Development of Economic Corridors, Inter-Corridors, feeder routes and Coastal Road primarily to improve the efficiency of freight movement in India (Lot-3Odisha & Jharkhand/Package-2) Raipur-Vishakhapatnam (Ch.124.661 - Ch. 365.033 km) (Length 240.372 km) in the State of Odisha by M/s National Highways Authority of India under Bharatmala Pariyojana

Proposal Number: IA/OR/NCP/131730/2019

Sl. No.	Additional details sought by EAC	Reply
1	EIA and EMP study does not reveal the details about the Public Hearing so also the commitment of the PP along with budgetary allocation	The details of public Hearing along with the commitment of the PP with budgetary allocation has been provided in Chapter 7 of EIA/EMP report.
2	Detailed Wildlife Conservation Plan for the Animal Bypass/Under Pass be submitted from the competent authority	The approved conservation plan as approved by Wildlife Warden has been attached as Annexure XV and its budget has been allocated in the EMP budget
3	Water Conservation Plan assured for the Local community at the time of public hearing be submitted	Water conservation plan for the local community has been provided in section 9.8 Chapter 9 of EIA/EMP report and its budget has been provided in the EMP cost.
4	The Animal crossing and its locations were not justified. A detailed note on animal crossing and related issues be submitted	A total 25 numbers of animal underpasses (dedicated for small and medium sized animals) have been proposed in the project. Detail locations was suggested by the concern DFO along the road. They have also suggested for crossing arrangement of amphibians or reptiles. The 265 nos. of culverts , 16 nos of major bridges and 76 nos. of minor bridges have already been designed in the project. The details of above mentioned animal passages and provision (Conservation plan) have been provided in Annexure XV of EIA/EMP report.
5	Environmental management plan has to be revised as many budget allocations made are not relevant to the issues highlighted in the EIA report	The revised and amended budgetary allocation incorporated in environment management plan (Chapter 9 of EIA/EMP report).
6	It is observed that the skill development details for the localities are lagging in the report	The detailed locations of skill development plan and awareness program and its budgetary provision has been provided in the EMP (Chapter 9).

Issues discussed during Public Hearing at Koraput district

S. No.	Issues Raised during public Hearing	Reply to Issues by PP
1	**Sri Biraj Kumar Benya, Dangari, Mastiput GP** **Sri Benya welcomed the project** and informed that about 30 acres of low land to be acquired for the project. He expressed his concern over the loss of total land of people having 1 to 2 acres area in the project and apprehended that they become landless. Further, he informed that he is also going to lose his land with others in this project. He said that, many local ST, SC people also losing their land in this project. He explained that Government policy says that nobody should be landless and minimum 2 acres of land to be provided for all. Apprehending that the people become landless due to the project, he requested the ADM, Koraput and Government for providing suitable land in lieu of land to be lost. He urged that the project should come up in a peaceful manner with fulfilling their demands and also warned that they may think for alternatives if their demands not fulfilled. He appealed to the public for not accepting money as compensation. He cited the example of losing their land for railway Line, Kolab Project and also in this project which make them landless and becomes beggars. He strongly advocated for providing land instead of money as it will be spent for purchasing Gold, marriages, etc and will be exhausted. He again requested for providing suitable land against the land to be acquired	There is no provision for providing alternate land in lieu of affected land as per NH Act 1956 and subsequent provision "Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013", However, the compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India.
2.	**Sri BhagabanBurudi, Ranagamatiguda, Mahadeiput, Koraput Block** Sri Burudi introduced himself as resident of Rangamatiguda and informed that the Bharatmala road project is passing through their village and they are going to be displaced. He demanded for Rs.15 Lakhs and Rs.30 Lakhs per acre as compensation. Further he informed that earlier they were settled at Littiguda and last 32 years residing in Rangamatiguda. They all are tribals and economically poor. He expressed his apprehension about the future and demanded for rehabilitation in Government lands with provision of 2 acres of land for their survival. Further he demanded compensation for their Salap, Jack fruit and Tamarind trees.	Compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. It may be mentioned that all these site specific local issues are taken care by the competent authority during settlement as per local law. The compensation for the properties (instant case trees) is also to be compensated as per above mentioned Act.
3	**Sri T P Srinivas Raju, Pukali, Pottangi**	Please refer compliance of para 1.

	Sri Raju introduced himself as a farmer and told that he came to express their griefs as they are losing their land in the project. He informed that in Koraput 10 to 15 families are getting their livelihood per Acre of land and hope that Government will extend support. He urged that the farmers should not suffer and emphasized that Government should redress their problem as the Koraput farmers are the backbone of the State. He told that they will submit their letter to the Collector for enhancement of the valuation of the land. He informed that Pukali is vegetable production rich area and vegetables are being exported. He requested to realignment the road near to the Pukali Hat for their benefits. He demanded for providing jobs, toll gate management etc in the project for the farmers who will lose their land. He expressed his concern about the problems of the farmers.	The proposed alignment designed based on ecological and socio economic issues after grant of ToR. Preferably locals are likely to be employed by the concerned contractor during constructional as well as operational phase.
4	**Sri Dashratha Malli, Litimaliguda, Mahadeiput** Sri Malli informed that he and his ancestor are residing in Litimaliguda since last 400 years. He told that they had 21 acres 10 cent of land and they distributed about 3 acres of land to their sisters and now they are 8 families having 60 to 62 members surviving on remaining land. He introduced himself as Mali Farmer and his family depends on cultivation. He informed that he has developed and encroached about 2 acres of Government Land which will be acquired for the project. Further he expressed that his yield from paddy cultivation is about 20 bags in Rainy season and 30 bags in summer which also going to be lost along with his paternal land. He expressed his concern over the loss of about 30 acres of land of his poor villagers. Further he expressed that the previous speaker Sri Bhagaban Burudi was took shelter at Litiguda as landless after displaced from Kolab and subsequently his village people settled him at Rangamatiguda and that village completely going to be displaced. He informed that people are losing pakka house and valuable agricultural land in the project and told that the 1 acre of agricultural land is more valuable for them for their survival than that of 5 acre of Donger land. Again he informed that more than Rs.2 lakhs was spent and about 30 years contribution made by his family for developing those 2 acres of land. He stated that about 22 years back he bought 1 acre of land @Rs.3000/- and now the Donger land costs about Rs.10 Lakhs per Acre in Koraput. While expressing their inability to stop the project he demanded for adequate compensation for the land at the prevailing rate in the Koraput.	The appropriate compensation will be done by the Kala with the funds of NHAI as per Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India.

5	**Sri Sarat Chandra Buruda, Bariguda, Mastiput** Sri Buruda introduced himself as a native of Malkangiri but he is having land at Mastiput. He expressed his concern over the displacement of the local people in various projects like Kolab Reservoir, NALCO and Bauxite mines in Koraput and the impact on the environment due to such project. He apprehended that the proposed Raipur-Visakhapatnam Road Project will have adverse impact on forest, rivers and Hills. He informed that Koraput is remotely located and covered with dense forest, but due to industrialization, forest area has been vanished and it is alarming for the environment. He expressed his satisfaction over the greenery in Koraput due to large scale Nilagiri plantation in Koraput area promoted by JK Paper Mills, BILT Paper Mills and Mangalam Timbers. He stated that deforestation taking place due to different projects including road projects. He pointed out that this express road project is meant for the Ambani&Adani, not for the general public as the public cannot access to that road due to barricading. Being a farmer, he expressed his grief and informed that he is going to lose 3 acres of land in the project. He informed that the Government bench mark valuation for Donger -I is 30,800, for Donger -II is 27,500 &for Donger -III is 23,100 per acre. He estimated that even after three times hike in bench mark value, he will get only 60,000 per acres for Donger -III land and also face significant loss in earning from his Orchard having more than 100 nos. of Mango, Lemon trees with Pineapple plants. He questioned on less valuation of land in scheduled area. He opined that due to Section-56 regulation the immovable property of ST people can only be transferred to other ST people and even Bank also not considering it for mortgaged and hence valuation is less. Also in order to reduce stamp duty, the lesser value being shown for registration. He informed that the local Mali families are cultivating vegetables round the year by utilizing stream water for their livelihood. Expressing their incapability of stopping the project, he urged that they should be properly compensated or else they are not going to give their land. Further he added that for service road all his land will be acquired. He demanded for 30 Lakhs per acre as compensation. He raised the displacement issue of Rangamatiguda village and suggested to resolve the issues by providing houses, suitable land and proper compensation after due consultation with the displaced villagers. He expressed that they are not opposing the project if they will be properly compensated or else he warned on behalf of farmers that they will strongly	It is appreciated the concern on ecology of Koraput district. The proposed project is a linear activities and chosen the alignment in such a manner so that bear minimum diversion of forest land and felling of trees. This project designed 02 nos Tunnel in hilly region so that landscape of that area remain intact. The green belt development will be done on either sides of the road as per IRC:2009 on available RoW apart from the statutory requirement There is provision of good nos. of underpasses (ROBs: 2, VUP: 23, VOP : 4, LVUP: 71, Animal Underpass: 25, Viaduct: 21) for safe passages of villagers and animals. The construction cost of 25 nos. animal underpass is **Rs 20500** lakh including noise barrier on underpass and either side 200 m on the ramp. There is also provision of 20 nos. of canopy bridge (for monkey). The construction cost of 20 nos. of canopy bridge is **Rs. 200 lakhs**. There is a provision for the villagers within certain limit from the Toll for their free movement across the toll along with their trolleys/tractors/bikes etc. There is also provision of slip roads/service roads for using main carriageway. The appropriate compensation will be done by the Kala with the funds of NHAI as per Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India.

	oppose the project. Further, he stressed on fulfilling the demand of the farmers to avoid law and order situation.	
6	**Sri Jagat Ram Nayak, Pukali, Pottangi** Sri Nayak introduced himself as a farmer and informed that the areas in Pottangi are mostly hilly lands and very less areas are suitable for agriculture on which they are depending for their livelihood from their forefathers. He informed that decision has been taken for the project and questioned on their survival if those agricultural lands will be lost forever. He told that they are not acquainted with the utilization of money and it will not help them for their livelihood. He demanded for proper compensation, rehabilitation and permanent job for at least one member of the family. He urged that Government should take steps so that farmers can be benefitted from the project otherwise after displacement they will be in distressed condition. He urged that all benefits of the road project passing near the Pukali and Pottangi area should be extended to the local people. He informed that they will submit their demand in written to the Collector and requested the Government to consider their demand seriously.	The appropriate compensation will be done by the Kala with the funds of NHAI as per Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. Preferably locals are likely to be employed by the concerned contractor during constructional as well as operational phase.
7	**Sri Ramachandra Paraja, Rangamatiguda, Mahadeiput** Sri Paraja introduced himself as a resident of Rangamatiguda and stated that all houses of the Rangamatiguda going to be displaced in the project. He requested for compensation of 15 Lakhs and job for the youth having age 18 years & more for their benefit.	
8	**Sri Prem Kanta Pan, Purimunda, Padagada** Sri Pan appealed the public to be united and cautioned that if we give our land then our life will be spoiled. Again he appealed to the public for giving application of their demands to the Collector unitedly. Further he expressed that if compensations are not given, demands are not fulfilled then they will meet Hon'ble MLA Jeypore and place their demands. He informed that he is going to lose 12 acres of paternal land, 60 cent of vegetable field and 25 nos of trees etc in the project. He expressed that road project may come up, but they should be compensated with land against land and rehabilitated with 2 acres of land in Koraput town to start their business for their survival, otherwise they will be compelled to protest on the road at the cost of their	There is no provision for providing alternate land in lieu of affected land as per NH Act 1956 and subsequent provision "Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013", However, the compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India.

	life. Further he told that the livelihood of the people of Koraput depends on agriculture, daily labour works, paddy cultivation twice in a year and growing vegetables. He informed that they are not acquainted with the use of money and cautioned that compensation money will be exhausted for marriages, alcohol consumption and other unnecessary expenses. He told that his paternal land of 25 acres divided and reduced to 12 acres for him and questioned on the survivability of the next generations since lands are being acquired from time to time for the railway line, Kolab reservoir and now for the road project in Koraput. He expressed his concern over the displacement from Kolab project and rehabilitation at Rangamatiguda and questioned on their survivability. He expressed his gratitude for the help received from the Hon'ble MLA Jeypore and told that he will give application to him for their demands. He informed that half of his house and vegetable field going to be acquired in this project on which his family was surviving. Again he demanded for 2 acres of land at Koraput town against the 12 acres land and other assets to start business by his next generation for their survival. He warned that if their demands are not fulfilled and not properly compensated, they will go for protest rally. He questioned on the limited compensation system of the Government for land and displacement and their survivability. He again stressed on compensation of land against land or else they will prefer to die. He cited the example of NALCO compensation system and stated that NALCO has given job against the land for the survival of their future generation and demanded similar compensation as compensation in form of money will be exhausted shortly. He explained that the paternal property will be enjoyed from generation to generation, so giving money is not proper compensation. He expressed his dissatisfaction over the less valuation for compensation and strongly demanded 30 Lakhs per acre of land to be acquired or to provide land at town for their survival.	
9	**Sri Tara Prasad Bahinipati, Hon'ble MLA, Jeypore** Hon'ble MLA Sri Bahinipati explained the importance of the land in Koraput area and informed that availability throughout Koraput district particularly over Government lands on which the local villagers depends for their livelihood. He informed that villagers planted large number of mango trees on Government land and peoples from outside used to purchase Harida, Bahada,	Compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. It may be mentioned that all these site specific local issues are taken care by the competent authority during settlement as per local law. The compensation for the properties

	Sahada, Amla & Nim from Koraput area. He cited the Supreme Court decision that if one family is displaced once, then they cannot be displaced further. He informed that the displaced persons of Kolab settled at Rangamatiguda and developed donger land for their livelihood. He appreciated the technique followed by the Mali community to channelize the stream water from one hill to another hill for cultivation purpose. He highlighted the large scale ginger cultivation made from Pottangi to Mahadeiput including his 25 acres of ginger field and questioned about the impact on cultivation if those land to be given for the project. He stated that he is not opposing the road project and explained about the job opportunity given to elder people by NALCO mines, Damanjodi and spent of compensation money in unnecessary means by the locals. He also expressed his dissatisfaction over the jobs provided in lower category to the locals by the NALCO. He described about his contribution towards getting job by the locals from NALCO. He stated that in HAL most of the jobs are given to the outsiders ignoring Koraput people. Further he described about his struggle in the past for enhancement of land cost to be acquired by Utkal Alumina and expressed his dissatisfaction over the ignoring the locals for employment by the company and also the cheating behaviour of locals towards him. He cautioned the public about the Divide and Rule Policy. He strongly opposed the compensation value fixed for the road project @ 30000 for Donger-I, 27000 for Donger-II & 22000 for Donger-Ill which is not acceptable. He urged that separate discussion is required for rehabilitation of Rangamatiguda village as there is no provision of second time rehabilitation in law based on verdict given by Hon'ble Supreme Court. He informed that they are no8t Getting forest clearance for their village road even for PradhanMantri Sadak Yojana and questioned that how_ this project will get forest clearance. He strongly recommended that though the land records are in name of Government, but tribal peoples are enjoying the land from their ancestors and hence belongs to them since it is a scheduled fifth area. He also informed that anabadidonger belongs to them, not Government land. He strongly opposed the shifting of the Model Degree College of Koraput located in Semiliguda block for the road project and warned that it may lead to bloodshed if attempt is taken for dismantling the Model Degree College	(instant case trees) is also to be compensated as per above mentioned Act. Preferably locals are likely to be employed by the concerned contractor during constructional as well as operational phase.

	Building. He informed that college is to be inaugurated in March and if it is shifted then it will take another ten years to come up which will greatly hamper the education facilities of the local tribal students. Further he added that the property belongs to public since it is constructed with the tax payer's money. He expressed that there is no need of the project unless their demands for proper compensation of land against Land, rehabilitation etc get fulfilled and then only they will consider about the project proposal. He again stressed upon the declaration of the Government for non-shifting of the College or else they will not allow the project for construction. He recalled the scarification of Veer SahidShriLakhamanNayak of Koraput for the Independence and appealed the public not to agree for the project if Authority will not listen to their demands. Further he warned that they will not tolerate if the project will take away their houses, schools, trees, lands etc and appealed the public to save their mother land even at the cost of their life. We are not against development but our demands to be fulfilled properly.	
10	**Sri Chittta RanjanSathpathy, jeypore** **Sri Sathpathy introduced himself as an advocate and expressed his happiness for such large road project**. He stated that local farmer, labourers and tribal are losing their land, houses, ponds etc for this project. He emphasized on completion of this project within a timeframe. Further he stressed upon proper compensation to the project affected people without any corruption. He expressed his dissatisfaction over the improper compensation to the affected people and corruption in Upper Kolab & Telengiri Project. He expressed his concern over the environmental impact due to loss of forests, ponds, rivers, houses, school & colleges etc in this project and demanded for proper recovery. He opined that the attendance sheet of the hearing should not be treated as No-Objection for the project. He strongly recommended for proper and adequate compensation to the affected people and to rehabilitate them in suitable place not in remote areas. He queried about the compensation of 30 Lakhs / acre in Nabarangpur area whereas 3 Lakhs / acre in Koraput area in the project. He stressed upon to pay 30 Lakhs per Acre as compensation and recommended to engage reputed company for construction of road to avoid corruption and to complete it in a time bound manner.	For land compensation issues kindly refer point No.1.

Issues discussed during Public Hearing at Nabrangpur district

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
1	**Sri GopalPujari, SamitiSabhya, Badabharandi** He requested the District administration to implement the project as per 2017 survey report. He gave emphasis for protection of Forest, Water bodies, & expressed that there is no alternatives for lively hood other than agriculture for people of Nabarangpur. Further he added that due to poor irrigation facilities, local people are compelled to migrate as "DadanShramik" to other states & during this COVID pandemic, they returned in distressed conditions & managing with Government aid. **Though he welcomed the Economic Corridor,** he suggested for renovation & expansion of existing NH 26 connecting Raipur - Jeypore that passes through Nabaranpur with due compensation. He expressed his dissatisfaction over the no clarity about 'compensation for land loosers & also non settlement of the land between Umerkote to Raighar even after 74 years of independence though it is a tribal area. He described regarding setting up of DNK colony in 1950 by destroying Reserve Forests. Further he questioned on the development of the District without having proper provision of Irrigation, Forest & Land for local Tribals. He also emphasised on development at grass root level through Mo Sarkar & 5T. He expressed his displeasure over fixing of pillars on their land without their knowledge for the project though **they are not opposing the Bharatmala project which is a pride for them.** He described about huge production of Corn largest in	Sri GopalPujari, Samiti Sabhya, Badabharandi welcomed the Economic Corridor. **Once again he further welcomed the project & urged that District administration should take such steps that nobody will suffer.** He has also suggested/raised following issues: The NH 26 will be maintained by NH division of Govt. of Odisha through MoRTH funding for maintaining the ongoing traffic and connectivity of locals. The outcome of preliminary survey in 2017 along existing alignment depicted that following existing alignment was not technically and economically feasible. The reasons for choosing greenfield alignment is as follows are as under: 1. Increase in length of around 96 km which causes indiscriminate use of natural resources for entire life cycle of the project. 2. The existing road carriageway is 5.5m to 7.0 m with sharp curves and black spots not conducive to the design standards for economic corridor. The improvement of existing carriageway 6 lane access control National highway required large numbers of structures for crossing arrangement of the existing villagers on either sides of the road almost in every 1-2 km in habitation area and realignment/bypass. Its results 90% of the stretch is in greenfield. 3. There is large impact on social for dismantling	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	Asia at present & earlier the cotton production & sugarcane along IndravatiRiv in their locality but no development occurred due to lack of industrial units. **He welcomed the project & urged that District administration should take such steps that nobody will suffer**. He again stressed on development of cotton farming & irrigation facilities up to Kundeai from Indrabati Reservoir for local employment & development. He suggested for revival of Ginning Mill & establishment of Corn factory & proper facilities for KBK at Umerkote. Being the President of Bharat Kissan Sangh, he informed that the Farmers are denying for giving their land for the project as lands encroached by them have not yet been settled which leads to apprehension on no compensation. He demanded for irrigation facilities through dams, Patta for their Land & protection of Forest to control Pollution. He wished for overall development of the district in the interest of the public. He also expressed his concern over the siltation of Bhaskel Reservoir & informed that people in Ayacut area of the Reservoir are not getting water for their Kharif crops. He suggested for renovation of Reservoir to facilitate irrigation. He told that Local Tribals were dependant on Forest products but now all type of Forests have been finished & people have encroached to those lands through Podu cultivation. He questioned on compensation on Government Lands & demanded equal area against the land to be lost. He also informed that proposed Road has been aligned through Private, Patita& Forest land excluding the Reserve Forest area. He requested the district administration to change the recent surveyed road	the structures and properties of the project affected families. It also cause huge air pollution during dismantling phases and also their temporary relocation. 4. The diversion of forest land involves of about 429.53 ha. of a length 95.45 km stretches of existing road passes through undulated and hilly forest area. The tree felling involves around 3.5 lakhs for improving the blackspots and sharp curves (on existing road). 5. If existing road will be followed then the land acquisition and compensation amount is almost 4 times higher than the LA cost on greenfield alignment as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. 6. It may be mentioned that State government shown their views during different meeting that removal of encroachment along the existing carriageway may be difficult in a time bound manner. 7. Government decided to implement the Raipur – Vishakhapatnam in the interest of development of Vishakhapatnam port, mining & industrial activities in around Koraput district under Bharatmala Pariyojana. 8. The NH 26 shall continue to be maintained by NH division of Govt. of Odisha through MoRTH funding for the connectivity of locals. For water conservation in and around the project	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	project & consider the existing Road for the Corridor. Later, he appealed to the farmers to support the 2017 survey road project for implementation & submitted a written representation to the Chair on behalf of Bharatiya Kissan Sangha, Nabarangpur during hearing.	corridor: 1. The ponds situated within 5 km lateral distance from the proposed RoW will be desilted up to 0.6m to 1m as per IRC guidelines in consultation with the local authorities on government land. The desilted material will be used during construction for the highway so that there will be zero discharge. 2. Rainwater harvesting structures shall be provided at the interval of 500 m on either sides of carriageway as per availability of RoW and depending on the water table of first aquifer. 3. Contractor will construct hand pump in consultation with appropriate authorities like district administration/panchayat on government land at every village along the road within 1 km lateral distance from the RoW. 4. The water holes will be constructed by contractor in consultation with the forest officials at interval of 2 km in forest patches on either side of the road and at a distance of 1 km lateral distance of the proposed RoW for drinking purpose of animals. 5. The construction of bridge cum barrage structure for serving dual purposes i.e. to cross the water bodies as well as to store the water on upstream sides as per MoRTH Notification RW-NH-34066/59/2015-S&R (B) dated April 18 2017 in consultation and NOC of principle secretary/Secretary PWD and after obtaining the permission from irrigation, water resources, environment and local	1. The cost of desilting of ponds on Government land is about Rs 200 lakh. 2. The cost for construction of 180 rainwater harvesting structures is Rs 900 lakh including its maintenance. 3. The approximate cost for providing 130 nos. of hand pumps is of Rs. 65 lakhs 4. The 30 nos. of water holes will be constructed by the contractor in consultation with the forest officials of Nabrangpur division. The cost for construction of water holes is about Rs 150 lakhs. 5. The additional cost for construction of 16 nos. of barrage structure underneath of bridge is about Rs. 350 lakh. 6. The cost for carrying out skill development at 16 locations once in a year for two years is about Rs. 320

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
		administration. This will met the requirement of villages in and around upstream sides. In this regard the requirement of downstream side also to be taken care so that their demand should also be met. (Copy of Notification attach) 6. For indigenous people in villages, living within 10 km boundary off project highway on either side, skill development course for 5 days per workshop including road construction skills to be organized.	lakh.
2	**Sri Sanraj Gond, President, Krusak Sangh, Raighar** Sri Gond told that Nabarangpur area is a scheduled tribe area & Gram Sabha is prime requirement for any developmental project. He expressed his dissatisfaction over conducting Public hearing after substantial progress of the project including survey. **He welcomed the project & hoped that it will bring development but questioned on the steps taken by the Government for improvement of Farmers**. He expressed his displeasure of not getting irrigation facilities from Indravati reservoir for Nabarangpur District & suggested to construct Check dams throughout the District to improve irrigation facilities for farmers. He hoped that there will be development due to this road project & will attract industrial units but land is the prime requirement for the livelihood of the farmers. He supported the road project & informed that all farmers urged for expansion of existing road connecting Raipur to Visakpatnam	**He welcomed the project & hoped that it will bring development but questioned on the steps taken by the Government for improvement of Farmers**. Please refer para 1.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	which will be economical & will save their water bodies, Forest & Land. The compensation for the project can be utilized for other purposes. He apprehended that the proposed road project will affect their Rivers, Land, Forest, Funeral grounds, Worship places, Environment etc. He requested to the authority of NHAI, District administration & Pollution Control Board to modify the proposed project to expansion of existing Road & appealed to the public for offering their views in this Hearing.		
3	**Shri Munna Khan, Hon'ble MP, Rajyasabha** **Hon'ble Sri Khan emphasized on the interest of the Farmers & simultaneously implementation of proposed Road project. He described about the benefits like time saving in journey, access to Medical facilities etc due to this project**. He informed that some farmers encroached to Government lands & some of them have private land & urged that a holistic approach should be followed by taking all farmers into confidence so that no farmer will suffer. **He welcomed the project & stressed on obtaining views of local farmers, especially the tribals on this project**. He assured full support from the Government for farmers & development of agriculture. Further he suggested for setting up of corn processing units in the District for the benefit of the Maize farmers & assured that Government will certainly take steps for this. He appealed to the public for offering their opinion before the Officials present in the Hearing for	He described about the benefits like time saving in journey, access to Medical facilities etc due to this project. He also welcomed the project & stressed on obtaining views of local farmers, especially the tribals on this project. Compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. It may be mentioned that all these site specific local issues are taken care by the competent authority during settlement as per local law.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	recording & hoped for proper implementation of developmental project. He expressed that they are always standing with the Farmers. While supporting the project, he emphasized on no adverse impact & proper compensation to the farmers. Further he assured his full support for the benefits of the locals.		
4	**Sri Saradu Bhatra, Karmari** Sri Bhatra introduced himself as successor of Freedom Fighter & also a farmer. He told that farmers need water, Land & road communication for their survival, but Land is the prime importance for livelihood. He informed that small farmers & their families are depending on 1 to 2 Acres of land for their livelihood & questioned on their survival if those lands will be taken for the project. He urged that demands of farmers should be fulfilled by the District administration, State & Central Government. He informed that Government has settled the Bangaladesi Refugees by allotting huge lands. He appealed to the Government not to compensate the Tribals & farmers with money & other means of income as farmers& their families can only survive through agricultures. He informed that farmers are having small patches of encroached land, Forestlands & requested District administration for resolving the issues. He also expressed that land settlement in Umerkote & Raighar is still pending since last 60 to 70 years & land losers of Bhaskel Dam project are not properly rehabilitated by the Government till date. He demanded for implementation of Road project as per survey made during 2017 & for renovation of existing NH 26. He expressed his	The alignment has been fixed by the Government of the India under Bharatmala Pariyojana by the consideration of the local authorities and proper compensation will be given to the affected structures falling on the ROW of the proposed NH. Compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. It may be mentioned that all these site specific local issues are taken care by the competent authority during settlement as per local law. The compensation for the properties is also to be compensated as per above mentioned Act.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	displeasure for not getting any reply of their demands from District Administration. He extended their support for development of the farmers, district as well as for the state & urged that the livelihood of the farmers should be ensured through proper interaction with them.		
5	**Sri Muna Rupchand, Advocate cum Secretary Krushak Sangha, Raighar** Sri Rupchand introduced himself as an Advocate & Sampadak of Krushak Sangh. He expressed that on request of farmers the Krushak Sangh organized a rally on 6th March to change the road project & communicated to different State & district level authorities. He apprehended that the road project is likely to *destroy forest, Hills, Small streams & rivers,* worship places of Tribals etc. He reminded that Food, Cloths & Shelters are basic needs of Human. Krushak Sangh opposed the road project but District Administration did not respond to their demands. While appreciating the contribution of the Collector & Project Director, DRDA for development, he expressed his dissatisfaction over non settlement of Lands in Raighar & Nabarangpur areas since long back. Further he expressed his concern on survivability of the successor families with the small patches of lands. He informed that nobody objected the survey for the road project made during 2017 & advised to consult with the farmers losing their lands from Raighar to Six Tehasils of Nabarangpur & implement the outcomes. Further he argued for execution of 2017 Road Project and to cancel the proposed 2020 Project.	Please refer para 1. Compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India. It may be mentioned that all these site specific local issues are taken care by the competent authority during settlement as per local law. The compensation for the properties is also to be compensated as per above mentioned Act.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
6	**Sri Topiram Nayak, Vice President, Krushak Sangh, Raighar** Sri Nayak told that they are farmers and informed that earlier Project work was started & then Hearing being conducted. Further he told that Government thought is to get the work done through small compensation. He opined that Farmers are backbone of the country & they are feeding the nation. **He expressed that they have not opposed the road project yet as they will be benefitted & it will bring development for their locality.** He expressed his dissatisfaction over the conduct of Public hearing prior to Pallisabha & Gram sabha & also for not getting any reply to their demands. Further he demanded for Patta land in place of land to be acquired &informed those lands have been encroached by them since British time. Land will not be handed over to Government. He warned Government that it may lead to public resentment &there will be the 2001 Raighar blood shade situation.	Sri Topiram Nayak, Vice President, Krushak Sangh, Raighar expressed that they have not opposed the road project yet as they will be benefitted & it will bring development for their locality. The project proponent replied that the construction of the proposed highway is not started yet and land acquisition is under progress and compensation will be given as per the prevailing government rules to the affected farmers. Public Consultation have been conducted during reconnaissance survey. However there is no provision for providing alternate land in lieu of affected land as per NH Act 1956 and subsequent provision "Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013",	
7	**Sri Pabitra Sunani, Raighar** Sri Sunani informed that he is going to lose his house & land for the project. He expressed that his fore father settled at Raighar when there was no town but the land Patta is still in his name. He is not willing to be displaced for the project & requested to implement the proposed Six lane project as per 2017 survey on existing road.	Please refer point No.1.	
8	**Sri Kedhuram Harijan, Hatibeda**	Please refer para No. 1.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	Sri Harijan expressed that they queried about the change of 2017 Road alignment in Bharatmala Project to the people engaged for survey but could not get any satisfactory reply. Then they approached to different leaders & authority for clarification on the project through KrushakSangh as they were unaware. He expressed that they know the use of land but not the money as crores of money will be exhausted in days. He requested for implementation of road project based on 2017 survey.		
9	**Sri Lachhamidhar Bhatra, Murtama** Sri Bhatra told that they are here for placing their demands before District administration. He opined that Government & country will be benefitted due to Bharatmala Road but farmers loosing their land would not be benefitted. He informed that they are cultivating the land since their ancestors and completely dependent for their livelihood. He expressed that the patta land holders will get compensation and questioned on the survival of the encroached land loosers. He demanded the provision of equal land in exchange of land to be acquired for all land loosers or else implementation of road project based on 2017 survey as suggested by Krushak Sangha and to cancel the proposed 2020 project. Further he described their land as mother and any attempt to grab their mother land cannot be tolerated. He expressed that their demands raised in the hearing should be fulfilled or else they are prepared to die for their land. He appealed to the public to wait till getting reply from the Government prior to take further	Please refer para No. 1. There is no provision for providing alternate land in lieu of affected land as per NH Act 1956 and subsequent provision "Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013",	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	decisions.		
10	**Sri GautamGand, Tarangapur, Raighar** Sri Gond expressed that they are small farmers and they do not have any other alternatives for their livelihood. They completely depend on agriculture and they are enjoying the small patches of land belonging since the time of their ancestors. Environment, food, clothes and forest are their prime concern. He apprehended that the Bharatmala road project may make them helpless. He added that farmers do not know any other business except cultivation. Though he welcomed the project, he suggested implementing the proposed project on existing road for safeguard of farmers.	Please refer para No. 1.	
11	**Sri Padmaram Nayak, Bagbeda** Sri Nayak informed that they are depending on agriculture for their livelihood and not willing to leave the land made by their ancestors. He requested to the Government for execution of the bypass road project on existing road.	Please refer para No. 1.	
12	**Sri Saroj Behera, Nabarangpur** **Sri Behera told that Nabarangpur district is having identity crisis and he welcomed the project**. He questioned the Government on protection of life and property of the tribals as per Law. He expressed his concern over the livelihood of the encroached land losers due to Bharatmala project. He expressed that whole world progress based on industrial growth whereas India's progress is based on agricultural growth. If there will be no development of farmers then India	There is no provision for providing alternate land in lieu of affected land as per NH Act 1956 and subsequent provision "Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013",	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	cannot be developed. He emphasized on settlement of encroached land. Further, he questioned on the real valuation of tribal lands away from the towns and demanded for four to six times of compensation of their land. He suggested for consideration of encroached Government land for compensation and demanded land in exchange of land. He informed that there is provision of giving land to landless people by the Government and described the land losers of the Bharatmala project as affected people. He strongly recommended for proper compensation, rehabilitation, land in exchange of land and Government job for one family member of each land loosers. Further, he cautioned that if Government will not fulfill the demand then farmers will reply		
13	**Sri JayasenKhara, Kacharapada Colony** Sri Khara expressed his concern over the lively hood of the tribal farmers & their families who are going to lose their land due to project. He stressed upon the protection of the land of the farmers and their livelihood. He suggested implementing the road project based on 2017 survey to protect the land and livelihood of the farmers. Further, he stated that farmers are approaching him for the protection of their land and families and he requested for their safeguard. He also warned that if Government will not listen to them then tribals will revolt with the traditional weapons and will die for their lands	Please refer point No. 1.	
14	**Sri Dibakar Pujari, Presiden to Rastrakishan**	The proposed project has been fixed by the Government of India and the proposed project	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	Majdhur Mahasangha, Nabarnagpur Sri Pujari introduced himself as Ex-Army man and President of Rastra Kishan Majdhur Mahasangha. He expressed his gratitude to the District Administration for conducting such interaction meet with the farmers for taking a decision on the road project. He described the Nabarangpur district as a backward and tribal area and questioned on the development of the tribals even after a long period. He expressed his disappointment on local tribal political leaders for not doing any improvements for local tribals though the seats of constituencies are reserved for them. He appealed to the public to think about the development of the farmers. He also informed that the tribal farmers are not willing to give their land. He told that they are not opposing for the roads and everybody wants the road like Cuttack-Bhubaneswar and lighting facilities like Bombay-Madras and it also reduce the accidents and improve in transportation. He cited the examples of KoraputJeypore, Malkangiri and Boriguma for road expansion and questioned the failure of Authority in Nabarangpur for such expansion. He compared the expenses for expansion of existing road versus the proposed bypass road and advised to go for expansion of existing road instead of by pass for sake of economic gain. He appealed to the public not to object the project for the sake of development and requested the district administration to ensure the safety and livelihood of the farmers to be affected due to the project. He emphasized on proper rehabilitation of the affected families. He informed that Government has made provision of Farmer ID Card for each	has many benefits such as (i) The proposed project would act as the prime artery for the economic flow to this region. (ii) Enhanced connectivity between rural & urban population which will benefit the all sections of the society like general population, small-medium-large scale industries, farmers, businessmen etc	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	farmer but most of them are not aware. He assured that if the interest of the farmers will be ensured then they will cooperate in the proposed project. He also emphasized on proper compensation and rehabilitation of encroached land losers.		
15	**Sri Ramesh Gond, Sargipada, Raighar.** Sri Gond expressed that they cannot give their ancestaral land in order to sustain of their livelihood and suggested to implement the road project based on 2017 survey.	The issues for the implementation of 2017 survey project have been provided in point No. 1.	
16	**Sri SatmanPujari, Ramanaguda, Dabugaon** Sri Pujari expressed that during demarcation of proposed project they ignored them & now conducting public hearing by inviting them. He informed that in Nabarangpur there are 04 categories of Pujaries & 03 of them belong to Batra Pujari & one belongs to Gond. He described about their traditions and apprehended that this project will convert them to drunkards. He suggested executing the project on existing road. He expressed his dissatisfaction on the non-availability of schools and hospitals in their locality and questioned on requirements of the roads. He informed that he is going to loose 12 acres of land for the project	This new NH will bring better level of service in terms of improved riding quality and smooth traffic flow and Faster transportation will ultimately lead to massive savings in the form of reduced wear and tear of vehicles, reduced vehicle operating costs (VOCs) and total reduction in transportation costs etc.	
17	**Sri Jayadev Pujari, Kacharapada, Kandripakara** Sri Pujari stated that all of them are going to loose their land in the project and expressed his grief by saying that either they will commit suicide or Government may shoot them. Further, he	The issues for the implementation of 2017 survey project have been provided in point No. 1.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	expressed that project work has been done earlier and now conducting public hearing. He told that they will support the road project if it will be executed based on 2017 survey. He warned that if new survey project will be implemented it may lead to bloodshed as done in 2000.		
18	**Sri Sukudev Gond, Jadapada, Raighar** Sri Gond expressed that they have communicated their problems to different authorities related to the road project, but unfortunately no body responded. He informed that after demarcation for the road project they are in panic conditions. He stated that land is their livelihood and money is insignificant. He expressed that their land has been developed by their forefathers, but, nobody asked them before putting pillars for the demarcation. Further, he told that they have no objection if the road project will be implemented based on 2017 survey. He apprehended that they have to migrate to other villages if their land will be taken away. He blamed the local politicians for not caring in this situation. He requested to shift this six lane project to existing main road	The issues for the implementation of 2017 survey project have been provided in point No. 1.	
19	**Sri Dillip Gond, Biripur, Bobeya, Raighar** Sri Gond supported the 2017 survey road project and appealed to cancel the 2020 survey project		
20	**Sri Santosh Kumar Gond, Biripur, Bobeya, Raighar** Sri Gond stated that they have small patches of land for agriculture and questioned that how they will survive if that land will be taken for the project. He also suggested for implementation of	The issues for the implementation of 2017 survey project have been provided in point No. 1.	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	2017 survey road project and to cancel the 2020 survey project.		
21	**Sri Dhansingh Gond, Jadapara, Raighar** Sri Gond addressed to the gathering in his local language. He expressed his dissatisfaction over the non-caring attitude of the Government. He also questioned on survivability of their families under such conditions. He opined that they will prefer to die rather to give their land for the project. He expressed that during election politicians are taking votes but later they are not responding to their problems. He supported the old existing road project and demanded to stop the proposed new road project		
22	**Sri Andru Gond, Kacharapara** Sri Gond stated that 2020 survey road project should be cancelled as their family likely to be suffered. Government may finish them or implement the old 2017 survey road project.		
23	**Sri Sanraj Gond, Gandhinagar, Nuapada** Sri Gond briefed about their Gond's traditions in Raigarh soil. He expressed his dissatisfaction over the politics and other nuisance, road construction etc in Raigarh soil leading to harassment of local poor people		
24	**Sri Somnath Gond, Kacharapara** Sri Gond described about different crops cultivation made by them**.**	---	
25	**Sri Prabhudas Gond, Tisaguda** Sri Gond expressed that Government is ignoring	The proposed alignment is the part of the Bharatmala pariyojana in the state of Odisha by	

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	the interest of Tribals. He described that farmers produce their own foods through hard work. He urged that their small patches of land should be protected. The lands are their livelihood. Government should not grab it for the benefits of the rich people. Taking away small patches of land from them may compel them for suicide. This small patch of land can provide food to them even after crisis. He suggested for renovation of the existing old road for their survival.	the Government of India and the alignment has been fixed with proper field survey.	
26	**Sri Krushna Harijan, Patrapara, Baboeya** Sri Harijan informed that land belongs to 15 families of their village going to lose for the project and they do not have any alternate shelters. He also complained that they have not obtained patta in spite of depositing tax for last two years. He stated that their funeral ground and other lands are likely to be lost in this project and they may die due to lack of any other alternatives.	The compensation to project affected persons will be paid as per the Fair Compensation and Transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013, National Highway Act (NH Act), 1956 and relevant acts and guidelines of Government of India.	
27	**Sri Singiram Naitam, Hatibeda** Sri Naitam expressed that thousands of villagers are loosing their land. They are neither literate nor they have jobs. He requested the district administration for implementation of 2017 survey road project for their benefits	The issues for the implementation of 2017 survey project have been provided in point No. 1.	
28	**Sri Meghnath Gond, Baranpara** Sri Gond expressed his sadness for loosing his land for the project. He requested the district administration for implementation of 2017 survey road project for their benefits.		
29	**Sri Balachand Gond, Khurabeda :**		

S. No.	Issues Raised during public Hearing	Reply to Issues by PP	Budget Allocation
	Sri Gond expressed that they are going to completely lose their house in this project and they are big families. He suggested for implementation of 2017 survey road project for their benefits and requested to cancel the 2020 survey road project.		
30	**Sri Dehedi Gond, Daspur, Jadigaon** Sri Gond informed that the proposed road project will pass near to their house, but he supported the 2017 survey road project.		
31	**Sri Ghanashyam Gond, Junanipara** Sri Gond expressed that he is going to lose his land in this project and Government is not paying any attention. He expressed his dissatisfaction on Government for ignoring tribals.	The proposed alignment is the part of the Bharatmala pariyojana in the state of Odisha by the Government of India and the alignment has been fixed with proper field survey.	
32	**Sri Jogeswar Rout, Bharanpara** Sri Rout informed that he is a land looser in the project.		

