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THE IMPACT OF DEVELOPMENT ON WILDLIFE SPECIES IN WARRI SOUTH WEST LOCAL GOVERNMENT AREA OF DELTA STATE

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Abstract

The study was conducted to assess the impact of development on wildlife species in Ogidigben and other adjourning communities in Warri South West Local Government Area of Delta State. Data were collected using both direct and indirect methods to assess diurnal and nocturnal animals respectively. Information on available species, relative abundance and distribution were obtained through oral interview and discussions with indigenous hunters and experienced community members who were aided with colour pictures of animals known to be common in the area. The potential environmental impacts were assessed based on the Environmental, Social and Health (ESH) model designed by Shell Global Solutions, Netherlands; which included impact identification, description and rating. Data collected were analyzed using percentage. The results showed that out of the animal species found in the area 3.23% were critically endangered, 12.90% were vulnerable and 12.90% were endangered. The results also showed that of the 21 species captured 12.90% were present, 54.84% were common and 32.26% were abundant. The study identified vegetation clearing as one of the activities that could lead to habitat destruction and fragmentation leaving the animal species vulnerable to attack and capture. The impact description is direct, negative, long term, local and irreversible and is therefore rated major. Mitigation included clearing the land in piece meal and creating small corridors to serve as shelter and hiding places for the animals. It was concluded that the impact of the project on Ogidigben and the surrounding communities would be reduced if the mitigation measures are implemented strictly.

Keywords: *Ogidigben, wildlife species, endangered species, vulnerable environment.*

Introduction

The Nigerian National Petroleum Corporation (NNPC) intends to develop an industrial park with sea port facility in line with its planned Gas Revolution Infrastructure Project (GRIP) in Ogidigben, Warri South West Local Government Area, Delta State, Nigeria. The industrial park will comprise necessary infrastructure (power, road, water supply, communication, port facility, etc) for its function and sustenance and is expected to serve as a hub for major downstream gas related industrial facilities, provide infrastructure for industrial growth and also support rapid rural transformation by harnessing the abundant natural gas in the area. The seaport facility will support the proposed Ogidigen Industrial Park/Free Trade Zone (FTZ). The study's scope is planned to cover the wildlife species and their habitats in Ogidigben, Ajudaibo, Madagho, Edede, Ijaghala, Opuede main, Opuede zion, Okpelana/Tebujo, Kpokpo and Ode-Ugborodo communities.

Objectives of study

The broad objective was to establish the present status of the wildlife species and their habitat in and around the project area, while the specific objectives were to:

i. Assess the potential effects (negative or positive) of the project on the wildlife and their environment;
ii. Predict the future impact of the project on the wildlife species and their ecology.
iii. Recommend appropriate measures to mitigate all identified negative impacts on the wildlife species and their ecology.

Overview of the Theoretical and Institutional Concepts

Theoretical Framework

The mangrove forest is home for numerous kinds of wildlife species and a natural means of strengthening livelihoods for the rural poor. It supports a high diversity of fauna micro and macroscopic, terrestrial and aquatic (marine and freshwater), temporary and residential. The residential organisms include vertebrates: gorilla, parrot, golden eagle and African manatee, kingfishers, mudskippers, snakes and mangrove monitor lizard, terrestrial invertebrates: spiders, ants, termites, moths and mosquitoes; aquatic invertebrates: mollusks, crustaceans and polychactes (Hutchings and Saenger, 1987). Fauna diversity is related to flora diversity (Lee, 1999), which has implication for biodiversity management, ecological restoration and rehabilitation programme. The ecology of coastal lands and waters provides numerous livelihood opportunities, encouraging concentrations of populations and development activities (Brown, 1997). The livelihoods of coastal people are based upon the exploitation of both terrestrial and aquatic resources for example, timber and fuel wood, fish and shell fish. It is often the poorer people that are forced to generate a livelihood from coastal areas (DFID, 1998). Sustainable livelihoods for coastal communities are therefore dependent upon effective management of all interrelated activities in coastal areas to achieve sustainable use of both living and non-living resources and equitable sharing of the benefits arising (Brown, 1997).

It is a known fact, globally that mangroves are destroyed by man-made activities which include urbanization, agriculture, aquaculture practices, lumbering, oil pollution etc (Ross, 1974, Fernandez, 1978; Erftemeijer, *et al*., 1989; Mastaller, 1996; Kathiresan, 2000).

Institutional Framework

In 1988 the Nigeria Federal Environmental Protection Agency (FEPA) was established and more recently National Coastal Management Authority (NCMA) has been proposed to regulate and manage all coastal resources. For now, however, no mangrove protection programme is in existence although the Cross River National Park contains some mangrove areas. The National Institute for Oceanography and Marine Research (NIOMR) has recommended that a system of mangrove forest reserves be established to replenish trees that are unavoidably felled by coastal inhabitants. It was also suggested that the price of cooking gas be reviewed downwards to reduce pressure on the mangrove forests for the provision of fuelwood (Amadi, 1991).

