IN ENSURING SUSTAINABLE DEVELOPMENT OF YANKARI GAME RESERVE IN BAUCHI STATE, NIGERIA

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### **Abstract**

This study aimed at appraising to what extent the development effort going on in the Yankari Game Reserve gave attention to the Environmental Impact Assessment (EIA) conducted in Ensuring Sustainable Development of the Game Reserve, the research formed the level of compliance with the environmental impact assessment regulation and mitigation measures put in place, the positive and negative impact of compliance and non-compliance as well as account for non-compliance with EIA. Data were obtained using Interview schedule, site inspection, compliance assessment and thorough review of EIA report. A total of 30 respondents were selected randomly in the units within the game reserve. The units are Clinic, General maintenance, power supply, Kitchen, Housekeeping, and Security. The result in Table 1, Shows that about 50% of proposed mitigation measures stipulate in the EIA report was not in compliance. An account for non-compliance to EIA result shows that no fence in the Wikki camp as stipulated in the EIA report and Issue of cable taxi from reception to Wikki warm spring, to animals viewing was not in adhered. There is an Illegal activity of poaching, grazing by domestic animals. The negative impact of non-compliance to EIA result shows that most of the soil needed for construction is being taken from close to the access road in Game Reserve. This has left very unsightly scenery and checker board along the road. The EIA of this construction activity carried out and negative impact of non-compliance to EIA is now in place. Arising from the findings of this research, the following recommendations were made: there is need for more effort by management and Bauchi State Government to provide enough funds that will help them to comply with all mitigation measure stipulate in the EIA report. Fuel station and power house are very close, this should be separated. The unfilled borrow pits should be fill back. No little impact will be negligent every impact must be taken into account and address.

**Keywords:** *Sustainable, Development, Yankari, Mitigation, Compliance, EIA*

### **Background to the Study**

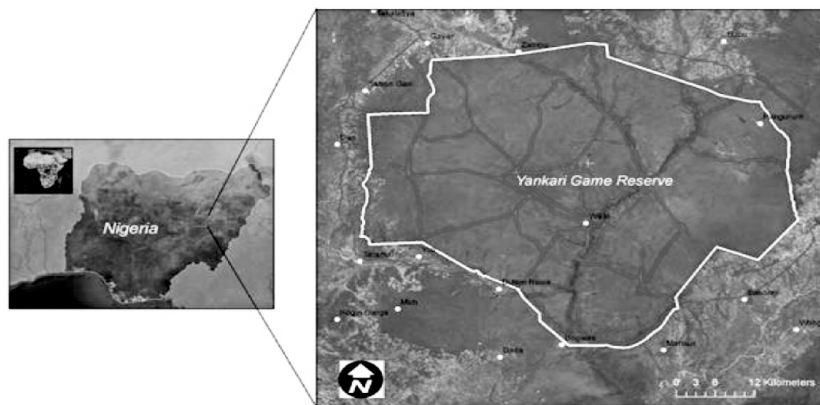
The Yankari upgrade project involved the reconstruction of existing structures which include site activities such as installation, grading, and resurfacing of existing roads from Dindima to Wikki camp, fencing of Wikki camp, concrete work, carpentry among others with the sole aim of improving the visitor's satisfaction. This will necessitate removal of soil overburden for various construction activities and the destruction of various ecosystems with the sole aim of improving the welfare of visitors to the Game Reserve. Doing this without proper adherence to the EIA specifications, will lead to various impacts on the immediate environment which may ultimately result to the endangering and extinction of some plants and animal species (Barau, 2010). Glasson et.al. (1999), considered EIA as a systematic process that examine the environmental consequences of the development action in advance. The goal is to maintain a delicate balance among the ecosystem of the area in order to fully benefit from the ecosystem services which involve provisioning, regulating, and supporting some cultural values to humanity.

Similar, Failure to comply with appropriate mitigation measures, environmental regulation and proper EIA report implementation may bring about environmental, biodiversity as well as socio-economic problems of Yankari Game Reserve as a result of developmental action put in place. Those problems if not check may likely cause affect to management and conservational practice. Uncontrolled development is always a recipe for environmental catastrophe as most environmental problems emanates from poor implementation of development projects (Parkin, 2007).