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WIL DLIF E) &

CHIEF WILDLIFE WARDEN, ODISHA

Department of Forest and Environment, Government of Odisha

PRAKRUTI BHAWAN, PLOT NO.1459, SAHEED NAGAR, BHUBANESWAR- 751007

Phone: 0674-2602250, Website: www.wildlife.odisha.gov.in, Email: odishawildlife@gmail.com

No. 2289 /7WL-FD&WLC-15/2021

Dated, Bhubaneswar the 1st March, 2021

To

The Project Director,

National Highways Authority of India,

Project Implementation Unit,

Berhampur

Sub: Development of Economic Corridors, Inter-Corridors, feeder routes and Coastal Road primarily to improve the efficiency of freight movement in India (Lot-3 Odisha & Jharkhand/Package-2) Raipur-Vishakhapatnam (Ch.124.661 - Ch. 365.033 km) (Length 240.371 km) in the State of Odisha by M/s NHAI under Bharatmala Pariyojana - Approval of Site Specific Wildlife Conservation Plan

Sir,

It is to intimate that you have to implement a Site Specific Wildlife Conservation Plan for the above project under Bharatmala Pariyojana in the State of Odisha in compliance to ToR No.4A(ii) prescribed by Government of India, MoEF&CC vide their letter No.F.No.10-4/2020-IA.III dt 02.03.2020 for preparation of EIA/EMP report.

2. The Site Specific Wildlife Conservation Plan in respect of the above project has been approved by the undersigned with financial forecast of ₹1469.65 lakh

P.T.O.

(Rupees fourteen crore sixty-nine lakh sixty-five thousand) only for the following activities.

(a) For activities to be implemented by the user agency in project area ₹54.00 lakh

(b) For activities to be implemented in project impact area by -

(i) DFO, Nabarangpur Division ₹818.17 lakh

(ii) DFO, Jeypore Division ₹156.54 lakh

(iii) DFO, Koraput Division ₹440.94 lakh

Sub-Total - ₹1415.65 lakh

Grand Total - ₹1469.65 lakh

3. Various activities in the project area will be executed by the project proponent under the guidance of DFO, Nabarangpur/ Jeypore/ Koraput, as the case may be. A sum of **₹1415.65 lakh may kindly be deposited in State CAMPA fund only through <https://parivesh.nic.in> for implementation of various activities within the project impact area by the Forest Department through concerned DFOs.**

4. The following conditions may be noted for future compliance.

- This plan may be revisited after 5 years and the User agency will give undertaking to contribute towards the revised cost of the conservation plan till the project period, if any.
- If there would be need for Site Specific Wildlife Conservation Plan after expiry of the present plan period, the User agency will have to submit another such plan at least one year before the expiry of the existing Conservation Plan and deposit the outlay amount upon its approval. In case of delay, it will be dealt as per law for violations of Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986.
- The User agency has to give an undertaking to bear the differential cost in case of enhancement of wage rate during implementation of this plan.

P.T.O.

- The approval accorded to this Site Specific Wildlife Conservation Plan is subject to issue of NOC from Project Elephant of MoEF&CC.

Yours faithfully

Encl: 2 copies of approved Plan

PCCF (WL) & CWLW, Odisha

Memo No. 2290 /dt 1/03/2021

Copy forwarded for information and necessary action to the -

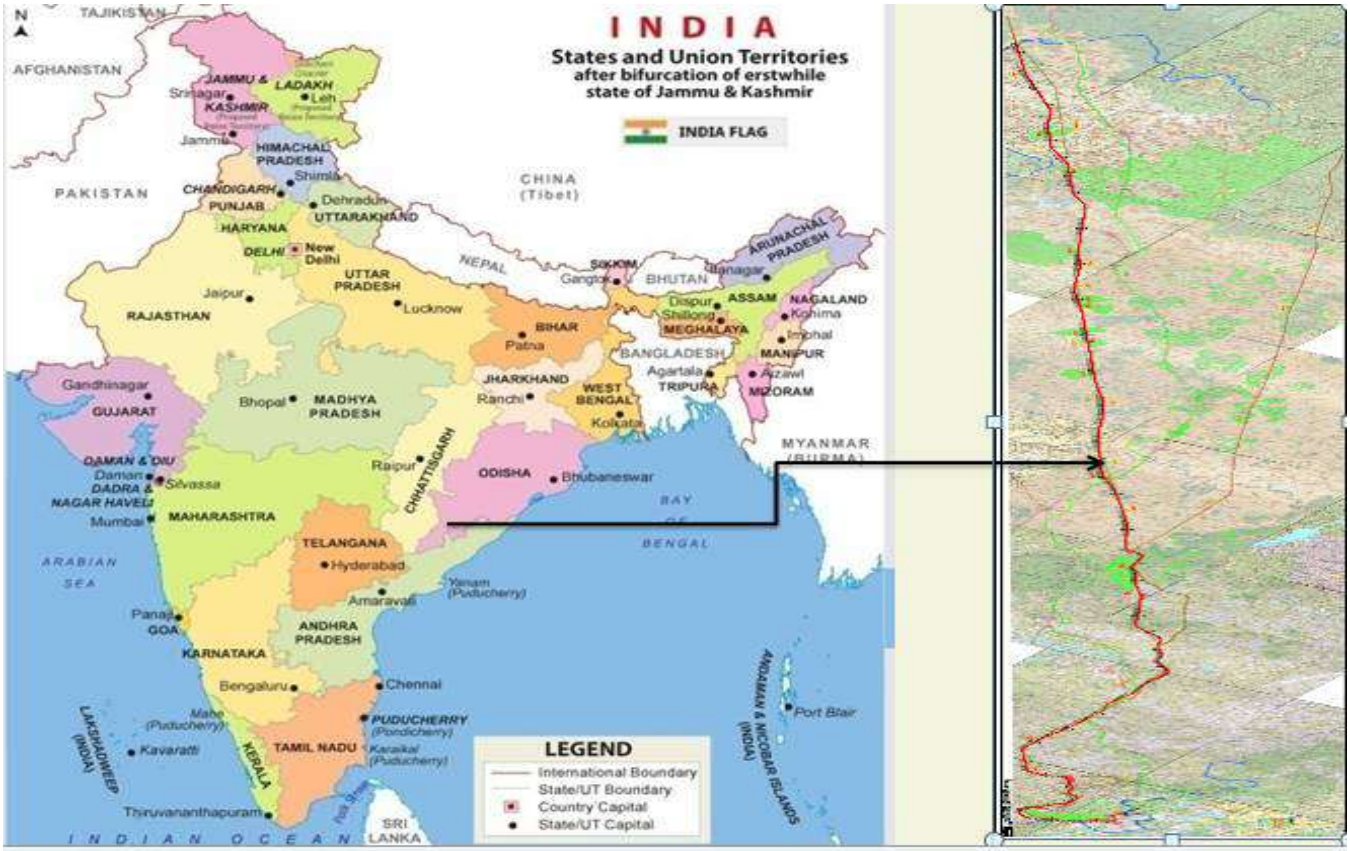
1. Special Secretary to Government of Odisha, F&E Department, Bhubaneswar
2. Principal CCF (FD & NO, FC Act), O/o PCCF & HoFF, Odisha, Bhubaneswar
3. Regional Chief Conservator of Forests, Koraput Circle with reference to his memo No.638 dt 25.02.2021
4. Divisional Forest Officer(s), Nabarangpur/ Jeypore/ Koraput Division alongwith copy of approved Site Specific Wildlife Conservation Plan

PCCF (WL) & CWLW, Odisha

SITE SPECIFIC WILDLIFE CONSERVATION PLAN

For

Development of Economic Corridors, Inter-corridors and feeder routes and Coastal road primarily to improve the efficiency of freight movement in India (Lot-3/Odisha & Jharkhand/Package-2) Raipur-Visakhapatnam (Ch 124.661 – Ch 365.033 km) in the state of Odisha under Bharatmala Pariyojana



Submitted By:

NATIONAL HIGHWAYS AUTHORITY OF INDIA

(Ministry of Road Transport &Highways, Government of India)

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

An ISO 9001-2015, OHSAS 18001:2007 & ISO 14001-2015 Certified Company,
Accredited by NABET, QCI for EIA Studies as 'A' Category Consultant Organization.
NABL MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.
Environmental Studies (EIA & EMP),Monitoring, Forest Diversion Planning,
DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey,
Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.
Regd. Office: 1st Floor, N-5/305, IRC village, Nayapalli, Bhubaneswar-751015, Odisha, India, Mobile: 9861032826
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CONTENTS

PREFACE

From: ***CEMC Pvt.Ltd.Bhubaneswar***

The Ministry of Road Transport and Highways (MoRTH), a Ministry of the Government of India, is the apex body for formulation and administration of the rules, regulations and laws relating to road transport and transport research, in order to increase the mobility and efficiency of the road transport system in India. The Ministry of Road Transport and Highways (MoRTH) in its nodal agency National Highways Authority of India (NHAI) havedecided to develop Economic Corridors, Inter Corridors, Feeder Routes and Coastal road primarily to improve the efficiency of freight movement in India under Bharatmala Pariyojana. The Proposed National Highway is planned to connect from Chhattisgarh to Andhra Pradesh connecting Chhattisgarh, Odisha and Andhra Pradesh.

In the state of Odisha, the project road starts from Dhanara village in Nabarangpur District to Tumbigura in Koraput district covering a total length of 240.372 Km. This project involves a total area of 1254.616 ha including 350.296 ha of Forest Land which comes under the jurisdiction of Nabarangpur, Jeypore and Koraput forest divisions. As per the preliminary study and forest records there has been report of schedule-I species such as Leopards, Sloth bear, Peafowl, Pangolin and Pythons etc. According to the condition 4 A (ii) mentioned in the TOR issued by MoEF & CC vide Letter no 10-4/2020-IA.III dated 2 nd March 2020 this conservation plan has been prepared. We feel obliged to the D.F.O., Nabarangpur, Koraput and Jeypore Forest Division for guiding us in preparation of this Plan. We also feel obliged to Range Officers and their staffs for providing us field data for strengthening this plan. We are thankful to The NHAI authorities for providing us necessary information for preparing this Plan.

Yours faithfully

Dr. B.K Patra

Director

EXECUTIVE SUMMARY

The Ministry of Road Transport and Highways (MoRTH) / National Highways Authority of India (NHAI) has decided to develop Economic Corridors, Inter Corridors, Feeder Routes and Coastal roads primarily to improve the efficiency of freight movement in India under Bharatmala Pariyojana. The Proposed National Highway is planned to connect from Chhattisgarh to Andhra Pradesh connecting Chhattisgarh, Odisha and Andhra Pradesh.

The project road in the part of odisha starts from Dhanara village in Nabarangpur District and ends at Tumbigura village in Koraput district from Ch: 124.661 to Ch. 365.033 covering a total length of 240.372 Km. Out of this total length, around 76 km is passing through forest area (52.346 KM in Nabarangpur, 8.747 km in Jeypore and 14.084 km in Koraput forest division).

The total area involved in this project in Odisha State is 1254.616 ha including 350.296 ha of forest land which comes under the jurisdiction of Nabarangpur, Jeypore and Koraput forest divisions.The forest types of the project area and its buffer zone can be broadly classified into Tropical moist deciduous type and tropical dry deciduous forest types. The major fauna were Leopard, Sloth bear, Peafowl, Pangolin, Pythons, Giant Squirrel etc.

The major threats anticipated due to this project are of habitat loss and fragmentation, forest fire, road accident to wildlife, Encroachment etc. On view of this we proposed Underpasses for small and medium sized animals, small pipe culverts and bridges for Reptiles & Amphibians, fire protection measures, habitat improvement, awareness programme etc. The total cost of this project is **1469.65 lac** out of which **54.00 lac** is for the Project area (core zone) and the rest **1415.65 lac** is for the buffer zone.

CEMC Pvt. Ltd. is an accredited consultant for preparation of Site Specific Wildlife Conservation Plan by the Chief Wildlife Warden Odisha. The Experts visited the Project area and interacted with the stake holders (local peoples, forest frontline staffs and project authority) and made preliminary field visits to prepare this report.

CHAPTER-1

INTRODUCTION AND METHODOLOGY

1. A INTRODUCTION

The Ministry of Road Transport and Highways (MoRTH) Government of India, is the apex body for formulation and administration of the rules, regulations and laws relating to road transport and transport research, in order to increase the mobility and efficiency of the road transport system in India. Here the National Highways Authority of India (NHAI) which is the nodal agency of the MoRTH has decided to develop Economic Corridors, Inter Corridors, Feeder Routes and Coastal road primarily to improve the efficiency of freight movement in India under Bharatmala Pariyojana. The Proposed National Highway is planned to connect from Chhattisgarh to Andhra Pradesh via Odisha. The proposed highway with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. Proposed National Highway is mostly Green field alignment project and proposed to 6 lanes.

The project road in the part of Odishastarts from Dhanara village in Nabarangpur District to Tumbigura in Koraput district from Ch: 124.661 to Ch. 365.033 having a total length of 240.372 Km. The proposed National Highway will pass through Nabarangpur and Koraput districts in the state of Odisha. The Project falls under category 'A' as per the MoEF&CC Notification dated Sep. 14, 2006 and its subsequent amendments.

1. A) i) Project Area:

The project area finds place in Topo Sheet no E44E1 to E44 E16 and E44K9 to E44K15. The total length of project road from Ch: 124.661 to Ch. 365.033 portion of the road starting from Dhanara village in Nabarangpur District to Tumbigura in Koraput district is240.372 km. The total land required for the project is 1254.616 ha which comprises 350.296 ha of Forest Land and the rest 904.32 ha of non-forest land including both Government and Pvt. Land.

Geographical Location: Geographically the 240.372 km alignment line of the project lies in between Latitude: 20°01'44.59"N Longitude: 81°51'58.13"E and Latitude: 18°25'42.52"N Longitude: 83°02'29.23"E. it finds place in the toposheets E44E1 to E44 E16 and E44K9 to E44K15. As per the District administrative jurisdiction the project area passes through Nabarangpur and Koraput district in the state Odisha. Similarly as per the forest area jurisdiction the total area is coming under threeforest divisions i.e. Nabragpur, Koraput and Jeypore forest division.

1. A) iv) <u>Land Schedule of The Project Area:</u>

This project involves a total area of 1254.616 ha including 350.296 ha ofForest Land and the rest 904.32 ha of non-forest land**.**

1.A) v) Proposed Land Use Pattern:

The entire land will be used for the construction of road, road side drainage, avenue plantation, temporary base camp/labour camp etc.

1. A) vi) Status of Forest Diversion Proposal and Environmental Clearance:

Forest diversion for this project is on the process and will be submitted to the MoEF portal soon for clearance.

1. B. VILLAGES LOCATED WITHIN THE STUDY AREA, THEIR DEMOGRAPHIC AND OCCUPATIONAL PROFILE:

The present demographic details were studied with reference to 2011 census report of Govt. of India. There are all together 127 villages exist within the Project area (core zone)and buffer zone of this project out of which 69 comes under Nabaragpur district and the rest 58 in Koraput district. The total numbers of household is 73612 with an average 4.57 numbers of people per households. Majority of the peoples belongs to sc and st category and the male female ratio is 990/1000. As the villages are tribal dominated the literacy rate is low. The details demography of these villages are provided below in the annexure 1

1.B) ii) Cropping Pattern adopted by village:

People of these areas generally cultivate Kharif and Rabi. Paddy is the major crop cultivated followed by pulse, oilseeds and cash crops. Among pulses, Kulthi and Biri are the most important whereas among the oil seeds til is important. Similarly in the cash crop people were seen cultivating sugarcane as their preferable one. Here the tribal follow their old traditional methods JHUM (shifting cultivation) for their cultivation. In such shifting cultivation virgin forest land is cleared by either cutting or burning and then the land is used for cultivation of crop for some certain years then left undisturbed for the regrowth of forest.

1.B) iii) Extent of Biotic Pressure of the Villages on the Study area:

Most of the SC and ST people depend on forest for their bonafied use. So, visiting to the forest area for collection of firewood, small timber etc is their regular habit. The villages adjoining to the project area also rear cattle, goat, sheep etc. These cattle herd also visit the forest for grazing and thereby increasing the biotic pressure on forest resources. Most importantly their methods of cultivation (JHUM) put huge pressure on the forest.

1.B) iv) Number of families depending upon the NTFP Collection:

As per the census report a total 336337 number of people living at the buffer zone of this project. Out of which around 25% people belong to SC and ST categories. For this SC and ST population majority have the habit of collecting NTFP from their nearest forest.

1.B) v) Method of NTFP Collection:

Collection of NTFP from the nearby forest is one of the main sources of earning for the tribal living in the buffer zone of the project. According to the survey they generally prefer the old methods like cutting or breaking the branches of the tree for collection of forest products. They also sweep the ground and use fire for cleaning the forest floor as a result they can easily collect the mahula flower and honey from the forest. This result in reduction of proportion of NTFP species in the Forest area and wildlife are deprived of their food like nuts and fruits of various edible species and forest fire also destroy the valuable forest growth.

List of medicinal Plants commonly collected

Table No. C3-21: List of Medicinal Plants recorded in the study area

MEDICINAL PLANTS			
BOTANICAL NAME	**FAMILY**	**PARTS USED**	
Acalypha indicia	Euphorbiaceae	Leaf	Constipation
Achras sapota	Sapotaceae	Young Fruit	Dysentery
Aegle marmelos	Rutaceae	Leaf & fruit	Diarrhea and promote digestion.
Ageratum conyzoides	Asteraceae	Leaf	External wound
Alangiumsalvifolium	Alangiaceae	Leaf	Relieve pain and swelling of joints.
Anacardium occidentale	Anacardiaceae	Fruit	Antidiarrhoeal
Azadirachta indica	Meliaceae	Whole plant	Curing skin diseases
Brassica campestris	Brassicaceae	Oil	Curing cold
Coccinia indica	Cucurbtaceae	Leaf	Skin disease
Cucurma longa	Zinziberaceae	Root	Skin disease
Holarrhenaantidysenterica	Apocynaceae	Bark	Dysentery
Emblica officinalis.	Euphorbiaceae	Fruit	Acute dysentery
Impompea pes-tigridis	Convolvulaceae	Leaf	Eczema and itches
Momusopselengi	Sapotaceae	Fruit	Dysentery
Ocimum sanctum	Lamiaceae	Leaf	Cold/flu
Rauwolifia serpentine	Apocynaceae	Root	Bold pressure
Semecarpus anacardium	Anacardeaceae	Oil	External wound
Stachytarphata indica	Verbenaceae	Leaf	External wounds
Tamarindus indica	Leguminaceae	Seed	Dysentery
Shorea robusta	Dipterocarpaceae	Resin	Cold
Murrayakeenigi	Rutaceae	Leaf	Dysentery

1.B) vi) Cattle population of the area and its dependency on the forest:

The villagers adjoin to the project area in Koraput and Nabarangpur district have an average 3-5 numbers of cattle (Cow, goat, sheep and buffalo which regularly visit the forest for grazing. Cattlepopulation are high in these areaswith an average density of 187 km^{-2} and mostly they depend on thenearest forest for their fodder.

1.C) i) Topography:

The topography of the proposed National Highway is mainly plain except at few locations where it is rolling/mountainous. The elevation of the project varies from 627m amsl (start point) to 289m amsl (end point).

1.C) ii) Natural Drainage lines:

There are eleven principal rivers traversing the entire state that can be grouped under eight major river basins within the state, whereas the Indravati, Kolab, Machkund sub-basins in the south forms part of Godavari river basin. Most of the major rivers flow in easterly and southeasterly direction with gentle gradient. Generally the rivers are effluent in nature. In general the drainage pattern is of both dendritic and radial types

1.C) iii) Climate:

The project area of both the Nabarangpur and Koraput district experiences the tropical climate where the summers are much rainier than the winters. December is the coldest month when the temperature goes below 1°C and may is the hottest. The mean daily average temperature is 25° C which reaches a maximum of 40^0 C in the month of May. The rain fall in the area is mostly from the south west monsoon lasts from middle of June to October. The average annual rainfall varies from 1030.21mm to 1569.50 mm. A perusal of these data indicates that the average annual rainfall is higher in the central parts as compared to other parts of the district. Further droughts are frequent in Nabarangpur, Raighar and Umerkote blocks.

1.C) iv) Soil Type:

The Nabrangpur district has varied geomorphologic features. The geomorphic units are (i) Lateritic Upland, (ii) Pediplane, (iii) Denudational Hills, (iv) Flood Plain, (v) Structural Hills, (vi) Inselberg, (vii) Mesa & Butte, (viii) Residual Hills, (ix) Intermontane Valleys, (x) Bazada (Plate-V). The distribution of different soil types in the district depends much on its physiographic and lithologic variations. Based on the physical and chemical characteristics, mode of origin and occurrence, soils of the district may be classified into two groups namely Alfisols and Vertisols.

The entire Koraput district has a unique physiographic set up. Except the north western and west - west central part, the rest of the district is occupied by densely forest with highly rugged mountains, interspersed with intermontane valleys. The elevation of the hilly terrain ranges from 900 to 1400 mm above mean sea level with the highest peak of 1620 m amsl. The major geomorphic units of the district are classified as - Flood plain, Mesa/butte, Denudational hills, Pediment, Deeply weathered pediplain, Inselberg, Structural hills, Severely dissected plateau, Intermontane valley, Structural valley, Residual hill and Bazada

1.D) i) Details of the linear infrastructures:

Linear infrastructure such as Araku NH 26, NH 201, NH 43, State Highway (SH) 4and 39 passes close to the proposed project. Besides a railway line connecting Koraput to Visakhapatnamand Koraput to Rayagada also also passes close to the proposed project.

1.D) ii) Townships:

Nabarangpur, Koraput, Jeyporeare the three major towns falling within the buffer zone of the proposed project area. Besides many small towns such as, Semiliguda, Damanjodi, Kunduli, Pottangi, etc are present in the close vicinity of the proposed project.

1.D) iii) Water Reservoir in Vertical Mining pits and presence of Dug-wells in the villages:

A total 14 rivers/nala and two major reservoirsi.e. Kolab and Indravati are present in theProject area (core zone) and bufferzone of this project.

1.E) Description of Flora and fauna:

The authenticated list of flora and fauna for both the Project area (core zone) and the bufferzone has been attached in the annexure

1.E) iii) Details of Endemic, threatened and Scheduled Species:

So far, according to our study and from the available literature, there is no endemic plant or animal species present in this area. As far as, threatened fauna is concerned all Schedule – I species and species belongs to Vulnerable and abovecategories as per the IUCN status are threatened.

1.E) iv) Habit and Habitats of Schedule-I Fauna present in the study area:

Sloth Bear (Melursus ursinus):

Distributed throughout the Central and south India, except a few areas of the coastal districts and is a threatened species.

Habit:

Bears are nocturnal in habit, their sense of smell is well developed than their sight and hearing. During accidental encounter with human being they cause severe damage to the human or even death. When they have cubs, they move with them, otherwise they are solitary or are in pair with opposite sex. They have a specific breeding season. Mating takes place in June to July and they give birth to cubs in caves during December and January. Litter varies between 1 and 3 cubs. Parental care lies with mother only. Their average life span is around 40 years.

Habitat:

They are in good number in drier and secondary forests and are also found in dense forests. They are omnivorous in nature. They feed on tubers, roots, grubs, various fruits, various insects, honey, termites, flowers (Mahua, Simul, etc.). It also damage sugar cane crop, maize etc. Their home range is limited and restricted. In quest of food they may travel several kilometres. It is believed that their gall bladder and bile have medicinal properties and hence they are exposed to poaching, particularly due to demand of these parts in China and other South East Asian countries.

Indian Rock Python (*Python molurus molurus*):

Habit: This is a non-venomous snake and can grow up to 4m and weigh 45 kg. The colour is dark brown to yellowish white in a blotched pattern. They are very good swimmers and take to water when disturbed but on land, they hiss and remain motionless. The species in oviparous and lay up to 100 eggs in a clutch protected and incubated by the female. Being exothermic, python basks in open but can also raise body temperature by muscular contraction.

Habitat: Python occurs in wide range of habitats viz. rocky foot hills, grass lands, marshes, swamps, wood lands, open jungle. At times, they take refuge in mammal burrows, hollow trees etc. It has also been reported close to habitation and crop fields. The snake feeds on small mammals, birds and reptiles but prefers the first. Chital deer, fawns, hares, mouse deer, jungle fowl are natural food. It can swallow prey bigger than its size as the jaw bones are not hinged. The prey is constricted to death by muscular movement and swallows head first. Once held in jaw, prey cannot escape because of inward bent teeth.

Pythons are held endangered according to law. Many specimens are killed due to ignorance or out of fear when they enter habitation and capture goats or poultry. Specimens are also silently poached for their ornamental skin.

Indian wolf (*Canis indica*):

For a long time, it was believed that the Indian Wolf was a gray wolf subspecies and was recognized as the *Canis lupus pallipes*, the same as the Iranian Wolf. However, recent genetic research suggests that the Indian Wolf has not cross-bred with any other subspecies in over 400,000 years which would make it a separate species of its own, the. The *Canis lupus pallipes* would then refer to the wolves from the Arabian Peninsula, Afghanistan, and Pakistan, but not India.

Characteristics: An Indian Wolf can be one of the smallest subspecies of wolves, though their sizes vary in height from 60 to 95 cm and in weight from 18 kg to 27 kg, and have a short, dense coat that is usually of a reddish, tawny colour. The Indian Wolf (*Canis indica*) is relatively smaller in size and genetically distinct from the Iranian Wolf (*Canis lupus pallipes*).

Status: Although it is supposedly protected as an endangered species in India under schedule 1 of the Indian Wildlife Act of 1972, the Indian Wolf is still hunted because of its attacks on children and livestock. The greatest threat to the Indian Wolf's survival is persecution by poison, and habitat loss due to intensive agriculture, development, and industry. A study released in 2004 estimated between 2000 and 3000 Indian Wolves remaining in the wild.

Habit: They live in packs, and are common in bare and open forest regions.

Diet: Because of its smaller size, the Indian Wolf can sometimes survive on smaller ungulates, rabbits, hares, and rodents it finds. However, much of the wildlife that the Indian Wolf used to prey on has been hunted to extinction by humans. The Indian Wolf is, therefore, often forced to prey on livestock. This draws them closer to people, including unattended children which the wolves see as fair game.

Breeding: The Indian Wolf's breeding season is usually around October after the rains. Only the alpha male and female of the pack reproduce. Usually, a litter of 3 to 5 pups is born in December or January in an underground den. The mother and father look after the pups until they are 6 months of age.

Habitat: The Indian Wolf is adapted to scrublands, grasslands, and semi-arid pastoral environments. It is found mainly in the Indian states of Gujarat, Rajasthan, Haryana, Uttar Pradesh, Madhya Pradesh, Maharashtra, Karnataka and Andhra Pradesh. Its territories range from 100 to 150 square miles. Much of the Indian Wolf's habitat overlaps that of the Himalayan Wolf, and because of this, it is a wonder why the two do not interbreed.

Peafowl (*Pavo cristatus*):

Habit: Pea fowl is the national bird of India and is colourful for its brilliant tail feathers with 'eyes'. The so called 'tail' of the peacock, also termed the 'train' is not tail quill feathers but highly elongated upper tail feather coverts. During moulting season, the males shed their stunning tail feathers. Peacocks train is fanned during courtship display. The male has a shining general blue-green plumage with blue neck. The peahen has a mixture of dull green, brown and grey in her plumage. She lacks the tail coverts but has a crest as in males. Many of the brilliant colours of peacock are due to optical interference based on periodic nano structure found in the barbules of feathers giving to iridescent hues. The plumage display by males is a courtship display to attract females. During mating season, high pitched calls are also emitted. Pea hens nest on the ground in a shallow scrape in a dense thicket,

lined with leaves and sticks in which 3-5 eggs are laid. Nesting occurs in spring and post monsoon season. It is a polygamous species and covey of one peacock and 3-6 peahens are seen. In non breeding season, unisex groups of peahens and rarely of peacocks are seen. With slight alarm, it takes to cover.

Habitat: Pea fowl inhabits both scrub and dense deciduous forests in valleys and slopes not far from water source. It roosts on trees during night. Food consists of grain, berries vegetable shoots, insects, lizards and even snakes. In mosaic habitats of forest and cultivation, pea fowls make regular forays to cultivated land and get killed due to poisoning from insecticide spray in crop lands. The birds are persecuted in the egg stage, hatched with the help of a domestic rooster hen, chicks reared and then pushed to pet trade. Indiscriminate fire wood collection and forest fires are a scourge to their habitat lowering its quality and cover values.

Indian Pangolin (*Manis crassicaudata*):

Indian Pangolin is listed on the IUCN Red list (1996) as Lower Risk/Near Threatened.

Physical appearance: Indian Pangolin is 45-75 cm long. They have small triangular shaped head. Their tongue is 23- 25.5 cm long and its tail is 33 – 45 cm long. They do not have teeth. They have bad listening power and have bad eyesight. Each limb has powerful five claws. They are covered with the horny scales which protect their body. Males are heavier than the females. Lifespan of Indian Pangolin is more than 13 years. They are found in almost all the parts of India.

Diet: Indian Pangolin is insectivore. It feeds on insects and termites and termite eggs.

Reproduction: The gestation period lasts for 65-70 days. Females give birth to single offspring. Young ones weigh between 200 -500 gm. New born is carried on mother's tail for several weeks. They are weaned at three months of age.

Habitat: Indian Pangolin prefers tropical rain forests, lower slopes of mountains, sub tropical thorn forests and plains to live.

F) i) Description of the forest and habitat condition:

Based on the classification of Champion & Seth the forest present in the ZOI of the project in the Koraput and Nabarangpur district can be broadly classified into following major group's namely Tropical moist deciduous forests and tropical dry deciduous forest. These forests can be further classified into subgroups of North Indian Tropical Moist Deciduous Forests and (3C), Moist peninsular sal forests (2C), South Indian Tropical Moist Deciduous Forests (2B). Southern moist mixed deciduous forests and dry bamboo brakes (2S1), Dry Teak Forests (C1) Southern Dry mixed deciduous forests (C3) etc. besides in some pockets, Boswellia serrata forestsand Northern semi-evergreen and Moist bamboo brakes can also be seen. The forests of this area have been extensively damaged by the practice of shifting cultivation. This continues to take its toll even now. This practice has reduced once rich forest of this district to open forests and scrub jungles over large areas. Forest fires are also very common because of shifting cultivation. Lot of damage has been done by domestic animal near human habitation.

G. Forest condition according to FSI Report:

According to the FSI report 2019 the state Odisha has a total forest cover of 37.46% of the total geographical area of the state (15571sq km). In terms of forest canopy density classes, the State has 16969.71 sq km under Very Dense Forest (VDF), 21551.93 sq km under Moderately Dense Forest (MDF) and 23096.87 sq km under Open Forest (OF). Forest Cover in the State has increased by 273.51 sq km as compared to the previous assessment reported in ISFR 2017. Coming to the project area and its ZOI the district Koraput has 8,807 sq km of the total geographical area out of which 94.48 is covered by very dense forest, 740.41 sq km is covered by moderately dense forest and 1,263.38 sq km is covered by open forest. Similarly in the case of Nabarangapur the total geographical area of the district is 5,291 sq km in which 172.63 sq km is covered by very dense forest 447.04 sq km is covered by moderately dense forest and 527.08 sq km by open forest. The forest cover percent of Koraput district is 23.83 and for Nabarangpur district it 29.48

1.F) ii) Wildlife Scenario of the Study area:

The Wildlife Scenario of the Study area has been mentioned in the point number 1E above.

1.G) i) Movement of Mega Wildlife, Man animal conflict, depredation

No elephant or tiger movement recorded either in the project area or its buffer zone in any of the forest divisions (Nabarangpur, Jeypore and Koraput forest division) through which the proposed project alignment is passing through. But in the case of human wildlife conflict, bear conflicts were frequently reported across the range (Palita and Debata 2014).Bear involved in several incidents of human injuries and death case and were also reported in the crop raiding incidents. The frequently raided crops were Bengal gram, Maize, Sugarcane, Groundnuts and tubers of Dioscorea sps. In case of animal deaths and road kill, though frequent road kills occurs in this road but no such official records were available.

1.I) Working Plan Prescriptions:

The proposed project area and its buffer zone of the project come under different working circle as per the approved working plan of Koraput and Nabarangpur forest division. The working circle and their special management objectives are as follows.

Selection cum Improvement Working Circle

To improve the density and composition of forest crop and to encourage natural regeneration through variety of Silvicultural Operations including soil and moisture conservation measures.

To remove only dead and uprooted trees besides felling of those mature trees whose removal would benefit better growth and more of adequate natural regeneration in consistence with the general objectives of management.

To remove congestion in the coppice crop by way of thinning operations so that conducive situation is created for better growth of existing crop and the upcoming natural regeneration.

Rehabilitation Working Circle

As the principal aim of management is to regenerate the degraded forest, the special objectives are as follows.

To enhance soil productivity through moisture and soil conservation measures.

To boost up the existing natural growth by appropriate cultural operation.

To re-stock barren areas (of course, invariably small in extent) through artificial regeneration of most desirable species.

To meet the bonafied requirements of local inhabitants from re-stocked areas and ensuring active participation of such communities in the entire process of management through the concept of JFM (Joint Forest Management).

Plantation Working Circle

To re-stock the barren and permanent blanks besides encroached areas by raising plantation of suitable species through artificial regeneration.

To nurse the existing old plantations by appropriate tending operations.

To harvest mature plantations to meet the requirement of both the industry and the local people followed with necessary replanting as per the silvicultural requirement. To augment fodder, fuel-wood and small timber requirement of the local people.

To concentrate more on such species of the plantations which have proved successful

Protection Working Circle

Since the areas included in this Working Circle are in need of complete protection measures coupled with improvement of the vegetative cover, the special objects are as follows:-

To keep delicate and eco-fragile areas ecologically intact by maintaining adequate vegetative cover.

To arrest future degradation and enhance the natural regeneration adopting appropriate silvicultural interventions including soil and moisture conservation measures to even check siltation downstream.

To protect these forests from fire and grazing and also to provide strict vigil against illicit felling, encroachment and shifting cultivation.

Prescriptions of each working circle

Selection cum Improvement Working Circle

The entire stock has been enumerated and mapped.

Thinning shall be carried out to ensure optimum increment and improvement of the growing stock.

Regeneration will be obtained through mainly by natural means, though areas deficient in natural regeneration will be attended to by artificial means as well.

The Silvicultural rotation period of 120 years is fixed for all the species.

In the selection felling series removal of non-Sal is limited to one out of eight marked trees and for Sal species it is one out of twenty marked exploitable trees.

The marking is mainly intended for improvement of the crop. Dead, diseased and hollow trees shall be removed. But, according to this wildlife management plan these trees should be retained for wildlife purpose.

Rehabilitation Working Circle

High stumps shall be rectified to encourage young coppice shoots.

Singling out of the multiple coppices shall be taken up to retain only the most promising ones.

In case of congestion in the crop, cleaning operation shall be undertaken to encourage regeneration and growth of locally desirable species.

The forest shall be strictly protected against uncontrolled grazing, forest fire and unauthorized removals. During removal of the dead, dry and fallen trees at least 50% of such removable trees should be left for the benefit of wildlife habitat utilization (according to this plan).

Whenever gaps are available, planting of locally desirable species should be encouraged.

Plantation Working Circle

Weeding and regular pruning shall be done till 8th year of plantation

Removal of dead trees and cutting of climbers should be in accordance with the practice of wildlife management, that is some fodder climber and a few dead trees should be left for the herbivores, insects and birds.

For felling of trees shall be enumerated and demarcated by the concerned Range Officer and only Acacia and Eucalyptus shall be clear felled. The stumps left should be less than 15 cm high.

Protection Working Circle

Dressing of high stumps, singling out of coppice shoots, cleaning and climber cutting shall be undertaken in annual protection areas.

The more promising coppice shoot shall be retained and rest cut back.

Light thinning shall be undertaken to remove congestion and to promote growth in forest.

For soil and moisture conservation check dams to be erected across gullies, along the stream a series of check –damps shall be created, to be decided by the gradient factor. Staggered and contour bunds shall be prepared along contour in order to arrest water speed, and harvest water. Vegetation barriers on contour based shall be created.

1.J) i) Details of the other Forest Diversion in the surrounding area:

In the buffer zone there are several Bauxite mines, power transmission line and severalirrigation projects (water reservoir) are present in the surrounding area of the proposed project.

1.J) ii) Details of the mitigative measures suggested in other conservation Plans of the Surrounding mines:

In general habitat improvement, fire protection, soil conservation measures, elephant management, corpus fund provision has been furnished in the conservation plans prepared for the adjoining developmental project.This plan provides mitigative measures which are not in sharp variance with such measures provided in conservation plan of other mines in the locality.

1.K) Experts involved in the Study and the date of visit of the area:

Centre for Envotech and Management and Consultant (Pvt.) Ltd is a recognised Consultancy farm for preparation of Site Specific Wildlife Conservation Plan by Principal Chief Conservator of Forests (Wildlife) Cum Chief Wildlife Warden, Odisha vide his Office letter No.6257/1WL>Misc.12/2018 Dt.09.07.2018.

The experts involved in preparing this Plan are as follows: -

Sl. No.	Name	Expertise
1.	Mr. L. K. Das, IFS (Retd.)	Forest, Biodiversity & Wildlife
2.	Dr. Bidyut Kumar Patra	Environment
3.	Mr. Siba Kumar Mohanty, OFS (Retd.)	Forest & Wildlife
4.	Smt. Gayatri Devi	Zoologist
5.	Dr. Rabi Kumar Mishra	Botanist & Wildlife & Bio-diversity
6.	Mrs. Tamishree Behera	Environment Engineering
7.	Miss Swetagni Mohanty	Wildlife & Bio-diversity

Methodology

- Topo maps (Sheet no E44E1 to E44 E16 and E44K9 to E44K15) from the survey of India were collected for the study of the general features of the project and its bufferzone.
- The Village list and demographic composition has been collected from 2011 Census Report.
- Secondary data (published literature & working plan) were collected from different source including the state forest department and based on the field survey and local interviews all the flora and fauna checklists were prepared.
- Data were collected from Working Plan of Koraput and Nabarangpur Forest Division.
- A questionnaire has been prepared with our own developed model for the survey of the surrounding Villages for Socio Economic Study.
- Mega herbivore movement and other conflict data were collected from the published literature and the state forest department.

CHAPTER-2

THE PERCEIVED IMPACTS OF THE PROJECT ON THE ENVIRONMENT

2.A) i) Impact on the environment in General:

Developmental projects have both positive and negative impact on the society and the environment. However to achieve the goal of sustainable development it is necessary to minimize/ mitigate the negative impact with modern technology and scientific study. This project is not left untouched in these aspects. When certain impacts are identified it needs to mitigate with modern technology and scientific study. Such negative impacts are discussed here to help in implementing mitigative measures.

This project hascertain impacts on the wildlife and their habitat as it passes through the forest area of Nabarangpur, Jeypore and Koraput forest division. Ithas also impacts on the soil, water, air, noise, and the overall environment. These are discussed below in details

2.A) ii) Impact on soil:

Road construction mainly occurs on the soil. So quality, texture, water holding capacity of the soil of the project area will be affected during the construction phase. In addition direct loss of vegetation from certain area might enhance soil erosion and can leads to landslides at the hill region.

2.A) iii) Impact on Vegetation:

Generally road projects have several impacts on the vegetation. Direct loss of a large numbers of trees for the construction of the road will affect severely to the existing habitat and ecosystem. Apart from the loss of forest,the substantial running of vehicle and roadside establishment of vending zones will eventually put a huge pressure on the existing vegetation directly or indirectly.

Habitat loss: This is a long-term impact of road project. This alters or removes conditions needed for plants or animals to survive. Natural habitat is rendered functionally unable to support the species. Plants and animals, which previously used the site are either displaced or destroyed. Habitat loss is not confined to the area of deforestation only. The adjacent areas also exposed to the ripple effects of deforestation, result in reduced carrying capacity and hence, the viability of the ecosystem. The habitat requirements of many animal species do not permit them to adjust to changes created by such landscape modification. The degree to which an animal tolerates human induced disturbance and human competition for space varies. Some species tolerate very little disturbance (low disturbance threshold). Where a particular critical habitat is restricted, e.g. rocky out crops, den, riverine

habitat, nursery ground of particular character, and the species may be eliminated. Revamping lost vegetation takes several decades to be attractive for animals again. The habitat loss is not only limited within the loss of area alone, but also attributed to the fragmentation of the habitat.

2.A) iv) Impact on Water Regime:

During construction available water sources may be polluted due to dust and soil erosion. But the design stage has taken care of the drainage across the section as part of good engineering practice which will control the soil erosion and will reduce the impact on the water bodies.

2.A) v) Impact on Air:

During the construction phaseand the operational phase of the road, there will be increase in emission of exhaust fumes from the vehicles will aill affect the air quality in general.

Dust pollution: Dust pollution generally reduced photosynthesis leading to reduced growth rates, reduced seeding, less viable seeds and hence, lowered or absence of regeneration. Dust when settled on the grasses, shrubs and even on trees of small height will make them unfit to be used as fodder for the herbivores. During construction phase the project proponent will use sprinkler to get control over the dust emission and in the operational phase, plantation along the both side of the road will definightly reduce the dust pollution.

