Wildlife Impact: Assessment and Conservation Measures on Schedule - 1 Species to Development Projects Like Mining and Cementplants, District: Chittorgarh (Rajasthan)

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Abstract: Nimbahera is known for the stone found here, Nimbahera stone, a kind of limestone that is used as a building material and raw material in cement manufacturing, making it a suitable destination for cement industries. Major Cement Plants in the city are J.K. Cement Nimbahera, J.K.Cement Mangrol-1, J.K.Cement Mangrol-2(Under project), Wonder Cement, Lafarge Cement, Dalmia Cement (under project), Saurastra Cement (Under project), jayPee Cement (under Project), Nimbahera is set to become the highest cement manufacturing area of Asia, after completion of the upcoming cement projects. Presently highest cement manufacturing area in India are Satna (Madhya Pradesh) &Nimbahera (Rajasthan) respectively.

Status of wildlife in this area was studied in year of Jan.2012 to June 2014 in season of summer and winter on the basis of field visit, consulting with Forest Department of Chittorgarh and local people. This study revealed thatTwo Mammals (Canislupas, Panther pardus), Two Reptiles species (Phythonmolurus, Crocodyluspalustris) and one species of birds (Pavocristatus) were recorded in Schedule I, according to wildlife Protection Act 1972.

The construction and operation phase of cement plants and mining activities affected survivals of wildlife of surrounding environment. The sittings of construction equipments, stores, labor camps, the operation of various construction equipments and construction work itself is likely to generate significant noise. Blasting will be generated vibration and the noise. The vibration and noise may scare the wild Fauna of nearby forests patches and force them to migrate to other areas.

In the operation phase, the emission of toxic gases in the environment may be created toxic impact on terrestrial and aquatic animals due to change in composition of elements. Migratory birds will be affected due to increase pollution level and lighting beam in or around industrial and mining activities.

The migratory bird rout will be affected and habitation of birds will be disturbed by the reason of topography changes, construction and blasting activities. The habitations of animals are becoming fragmentation and shrinkage due to running and upcoming plants and Mining in study area. The migration path is also disturbed due to increase transportation and digging mine pit on the rote of migration. Artificial light beam are affected invertebrate animal and nocturnal activities of animals are also affected. The human wildlife conflict may be occurred through habitat destruction of wildlife.

Although these threats are beloved to be causing an alarming decline in population, the magnitude and pattern of the effects in study area are yet to be quantified and conservation plans would be implanted by owner of Cement Plants and Mining with cooperation of Forest Department of Chittorgarh.

Keywords: wildlife, Biodiversity, Migratory Birds, Schedule I, wildlife Protection Act 1972.

1. INTRODUCTION

Nimbaera is known for the stone found here, Nimbahera stone, a kind of limestone that is used as a building material and raw material in cement manufacturing, making it a suitable destination for cement industries. Major Cement Plants in the city are J.K. Cement Nimbahera, J.K.Cement Mangrol-1, J.K.Cement Mangrol-2(Under project), Wonder Cement, Lafarge Cement, Dalmia Cement (under project), Saurastra Cement (Under project), jayPee Cement (under Project), Nimbahera is set to become the highest cement manufacturing area of Asia, after completion of the upcoming cement projects.

Presently highest cement manufacturing area in india are Satna (Madhya pradesh) &Nimbahera (Rajasthan) respectively.

Keeping in view of the unique diversity of the Semi-desert area of project study area the mining and cement plants development are concerned about the negative impact on the wildlife of the area, which might be impact or direct or indirect and/or short-and long-term.

Study Area:-

Fig. 1.0:- Google Image of Study area

Fig. 1.1. Google image of study area of major mine activities

Fig. 1.2 Google image of study area of one of them mine activities

Photo Plate 1.1 Overview of Study Area

ISBN: 978-81-93024-71-3

ISBN: 978-81-93024-71-3

Material and method

Ground survey were carried out by trekking the impact zone for identification of important animal group such as butterflies (Insect), birds, mammals and reptiles etc inhibiting the area. The fauna were identified by using standard monograph of birds, butterflies, reptiles, Mammals etc.

Survey techniques: The visual encounter survey (VES) technique was used. The VES technique involves walking through the study site systematically searching for animals during a given time period. No Time Constrained Studies (TCS) were utilized and hence a varied amount of time was spent at the sites based on species diversity. Micro-habitats studied included terrestrial, arboreal and aquatic during the study.