Substantial percentage of Nigeria's total land area is today threatened by either desertification (north), soil erosions (east and west) or oil pollution in (south-south) (Sahel, 2008:4). It is needless to emphasize that these forms of degradation that are currently ravaging our environment occur as a direct consequences of our actions either collectively or individually. It is therefore important to be conscious of the consequences of our actions on the environment while economic and social goals are being pursued so as to ensure a balanced and sustainable development and EIA is one of the primary tools used in achieving that. In view of that the evaluation of adherence to Yankari Game arises.

### **Study Area**

The Yankari Game Reserve is located between latitude 9° 34' – 10°00'N and longitude 10°05' – 10° 45' E in south- central of Bauchi state, north – eastern Nigeria. (Figure 1 and 2) It encompasses some parts of Duguri, Pali and Gwana District of Alkaleri Local Government Area (LGA) the reserve has a total area of 2,244 km<sup>2</sup>. The wikki camp (tourists/visitors accommodation and ancillary and ancillary facilities, wildlife trophy museum, park management resources, warm spring, etc) occupy an area of about 77 hectare within the park. The Wikki warm springs is another attraction located near the park lodge and is about 200m long and 10m wide, containing crystal-clear water at a temperature of around 31oc. Access to the park is through branch off the Bauchi-Gombe road at Dindima village. The is 110km from Bauchi, 200km from Jos, 400km from Kano, 555km from Abuja, and 510km Maiduguri.



**FIGURE 1: MAP OF NIGERIA SHOWING THE YANKARI GAME RESERVE**

### **Method of Data Collection**

Data were obtained through various methods within Yankari Game Reserve, an interview was conducted and site inspection / assessment was carried out. This constituted the primary sources of data. Site inspection was carried out to ascertain level of compliance with mitigation measures by the management. During the site visit and observation, various photographs were taken with a digital camera in order to back up the observation situation.

### **Sampling Techniques**

A total of 30 respondents were selected using random sampling techniques from each unit within the Game Reserve and appropriate questions were asked with respect to different units of the Game Reserve. These are Power Supply house, Fuel Station, Medical activities (clinic), Water Supply (from Wikki Warm Spring), General Maintenance Activities, Security at Site, Kitchen activities, Food service, Bar and Lounge Activities, Housekeeping, Accommodation services-Yankari retreat suites, spring, etc) which provide information about the effectiveness / physical impact of the project.

### **Result and Discussion**

#### **Identified Levels of Compliance with Mitigation Measures**

Proper mitigation measures are necessary for maintaining the integrity of the environment and well-being of the inhabitants in the area. The result shows that compliance with mitigation measures put in place within Yankari Game Reserve is not highly pronounced considering that about 50% of the proposed mitigation measures stipulated in the EIA Report of Yankari Game Reserve was not adhered to by the management. (Table 1)

**An Identified Level of Compliance with Mitigation Measures in Yankari Game Reserve**  
**Table 1: An Identified Level of Compliance With Mitigation Measures In Yankari Game Reserve**