2.A) vi) Noise effect:

The Road project has long term noise effect on the environment as significant noise pollution will be generated both during the construction and its post operational phase. During the construction phase noise will be generated by the movement of heavy vehicular movement, transportation, loading and unloading of earth moving machineries. And after the construction due to movement of a large numbers of vehicles significant amount of noise will be produced which will have significant impact on the wildlife. These are as follows

- Hearing impairment.
- Signal masking i.e. inability to hear important environmental clues and alarm, distress and mating calls of conspecific for survival.
- Increased heart rate, respiration and stress reaction.
- Loss of fecundity or inability to litter or increase in abortion.
- Decline in bird population due to muffling of mating calls.

2.A) vii) light effect:

All animals are adapted to rhythm of solar light and darkness and accordingly remain passive or active depending on their nature (diurnalor nocturnal). Artificial lights due to this project may contribute to disturbance of wildlife near

roads. It may disorient birds, disturb breeding and foraging behaviour in birds, repel spiders and beetles, and influence the behaviour of nocturnal frogs. It is also thought that a flash of artificial light causes an animal to become temporarily blind, popularly called the 'deer-in-the headlights' effect, reducing its chances of avoiding collisions with vehicles. Headlight glare can interfere with the flights of birds and bats. It can disrupt homing behaviour and mating calls (croaking) of amphibians in wetland habitats, and influence navigational ability and decline in population of reptiles. For migrating and dispersing animals, highway lights can be disorienting. Besides movement of vehicles after the completion of the project will add up illumination in the area. The above activities will increase the stress condition. Animals exposed to light may exhibit erratic behaviour pattern, expressed in their deflected movement and aggressive behaviour.

2.B) Quantum of Pollutants may be produced by the Project:

It is expected that, the pollutants like total suspended particulate matter, respirable particulate matter, NO, SO_2, CO as well as CO_2 will be generated during work procedure and their level will be increased gradually. It has been estimated that the pollutants will be within the approved standard as furnished below.

Pollutants	**Approved standard**
Total suspended particulate matter	200 micro gm/m^3
Respirable particulate matter	100 micro gm/m^3
NO	80 micro gm/m^3
SO_2	80 micro gm/m^3
CO	4 mg/ m^3

2.C) Degradation Anticipated and Qualitative Changes in the Wildlife Habitat:

A total 10000approx. number of trees will be felled, and that will affect to the existing wildlife habitat. The loss of such trees and construction of the road will fragment the existing habitat of the wildlife.The proposed road may also act as a barrier for their movement and safe passage within their home ranges. In addition the effect of this project further leads to degradation of habitat, road accident of wildlife and isolation to the small creature within a small portion of their home range.

2.C) i) Habitat fragmentation:

Clearance of native vegetation during construction and formation of such sixlane road will definitely fragment the existing habitat. Itfurther involves increase in edge effect and reduction in biodiversity

2.C) ii) Loss of biodiversity:

Loss of biodiversity due to this project is anticipated as the implementation of this project needs to cut a large numbers of trees. Besides in the impact area of the project Sal and its associated tree species are found. Somewhere they are sparsely distributed and somewhere dense. Majority of other species are represented by lesser number of individuals, and covering middle storey, field and ground level. Animals are adapted to different layers of vegetation, different tropic levels and micro habitats and develop a large number of niches. However, there is overall loss of biodiversity due to different developmental activities including the present project of NHAI, which ultimately impacting the natural relationship between different group of plants and animals.

2.C) iii) Habitat destruction by illicit felling:

Illicit felling of timber products leads to canopy opening and specielike squirrels, monkeys and variety of birds are affected by this activity. Mega herbivores such as Elephants are also affected as the habitat is rendered sub-optimal due to loss of cover and reduction in variety and quality food. In such gaps, climbers and weeds are getting foothold. Vegetation is also degraded by activity of encroachers. These changes reduce living space, reduce range essentials and restrict critical habitat for survival. Where a critical habitat such as physiographic depression, aquatic vegetation, climber thickets, wallows, grass land, nursery ground, continuity in canopy, hollow trees, down logs etc., is restricted or obliterated, it could eliminate the species of that particular habitat.

However,no such threat is anticipated due to this project.

2.C) iv) Habitat destruction by Grazing and transmission of disease:

No such threat is anticipated due to this project.

2.C) v) Forest fire:

A large number of workers (1000 approx) will be engaged during the construction phase. Such large no of labour force may pose serious threat of forest fire. Such fires can cause irreversible damage to plants and animals that may choose to colonize the area. If not controlled, fire can spread to adjoining buffer area, fanned by wind. Fires usually char to death small animals and young ones who cannot escape as fast as its spread. Fire not only destroys plants and displaces animals; it also impacts the soil properties and increases run-off and soil erosion and moisture content. Post fire scenario usually shows temporary increase in forage of fire hardy coarse material. Repeated fires of high intensity, however, change the species

composition of ground flora, lower the browse and forage volume, destroy tender plants. These affect grazing food chain.

The project proponent has planned for regular awareness programme among the labourer regarding the importance of the wildlife and will direct them to work carefully in the forest area. Besides, several awareness posters will be posted along the road to aware people on the threat of forest fire which ailldefinightly reduce this threat.

2.D) Nature of Threats to the Flora and Fauna:

Threats to flora: The project has threats to the flora, This will reduce the forest cover to some extent, which will be compensated on completion of Comp. Affn. During the construction and post operational phase the dust and fumes that to be generated from the vehicular traffic will have impact on the flora.

Threats to fauna: Similar to other linear project this project has also several anticipated threat to the wildlife particularly those presented in the project and its buffer zone. This road will pose physical threat to animals it will act as a barrier for their movement and there has been chance of animals being road killed while crossing the road. Reptiles and amphibians those cross the road mostly during dusk and dawn and the nocturnal animal which become active during night time may also get killed accidentally during their movement. Small rodents, birds mostly inhabiting in the adjoining forest trees will be displaced due to removal of their nests during tree felling and clearing of ground. Noise generated during vehicular movement will affect the tranquillity and may disorient the animals. Similarly light pollution will have also effect on the movement and behaviour of the wildlife.

2.D) i) Encroachment:

Threat of encroachment due to this project is not anticipated

2.D) ii) Litter generation:

No such threat is anticipated due to this project. However in the operational phase people travelling on the road may litter in the forest area.

2.D) iii) Accidental fall of animals in pits:

Though this kind of threat is anticipated due to this project but can be minimised by careful planning of the dug pit during the construction phase. But if these burrow pits are left unattended this may prove hazardous for movement of medium & large sized animals.

2.D) iv) Pollution of Surface runoff:

No such kind of threat is anticipated due to this project.

2.D) vi) Road Accident:

The project itself is a road project and as it is a six lane road the speed limit will also be high. Besides this road will facilitate transport of goods like fruits, vegetables, dairy products etc. and increase business transactions between the states of Odisha, Chhattisgarh and Andhra Pradesh. This will result into increased movement of heavy vehicles, trucks all through night and day. This will certainly restrict the movement of large and small wild animals; those usually pass through the road. Headlight of the night plying vehicles will also obstruct the movement path of animals causing frequent accidents unless the drivers are vigilant of them.

2.E) Probable Increase in Vehicular Traffic:

After completion of the road all the vehicle that travel interstate will choose this route. As it will be a very wide road (Six lane) movement of a large numbers of vehicles is anticipated which will increase the traffic of this area.

2.F) Noise, Water, Air, Underground Pollutions:

These are discussed in details in this Chapter-2. A above.

2.G) i) Study techniques adopted and Details of Visit:

- All the topographical details were collected for the Survey of India Topo Sheets
- The Village list and demographic composition has been collected from 2011 Census Report.
- **D**ata were collected from Working Plan (1996-97 to 2015-16) of the forest division.
- A questionnaire has been prepared with our own developed model for the survey of the surrounding Villages for Socio Economic Study.
- Conflict data, wildlife offence cases, animal depredation data, sanction orders of compassionate grants etc. were collected from the State forest Department.
- Flora and fauna study have been done by field visit and in consultation with Forest Field Staff and villagers by exhibiting a book on Wildlife written by Sri N.C. Mohanty, I.F.S.(Retd.) and Sri S.C. Jena, IFS (Retd.) Ex-PCCF, Bihar.

2.G) ii) Area Visited:

The study area has been visited by the above mentioned experts during the month of September

2.G) iii) Records Referred:

The following books were referred for preparation of site specific conservation plan.

1. Swain D. (2004). Asian Elephants – Past, Present and Future. Dehra Dun: International Book Distributors.
2. State of India's Forest Report-2017; Forest Survey of India. Derha Dun
3. Champion H G. and Seth S K. (1968). A revised survey of forest types of India. Govt. of India: New Delhi. Flora of Orissa-Bihar, Saxena & Brahman.
4. Right of Passage-elephant corridors of India - Wildlife Trust of India.
5. Working Plan of Vizianagaram Forest Division
6. Pictorial view of species schedule wise compiled by Sri N.C Mohanty, IFS, retd.

7. A Glimpse of Bio-Diversity in Chhattisgarh, Madhya Pradesh, Maharastra and Odisha by Mr. S. C. Jena, Ex-PCCF, Chhattisgarh.
8. Flora of Orissa by Brahman and Saxena.
9. Book on Indian Birds by Salim Ali
10. Book on Indian Animals by Prater
11. Book on Indian Reptiles by J.C. Daniel
12. Wildlife (Protection) Act 1972
13. WII (2016). Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife. Wildlife Institute of India, Dehradun, India

2.G) iv) Sampling Method adopted:

The team visited the project area and its buffer zone during September this year (2020). The team included –Sri Siba Kumar Mohanty, Retd. OFS, Gayatri Devi, Lect in Zoology.

- The proposed project area and its 10 km bufferzone has been marked in the topomap as well as in the satellite map (Google earth image) by using Arc GIS.
- A base line of 500 m was selected in E-W direction.
- Two transact line of 500 m each perpendicular to the baseline, one at a distance of 125 m from the starting point and other at a distance of 350 m from the starting point was drawn. On both of the perpendicular transect 30mx30m sample plot size was drawn.
- Within the sample plot the available tree species, herbs, shrubs, grasses and ground cover were identified and recorded.
- From outside the RF, the specimen was collected for preparation of Herbarium.
- For faunal identification, primary data was prepared by direct sighting, scat collection, marks on the ground and even from call of the animals.
- Secondary data on fauna was collected from working plan of both of the forest divisions, wildlife offence cases, conflict datas, indirect evidences and information collected from forest dept staff, villagers etc.
- Even different habitat was also indicative of presence of particular type of animal in those habitats.

2.G) v) Justification in Extrapolation:

The information collected from various sources were compiled and the conclusion was drawn. All the imformation collected from different sources are authentic and are accepted by a large group of audience. Hence, we believe our study is justified for the purpose of preparing this conservation plan.

CHAPTER-3

OBJECTIVES OF MANAGEMENT AND MITIGATION STRATEGIES

3.A. Objectives of Management:

Wildlife management is an attempt to balance the needs of wildlife with the needs of people using the best available science. It consists of promoting welfare factors, arresting or reducing the impacts of decimating factors and neutralizing harmful effects of limiting factors that keep the animal population lower than the carrying capacity of the area. It also aims at management of human dimensions relating to regulation of habitat use, sufferance from animal damages, livelihood issues and taking people as partners in conservation management. Hence, the main objective of this plan is to reduce/minimize/ mitigate various stress occur due to implementation of this project in this particular locality having wildlife importance by using modern technologies and available Science. This Conservation Plan will suggest measures to mitigate such stress and if possible how to avoid certain activities which could reduce the negative impact and the most important to ensure safe passage of wildlife. The management of the project area aim for maintenance of habitat for smaller animals that used to live and share habitat along with the traffic and vehicular movement along the road. At the same time, it ensures the safe passage of wildlife in their habitat.

The management of Buffer Zone will target optimization and maintenance of wildlife habitat and biodiversity, involving local people as far as practicable and aim to avoid / minimise or mitigate the adverse impacts of the wide NH. The project area has Reserve Forest and tall trees stand in virgin area. Besides small animals, larger ones like sloth bear, spotted deer etc. make use of the area regularly, as the area is undisturbed. Large animals will be affected in the area once the project is completed. The displaced animals should not be left as refugee. Their rehabilitation would be the major objective of the plan. To fulfil all these requirements, the plan focused on improving forage and browse volume by increasing food plant diversity with vertical and horizontal cover. These will arrest habitat destruction and fragmentations also prevent soil erosion and loss of bio-diversity. Keeping natural water resource free from negative impact during construction phase will also be targeted.

Mitigation measuresrefers to avoid, reduce or remedy harm and addresses the conservation concerns likely to be associated with the development proposals. Hence there is need to follow the mitigation principles to deliver potential benefits of Green Infrastructure Development Approach.

The Objective of management to mitigate the threats to the wildlife is covering the following aspects.

PROJECT AREA (CORE ZONE)

- Undertake appropriate attenuative measures to avoid / minimise or mitigate the adverse impacts like accidents and casualities of wildlife in and around the road.
- Undertake appropriate facilities for safe movement of reptiles, amphibians, fieshes etc.
- Promotion awareness by displaying hoardings
- Infrastructure like torch, and fixing light in villages to prevent human wildlife interface.

ZONE OF INFLUENCE

- Plantation in degraded forest patches to improve habitat conditions of wildlife
- To prepare strategies for fire management plan to prevent forest fire. by engaging fire fighting squad to combat fire damage.
- Create a Corpus Fund to facilitate meeting expenses in exigencies of human-wildlife conflict.
- To engage research fellows in the concern forest division for the long term monitoring of the impact of road on the wildlife and to develop strategies to reduce the impact.

3.B) Strategies to mitigate and minimize adverse impacts.

3.B) i) Strategies for Project Area:

In the project area the primary focus is to reduce the barrier effect and ensure safe passage of not only the mega herbivores but also other wild animals living on both side of the NH. Besides the focus will also be on the reduction of wildlife accident and road kill. These are provided below with details description

3.B) i) 1. Facilities forSafe wildlife under passes:

For the uninterrupted movement of wildlife there is need to enhance permeability of crossing structures which are to be effective and acceptable. According to the guidelines given in the book "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife" An underpasses/passageway of over 50 m per 1 km length of infrastructure should be created in forested habitats.

Though the project has proposed 16 major bridges and 57 minor bridges over the canals, Rivers, Nalas and streams but majority are falling outside the forested area.Hence, to meet the requirement of the guidelines given in the book "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife", the User

Agency has proposed to provide additional **25 numbers ofunderpasses**for large carnivore and medium sized herbivore in the **Koraput (10), Nabarangpur (10) and Jeypore (5)** forest division.The under passes will be in the size of 30 m span with a height of 5 m and a width of 8-10 m. In addition it is also proposed to provide 20 numbers of Canopy bridges (Aerial bridges) in the Koraput division**(10)** and Nabarangpur forest division **(10)** for the tree dwelling animals. The design of the underpass as well as the canopy bridges along with their proposed locatiuons are are provided below whereas the exact location for the under pass will be decided as per the direction of DFO of the concern area.

Proposed locations of Animal Underpasses in all the three divisions

Underpasses for Large carnivores and small and midium sized mammals				
Sl. No.	**Chainage**		**No. of Structure**	**size of the underpasses**
Nabarangpur Forest Division				
1	132+450	133+450	1	30m span x 5m height x 5-8m width
2	198+850	199+350	1	
3	204+750	206+100	1	
4	236+400	237+850	1	
5	217+050	217+800	1	
6	125+250	125+450	1	
7	127+350	127+650	1	
8	128+850	129+450	1	
9	140+550	141+500	1	
10	144+400	144+850	1	
Jaypore Forest Division				
6	241+350	242+750	1	30m span x 5m height x 5-8m width
7	246+700	247+700	1	
8	269+000	273+450	3	
Koraput Forest Division				
9	273+500	275+000	1	30m span x 5m height x 5-8m width
10	278+400	279+400	1	
11	287+450	290+200	1	
12	339+500	342+250	2	
13	347+350	351+100	2	

14	356+000	357+100	1	
15	358+650	360+950	1	
16	362+700	363+600	1	
Total			**25**	
Source: Eco-Friendly Measures to Mitigate Impacts of Linear Infrastructure on Wildlife (Page No. 70 and 79				

Under pass for small and medium sized mammals

Canopy Bridge for tree dwelling animals

the User Agency should also make provision of covering the area outside the under passes with vegetation cover of **fodder species** of the trees and shrubs like- *Ficus bengalensis (*Bara*), Ficus religiosa (*Aswastha*), Ficus glomerata (*Dimir*i), Ficus benjamina (*jari*), Syzigium cumini (*Jamun*), Kydia calicina(*Bana Kapasia*), Lannnea coromondalica (*Moi*), Ziziphus mauriatina(*Barkoli*), Emblica officinalis (*Amla*), Spondias pinata (*Ambada*), Ougeinia oojeinensis (*Bandhan*), Buchananis lanzan (*Chara*), Alstonia scholars (*Chhatian*), Anogissus latifolia (*Dhaura*), Macaranga peltata (*Manda*), Bambusa arundinacia (*Sundarkania bauns*), Dendrocalamus strictus (* salia baunsa*)* which would connect the adjoining forest area so that this route would guide wild animals to cross through the opening of underpasses.

3.B)i) 2. Hoarding and Signage

Hoarding, banners, flexes and Sign Boards with good write up should be displayed at every 400 meter in the straight path and in each turn of the road where ever it passes through the forested area. Besides the user agency will also put posters of Dos and Don'ts for human animalconflict and posters promoting human-wildlife coexistence in the revenue area in consultation with the state forest department.

3.B)i) 3. Rumble Strip

To control the speed of vehicles in the forest areas, it is proposed to build rumble stripe in every 400 meter on the road where it passes through the forest land. It will help in reducing the speed of the vehicle, which will ultimately reduce the chance of road kill to the animals

3.B)i) 4. Awareness programme

There is also provision to spread awareness on importance of conservation of wildlife, forest and environment particularly at school, college and village level.

3.B) i) 5. Infrastructure

There is provision for the User Agency to procure and supply – torch to the villagers and to provide Solar light to the villages along the roads prone to wildlife movement, in each division.

3.B) ii. Conservation Plan For ZoI:

3.B) ii) 1. ANR plantation: For maintaining the stability of the forest it is proposed to make a provision for ANR plantation 400ha (Koraput and Jeypore 100ha each and Nabarangpur 200 ha) with 200 plants per ha. The species which are to be chosen for plantation should be indigenous such as sal (*Shoerea robusta*),

mango (*Mangefera indica*), jamun (*Sizizium cumini*), Bara (*Ficus bengalensis*), Amla (*Emblica officinalis*), Harida (*Terminalia alata*), bahada (*Terminalia belerica*) and other fruit bearing species. Here the suggestion is only to provide/improve forage in the existing habitat.

It is also proposed for 4 numbers of waterholes (Koraput and Nabarangpur 2 each), 12 numbers of artificial bear cave (Koraput and Nabarangpur 6 each) and artificial bird nest in Koraput forest division.

Artificial Bear cave

3.B) ii) 2. Fire fighting squad:

The forest blocks are prone to annual fires. Hence, adequate measures to protect the forest area from fire are essential to sustain the biodiversity. There is provision of deploying **10 no of fire watchers** in **each forest division (Koraput,**

Jeyporeand Nabarangpur) during fire season, a period of 5 months from **February to June** of every year. They will be supplied with vehicle, fire blowers and will also be provided for recharge of their mobiles.

3. B) ii) 3. Provision to deploy one wildlife rescue team and strengthening the existing rescue centre in Nabarangur forest division

There is also a provisionto deploy one wildlife Rescue/rapid response team in the Nabarangpur forest division and to strenghthen the existing rescue centre with supplements of modern equipments and a permanent veterinarian in the same forest division.

3. B) ii) 4. Remuneration to the informer/vss

There is also a provision to provide remuneration to the Informer and VSS members for their support in the wildlife conservation.

3.B)ii) 5. Engaging research Biologist

It is proposed to engage fourresearch fellows (One senior biologist,two fellows for the biological component and one for GIS component) in the RCCF office of Koraput circle for the study of biodiversity and long-term monitoring on the effect of road to the existing wildlife. The research fellows will also conduct research on the Biodiversity, Ecology of wildlife and human wildlife conflicts in Koraput circle level including both Koraput and Nabarangpur Districts. They will identify vulnerable zones and develop hotspot maps which will be definitely helpful in developing strategies for management.

They will take up the research, monitor, evaluate etc activities in all the three forest divisions as per the need and as suggested by the DFOs.

3. B) ii) 6. Monitoring Committee:

A monitoring committee will be formed in each forest division under the Chairmanship of the concern D.F.O. for the monitoring of the implementation of the work. The other members will be Range Officers and a representative of User Agency. Monitoring committee will sit at least twice in a year to review implementation of the prescriptions of this Plan and sort out bottlenecks and if necessary may suggest for addition/alteration etc. also the committee will evaluate level of human-animal conflict indicators like human injuries and death of human in the zone of influence, incident and extent of fire, area burnt. Grazing pressure and illegal felling.

CHAPTER-4

MANAGEMENT STRATEGIES WITHIN THE PROJECT AREA WITH FINANCIAL FORECAST

a) Interventions to be implemented by the project Authority inside the project area with Justification.

All remedial measures for wildlife safety in the Project area (core zone) have been discussed in Chapter–**3.** The financial requirement of various interventions suggested in the plan as per current labour wage rate i.e. Rs.308 is given in flowing table for the plan period of **10 years** and annual cash flow for the Project area (core zone)of the project. All activities within the Project area (core zone) will be implemented by the Project Proponent.

b) Location of the proposed intervention and maps overlaid in the proposed land use plan map.

The map showing the intervention implemented inside the project area by the project authority has been furnished in **chapter 6** of this plan.

c) Relevant provision of Environmental plan for the project and the Intervention overlapping in nature are to be specified.

Financial provision of works in Project area @Rs.308

For Nabarangpur Forest Division

Sl. No.	Para Ref	Management interventions in Project area (core zone)	Estimated Cost (in Lac)
Safe Passage of wildlife			
1	**3.B)I)1**	10 underpass of size **30m span x 5m height x 5-8m** width for small and medium size mammals to be provided for the Nabarangpur forest Division as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". & 10 numbers of canopy bridges will be provided for the tree dwelling species in Nabarangpur forest division as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife".	The cost is to be included in the project cost and to be borne by the User Agency
2	**3.B)i)2**	For amphibians or reptiles small pipe culverts or bridges should be constructed in every 100 mtr stretch of raod as per need & technical feasibility in consultation with DFO/RCCF concern as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". The diameter of pipe culverts should be atleast 200 cm.	The cost is to be included in the project cost and to be borne by the User Agency
Infrastructure			
3	**3.B)i)3**	Hoarding and Signage (Animal crossing zone, don't feed animals etc) will be provided (at every 400 meter in the straight path and in each turn) on both side of the road where-ever it passes through the forest area as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". In revenue area hoardings and signages explaining do's and don'ts for general awareness in the public to avoid human-animal conflict and promoting Human wildlife co-existence will be provided. The design and content of the hoardings and signages are to be finalised in consultation with the State Forest Department.	The cost is to be included in the project cost and to be borne by the User Agency
4	**3.B)i)4**	To control the speed of vehicles in the forest area, Rumble strips will be provided in the critical wildlife habitat on the road where it passes through the forest.	The cost is to be included in the project cost and to be borne by the User Agency
5	**3.B)i)5**	Community awareness programme	5.00
6	**3.B)i)6**	Provision for solar light to the remote villages along the road prone to wildlife movement	10.00
		Total	15.00
		Escalation 20%	3.00
		Grand Total in lac.	**18.00**

Annual Work Programme:

d) Details of the flow of funds for different years of the plan for Project area are given below: (Rs. In Lacs)

Sl. No.	Para Ref.	Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
1	**3.B)I)1**	10 underpass for small and medium size mammals **&** 10 canopy bridges for the tree dwelling species	The cost is to be included in the project cost and borne by the User Agency										
2	**3.B)I)2**	Small Pipe culverts and bridges for Amphibians & Reptiles	The cost is to be included in the project cost and borne by the User Agency										
3	**3.B)I)3**	Hoardings and Signages in the forest area and revenue area	The cost is to be included in the project cost and borne by the User Agency										
4	**3.B)I)4**	Rumble strips in critical wildlife habitat	The cost is to be included in the project cost and borne by the User Agency										
5	**3.B)I)5**	Community awareness	5.00	-	-	-	-	-	-	-	-	-	5.00
6	**3.B)I)6**	Solar lights	10.00	-	-	-	-	-	-	-	-	-	10.00
		Total	**15.00**										**15.00**
		+20% escalation	3.00	-	-	-	-	-	-	-	-	-	**3.00**
		Grand Total	18.00										**18.00**

e) For Jeypore Forest Division

Sl. No.	Para Ref	Management interventions in Project area (core zone)	Estimated Cost (in Lac)
		Safe Passage of wildlife	
1	**3.B)i)1**	5 underpass of size **30m span x 5m height x 5-8m width** for small and medium size mammals to be provided for the Jeypore forest Division as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife".	The cost is to be included in the project cost and to be borne by the User Agency
2	**3.B)i)2**	For amphibians or reptiles small pipe culverts or bridges should be constructed in every 100 mtr stretch of raod as per need & technical feasibility in consultation with DFO/RCCF concern as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". The diameter of pipe culverts should be atleast 200 cm.	The cost is to be included in the project cost and to be borne by the User Agency
		Infrastructure	
3	**3.B)i)3**	Hoarding and Signage (Animal crossing zone, don't feed animals etc) will be provided (at every 400 meter in the straight path and in each turn) on both side of the road where-ever it passes through the forest area. In revenue area hoardings and signages explaining do's and don'ts for general awareness in the public to avoid human-animal conflict and promoting Human wildlife co-existence will be provided as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". The design and content of the hoardings and signages are to be finalised in consultation with the State Forest Department.	The cost is to be included in the project cost and to be borne by the User Agency
4	**3.B)i)4**	To control the speed of vehicles in the forest area, Rumble strips will be provided in critical wildliife habitat on the road where it passes through the forest	The cost is to be included in the project cost and to be borne by the User Agency
5	**3.B)i)5**	Community awareness programme	5.00
6	**3.B)i)6**	Provision for solar light to the remote villages along the road prone to wildlife movement	10.00
Total			**15.00**
Escalation 20%			**3.00**
Grand Total in lac.			**18.00**

Annual Work Programme:

f) Details of the flow of funds for different years of the plan for Project area are given below: (Rs. In Lacs)

Sl. No.	Para Ref.	Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
1	**3.B)I)1**	Underpasses for small and medium size mammals	The cost is to be included in the project cost and borne by the User Agency										
2	**3.B)I)2**	Small Pipe culverts and bridges for Amphibians & Reptiles	The cost is to be included in the project cost and borne by the User Agency										
3	**3.B)i)3**	Hoardings and Signages in the forest area and revenue area	The cost is to be included in the project cost and borne by the User Agency										
4	**3.B)I)4**	Rumble strips will be provided in critical wildlife habitat	The cost is to be included in the project cost and borne by the User Agency										
5	**3.B)I)5**	Community awareness programme	5.00										5.00
6	**3.B)I)6**	Solar light	10.00	-	-	-	-	-	-	-	-	-	10.00
		Total	**15.00**										**15.00**
		+20% escalation	**3.00**	-	-	-	-	-	-	-	-	-	**3.00**
		Grand total	**18.00**	-	-	-	-	-	-	-	-	-	**18.00**

For Koraput Forest Division

Sl. No.	Para Ref	Management interventions in Project area (core zone)	Estimated Cost (in Lac)
Safe Passage of wildlife			
1	**3.B)i)1**	10 underpass of size **30m span x 5m height x 5-8m width** for small and medium size mammals to be provided for the Koraput forest Division as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". **&** 10 numbers of canopy bridges will be provided for the tree dwelling species in Koraput forest division as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife".	The cost is to be included in the project cost and to be borne by the User Agency
2		For amphibians or reptiles small pipe culverts or bridges should be constructed in every 100 mtr stretch of raod as per need & technical feasibility in consultation with DFO/RCCF concern as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". The diameter of pipe culverts should be atleast 200 cm.	The cost is to be included in the project cost and to be borne by the User Agency
Infrastructure			
3	**3.B)i)2**	Hoarding and Signage (Animal crossing zone, don't feed animals etc) will be provided (at every 400 meter in the straight path and in each turn) on both side of the road where-ever it passes through the forest area as per the guideline provided in "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife". In revenue area hoardings and signages are to be provided explaining do's and don'ts for general awareness in the public to avoid human-animal conflict and promoting Human wildlife co-existence. The design and content of the hoardings and signages are to be finalised in consultation with the State Forest Department.	The cost is to be included in the project cost and to be borne by the User Agency
4	**3.B)i)3**	To control the speed of vehicles in the forest area, Rumble strips will be provided in critical wildlife habitat on the road where it passes through the forest	The cost is to be included in the project cost and to be borne by the User Agency
5	**3.B)i)4**	Community awareness programme	**10.00**
6	**3.B)I)5**	Provision for solar light to the remote villages along the road prone to wildlife movement	**5.00**
Total			**15.00**
Escalation 20%			**3.00**
Grand Total in lac.			**18.00**

Annual Work Programme:

g) Details of the flow of funds for different years of the plan for Project area are given below: (Rs. In Lacs)

h)

Sl. No.	Para Ref.	Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
1	**3.B)I)1**	10 Underpasses for small and medium size mammals **&** 10 canopy bridges for tree dwelling animals	The cost is to be included in the project cost and borne by the User Agency										
2	**3.B)I)2**	Small Pipe culverts and bridges for Amphibians & Reptiles	The cost is to be included in the project cost and borne by the User Agency										
3	**3.B)i)3**	Signages will be put at every 400 meter in the straight path and in each turn on both side of the road where-ever it passes through the forest area.	The cost is to be included in the project cost and borne by the User Agency										
4	**3.B)I)4**	Rumble strips will be provided in critical wildlife habitat on the road where it passes through the forest	The cost is to be included in the project cost and borne by the User Agency										
5	**3.B)I)5**	Community awareness programme	5.00										5.00
6	**3.B)I)6**	Solar light	10.00	-	-	-	-	-	-	-	-	-	10.00
		Total	**15.00**										**15.00**
		+20% escalation	**3.00**	-	-	-	-	-	-	-	-	-	**3.00**
		Grand total	**18.00**	-	-	-	-	-	-	-	-	-	**18.00**

CHAPTER-5

MANAGEMENT STRATEGIES WITHIN THE ZONE OF INFLUENCE OF THE PROJECT WITH FINANCIAL FORECAST

Intervention to be adopted by the Divisional forest Officer in the project impact area (Zone of Influence). This will include the habitat improvement measures to reduce/ameliorate the human animal interface and measures to facilitate the movement of mega fauna across the man made linear infrastructure causing hindrance in their movement

The financial requirement of various interventions suggested in this plan are as per current labour wage rate is given in following table for the plan period of **10 years** and annual cash flow for the Zone of Influence has also been furnished. All activities in the Zone of Influence will be implemented by the ***Divisional Forest Officer concerned Forest Division.***

Financial provision of works in Zone of Influence
(Wage rate @ Rs.308.00)

For Nabarangpur Forest Division

Sl. No.	Para Ref	Management interventions in buffer Zone	Estimated Cost (in Lac)
Habitat Improvement			
1	**3.B)ii)1**	For maintaining the stability of the forest and habitat of the surrounding ANR Plantation will be raised over **200.00 ha** in Nabarangpur forest division @ Rs.46118.1/- x 10 ha for 10 years maintenance.	92.24
		Creation of Water holes for enhancing water source for the wild animals @Rs 6.00 lac each	12.00
		Creation of 6 artificial bear hideouts @ 2.00 lac each along with plantation of a patch of 10 ha of ANR plantation of fruit bearing species surrounding each artificial bear hideouts 10 ha x 6 = 60 ha ANR plantation @ Rs.46118.1/ha	39.67
Fire protection			
2	**3.B)ii) 2**	Deployment of fire fighting squad with 10 no of fire watchers@ Rs.308.00x 150 days (Feb.- June) x 10-person x 10 years @ Rs. 9,240/- per month with **five fire blowers @ Rs.1,20,000/- each**. + 500/month for mobile recharge =46.20+6.00+0.25 Provision for a hired vehicle for the fire fighting squad along with fuel charges @ 25.5	77.95
Wildlife protection and anti depredation			
3	**3.B)ii) 3**	a) Deployment of wildlife rescue-cum-rapid response team with 10 nos of rescuers to be engaged through sevice provider @ 12505/month/person x 10 persons x12 month x 10 years hired vehicle @ 31000/pm x 12 month x 10 years POL charges @15000/pm x12 months x 10 years Recharge of mobile @ 1000/pm x12 months x 10 years Medical expences @ 20000/year x 10 years Uniform and Camp equipments @ 14900/year x 10 years	209.95
		b) Strengthening of the existing transit centre for sick, injured wildanimals with modern equipments/ tools, nets, wildlife protection suits, dart gun, binocular etc along with a provision of a full time veterinarian for 10 years at Papdahandi.	200.00
		c) Provision of a Rescue vehicle	30.00

4	**3.B)ii) 4**	Reward to the informer/vss& Contingency	20.00
		Total	**681.81**
		Escalation 20%	**136.36**
		Grand Total	**818.17**

Annual Work Programme:

Details of the flow of funds for different years of the plan for ZoI are given below: (Rs. In Lacs)

Sl. No.	Para Ref.	Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
1	**3.B)ii) 1**	ANR Plantation Over 200 ha+2water hole+6bear hideouts with 60ha additional ANR plantations	96.26	21.03	8.94	2.52	2.52	2.52	2.52	2.52	2.52	2.52	143.91
2	**3.B)ii) 2**	Engaging 10 fire watcher with 5 fire blower and vehicle	13.195	7.195	7.195	7.195	7.195	7.195	7.195	7.195	7.195	7.195	77.95
3	**3.B)ii) 3**	Deployment of wildlife rescue team (10 members)	20.995	20.995	20.995	20.995	20.995	20.995	20.995	20.995	20.995	20.995	209.95
		Strengthening of Reuse centre and provision of a VET	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	200.00
		Provision of a rescue vehicle	30.00	-	-	-	-	-	-	-	-	-	30.00
4	**3.B)ii)4**	Reward to the informer/ VSS & Contingency	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
		Total	182.45	71.22	59.13	52.71	52.71	52.71	52.71	52.71	52.71	52.71	681.81
		+20% escalation	36.49	14.244	11.826	10.542	10.542	10.542	10.542	10.542	10.542	10.542	136.36
		Grand total	218.94	85.464	70.956	63.252	63.252	63.252	63.252	63.252	63.252	63.252	818.17

For Jay pore Forest Division

Sl. No.	Para Ref	Management interventions in buffer Zone	Estimated Cost (in Lac)
Habitat Improvement			
1	**3.B)ii)1**	For maintaining the stability of the forest and habitat of the surrounding ANR Plantation will be raised over **100.00 ha** in Jeypore forest Division @Rs.46118.1/- x 10 ha for 10 years maintenance.	46.10
Fire protection			
2	**3.B)ii) 2**	Deployment of fire fighting squad with 10 no of fire watchers@ Rs.308.00x 150 days (Feb.-June) x 10-person x 10 years @ Rs. 9,240/- per month with **two fire blowers @ Rs.1,20,000/- each**. + 500/person for mobile recharge + one hired vehicle for fire fighting squads	74.35
Wildlife protection and anti depredation			
3	**3.B)ii) 4**	Reward to the informer/vss	10.00
		Total	**130.45**
		Escalation 20%	**26.09**
		Grand Total	**156.54**

Annual Work Programme:

Details of the flow of funds for different years of the plan for ZoI are given below: (Rs. In Lacs)

Sl. No.	Para Ref.	Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
1	**3.B)ii)1**	ANR Plantation Over 100 ha	27.79	8.09	3.44	0.97	0.97	0.97	0.97	0.97	0.97	0.97	46.10
2	**3.B)ii)2**	Engaging 10 fire watcher with 2 fire blower	11.8	6.95	6.95	6.95	6.95	6.95	6.95	6.95	6.95	6.95	74.35
3	**3.B)ii)4**	Reward to the informer/ VSS	10.00										10.00
		Total	45.225	15.525	10.875	8.405	8.405	8.405	8.405	8.405	8.405	8.405	130.45
		+20% escalation	9.045	3.105	2.175	1.681	1.681	1.681	1.681	1.681	1.681	1.681	26.09
		Grand total	54.27	18.63	13.05	10.086	10.086	10.086	10.086	10.086	10.086	10.086	156.54

For Koraput Forest Division

Sl. No.	Para Ref	Management interventions in buffer Zone	Estimated Cost (in Lac)
Habitat Improvement			
1	**3.B)ii)1**	For maintaining the stability of the forest and habitat of the surrounding ANR Plantation will be raised over **100.00 ha** in Koraput forest division @Rs.46118.1/- x 10 ha for 10 years maintenance.	46.12
		Creation of two water bodies@ 6.00 lac each	12.00
		Creation of 6 artificial bear cave @ 2.00 lac each and artificial bird nests @ 10 lakh =12.00+10.00	22.00
Fire protection			
2	**3.B)ii) 2**	Deployment of fire fighting squad with 10 no of fire watchers@ Rs.308.00x 150 days (Feb.-June) x 10-person x 10 years @ Rs. 9,240/- per month with **six fire blowers @ Rs.1,20,000/- each**. + 500/month for mobile recharge + one vehicle for fire fighting squad =46.20+7.20+0.25+25.50	79.15
Wildlife protection and anti depredation			
3	**3.B)ii) 4**	Reward to the informer/vss	10.00
		Total	**169.27**
		Escalation 20%	**33.85**
		Grand Total	**203.12**

Annual Work Programme:

Details of the flow of funds for different years of the plan for ZoI are given below: (Rs. In Lacs)

Sl. No.	Para Ref.	Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
1	**3.B)ii) 1**	ANR Plantation Over 100 ha + 2 water hole + 6 bear cave + bird nest	59.79	8.09	3.44	0.97	0.97	0.97	0.97	0.97	0.97	0.97	78.11
2	**3.B)ii) 2**	Engaging 10 fire watcher with 6 fire blower + one vehicle	14.62	7.17	7.17	7.17	7.17	7.17	7.17	7.17	7.17	7.17	79.15
3	**3.B)ii)4**	Reward to the informer/ VSS	10.00										10.00
		Total	86.42	15.26	10.61	8.14	8.14	8.14	8.14	8.14	8.14	8.14	169.27
		+20% escalation	17.284	3.052	2.122	1.628	1.628	1.628	1.628	1.628	1.628	1.628	33.854
		Grand total	103.704	18.312	12.732	9.768	9.768	9.768	9.768	9.768	9.768	9.768	203.124

A common provision for all the three forest divisions (Koraput Circle) to be implemented under the Guidance of RCCF Koraput. The researchers will take up the research, monitoring, evaluate, etc activities in all the three divisions as per the need and suggestion by the DFOs.

Para No.	Intervention	Cost in lac.
3.B)ii)4	Engagement of 4 research fellow including one Senior Fellow one GIS Expert & Two Biologist 35,000+ 16% HRA for Senior fellow & 31,000+16% HRA for Research Fellow	178.18
	Cost of Research equipment (GPS/Binoculars/Laptops/Camera Traps/Radio Collars etc.) and Travels (Hired vehicles)	20.00
	Total	**198.18**
	20% Escalation	**39.64**
	Grand Total	**237.82**

Annual Work Programme:

Type of interventions	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	Total in Lac.
Engaging Research fellows for research purpose	17.818	17.818	17.818	17.818	17.818	17.818	17.818	17.818	17.818	17.818	178.18
Equipment Cost	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	20.0
total	19.818	19.818	19.818	19.818	19.818	19.818	19.818	19.818	19.818	19.818	198.18
20% Escalation	3.9636	3.9636	3.9636	3.9636	3.9636	3.9636	3.9636	3.9636	3.9636	3.9636	39.636
Grand Total	23.7816	23.7816	23.7816	23.7816	23.7816	23.7816	23.7816	23.7816	23.7816	23.7816	237.816

a) **Location (preferably GPS co-ordinate) and map of the area of the proposed intervention. Such maps should also show the man made infrastructure and ameliorative measures such as under/over pass etc.**
Location of the above mentioned intervention will be decided by the concern DFO, of the respected forest Divisions according to availability of space and requirement.

b) **Plan period:**
The plan is for 10 years from 2020-21 to 2030-31, in consonance with accepted norm. The intermediate revision is not foreseen unless the project increases in size or closed down or there is slump in market or departure of present Government policy for forest management.

Cost Abstract of this Plan

Forest Divisions	Project area (core zone) (cost in Lac)	Buffer Zone (cost in Lac)
Nabarangpur	18.00	818.17
Jeypore	18.00	156.54
Koraput	18.00	440.94
Total	54.00	1415.65

Approved

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar

CHAPTER-6

ANNEXURE & MAPS

1. **Annexure –1: Authenticated list of flora and fauna for both the Project area (core zone) and buffer zone of this project**
2. **Annexure –2:ANR Plantation Cost Norm**
3. **Annexure-3: Village list (Demographic details)**
4. **Plate -1- Map showing project area with 10 km radius, and the proposed intervension area**
5. **Plate-2- Map showing distance to protected areas.**

OFFICE OF THE DIVISIONAL FOREST OFFICER, NABARANGPUR DIVISION
Phone No. 06858-222014 (OFFICE/FAX), Cell No. 09437094840
Email –dfo.ngpur@yahoo.co.in

Letter No. 102 /4F (Misc.) Dated 6th Jan, 2021

From

Sri Magar Dhanaji Raoso, IFS
D.F.O. Nabarangpur Forest Division.