Given the elusive nature of animals, VES techniques are very effective to estimate the species richness. However, species counts of animals are very difficult, given the terrain and nocturnal habits of many species.

Equipment used: Torches for night searches, measuring tape and vernier calipers for measurements and a Nikon camera for photography and binocular for assessment of animal from safe distance.

Monitoring Station

We have selected sampling point for assessment of wildlife of study area and we have taken GPS point of all of area selected for wildlife assessment.

Table 1.2: - GPS points have been taken for Biodiversity Assessment

Y	X	Location Name
24°40'52.30"N	74°36'46.32"E	mine area
24°43'28.22"N	74°34'19.64"E	Forest area
24°44'6.84"N	74°33'3.75"E	Forest area
24°43'9.77"N	74°33'31.61"E	Forest area
24°36'49.24"N	74°42'29.73"E	Kadmali river
24°33'15.88"N	74°42'41.70"E	Adjacent river environment
24°42'4.90"N	74°43'45.78"E	Gambhirreservior
24°42'58.07"N	74°43'14.10"E	Gambhir river
24°42'10.51"N	74°37'53.58"E	Murliya DAM
24°35'3.20"N	74°37'21.09"E	Unchatalab

Environment Setting of study area:

Environment is critical element for sustaining life. Various environmental parameters (Temperature, humidity, and rainfall besides components of the physical environment like soil) determine the composition of the species within plant communities that, in turn, affect colonization by and movement of animals. Consequently, it is important to take a brief look at the environment setting, particularly of the area within 10 km periphery from project site.

The climate of Chittorgarh is quite dry and parched. The summer season extends from April to June and is quite hot. The average temperature in summers falls between 43.8° C to 23.8° C. The winter season lasts from October to February. Chittorgarh weather in the winters is pretty cool. The temperature averages around 28.37° C to 11.6° C. The monsoon season falls during the months of June to August. As far as climatic conditions of Chittorgarh, Rajasthan in monsoon are concerned, there is only slight rainfall that averages around 60 cm to 80 cm

Forest Type of study area

The forest found in this biodiversity assessment is classified as II- Dry tropical forests, which is further diversified into group 5- Tropical dry deciduous forest with 5A- Southern tropical dry deciduous forest (including C1-dry teak bearing forest) and 5B- Northern tropical dry deciduous forest (including C2 –northern dry mixed deciduous forest) (Champion and Seth 1968).

Impact on Wildlife

During biodiversity assessment in study area reveled that there are significant and densewild life habitation. **Schedule -1** species were recorded in the study area during the biodiversity assessment.

During construction and operation phase, a large number of machinery and construction labor will be active in the construction sites. The sittings of construction equipments, stores, labor camps, the operation of various construction equipments and construction work itself is likely to generate significant noise. Blasting will be generated vibration and the noise. The vibration and noise may scare the wild Fauna of

ISBN: 978-81-93024-71-3

nearby forests patches and force them to migrate to other area and movement of wildlife form one protected forest to other forest patches are affecting. In the operation phase, the emission of toxic gases and particulate matter in the environment may be created toxic impact on terrestrial and aquatic animals.

Migratory birds will be affected due to increase pollution level and lighting beam in or around industrial and mining activities. The migratory bird rout will be affected and habitation of birds will be disturbed by the reason of topography changes, construction and blasting activities

Impact Mitigation Measures

During construction and operation phase of mining and cement plant should be followed mitigation measure for mitigate biodiversity impact on surrounding environment which have been given below:

1. Water sprinkler should be used on connecting road for transportation of construction material during construction phase and raw material and product in operation phase to control fugitive emission in surrounding environment.
2. Paved road should be use for transportation of construction material and product to minimize fugitive emission**.**
3. Transported material and store of raw material should also be well covered.
4. Transport vehicles and machinery should be properly maintained and periodically check pollution level to reduce noise level and gases emission surrounding environment.
5. Blasting should be carried out in deep hole to minimize impact on vibration and noise on Ecology and biodiversity.
6. Emission of particulate matter and gaseous in during operation phase should be control at source by using particulate matter control and gaseous emission control devises as per CPCB guidelines. Thick Green Belt should be developed in 33 % area around of project site. The plant specifies selection for greenbelt should be according to guideline of CPCB. These species should be drought resistance and can be control gaseous emission. The green belt is also beneficial for controlling noise pollution of surrounding environment.
7. Do not use exotic species that may be fast growing.
8. No labor camps on around of reserve and protected forest.
9. Maintain the ecology of the preferred routes of animal's movement.
10. Use flasher to prevent animals from crossing busy interaction.
11. Transportation of raw material and construction material should be preferred in day time. If any circumstance for transportation at night time should be use night readable signboard cautioning the drivers to watch for animal. Use fluorescent ink to make them readable after darkness.
12. Restrict the removal of aggregate materials from dry riverbeds that have been identified as important riparian habitats for amphibian, birds and other wildlife movement.
13. Built a clause in contract document for the contractor that would not permit the labors, worker, supervisors, contractors and other employees to collect and utilize forest produce, including firewood. Frequent visitation to the forest habitats for collection of resources could scare the wildlife and may also result in human –wildlife conflict.
14. No labor camp to be established in area identified as animal movement corridors.
15. Create a live hedge of sturdy woody shrubs along the road on either side that would restrict the wildlife to cross road connected to project site. Closely packed bamboo and tail grasses could be used.
16. Undertaken an educational and awareness drive in labor camps to ensure that traps are not laid by the labors for trapping small animals.
17. Weed control method should be conformed to the ecological conservation officer to prevent any undesirable secondary impact.
18. The removal or picking of any protected or unprotected plants shall not be permitted.
19. The grass mix should consist of indigenous grasses adapted to the local environment conditions.
20. In the event that animals are present that may pose a risk to human safety, a suitable animal handler must be requested to removed the animal in an environmentally responsible manner. This specifically refers to snake and scorpions.

Wildlife conservation measures for Schedule I and Migratory Birds:-

Peafowl:-

- Encourage Afforestation activities around close to peafowl habitation. The selection of plant species should be based on requirements of peafowl roosting, food, shelter**.**
- Organized seminar, conferences, poster presentation at school and Gram Panchyat level around peafowl

ISBN: 978-81-93024-71-3

habituation area with discussed on aware local people about not kill this bird for meat, feathers. Protect it birds to wild dog and his eggs to predators.

- Peafowl have culture value in India with associated to god of Krishana, Kartikaya. It feathers are used to various festivals like dipawali. Encourage the local people to give his contribution in protection of peafowl. It is necessary to aware local people to his cultural value.
- Small water tank should be constructed in habitation zone of Peafowl and its water quality should be maintained.
- Fruit and shade plant should be planted nearby peafowl habitation like mango, Ambla, Amrud, Emli, Bargad, Neem, Pipal etc.
- Small sacred grove should be constructed on wasteland in each peafowl habitation area. Sacred grove is small patches of vegetation that are protected by traditional manner. This sacred grove should constructed boundary about 7- 10 ft height and one temple should construct in sacred grove. One person should be monitor to wild dog, monkey and give organic farming food like maze, Pulls, wheat, rice for Peafowl.
- Encourage local farmer to use biopesticide, biofertilizer and vermicomposting in agriculture practices.

Crocodile

- **Population Monitoring**: A programme of regular, systematic monitoring of known *Crocodylus palustris* population is essential. Nest and bask sites should be identified and mapped and census technique needs to be refined and standardized so that they are scientifically credible. Initially this should be carried out in protected areas.
- **Protection of habitats**: Within Protected Areas, Mugger habitats require monitoring (eg siltation and drying up during drought). All Protected Areas that Mugger require protection from illegal activities that threaten Mugger in particular - especially netting, disturbance at nest and bask spots and killing of prey species. Adequate protection should be afforded to Mugger burrows especially from livestock.
- **Integration of local people into conservation programs:** Major threats to *C. palustris*include accidental drowning in fishing nets, and animals found entangled are often intentionally killed by fishermen. In some areas, Mugger eggs are collected for local consumption. A conservation awareness program that involves local people in the conservation of Mugger is vital to ensure long-term success of any management plan. Plans should include educational materials, signs, and instill pride amongst the locals as caretakers of the last populations of crocodiles in their water bodies. There is an equally compelling need for a concerted human/crocodile conflict mitigation program.
- **Public awareness/education about crocodiles**: Public awareness is an important priority within the scope of overall management plans for the species.
- Aware local people and built effective information system against hunting and poaching activities.
- Ensure sufficient water level for survival of crocodile mostly in summer season and drought condition.