Environmental Aspect	Associated and Potential Impact	Mitigation Measures In Place	Observable Level of Compliance With Mitigation Measures	
			Adequate	Inadequate
Power Supply	Loss of assets, investments and death / injury to personnel / third party in the event of fire / explosion	<ul style="list-style-type: none"> <li>• BSG shall activate emergency response plan</li> <li>• BSG shall carryout periodic checks on generators for leaks</li> <li>• BSG shall locate generators away from fuel storage tanks</li> </ul>	<ul style="list-style-type: none"> <li>• Punctual</li> </ul>	<ul style="list-style-type: none"> <li>• Fair</li> <li>• Fair</li> </ul>
Fuel Station	Accidental fuel spills during dispensing leading to soil contamination	<ul style="list-style-type: none"> <li>• BSG shall adopt safe fuel handling procedures</li> <li>• BSG shall carryout environmental awareness training for personnel</li> <li>• BSG shall use drip pans especially at transfer points to control spills</li> </ul>	<ul style="list-style-type: none"> <li>• Try there best</li> </ul>	<ul style="list-style-type: none"> <li>• Fair</li> <li>• Not put in place</li> </ul>
	Risk of fire and explosion from underground storage tanks	<ul style="list-style-type: none"> <li>• BSG shall activate emergency response plan</li> <li>• BSG shall carry out periodic pressure test of vessels/tanks and keep records</li> </ul>		<ul style="list-style-type: none"> <li>• Fair</li> <li>• No bury tank, only record of fuel used</li> </ul>
	Littering of the area with used cans, filters, food packs, plastics etc with potential of entangling / suffocating wildlife when consumed	<ul style="list-style-type: none"> <li>• BSG shall adopt effective waste management practices</li> <li>• BSG shall carry environmental awareness training in waste handling for personnel</li> </ul>		<ul style="list-style-type: none"> <li>• Fair</li> <li>• Fair</li> </ul>
Medical activities (clinic)	Transmission of STDs from use of improperly sterilized needles, blades etc	<ul style="list-style-type: none"> <li>• BSG shall ensure one -off use of needles, syringes etc</li> <li>• BSG shall ensure medical equipment are properly sterilized before use</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted</li> <li>• Adopted</li> </ul>	
	Litter of environment from indiscriminate disposal of waste of syringes, expired drugs, bottles etc	<ul style="list-style-type: none"> <li>• BSG shall adopt effective waste management practices</li> <li>• BSG shall carry environmental awareness training in waste handling for personnel</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted</li> <li>• Through community health workers</li> </ul>	
Water Supply (from Wikki Warm Spring)	Health risks use of untreated Wikki spring water for drinking, bathing, and other domestic purposes.	<ul style="list-style-type: none"> <li>• BSG shall treat water prior to use</li> </ul>		<ul style="list-style-type: none"> <li>• No treatment reagent</li> </ul>
General Maintenance Activities	Health risks (skin, eye, throat irritation etc.) to workers from exposure to cleaning product from polishing pesticide and herbicides used in the kitchen, etc	<ul style="list-style-type: none"> <li>• BSG shall use low toxic chemical where possible</li> <li>• BSG shall train personnel in the use of MSDS</li> <li>• BSG shall enforce the use of appropriate PPE</li> </ul>		<ul style="list-style-type: none"> <li>• They are using CL</li> <li>• Fair</li> <li>• Fair no any protected cloth</li> </ul>
	Trips and fall from ladders when reaching heights- ceilings, chandeliers, walls, etc for maintenance purposes	<ul style="list-style-type: none"> <li>• BSG shall enforce the use of appropriate PPE</li> <li>• BSG shall ensure scaffolds are inspected for breaks</li> <li>• BSG shall use competent workers</li> <li>• BSG shall ensure safety briefings are carried out prior to work</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted</li> <li>• Adopted</li> </ul>	<ul style="list-style-type: none"> <li>• Fair no any protected cloth</li> <li>• Fair</li> </ul>
	Generation / disposal of waste oils, cleaning solvents, waste paints, construction waste, metal scraps wastewater, waste electrical parts, etc leading to soil water pollution	<ul style="list-style-type: none"> <li>• BSG shall adopt effective waste management practices</li> <li>• BSG shall carry out environmental awareness training in waste handling for relevant personnel</li> </ul>		<ul style="list-style-type: none"> <li>• Fair</li> <li>• Fair</li> </ul>
Security at Site	Loss of good and other valuables by customers to robbers/thieves	<ul style="list-style-type: none"> <li>• BSG shall station security personnel at strategic locations within the facility</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted through various techniques</li> </ul>	
	Possible injury / death to tourist through robbery attacks	<ul style="list-style-type: none"> <li>• BSG shall station security personnel at strategic locations within the facility</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted, very excellent</li> </ul>	
	Illegal hunting / poaching / fishing / grazing leading to decline in wildlife biodiversity	<ul style="list-style-type: none"> <li>• BSG shall am patrol rangers and as well intensify patrols/ surveillance within/ around the park to cull activities of trespassers</li> <li>• BSG shall raise community / society awareness training in waste handling</li> </ul>	<ul style="list-style-type: none"> <li>• Adopted</li> </ul>	<ul style="list-style-type: none"> <li>• Fair</li> </ul>
Kitchen activities	Contamination of soil from discharge of wastewaters from dishwashing, cleaning, etc	<ul style="list-style-type: none"> <li>• BSG shall adopt effective waste management practices</li> <li>• BSG shall carry out environmental awareness training on waste handling for all personnel</li> </ul>	<ul style="list-style-type: none"> <li>• They are trying</li> </ul>	<ul style="list-style-type: none"> <li>• Fair</li> </ul>
Food service	Injuries resulting from slips/trips over slippery/wet surface during serving food,	<ul style="list-style-type: none"> <li>• BSG shall ensure the work environment is constantly dry and free from spills</li> <li>• BSG shall ensure her employers wear sturdy, low -heeled, rubber</li> </ul>	<ul style="list-style-type: none"> <li>• They are trying</li> </ul>	<ul style="list-style-type: none"> <li>• Fair</li> </ul>