To

The Project Director,
National Highway Authority of India,
(Ministry of Road Transport & Highways)
Project Implementation Unit, Berhampur.

Sub: - DPR of the project under BharatmalaPariyojna connecting Raipur to Vishakhapatnam Corridor – From Odisha – Chhattisgarh Border (Near kundei village) to Odisha- Andhra Pradesh Border (near Ondarangi village) of Odisha State-Authentication of Flora & Fauna list for core & Buffer Zone and Wildlife Map of the project area for preparation of Site-specific Wildlife Conservation Plan of Bharatmalapariyojna project of National Highways Authority of India (NHAI).

Ref: Your Letter No. NHAI/11012/16/Forest/2020/PIU/BER/30 dtd 22.10.2020.

Sir,

With reference to the subject cited above, it is to inform you that you have submitted the Flora & Fauna list in core & buffer zone of the project area and Location Map of the project site showing Sanctuaries, National Parks, Biosphere Reserves, Wildlife Corridors, etc which is hereby authenticated on the basis of field reports received from Range Officers for preparation of site- specific Wildlife Conservation Plan of Bharatmala Pariyojna project of National Highway Authority of India (NHAI).

This is for favour of your kind information & necessary action.

Encl: As above.

Yours faithfully,

06/01/2021

Divisional Forest Officer,
Nabarangpur Forest Division.

DETAILS LIST OF FLORA AND FUNA

CORE ZONE:-

FLORA (COMMON TREES)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Amba	*Mangifera indica*	Anacardiaceae
2	Ambada	*Spondias mangifera*	Anacardiaceae
3	Aata	*Annona squamosa*	Annonaceae
4	Achu	*Morinda Tinctoria*	Rubiaceae
5	Ankula	*Alangium salvifolium*	Alangiaceae
6	Amla	*Emblica officianlis*	Euphorbiaceae
7	Arjun	*Terminalia arjuna*	Combretaceae
8	Asan	*Terminalia tomentosa*	Combretaceae
9	Ashoka	*Saraca asoca*	Caesalpinlaceae
10	Aswastha	*Ficus religiosa*	Moraceae
11	Baro	*Ficus benghalensis*	Moraceae
12	Belo	*Aegle marmelos*	Rutaceae
13	Bahada	*Terminalia bellerica*	Combretaceae
14	Bandhan	*Ougeinia oogeinensis*	Fabaceae
15	Babul	*Acacia areabica*	Mimosaceae
16	Barang	*Kydia calycina*	Mimosaceae
17	Baldia	*Erythrina suberosa*	Fabaceae
18	Barada	*Bauhinia purpurea*	Leguminasae Caesalpinieae
19	Behanta	*Limonia acidissima*	Rutaceae
20	Berimanj	*Casaeria tomentosa*	Passiflorales
21	Bhalia	*Semicarpus anacardium*	Anacardiaceae
22	Bija	*Pterocarpus marsupium*	Fabaceae
23	Bheru	*Cholroxylon swietenia*	Rutaceae
24	Chakunda(Bada)/Rain tree	*Samanea saman*	Mimosaceae
25	Champa	*Michelia champaca*	Magnoliaceae
26	Char	*Buchanania lanzan*	Anacardiaceae
27	Chhatian	*Alstonia scholaris*	Apocunaceae
28	Chadeigudi	*Vitex peduncularis*	Verbenaceae
29	Chhatiana	*Alstonia scholaris*	Apocynaceae
30	Chakunda	*Cassia siamea*	Mimosaceae
31	Dhaura	*Anogeissus latifolia*	Combretaceae
32	Dhaman	*Grewia tiliaefolia*	Tiliaceae
33	Damkurudu	*Gardenia latifolia*	Rubiaceae
34	Dhala siris	*Albizzia procera*	leguminesae Miniseae
35	Dhobin	*Dalbergia paniculata*	Papilonaceae
36	Dimiri	*Ficus glomerata*	Moraceae
37	Gambhari	*Gmelina arborea*	Verbenaceae
38	Gandha Palas	*Miliusa tomentosa*	Annocaceae
39	Ghanto	*Zizyphus globerrina*	Rhamnaceae
40	Gharalanja	*Albizzia stipulatta*	leguminesae Miniseae
41	Gohira	*Acacia leucophloea*	Mimosaceae
42	Gharanim	*Ailanthus excels*	Melinceae
43	Genduli	*Sterculia urens*	Sterculiaceae
44	Giringa	*Pterospermun heyneamum*	Sterculiaceae
45	Haldi	*Diospyros montana*	Ebenaceae

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46	Haldu(Halamda)	*Adina cordifolia*	Rubiaceae
47	Harida	*Terminalia chebula*	Combretaceae
48	Jamun	*Syzigium cumini*	Myrtaceae
49	Kalchua	*Glochidion lanceolarium*	Auphorbiaceae
50	Kamalagundi	*Mallotus philippenensis*	Auphorbiaceae
51	Kansa	*Hymendictyon excelsum*	Rubiaceae
52	Khekad	*Garuga pinnata*	Burseraceae
53	Kochila	*Strychnos nux-vomica*	Strychnaceae
54	Kumbhi	*Careya arborea*	Myrtaceae
55	kadamba	*Anthocephalus cadamba*	Rubiaceae
56	Kaju(Lanka Badam)	*Anacardium occidentale*	Anacardiaceae
57	Kanchan	*Bauhinia variegata*	Caesalpinlaceae
58	Karanja	*Pongamia pinnata*	Fabaceae
59	Karda	*Cleistanthus collinus*	Euphorbiaceae
60	Kasi	*Bridelia retusa*	Euphorbiaceae
61	Kendu	*Diospyros melanoxylon*	Ebenaceae
62	Khaira	*Acacia catechu*	Mimosaceae
63	Kusum	*Schleichera oleosa*	Sapindaceae
64	Mahul	*Madhuca indica*	sapotaceae
65	Mankadakendu	*Diospyros montana*	Ebenaceae
66	Moi	*Lannea coromandelica*	Annacardiaceae
67	Mundi	*Mitragyna parvifolia*	Rubiaceae
68	Neem/Limba	*Azadirachta indica*	Meliaceae
69	Panigambhar	*Trewia nudiflora*	Auphorbiaceae
70	Phasi	*Anogeissus accuminata*	Combretaceae
71	Pipal	*Ficus religiosa*	Moraceae
72	Palasa	*Butea monosperma*	Fabaceae
73	Panas	*Artocarpus heterophyllus*	Moraceae
74	Phanaphana	*Oroxylum indicum*	Bignoniaceae
75	Pipal	*Ficus religiosa*	Moraceae
76	Saguan	*Tectona grandis*	Verbenaceae
77	Sahaj	*Terminalia tomentosa*	Combretaceae
78	Sal	*Shorea robusta*	Dipterocarpaceae
79	Salai	*Boswellia serrata*	Burseraceae
80	Sidha	*Lagerostreemia parviflora*	Lythraceae
81	Sahada	*Streblus asper*	Moraceae
82	Salap	*Caryota urens*	Arecaceae
83	Semul	*Bombax ceiba*	Bombacaceae
84	Siris	*Alibizzia lebbek*	Mimosaceae
85	Sunajhari	*Acacia auriculaeformis*	Mimosaceae
86	Sunari	*Cassia fistula*	Caesalpilnisceae
87	safed siris	*Albizia prosera*	Mimosaceae
88	Sisoo	*Dalbergia sissoo*	Fabaceae
89	Tal	*Borassus flabellifer*	Arecaceae
90	Tangini	*Xylia xylocarpa*	Mimosaceae

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91	Telkeruhan	*Ixora parviflora*	Rubiaceae
92	Toon	*Cedrela toona*	Meliaceae
93	Tentuli	*Tamarindus indica*	Caesalpiniaceae

FLORA (HERBS AND SHRUBS)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Amada/Ama-haldi	*Curcuma amada*	Zingiberaceae
2	Anata-mula	*Hemidesnus indicus*	Asclepiadaceae
3	Arakha(arka)	*Caltropis procera*	Solanaceae
4	Ashwagandha	*Withania somnifera*	Annonaceae
5	Ata/Seetaphal	*Annona squamosa*	Euphorbiaceae
6	Bana kadali	*Musa superba*	Dioscoreaceae
7	Bana Haldi	*Curcuma spp*	Scitamineae
8	Bana Khajuri	*Phoenix acaulis*	Arecaceae
9	Begunia	*Vitex negundo*	Rutaceae
10	Baigaba	*Jatropha curcas*	Lamiaceae
11	Bana-tulasi	*Ocimum gratissimum*	Rhamnaceae
12	Barkoli	*Ziziphus mauritiana*	Acanthaceae
13	Basanga	*Justicia adhatoda*	Solanaceae
14	Bhejibaigana(Ankaranti)	*Solanum xanthocarpum*	Acanthaceae
15	Bhuin-Nim(Chirecta)(Kala-megh)	*Andrographis paniculata*	Rutaceae
16	Bhursunga(Mirsingapattra)	*Murraya koenigii*	Asteraceae
17	Bisalya-Karani/Bhumi poksungo	*Tridax procumbens*	Acanthaceae
18	Chaubhua	*Glycosmis pentaphylla*	Rutaceae
19	Chireita	*Andrographis paniculata*	Asteraceae
20	Das karanta	*Barleria prionites*	Scanthaceae
21	Datura(Duddura)	*Datura stramonium*	Solanaceae
22	Dhatiki	*Woodfordia fructicosa*	Lythraceae
23	Gangasiuli(gotikhadika)	*Nyctanthes arbor-trsitis*	Oleaceae
24	Girli	*Indigofera pulchella*	Fabaceae
25	Gudamari	*Gymnema Sylvestre*	Apocynaceae
26	Kanteikoli	*Ziziphus oenoplia*	Rhamnaceae
27	Khakada(Kakali)	*Casearia tomentosa*	Flacourtiaceae
28	Kuradu	*Gardenia gummifera*	Rubiaceae
29	Kurei/Kurmi	*Holarrhena antidysenterica*	Apocynaceae
30	Lajkuli	*Mimosa pudica*	Mimosaceae
31	Mudimudika	*Helicteres isora*	Sterculiaceae
32	Mehandi(Manjuati)	*Lawsonia inermis*	Lythraceae
33	Mohana(Pottua)	*Randia dumetorum*	Rubiaceae
34	Nagauiri(Nagaboiri)	*Lantana camara*	Verbenaceae
35	Nirgundi(Begunia)	*Vitex negundo*	Verbenaceae
36	Patala garuda	*Rauwolfia serpentina*	Apocynaceae
37	Pokosungha	*Ageratum conyzoides*	Asteraceae
38	Panidatun	*Flemengia chapper*	Papilonaceae
39	Satabari	*Asparagus reacemosus*	Liliaceae
40	Tilei	*Wendlandia exserta*	Rubiaceae
41	Salparni	*Desmodium gangeticum*	Papilonaceae

02/01/2024

FLORA (CLIMBERS)			
Sl No.	**LOCAL NAME**	**BOTANICAL NAME**	**FAMILY**
1	Atundi	*Combretum indicum*	Combretaceae
2	Baldanka	*Mucuna monosperma*	Papilonaceae
3	Gila	*Caesalpinia sepiaria*	Mimosaceae
4	Danturi	*Acacia pinnata*	Mimosaceae
5	Lata Palasa	*Butea superba*	Fabaceae
6	Madang	*Loranthus scurrula*	Loranthaceae
7	Muturi	*Smilax macrophylla*	Smilaceae
8	Nirmuli	*Cassutha rhipsalis*	Cassytha
9	Satawari	*Asperagus racemosus*	Liliaceae
10	Siali	*Bauhinia vahlii*	Caesalpiniaceae
FLORA (BAMBOO)			
Sl No.	**LOCAL NAME**	**BOTANICAL NAME**	**FAMILY**
1	Salia Bamboo	*Dendrocalamus strictus*	Poaceae
2	Daba Bamboo	*Bambusa arundinacea*	Poaceae
FLORA (GRASSES)			
Sl No.	**LOCAL NAME**	**BOTANICAL NAME**	**FAMILY**
1	Balunga	*Oryza rufipogon*	Poaceae
2	Duba(Dhubo)	*Cynodon dactylon*	Poaceae
3	Dhanawantari	*Cymbopogon citratus*	Poaceae
4	Mutha	*Cyperus rotundus*	Poaceae
5	Phool jhadu	*Thysanolaena maxima*	Poaceae
6	Ghodalanji	*Aristida setacea*	Poaceae
7	Gunguvhia	*Chrysopogon gryllus*	Poaceae
8	Rosa grass	*Cymbopogon martinii*	Poaceae
FAUNA(MAMMALS)			
Sl No.	**LOCAL NAME**	**ENGLISH NAME**	**LATIN NAME**
1	Balia Kukura	Wild dog or Dholes	*Cuon alpinus*
2	Bajrakapta	Pangolins	*Manis crassicaudata*
3	Banbiradi	Jungle cat	*Felis chaus*
4	Barha	Wild boar	*Sus scrofa*
5	Bhalu	Sloth bear	*Melursus ursinus*
6	Bilua	Jackal	*Canis aureus*
7	Chausingha	The Four Horned antelope	*Tetracerus quadricornis*
8	Gunduchimusa	5 stripped palm squirrel	*Funambulus pennanti*
9	Harina	Spotted deer	*Axis axis*
10	Heta Bagha	Hyaena	*Hyaena hyaena*
11	Gadhia	Hyaena	*Hyaena hyaena*
12	Jhinka	Porcupine	*Hystrix indica*
13	Kalarapatria Bagha	Leopard (panther)	*Panthera pardus*
14	Kokisiali	Fox	*Vulpes bengalinsis*
15	Kutura	Barking deer	*Muntiacus muntjak*
16	Mankada (Hanu)	Langur	*Presbytis entellus*
17	Mankada(Pati)	Rhesus monky	*Macaca mulatta*
18	Mankada (Grey)	Northen pleins grey langur	*Semnoeithecus entellus*
19	Neula(Hatia)	Common mongoose	*Herpestes edwardsii*
20	Odha	Smooth Indian otter	*Lutra perspicillata*
21	Ramsiali	Wolf	*Canis lupus*
22	Saliapatni	Small Indian Civet	*Viverrivula indica*

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23	Saliapatni	Large Indian Civet	*Viverrazibekha*
24	Saliapatni	Common palm Civet	*Paratoxurushermathroditus*
25	Sambar	Sambar	*Cervus unicolor*
26	Thekua	Hare	*Lepus nigricollis*
27	House mouse	House mouse	*Musculus*
28	Indian bush rat	Indian bush rat	*Golunda ellioti*
29	Badudi	Short nosed Fruit bat	*Cynopterus sphinx*
30	Bilua	Golden Jackle	*Canis aureus*

FAUNA(SNAKES)

Sl No.	LOCAL NAME	ENGLISH NAME	LATIN NAME
1	Ajagarh	Indian python	*Python molurus*
2	Boda	Indian wolf snake	*Lycodon aulicus*
3	Chandan Boda	Russell's viper	*Vipera ruseelli*
4	Chiti	Common Inian krait	*Bungarus caeruleus*
5	Dhamana	Rat snake	*Ptyas mucosa*
6	Dhandaboda	Russels viper	*Viper russell's*
7	Naga (Gokhar)	Indian cobra	*Naja species*
8	Bahurupi	Garden gecko	*Calotes versicolor*
9	Champaineul	Skink	*Mabuya biborni*
10	Endua	Rock gecko	*Hemidactylus lescenaulti*
11	Mugger	Crocodile (Mugger)	*Crocodylus palustris*
12	Panidhanda	Checkeered keel back	*Natrix piscator*
13	Rana	krait	*Bungarus candidus*

FAUNA-FISHES (FRESH WATER)

Sl No.	LOCAL NAME	LATIN NAME
1	Balia	*Walagonia attu*
2	Bhakur	*Catla catla*
3	Chenga	*Ophiocaphalus gachua*
4	Dandkiri	*Esomus danricus*
5	Gadisa	*Ophiocaphalus punctatus*
6	Kerandi	*Barbusam Basis*
7	Kou	*Anabas tistudineus*
8	Magura	*Clarias batrachus*
9	Mahurali	*Amblypharyngodon mola*
10	Mirakali	*Cirrbina mrigala*
11	Pohale (Chuna)	*Verbena reba*
12	Rohi	*Labeo rohita*
13	Singi	*Heteropneustes fossilis*

FAUNA (BIRDS)

Sl No.	LOCAL NAME	ENGLISH NAME	LATIN NAME
1	Baga	Cattle egret	*Bubulcus ibis*
2	Banakukuda	Red jungle fowl	*Gallus gallus*
3	Bani	Myna Indian	*Acridotheres tristis*
4	Bataka	Common teal	*Anas crecca*
5	Baya	Baya weaver bird	*Ploceus philippinus*
6	Bhadbhadalia	Roller or blue jay	*Coracias benghalensis*
7	Bhrungaraja	Drongo rocket tailed	*Dicrurus paradiseus*
8	Bulbul or Gobrachadhei	Bulbul (Red vented)	*Pycnonotus cafer*
9	Chatak	Cuckoo pied crested	*Clamator jacobinus*
10	Chakua-chakoi	Duck Ruddy Sheldrake	*Casarca ferrigines*
11	Damara kau	Crow jungle	*Corvus macrorhynchos*

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12	Deuliapara	Pigeon Bluerock	*Columba livia (Gmelin)*
13	Gandalia	Stork openbilled	*Anostomus oscitans*
14	Gharchatia	Indian house sparrow	*Passer domesticus*
15	Ghukalika	Myna peid	*Sturuns contra*
16	Gunduri	Common Quail	*Coturnix coturnix*
17	Haladibasanta	Indian golden oriole	*Oriolus kundoo*
18	Hansa	Spotbilled Duck	*Anas poecilorhyncha*
19	Kajalapati	Black drongo or kingcrow	*Dicrurus macrocerus*
20	Kantiabaga	Heron pond or paddy bird	*Ardeola grayii*
21	Kapota	Indian spotted dove	*Streptopelia chinensis*
22	Kathakhumpa	Woodpecker	*Picoides nanus*
23	Kau	House crow	*Corvus splendens*
24	Koili	Cuckoo Indian	*Cuculus micropeterus*
25	Machharanka	King Fisher	*Alcedo attahis bengalensis*
26	Mayur	Peofowl	*Pavo cristastus*
27	Nilkantha	Robin magpie	*Ceryle rudis*
28	Panikua	Cormorant little	*Phalacrocorax niger*
29	Pecha	Spotted owlet	*Athene brama*
30	Phutki	Tailor bird	*Orthotonus sutorius*
31	Saguna	Vulture white backedor	*Gyps bengalensis*
32	Sankhachilla	Kite Brahminy	*Haliastur indus*
33	Sari	Hill myna	*Gracula religiosa*
34	Sua	Indian Parakeet	*Psittacula eupatria*

ZONE OF INFLUENCE:

FLORA (COMMON TREES)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Amba	*Mangifera indica*	Anacardiaceae
2	Aata	*Annona squamosal*	Annonaceae
3	Ashoka	*Saraca asaca*	Caesalpinlaceae
4	Ankula	*Alangium salvifolium*	Alangiaceae
5	Amla	*Emblica officianlis*	Euphorbiaceae
6	Arjun	*Terminalia arjuna*	Combretaceae
7	Asan	*Terminalia tomentosa*	Combretaceae
8	Bara	*Ficus bengalensis*	Moraceae
9	Bela	*Aegle marmelos*	Rutaceae
10	Bahada	*Terminalia bellerica*	Combretaceae
11	Bandhan	*Ougeinia oogeinensis*	Fabaceae
12	Babul	*Acacia areabica*	Mimosaceae
13	Barang	*Kydia calycina*	Mimosaceae
14	Baldia	*Erythrina suberosa*	Fabaceae
15	Barada	*Bauhinia purpurea*	Leguminasae Caesalpinieae
16	Behanta	*Limonia acidissima*	Rutaceae
17	Berimanj	*Casaeria tomentosa*	Passiflorales
18	Bhalia	*Semicarpus anacardium*	Anacardiaceae
19	Bija	*Pterocarpus marsupium*	Fabaceae
20	Bheru	*Cholroxylon swietenia*	Rutaceae
21	Chakunda (Bada)/ Rain tree	*Samanea saman*	Mimosaceae
22	Champa	*Michelia champaca*	Magnoliaceae
23	Chadeigudi	*Vitex peduncularis*	Verbenaceae
24	Chhatiana	*Alstonia scholaris*	Apocynaceae

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25	Chakunda	*Cassia siamea*	Mimosaceae
26	Dhaura	*Anogeissus latifolia*	Combretaceae
27	Dhaman	*Grewia tiliaefolia*	Tiliaceae
28	Damkurudu	*Gardenia latifolia*	Rubiaceae
29	Dhala siris	*Albizzia procera*	leguminesae Miniseae
30	Dhobin	*Dalbergia paniculata*	Papilonaceae
31	Dhaman	*Grewia tiliaefolia*	Tiliaceae
32	Dhaura	*Anogeissus latifolia*	Com bretaceae
33	Dimiri	*Ficus glomerata*	Moraceae
34	Gamhari	*Gmelina arborea*	Verbenaceae
35	Giringa	*Pterospermum heyneamum*	Sterculiaceae
36	Gandha Palas	*Miliusa tomentosa*	Annocaceae
37	Ghanto	*Zizyphus globerrina*	Rhamnaceae
38	Gharalanja	*Albizzia stipulatta*	leguminesae Miniseae
39	Gohira	*Acacia leucophloea*	Mimosaceae
40	Gharanim	*Ailanthus excels*	Melinceae
41	Haldi	*Diospyros montana*	Ebenaceae
42	Haldu (Halamda)	*Adina cordifolia*	Rubiaceae
43	Harida	*Terminalia chebula*	Combretaceae
44	Jamun	*Syzygium cumini*	Mytraceae
45	Kadamba	*Anthocephalus kadamba*	Rubiaceae
46	Kaitho	*Feronia elephantum*	Rutaceae
47	Kaju (Lanka Badam)	*Anacardium occidentale*	Anacardiaceae
48	Kalchua	*Glochidion lanceolarium*	Auphorbiaceae
49	Kamalagundi	*Mallotus philippenensis*	Auphorbiaceae
50	Kansa	*Hymendictyon excelsum*	Rubiaceae
51	Khekad	*Garuga pinnata*	Burseraceae
52	Kochila	*Strychnos nux-vomica*	Strychnaceae
53	Kumbhi	*Careya arborea*	Myrtaceae
54	Kanchan	*Bauhinia variegata*	Caesalpinlaceae
55	Karanja	*Pongamia pinnata*	Fabaceae
56	Karda	*Cleistanthus collinus*	Euphorbiaceae
57	Kasi	*Bridelia retusa*	Euphorbiaceae
58	Kendu	*Diospyros melanoxylon*	Ebanaceae
59	Khaira	*Acacia catechu*	Mimosaceae
60	Kusum	*Schleichera oleosa*	Sapindaceae
61	Mahul	*Madhuca indica*	Sapotaceae
62	Mankadakendu	*Diospyros malabarica*	Ebenaceae
63	Neem / Limba	*Azadirachta indica*	Meliaceae
64	Panigambhar	*Trewia nudiflora*	Auphorbiaceae
65	Phasi	*Anogeissus accuminata*	Combretaceae
66	Pahadi sisoo	*Dalbergia latifolia*	Fabaceae
67	Palasa	*Butea monsperma*	Fabaceae
68	Panasa	*Artocarpus heterophyllus*	Moraceae
69	Phanaphana`	*Oroxylum indicum*	Bignoniaceae
70	Pipal	*Ficus religiosa*	Moraceae
71	Radhachuda	*Peltophorum ferrugieum*	Caesalpiniaceae
72	Saguan	*Tectona grandis*	Verbenaceae
73	Salai	*Boswellia serrata*	Burseraceae
74	Sidha	*Lagerostreemia parviflora*	Lythraceae
75	Sahada	*Streblus asper*	Moraceae

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76	Salap	*Caryota urens*	Arecaceae
77	Semul	*Bombax ceiba*	Bombacaceae
78	Siris	*Alibizzia lebbek*	Mimosaceae
79	Sunajhari	*Acacia auriculaeformis*	Mimosaceae
80	Safed siris	*Albizzia procera*	Mimosaceae
81	Sahaj	*Terminalia tomentosa*	Combretaceae
82	Sal	*Shorea robusta*	Dipterocarpaceae
83	Sennha (Sidha)	*Legarstroemia parvifolia*	Lythraceae
84	Sissoo (Bali)	*Dalbergia sissoo*	Fabaceae
85	Sunari	*Cassia fistula*	Caesalpiniaceae
86	Tal	*Borassus flabellifer*	Arecaceae
87	Tangini	*Xylia xylocarpa*	Mimosaceae
88	Telkeruhan	*Lxora parviflora*	Rubiaceae
90	Toon	*Cedrela toona*	Meliaceae
91	Tentuli	*Tamarindus indica*	Caesalpiniaceae

FLORA (HERBAS AND SHRUBS)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Amada/ Ama-haldi	*Curcuma amada*	Zingibereceae
2	Arakha (arka)	*Calotropis procera*	Asclepiadaceae
3	Ata/Seetaphal	*Annona squamosal*	Annonaceae
4	Bana kadali	*Musa superba*	Dioscoreaceae
5	Bana Haldi	*Curcuma spp*	Scitamineae
6	Bana Khajuri	*Phoenix acaulis*	Arecaceae
7	Begunia	*Vitex negundo*	Rutaceae
8	Baigaba	*Jatropha curcas*	Euphorbiaceae
9	Bana-tulasi	*Ocimum gratissimum*	Lamiaceae
10	Ban-Khajuri	*Phoenix acaulis*	Arecaceae
11	Barkoli	*Ziziphus mauritiana*	Rhamnaceae
12	Basanga	*Justicia adhatoda*	Acenthaceae
13	Bhuin-Nim(Chirecta)(Kala-megh)	*Andrographis paniculata*	Acenthaceae
14	Bhursunga (Mirsingapattra)	*Murraya koenigii*	Rutaceae
15	Bisalya-karani/Bhumi poksungo	*Tridax procumbens*	Asteraceae
16	Bisiripi/Bajramuli	*Sida cordifolia*	Malvaceae
17	Chaubhua	*Glycosmis pentaphylla*	Rutaceae
18	Chireita	*Andrographis paniculata*	Asteraceae
19	Das karanta	*Barleria prionites*	Scanthaceae
20	Datura (Duddura)	*Datura stramonium*	Solanaceae
21	Dhatiki	*Woodfordia fruticosa*	Lythraceae
22	Gangasiuli (Gorikhadika)	*Nyctanthes arborteitis*	Oleaceae
23	Girlli	*Indigofere pulchela*	Fabaceae
24	Gudamari	*Premna herbacea*	Verbenaceae
25	Hansalata	*Aristolochia bracteata*	Aristolochiaceae
26	Kanteikoli	*Ziziphus oenoplea*	Rhamnaceae
27	Khakada (Kakali)	*Casearia tomentosa*	Flacouriaceae
28	Khuradu	*Gardenia gummifera*	Rubiaceae
29	Kundo-phul	*Jasminum humile*	Oleaceae
30	Kurei/Kurmi	*Holarrhena antidysenterica*	Apocynaceae
31	Lajkuli	*Mimosa pudica*	Mimosaceae
32	Mudimudika	*Helicteres isora*	Sterculiaceae
33	Mehandi(Manjuati)	*Lawsonia inermis*	Lytharaceae
34	Patala garuda	*Rauwolfia serpentina*	Apocynaceae

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35	Pokosungha	*Ageratum conyzoides*	Asteraceae
36	Panidatun	*Flemengia chapper*	Papilonaceae
37	Satabari	*Asparagus reacemosus*	Liliaceae
38	Tilei	*Wendlandia exserta*	Rubiaceae
39	Salparni	*Desmodium gangeticum*	Papilonaceae

FLORA (CLIMBERS)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Atundi	*Combretum decandrum*	Combretaceae
2	Gila	*Caesalpinia sepiaria*	Mimosaceae
3	Danturi	*Acacia pinnata*	Mimosaceae
4	Dantari (Nali-Kantia)	*Acacia sinuata*	Mimosaceae
5	Desi Alu	*Dioscorea deltoidea*	Dioscoreaceae
6	Muturi	*Smilax mocrophylla*	Smilaceae
7	Nirmuli	*Cassytha filiformis*	Cassytha
8	Satawari	*Asperagus recemosus*	Liliaceae
9	Siali	*Bauhinia vahlii*	Caesalpliniaceae

FLORA (BAMBOO)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Badia Bauns	*Bambusa nutans*	Poaceae
2	Daba Bamboo	*Bambusa arundinacea*	Poaceae
3	Banus (Salia Bamboo)	*Dedricalamus strictus*	Poaceae
4	Sundarkani	*Bambusa vulgaris*	Poaceae

FLORA (GRASSES)

Sl No.	LOCAL NAME	BOTANICAL NAME	FAMILY
1	Basana	*Bethriochoa pertma*	Poaceae
2	Chhana	*Imperata arundianaceae*	Poaceae
3	Dhanwaritari	*Cymbopogon flexuosus*	Poaceae
4	Duba (Dhubo)	*Cynodon dactylon*	Poaceae
5	Dhanawantari	*Cymbopogon citratus*	Poaceae
6	Mutha	*Cyperus rotundus*	Poaceae
7	Phool jhadu	*Thysanolaena maxima*	Poaceae
8	Jharu	*Arundinella setosa*	Poaceae
9	Kasatandi (Chadela)	*Saccharum spontaneum*	Poaceae
10	Rosa grass	*Cymbopogon matinii*	Poaceae
11	Sinkulia	*Heteropogon contortus*	Poaceae
12	Tandi (Kasatandi)	*Sacchrum spontaneum*	Poaceae

FAUNA

FAUNA (MAMMALS)

Sl No.	LOCAL NAME	ENGLISH NAME	LATIN NAME
1	Bajrakapta	Pangolin	*Manis crassicaudata*
2	Balia Kukura	Wild dog or Dholes	*Cuon alpinus*
3	Banabiradi	Jungle cat	*Felis chaus*
4	Barha	Wild bear	*Sus scrofa*
5	Bhalu	Sloth bear	*Melursus ursinus*
6	Cheetah Biradi	Leopard cat	*Felis bengalensis*
7	Chausingha	The Four Horned antelope	*Tetracerus quadricornis*
8	Gada Bhalu	Ratel	*Mellivora capensis*
9	Gunduchi Musa	3 Stripped palm squirrel	*Funambulus palmarum*
10	Harina	Spotted deer	*Axis axis*
11	Heta Bagha	Hyaena	*Hyaena hyaena*
12	Jhinka	Porcupine	*Hystrix Indica*

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13	Kutura	Barking deer	*Muntiacus muntijak*
14	Kalarapatria Bagha	Leopard (panther)	*Panthera pardus*
15	Kokisiali	Fox	*Vulpes bengalinsis*
16	Mankada (Hanu)	Langur	*Presbytis entellus*
17	Mankada (Pati)	Rhesus monkey	*Macaca mulatta*
18	Mankada (Grey)	Northen pleins grey langur	*Semnoeithecus entellus*
18	Neula(Hatia)	Common mongoose	*Herpeste sedwardsi*
19	Neula (Keji)	Small Indian Mongoose	*Herpestes auropunctatus*
20	Saliapatni	Large Indian Civet	*Viverrazibekha*
21	Saliapatni	Common palm Civet	*Paratoxurushermathroditus*
22	House mouse	House mouse	*Musculus*
23	Indian bush rat	Indian bush rat	*Golunda ellioti*
24	Badudi	Short nosed Fruit bat	*Cynopterus sphinx*
25	Bilua	Golden Jackle	*Canis aureus*
26	Odha	Smooth Indian otter	*Lutra perspicillata*
27	Saliapatni	Small Indian Civet	*Viverrivula indica*
28	Sambar	Sambar	*Cervus unicolor*
29	Thekua	Hare	*Lepus nigricollis*

FAUNA (SNAKES)

Sl No.	LOCAL NAME	ENGLISH NAME	LATIN NAME
1	Ahiraja	King cobra	*Ophiphagus hannh*
2	Ajagar	Indian Python	*Python molurus*
3	Boda	Indian wolf snake	*Lycodon aulicus*
4	Bahurupi	Garden gecko	*Calotes versicolor*
5	Chiti	Common Indian krait	*Bungarus caeruleus*
6	Champaineul	Skink	*Mabuya biborni*
7	Dhamana	Rat Snake	*Ptyas mucosa*
8	Dhandaboda	Russels' viper	*Viper russelli*
9	Endua	Rock gecko	*Hemidactylus lescenaulti*
10	Mugger	Crocodile (Mugger)	*Crocodylus palustris*
11	Kandanali	Tree snake	*Ahetulia spp.*
12	Naga (Gokhar)	Indian Cobra	*Naja tripudians*
13	Penidhanda	checkeered keel back	*Natrix piscator*
14	Rana	Krait	*Bungarus candidus*

FAUNA-FISHES (FRESH WATER)

Sl No.	LOCAL NAME	LATIN NAME
1	Balia	*Walagonia attu*
2	Bansapati	*Allia coha*
3	Bhakur	*Catla catla*
4	Chenga	*Ophiocaphalus gachua*
5	Dandkiri	*Esomus dandrica*
6	Gadisa	*Ophiocaphalus punctatus*
7	Kantia	*Myotus cavasius*
8	Kerandi	*Barbusam Bassis*
9	Kou	*Anabas tistudineus*
10	Magura	*Clarias batrachus*
11	Mahurali	*Amblypharyngodon mola*
12	Mirakali	*Cirrbina mrigala*
13	Pohale (Chuna)	*Virrbuna reba*
14	Pohale(Denga)	*Lebeo bata*
15	Rohi	*Lebeo rohita*

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16	Singi	*Heteropheustes fossilis*

FAUNA (BIRDS)

Sl No.	LOCAL NAME	ENGLISH NAME	LATIN NAME
1	Baga	Cattle egret	*Bubulcus ibis*
2	Banakukuda	Red jungle fowl	*Gallus gallus*
3	Bani	Myna Indian	*Acridotheres tristis*
4	Baya	Baya weaver bird	*Ploceus phillipinus*
5	Bataka	Common teal	*Anas crecca*
6	Bhadbhadalia	Roller or blue jay	*Coracias benghalenisis*
7	Bhrungaraja	Drongo rocket tailed	*Dicrus paradisens*
8	Bulbul or Gobrachadhei	Bulbul (Red vented)	*Pycnonotus cafer*
9	Chatak	Cuckoo pied crested	*Clamator jacobinus*
10	Chakua-chakoi	Duck Ruddy Sheldrake	*Casarca ferrigines*
11	Damara kau	Crow jungle	*Corvus macrorhynchos*
12	Deuliapara	Pigeon Bluerock	*Columba livia (Gmelin)*
13	Gandalia	Stork openbilled	*Anastomus oscitans*
14	Gharchatia	Indian house sparrow	*Passer domesticus*
15	Ghukalika	Pied Myna	*Sturnus contra*
16	Gunduri	Common Quail	*Coturnix coturnix*
17	Haladibasanta	Indian golden oriole	*Oriolus kundoo*
18	Hansa	Spotbilled Duck	*Anas poecilorhyncha*
19	Kajalapati	Black drongo or kingcrow	*Dicrurus macrocerus*
20	Kantiabaga	Heron pond or paddy bird	*Ardeola grayii*
21	Kapota	Indian spotted dove	*Streptopelia chinensis*
22	Kathakhumpa	Woodpecker	*Picoides nanus*
23	Kathakhumpa	Golden backed woodpecker	*Dinopium benghalense*
24	Kau	House crow	*Corvus splendens*
25	Koili	Indian Cuckoo	*Cuculus micropterus*
26	Kumbhatua	Crow pheasant	*Centropus sinensis*
27	Kunda	Common Babbler	*Turdoides caudata*
28	Machharanka	King Fisher	*Alcedo atthis bengalensis*
29	Mayur	Peofowl	*Pavo cristatus*
30	Pecha	Spotted owlet	*Athene brama*
31	Saguna	Vulture white backedor	*Gyps bengalensis*
32	Sankhachilla	Kite Brahminy	*Haliastur indus*
33	Sari	Hill myna	*Gracula religiosa*
34	Sua	Indian Parakeet	*Psittacula krameri*
35	Teetri	Grey patridge	*Francolinus pondicerianus*

06/01/2021

Divisional Forest Officer,
Nabarangpur Forest Division.

OFFICE OF THE DIVISIONAL FOREST OFFICER -CUM-WILDLIFE WARDEN, KORAPUT FOREST DIVISION, KORAPUT

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Letter No. 180 / **Dated.** 07/01/**/2021**

To

The Project Director,
(Ministry of Road Transport & highways)
Bada Sahi, Plot No.1187, Hilpatna,
Berhampur-760005 (Odisha).

Sub: - DPR of the Project under Bharatamala Pariyojna connecting Raipur to Vishakhapatnam Corridor from Odisha-Chhattisgarh Border (Near Kundei village) to Odisha-Andhra Pradesh Border (Near Ondarangi village) of Odisha State-Authentication of Flora & Fauna list for Core & Buffer Zone and Wildlife Map of the Project area for preparation of Site Specific Wildlife Conservation Plan of Bharatmala Pariyojna Project of NHAI.

Ref: - Your Letter No./NHAI/11012/16/Forest/2020/PIU/BER.128 dated 24.12.2020.

Sir,

Please find here with the list of Flora and Fauna of the Project area under Bharatmala Pariyojna connecting Raipur to Vishakhapatnam Corridor from Odisha- Chhattisgarh Border (Near Kundei village) to Odisha-Andhra Pradesh Border (Near Ondarangi village) duly authenticated by the undersigned.

Encl:- As above.

Yours faithfully,

07/01/2021
Divisional Forest Officer,
Koraput Division.

Memo No. 181 / Dated 07/01/2021
Copy forwarded to the Forest Range officer, Koraput and Semiliguda Range for information and necessary action.

07/01/2021
Divisional Forest Officer,
Koraput Division.