Materials and Methods

Study Area

The study area lies within the Mangrove Swamp forest of the Niger Delta, dominated by the mangrove vegetation characterized by the *Rhizophora* spp. fringing the banks of the rivers, creeks and creeklets, whereas, further inland the freshwater swamp forest occurs. The local

communities depend on the mangrove forest for their livelihood. International Union for conservation of Nature (IUCN) already classified the Mangroves as endangered as a result of its increasing exploitation associated with increasing demographic pressure and industrial development. The animals found in this area include – Monitor lizards, crocodiles, bush pig, cattle egret, hawk, monkeys, and many others. The following communities lie within the study area – Ajudaibo, Madogho, Edede, Ijaghala, Opuede main, Opuede zion, Okpelana/Tebujo, Kpokpo and Ode Ugborodo.

Project Location

The project, covering about 2,700 ha of land is located in Ogidigben on the bank of the Escravos River in Warri South West Local Government Area of Delta State. Warri South West is located at Latitude 05° 34′ N and Longitude 05° 12′ E of the equator. The project is adjacent to the Chevron Escravos Terminal and also close to other existing oil and gas facilities of other major players in the oil industry.

Materials Used & Assessment Methods

The materials used included the following kits: binoculars, camera, rain booth, rain coat, cutlass swamp suit, field keys and guides. Different methods (direct and indirect) were used to assess wildlife diversity in the area. Direct method involved the investigation carried out along a predetermined transect/foot path early in the morning and towards dusk and all the animals sighted were identified and recorded. Nocturnal or shy animals were assessed using the indirect method involving the use of animal signs (foot print, fecal droppings, presence of hair or feathers etc) or markings. Information on available species, relative abundance and distribution were obtained through oral interviews and discussions with indigenous hunters and experienced community members who were aided with coloured pictures of animals known to be common in the area. The potential environmental impacts of the project were assessed following the Environmental social and health assessment model designed by Shell Global Solution, Netherlands. The process included impact identification, description and rating (a term that includes the prediction of magnitude, consequence and significance of impacts).

Results and Discussion

Rare, near endangered and endangered species

Table 1 shows the list of animals commonly found in the project area. These animals are classified into the various levels of endangerment (IUCN, 2004). Out of the animals captured in Table 1 3.23% were critically endangered, 12.90% were vulnerable and 12.90% were endangered.

Table 1: Checklist of animals and birds found in the area

Common name	Local Name (Itsekiri)	Local Name (Ijaw)	Scientific name	Status	Population Estimate
Python	Akpakidon	Okinikini	*Python sebae*	VU	++++
Spotted Hyena	Okosin	-	*Crocuta crocuta*	LC	++
Sea Turtle	Oko	Ilukeke	*Chelonia myds*	EN	++
Tortoise (Land)	-	Ugwi	*Pelusias castaneus*	EN	++
Gorilla	Onioko	-	*Gorilla gorilla*	CR	+
Salt water crocodile	Agbakara	Igere	*Crocodylus porosus*	LC	+++
Freshwater crocodile	Agbakara	Igere	*Crocodylus johnstoni*	LC	+++
Iguana	Ayeyere	Abedi	*Iguana iguana*	EN	++
Monitor Lizard	Egungun	Shibiri	*Veranus niloticus*	NE	++
Tantalus monkey	Afonesigba	Obuko	*Ceropithecus aethiops*	LC	+++
Antelope	Etu	Agira	*Cephalophus grimmia*	LC	++
Fox	Okosi	Ewere	*Vulpes vulpes*	LC	++
Giant Forest Squirrel	Esuigbe	Ugboru	*Protoxerus stangeri*	LC	+++
Bush pig	Esioko	Ube	*Phacochoerus africanus*	LC	+++
Alligator	Egwugun	-	*Alligator mississipiensis*	LC	++
Green Mamba	Agwe	Ugowe	*Dendroaspis augusticeps*	LC	++
Green Aquatic snake	Omueri	-	*Nerodia cyclopion*	LC	++
Bush dog	Awawa	Awawa	*Speothos venticus*	VU	++
Great Horned Owl	Okutukutu	-	*Bubo virginianus*	LC	++
Giant African Large snails	Mota	Osi	*Archachatina marginata*	VU	+++
Parrots	Alabara	Okolobi	*Parrotuise lailia*	NT	+
Golden Eagle	Akala	Igo	*Aquila chrysaetos*	LC	+
Cattle Egret	Ilebe	Boi	*Ardeola ibis*	LC	++
Wood pecker	Ekuku	Arugbolawei	*Melanerpes formicivorous*	LC	++
African manatee	Ese	-	*Trichechus senegalensis*	VU	+
Periwinkles	Mekpe	Isami (Alukpara)	*Littorina littorea*	NT	+++
Coopers Hawk	Udi	Odoko	*Accipiter cooperii*	LC	++
Mourning Dove	Olikuku	Kuku	*Zenaida macroura*	LC	+++
Social Weaver Bird	-	Azamai	*Philetairus socius*	LC	++
Bat	-	Kefein	*Pipistrellus pipistrellus*	LC	++
Bees	Oyin	-	*Apis mellifera*	EN	+++