**Positive Environmental Impact of Compliance with An Eia**

Upgrading of Yankari Game Reserve offer better conservation practice of wildlife and provide adequate infrastructural facilities in the game reserve which include electrification, network sources, road, modern structures in terms of buildings etc. and other social amenities such as modern truck game viewing vehicles, etc. that increase visitors satisfaction.



**Plate 1: New structures in Yankari**

The results of interview show that Yankari Game Reserve is facing less problems than before in the sense that it provide safari, amazement and excellent resort. With effective adhered to EIA Wikki Natural Warm Spring is more condusive and convenient, the responses of interview held with the Yankari Game Reserve Official shows that the natural water is clean and no any water borne diseases experience so far. From the interview result, it is evident that it has achieved it objectives in terms of visitor satisfaction.



**Plate 3: An aesthetic looking of Wikki camp premises**

Moreover from the responses of the interview held, it is evident that maximum adherence to the EIA provision was paid during the project execution. For instances, according to the manager, in order to prevent soil compaction, wheel barrows were used to transport materials in an environmental sensitive areas.

From the responses, it is evident that efforts were made to prevent any possible impacts that may emanate from the water use and water supply. For instance, in order to prevent people from water borne disease plastic truss pipes were used. Furthermore, in order to reduce the possible effect of the mosquito vectors and to prevent the wild animals from excessive falling the sewer pipes were closed and the pipes were placed in ground. In Yankari Game Reserve road showing road division in order to minimize the risk of road accident by tourist on animals in crossing which is another positive environmental impact of compliance with



### **An Assessment of Negative Impact of Non Compliance to EIA**

Result shows that most of the soil needed for construction is being taken from close to the access road in the Game Reserve. This has left very unsightly scenery and checker board along the road. The EIA of this construction activity was carried out however negative impact of non-compliance to EIA is now in place. The following were identified:

- I. In spite of the effort to refill the borrow pits, still unfilled ones exist.
- II. The EIA report did not address some issues such as soil quarry or excavation within conserved area
- III. In spite of the enormous important of the vegetation in the area, there was no any attempt to either revegetate or afforest the site in order to lessen the impacts that result or may result from the site clearance.
- IV. It was observed that, some wild animals' uses the open borrow pits which is left as their water source. This is because of the ability of the borrow pits to store water at list in some part of the year or season and it can serve as breeding ground of pest.
- V. It was also observed that a telephone mast was installed in the game reserve area which has an effect of radiation on the animal.
- VI. Future upgrade project should not be completely destroyed / located in historical monuments and environmental sensitive areas because they have value for cultural attraction and this project aimed at conserving these features.