DETAIL LIST OF FLORA AND FAUNA

CORE ZONE: -

FLORA (COMMON TREES)

LOCAL NAME	BOTANICAL NAME	FAMILY
Amba	*Mangifera indica*	Anacardiaceae
Ankula	*Alangium lamarckii*	Alangiaceae
Ashoka	*Saraca asoca*	Caesalpinlaceae
Bahada	*Terminalia bellirica*	Combretaceae
Bandhan	*Desmodium oojeinensis*	Fabaceae
Baro	*Ficus benghalensis*	Moraceae
Barun	*Crateva religiosa/ C. nurvala*	Capparaceae
Belo	*Aegle marmelos*	Rutaceae
Bhalia	*Semecarpus anacardium*	Anacardiaceae
Behenta	*Limonia acidissima*	Rutaceae
Bheru	*Chloroxylon swietenia*	Rutaceae
Bija	*Pterocarpus marsupium*	Fabaceae
Chakunda (Bada)/Rain tree	*Samanea saman*	Mimosaceae
Chakundi	*Cassia siamea*	Caesalpinlaceae
Champa	*Michelia champaca*	Magnoliaceae
Char	*Buchanania lanzan*	Anacardiaceae
Chhatlan	*Alstonia scholaris*	Apocynaceae
Dhaman	*Grewia tiliifolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Com bretaceae
Dimiri	*Ficus glomerata*	Moraceae
Gambhari	*Gmelina arborea*	Verbenaceae
Giringa	*Pterospermum heyneamum*	Sterculiaceae
Gohira	*Acacia leucophloea*	Mimosaceae
Haldi	*Diospyros montana*	Ebenaceae
Haldu (Halamda)	*Haldina cordifolia*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae
Jamun	*Syzygium cumini*	Myrtaceae
Kadamba	*Anthocephalus cadamba*	Rubiaceae
Kaitho	*Feronia elephantum*	Rutaceae
Kaju(Lanka Badam)	*Anacardium occidentale*	Anacardiaceae
Kanchan	*Bauhinia variegata*	Caesalpiniaceae
Kansa	*Hymenodictyon excelsum*	Rubiaceae
Karanja	*Pongamia pinnata*	Fabaceae
Karda	*Cleistanthus collinus*	Euphorbiaceae
Kasi	*Bridelia retusa*	Euphorbiaceae
Kendu	*Diospyros melanoxylon*	Ebenaceae
Mai	*Garuga pinnata*	Burseraceae
Khaira	*Acacia catechu*	Mimosaceae
Khajuri	*Phoenix sylvestris*	Arecaceae

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Koniyari	*Cascabela thevetia*	Apocynaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Machhkund/Giringa	*Pterospermum heyneanum*	Sterculiaceae
Mahul	*Madhuca indica*	Sapotaceae
Mankadakendu	*Diospyros malabarica*	Ebenaceae
Moi	*Lannea coromandelica*	Anacardiaceae
Mundi	*Mitragyna parvifolia*	Rubiaceae
Neem/Limba	*Azadiracta indica*	Meliaceae
Pahadi sisoo	*Dalbergia latifolia*	Fabaceae
Palasa	*Butea monosperma*	Fabaceae
Panas	*Artocarpus heterophyllus*	Moraceae
Phasi	*Anogeissus accuminata*	Combretaceae
Phanaphana	*Oroxylum indicum*	Bignoniaceae
Pipal	*Ficus religiosa*	Moraceae
Radhachuda	*Peltophorum ferrugineum*	Caesalpiniaceae
Rai	*Dellenia pentagyna*	Dilleniaceae
Rithaphala (Muktamanja)	*Sapindus mucorosis*	Sapindaceae
Rohini	*Soymida febrifuga*	Meliaceae
Safed siris	*Albizzia procera*	Mimosaceae
Saguan (Teak)	*Tectona grandia*	Verbenaceae
Sahada	*Strebulus aspera*	Moraceae
Sahaja (Asan)	*Terminalia tomantosa*	Combretaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Salai	*Boswellia serrata*	Burseraceae
Sisoo	*Dalbergia sissoo*	Fabaceae
Sunari	*Cassia fistula*	Caesalpiniaceae
Tentuli	*Tamarindus indica*	Caesalpiniaceae
FLORA (HERBS AND SHRUBS)		
LOCAL NAME	**BOTANICAL NAME**	**FAMILY**
Amada/Ama-haldi	*Curcuma amada*	Zingiberaceae
Anata-mula	*Hemides musindicus*	Asclepiadaceae
Antia (Murmuria)	*Helicteres isora*	Sterculiaceae
Apamaranga	*Achyranthes aspera*	Amaranthaceae
Arakha(arka)	*Calotropis procera*	Asclepiadaceae
Ashwagandha	*Withanias omnifera*	Solanaceae
Ata/Seetaphal	*Annona squamosa*	Annonaceae
Baigaba	*Jatropha carcus*	Euphorbiaceae
Bana-tulasi	*Ocimum gratissimum*	Lamiaceae
Ban-Khajuri	*Phoenix acaulis*	Arecaceae
Barkoli	*Ziziphus mauritiana*	Rhamnaceae
Bhuin-Nim (Chirecta)(Kala-megh)	*Andrographis paniculata*	Acanthaceae
Bhursunga (Mirsingapattra)	*Murraya koenigii*	Rutaceae
Bisalya-karani/Bhúmi poksungo	*Tridax procumbens*	Asteraceae
Bisiripi/Bajramuli	*Sida cordifolia*	Malvaceae

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Brahmi/Thalkuni	*Hydrocotyle asiatica*	Apiaceae
Datura (Duddura)	*Datura stramonium*	Solanaceae
Dhatiki	*Woodfordia fructicosa*	Lythraceae
Gangasiuli (gotikhadika)	*Nyctanthes arbortriatis*	Oleaceae
Girli	*Indigofera pulchela*	Fabaceae
Gudamari	*Premna herbacea*	Verbenaceae
Mehandi(Manjuati)	*Lawsonia inermis*	Lythraceae
Mohana (Pottua)	*Randia dumetorum*	Rubiaceae
Nagauiri(Nagaboiri)	*Lantana camara*	Verbenaceae
Nirgundi (Begunia)	*Vitex negundo*	Verbenaceae
Palua/Bana-haidi	*Curcuma aromatica*	Zingiberaceae
Tulasi	*Ocimum zanctum*	Lamiaceae

FLORA(CLIMBERS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Arkawla	*Millettia auriculata*	Fabaceae
Atundi	*Combretum decandrum*	Combretaceae
Dantari (Nali-Kantia)	*Acacia sinuata*	Mimosaceae
Desi Alu	*Dioscorea deltoidea*	Dioscoreaceae
Dudhi-mal	*Cryptolepis buchananii*	Periplocaceae
Gunja (Kaincha)	*Abrus precatorius*	Fabaceae
Kalmi sag	*Ipomea reptans*	Convolvulaceae
KaruKando/Kulihakanda	*Dioscorea hispida*	Dioscoreaceae
Lata palasa	*Butea superba*	Fabaceae
Madang	*Loranthus scurrula*	Loranthaceae
Muturi	*Smilax macrophylla*	Smilaceae
Petchurimal(Torida)	*Ventilago madraspatana*	Rhamnaceae
Pitchuli/Kantamali	*Ventilago denticulata*	Rhamnaceae
Satawari	*Asperagusc racemosus*	Liliaceae
Siali	*Bauhinia vahlii*	Caesalpiniaceae

FLORA(BAMBOO)

LOCAL NAME	BOTANICAL NAME	FAMILY
Badia Bauns	*Bambusa nutans*	Poaceae
Bauns(Salia bamboo)	*Dendricalamus strictus*	Poaceae
TaledaBauns	*Bambusa tulda*	Poaceae

FLORA(GRASSES)

LOCAL NAME	BOTANICAL NAME	FAMILY
Balunga	*Oryza rufipogon*	Poaceae
Basana	*Bethriochoa pertma*	Poaceae
Chhana	*Imperata arundinaceae*	Poaceae
Dhanwaritari	*Cymbopogon flexuosus*	Poaceae
Duba (Dhubo)	*Cynodon dactylon*	Poaceae
Phulbadhun (PhutJhadu)	*Thysanolaena maxima*	Poaceae
PhuriPhuri	*Eragrostis unioloides*	Poaceae
Rosa grass	*Cymbopogon matinii*	Poaceae

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Sabai (Panasi)	*Eulaliopsis binata*	Poaceae
Sinkulia	*Heteropogon contortus*	Poaceae
Tandi (kasatandi)	*Saccharum spontaneum*	Poaceae

FAUNA(MAMMALS)			
LOCAL NAME	**ENGLISH NAME**	**LATIN NAME**	**SCHEDULE**
Banbiradi	Jungle cat	*Felis chaus*	II
Bhalu	Sloth bear	*Melursus ursinus*	I
Bilua	Jackal	*Canis aureus*	II
Gunduchimusa	5 stripped palm squirrel	*Funambulus pennanti*	IV
Heta Bagha	Hyaena	*Hyaena hyaena*	III
Jhinka	Porcupine	*Hystrix indica*	IV
Kutura	Barking deer	*Muntiacus muntijak*	III
Mankada (Hanu)	Monkey	*Presbytis entellus*	II
Mankada (Pati)	Rhesus monkey	*Macaca mulatta*	II
Neula	Common mongoose	*Herpestes edwardsi*	IV
Saliapatani	Small Indian civet	*Viverricula indica*	
Thekua	Hare	*Lepus nigricollis*	
FAUNA(SNAKES)			
LOCAL NAME	**ENGLISH NAME**	**LATIN NAME**	**SCHEDULE**
Ahiraja	King cobra	*Ophiphagus hannah*	II
Ajagara	Indian python	*Python molurus*	II
Chiti	Common Indian krait	*Bungarus caeruleus*	IV
Dhamana	Rat snake	*Ptyas mucosus*	II
Dhandaboda	Russels viper	*Viper russelli*	
Naga (Gokhar)	Indian cobra	*Naja naja*	II
Panidhanda	Checkeered keel back	*Natrix piscator*	II
Rana	Krait	*Bungarus candidus*	
FAUNA-FISHES (FRESH WATER)			
LOCAL NAME	**LATIN NAME**		
Balia	*Wallagonia attu*		
Bhakur	*Catla catla*		
Chenga	*Ophiocaphalus gachua*		
Dandkiri	*Esomus dandrica*		
Gadisa	*Ophiocaphalus punctatus*		
Kerandi	*Barbusam bassis*		
Kou	*Anabas tistudineus*		
Magura	*Clarias batrachus*		
Mahurali	*Amblypharyngodon mola*		
Mirakali	*Cirrhina mrigala*		
Pohale (chuna)	*Cirrbina reba*		
Rohi	*Labeo rohita*		

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Singi	*Heterophneustes fossilis*	
FAUNA(BIRDS)		
LOCAL NAME	**ENGLISH NAME**	**LATIN NAME**
Baga	Egret cattle	*Babulcus ibis*
Banakukuda	Jungle fowl red	*Gallus gallus*
Bani	Myna Indian	*Acridotheres tristris*
Baya	Baya weaver bird	*Ploceus phillipinus*
Bulbul or Gobrachadhei	Bulbul (red vented)	*Pyononotus cafer*
Chakua-chakoi	Duck Ruddy sheldrake	*Casarca ferrigines*
Chatak	Cuckoo pied crested	*Clamator jacobinus*
Damara kau	Crow jungle	*Corvus macrorhynchos*
Deuliapara	Pigeon Bluerock	*Columba livia (Gmelin)*
Gandalia	Stork openbilled	*Anostomus oscitans*
Gharchatia	Sparrow House	*Passer domesticus*
Haladibasanta	Oriole black headed	*Oriolus xanthornus*
Hansa	Duck Grey or spotbill	*Anas poecilorhyncha*
Kajalpati	Drongo black or King	*Dicrurus macrocerus*
Kantiabaga	Heron pond or paddy bird	*Ardeola grayili*
Kapota	Dove king	*Streptopelia decaocto*
Kapota	Dove spotted	*Streptopelia chinesnsis*
Kathkhumpa	Woodpecker	*Picoides nanus*
Kau	Crow house	*Corvuss plendens*
Koili	Cuckoo Indian	*Cuculus micropterus*
Kumbhatua	Crow pheasant	*Centopus sinensis*
Kunda	Babbler common	*Turdoides caudatus*
Machharanka	King fisher pied	*Ceryle rudis*
Mayur	Peafowl common	*Pavocristatus (Linnaeus)*
Panikua	Cormorant little	*Phalacrocorax niger*
Phutki	Tailor bird	*Orthotonus sutorius*
Saguna	Vulture white	*Gyps bengalensis*
Sankhachilla	Kite Brahminy	*Haliastur indus*
Sari	Myna hill	*Gracula religiosa*
Sua	Parakeet large indian	*Psittacula eupatria*
Peccha	Owlet spotted	*Athena brama*
Chataka	Pied crested cuckoo	*Clamator jacobinus*

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ZONE OF INFLUENCE: -

FLORA (COMMON TREES)		
LOCAL NAME	**BOTANICAL NAME**	**FAMILY**
Amba	*Mangifera indica*	Anacardiaceae
Ankula	*Alangium lamarckii*	Alangiaceae
Ashoka	*Saraca asoca*	Caesalpinlaceae
Bahada	*Terminalia bellirica*	Combretaceae
Bandhan	*Desmodium oojeinensis*	Fabaceae
Baro	*Ficus benghalensis*	Moraceae
Barun	*Crateva religiosa/ C. nurvala*	Capparaceae
Belo	*Aegle marmelos*	Rutaceae
Bhalia	*Semecarpus anacardium*	Anacardiaceae
Bheru	*Chloroxylon swietenia*	Rutaceae
Bija	*Pterocarpus marsupium*	Fabaceae
Chakunda (Bada)/Rain tree	*Samanea saman*	Mimosaceae
Chakundi	*Cassia siamea*	Caesalpinlaceae
Char	*Buchanania lanzan*	Anacardiaceae
Chhatian	*Alstonia scholaris*	Apocynaceae
Dhaman	*Grewia tiliifolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Com bretaceae
Dimiri	*Ficus glomerata*	Moraceae
Gambhari	*Gmelina arborea*	Verbenaceae
Giringa	*Pterospermum heyneamum*	Sterculiaceae
Gondaguria (Manda)	*Macaranga peltata*	Euphorbiaceae
Haldi	*Diospyros montana*	Ebenaceae
Haldu (Halamda)	*Haldina cordifolia*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae
Jamun	*Syzygium cumini*	Myrtaceae
Kaitho	*Feronia elephantum*	Rutaceae
Kaju(Lanka Badam)	*Anacardium occidentale*	Anacardiaceae
Kalasiris	*Albizia lebbeck*	Mimosaceae
Karanja	*Pongamia pinnata*	Fabaceae
Karda	*Cleistanthus collinus*	Euphorbiaceae
Kasi	*Bridelkjia retusa*	Euphorbiaceae
Kendu	*Diospyros melanoxylon*	Ebenaceae
Mai	*Garuga pinnata*	Burseraceae
Khaira	*Acacia catechu*	Mimosaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Machhkund/Giringa	*Pterospermum heyneanum*	Sterculiaceae
Mahul	*Madhuca indica*	Sapotaceae
Mankadakendu	*Diospyros malabarica*	Ebenaceae
Moi	*Lannea coromandelica*	Anacardiaceae
Mundi	*Mitragyna parvifolia*	Rubiaceae

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Neem/Limba	*Azadirachta indica*	Meliaceae
Pahadi sisoo	*Dalbergia latifolia*	Fabaceae
Palasa	*Butea monosperma*	Fabaceae
Panas	*Artocarpus heterophyllus*	Moraceae
Pipal	*Ficus religiosa*	Moraceae
Radhachuda	*Peltophorum ferrugineum*	Caesalpiniaceae
Rai	*Dellenia pentagyna*	Dilleniaceae
Rithaphala (Muktamanja)	*Sapindus mucorosis*	Sapindaceae
Rohini	*Soymida febrifuga*	Meliaceae
Safed siris	*Albizzia procera*	Mimosaceae
Saguan (Teak)	*Tectona grandia*	Verbenaceae
Sahada	*Strebulus aspera*	Moraceae
Sahaja(Asan)	*Terminalia tomantosa*	Combretaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Salap(Toddypalm)	*Caryot aurens*	Arecaceae
Semili	*Bombax ceiba*	Born bacaceae
Sennha (Sidha)	*Lagerstroemia parviflora*	Lythraceae
Sisoo	*Dalbergia sissoo*	Fabaceae
Sunajhari	*Acacia auriculiformia*	Mimosaceae
Sunari	*Cassia fistula*	Caesalpiniaceae
Tala	*Borassus flabellifer*	Arecaceae
Tangini	*Xylia xylocarpa*	Mimosaceae
Tentuli	*Tamarindus indica*	Caesalpiniaceae

FLORA (HERBS AND SHRUBS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Amada/Ama-haldi	*Curcuma amada*	Zingiberaceae
Anata-mula	*Hemidesmus indicus*	Asclepiadaceae
Antia (Murmuria)	*Helicteres isora*	Sterculiaceae
Apamaranga	*Achyranthes aspera*	Am aranthaceae
Arakha(arka)	*Calotropis procera*	Asclepiadaceae
Ashwagandha	*Withanias omnifera*	Solanaceae
Ata/Seetaphal	*Annona squamosa*	Annonaceae
Baigaba	*Jatropha carcus*	Euphorbiaceae
Bana-tulasi	*Ocimum gratissimum*	Lamiaceae
Ban-Khajuri	*Phoenix acaulis*	Arecaceae
Barkoli	*Ziziphus mauritiana*	Rhamnaceae
Basanga	*Justiciar adhatoda*	Acanthaceae
Bhant	*Clerodendron infortunatum*	Verbenaceae
BhejiBaigana(Ankaranti)	*Solanum xanthocarpum*	Solanaceae
Bhuin-Nim (Chirecta)(Kala-megh)	*Andrographis paniculata*	Acanthaceae
Bhursunga (Mirsingapattra)	*Murraya koenigii*	Rutaceae
Bisalya-karani/Bhumi poksungo	*Tridax procumbens*	Asteraceae
Bisiripi/Bajramuli	*Sida cordifolia*	Malvaceae
Brahmi/Thalkuni	*Hydrocotyle asiatica*	Apiaceae

Researcher

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Datura (Duddura)	*Datura stramonium*	Solanaceae
Dhatiki	*Woodfordia fructicosa*	Lythraceae
Gangasiuli (gotikhadika)	*Nyctanthes arbortriatis*	Oleaceae
Girli	*Indigofera pulchela*	Fabaceae
Gudamari	*Premna herbacea*	Verbenaceae
Hansalata	*Aristolochia bracteata*	Aristolochiaceae
Kanteikoli	*Zizyphus oenoplea*	Rharnnaceae
Khakada (Kakali)	*Casearia tomentosa*	Flacourtiaceae
Khuradu	*Gardenia gummifera*	Rubiaceae
Kundo-phul	*Jasminum humile*	Oleaceae
Kurei/Kurmi	*Holarrhena antidysenterica*	Apocynaceae
Mehandi(Manjuati)	*Lawsonia inermis*	Lythraceae
Mohana (Pottua)	*Randia dumetorum*	Rubiaceae
Nagauiri(Nagaboiri)	*Lantana camara*	Verbenaceae
Nirgundi (Begunia)	*Vitex negundo*	Verbenaceae
Palua/Bana-haidi	*Curcuma aromatica*	Zingiberaceae
Simakoina	*Pithecellobium dulce*	Mimosaceae

FLORA(CLIMBERS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Arkawla	*Millettia auriculata*	Fabaceae
Atundi	*Combretum decandrum*	Combretaceae
Dantari (Nali-Kantia)	*Acacia sinuata*	Mimosaceae
Desi Alu	*Dioscorea deltoidea*	Dioscoreaceae
Dudhi-mal	*Cryptolepis buchananii*	Periplocaceae
Gilo	*Entada acandens/E.pursaitha*	Mimosaceae
Gunja (Kaincha)	*Abrus precatorius*	Fabaceae
Kalmi sag	*Ipomea reptans*	Convolvulaceae
KaruKando/Kulihakanda	*Dioscorea hispida*	Dioscoreaceae
Lata palasa	*Butea superba*	Fabaceae
Madang	*Loranthus scurrula*	Loranthaceae
Madhumalati	*Hiptage madablota*	Malpighiaceae
Meheriaphulo	*Gloriosa superba*	Liliaceae
Muturi	*Smilax macrophylla*	Smilaceae
Nirmuli	*Cassytha filiformis*	Cassytha
Petchurimal(Torida)	*Ventilago madraspatana*	Rhamnaceae
Pitchuli/Kantamali	*Ventilago denticulata*	Rhamnaceae
Satawari	*Asperagus racemosus.*	Liliaceae
Siali	*Bauhinia vahlii*	Caesalpiniaceae

FLORA(BAMBOO)

LOCAL NAME	BOTANICAL NAME	FAMILY
BadiaBauns	*Bambusa nutans*	Poaceae
Bauns(Salia bamboo)	*Dendricala musstrictus*	Poaceae

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Forest Ranger Officer
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DabaBauns (Kanta bamboo)	*Bambusa arundinacea*	Poaceae
Sundarkani	*Bambusa vulgaris*	Poaceae

FLORA(GRASSES)		
LOCAL NAME	**BOTANICAL NAME**	**FAMILY**
Balunga	*Oryza rufipogon*	Poaceae
Basana	*Bethriochoa pertma*	Poaceae
Chhana	*Imperata arundinaceae*	Poaceae
Dhanwaritari	*Cymbopogon flexuosus*	Poaceae
Duba (Dhubo)	*Cynodon dactylon*	Poaceae
Ghodalanji	*Aristida setacea*	Poaceae
Gondabena	*Bothriochloa bladhii*	Poaceae
Guguchia	*Chrysopogon gryllus*	Poaceae
Kasatandi (Chadeia)	*Saccharum spontaneum*	Poaceae
Khus-Khus (Bena)	*Vetiveria zizaniodes*	Poaceae
Phulbadhun (PhutJhadu)	*Thysanolaena maxima*	Poaceae
Rosa grass	*Cymbopogon matinii*	Poaceae
Sabai (Panasi)	*Eulaliopsis binata*	Poaceae
Sinkulia	*Heteropogon contortus*	Poaceae
Tandi (kasatandi)	*Saccharum spontaneum*	Poaceae

FAUNA(MAMMALS)		
LOCAL NAME	**ENGLISH NAME**	**LATIN NAME**
Banbiradi	Jungle cat	*Felis chaus*
Barha	Wild boar	*Sus scrofa*
Bhalu	Sloth bear	*Melursus ursinus*
Ramsiala	Jackal	*Canis aureus*
Gunduchimusa	3 stripped palm squirrel	*Funambulus palmarum*
Gunduchimusa	5 stripped palm squirrel	*Funambulus pennanti*
Jhinka	Porcupine	*Hystrix indica*
Kutura	Barking deer	*Muntiacus muntijak*
Mankada (Hanu)	Monkey	*Presbytis entellus*
Mankada (Pati)	Rhesus monkey	*Macaca mulatta*
Neula (Hatia)	Common mongoose	*Herpestes edwardsi*
Neula (Kuji)	Small Indian mongoose	*Herpestes auropunctatus*
Thekua	Hare	*Lepus nigricollis*

FAUNA(SNAKES)		
LOCAL NAME	**ENGLISH NAME**	**LATIN NAME**
Ahiraja	King cobra	*Ophiphagus hannah*
Ajagarh	Indian python	*Python molurus*
Chiti	Common Indian krait	*Bungarus caeruleus*
Dhamana	Rat snake	*Ptyas mucosus*
Dhandaboda	Russels viper	*Viper russelli*

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Researcher

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Koraput Forest Range
Koraput

Kandanali	Tree snake	*Ahetulla spp.*
Naga (Gokhar)	Indian cobra	*Naja species*
Panidhanda	Checkeered keel back	*Natrix piscator*
Rana	Krait	*Bungarus candidus*

FAUNA-FISHES (FRESH WATER)

LOCAL NAME	LATIN NAME
Balia	*Wallagonia attu*
Bansapati	*Allia coha*
Bhakur	*Catla catla*
Chenga	*Ophiocaphalus gachua*
Dandkiri	*Esomus dandrica*
Gadisa	*Ophiocaphalus punctatus*
Jallah	*Chela argentea*
Kantia	*Myotus cavasius*
Kerandi	*Barbusam bassis*
Kou	*Anabas tistudineus*
Magura	*Clarias batrachus*
Mahurali	*Amblypharyngodon mola*
Mirakali	*Cirrhina mrigala*
Pohale (chuna)	*Cirrbina reba*
Pohale (Denga)	*Labeo bata*
Rohi	*Labeo rohita*
Singi	*Heterophneustes fossilis*

FAUNA(BIRDS)

LOCAL NAME	ENGLISH NAME	LATIN NAME
Baga	Egret cattle	*Babulcus ibis*
Banakukuda	Jungle fowl red	*Gallus gallus*
Bani	Myna Indian	*Acridotheres tristris*
Baya	Baya weaver bird	*Ploceus phillipinus*
Bhadbhadalia	Roller or blue jay	*Coracias benghalenisis*
Bhrungaraja	Drongo rocket tailed	*Dicrurus paradisens*
Bulbul or Gobrachadhei	Bulbul (red vented)	*Pyononotus cafer*
Chakua-chakoi	Duck Ruddy sheldrake	*Casarca ferrigines*
Chatak	Cuckoo pied crested	*Clamator jacobinus*
Damara kau	Crow jungle	*Corvus macrorhynchos*
Deuliapara	Pigeon Bluerock	*Columba livia (Gmelin)*
Gandalia	Stork openbilled	*Anostomus oscitans*
Gharchatia	Sparrow House	*Passer domesticus*
Ghukalika	Myna pied	*Sturnus contra*
Haladibasanta	Oriole black headed	*Oriolus xanthornus*
Hansa	Duck Grey or spotbill	*Anas poecilorhyncha*
Kajalpati	Drongo black or King crow	*Dicrurus macrocerus*
Kantiabaga	Heron pond or paddy bird	*Ardeola grayili*

Sunil Kumar Dash
Researcher

Forest Range Officer
Koraput Forest Range
Koraput

Kapota	Dove king	*Streptopelia decaocto*
Kathkhumpa	Woodpecker	*Picoides nanus*
Kathkhumpa	Woodpecker golden backed	*Dinopium benghalense*
Kau	Crow house	*Corvus splendens*
Koili	Cuckoo Indian	*Cuculus micropterus*
Kumbhatua	Crow pheasant	*Centopus sinensis*
Kunda	Babbler common	*Turdoides caudatus*
Machharanka	King fisher pied	*Ceryle rudis*
Mayur	Peafowl common	*Pavo cristatus (Linnaeus)*
Nilkantha	Robin magpie	*Copsychus saularis*
Panikua	Cormorant little	*Phalacrocorax niger*
Phutki	Tailor bird	*Orthotonus sutorius*
Saguna	Vulture white backedor	*Gyps bengalensis*
Sankhachilla	Kite Brahminy	*Haliastur indus*
Sari	Myna hill	*Gracula religiosa*
Sua	Parakeet large indian	*Psittacula eupatria*
Teetiri	Patridge grey	*Francolinus pondicerianus*

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Koraput

Divisional Forest Officer
Koraput Forest Division

DETAIL LIST OF FLORA AND FAUNA

CORE ZONE: -

FLORA (COMMON TREES)		
LOCAL NAME	**BOTANICAL NAME**	**FAMILY**
Amba	*Mangifera indica*	Anacardiaceae
Ankula	*Alangium lamarckii*	Alangiaceae
Ashoka	*Saraca asoca*	Caesalpinlaceae
Bahada	*Terminalia bellirica*	Combretaceae
Bandhan	*Desmodium oojeinensis*	Fabaceae
Baro	*Ficus benghalensis*	Moraceae
Barun	*Crateva religiosa/ C. nurvala*	Capparaceae
Belo	*Aegle marmelos*	Rutaceae
Bhalia	*Semecarpus anacardium*	Anacardiaceae
Behenta	*Limonia acidissima*	Rutaceae
Bheru	*Chloroxylon swietenia*	Rutaceae
Bija	*Pterocarpus marsupium*	Fabaceae
Chakunda (Bada)/Rain tree	*Samanea saman*	Mimosaceae
Chakundi	*Cassia siamea*	Caesalpinlaceae
Champa	*Michelia champaca*	Magnoliaceae
Char	*Buchanania lanzan*	Anacardiaceae
Chhatian	*Alstonia scholaris*	Apocynaceae
Dhaman	*Grewia tiliifolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Com bretaceae
Dimiri	*Ficus glomerata*	Moraceae
Gambhari	*Gmelina arborea*	Verbenaceae
Giringa	*Pterospermum heyneamum*	Sterculiaceae
Gohira	*Acacia leucophloea*	Mimosaceae
Haldl	*Diospyros montana*	Ebenaceae
Haldu (Halamda)	*Haldina cordifolia*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae
Jamun	*Syzygium cuminl*	Myrtaceae
Kadamba	*Anthocephalus cadamba*	Rublaceae
Kaitho	*Feronia elephantum*	Rutaceae
Kaju(Lanka Badam)	*Anacardium occidentale*	Anacardiaceae
Kanchan	*Bauhinia variegata*	Caesalpiniaceae
Kansa	*Hymenodictyon excelsum*	Rubiaceae
Karanja	*Pongamia pinnata*	Fabaceae
Karda	*Cleistanthus collinus*	Euphorbiaceae
Kasi	*Bridelia retusa*	Euphorbiaceae
Kendu	*Diospyros melanoxylon*	Ebenaceae
Mai	*Garuga pinnata*	Burseraceae
Khaira	*Acacia catechu*	Mimosaceae
Khajurl	*Phoenix sylvestris*	Arecaceae
Koniyari	*Cascabela thevetia*	Apocynaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Machhkund/Giringa	*Pterospermum heyneanum*	Sterculiaceae

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Mahul	*Madhuca indica*	Sapotaceae
Mankadakendu	*Diospyros malabarica*	Ebenaceae
Moi	*Lannea coromandelica*	Anacardiaceae
Mundi	*Mitragyna parvifolia*	Rubiaceae
Neem/Limba	*Azadiracta indica*	Meliaceae
Pahadi sisoo	*Dalbergia latifolia*	Fabaceae
Palasa	*Butea monosperma*	Fabaceae
Panas	*Artocarpus heterophyllus*	Moraceae
Phasi	*Anogeissus accuminata*	Combretaceae
Phanaphana	*Oroxylum indicum*	Bignoniaceae
Pipal	*Ficus religiosa*	Moraceae
Radhachuda	*Peltophorum ferrugineum*	Caesalpiniaceae
Rai	*Dellenia pentagyna*	Dilleniaceae
Rithaphala (Muktamanja)	*Sapindus mucorosis*	Sapindaceae
Rohini	*Soymida febrifuga*	Meliaceae
Safed siris	*Albizzia procera*	Mimosaceae
Saguan (Teak)	*Tectona grandia*	Verbenaceae
Sahada	*Strebulus aspera*	Moraceae
Sahaja (Asan)	*Terminalia tomantosa*	Combretaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Salai	*Boswellia serrata*	Burseraceae
Sisoo	*Dalbergia sissoo*	Fabaceae
Sunari	*Cassia fistula*	Caesalpiniaceae
Tentuli	*Tamarindus indica*	Caesalpiniaceae

FLORA (HERBS AND SHRUBS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Amada/Ama-haldi	*Curcuma amada*	Zingiberaceae
Anata-mula	*Hemides musindicus*	Asclepiadaceae
Antia (Murmuria)	*Helicteres isora*	Sterculiaceae
Apamaranga	*Achyranthes aspera*	Amaranthaceae
Arakha(arka)	*Calotropis procera*	Asclepiadaceae
Ashwagandha	*Withanias omnifera*	Solanaceae
Ata/Seetaphal	*Annona squamosa*	Annonaceae
Baigaba	*Jatropha carcus*	Euphorbiaceae
Bana-tulasi	*Ocimum gratissimum*	Lamiaceae
Ban-Khajuri	*Phoenix acaulis*	Arecaceae
Barkoli	*Ziziphus mauritiana*	Rhamnaceae
Bhuin-Nim (Chirecta)(Kala-megh)	*Andrographis paniculata*	Acanthaceae
Bhursunga (Mirsingapattra)	*Murraya koenigii*	Rutaceae
Bisalya-karani/Bhumi poksungo	*Tridax procumbens*	Asteraceae
Bisiripi/Bajramuli	*Sida cordifolia*	Malvaceae
Brahmi/Thalkuni	*Hydrocotyle asiatica*	Apiaceae
Datura (Duddura)	*Datura stramonium*	Solanaceae
Dhatiki	*Woodfordia fructicosa*	Lythraceae
Gangasiuli (gotikhadika)	*Nyctanthes arbortriatis*	Oleaceae
Girli	*Indigofera pulchela*	Fabaceae
Gudamari	*Premna herbacea*	Verbenaceae

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Mehandi(Manjuati)	*Lawsonia inermis*	Lythraceae
Mohana (Pottua)	*Randia dumetorum*	Rubiaceae
Nagauiri(Nagaboiri)	*Lantana camara*	Verbenaceae
Nirgundi (Begunia)	*Vitex negundo*	Verbenaceae
Palua/Bana-haidi	*Curcuma aromatica*	Zingiberaceae
Tulasi	*Ocimum zanctum*	Lamiaceae

FLORA(CLIMBERS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Arkawla	*Millettia auriculata*	Fabaceae
Atundi	*Combretum decandrum*	Combretaceae
Dantari (Nali-Kantia)	*Acacia sinuata*	Mimosaceae
Desi Alu	*Dioscorea deltoidea*	Dioscoreaceae
Dudhi-mal	*Cryptolepis buchananii*	Periplocaceae
Gunja (Kaincha)	*Abrus precatorius*	Fabaceae
Kalmi sag	*Ipomea reptans*	Convolvulaceae
KaruKando/Kulihakanda	*Dioscorea hispida*	Dioscoreaceae
Lata palasa	*Butea superba*	Fabaceae
Madang	*Loranthus scurrula*	Loranthaceae
Muturi	*Smilax macrophylla*	Smilaceae
Petchurimal(Torida)	*Ventilago madraspatana*	Rhamnaceae
Pitchuli/Kantamali	*Ventilago denticulata*	Rhamnaceae
Satawari	*Asperagusc racemosus*	Liliaceae
Siali	*Bauhinia vahlii*	Caesalpiniaceae

FLORA(BAMBOO)

LOCAL NAME	BOTANICAL NAME	FAMILY
Badia Bauns	*Bambusa nutans*	Poaceae
Bauns(Salia bamboo)	*Dendricalamus strictus*	Poaceae
TaledaBauns	*Bambusa tulda*	Poaceae

FLORA(GRASSES)

LOCAL NAME	BOTANICAL NAME	FAMILY
Balunga	*Oryza rufipogon*	Poaceae
Basana	*Bethriochoa pertma*	Poaceae
Chhana	*Imperata arundinaceae*	Poaceae
Dhanwaritari	*Cymbopogon flexuosus*	Poaceae
Duba (Dhubo)	*Cynodon dactylon*	Poaceae
Phulbadhun (PhutJhadu)	*Thysanolaena maxima*	Poaceae
PhuriPhuri	*Eragrostis unioloides*	Poaceae
Rosa grass	*Cymbopogon matinii*	Poaceae
Sabai (Panasi)	*Eulaliopsis binata*	Poaceae
Sinkulia	*Heteropogon contortus*	Poaceae
Tandi (kasatandi)	*Saccharum spontaneum*	Poaceae

FAUNA(MAMMALS)

LOCAL NAME	ENGLISH NAME	LATIN NAME	SCHEDULE
Banbiradi	Jungle cat	*Felis chaus*	II
Bhalu	Sloth bear	*Melursus ursinus*	I

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Bilua	Jackal	*Canis aureus*	II
Gunduchimusa	5 stripped palm squirrel	*Funambulus pennanti*	IV
Heta Bagha	Hyaena	*Hyaena hyaena*	III
Jhinka	Porcupine	*Hystrix indica*	IV
Kutura	Barking deer	*Muntiacus muntijak*	III
Mankada (Hanu)	Monkey	*Presbytis entellus*	II
Mankada (Pati)	Rhesus monkey	*Macaca mulatta*	II
Neula	Common mongoose	*Herpestes edwardsi*	IV
Saliapatani	Small Indian civet	*Viverricula indica*	
Thekua	Hare	*Lepus nigricollis*	

FAUNA(SNAKES)

LOCAL NAME	ENGLISH NAME	LATIN NAME	SCHEDULE
Ahiraja	King cobra	*Ophiphagus hannah*	II
Ajagara	Indian python	*Python molurus*	II
Chiti	Common Indian krait	*Bungarus caeruleus*	IV
Dhamana	Rat snake	*Ptyas mucosus*	II
Dhandaboda	Russels viper	*Viper russelli*	
Naga (Gokhar)	Indian cobra	*Naja naja*	II
Panidhanda	Checkeered keel back	*Natrix piscator*	II
Rana	Krait	*Bungarus candidus*	

FAUNA-FISHES (FRESH WATER)

LOCAL NAME	LATIN NAME
Balia	*Wallagonia attu*
Bhakur	*Catla catla*
Chenga	*Ophiocaphalus gachua*
Dandkiri	*Esomus dandrica*
Gadisa	*Ophiocaphalus punctatus*
Kerandi	*Barbusam bassis*
Kou	*Anabas tistudineus*
Magura	*Clarias batrachus*
Mahurali	*Amblypharyngodon mola*
Mirakali	*Cirrhina mrigala*
Pohale (chuna)	*Cirrbina reba*
Rohi	*Labeo rohita*
Singi	*Heterophneustes fossilis*

FAUNA(BIRDS)

LOCAL NAME	ENGLISH NAME	LATIN NAME
Baga	Egret cattle	*Babulcus ibis*
Banakukuda	Jungle fowl red	*Gallus gallus*
Bani	Myna Indian	*Acridotheres tristris*
Baya	Baya weaver bird	*Ploceus phillipinus*
Bulbul or Gobrachadhei	Bulbul (red vented)	*Pyononotus cafer*
Chakua-chakoi	Duck Ruddy sheldrake	*Casarca ferrigines*
Chatak	Cuckoo pied crested	*Clamator jacobinus*
Damara kau	Crow jungle	*Corvus macrorhynchos*
Deuliapara	Pigeon Bluerock	*Columba livia (Gmelin)*

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Gandalia	Stork openbilled	*Anostomus oscitans*
Gharchatia	Sparrow House	*Passer domesticus*
Haladibasanta	Oriole black headed	*Oriolus xanthornus*
Hansa	Duck Grey or spotbill	*Anas poecilorhyncha*
Kajalpati	Drongo black or King	*Dicrurus macrocerus*
Kantiabaga	Heron pond or paddy bird	*Ardeola grayili*
Kapota	Dove king	*Streptopelia decaocto*
Kapota	Dove spotted	*Streptopelia chinesnsis*
Kathkhumpa	Woodpecker	*Picoides nanus*
Kau	Crow house	*Corvuss plendens*
Koili	Cuckoo Indian	*Cuculus micropterus*
Kumbhatua	Crow pheasant	*Centopus sinensis*
Kunda	Babbler common	*Turdoides caudatus*
Machharanka	King fisher pied	*Ceryle rudis*
Mayur	Peafowl common	*Pavocristatus (Linnaeus)*
Panikua	Cormorant little	*Phalacrocorax niger*
Phutki	Tailor bird	*Orthotonus sutorius*
Saguna	Vulture white	*Gyps bengalensis*
Sankhachilla	Kite Brahminy	*Haliastur indus*
Sari	Myna hill	*Gracula religiosa*
Sua	Parakeet large indian	*Psittacula eupatrla*
Pecca	Owlet spotted	*Athena brama*
Chataka	Pied crested cuckoo	*Clamator jacobinus*

ZONE OF INFLUENCE: -

FLORA (COMMON TREES)		
LOCAL NAME	**BOTANICAL NAME**	**FAMILY**
Amba	*Mangifera indica*	Anacardiaceae
Ankula	*Alangium lamarckii*	Alangiaceae
Ashoka	*Saraca asoca*	Caesalpinlaceae
Bahada	*Terminalia bellirica*	Combretaceae
Bandhan	*Desmodium oojeinensis*	Fabaceae
Baro	*Ficus benghalensis*	Moraceae
Barun	*Crateva religiosa/ C. nurvala*	Capparaceae
Belo	*Aegle marmelos*	Rutaceae
Bhalia	*Semecarpus anacardium*	Anacardiaceae
Bheru	*Chloroxylon swietenia*	Rutaceae
Bija	*Pterocarpus marsupium*	Fabaceae
Chakunda (Bada)/Rain tree	*Samanea saman*	Mimosaceae
Chakundi	*Cassia siamea*	Caesalpinlaceae
Char	*Buchanania lanzan*	Anacardiaceae
Chhatian	*Alstonia scholaris*	Apocynaceae
Dhaman	*Grewia tiliifolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Com bretaceae
Dimiri	*Ficus glomerata*	Moraceae

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Gambhari	*Gmelina arborea*	Verbenaceae
Giringa	*Pterospermum heyneamum*	Sterculiaceae
Gondaguria (Manda)	*Macaranga peltata*	Euphorbiaceae
Haldi	*Diospyros montana*	Ebenaceae
Haldu (Halamda)	*Haldina cordifolia*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae
Jamun	*Syzygium cumini*	Myrtaceae
Kaitho	*Feronia elephantum*	Rutaceae
Kaju(Lanka Badam)	*Anacardium occidentale*	Anacardiaceae
Kalasiris	*Albizia lebbeck*	Mimosaceae
Karanja	*Pongamia pinnata*	Fabaceae
Karda	*Cleistanthus collinus*	Euphorbiaceae
Kasi	*Bridelkjia retusa*	Euphorbiaceae
Kendu	*Diospyros melanoxylon*	Ebenaceae
Mai	*Garuga pinnata*	Burseraceae
Khaira	*Acacia catechu*	Mimosaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Machhkund/Giringa	*Pterospermum heyneanum*	Sterculiaceae
Mahul	*Madhuca indica*	Sapotaceae
Mankadakendu	*Diospyros malabarica*	Ebenaceae
Moi	*Lannea coromandelica*	Anacardiaceae
Mundi	*Mitragyna parvifolia*	Rubiaceae
Neem/Limba	*Azadirachta indica*	Meliaceae
Pahadi sisoo	*Dalbergia latifolia*	Fabaceae
Palasa	*Butea monosperma*	Fabaceae
Panas	*Artocarpus heterophyllus*	Moraceae
Pipal	*Ficus religiosa*	Moraceae
Radhachuda	*Peltophorum ferrugineum*	Caesalpiniaceae
Rai	*Dellenia pentagyna*	Dilleniaceae
Rithaphala (Muktamanja)	*Sapindus mucorosis*	Sapindaceae
Rohini	*Soymida febrifuga*	Meliaceae
Safed siris	*Albizzia procera*	Mimosaceae
Saguan (Teak)	*Tectona grandia*	Verbenaceae
Sahada	*Strebulus aspera*	Moraceae
Sahaja(Asan)	*Terminalia tomantosa*	Combretaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Salap(Toddypalm)	*Caryot aurens*	Arecaceae
Semili	*Bombax ceiba*	Born bacaceae
Sennha (Sidha)	*Lagerstroemia parviflora*	Lythraceae
Sisoo	*Dalbergia sissoo*	Fabaceae
Sunajhari	*Acacia auriculiformia*	Mimosaceae
Sunari	*Cassia fistula*	Caesalpiniaceae
Tala	*Borassus flabellifer*	Arecaceae
Tangini	*Xylia xylocarpa*	Mimosaceae
Tentuli	*Tamarindus indica*	Caesalpiniaceae

FLORA (HERBS AND SHRUBS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Amada/Ama-haldi	*Curcuma amada*	Zingiberaceae