VU = Vulnerable, LC Least concern, EN = Endangered, CR = critically endangered, NT = Near threatened, NE Not evaluated. +++ = Abundant Population, ++ = Moderate population, + = minimal population

Abundance and Distribution

Table 1, also shows that of the 31 wildlife species captured that 12.90% were present, 54.84% were common and 32.26% were abundant. The interview conducted also showed that apart from the Gorrilla, Parrot, Golden Eagle and the African Manatee that all other species were fairly evenly distributed around the study area.

Potential Environmental Impacts and their mitigations

All the impacts described as negative and rated either major or moderate are discussed here. The measures suggested here for the predicted environmental impacts from the project rely heavily on the following:

- Environmental laws in Nigeria as enforced by the Federal Environmental Protection Agency (FEPA, 1991), [now Federal Ministry of Environment (FMENV)], and the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN, 2002).
- Best available technology for sustainable development;
- Feasibility of application of the measures in Nigeria, etc.

Table 2a: Associated and potential environmental impact as they affect wildlife and their habitat

Project activities	Impact	Type of Impact	Description	Likelihood	Consequences	Rating
Site preparation Veg. Clearing	Destruction of vegetation (Medicinal economic and food)	ESH	• Direct • Negative • Long term • Local • Irreversible	High	Great	Major
	Loss of habitat for wildlife, micro-organisms etc	E	• Direct • Negative • Long term • Local • Irreversible	High	Great	Major
	Increased erosion of the cleared area	E	• Direct • Negative • Short term • Local • Reversible	Medium	Considerable	Moderate
	Increased access for hunting and logging	E, S	• Direct • Negative • Long term • Local • Reversible	Medium	Considerable	Moderate
	Nuisance (noise emissions, vibrations) from heavy machinery	ESH	• Direct • Negative • Short term • Local • Reversible	Medium High	Considerable	Moderate
Construction work	Disturbance of soil dwelling organisms	E	• Direct • Negative • Short term • Local • Reversible	High	Great	Major
	Reduction in the quality of surface and ground water	E	• Direct • Negative • Short term • Widespread	Medium	Considerable	Moderate
	Increased nuisance from dust, emissions, noise and vibration etc.	ESH	• Direct • Negative • Short term • Local • Reversible	High	Great	Major
Waste generation emissions	Impairment of air quality	ESH	• Direct • Negative • Short term • Widespread • Reversible	High	Considerable	Major

Table 2b: Associated and potential environmental impact as they affect wildlife and their habitat

Project activities	Impact	Type of Impact	Description	Likelihood	Consequences	Rating
	Decreased quality of habitat (biodiversity)	E, S	• Direct • Negative • Long term • Local • Reversible	Medium	Considerable	Moderate
	Impaired surface water	E	• Direct • Negative • Short term • Widespread • Reversible	Medium	Considerable	Moderate
	Contamination of surface water quality	ESH	• Direct • Negative • Short term • Widespread • Reversible	High	Considerable	Major
Waste generation effluent	Impairment of health of aquatic and terrestrial life	E, S	• Direct • Negative • Short term • Widespread • Reversible	Medium	Little	Minor
Generation of nuisance noise vibration and lighting	Habitat disruption and human discomfort	ESH	• Direct • Negative • Short term • Local • Reversible	Medium	Little	Minor
Supply of operational equipment and materials	Disturbance of ecosystem in the event of chemical spills	ESH	• Direct • Negative • Short term • Local • Reversible	Low	Little	Negligible
Energy requirement	Emission of noxious gases to the atmosphere	EH	• Direct • Negative • Short term • Local • Reversible	Medium high	Little	Moderate
Installation of seaport facilities	Disturbance of water flow and aquatic life	E, S	• Direct • Negative • Long term • Widespread • Irreversible	High	Great	Major

Note: *1. ESH = Environment, Social and Health*

2. <u>Degree of impact significance</u>:

Major significance	-	*Major impact rating*
Moderate significance	-	*Moderate impact rating*
Minor significance	-	*Minor impact rating*
Negligible significance	-	*Negligible impact rating*

Vegetation Clearing

Clearing of 2,700 ha of vegetation could lead to the destruction of indigenous plant communities, loss of economic, medicinal and food crops. The impact probability is major and high (80–100%), and described as direct, negative, long term, local and irreversible.