**Plate 5: General Maintenance Unit no effective waste management**



**Plate 6: Effect of transportation and movement of heavy equipment that leads to loss of vegetation cover and exposure of soil and microorganism to haze weather**



**Plate 7: Effect of top soil excavation during road construction on fragile soil of Yankari that lead to borrow pits**

### **An Account for Non Compliance with EIA**

After a thorough review of the EIA report and a skillful interview with the Yankari game reserve official, and a thoroughly observed in other to ascertain the validity of information given by the EIA report and the interviewers.

An account for non-compliance to EIA can be summarized into the following:-

- I. No any fence in the Wikki camp as stipulated in the EIA report
- II. Issue of cable taxi from reception to Wikki warm spring, to animals viewing, etc was not put in place
- III. Fuel station and power house are very close that is no risk bearing.
- IV. It has been observed that, in some sites the debris of the demolished structures has not been disposed of.
- V. Illegal activities of poaching and grazing by domestic animals
- VI. Game rangers were attacked by poachers which can result to serious injuries
- VII. Inadequate funding in managing the protected area.

### **Summary**

This research was aimed at appraising to what extent the development effort going on in the Yankari Game Reserve gave attention to the Environmental Impact Assessment (EIA) conducted in Ensuring Sustainable Development of the Game Reserve.

The result in Table 1, Showed that about 50% of proposed mitigation measures stipulated in the EIA report was not in compliance. An account for non-compliance to EIA result showed that no fence in the Wikki camp as stipulated in the EIA report and Issue of cable taxi from reception to Wikki warm spring, to animals viewing was not in adhered. There is an Illegal activity of poaching, grazing by domestic animals. Meanwhile Fuel station and power house are very close that is, no risk bearing. The negative impact of non-compliance to EIA result shows that most of the soil needed for construction is being taken from close to the access road in Game Reserve. This has left very unsightly scenery and checker board along the road. The EIA of this construction activity carried out and negative impact of non-compliance to EIA is now in place. From the responses of the interviews, it has been observed by the research that most provisions in the EIA report have been adhered to and were implemented. But, the site visit and observation have yield contrasting information, in which it was observed that some impacts can yet be seen in the site. This evidently revealed that, either the EIA report does not fully address the issue or the implementations of the provisions of EIA report were not fully put in place.

### **Conclusion**

From the result obtained, it can be concluded that a comprehensive EIA report helped in preventing negative environmental impact to development project, yet the EIA conducted for this project have actually help in preventing negative impact from happening. This can be attributed the fact that most of the environmental aspect was well plan, but not fully address some issues.

Upgrading of Yankari Game Reserve offer better conservation practice of wildlife and provide adequate infrastructural facilities in the game reserve which include electrification, network sources, road, modern structures in terms of buildings etc. and other social amenities such as modern truck for game viewing vehicles, etc. this increase visitors satisfaction. Failure of the project to comply with the EIA report and proper mitigation measures are necessary for maintaining of the environment and well-being of the inhabitants in the area.

Observed level of compliance with mitigation measures the result shows that they are inadequate so that there is need for more effort by management and Bauchi State Government to provide enough funds that will help them to comply with all mitigation measure stipulate in the EIA report.

### **Recommendations**

Arising from the findings of this research, the following recommendations were made:-

1. There is need for first aid personnel around Wikki warm spring, game rangers, etc.
2. Water sources and water quality should be periodically checked.
3. There should be a regular monitoring and evaluation of mitigation measure (visit and revisit of project).
4. Bauchi state Government should pump adequate funds to Yankari Game Reserve in order to manage and conserve the protected area
5. Fuel station and power house are very close. That is, no risk bearing. This should be separated.
6. Frequent monitoring should be paid during the project execution in order to assess the level of compliances to the EIA provisions.
7. The unfilled borrow pits should be fill back as a matter of urgency.
8. The indisposed debris should be packed and disposed of in a safer location.
9. The effect of GSM mast on the wild animals should be quantified.
10. There should be regulatory body that will ensure and enforce strict compliance to the mitigation measure before a project is awarded and during operational and decommissioning stages.
11. People of the communities around the Game Reserve should be employed in order to give them a sense of belonging and job opportunity.
12. No little impact should be neglected, every impact must be taken into account and addressed.

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