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Anata-mula	*Hemidesmus indicus*	Asclepiadaceae
Antia (Murmuria)	*Helicteres isora*	Sterculiaceae
Apamaranga	*Achyranthes aspera*	Am aranthaceae
Arakha(arka)	*Calotropis procera*	Asclepiadaceae
Ashwagandha	*Withanias omnifera*	Solanaceae
Ata/Seetaphal	*Annona squamosa*	Annonaceae
Baigaba	*Jatropha carcus*	Euphorbiaceae
Bana-tulasi	*Ocimum gratissimum*	Lamiaceae
Ban-Khajuri	*Phoenix acaulis*	Arecaceae
Barkoli	*Ziziphus mauritiana*	Rhamnaceae
Basanga	*Justiciar adhatoda*	Acanthaceae
Bhant	*Clerodendron infortunatum*	Verbenaceae
BhejiBaigana(Ankaranti)	*Solanum xanthocarpum*	Solanaceae
Bhuin-Nim (Chirecta)(Kala-megh)	*Andrographis paniculata*	Acanthaceae
Bhursunga (Mirsingapattra)	*Murraya koenigii*	Rutaceae
Bisalya-karani/Bhumi poksungo	*Tridax procumbens*	Asteraceae
Bisiripi/Bajramuli	*Sida cordifolia*	Malvaceae
Brahmi/Thalkuni	*Hydrocotyle asiatica*	Apiaceae
Datura (Duddura)	*Datura stramonium*	Solanaceae
Dhatiki	*Woodfordia fructicosa*	Lythraceae
Gangasiuli (gotikhadika)	*Nyctanthes arbortriatis*	Oleaceae
Girli	*Indigofera pulchela*	Fabaceae
Gudamari	*Premna herbacea*	Verbenaceae
Hansalata	*Aristolochia bracteata*	Aristolochiaceae
Kanteikoli	*Zizyphus oenoplea*	Rharnnaceae
Khakada (Kakali)	*Casearia tomentosa*	Flacourtiaceae
Khuradu	*Gardenia gummifera*	Rubiaceae
Kundo-phul	*Jasminum humile*	Oleaceae
Kurei/Kurmi	*Holarrhena antidysenterica*	Apocynaceae
Mehandi(Manjuati)	*Lawsonia inermis*	Lythraceae
Mohana (Pottua)	*Randia dumetorum*	Rubiaceae
Nagauiri(Nagaboiri)	*Lantana camara*	Verbenaceae
Nirgundi (Begunia)	*Vitex negundo*	Verbenaceae
Palua/Bana-haidi	*Curcuma aromatica*	Zingiberaceae
Simakoina	*Pithecellobium dulce*	Mimosaceae

FLORA(CLIMBERS)

LOCAL NAME	BOTANICAL NAME	FAMILY
Arkawla	*Millettia auriculata*	Fabaceae
Atundi	*Combretum decandrum*	Combretaceae
Dantari (Nali-Kantia)	*Acacia sinuata*	Mimosaceae
Desi Alu	*Dioscorea deltoidea*	Dioscoreaceae
Dudhi-mal	*Cryptolepis buchananii*	Periplocaceae
Gilo	*Entada acandens/E.pursaitha*	Mimosaceae
Gunja (Kaincha)	*Abrus precatorius*	Fabaceae
Kalmi sag	*Ipomea reptans*	Convolvulaceae
KaruKando/Kulihakanda	*Dioscorea hispida*	Dioscoreaceae

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Lata palasa	*Butea superba*	Fabaceae
Madang	*Loranthus scurrula*	Loranthaceae
Madhumalati	*Hiptage madablota*	Malpighiaceae
Meheriaphulo	*Gloriosa superba*	Liliaceae
Muturi	*Smilax macrophylla*	Smilaceae
Nirmuli	*Cassytha filiformis*	Cassytha
Petchurimal(Torida)	*Ventilago madraspatana*	Rhamnaceae
Pitchuli/Kantamali	*Ventilago denticulata*	Rhamnaceae
Satawari	*Asperagus racemosus.*	Liliaceae
Siali	*Bauhinia vahlii*	Caesalpiniaceae

FLORA(BAMBOO)

LOCAL NAME	BOTANICAL NAME	FAMILY
BadiaBauns	*Bambusa nutans*	Poaceae
Bauns(Salia bamboo)	*Dendricala musstrictus*	Poaceae
DabaBauns (Kanta bamboo)	*Bambusa arundinacea*	Poaceae
Sundarkani	*Bambusa vulgaris*	Poaceae

FLORA(GRASSES)

LOCAL NAME	BOTANICAL NAME	FAMILY
Balunga	*Oryza rufipogon*	Poaceae
Basana	*Bethriochoa pertma*	Poaceae
Chhana	*Imperata arundinaceae*	Poaceae
Dhanwaritari	*Cymbopogon flexuosus*	Poaceae
Duba (Dhubo)	*Cynodon dactylon*	Poaceae
Ghodalanji	*Aristida setacea*	Poaceae
Gondabena	*Bothriochloa bladhii*	Poaceae
Guguchia	*Chrysopogon gryllus*	Poaceae
Kasatandi (Chadeia)	*Saccharum spontaneum*	Poaceae
Khus-Khus (Bena)	*Vetiveria zizaniodes*	Poaceae
Phulbadhun (PhutJhadu)	*Thysanolaena maxima*	Poaceae
Rosa grass	*Cymbopogon matinii*	Poaceae
Sabai (Panasi)	*Eulaliopsis binata*	Poaceae
Sinkulia	*Heteropogon contortus*	Poaceae
Tandi (kasatandi)	*Saccharum spontaneum*	Poaceae

FAUNA(MAMMALS)

LOCAL NAME	ENGLISH NAME	LATIN NAME
Banbiradi	Jungle cat	*Felis chaus*
Barha	Wild boar	*Sus scrofa*
Bhalu	Sloth bear	*Melursus ursinus*
Ramsiala	Jackal	*Canis aureus*
Gunduchimusa	3 stripped palm squirrel	*Funambulus palmarum*
Gunduchimusa	5 stripped palm squirrel	*Funambulus pennanti*
Jhinka	Porcupine	*Hystrix indica*
Kutura	Barking deer	*Muntiacus muntijak*

Forester
Semiliguda Section

Forester
Pottangi Section

Forester
Sunki Section

Mankada (Hanu)	Monkey	*Presbytis entellus*
Mankada (Pati)	Rhesus monkey	*Macaca mulatta*
Neula (Hatia)	Common mongoose	*Herpestes edwardsi*
Neula (Kuji)	Small Indian mongoose	*Herpestes auropunctatus*
Thekua	Hare	*Lepus nigricollis*

FAUNA(SNAKES)

LOCAL NAME	ENGLISH NAME	LATIN NAME
Ahiraja	King cobra	*Ophiphagus hannah*
Ajagarh	Indian python	*Python molurus*
Chiti	Common Indian krait	*Bungarus caeruleus*
Dhamana	Rat snake	*Ptyas mucosus*
Dhandaboda	Russels viper	*Viper russelli*
Kandanali	Tree snake	*Ahetulla spp.*
Naga (Gokhar)	Indian cobra	*Naja species*
Panidhanda	Checkeered keel back	*Natrix piscator*
Rana	Krait	*Bungarus candidus*

FAUNA-FISHES (FRESH WATER)

LOCAL NAME	LATIN NAME
Balia	*Wallagonia attu*
Bansapati	*Allia coha*
Bhakur	*Catla catla*
Chenga	*Ophiocaphalus gachua*
Dandkiri	*Esomus dandrica*
Gadisa	*Ophiocaphalus punctatus*
Jallah	*Chela argentea*
Kantia	*Myotus cavasius*
Kerandi	*Barbusam bassis*
Kou	*Anabas tistudineus*
Magura	*Clarias batrachus*
Mahurali	*Amblypharyngodon mola*
Mirakali	*Cirrhina mrigala*
Pohale (chuna)	*Cirrbina reba*
Pohale (Denga)	*Labeo bata*
Rohi	*Labeo rohita*
Singi	*Heterophneustes fossilis*

FAUNA(BIRDS)

LOCAL NAME	ENGLISH NAME	LATIN NAME
Baga	Egret cattle	*Babulcus ibis*
Banakukuda	Jungle fowl red	*Gallus gallus*
Bani	Myna Indian	*Acridotheres tristris*
Baya	Baya weaver bird	*Ploceus phillipinus*
Bhadbhadalia	Roller or blue jay	*Coracias benghalenisis*
Bhrungaraja	Drongo rocket tailed	*Dicrurus paradisens*
Bulbul or Gobrachadhei	Bulbul (red vented)	*Pyononotus cafer*
Chakua-chakoi	Duck Ruddy sheldrake	*Casarca ferrigines*
Chatak	Cuckoo pied crested	*Clamator jacobinus*
Damara kau	Crow jungle	*Corvus macrorhynchos*

P.M. NHAS

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Pottangi Section

Forester
Sunki Section

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Semiliguda Forest Range

Deuliapara	Pigeon Bluerock	*Columba livia (Gmelin)*
Gandalia	Stork openbilled	*Anostomus oscitans*
Gharchatia	Sparrow House	*Passer domesticus*
Ghukalika	Myna pied	*Sturnus contra*
Haladibasanta	Oriole black headed	*Oriolus xanthornus*
Hansa	Duck Grey or spotbill	*Anas poecilorhyncha*
Kajalpati	Drongo black or King crow	*Dicrurus macrocerus*
Kantiabaga	Heron pond or paddy bird	*Ardeola grayili*
Kapota	Dove king	*Streptopelia decaocto*
Kathkhumpa	Woodpecker	*Picoides nanus*
Kathkhumpa	Woodpecker golden backed	*Dinopium benghalense*
Kau	Crow house	*Corvus splendens*
Koili	Cuckoo Indian	*Cuculus micropterus*
Kumbhatua	Crow pheasant	*Centopus sinensis*
Kunda	Babbler common	*Turdoides caudatus*
Machharanka	King fisher pied	*Ceryle rudis*
Mayur	Peafowl common	*Pavo cristatus (Linnaeus)*
Nilkantha	Robin magpie	*Copsychus saularis*
Panikua	Cormorant little	*Phalacrocorax niger*
Phutki	Tailor bird	*Orthotonus sutorius*
Saguna	Vulture white backedor	*Gyps bengalensis*
Sankhachilla	Kite Brahminy	*Haliastur indus*
Sari	Myna hill	*Gracula religiosa*
Sua	Parakeet large indian	*Psittacula eupatria*
Teetiri	Patridge grey	*Francolinus pondicerianus*

Forester
Semiliguda Section

Forester
Pottangi Section

Forester
Sunki Section

Forest Range Officer
Semiliguda Forest Range

Divisional Forest Officer
Koraput Forest Division

OFFICE OF THE DIVISIONAL FOREST OFFICER: JEYPORE FOREST DIVISION.

Letter No. 293 /4F/2021 (Misc)
Dated Jeypore, the 12th January, 2021.

To

The Project Director,
National Highways Authority of India
Bada Sahi, Plot No-1187, Hillpatna
Berhampur, Pin-760005 (Odisha)

Sub: - DPR of the project under Bharatmala Pariyojna connecting Raipur to Vishakhapatnam Corridor- from Odisha-Chhattisgarh Border (Near kundei village) to Odisha-Andhrapradesh border (near Ondarangi village) of Odisha State- Authentication of Flora & Fauna.

Ref: - Your Office Letter No.28 dated.22.10.2020.

Sir

With reference to the above cited correspondence the Flora & Fauna list submitted on dated.12.01.2021 to this office is hereby authenticated and returned for needful action. This is for your information and necessary action.

Encl As Above: -

Yours faithfully

NJPSengl 12.1.2021
Divisional Forest Officer,
Jeypore Forest Division.

-:List of Flora: -

Local Name	Botanical Name	Family
chu	*Morinda Tinctoria*	Rubiaceae
Agasti	*Sesbania grandiflora*	Fabaceae
Amata, Ambalata	*Bauhinia racemosa*	Fabaceae
Amba	*Mangifera indica*	Anacardiaceae
Ambeda	*Spondias pinnata*	Anacardiaceae
Amla	*Phyllanthus emblica*	Euphorbiaceae
Ankula	*Alangium salvifolium*	Cornaceae
Arjun	*Terminalia arjuna*	Combretaceae
Asan	*Terminalia tomentosa*	Combretaceae
Ashoka	*Saraca asoca*	Caesalpinlaceae
Babul	*Acacia arabica*	Mimosaceae
Badopatri	*Callicarpa aroborea*	Verbenaceae
Bahada	*Terminalia bellerica*	Combretaceae
Baldia (Paldhaua)	*Erythrina suberosa*	Fabaceae
Bandhan	*Ougeinia oojeinensis*	Fabaceae
Bara	*Ficus bengalensis*	Moraceae
Barada		Fabaceae
Barang, Bankapasia	*Kydia calycina*	Malvaceae
Barbakulia	*Dalbergia paniculata*	Fabaceae
Barun	*Crateva religiosa / C.nurvala*	Capparaceae
Behanta	*Limonia acidissima*	Rutaceae
Bela	*Aegle marmelos*	Rutaceae
Berimanj	*Casearia tomentosa*	Salicaceae
Bhalia	*Semicarpus anacardium*	Anacardiaceae
Bheru	*Chloroxylon swietenia*	Rutaceae
Bija	*Pterocarpus marsupium*	Fabaceae
Bishnuchuda	*Jacaranda mimosifolia*	Bignoniaceae
Blue gum (Nilagiri)	*Eucalyptus globulus*	Myrtaceae
Bod-kurhein	*Wrightia tomentosa*	Apocynaceae
Chadeigundi	*Vitex peduncularis*	Verbenaceae
Chakunda(Bada) Rain tree	*Samanea saman*	Mimosaceae
Chakundi	*Cassia siamea*	Caesalpinlaceae
Champa	*Magnolia champaca*	Magnoliaceae
Chandan	*Santalum album*	Santalaceae
Char	*Buchanania lanzan*	Anacardiaceae
Chhatiana / Chhatin	*Alstonia scholaris*	Apocynaceae
Damkurudu	*Gardenia latifolia*	Rubiaceae
Dauranja	*Holoptelia integrifolia*	Ulmaceae
Debadaru (Ashoka)	*Polyalthia Longifolia*	Annonaceae
Dhala siris	*Albizzia procera*	Fabaceae
Dhaman	*Grewia tiliaefolia*	Tiliaceae
Dhaura	*Anogeissus latifolia*	Combretaceae
Dhobin	*Dalbergia paniculata*	Fabaceae
Dimiri	*Ficus glomerata*	Moraceae
Gadapanasa (Baghoari)	*Litsea macrophylla*	Lauraceae
Gamhar	*Gmelina arborea*	Verbenaceae
Gandha Palas	*Miliusa velutina*	Annonaceae
Genduli	*Sterculia urens*	Sterculiaceae
Ghanto	*Ziziphus mauritiana*	Rhamnaceae
Gharalanja	*Albizia stipulata*	Fabaceae
Mahaneem	*Ailanthus excelsa*	Simaroubaceae

[illegible]ringa	*Pterospermum xylocarpum*	Sterculiaceae
[illegible]ohura	*Acacia leucophloea*	Mimosaceae
[illegible]daguria	*Macaranga peltata*	Euphorbiaceae
Goniari (Kantapalas)	*Cochlospermum gossipium*	Cochlospermaceae
Haldi	*Diospyros montana*	Ebenaceae
Haldu	*Adina cordifolia*	Rubiaceae
Harida	*Terminalia chebula*	Combretaceae
Hinjal	*Barringtonia acutangula*	Barringtoniaceae
Jamu	*Syzygium cumini*	Myrtaceae
Japhra	*Bixa orellana*	Bixaceae
Jeutha (monkey jack)	*Artocarpus lakoocha*	Moraceae
Kadamba	*Neolamarkia cadamba*	Rubiaceae
Kaitho	*Feronia elephantum*	Rutaceae
Kaju (Lankabadam)	*Anacardium occidentale*	Anacardiaceae
Kalasiris	*Albizia lebbeck*	Mimosaceae
Kalchua	*Glochidion lanceolarium*	Phyllanthaceae
Kamalagundi	*Mallotus philippensis*	Euphorbiaceae
Kanchan	*Bauhinia variegata*	Caesalpiniaceae
Kansa	*Hymenodictyon excelsum*	Rubiaceae
Karada	*Cleistanthus collinus*	Euphorbiaceae
Karanja	*Pongamia pinnata*	Fabaceae
Kasi	*Bridelia retusa*	Euphorbiaceae
Kendu	*Diospyros melanoxylon*	Ebenaceae
Khaira	*Acacia catechu*	Mimosaceae
Khajuri	*Phoenix sylvestris*	Arecaceae
Khekad / Kenkat	*Garuga pinnata*	Burseraceae
Kochila	*Strychnos nux-vomica*	Strychnaceae
Koniyari	*Cascabela thevetia*	Apocynaceae
Krushnachuda	*Delonix regia*	Caesalpinlaceae
Kuilari (Debakanchan)	*Bauhinia purpurea*	Caesalpinlaceae
Kumbhi	*Careya arborea*	Lecythidaceae
Kusum	*Schleichera oleosa*	Sapindaceae
Muchukund	*Pterospermum acerifolium*	Malvaceae
Mahagni	*Swietenia mahagoni*	Meliaceae
Mahua / Mahula	*Madhuca indica*	Sapotaceae
Mankada kendu	*Diospyros malabarica*	Ebenaceae
Moi	*Lannea coromandelica*	Anacarbiaceae
Mokha / Mukha	*Schrebera swietenioides*	Oleaceae
Munika (sajana)	*Moringa oleifera*	Moringaceae
Mundi	*Mitragyna parviflora*	Rubiaceae
Neem / limba	*Azadirachta indica*	Meliaceae
Nilagari	*Eucalyptus hybrid*	Myrtaceae
Padhel (Chuin patoli)	*Pterospermum suaveolens*	Sterculiaceae
Pahadi sisoo	*Dalbergia latifolia*	Fabaceae
Palasa	*Butea monosperma*	Fabaceae
Panasa	*Artocarpus heterophyllus*	Moraceae
Panigambhar	*Trewia nudiflora*	Euphorbiaceae
Phasi	*Anogeissus accuminata*	Combrepaceae
Phanphana	*Oroxylum indicum*	Bignoniaceae
Pijuli	*Psidium guajava*	Myrtaceae
Pine (Khasi)	*Pinus insularis / p. khasia*	Pinaceae
Pipal	*Ficus religiosa*	Moraceae
Pita Jamu (Poi- gam)	*Syzygium operculate*	Myrtaceae

dhachuda	*Peltophorum ferrugineum*	Caesalpiniaceae
	Dillenia pentagyna	Dilleniaceae
m phala	*Annona reticulata*	Annonaceae
Rimili	*Bursera serrata*	Burseraceae
Ritha	*Sapindus emarginatus*	Sapindaceae
Ritha Phala(Muktamanja)	*Sapindus mucorosis*	Sapindaceae
Rohini	*Soymida febrifuga*	Maliaceae
Dhala siris	*Albizzia procera*	Mimosaceae
Saguan (Teak)	*Tectona grandis*	Verbenaceae
Sahada	*Streblus asper*	Moraceae
Sahaj	*Terminalia tomentosa*	Combretaceae
Sal	*Shorea robusta*	Dipterocarpaceae
Salai	*Boswellia serrata*	Burseraceae
Salap (Toddypalm)	*Caryota urens*	Arecaceae
Salia bamboo	*Dendrocalamus strictus*	Poaceae
Semal	*Bombax ceiba*	Bombacaceae
Sidha (Sennha)	*Lagerostroemia parviflora*	Lythraceae
Siris	*Albizzia lebbek*	Fabaceae
Bali Sisoo	*Dalbergia sissoo*	Fabaceae
Sunajhari	*Acacia auriculiformis*	Mimosaceae
Sunari	*Cassia fistula*	Caesalpiniaceae
Tala	*Borassus flabellifer*	Arecaceae
Tangini	*Xylia xylocarpa*	Mimosaceae
Telkeruhan	*Ixora parviflora*	Rubiaceae
Tentuli	*Tamarindus indica*	Caesalpiniaceae
Thalka	*Tamilnadia uliginosa*	Rubiaceae
Thelko	*Randia dumetorum*	Rubiaceae
Toon	*Toona ciliata*	Meliaceae

➢ ***LIST OF SHRUBS & HERBS FOUND***

Local Name	**Botanical Name**	**Family**
Amada/ Ama haldi	*Curcuma amada*	Zingiberaceae
Anata mula	*Hemidesmus indicus*	Asclepiadaceae
Anita (Murmuria)	*Helicteres isora*	Sterculiaceae
Apamaranga	*Achyranthes aspera*	Amaranthaceae
Arakha	*Calotropis procera*	Asclepiadaceae
Ashwagandha	*Withania somnifera*	Solanaceae
Ata / Sita phala	*Annona squamosa*	Annonaceae
Baigaba	*Jatropha curcas*	Euphorbiaceae
Bana haldi	*Curcuma spp*	Zingiberaceae
Bana kadali	*Musa superba*	Musaceae
Bana Khajuri	*Phoenix acaulis*	Arecaceae
Bana Tulsi	*Ocimum gratissimum*	Lamiaceae
Barkoli	*Ziziphus mauritiana*	Rhamnaceae
Basanga	*Justicia adhatoda*	Acanthaceae
Begunia	*Vitex negundo*	Lamiaceae
Amari	*Ipomea batatus*	Convolvulaceae
Bhant	*Clerodendron infortunatum*	Verbenaceae
Bheji baigana (Ankaranti)	*Solanum xanthocarpum*	Solanaceae
Bhui neem	*Andrographis paniculata*	Acanthaceae
Bhursunga	*Murraya koenigii*	Rutaceae
Bisalya karani	*Tridax procumbens*	Asteraceae
Bisiripi / Bajaramuli	*Sida cordifolia*	Malvaceae

Brahmi/ Thalkudi	*Hydrocotyle asiatica*	Apiaceae
Chauladhua	*Glycosmis pentaphylla*	Rutaceae
Dhala Chakunda	*Cassia tora*	Caesalpiniaceae
Dhatuki	*Woodfordia fruticosa*	Lythraceae
Duddura	*Datura stramonium*	Solanaceae
Gangasiuli	*Nyctanthes arbor-tristis*	Oleaceae
Girli	*Indigofera pulchella*	Fabaceae
Gokhara	*Tribulus terrestris*	Averrhoaceae
Gudamari	*Gymnema sylvestre*	Apocynaceae
Hansalata	*Aristolochia bracteata*	Aristolochiacae
Hariharika	*Euphorbia hirta*	Euphorbiaceae
Jada	*Ricinus communis*	Euphorbiaceae
Kaminic	*Murraya exotica*	Rutaceae
Kanteikoli	*Zizyphus oenoplea*	Rhamnaceae
Karibira	*Nerium indicum*	Apocynaceae
Khadisiju	*Euphorbia tirucalli*	Euphorbiaceae
Khakda	*Casearia tomentosa*	Salicaceae
Khuradu	*Gardenia gummifera*	Rubiaceae
Kila keruan	*Ixora parviflora*	Rubiaceae
Kundaphula	*Jasminum pubescens*	Oleaceae
Kundophul	*Jasminum humile*	Oleaceae
Kurei /Kurmi	*Holarrhena antidysenterica*	Apocynaceae
Lajakuli	*Mimosa pudica*	Mimosaceae
Mehandi (Munjuati)	*Lawsonia inermis*	Lythraceae
Mohana(Pottua)	*Randia dumetorum*	Rubiaceae
Mudimudika	*Helicteres isora*	Sterculiaceae
Murga	*Agave americana*	Agavaceae
Nagairi	*Lantana camara*	Verbenaceae
Nilabaigaba	*Jatropha gossypifolia*	Euphorbiaceae
Palua / Palagunda	*Curcuma angustifolia*	Zingiberaceae
Banahaldi	*Curcuma aromatica*	Zingiberaceae
Ranidatun	*Flemengia chapper*	Fabaceae
Patala garuda	*Rauwolfia serpentina*	Apocynaceae
Pokosungha	*Eupatorium odoratum*	Asteraceae
Punarnava	*Boerhavia diffusa*	Nyctaginaceae
Rakata chitaparu(Lal chita)	*Plumbago rosea*	Plumbaginaceae
Salaparni	*Desmodium gangeticum*	Fabaceae
Saru	*Colocasia esculenta*	Araceae
Satabari	*Asparagus racemosus*	Liliaceae
Sima koina	*Pithecellobium dulce*	Mimosaceae
Sisal	*Agava sisalana*	Agavaceae
Dhla chitaparu	*Plumbago zeylanica*	Plumbaginaceae
Sunaragoda	*Grewia hirsute*	Tiliaceae
Thelko	*Randia dumetorum*	Rubiaceae
Tilei	*Wendlandia hyenei*	Rubiaceae
Tulasi (Dhala)	*Ocimum basilicum*	Lamiaceae
Tulsi (Kala)	*Ocimum sanctum*	Lamiaceae

➢ **LIST OF RARE, ENDANGERED & THREATENED (RET)**

Local Name	**English Name**	**Botanical Name**
Phasi		*Anogeisus accuminata*
Pahadi Sisu		*Dalbergia latifolia*
Bija		*Pterocarpus marsupium*

➢ LIST OF COMMON CLIMBERS FOUND

Local Name	Botanical Name	Family
Arkawla	*Millettia auriculata*	Fabaceae
Atundi	*Combretum decandrum*	Combretaceae
Danturi (Nali kantia)	*Acacia sinuata*	Mimosaceae
Desi alu	*Dioscorea deltoidea*	Dioscoreaceae
Dudhi-mal	*Cryptolepis buchanani*	Periplocaceae
Gila	*Entada scandens*	Mimosaceae
Gunja (kaincha)	*Abrus precatorius*	Fabaceae
Kalmi saga	*Ipomea reptans*	Convolvulaceae
Karukando / Kulihakanda	*Dioscorea hispida*	Dioscoreaceae
Lata palas	*Butea superba*	Fabaceae
Madang	*Loranthus scurrula*	Loranthaceae
Madhumalati	*Hiptage madablota*	Malpighiaceae
Meheria Phulo	*Gloriosa superba*	Liliaceae
Muturi	*Smilax macrophylla*	Smilaceae
Nirmuli	*Cassytha filiformis*	Cassytha
Petchurimal (Torida)	*Ventilago madraspatana*	Rhamnaceae
Pitchuli / Kantamali	*Ventilago denticulate*	Rhamnaceae
Satawari	*Asparagus racemosus*	Liliaceae
Siali	*Bauhinia vahlii*	Caesalpiniseae

➢ LIST OF COMMON GRASSES

Local Name	English Name	Botanical Name
Balunga	*Oryza rufipogon*	Poaceae
Basana	*Bethriochoa pertma*	Poaceae
Chhana	*Imperata arundinaceae*	Poaceae
Dhanwantari	*Cymbopogon Flexuosus*	Poaceae
Duba	*Cynodon dactylon*	Poaceae
Ghodalanjai	*Aristida setacea*	Poaceae
Gondabena	*Bothriochloa bladhii*	Poaceae
Guguchia	*Chrysopogon gryllus*	Poaceae
Jharu	*Arundinella setosa*	Poaceae
Kasatandi (Chadeia)	*Saccharum spontaneum*	Poaceae
Khus-khus (Bena)	*Vetiveria zizaniodes*	Poaceae
Mutha	*Cyperus rotundus*	Poaceae
Noto	*Phragmites karka*	Poaceae
Phool Jhadu (Phool Badhun)	*Thysanolaena maxima*	Poaceae
Phuriphuri	*Eragrostis unioloides*	Poaceae
Rosa grass	*Cymbopogon matinii*	Poaceae
Sabai (Panasi)	*Eulaliopsis binata*	Poaceae
Sinkulia	*Heteropogon contortus*	Poaceae
Tandi (Kasatandi)	*Saccharum spontanum*	Poaceae
Tuli	*Ichaemum rugosum*	Poaceae

➢ LIST OF BAMBOOS

Local Name	English Name	Botanical Name
Badia Bauns	*Bambusa nutans*	Poaceae
Bauns (Salia Bamboo)	*Dendrocalamus strictus*	Poaceae
Daba Bauns (Kanta Bamboo)	*Bmbusa arundinacea*	Poaceae
Sundarkani	*Bmbusa vulgaris*	Poaceae

12.01.2021
Divisional Forest Officer
Jeypore Forest Division

LIST OF FAUNA

Local Name	English Name	Latin / Zoological Name
Baduli	Short nosed fruitbat	*Cynopterus sphinx*
~~Bagha~~	~~Tiger~~	~~*Panthera tigris*~~
Bajrakapta	Pangolin	*Manis crassicaudata*
Bala kukur	Wild dog or Dholes	*Cuon alpinus*
Bamburadi	Jungle cat	*Felis chaus*
Barha	Wild bear	*Sus scrofa cristamus*
Bhalu	Sloth bear	*Melursus ursinus*
Bilua	Jackal	*Canis aureus*
Chausingha	The four horned antelope	*Tetracerus quadricornis*
Cheetah Biradi	Leopard Cat	*Felis bengalensis*
Chhuchhundra	Grey Muskshrew	*Suncus murinus*
Gada Bhalu	Ratel	*Mellivora capensis*
Gunduchi Musa	3 stripped palm squirrel	*Funambulus palmarum*
Gunduchi Musa	5 stripped palm squirrel	*Funambulus pennanti*
Gurandi	Mouse deer	*Tragulus meninna*
Harina	Spotted deer	*Axis axis*
Heta Bagha	Hyaena	*Hyaena hyaena*
Jhinka	Porcupine	*Hystrix indica*
Kalarapatria Bagha	Leopard (Panther)	*Panthera pardus*
Kokisiali	Fox	*Vulpes bengalensis*
Kutura	Barking deer	*Muntiacus muntijak*
Mankada (Hanu)	Monkey	*Presbytis entellus*
Mankada (Pati)	Rhesus monkey	*Macaca mulatta*
Musa	Rat	*Rattus rattus*
Musa	White tailed wood rat	*Rattus blanfordi*
Musa	Long tailed tree mouse	*Vandeleuria oleracca*
Musa (Nepali)	Gaint Indian Squirrel	*Ratufa indica*
Neula (Hatia)	Common Mangoose	*Herpestes edwardsil*
Neula (Kuji)	Small India Mangoose	*Herpestes auropunctatus*
Ramsiali	Wolf	*Canis lupus*
Saliapatani	Small Indian Civet	*Viverricula indica*
Saliapatani	Toddycat	*Paradoxurus hermaphroditus*
Sambar	Sambar	*Cervus unicolor*
Thekua	Hare	*Lepus nigricollis*

➢ **FAUNA: SNAKE**

Local Name	English Name	Latin /Zoological Name
Ahiraja	King Cobra	*Ophiphagus Hannah*
Ajagarh	Indian Python	*Python molurus*
Boda	Common Boa	*Boa constricta*
Chita	Common Indian krait	*Bungarus caeruleus*
Dhamana	Rat snake	*Ptyas mucosus*
Dhandaboda	Russels viper	*Viper russelli*
Dhulinag	Saw scale viper	*Echis carinatus*
Kandanali	Tree snake	*Ahetulla spp.*
Laudankia	Common green whipsnake	*Dryophis nasutus*
Naga (Gokhar)	Indian Cobra	*Naja naja*
Pani Dhanda	Checkeered keel back	*Natrix piscator*
Rana	Krait	*Bungarus candidus*
Teli Sapa	Common blind snake	*Typhlops brahminus*

➢ FAUNA: LIZARDS		
Local Name	**English Name**	**Latin/ Zoological Name**
Bahurupi	Indian chameleon	*Chameleon zeylanicus*
Bahurupi kuasap	Garden geeko	*Calotes versicolor*
Champainoli	Skink	*Mabuya bibro*
Endua	Rock geeko	*Hemidactylus maculates*
Godhi	Land monitor	*Varnus bengalensis*
Jhitipiti	House lizard	*Hemidactylus flaviviridis*
Pani Godhi	Water Monitor	*Varnus salvadoor*

➢ FAUNA: TORTOISE		
Local Name	**English Name**	**Latin/ Zoological Name**
Chebeda kaincha	Land tortoise	*Trionyx gangeticus*
Kurma	Indian tent turtle	*Kachuga tectatecta*
Pani kaincha	Terrapin	*Lissemys punctata*

➢ FAUNA: CROCODILE		
Local Name	**English Name**	**Latin/ Zoological Name**
Magar	Crocodile (Magar)	*Crocodiles palustris*

➢ FAUNA: FISH (FRESH WATER)		
Local Name	**English Name**	**Latin/ Zoological Name**
Balia		*Wallagonia attu*
Bansa pati		*Allia coha*
Bhakur		*Catla catla*
Chenga		*Ophiocaphalus gachua*
Dhankiri		*Esomus dandrica*
Gadisa		*Ophiocaphalus punctatus*
Jallah		*Chela argenta*
Kantia		*Myotus cavasius*
Kerandi		*Barbus ambasis*
Kou		*Anabas tistudineus*
Magura		*Clarias batrachus*
Mahurali		*Amblypharyngodon mola*
Mirakali		*Cirrhina mrigala*
Pohale (chuna)		*Cirrbina reba*
Pohale (denga)		*Labeo bata*
Rohi		*Labeo rohita*
Singi		*Heterophneustes fossilis*

➢ FAUNA: BIRDS		
Local Name	**English Name**	**Latin/ Zoological Name**
Baga	Egret cattle	*Babulcus ibis*
Banakukuda	Jungle fowl grey	*Gallus sonneratli*
Banakukuda	Jungle fowl red	*Gallus gallus*
Bani	Myna Indian	*Acridotheres tristris*
Batak	Teal common	*Anas crecca (Linnaeus)*
Baya	Baya waver bird	*Ploceus phillipinus*
Bhadbhadalia	Roller or blue jay	*Coracias benghalenisis*
Bhaliakhai	Hornbill common grey	*Tockus birostris*
Bhrungaraja	Drongo rocket tailed	*Dicrurus paradisens*
Bulbul or Gobrachadhei	Bulbul (red vented)	*Pyononotus cafer*
Chatak	Cuckoo pied crested	*Clamator jacobinus*

Chilla	Kite common pariak	*Milvus migrans*
Damara kau	Crow jungle	*Corvus macrorhynchos*
Deuliapara	Pigeon blucrok	*Columba livia (Gmelin)*
Gendalia	Stork openbilled	*Anostomus oscitans*
Ghar Chatia	Soarriw house	*Passer domesticus*
Ghukalika	Myna pied	*Sturnus contra*
Gunduri	Quail blue legged	*Turnix suscitator*
Haladi Basanta	Oriole black headed	*Oriolus xanthornus*
Hansa	Duck grey or spotbill	*Anas poecilorhyncha*
Hansarali	Grebe little or debachick	*Podiceps ruficollis*
Kajalapati	Drongo black or King Crow	*Dicrurus macrocerus*
Kantiabaga	Heron pond or paddy bird	*Ardeola grayili*
Kapota	Dove king	*Streptopelia decaocto*
Kapota	Dove spotted	*Streptopelia Chinensis*
Kathakhumpa	Woodpecker	*Picoides nanus*
Kathakhumpa	Woodpecker golden backed	*Dinopium benghalense*
Kau	Crow house	*Corvus splendens*
Koili	Cuckoo common Hawk	*Cuculus varius*
Koili	Cuckoo Indian	*Cuculus micropterus*
Kuchilakhai	Hornbill malabar pied	*Anthracoceros corobatus*
Kumbhatua	Crow pheasant	*Centopus sinensis*
Kunda	Babbler common	*Turdoides caudatus*
Machharanka	King fisher pied	*Ceryle rudis*
Mayur	Peafowl common	*Pavo cristatus (Linnaeus)*
Nilkantha	Robin magpie	*Copsychus saularis*
Pahadi bulbul	Bulbul (red whiskered)	*Pyononotus jocosus*
Panikua	Cormorant little	*Phalacrocora xniger*
Para	Pigeon imperial green	*Ducula aenea*
Pecha	Owl Indian great horned	*Bubo bubo*
Pecha	Owlet spotted	*Athene brama*
Phutki	Tailor bird	*Orthotonus sutorius*
Sankhachilla	Kite brahminy	*Haliastur Indus*
Sari	Myna hill	*Gracula religiosa*
Sua	Parakeet large Indian	*Psittacula eupatria*
Teetri	Patridge gray	*Francolinus pondicerinus*
Teetri	Quail bush jungle	*Perdicula asiatica*

12.01.2021
Divisional Forest Officer
Jeypore Forest Division

ANNEXURE-II

ESTIMATE OF COST FOR 1.00 HA. UNDER ANR PLANTATION MODEL

COST NORM FOR ANR PLANTATION IN DEGRADED FOREST @ 200 PLANTS PER HECTARE @Rs. 308.00/ MANDAY

Sl. No.	Item of Work	Preferable period of Execution	Labour in Mandays	Labour Cost (Rs)	Material Cost (Rs)	Total Cost in (Rs)
	0TH YEAR OPERATION					
1	Survey, Demarcation and Pillar Posting, GPS Reading with mapping	Nov/Dec	2	616	0	616
2	Site Preparation	Nov/Dec	2	616	0	616
3	Silvicultural Operation including clearance of weed, climber cutting, high stump cutting, singling of shoots etc.	Jan/Feb	5	1540.00	0	1540
4	Nursery cost (6 months old seedling)part @ Rs.12.43/- seedling (Rs.8.67 in 0th year + Rs.3.76 in 1st year) for 220 seedlings (200+20)	Jan-March	5.5	1694	367.00	2061
5	Contingency and Unforeseen Expenditures		0	0	133.00	133.00
	SUB TOTAL		**14.5**	**4466**	**500.00**	**4966**
6	Monitoring & Supervision charge 5% of the total cost					248.3
	GRAND TOTAL		**14.5**	**4466**	**500.00**	**5214.3**
	1ST YEAR OPERATION					
1	Nursery cost (6 months old seedling) balance @ Rs.3.76 for 220 seedlings	Apr-June	2.5	770	128	898
2	Pitting 30 cm cube size	Feb/Mar	6	1848	0	1848
3	Carriage and planting including casualty replacement	Jul/Aug	5	1540	0	1540
4	Complete weeding, Soil working, Manuring	Aug/Sep	6	1848	0	1848
5	Cost of Vermi compost @200 gms/plant @ Rs.20/- per kg = Rs.800.00 and Granular Insecticide 5 gms/plant @ Rs.80/-	Aug/Sep	0	0	880.00	880.00

	per kg. =Rs.80.00					
6	Cost of Chemical fertiliser (a) Urea 70 gms/plant in two subsequent doses @ Rs.6/- per kg =Rs.84.00 (b) NPK 50 gms/plant @ Rs.24/- per kg=Rs.240.00 as basal dose	Jul/Aug	0	0	324.00	324.00
7	Silvicultural Operation involving clearance of weeds, cutting of climbers, singling of shoots etc.	Sep/Oct	15	4620	0	4620
8	Soil Conservation Measures (Staggered trenches of dimension 2 m X 0.5 m X 0.5 m @ 60 nos per ha) or its equivalent	Sep/Oct	20	6160	0	6160
9	Fireline Tracing and Inspection Path	Feb/Mar	3	924	0	924
10	Watch & ward	Aug-Mar	7	2156	0	2156
11	Contingency and Unforeseen Expenditures		0	0	304.00	304.00
	SUB TOTAL		**64.5**		**1636.00**	**21502**
212	Monitoring & Supervision charge 5% of the total cost			0		1075.1
	GRAND TOTAL		**64.5**	**19866**	**1636.00**	**22577.1**
	2ND YEAR OPERATION					
1	Casualty Replacement including cost of seedling, carriage and planting	Jul/Aug	1	308	248.60	556.60
2	Complete weeding and cultural operations	Sep/Oct	2	616	0	616
3	Soil working and manuring	Sep/Oct	2	616	0	616
4	Cost of Fertiliserand insecticide (a) Vermicompost 200gms/plant @ Rs.20/- per kg=Rs.800.00 (b) Granular Insecticides 5 gms/plant for 20 plants 100 gms @ Rs.80/- per kg=Rs.8.00	Sep/Oct	0	0	808.00	808.00
5	Soil Conservation Measures (Renovation of staggered trenches etc.)	Sep/Oct	8	2464	0	2464
6	Fireline Tracing and Inspection	Feb/Mar	1	308	0	308

	Path					
7	Watch & ward (whole year)	Apr-Mar	7	2156	0	2456
8	Contingency and Unforeseen Expenditures		0	0	181.00	181.00
	SUB TOTAL		**21**	**6468**	**1238.00**	**7706**
9	Monitoring & Supervision charge 5% of the total cost					385.3
	GRAND TOTAL		**21**	**6371.40**	**1238.00**	**8091.3**
	3RD YEAR OPERATION					
1	Complete weeding and cultural operations	Aug/Sep	1	308	0	308
2	Soil working	Aug/Sep	1	308	0	308
3	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
4	Watch & ward (whole year)	Apr-Mar	7	2156	0	2156
5	Contingency		0	0	200.00	200.00
	SUB TOTAL		**10**	**3080**	**200.00**	**3280**
6	Monitoring & Supervision charge 5% of the total cost					164
	GRAND TOTAL		**10**	**3034.00**	**200.00**	**3444**
	4TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**
	5TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**
	6TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308

2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**
	7TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**
	8TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**
	9TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**
	10TH YEAR OPERATION					
1	Fireline Tracing and Inspection Path	Feb/Mar	1	308	0	308
2	Watch & ward and cultural operations	Apr-Mar	2	616	0	616
	SUB TOTAL		**3**	**924**	**0**	**924**
3	Monitoring & Supervision charge 5% of the total cost					46.2
	GRAND TOTAL		**3**	**924**	**0**	**970.2**