Mitigation

- NNPC should minimize the area of land to be cleared.
- Felled trunks should be chopped to a manageable size and stockpiled for local use.
- Indiscriminate felling of mangrove trees should be prohibited.

Loss of habitat for wildlife

Vegetation clearing could also result in the destruction of the habitat for Wildlife including their migrating routes and their breeding sites. This activity could disperse wild animals into surrounding areas as their habitat is fragmented thereby increasing their vulnerability to attack and capture. This is a threat to the population of the endangered specs as shown in table 1. The impact description is direct, negative, long term, local and irreversible. It is rated as major.

Mitigation

- NNPC should minimize the area of land to be cleared.
- Clearing should be done in piece meal to enable the animals move peacefully without much mishap. Small corridors should be created to serve as shelter and hiding places for the animals.
- Breeding sites and potential breeding sits should be identified and protected.

Increased erosion of the cleared area

Site preparation could also lead to erosion as a result of soil exposure. This impact is described as direct, negative, short term, local and reversible. It is rated as moderate.

Mitigation

Site preparation should be done in the dry season.

Area to be cleared should be minimized

Nuisance (noise, emissions, vibrations)

Heavy machinery construction activity could generate noise and emissions which are pollutants and vibrations too. This could impair air quality and could also scatter the wild animals in a way that their lives are in danger. The impact description is direct, negative, short term local and reversible. It is rated as moderate.

Mitigation

- NNPC should deploy best practice and cleaner technologies that will ensure emission reduction. Machinery to be used should undergo proper maintenance with muffled engine to generate minimal noise.

Disturbance of soil dwelling organisms

Noise from the operation of heavy duty equipment could disturb soil dwelling organisms necessitating them to abandon their burrows and run for their dear lives. The impact is direct, negative, short term, local and reversible. It is rated as major.

Mitigation

- Light low impact equipment and machinery with low noise generation should be used.

Reduction in the quality of surface and ground water

Contamination of surface and ground water could affect their quality and consequently affect the lives and well-being of aquatic animals. The impact description is direct, negative, short term and widespread. It is rated as moderate.

Mitigation

- NNPC should avoid the discharge of untreated waste into the aquatic environment.
- Ensure appropriate response to strategies, and undertake regular monitoring of facilities.

Impairment of air quality

Exhaust fumes from vehicles, boats, tractors, generators and others could impinge on air quality and this is detrimental to wild animals. The impact is direct negative, short term, widespread and irreversible. It is rated as major.

Mitigation

- Machinery must be adequately maintained so as to produce minimal concentration of pollutants.

Decreased quality of habitat (Biodiversity)

The photosynthetic ability of the plants could be adversely affected when suspended particulate matter settle on the surface of leaves of plants. The overall effect could be deterioration of the habitat and alteration of its biodiversity. The impact is direct, negative, long term, local and reversible. It is rated as moderate.

Mitigation

- NNPC should deploy best practice and cleaner technologies that ensure reduced emission.

Emission of noxious gases to the atmosphere.

Activities in the project area involve the use of all kinds of equipment and these are capable of emitting harmful gases into the environment. This could affect negatively the fauna and flora of the immediate environment. This impact is direct, negative, short term, local and reversible. It is rated moderate.

Mitigation

- NNPC should deploy best practice and clearer technologies that will ensure emission reduction.
- Equipment used must be adequately serviced to reduce the tendency of releasing harmful gases into the atmosphere, especially carbon II oxide (CO).

Disturbance of water flow and aquatic life

The installation of the sea port facilities could affect the water flow and also the aquatic life. The water will definitely be dredged to accommodate the berthing of ocean going vessels. The leakages from the ships could also pollute the water thereby increasing the mortality of the aquatic animals. The impact is direct, negative, long term, widespread irreversible. It is rated major.

Mitigation

- Off-site spoil disposal of dredge shall be implemented.
- Care must be taken to prevent leakage from the ships that utilize this port.

Summary and Conclusions

The execution of the project was observed to have some potential negative influences on the wildlife of this area just as listed below:

- Destruction of indigenous plant communities, medicinal and food crops including endangered plant and animal species.
- Destruction of the habitat including food, shelter, migratory route, and breeding sites for both arboreal and land animals.
- Exposing the soil to erosion and consequently the siltation of the surrounding creeks and creeklets.
- Pollution of the air, land, water bodies in the area.

To ameliorate these negative effects some mitigation actions were suggested such as:

- Control of indiscriminate felling of trees and minimizing the area of land to be cleared.
- Clearing to be done in piecemeal and corridors to be created to serve as shelter and hiding places for the animals.
- Site preparation to be done during the dry seasons.

- Best practice to be deployed, cleaner technologies to be used and machinery to undergo proper maintenance.

It is therefore, concluded that if the mitigation measures are implemented the impact of this project on the communities will definitely be reduced.

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