Python:-

- Probable habitat boundaries need to determine for all areas that are likely to possess viable populations so that protection measures can be initiated.
- All appropriate landowners within these protection boundaries should be identified. Each should be contacted in the manner that will ensure cooperation. Land owners should be made aware of the sensitivity of the endangered python and of the value of maintain natural habitat. They should be made aware of the available conservation options.
- A conservation awareness program that involves local people in the conservation of python is vital to ensure long-term success of any management plan. Plans should include educational materials, signs, and instill pride amongst the locals as caretakers of the last populations of python in their habitation. There is an equally compelling need for a concerted human/python conflict mitigation program.
- Public awareness is an important priority within the scope of overall management plans for the species. Public awareness often yields new locality information and could reduce the frequency with which python are killed.
- Poaching and hunting of python should continuous monitor and take action against it according to wildlife protection act-1972. Aware local people and built effective information system against hunting and poaching activities.
- Effective communication network should be developed between local people, forest officers and conservation experts to reduce the risk of the human conflict with python, hunting and poaching activities.
- Training programme should be conducted to conservation expert team and local people for safe handling of python.

Leopard:-

- **Habitat Improvement**: - It is important that sufficient prey or food is available in the forest. Through the study area supports fair number of Nilgai and wild pig which can be prey for leopard, as part of conservation plan for this predator, habitat protection and improvement, especially the food availability of water and salt licks are of priority. The langur, which is an important prey species for leopard in this region.

ISBN: 978-81-93024-71-3

i) Gap plantation with woody shrubs

Gap plantation can be done in the degraded reserved forest areas, mainly in the patches that are heavily degraded and lack natural regeneration, covering at least one ha area in each plantation site. The species suggested for gap plantation as part of habitat improvement.

Table1.1:- List of Woody shrub species suggested under habitat improvement program

S. No.	Species Name	Local Name
1	*Carissa spinarum*	Karonda
2	*Grewiatenox*	Gangor
3	*Capparisseparia*	Kenter
4	*Zizyphusxyiopyrus*	-
5	*Zizyphusnummularia*	Ber

A total of 5 shrub and woody shrub species have been suggested under gap plantation to improve the habitat quality**:-**

- Improve vegetation cover and provide shelter for small mammals such as rats, mouse, hare, jackal and wild pig.
- Control soil erosion and retain the soil moisture and thereby improve the overall regeneration potential of other tree species of the forest habitat.
- Provide food for Wildpig, common langur and Nilgai which are main prey species for leopard which is top carnivore of the study area**.**

ii) Development of Grasslands/patches for prey species of leopard

In order to improve the prey species, including the rodent population that are also eaten regularly by leopard where prey especially ungulates population is low, the habitat improvement should involve developing grass patches in the area that are open. List of some grass species reported in the study area are suggested for grassland development**.**

Table1.2 Grasses species are suggested to grassland development in study area

S. No.	Grass Species
1	*Cynadondactylon*
2	*Heteropogonconfortus*
3	*Cenchrusciliaris*
4	*Eragrostis Sp.*
5	*Apludamutica*
6	*Sporoboluscoromandelianus*

iii) Water hole can be constructed in habitation zone of Leopard for drinking purpose and its availability should be ensured.

Organized seminar, conferences, poster presentation at school and Gram Panchyat level around leopard habitation area with discussed on aware local people about not kill for trade for skin.

In drought condition, its food and dirking water availability should be maintained.

Information system should be built in around habitation of leopard and aware local people if leopard entered in human settlement. In such case, people should be informed forest officers immediately to safe caught of leopard and leave in his habitation.

2. CONCLUSIONS

Although these threats are beloved to be causing an alarming decline in population, the magnitude and pattern of the effects in study area are yet to be quantified and conservation plans would be implanted by owner of Cement Plants and Mining with cooperation of Forest Department of Chittorgarh**.**

ISBN: 978-81-93024-71-3

ACKNOWLEDGEMENTS

One of us(p k) is grateful to the management of Company j M EnviroNet (P) Ltd, Jaipur for their incessant support and guidance throughout the tenure of my work. Rajasthan state Forest Department, Chittorgarh for their cooperation in conducting the present study.

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