ABSTRACT						
SL. No.	Item of Work	No. Person Day	Labour cost @ Rs 308 per day	Material cost (Rs)	Monitoring & Supervision charge 5% of the total cost	Total cost in (Rs)
1	0th Year operation	14.5	4466	500.00	248.3	5214.3
2	1st Year operation	64.5	19866	1636.00	1075.3	22577.1
3	2nd Year operation	21	6468	1238.00	385.3	8091.3
4	3rd Year operation	10	3080	200.00	164	3444
5	4th Year operation	3	924	0	46.2	970.2
6	5th Year operation	3	924	0	46.2	970.2
7	6th Year operation	3	924	0	46.2	970.2
8	7th Year operation	3	924	0	46.2	970.2
9	8th Year operation	3	924	0	46.2	970.2
10	9th Year operation	3	924	0	46.2	970.2
11	10th Year operation	3	924	0	46.2	970.2
TOTAL		**131**	**40348**	**3574.00**	**2196.3**	**46118.1**

Village-wise Demographic Pattern of the Study Area

Sl. No.	Village	No. of Household	Population												Sex Ratio			
			Total	Male	Female	SC			ST			0 - 6 Years						
						Total	Male	Female	Total	Male	Female	Total	Male	Female	Overall	SC	ST	0-6 Years
Nabarangpur																		
1	Borogan	281	1332	655	677	16	8	8	1216	595	621	214	127	87	968	1000	958	1460
2	Hirapara	61	316	165	151	0	0	0	226	120	106	74	39	35	1093	0	1132	1114
3	Biripur	422	2060	1056	1004	386	203	183	1516	762	754	285	144	141	1052	1109	1011	1021
4	Daspur	396	1854	938	916	764	377	387	734	373	361	276	146	130	1024	974	1033	1123
5	Khatuarpara	145	715	355	360	107	53	54	548	273	275	116	64	52	986	981	993	1231
6	Hatibena	308	1550	787	763	528	272	256	865	430	435	277	143	134	1031	1063	989	1067
7	Junuanipara	186	864	434	430	37	19	18	798	402	396	144	63	81	1009	1056	1015	778
8	Birisadihi	257	1225	580	645	44	20	24	582	278	304	251	118	133	899	833	914	887
9	Debagaon	299	1552	781	771	100	53	47	1301	651	650	283	155	128	1013	1128	1002	1211
10	Kurubella	354	1714	836	878	156	71	85	1382	677	705	327	163	164	952	835	960	994
11	Kacharapara	805	3957	2000	1957	1326	676	650	2077	1040	1037	658	337	321	1022	1040	1003	1050
12	Kalepara	92	456	231	225	0	0	0	450	229	221	63	34	29	1027	0	1036	1172
13	Dhungiadihi	136	625	316	309	77	45	32	512	254	258	79	43	36	1023	1406	984	1194
14	Tarangapur	153	784	405	379	0	0	0	690	354	336	123	60	63	1069	0	1054	952
15	Dhanara	321	1621	814	807	67	32	35	1504	760	744	252	125	127	1009	914	1022	984
16	Ampara	94	460	216	244	0	0	0	451	212	239	63	27	36	885	0	887	750
17	Sargiguda	80	421	205	216	2	2	0	409	195	214	87	39	48	949	0	911	813
18	Keskonga	78	403	224	179	40	22	18	293	162	131	57	25	32	1251	1222	1237	781
19	Jadapara	266	1287	680	607	64	38	26	1103	572	531	205	107	98	1120	1462	1077	1092
20	Umarkote	34962	166909	83253	83656	26195	13352	12843	108008	53492	54516	31814	15993	15821	995	1040	981	1011
21	Andriguda	252	1254	624	630	1	0	1	1005	510	495	309	146	163	990	0	1030	896
22	Kesarabera	311	1778	932	846	94	47	47	1520	798	722	359	206	153	1102	1000	1105	1346
23	Matgan	297	1263	618	645	47	23	24	1143	560	583	257	121	136	958	958	961	890
24	Murtama	820	3962	2028	1934	1339	653	686	2134	1107	1027	693	358	335	1049	952	1078	1069

25	Khadaka	432	2011	1024	987	187	90	97	1724	882	842	415	211	204	1037	928	1048	1034
26	Sukigan alias Dabiriguda	431	2065	1059	1006	870	452	418	791	399	392	342	172	170	1053	1081	1018	1012
27	Dangriguda	75	354	176	178	0	0	0	296	147	149	70	32	38	989	0	987	842
28	Tishaguda	196	872	437	435	131	65	66	590	299	291	169	84	85	1005	985	1027	988
29	Pujaribharandi	297	1443	719	724	181	87	94	912	453	459	224	120	104	993	926	987	1154
30	Adhikarigud a	344	1653	882	771	1220	667	553	242	120	122	225	116	109	1144	1206	984	1064
31	Kochiniamb a	40	148	75	73	33	19	14	0	0	0	19	9	10	1027	1357	0	900
32	Chhanchanb eda	248	1110	555	555	189	93	96	890	443	447	198	95	103	1000	969	991	922
33	Khutuguda	746	3442	1745	1697	941	488	453	1627	806	821	592	288	304	1028	1077	982	947
34	Mohuli	600	2820	1419	1401	564	294	270	1694	835	859	504	247	257	1013	1089	972	961
35	Khatiguda	79	340	170	170	49	26	23	159	77	82	76	39	37	1000	1130	939	1054
36	Koramari	155	887	459	428	92	49	43	746	386	360	176	88	88	1072	1140	1072	1000
37	Malikguda	99	449	231	218	117	55	62	317	167	150	95	52	43	1060	887	1113	1209
38	Majhia	345	1565	808	757	111	53	58	962	499	463	296	156	140	1067	914	1078	1114
39	Turunji	242	1153	572	581	459	217	242	618	318	300	248	108	140	985	897	1060	771
40	Mandiaguda	123	601	280	321	149	73	76	439	201	238	113	41	72	872	961	845	569
41	Nandapura	489	2095	1038	1057	571	265	306	1018	515	503	397	198	199	982	866	1024	995
42	Parsabeda	182	867	441	426	1	1	0	727	365	362	181	85	96	1035	0	1008	885
43	Muliaguda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	Rabanaguda	387	1787	861	926	110	55	55	1061	502	559	270	113	157	930	1000	898	720
45	Ambaguda	92	369	182	187	1	0	1	23	8	15	70	28	42	973	0	533	667
46	Khuntaguda	157	727	373	354	172	94	78	269	139	130	141	74	67	1054	1205	1069	1104
47	Chelibeda	127	513	244	269	8	5	3	404	193	211	87	41	46	907	1667	915	891
48	Motigam	139	624	313	311	0	0	0	486	246	240	127	67	60	1006	0	1025	1117
49	Talbeda	169	663	330	333	1	0	1	623	310	313	130	63	67	991	0	990	940

50	Godegam	192	807	388	419	8	4	4	686	333	353	132	57	75	926	1000	943	760
51	Bodo-olma	558	2715	1284	1431	354	160	194	1691	785	906	470	216	254	897	825	866	850
52	Khutuluguda	157	601	281	320	185	85	100	397	188	209	121	56	65	878	850	900	862
53	Bhaluguda	77	338	164	174	52	24	28	271	133	138	83	45	38	943	857	964	1184
54	Sano-olma	207	923	469	454	199	103	96	632	318	314	144	70	74	1033	1073	1013	946
55	Hatibeda	1317	6109	2899	3210	581	275	306	4032	1892	2140	1125	521	604	903	899	884	863
56	Silakaguda	155	680	350	330	130	63	67	402	209	193	92	42	50	1061	940	1083	840
57	Palapur	387	1673	828	845	127	65	62	918	449	469	315	158	157	980	1048	957	1006
58	Dangra	999	4562	2242	2320	409	203	206	2859	1377	1482	859	425	434	966	985	929	979
59	Khutuguda	88	417	202	215	2	0	2	377	183	194	79	36	43	940	0	943	837
60	Biriguda	656	2893	1450	1443	653	321	332	1251	633	618	521	290	231	1005	967	1024	1255
61	Dengaguda	206	917	456	461	77	38	39	410	205	205	165	88	77	989	974	1000	1143
62	Kharki	283	1201	588	613	329	153	176	756	377	379	227	111	116	959	869	995	957
63	Chatahandi	1813	7656	3843	3813	887	474	413	4448	2317	2131	1297	665	632	1008	1148	1087	1052
64	Teliguda	40	148	83	65	78	43	35	34	21	13	22	16	6	1277	1229	1615	2667
65	Bikrampur	450	1815	879	936	371	182	189	626	299	327	223	107	116	939	963	914	922
66	Deula	381	1660	820	840	126	67	59	852	408	444	350	181	169	976	1136	919	1071
67	Bhatra	182	821	394	427	205	98	107	582	276	306	129	66	63	923	916	902	1048
68	Daspur	414	1739	895	844	149	80	69	1574	804	770	316	163	153	1060	1159	1044	1065
69	Pujariguda	446	1881	922	959	121	62	59	1357	674	683	301	143	158	961	1051	987	905
Koraput																		
70	Patigan	134	630	336	294	231	118	113	399	218	181	126	62	64	1143	1044	1204	969
71	Porsola	542	2534	1261	1273	685	354	331	1224	610	614	480	248	232	991	1069	993	1069
72	Khandiguda	250	1094	531	563	108	55	53	683	329	354	188	96	92	943	1038	929	1043
73	Champia	262	1159	587	572	117	57	60	580	299	281	174	96	78	1026	950	1064	1231
74	Kamara	277	1202	613	589	192	98	94	267	138	129	195	105	90	1041	1043	1070	1167
75	Kaliaguda	246	942	470	472	65	26	39	281	139	142	154	80	74	996	667	979	1081
76	Khutulaguda	62	252	111	141	0	0	0	252	111	141	48	21	27	787	0	787	778
77	Hordali	1214	5104	2606	2498	1094	565	529	2573	1336	1237	946	488	458	1043	1068	1080	1066
78	Kupia	175	720	361	359	145	76	69	516	258	258	126	71	55	1006	1101	1000	1291
79	Sanadubuli	153	618	303	315	7	3	4	264	132	132	90	48	42	962	750	1000	1143

80	Keraput	197	762	370	392	279	131	148	276	131	145	130	64	66	944	885	903	970
81	Benasur	507	1991	949	1042	311	144	167	1408	670	738	336	157	179	911	862	908	877
82	Gujuniguda	68	305	153	152	69	27	42	116	66	50	51	24	27	1007	643	1320	889
83	Benagam	324	1419	650	769	331	157	174	924	410	514	235	107	128	845	902	798	836
84	Chandalgudа	270	1070	496	574	201	100	101	566	252	314	234	99	135	864	990	803	733
85	Piteiguda	97	369	176	193	0	0	0	366	174	192	73	35	38	912	0	906	921
86	Lathiguda	114	413	214	199	21	11	10	385	199	186	73	37	36	1075	1100	1070	1028
87	Majhiguda	48	182	90	92	0	0	0	140	67	73	41	26	15	978	0	918	1733
88	Kartas	551	2103	1006	1097	399	190	209	1203	568	635	442	224	218	917	909	894	1028
89	Bakadaguda	37	175	59	116	6	1	5	169	58	111	33	11	22	509	200	523	500
90	Purimunda	53	156	84	72	57	30	27	98	53	45	19	9	10	1167	1111	1178	900
91	Baunsaguda	90	336	160	176	1	1	0	104	52	52	74	39	35	909	0	1000	1114
92	Guntha	168	692	341	351	2	1	1	468	236	232	126	58	68	972	1000	1017	853
93	Phattu(Patu)	284	1136	570	566	129	63	66	331	162	169	163	77	86	1007	955	959	895
94	Sankar	232	879	434	445	0	0	0	689	335	354	144	73	71	975	0	946	1028
95	Deopottangi	638	3019	1498	1521	145	82	63	2112	1039	1073	543	304	239	985	1302	968	1272
96	Baraja	638	3049	1516	1533	53	34	19	2218	1094	1124	557	277	280	989	1789	973	989
97	Pukali	699	2678	1229	1449	368	177	191	1231	524	707	429	202	227	848	927	741	890
98	Tologolluru (Talagoluru)	148	629	335	294	3	3	0	617	327	290	91	52	39	1139	0	1128	1333
99	Sikaparu	111	498	263	235	3	1	2	484	254	230	106	57	49	1119	500	1104	1163
100	Ampaballi	443	1795	943	852	33	16	17	1112	562	550	266	141	125	1107	941	1022	1128
101	Kurli	172	687	332	355	108	57	51	484	232	252	114	51	63	935	1118	921	810
102	Kandili	802	3517	1708	1809	197	94	103	2255	1085	1170	591	310	281	944	913	927	1103
103	Peturu	160	611	290	321	80	40	40	330	159	171	117	53	64	903	1000	930	828
104	Tedda	118	495	234	261	17	9	8	262	117	145	75	41	34	897	1125	807	1206
105	Tumbiguda	109	435	214	221	6	3	3	164	72	92	116	49	67	968	1000	783	731
106	Olaparu	134	592	289	303	27	13	14	176	84	92	105	53	52	954	929	913	1019
107	Hadiguda	145	511	246	265	99	54	45	39	16	23	104	54	50	928	1200	696	1080
108	Gadikhamar	259	1047	498	549	119	66	53	490	237	253	202	111	91	907	1245	937	1220

	a																	
109	Dusura	442	1692	852	840	51	29	22	975	488	487	267	141	126	1014	1318	1002	1119
110	Bhairabgura	109	442	220	222	0	0	0	188	100	88	60	28	32	991	0	1136	875
111	Kutugam	366	1397	690	707	148	74	74	807	403	404	223	119	104	976	1000	998	1144
112	Kakiriguda	632	2527	1168	1359	249	116	133	1232	531	701	432	202	230	859	872	757	878
113	Lunguri	624	2598	1293	1305	296	141	155	985	482	503	422	218	204	991	910	958	1069
114	Khalapadi	298	996	498	498	41	23	18	938	462	476	181	95	86	1000	1278	971	1105
115	Charangul	1495	5841	2950	2891	791	397	394	1255	602	653	912	474	438	1020	1008	922	1082
116	Kunduli	453	1903	965	938	253	125	128	908	466	442	239	129	110	1029	977	1054	1173
117	Pungar	321	1660	884	776	73	41	32	1078	582	496	226	130	96	1139	1281	1173	1354
118	Sirimoda	190	742	354	388	0	0	0	709	342	367	160	78	82	912	0	932	951
119	Litiguda	142	438	214	224	86	38	48	40	19	21	87	47	40	955	792	905	1175
120	Doliamba	122	381	188	193	20	9	11	274	137	137	58	28	30	974	818	1000	933
121	Belaput	83	295	121	174	0	0	0	113	47	66	48	16	32	695	0	712	500
122	Karanjiguda	40	136	67	69	3	2	1	47	20	27	20	10	10	971	2000	741	1000
123	Rengaguda	23	82	41	41	0	0	0	0	0	0	13	8	5	1000	0	0	1600
124	Tola	526	2122	951	1171	19	8	11	1378	576	802	323	168	155	812	727	718	1084
125	Dangari	135	437	201	236	13	8	5	268	129	139	85	40	45	852	1600	928	889
126	Bagaraguda	65	221	100	121	17	7	10	204	93	111	46	26	20	826	700	838	1300
127	Bilaput	37	145	69	76	26	12	14	23	11	12	13	4	9	908	857	917	444

Table No. C3-23: Village-wise Occupation Pattern of the Study Area

S.No.	Village	Main and Marginal												Percentage			
		Cultivators			Agricultural Labourers			Household Labourers			Other workers						
		Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Cultivators	Agricultural Labourers	Household labours	Other workers
Nabarangpur																	
1	Borogan	312	225	87	350	93	257	60	26	34	29	12	17	23.4	26.3	4.5	2.2
2	Hirapara	132	87	45	32	2	30	0	0	0	9	3	6	41.8	10.1	0.0	2.8
3	Biripur	400	391	9	598	153	445	3	3	0	72	63	9	19.4	29.0	0.1	3.5
4	Daspur	421	378	43	520	154	366	5	2	3	67	42	25	22.7	28.0	0.3	3.6
5	Khatuarpara	150	150	0	209	28	181	1	1	0	5	3	2	21.0	29.2	0.1	0.7
6	Hatibena	322	318	4	128	56	72	2	2	0	74	62	12	20.8	8.3	0.1	4.8
7	Junuanipara	147	146	1	347	105	242	1	1	0	3	2	1	17.0	40.2	0.1	0.3
8	Birisadihi	159	149	10	321	149	172	7	6	1	7	6	1	13.0	26.2	0.6	0.6
9	Debagaon	243	230	13	351	115	236	3	2	1	17	13	4	15.7	22.6	0.2	1.1
10	Kurubella	345	328	17	356	77	279	3	2	1	27	18	9	20.1	20.8	0.2	1.6
11	Kacharapara	1090	894	196	697	203	494	11	6	5	90	56	34	27.5	17.6	0.3	2.3
12	Kalepara	117	113	4	181	34	147	0	0	0	3	2	1	25.7	39.7	0.0	0.7
13	Dhungiadihi	137	135	2	233	56	177	0	0	0	0	0	0	21.9	37.3	0.0	0.0
14	Tarangapur	196	189	7	245	40	205	2	1	1	2	2	0	25.0	31.3	0.3	0.3
15	Dhanara	435	368	67	659	189	470	4	2	2	11	8	3	26.8	40.7	0.2	0.7
16	Ampara	107	91	16	136	26	110	2	1	1	20	13	7	23.3	29.6	0.4	4.3
17	Sargiguda	55	33	22	195	95	100	1	0	1	6	2	4	13.1	46.3	0.2	1.4
18	Keskonga	0	0	0	195	102	93	0	0	0	4	1	3	0.0	48.4	0.0	1.0
19	Jadapara	288	249	39	392	122	270	35	14	21	37	28	9	22.4	30.5	2.7	2.9
20	Umarkote	29606	25509	4097	42291	14906	27385	1940	883	1057	8677	5520	3157	17.7	25.3	1.2	5.2
21	Andriguda	210	203	7	260	112	148	1	0	1	130	9	121	16.7	20.7	0.1	10.4

22	Kesaraberа	236	227	9	563	159	404	3	3	0	58	29	29	13.3	31.7	0.2	3.3
23	Matgan	296	253	43	195	75	120	5	3	2	45	25	20	23.4	15.4	0.4	3.6
24	Murtama	739	547	192	1075	451	624	16	11	5	167	132	35	18.7	27.1	0.4	4.2
25	Khadaka	277	266	11	447	117	330	12	6	6	252	139	113	13.8	22.2	0.6	12.5
26	Sukigan alias Dabiriguda	421	410	11	312	76	236	2	0	2	257	123	134	20.4	15.1	0.1	12.4
27	Dangrigudа	6	6	0	162	81	81	0	0	0	13	10	3	1.7	45.8	0.0	3.7
28	Tishaguda	60	59	1	299	133	166	2	2	0	43	34	9	6.9	34.3	0.2	4.9
29	Pujaribhar andi	253	247	6	392	114	278	1	0	1	39	34	5	17.5	27.2	0.1	2.7
30	Adhikarigu da	140	113	27	184	74	110	3	1	2	374	285	89	8.5	11.1	0.2	22.6
31	Kochiniam ba	8	8	0	6	2	4	2	1	1	73	39	34	5.4	4.1	1.4	49.3
32	Chhancha nbeda	17	16	1	446	225	221	3	2	1	304	168	136	1.5	40.2	0.3	27.4
33	Khutugud a	702	627	75	874	254	620	10	7	3	108	77	31	20.4	25.4	0.3	3.1
34	Mohuli	779	603	176	610	143	467	21	10	11	89	52	37	27.6	21.6	0.7	3.2
35	Khatiguda	54	50	4	145	50	95	1	1	0	10	3	7	15.9	42.6	0.3	2.9
36	Koramari	142	140	2	335	105	230	4	4	0	20	12	8	16.0	37.8	0.5	2.3
37	Malikguda	100	68	32	145	60	85	0	0	0	5	4	1	22.3	32.3	0.0	1.1
38	Majhia	143	137	6	417	298	119	1	1	0	35	13	22	9.1	26.6	0.1	2.2
39	Turunji	98	97	1	183	140	43	6	6	0	46	38	8	8.5	15.9	0.5	4.0
40	Mandiagud a	81	76	5	122	54	68	1	1	0	28	18	10	13.5	20.3	0.2	4.7
41	Nandapura	246	142	104	849	408	441	17	8	9	43	23	20	11.7	40.5	0.8	2.1
42	Parsabeda	151	151	0	328	97	231	1	1	0	11	4	7	17.4	37.8	0.1	1.3

43	Muliaguda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	Rabanagud a	745	412	333	412	140	272	5	3	2	74	56	18	41.7	23.1	0.3	4.1
45	Ambaguda	24	23	1	179	88	91	0	0	0	4	2	2	6.5	48.5	0.0	1.1
46	Khuntagud a	62	49	13	268	118	150	1	1	0	7	3	4	8.5	36.9	0.1	1.0
47	Chelibeda	65	63	2	250	93	157	2	2	0	7	6	1	12.7	48.7	0.4	1.4
48	Motigam	102	82	20	221	74	147	5	4	1	18	13	5	16.3	35.4	0.8	2.9
49	Talbeda	133	91	42	267	109	158	0	0	0	23	16	7	20.1	40.3	0.0	3.5
50	Godegam	74	71	3	117	106	11	5	3	2	184	58	126	9.2	14.5	0.6	22.8
51	Bodo-olma	256	213	43	456	160	296	10	6	4	583	318	265	9.4	16.8	0.4	21.5
52	Khutulugud a	102	99	3	68	22	46	0	0	0	83	35	48	17.0	11.3	0.0	13.8
53	Bhaluguda	4	4	0	86	43	43	0	0	0	86	41	45	1.2	25.4	0.0	25.4
54	Sano-olma	151	140	11	299	88	211	5	4	1	28	23	5	16.4	32.4	0.5	3.0
55	Hatibeda	898	839	59	1948	645	1303	46	21	25	237	194	43	14.7	31.9	0.8	3.9
56	Silakaguda	13	2	11	407	206	201	3	1	2	6	4	2	1.9	59.9	0.4	0.9
57	Palapur	243	226	17	366	73	293	4	4	0	226	193	33	14.5	21.9	0.2	13.5
58	Dangra	491	422	69	1752	761	991	11	7	4	139	84	55	10.8	38.4	0.2	3.0
59	Khutuguda	68	54	14	153	58	95	14	10	4	11	8	3	16.3	36.7	3.4	2.6
60	Biriguda	470	423	47	947	284	663	22	13	9	80	56	24	16.2	32.7	0.8	2.8
61	Dengaguda	109	98	11	204	125	79	9	8	1	38	24	14	11.9	22.2	1.0	4.1
62	Kharki	115	112	3	265	182	83	11	10	1	104	38	66	9.6	22.1	0.9	8.7
63	Chatahandi	1218	902	316	2242	818	1424	269	144	125	807	498	309	15.9	29.3	3.5	10.5
64	Teliguda	1	1	0	70	36	34	0	0	0	5	5	0	0.7	47.3	0.0	3.4
65	Bikrampur	104	101	3	448	176	272	1	1	0	271	229	42	5.7	24.7	0.1	14.9
66	Deula	135	128	7	624	206	418	29	18	11	190	144	46	8.1	37.6	1.7	11.4
67	Bhatra	72	69	3	251	134	117	1	1	0	58	37	21	8.8	30.6	0.1	7.1
68	Daspur	124	103	21	348	154	194	48	17	31	316	203	113	7.1	20.0	2.8	18.2
69	Pujariguda	81	77	4	638	286	352	13	7	6	233	175	58	4.3	33.9	0.7	12.4

Koraput																	
70	Patigan	87	44	43	210	109	101	0	0	0	24	18	6	13.8	33.3	0.0	3.8
71	Porsola	427	235	192	881	394	487	8	4	4	118	72	46	16.9	34.8	0.3	4.7
72	Khandiguda	51	47	4	323	146	177	32	12	20	85	75	10	4.7	29.5	2.9	7.8
73	Champia	208	192	16	311	118	193	1	1	0	16	10	6	17.9	26.8	0.1	1.4
74	Kamara	58	58	0	499	201	298	13	3	10	79	63	16	4.8	41.5	1.1	6.6
75	Kaliaguda	107	93	14	201	57	144	2	2	0	147	118	29	11.4	21.3	0.2	15.6
76	Khutulaguda	41	41	0	95	28	67	0	0	0	5	3	2	16.3	37.7	0.0	2.0
77	Hordali	346	278	68	1388	579	809	71	46	25	758	442	316	6.8	27.2	1.4	14.9
78	Kupia	60	56	4	310	126	184	1	1	0	16	11	5	8.3	43.1	0.1	2.2
79	Sanadubuli	120	73	47	194	90	104	4	3	1	21	11	10	19.4	31.4	0.6	3.4
80	Keraput	72	53	19	284	122	162	7	6	1	56	35	21	9.4	37.3	0.9	7.3
81	Benasur	243	225	18	659	255	404	3	1	2	59	41	18	12.2	33.1	0.2	3.0
82	Gujuniguda	9	8	1	101	56	45	8	3	5	50	21	29	3.0	33.1	2.6	16.4
83	Benagam	81	78	3	255	101	154	4	3	1	208	131	77	5.7	18.0	0.3	14.7
84	Chandalguda	102	98	4	364	68	296	8	5	3	181	147	34	9.5	34.0	0.7	16.9
85	Piteiguda	40	36	4	31	14	17	0	0	0	125	58	67	10.8	8.4	0.0	33.9
86	Lathiguda	95	76	19	38	11	27	1	0	1	77	38	39	23.0	9.2	0.2	18.6
87	Majhiguda	54	28	26	56	20	36	0	0	0	0	0	0	29.7	30.8	0.0	0.0
88	Kartas	434	386	48	627	123	504	3	2	1	95	46	49	20.6	29.8	0.1	4.5
89	Bakadaguda	1	0	1	75	33	42	0	0	0	4	3	1	0.6	42.9	0.0	2.3
90	Purimunda	40	32	8	26	2	24	0	0	0	8	5	3	25.6	16.7	0.0	5.1
91	Baunsaguda	34	26	8	68	22	46	9	9	0	34	27	7	10.1	20.2	2.7	10.1
92	Guntha	375	194	181	10	1	9	0	0	0	1	1	0	54.2	1.4	0.0	0.1
93	Phattu(Patu)	417	278	139	328	89	239	5	4	1	21	13	8	36.7	28.9	0.4	1.8
94	Sankar	107	98	9	373	143	230	1	1	0	13	9	4	12.2	42.4	0.1	1.5
95	Deopottangi	649	614	35	316	53	263	1	1	0	37	19	18	21.5	10.5	0.0	1.2
96	Baraja	1367	735	632	211	46	165	1	1	0	49	34	15	44.8	6.9	0.0	1.6

97	Pukali	792	425	367	377	119	258	6	5	1	183	134	49	29.6	14.1	0.2	6.8
98	Tologolluru (Talagoluru)	98	86	12	231	73	158	4	3	1	10	6	4	15.6	36.7	0.6	1.6
99	Sikaparu	167	137	30	122	15	107	0	0	0	3	1	2	33.5	24.5	0.0	0.6
100	Ampaballi	617	345	272	227	44	183	14	8	6	160	124	36	34.4	12.6	0.8	8.9
101	Kurli	190	171	19	215	31	184	0	0	0	10	6	4	27.7	31.3	0.0	1.5
102	Kandili	1530	759	771	564	256	308	0	0	0	16	10	6	43.5	16.0	0.0	0.5
103	Peturu	355	171	184	31	14	17	0	0	0	19	14	5	58.1	5.1	0.0	3.1
104	Tedda	149	101	48	173	52	121	1	0	1	7	4	3	30.1	34.9	0.2	1.4
105	Tumbiguda	273	137	136	0	0	0	0	0	0	0	0	0	62.8	0.0	0.0	0.0
106	Olaparu	227	153	74	101	11	90	0	0	0	0	0	0	38.3	17.1	0.0	0.0
107	Hadiguda	83	70	13	209	67	142	0	0	0	11	6	5	16.2	40.9	0.0	2.2
108	Gadikhamara	239	228	11	354	32	322	0	0	0	31	29	2	22.8	33.8	0.0	3.0
109	Dusura	487	437	50	454	41	413	0	0	0	40	18	22	28.8	26.8	0.0	2.4
110	Bhairabgura	95	94	1	206	49	157	0	0	0	7	5	2	21.5	46.6	0.0	1.6
111	Kutugam	200	144	56	626	224	402	2	1	1	51	43	8	14.3	44.8	0.1	3.7
112	Kakiriguda	663	352	311	231	87	144	27	17	10	316	154	162	26.2	9.1	1.1	12.5
113	Lunguri	144	87	57	338	141	197	67	54	13	605	443	162	5.5	13.0	2.6	23.3
114	Khalapadi	20	13	7	132	19	113	4	3	1	382	260	122	2.0	13.3	0.4	38.4
115	Charangul	299	201	98	783	251	532	154	99	55	1571	1136	435	5.1	13.4	2.6	26.9
116	Kunduli	319	205	114	486	161	325	9	6	3	161	118	43	16.8	25.5	0.5	8.5
117	Pungar	425	258	167	201	48	153	0	0	0	45	30	15	25.6	12.1	0.0	2.7
118	Sirimoda	145	141	4	308	70	238	0	0	0	6	3	3	19.5	41.5	0.0	0.8
119	Litiguda	163	78	85	108	48	60	2	2	0	1	1	0	37.2	24.7	0.5	0.2
120	Doliamba	95	89	6	124	17	107	0	0	0	15	12	3	24.9	32.5	0.0	3.9
121	Belaput	65	39	26	92	35	57	0	0	0	21	8	13	22.0	31.2	0.0	7.1
122	Karanjiguda	26	16	10	21	9	12	3	1	2	35	16	19	19.1	15.4	2.2	25.7
123	Rengaguda	25	21	4	23	2	21	0	0	0	0	0	0	30.5	28.0	0.0	0.0
124	Tola	424	403	21	661	120	541	0	0	0	16	11	5	20.0	31.1	0.0	0.8
125	Dangari	96	94	2	133	22	111	0	0	0	5	3	2	22.0	30.4	0.0	1.1

126	Bagaraguda	5	4	1	2	1	1	5	4	1	75	38	37	2.3	0.9	2.3	33.9
127	Bilaput	123	60	63	6	4	2	0	0	0	3	2	1	84.8	4.1	0.0	2.1

Table No. C3-24: Village-wise Employment Potential of the Study Area

Sl. No.	Village	Working Population			Main Workers			Marginal Workers			Non Workers			Percentage		
		Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Main Worker	Marginal Worker	Non Worker
Nabarangpur																
1	Borogan	751	356	395	253	198	55	498	158	340	581	299	282	19.0	37.4	43.6
2	Hirapara	173	92	81	120	92	28	53	0	53	143	73	70	38.0	16.8	45.3
3	Biripur	1073	610	463	468	456	12	605	154	451	987	446	541	22.7	29.4	47.9
4	Daspur	1013	576	437	447	403	44	566	173	393	841	362	479	24.1	30.5	45.4
5	Khatuarpara	365	182	183	155	154	1	210	28	182	350	173	177	21.7	29.4	49.0
6	Hatibena	526	438	88	333	328	5	193	110	83	1024	349	675	21.5	12.5	66.1
7	Junuanipara	498	254	244	195	177	18	303	77	226	366	180	186	22.6	35.1	42.4
8	Birisadihi	494	310	184	149	138	11	345	172	173	731	270	461	12.2	28.2	59.7
9	Debagaon	614	360	254	425	289	136	189	71	118	938	421	517	27.4	12.2	60.4
10	Kurubella	731	425	306	362	345	17	369	80	289	983	411	572	21.1	21.5	57.4
11	Kacharapara	1888	1159	729	851	798	53	1037	361	676	2069	841	1228	21.5	26.2	52.3
12	Kalepara	301	149	152	121	117	4	180	32	148	155	82	73	26.5	39.5	34.0
13	Dhungiadihi	370	191	179	145	144	1	225	47	178	255	125	130	23.2	36.0	40.8
14	Tarangapur	445	232	213	198	193	5	247	39	208	339	173	166	25.3	31.5	43.2
15	Dhanara	1109	567	542	321	308	13	788	259	529	512	247	265	19.8	48.6	31.6
16	Ampara	265	131	134	113	98	15	152	33	119	195	85	110	24.6	33.0	42.4
17	Sargiguda	257	130	127	71	62	9	186	68	118	164	75	89	16.9	44.2	39.0
18	Keskonga	199	103	96	28	24	4	171	79	92	204	121	83	6.9	42.4	50.6
19	Jadapara	752	413	339	312	290	22	440	123	317	535	267	268	24.2	34.2	41.6
20	Umarkote	82514	46818	35696	41432	34616	6816	41082	12202	28880	84395	36435	47960	24.8	24.6	50.6
21	Andriguda	601	324	277	250	242	8	351	82	269	653	300	353	19.9	28.0	52.1

22	Kesarabera	860	418	442	333	319	14	527	99	428	918	514	404	18.7	29.6	51.6
23	Matgan	541	356	185	282	268	14	259	88	171	722	262	460	22.3	20.5	57.2
24	Murtama	1997	1141	856	1193	830	363	804	311	493	1965	887	1078	30.1	20.3	49.6
25	Khadaka	988	528	460	418	367	51	570	161	409	1023	496	527	20.8	28.3	50.9
26	Sukigan alias Dabiriguda	992	609	383	472	455	17	520	154	366	1073	450	623	22.9	25.2	52.0
27	Dangriguda	181	97	84	87	83	4	94	14	80	173	79	94	24.6	26.6	48.9
28	Tishaguda	404	228	176	217	198	19	187	30	157	468	209	259	24.9	21.4	53.7
29	Pujaribharandi	685	395	290	392	343	49	293	52	241	758	324	434	27.2	20.3	52.5
30	Adhikariguda	701	473	228	544	417	127	157	56	101	952	409	543	32.9	9.5	57.6
31	Kochiniamba	89	50	39	46	39	7	43	11	32	59	25	34	31.1	29.1	39.9
32	Chhanchanbeda	770	411	359	300	279	21	470	132	338	340	144	196	27.0	42.3	30.6
33	Khutuguda	1694	965	729	881	821	60	813	144	669	1748	780	968	25.6	23.6	50.8
34	Mohuli	1499	808	691	978	622	356	521	186	335	1321	611	710	34.7	18.5	46.8
35	Khatiguda	210	104	106	132	87	45	78	17	61	130	66	64	38.8	22.9	38.2
36	Koramari	501	261	240	378	233	145	123	28	95	386	198	188	42.6	13.9	43.5
37	Malikguda	250	132	118	120	118	2	130	14	116	199	99	100	26.7	29.0	44.3
38	Majhia	596	449	147	399	368	31	197	81	116	969	359	610	25.5	12.6	61.9
39	Turunji	333	281	52	168	162	6	165	119	46	820	291	529	14.6	14.3	71.1
40	Mandiaguda	232	149	83	128	110	18	104	39	65	369	131	238	21.3	17.3	61.4
41	Nandapura	1155	581	574	418	398	20	737	183	554	940	457	483	20.0	35.2	44.9
42	Parsabeda	491	253	238	174	165	9	317	88	229	376	188	188	20.1	36.6	43.4
43	Muliaguda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	Rabanaguda	1236	611	625	340	312	28	896	299	597	551	250	301	19.0	50.1	30.8
45	Ambaguda	207	113	94	34	32	2	173	81	92	162	69	93	9.2	46.9	43.9
46	Khuntaguda	338	171	167	64	47	17	274	124	150	389	202	187	8.8	37.7	53.5
47	Chelibeda	324	164	160	132	125	7	192	39	153	189	80	109	25.7	37.4	36.8
48	Motigam	346	173	173	297	164	133	49	9	40	278	140	138	47.6	7.9	44.6
49	Talbeda	423	216	207	230	206	24	193	10	183	240	114	126	34.7	29.1	36.2

50	Godegam	380	238	142	139	131	8	241	107	134	427	150	277	17.2	29.9	52.9
51	Bodo-olma	1305	697	608	525	385	140	780	312	468	1410	587	823	19.3	28.7	51.9
52	Khutuluguda	253	156	97	136	130	6	117	26	91	348	125	223	22.6	19.5	57.9
53	Bhaluguda	176	88	88	11	9	2	165	79	86	162	76	86	3.3	48.8	47.9
54	Sano-olma	483	255	228	175	156	19	308	99	209	440	214	226	19.0	33.4	47.7
55	Hatibeda	3129	1699	1430	946	859	87	2183	840	1343	2980	1200	1780	15.5	35.7	48.8
56	Silakaguda	429	213	216	8	5	3	421	208	213	251	137	114	1.2	61.9	36.9
57	Palapur	839	496	343	481	441	40	358	55	303	834	332	502	28.8	21.4	49.9
58	Dangra	2393	1274	1119	1152	1011	141	1241	263	978	2169	968	1201	25.3	27.2	47.5
59	Khutuguda	246	130	116	109	102	7	137	28	109	171	72	99	26.1	32.9	41.0
60	Biriguda	1519	776	743	589	554	35	930	222	708	1374	674	700	20.4	32.1	47.5
61	Dengaguda	360	255	105	222	185	37	138	70	68	557	201	356	24.2	15.0	60.7
62	Kharki	495	342	153	159	151	8	336	191	145	706	246	460	13.2	28.0	58.8
63	Chatahandi	4536	2362	2174	1445	1290	155	3091	1072	2019	3120	1481	1639	18.9	40.4	40.8
64	Teliguda	76	42	34	76	42	34	0	0	0	72	41	31	51.4	0.0	48.6
65	Bikrampur	824	507	317	555	420	135	269	87	182	991	372	619	30.6	14.8	54.6
66	Deula	978	496	482	442	359	83	536	137	399	682	324	358	26.6	32.3	41.1
67	Bhatra	382	241	141	140	129	11	242	112	130	439	153	286	17.1	29.5	53.5
68	Daspur	836	477	359	455	357	98	381	120	261	903	418	485	26.2	21.9	51.9
69	Pujariguda	965	545	420	302	264	38	663	281	382	916	377	539	16.1	35.2	48.7
Koraput																
70	Patigan	321	171	150	314	168	146	7	3	4	309	165	144	49.8	1.1	49.0
71	Porsola	1434	705	729	1119	580	539	315	125	190	1100	556	544	44.2	12.4	43.4
72	Khandiguda	491	280	211	283	224	59	208	56	152	603	251	352	25.9	19.0	55.1
73	Champia	536	321	215	262	246	16	274	75	199	623	266	357	22.6	23.6	53.8
74	Kamara	649	325	324	309	240	69	340	85	255	553	288	265	25.7	28.3	46.0
75	Kaliaguda	457	270	187	181	166	15	276	104	172	485	200	285	19.2	29.3	51.5
76	Khutulaguda	141	72	69	70	64	6	71	8	63	111	39	72	27.8	28.2	44.0
77	Hordali	2563	1345	1218	1340	971	369	1223	374	849	2541	1261	1280	26.3	24.0	49.8

78	Kupia	387	194	193	176	161	15	211	33	178	333	167	166	24.4	29.3	46.3
79	Sanadubuli	339	177	162	229	161	68	110	16	94	279	126	153	37.1	17.8	45.1
80	Keraput	419	216	203	82	67	15	337	149	188	343	154	189	10.8	44.2	45.0
81	Benasur	964	522	442	511	451	60	453	71	382	1027	427	600	25.7	22.8	51.6
82	Gujuniguda	168	88	80	136	76	60	32	12	20	137	65	72	44.6	10.5	44.9
83	Benagam	548	313	235	212	187	25	336	126	210	871	337	534	14.9	23.7	61.4
84	Chandalguda	655	318	337	165	145	20	490	173	317	415	178	237	15.4	45.8	38.8
85	Piteiguda	196	108	88	121	86	35	75	22	53	173	68	105	32.8	20.3	46.9
86	Lathiguda	211	125	86	106	97	9	105	28	77	202	89	113	25.7	25.4	48.9
87	Majhiguda	110	48	62	55	29	26	55	19	36	72	42	30	30.2	30.2	39.6
88	Kartas	1159	557	602	722	416	306	437	141	296	944	449	495	34.3	20.8	44.9
89	Bakadaguda	80	36	44	32	28	4	48	8	40	95	23	72	18.3	27.4	54.3
90	Purimunda	74	39	35	46	37	9	28	2	26	82	45	37	29.5	17.9	52.6
91	Baunsaguda	145	84	61	81	69	12	64	15	49	191	76	115	24.1	19.0	56.8
92	Guntha	386	196	190	366	191	175	20	5	15	306	145	161	52.9	2.9	44.2
93	Phattu(Patu)	771	384	387	332	296	36	439	88	351	365	186	179	29.2	38.6	32.1
94	Sankar	494	251	243	369	232	137	125	19	106	385	183	202	42.0	14.2	43.8
95	Deopottangi	1003	687	316	675	634	41	328	53	275	2016	811	1205	22.4	10.9	66.8
96	Baraja	1628	816	812	927	653	274	701	163	538	1421	700	721	30.4	23.0	46.6
97	Pukali	1358	683	675	816	560	256	542	123	419	1320	546	774	30.5	20.2	49.3
98	Tologolluru (Talagoluru)	343	168	175	116	99	17	227	69	158	286	167	119	18.4	36.1	45.5
99	Sikaparu	292	153	139	173	126	47	119	27	92	206	110	96	34.7	23.9	41.4
100	Ampaballi	1018	521	497	602	438	164	416	83	333	777	422	355	33.5	23.2	43.3
101	Kurli	415	208	207	296	168	128	119	40	79	272	124	148	43.1	17.3	39.6
102	Kandili	2110	1025	1085	1649	820	829	461	205	256	1407	683	724	46.9	13.1	40.0
103	Peturu	405	199	206	360	175	185	45	24	21	206	91	115	58.9	7.4	33.7
104	Tedda	330	157	173	157	102	55	173	55	118	165	77	88	31.7	34.9	33.3
105	Tumbiguda	273	137	136	272	137	135	1	0	1	162	77	85	62.5	0.2	37.2

106	Olaparu	328	164	164	137	129	8	191	35	156	264	125	139	23.1	32.3	44.6
107	Hadiguda	303	143	160	117	107	10	186	36	150	208	103	105	22.9	36.4	40.7
108	Gadikhamara	624	289	335	421	274	147	203	15	188	423	209	214	40.2	19.4	40.4
109	Dusura	981	496	485	859	472	387	122	24	98	711	356	355	50.8	7.2	42.0
110	Bhairabgura	308	148	160	86	84	2	222	64	158	134	72	62	19.5	50.2	30.3
111	Kutugam	879	412	467	291	232	59	588	180	408	518	278	240	20.8	42.1	37.1
112	Kakiriguda	1237	610	627	820	482	338	417	128	289	1290	558	732	32.4	16.5	51.0
113	Lunguri	1154	725	429	774	610	164	380	115	265	1444	568	876	29.8	14.6	55.6
114	Khalapadi	538	295	243	232	179	53	306	116	190	458	203	255	23.3	30.7	46.0
115	Charangul	2807	1687	1120	1946	1503	443	861	184	677	3034	1263	1771	33.3	14.7	51.9
116	Kunduli	975	490	485	489	340	149	486	150	336	928	475	453	25.7	25.5	48.8
117	Pungar	671	336	335	480	300	180	191	36	155	989	548	441	28.9	11.5	59.6
118	Sirimoda	459	214	245	224	186	38	235	28	207	283	140	143	30.2	31.7	38.1
119	Litiguda	274	129	145	213	119	94	61	10	51	164	85	79	48.6	13.9	37.4
120	Doliamba	234	118	116	109	100	9	125	18	107	147	70	77	28.6	32.8	38.6
121	Belaput	178	82	96	155	76	79	23	6	17	117	39	78	52.5	7.8	39.7
122	Karanjiguda	85	42	43	76	38	38	9	4	5	51	25	26	55.9	6.6	37.5
123	Rengaguda	48	23	25	24	22	2	24	1	23	34	18	16	29.3	29.3	41.5
124	Tola	1101	534	567	582	475	107	519	59	460	1021	417	604	27.4	24.5	48.1
125	Dangari	234	119	115	106	99	7	128	20	108	203	82	121	24.3	29.3	46.5
126	Bagaraguda	87	47	40	85	46	39	2	1	1	134	53	81	38.5	0.9	60.6
127	Bilaput	132	66	66	60	32	28	72	34	38	13	3	10	41.4	49.7	9.0

Table No. C3-25: Village-wise Literacy Status of the Study Area

Sl. No.	Village	Literates			Illiterate			Literacy Rate
		Total	Male	Female	Total	Male	Female	
Nabarangpur								
1	Borogan	428	265	163	904	390	514	32.13
2	Hirapara	91	62	29	225	103	122	28.80
3	Biripur	1018	656	362	1042	400	642	49.42
4	Daspur	952	593	359	902	345	557	51.35
5	Khatuarpara	273	168	105	442	187	255	38.18
6	Hatibena	690	419	271	860	368	492	44.52
7	Junuanipara	255	174	81	609	260	349	29.51
8	Birisadihi	404	239	165	821	341	480	32.98
9	Debagaon	665	416	249	887	365	522	42.85
10	Kurubella	514	334	180	1200	502	698	29.99
11	Kacharapara	1798	1088	710	2159	912	1247	45.44
12	Kalepara	169	109	60	287	122	165	37.06
13	Dhungiadihi	242	161	81	383	155	228	38.72
14	Tarangapur	328	220	108	456	185	271	41.84
15	Dhanara	631	415	216	990	399	591	38.93
16	Ampara	253	148	105	207	68	139	55.00
17	Sargiguda	140	87	53	281	118	163	33.25
18	Keskonga	173	134	39	230	90	140	42.93
19	Jadapara	519	343	176	768	337	431	40.33
20	Umarkote	58186	35999	22187	108723	47254	61469	34.86

21	Andriguda	288	210	78	966	414	552	22.97
22	Kesarabera	750	486	264	1028	446	582	42.18
23	Matgan	362	242	120	901	376	525	28.66
24	Murtama	1557	920	637	2405	1108	1297	39.30
25	Khadaka	565	373	192	1446	651	795	28.10
26	Sukigan alias Dabiriguda	1004	628	376	1061	431	630	48.62
27	Dangriguda	145	92	53	209	84	125	40.96
28	Tishaguda	326	218	108	546	219	327	37.39
29	Pujaribharandi	647	388	259	796	331	465	44.84
30	Adhikariguda	1022	635	387	631	247	384	61.83
31	Kochiniamba	96	62	34	52	13	39	64.86
32	Chhanchanbeda	425	275	150	685	280	405	38.29
33	Khutuguda	1381	849	532	2061	896	1165	40.12
34	Mohuli	1281	797	484	1539	622	917	45.43
35	Khatiguda	111	64	47	229	106	123	32.65
36	Koramari	319	224	95	568	235	333	35.96
37	Malikguda	137	86	51	312	145	167	30.51
38	Majhia	487	318	169	1078	490	588	31.12
39	Turunji	360	215	145	793	357	436	31.22
40	Mandiaguda	184	116	68	417	164	253	30.62
41	Nandapura	466	299	167	1629	739	890	22.24
42	Parsabeda	252	178	74	615	263	352	29.07
43	Muliaguda	0	0	0	0	0	0	#DIV/0!
44	Rabanaguda	583	386	197	1204	475	729	32.62

45	Ambaguda	154	104	50	215	78	137	41.73
46	Khuntaguda	55	24	31	672	349	323	7.57
47	Chelibeda	138	83	55	375	161	214	26.90
48	Motigam	146	96	50	478	217	261	23.40
49	Talbeda	194	138	56	469	192	277	29.26
50	Godegam	209	141	68	598	247	351	25.90
51	Bodo-olma	1106	586	520	1609	698	911	40.74
52	Khutuluguda	184	109	75	417	172	245	30.62
53	Bhaluguda	80	48	32	258	116	142	23.67
54	Sano-olma	300	181	119	623	288	335	32.50
55	Hatibeda	2317	1338	979	3792	1561	2231	37.93
56	Silakaguda	215	149	66	465	201	264	31.62
57	Palapur	556	347	209	1117	481	636	33.23
58	Dangra	1215	747	468	3347	1495	1852	26.63
59	Khutuguda	128	82	46	289	120	169	30.70
60	Biriguda	887	547	340	2006	903	1103	30.66
61	Dengaguda	236	146	90	681	310	371	25.74
62	Kharki	392	255	137	809	333	476	32.64
63	Chatahandi	1984	1278	706	5672	2565	3107	25.91
64	Teliguda	59	37	22	89	46	43	39.86
65	Bikrampur	962	568	394	853	311	542	53.00
66	Deula	399	253	146	1261	567	694	24.04
67	Bhatra	316	180	136	505	214	291	38.49
68	Daspur	665	445	220	1074	450	624	38.24
69	Pujariguda	946	562	384	935	360	575	50.29

Koraput								
70	Patigan	253	170	83	377	166	211	40.16
71	Porsola	763	506	257	1771	755	1016	30.11
72	Khandiguda	224	130	94	870	401	469	20.48
73	Champia	470	291	179	689	296	393	40.55
74	Kamara	510	333	177	692	280	412	42.43
75	Kaliaguda	347	217	130	595	253	342	36.84
76	Khutulaguda	117	68	49	135	43	92	46.43
77	Hordali	1799	1270	529	3305	1336	1969	35.25
78	Kupia	265	181	84	455	180	275	36.81
79	Sanadubuli	247	155	92	371	148	223	39.97
80	Keraput	263	158	105	499	212	287	34.51
81	Benasur	740	452	288	1251	497	754	37.17
82	Gujuniguda	146	84	62	159	69	90	47.87
83	Benagam	528	284	244	891	366	525	37.21
84	Chandalguda	224	148	76	846	348	498	20.93
85	Piteiguda	72	41	31	297	135	162	19.51
86	Lathiguda	90	52	38	323	162	161	21.79
87	Majhiguda	25	13	12	157	77	80	13.74
88	Kartas	487	305	182	1616	701	915	23.16
89	Bakadaguda	81	27	54	94	32	62	46.29
90	Purimunda	65	49	16	91	35	56	41.67
91	Baunsaguda	82	48	34	254	112	142	24.40
92	Guntha	154	120	34	538	221	317	22.25
93	Phattu(Patu)	350	264	86	786	306	480	30.81

94	Sankar	311	196	115	568	238	330	35.38
95	Deopottangi	984	579	405	2035	919	1116	32.59
96	Baraja	663	455	208	2386	1061	1325	21.74
97	Pukali	963	524	439	1715	705	1010	35.96
98	Tologolluru (Talagoluru)	220	154	66	409	181	228	34.98
99	Sikaparu	121	79	42	377	184	193	24.30
100	Ampaballi	698	468	230	1097	475	622	38.89
101	Kurli	351	175	176	336	157	179	51.09
102	Kandili	376	268	108	3141	1440	1701	10.69
103	Peturu	112	81	31	499	209	290	18.33
104	Tedda	90	63	27	405	171	234	18.18
105	Tumbiguda	47	27	20	388	187	201	10.80
106	Olaparu	136	78	58	456	211	245	22.97
107	Hadiguda	142	111	31	369	135	234	27.79
108	Gadikhamara	249	155	94	798	343	455	23.78
109	Dusura	754	527	227	938	325	613	44.56
110	Bhairabgura	266	159	107	176	61	115	60.18
111	Kutugam	504	320	184	893	370	523	36.08
112	Kakiriguda	1056	607	449	1471	561	910	41.79
113	Lunguri	1300	718	582	1298	575	723	50.04
114	Khalapadi	325	215	110	671	283	388	32.63
115	Charangul	3223	1939	1284	2618	1011	1607	55.18
116	Kunduli	1041	643	398	862	322	540	54.70
117	Pungar	919	576	343	741	308	433	55.36

118	Sirimoda	244	161	83	498	193	305	32.88
119	Litiguda	138	99	39	300	115	185	31.51
120	Doliamba	173	107	66	208	81	127	45.41
121	Belaput	120	72	48	175	49	126	40.68
122	Karanjiguda	52	37	15	84	30	54	38.24
123	Rengaguda	54	30	24	28	11	17	65.85
124	Tola	865	474	391	1257	477	780	40.76
125	Dangari	128	82	46	309	119	190	29.29
126	Bagaraguda	84	53	31	137	47	90	38.01
127	Bilaput	59	32	27	86	37	49	40.69

MAP OF THE PROPOSED PROJECT AREA ITS 10 K.M. BUFFER ZONE & PROPOSED INTERVENTION ZONE IN KORAPUT, JEYPORE, NABARANGPUR FOREST DIVISION, ODISHA.

N

W E

S

1:200,000

0 4,500 9,000 18,000 27,000 36,000

Meters

Legend

- ODISHA-CORRIDOR
- 10KM BUFFER
- INTERVENTION ZONE

THE MAP OF ODISHA SHOWING THE DISTANCE OF NHAI PROJECT IN NABRANGPUR AND KORAPUT DISTRICT OF ODISHA FROM THE NATIONAL PARK/SANCTUARIES AND ELEPHANT/TIGER RESERVE AND THEIR CORRIDORS

Scale

0 10 20 40 60 80 Kilometers

LEGEND

- Proposed Project Site
- Elephant Corridor
- Existing Railways
- National Highways
- District Boundary
- Wildlife Sanctuaries/National Parks
- Elephant Reserve
- Tiger Reserve
- Biosphere Reserve

List of Sanctuaries/ National Parks/Tiger Reserves/Elephant Reserves in Orissa

Sanctuaries

1 Bhitarkanika
2 Similipal
3 Satkosia Gorge
4 Hadgarh
5 Nandankanan
6 Baisipalli
7 Kotagarh
8 Chandaka-Damapara
9 Khalasuni
10 Balukhand-Konark
11 Kuldia
12 Debrigarh
13 Lakhari Valley
14 Chilika (Nalaban)
15 Badrama
16 Sunabeda
17 Karlapat
18 Gahirmatha(Marine)
19 Kapilas

National Park

1 Similipal
2 Bhitarkanika

Tiger Reserve

1 Similipal
2 Satkoshia

Elephant Reserve

1 Mayurbhanj Elephant Reserve
2 Sambapur Elephant Reserve
3 Mahanadi Elephant Reserve

LIST OF IDENTIFIED ELEPHANT CORRIDORS
Source:O/o PCCF (Wild Life), Govt. of Orissa

1 Badampahar-DhobaDhobin
2 Badampahar-Karida-East
3 West Bengal-Deuli-Suliapada
4a Similipal-Hadgarh
4b Similipal-Kuldiha
5 Telkoi-Pallahada
6 Kero(Keonjhar)-Karampada(Jh.Khand)
7 Maulabhanja-Jiridimal-Anantpur
8 Kahneijena-Anantpur
9 Buguda-Central RF of Nayagarh Divn
10 Nuagaon-Baruni
11 Tal-Kholgarh
12 Barpahad-Tarava-Kantamal
13 Kotagarh-Chandrapur
14 Karlapat-Urladani

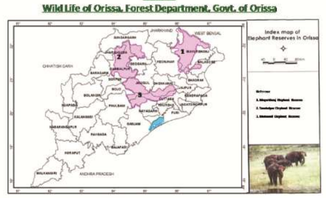
Checked & Verified
Asst. Conservator of Forests
Nabarangpur Forest Division

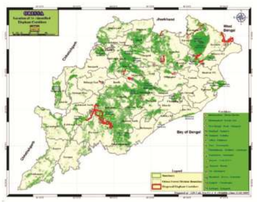
Checked & Verified
Asst. Conservator of Forests
Nabarangpur Forest Division

Divisional Forest Officer
Nabarangpur Division

Source:
Wild Life of Orissa, Forest Department, Govt. of Orissa

Source:
Wild Life of Orissa, Forest Department, Govt. of Orissa





CHAPTER-9: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

9.1 INTRODUCTION

Some additional measures needed to improve the environment are proposed to be undertaken during the project implementation. Such measures are known as environmental enhancements. These relate to improvement of natural, physical and aesthetic environment of roadside. The 'enhancement measures', in fact, differ from 'mitigation measures'. While the former aims at improving the already degraded or mundane ambience, the latter intends to reduce the negative impacts due to the project.

The objective of these measures include: -

- To enhance the appeal of the proposed project,
- To improve the environmental quality, and
- To generate goodwill amongst local community

To achieve these objectives, some suggested measures include:

1. Enhancement of roadside facilities (bus stops, rest areas, etc.)
2. Improvement of aesthetic qualities along the proposed highway.
3. Improvement of the local natural resources for local population.
4. Enhancement of cultural properties and access to them.
5. Management of some existing problems.

9.2 ENHANCEMENT OF NATURAL ENVIRONMENT

The natural environment can be improved by plantation of ornamental and shade providing avenue trees on the roadside, the shrubs and some important herbs besides developing ponds and providing bore wells along the roadside.

9.2.1 Plantation of Trees, Shrubs and Herbs along the proposed Highway

The plantation of trees can be done in different densities depending on:

- Habitat and soil type
- Water table depth
- Availability of indigenous species
- Survival rate of plants and
- People's choice

The physical growth characteristics like the form and shape of canopy types, branching patterns, growth rate, colour of flowers, foliage and root characteristics were also the major criteria in the selection of plantation type and densities.

Since the natural forests of desired density are lacking in the region, the ecological importance of the roadside plantation becomes increasingly significant. But, what kind of tree species should be selected for such plantation has been a debated issue. The acute shortage of forest products provided support to the view point that the strip plantation along the highway should be managed primarily to meet the requirement of the local people and industries for various forest products. However the consideration of comfort to travelers was given the top priority.

9.2.2 Enhancement of Water Bodies

There are number of surface water bodies crossing the project corridor. In order to make these water bodies more accessible and enhance the waterfront landscape following measures has been suggested.

The water bodies are used for various purposes including bathing, washing, fishing, growing water-fruits, livestock drinking and often irrigating the agricultural fields. The landscape treatment includes

- Provision of stepped access to the edge of water
- Providing flat boulders for washing
- Stone pitching for slope stabilization towards roadside
- Plantation of trees and shrubs for stabilization of pond edge.
- Silt fencing is proposed near ponds.

9.3 CONSERVATION STATUS AND BIODIVERSITY MANAGEMENT

The project area does not pass through any protected/reserve forest or wildlife sanctuaries. The natural resource management cannot be successful without the participation of all the stakeholders utilizing the resource. So during the field visit to the project area, concerted attempts were made to consult and listen the stakeholders, such as some visitors and local inhabitants of area and Intersection sites to understand their perception, concern and knowledge. The analysis of flora and fauna of the project area indicates that there is no endangered species in the study area.

9.3.1 THREATS TO BIODIVERSITY IN THE PROJECT SITE

The major threats are enumerated as follows:

- Fragmentation and gradual shrinkage of wildlife habitat due to expansion of agriculture and economic development activities

- Existence of altered habitats in patches or in continuity and further spread on account of changed environment due to climate change and anthropogenic activities
- Gradual increase in human and livestock population
- Limited waterholes
- Lack of herbaceous fodder during summer on account of nearly zero rainfall
- Unusual soil erosion on the fringes of Park and around wetlands
- Human and livestock activities, such as, burning, open grazing and seasonal flooding in the low-lying areas
- Exposure to diseases in case of wildlife (least at present) due to exposure to domestic cattle

9.4 PHYSICAL ENVIRONMENT

9.4.1 Construction of Bus Stops

Bus stops will be constructed for providing comfort to travelers. Following improvement in design of bus stops are suggested:

- Provision of bus bays to prevent the bus from stopping in the carriageway
- Provision of covered, semi-covered and open spaces with seating areas
- Plantation of shade trees to improve the microclimate
- The bus stop should be aesthetically pleasing
- Provision of adequate right distances

9.4.2 Developing Truck Stoppage Complex

In view of the heavy truck parking activities in midsections, truck stoppage sites/ truck lay bays are suggested at the appropriate locations along the highway.

The requirements of truck stoppage complexes are:

- Acquisition of land for developing the complex
- Each complex should have some shops covering the repair shops, medicine shops, restaurants, and recreation
- The location of petrol pumps should be close to such complexes
- Ornamental and shade trees and shrubs to be planted in order to develop the area aesthetically.

9.4.3 Enhancement of Major Road Intersections

The road intersections are the main nodal spaces along the corridor. Proper landscaping of these areas by flowering trees and shrubs will improve the area aesthetically.

9.4.4 Enhancement of Cultural Properties

The cultural properties should be viewed as assets contributing towards meaningful and pleasurable traveling experience. These are the sites of community and individual sentiments. The landscape and design improvements include:

- Providing and improving access to cultural properties.
- The precincts of such properties should be defined or redefined.
- Provision of parking should be made to avoid haphazard parking activities.
- Seating space and rest areas around the cultural properties to be developed.
- Plantation of trees and shrubs for shade and aesthetics.

9.4.5 Enhancement of Quarries and Borrow Areas

The following enhancement measures will be undertaken for quarries:-

Construction Stage

Development of site: To minimize the adverse impact during excavation of material following measures are need to be undertaken:

i) Adequate drainage system shall be provided to prevent the flooding of the excavated area

ii) At the stockpiling locations, the Contractor shall construct sediment barriers to prevent the erosion of excavated material due to runoff

iii) Construction of offices, laboratory, workshop and rest places shall be done in the up-wind of the plant to minimize the adverse impact due to dust and noise.

iv) The access road to the plant shall be constructed taking into consideration the location of units and also slope of the ground to regulate the vehicle movement within the plant.

v) Incase of storage of blasting material, all precautions shall be taken as per The Explosive Rules, 1983.

Quarry Operations Including Safety

i) Overburden shall be removed and disposed on designated site

ii) During excavation, slopes shall be flatter than 20 degrees to prevent their sliding. Incases where quarry strata are good and where chances of sliding are less this restriction can be ignored.

iii) Incase of blasting, procedure and safety measures shall be taken as per The Explosive Rules, 1983.

iv) The contractor shall ensure that all workers related safety measures shall be done as per guidelines for Workers and Safety.

v) The Contractor shall ensure maintenance of crushers regularly as per manufacturer's recommendation.

Topsoil will be excavated and preserved during transportation of the material. Measures shall be taken to minimize the generation of dust and prevent accidents.

Borrow Areas Management

Borrow areas will be finalized either form the list of locations recommended during EIA stage or new areas identified by contractor. The finalization of locations identified during EIA identified and may be finalized by contractor depends upon the formal agreement between landowners and contractor and its suitability from civil engineering as well as environmental consideration. Meeting the guidelines/notifications as stipulated from time to time by the Ministry of Environment, Forest and Climate Change, Government of India, and local bodies, as applicable shall be the sole responsibility of the contractor.

Besides this certain precautions have to be taken to restrict unauthorized borrowing by the contractor. No borrow area shall be opened without permission of the Engineer/EO. The engineer in addition to the established practices, rules and regulation will also consider following criteria before approving the Borrow areas.

To avoid any embankment slippage, the borrow areas will not be dug continuously, and the size and shape of borrow pits will be decided by the Engineer. Redevelopment of the borrow areas to mitigate the impacts will be the responsibility of the contractor. The contractor shall evolve site-specific redevelopment plans for each borrow area location, which shall be implemented after the approval of the Supervision Consultant.

To ensure that the spills, which might result from the transport of borrow and quarry materials do not impact the settlements, it will be ensured that the excavation and carrying of earth will be done during day-time only. The unpaved surfaces used for the haulage of borrow materials will be maintained properly.

Borrowing of earth shall be carried out at locations recommended as follows:

Non-Cultivable Lands: Borrowing of earth will be carried out upto a depth of 2.0 m from the existing ground level. Borrowing of earth shall not be done continuously. Ridges of not less than 8m width shall be left at intervals not exceeding 300 m. Small drains shall be cut through the ridges, if necessary, to facilitate drainage. Borrow pits shall have slopes not steeper than 1 vertical in 4 horizontal.

Productive Lands: Borrowing of earth shall be avoided on productive lands. However, in the event of borrowing from productive lands, under circumstances as described above, topsoil shall be preserved in stockpiles. The conservation of topsoil shall be carried out as described in section of this chapter. At such locations, the depth of borrow pits shall not exceed 45 cm and it may be dug out to a depth of not more than 30 cm after stripping the 15 cm top soil aside.

Elevated Lands: At locations where private owners desire their fields to be leveled, the borrowing shall be done to a depth of not more than 2 m or up to the level of surrounding fields.

Borrow pits along Roadside: Borrow pits shall be located 5m away from the toe of the embankment. Depth of the pit should be such that the bottom of the pit shall not fall within an imaginary line of slope 1 vertical to 4 horizontal projected from the edge of the final section of the bank. Borrow pits should not be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300 m. Small drains should be cut through the ridges to facilitate drainage.

Borrow pits on the riverside: The borrow pit should be located not less than 15m from the toe of the bank, distance depending on the magnitude and duration of flood to be withstood.

Community / Private Ponds: Borrowing can be carried out at locations, where the private owners (or in some cases, the community) desire to develop lands (mostly low-lying areas) for pisciculture purposes and for use as fishponds.

Borrow Areas near Settlements: Borrow pit location shall be located at least 1.0 km from villages and settlements. If unavoidable, they should not be dug for more than 30 cm and should be drained.

After identification of borrow areas based on guidelines. Contractor will fill reporting format as under and submit the same for approval to the "Engineer" Once approved the contractor will adhere to the recommendation for borrow area to the satisfaction of Engineer.

(1) In no case the depth of borrow area should exceed 2m from the existing ground level.

(2) Borrow pits slope should be maintained, no steeper than 1 Vertical: 2 Horizontal.

(3) Water pooling to be avoided/managed so that NO disease spread due to water stagnation.

(4) Precautionary measures as the covering of vehicles will be taken to avoid spillage during transportation of borrow area.

(5) The unpaved surfaces used for the haulage of borrow materials should be maintained properly for dust suppression.

(6) Haulage of material to embankments or other areas of fill shall proceed only when sufficient spreading and compaction facility is operating at the place of deposition, to minimize dust pollution.

(7) During rains appropriate measures to be taken to minimize soil erosion, silt fencing to be provided as directed by Engineer/EO.

The Contractor will keep record of photographs of various stages i.e., before using materials from the location (pre-project), for the period borrowing activities (construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.

9.4.6 Management Measures for Muck Disposal Sites

A large quantum of muck is expected to be generated during the construction of 02 nos. of tunnels in the proposed project highway. A part of muck is proposed to be utilized as a construction material for various project appurtenances. The balance is proposed to be disposed at the designated site. Muck generated from excavation of any project component is required to be disposed in a planned manner so that it takes a least possible space and is not hazardous to the environment. In the hilly area, dumping is done after creating terraces thus usable terraces are developed. The overall idea is to enhance/maintain aesthetic view in the surrounding area of the project in post-construction period and avoid contamination of any land or water resource due to muck disposal**.**

Various activities proposed as a part of the management plan are given as below:

- Land acquisition for muck dumping sites.
- Civil works (construction of retaining walls, boulder crate walls etc.)
- Dumping of muck.
- Leveling of the area, terracing and implementation of various engineering control measures e.g., boulder, crate wall, masonry wall, catch water drain.
- Spreading of soil.
- Application of fertilizers to facilitate vegetation growth over disposal sites.

For stabilization of muck dumping areas following measures of engineering and biological measures have been proposed.

9.4.6.1 Engineering Measures

It has been observed that after disposal of muck, it creates problem as it is susceptible to scattering unless the muck disposal yards are supported with

engineering measures such as gabions. All the dumping sites need proper handling to avoid spilling of muck into the river water while dumping and in the post dumping stages. All the muck disposal sites have to be developed from the ground level either by providing stone masonry or by gabion structure. The costing of engineering measures has been worked out based on gabion structure. In all the muck dump sites, the muck brought in dumpers shall be dumped and manually spread behind the crates and roller compacted in such a manner that rock mass is properly stacked behind the crates with minimum of voids.

- Wire crate wall
- Boulder crate wall
- R.C.C
- Catch Water Drain

Suitable retaining walls shall be constructed to develop terraces so as to support the muck on vertical slope and for optimum space utilization. Loose muck would be compacted layer wise. The muck disposal area will be developed in a series of terraces of boulder crate wall and masonry wall to protect the area/muck from flood water during monsoons. In-between the terraces, catch water drain will be provided. The terraces of the muck disposal area will be ultimately covered with fertile soil and suitable plants will be planted adopting suitable bio-technological measures.

9.4.6.2 Biological Measures

Biological measures, however, require special efforts as the disposed muck will be devoid of nutrients and soil contents to support vegetation. The selection of soil for spreading over such an area would require nutrient profiling of soil for different base elements. Suitable mixture of nutrients would be done before placing the soil on the top surface of muck disposal areas to have administered growth of forest canopy.

- Plantation of suitable tree species and soil binding species
- Plantation of ornamental plants
- Barbed wire fencing

Muck generally lacks nutrients and therefore, are difficult to re-vegetate. However, if no attempts to vegetate the slopes are made, the muck could slide lower down during rain and may eventually wash off the check dams also. Since, top soils are not available in large quantities in hilly terrains of the project area; it may not be possible to apply a thin layer of soil over the muck. Bio-fertilizer technique developed by National Environmental Engineering Research Institute (NEERI) can be adopted in the proposed project.

9.4.6.3 Budget allocation for the stabilization of muck disposal sites[1]

The total expenditure required for stabilization of muck disposal sites has been estimated to be of the order of **Rs. 8.45 Crores**. The breakup of the allocation of the cost has been presented in **Table No. C9-1.**

Table No. C9-1: Breakup of the allocation of cost for stabilization of muck disposal sits

Sl. No	Component	Quantity	Unit	Rate/Sqm	Total Cost In Cr.
1	Geotextile	62.22	Ha	120.00	7.47
2	Turfing	62.22	Ha	14.2	0.88
3	Fencing		Lump Sum	500000	0.05
4	Watering and maintenance		Lump Sum	500000	0.05
Total					**8.45**

9.5 SOLID WASTE MANAGEMENT

Excavated earth/muck is likely to be generated due to road preparation activities. The muck will also be generated during cutting of road section. All the muck generated will be disposed as per C&D Waste Management rule 2016 and other applicable laws.

The objective of this plan is to minimize the various wastes well within the acceptable limit to protect/prevent air, water and soil pollution and provide requirements for the storage, safe disposal, and record keeping for the management of construction waste at proposed project and its related facilities, effective management of waste, both liquid and solid, involves identification, segregation collection, storage, reuse, recycle, (treatment by PCB/CPCB Authorized agency) and disposal.

This procedure is applicable for all wastes generated from road construction work and its associated facilities viz. base camps, labor camps, store yard. It is understood that waste management will be based on a hierarchy of practices viz. source reduction, reuse, recycling & discovery, treatment (by PCB/CPCB Authorized agency) and offsite/onsite disposal.

[1] The cost for stabilization of muck disposal sits has been included in the cost of EMP cost.

Mitigation measures:

- All excavated materials from roadway, shoulders, drains, cross drainage will be used for backfilling embankments, borrow area, filling pits, and landscaping.
- Unusable debris material should be suitably disposed-off at pre-designated disposal locations, with approval of the concerned authority.
- The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner and may also used in shoulders with proper treatment and approval of concerned engineer.
- Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.
- Concrete waste should be utilized suitably in temporary access road or disposed off suitably with prior permission of the Environment Expert.
- The hazardous waste (waste/burned oil) will be disposed of through SPCB approved vendor.
- Scrap materials (tyre/steel/sand bags) will sold out to the authorized vendors.
- Biodegradable waste from the labour camp/Mess will be disposed off on daily basis by the municipality authority/ local waste collector. Also some quantity of biodegradable waste will be used for the preparation of compost.

The types of Waste and its Management have been presented in **Table No. C9-2.** The reuse/Recycle of Waste at Project Site has been presented in **Table No. C9-3.**

Table No. C9-2: Types of waste and its management

Waste Class	Type of Waste	Disposal Plan	Storage Guidelines	Remarks
A	Hazardous waste (Used oil from DG sets/Machineries/ Equipments)	Concrete platform with sump/collection tray, to be sent for recycle purpose, to be disposal by buy-back arrangement with suppliers. Storage of the oil drums should be in drip trays.	Sold to authorized recycler, Label drum segregated areas, No contamination of land, storage to be done in concrete area.	Used oil to be sold to CPCB authorized recycler only.

B	Metal scraps	Cutting in small pieces for barricade purpose.	Stored at scrap yards	Reused at the site or sell to vendor
C	Biodegradable (office and labour camp waste)	Shall be disposed off in coordination with the concerned authorities. Segregation of waste should be done including colour coding of the different waste containers.	Dust bins	Should be Manage with organic waste recycling process
D	Non-Biodegradable (Plastic bag, thermocol)	Sold to recycler if in large quantities.	Storage area duly marked (all sites).	--
E	Construction debris	To be disposed only on municipal permitted land	Select/designated location only (waste yard)	--
F	Excavated soil	Collected and transferred throw dumpers used for leveling.	Approved area	--
G	Used electrical/ plastic/wood and other miscellaneous waste item	Sold to recycler if in large quantities.	Scrap yards	--

Table No. C9-3: Reuse/Recycle of Waste at Project Site

S. No	Type of Waste	Can be Reused or Recycled
1	Excavated soil/earth	Recycle for use as fill material
2	Excavated soil/earth	Reuse for landscaping, leveling of borrow area, filling of pits etc
3	Concrete	Recycle for use as aggregate in new concrete Reused in temporary access roads
4	Metal & Scrap	Recycled through vendor
5	Biodegradable waste	Converted to compost

6	Timber	Reuse e.g.: for shuttering/hording
7	Waste Oil	Recycled through authorized vendor
8	Cement Bags	Reused as sand bags

The details of muck generated in the project and its disposal locations are presented in **Table No. C9-4** below:

Table No. C9-4: Details of muck generated in the project and its disposal locations

Chainage		Total Cutting Volume	Total Filling Volume	Quantity of Earth/Muck Generated	Quantity of Muck Utilized in different construction Activity	Balance Quantity of Earth/Muck for disposal
From	To	(Cum)	(Cum)	(Cum)	(Cum)	(Cum)
124+661	146+500	2,90,243.57	21,08,425.17	2,90,243.57	1,68,791.99	1,21,451.58
146+500	179+000	6,63,775.44	41,65,108.84	6,63,775.44	3,68,454.52	2,95,320.92
179+000	226+500	13,93,712.71	52,80,011.42	13,93,712.71	5,64,741.35	8,28,971.36
226+500	249+000	4,30,848.26	24,62,196.49	4,30,848.26	1,50,671.42	2,80,176.84
249+000	293+000	1,23,00,001.65	37,67,003.05	1,23,00,001.65	23,31,181.22	99,68,820.43
293+000	338+500	47,42,246.44	51,30,846.94	47,42,246.44	15,88,586.20	31,53,660.24
338+500	343+000	4,99,950.00	0	4,99,950.00	0.00	4,99,950.00
343+000	365+033	39,03,150.34	13,04,369.76	39,03,150.34	9,45,437.64	29,57,712.70

The earth/muck disposal locations have been presented in **Table No. C9-5.**

Table No. C9-5: Earth/Muck Disposal Locations

District	Location	Area of Dumping Site (Ha.)	Amount of Muck Disposed (Cum)
Nabarangpur	Ch. 131+900 Kalepara Village	22.38 Ha.	1,21,451.58
	Ch. 146+000 Katuarpara Village	30.21 Ha.	2,95,320.92
	Ch. 188+000 Khatiguda Village	63.00 Ha.	8,28,971.36
	Ch. 236+800 Pujariguda Village	8.24 Ha.	2,80,176.84
Koraput	Ch. 248+300	18.9 Ha.	99,68,820.43

District	Location	Area of Dumping Site (Ha.)	Amount of Muck Disposed (Cum)
	Kamra Village		
	Ch. 299+200 Chhagaon Village	17.75 Ha.	31,53,660.24
	Ch. 336+000 Baraja Village	26.7 Ha.	4,99,950.00
	Ch. 343+250 Kandili Village	38.44 Ha.	29,57,712.70

9.6 ENVIRONMENT MANAGEMENT ACTION PLAN

The Environmental Management Action Plan is the synthesis of all proposed mitigation and monitoring actions, to be implemented within a time frame with specific responsibility assigned and follow-up actions defined. It contains all the information for the project proponents, the contractors and the regulatory agency to implement the project within a specified time frame.

- The EMP is a plan of action for avoidance, mitigation and management of the negative impacts of the project. The Environmental Enhancement is also an important component of EMP.
- The EMP refers to all implementable task at different stages of project, namely,

  i. Design Phase

  ii. Construction Phase, and

  iii. Operation Phase
- The EMP includes a list of all project-related activities and impacts and a clear reporting schedule.
- The EMP is divided into two broad components, (i) dealing with natural environment, and (ii) dealing with action plan for resettlement and rehabilitation (RAP). While the mitigation measures of the natural environment and their management have been incorporated in the present volume, the management of issues related with resettlement and rehabilitation of human communities has been provided in Resettlement Action Plan.

The EMP has been presented in the **Table No. C9-6.**

Table No. C9-6: Environmental Management Action Plan

Environmental Issue/Component	Impact Description	Remedial Measure
PRE-CONSTRUCTION/DESIGN PHASE		
1. ALIGNMENT		
Constricted sections / settlements	• The local traffic will mix up with fast moving vehicles leading to accidents • Communities on two sides in market are unable to cross the road easily • Loss of property & income source • Increased traffic	• Erecting the service lanes • Developing underpasses in markets • Developing resettlement sites • Modify designs to save settlements, trees and other environmental Components • Construction of wide Road
2. LAND		
Embankment slopes	• Some degree of soil erosion on newly constructed embankment	• Turfing of the slopes to check soil erosion with grasses, etc. • Care should be taken that the slope gradient shall not be greater than 2:1. • The earth stockpiles to be provided with gentle slopes to prevent soil erosion.
Borrow areas	• Soil and land use will be changed	• Borrow pits shall not be dug continuously. The location, shape and size of the designated borrow areas shall be as approved by the Engineer. No borrow area shall be opened without permission of the engineer. • Topsoil to be stockpiled and protected for use at the rehabilitation stage. • Depths of borrow pits to be regulated. • If borrow pits along the highway is permitted by the Engineer, these shall not be dug continuously and shall confirm to MORTH specifications.

Environmental Issue/Component	Impact Description	Remedial Measure
		• Borrow pits shall be redeveloped as per MoEF&CC guidelines. Spoils shall be dumped with an overlay of stockpiled topsoil in accordance with compliance requirements with respect to MoEF&CC guidelines.
3. WATER		
Water source	• No appreciable impact on underground water sources • No loss of surface water bodies or ponds	• Relocation of water sources like wells and hand pumps
Drainage	• No significant impact as sufficient no. of CD works are available	• Raising the road level • Provision for drainage on the side of highway
4. FLORA AND FAUNA		
Protected forest	• Removal of approx. 67,050 no of trees	• Loss of trees will be compensated through compensatory afforestation and roadside plantation.
Wildlife	• Loss of Habitat and Defragmentation	• Total 25 Animal Underpass are proposed for safe passage of wildlife movement. In addition to this, 20 Canopy Bridge, 23 VUP, 04 VOP 71 LVUP, 21 Viaduct and box culverts are also proposed for safe movement.
	• Noise Induced physiological and behavioral Changes	• Tree plantation shall be done along the road for noise attenuation. • Silence zone will be marked and provided with sign boards to alert drivers • Noise Barrier will be provided
	• Impacts of Headlights Glare on Wildlife	• Boundary wall with plantation shall be provided on both edge of the RoW to prevent the glaring effect.
	• Avoidance of Road by Animals • To avoid Injury and Mortality of animals	Boundary wall will be provided along the edge of the RoW to present the animal entry in the RoW.

<table>
<tr><th>Environmental Issue/Component</th><th>Impact Description</th><th>Remedial Measure</th></tr>
<tr><td></td><td>•
•</td><td>• Box culverts will be constructed for passage of herpetofauna, amphibians etc.
• Total 25 Animal underpasses shall be provided for the safe movement of wild animal. The details of animal underpass are given as under:
<table>
<tr><th>Sl. No.</th><th colspan="2">Chainage</th><th>No. of Structure</th><th>size of the underpasses</th></tr>
<tr><td colspan="5">Nabarangpur Forest Division</td></tr>
<tr><td>1</td><td>132+450</td><td>133+450</td><td>1</td><td rowspan="5">30m span x 5m height x 5-8m width</td></tr>
<tr><td>2</td><td>198+850</td><td>199+350</td><td>1</td></tr>
<tr><td>3</td><td>204+750</td><td>206+100</td><td>1</td></tr>
<tr><td>4</td><td>236+400</td><td>237+850</td><td>1</td></tr>
<tr><td>5</td><td>217+050</td><td>217+800</td><td>1</td></tr>
<tr><td>6</td><td>125+250</td><td>125+450</td><td>1</td><td></td></tr>
<tr><td>7</td><td>127+350</td><td>127+650</td><td>1</td><td></td></tr>
<tr><td>8</td><td>128+850</td><td>129+450</td><td>1</td><td></td></tr>
<tr><td>9</td><td>140+550</td><td>141+500</td><td>1</td><td></td></tr>
<tr><td>10</td><td>144+400</td><td>144+850</td><td>1</td><td></td></tr>
<tr><td colspan="5">Jaypore Forest Division</td></tr>
<tr><td>6</td><td>241+350</td><td>242+750</td><td>1</td><td rowspan="3">30m span x 5m height x 5-8m width</td></tr>
<tr><td>7</td><td>246+700</td><td>247+700</td><td>1</td></tr>
<tr><td>8</td><td>269+000</td><td>273+450</td><td>3</td></tr>
<tr><td colspan="5">Koraput Forest Division</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Environmental Issue/Component</th><th>Impact Description</th><th>Remedial Measure</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>9</td><td>273+500</td><td>275+000</td><td>1</td><td rowspan="8">30m span x 5m height x 5-8m width</td></tr>
<tr><td>10</td><td>278+400</td><td>279+400</td><td>1</td></tr>
<tr><td>11</td><td>287+450</td><td>290+200</td><td>1</td></tr>
<tr><td>12</td><td>339+500</td><td>342+250</td><td>2</td></tr>
<tr><td>13</td><td>347+350</td><td>351+100</td><td>2</td></tr>
<tr><td>14</td><td>356+000</td><td>357+100</td><td>1</td></tr>
<tr><td>15</td><td>358+650</td><td>360+950</td><td>1</td></tr>
<tr><td>16</td><td>362+700</td><td>363+600</td><td>1</td></tr>
<tr><td colspan="3">Total</td><td>25</td><td></td></tr>
</table>
• Watch tower will be constructed in supervision of the forest officials to direct the animals to cross the road through the underpasses.
• Guard wall with underpass will be provided in combination with underpasses to direct animals away from the highway.
The wildlife conservation plan is attached as Annexure XV.
</td></tr>
<tr><td>Plantation</td><td>• Loss of trees leading to increase in air and noise pollution; the loss of ecological and economic activities</td><td>• Approx. 2,01,150 nos of tree shall be planted (Two row on either sides within the available RoW shall be done and shrubs shall be planted in the median)</td></tr>
<tr><td colspan="3">5. ENVIRONMENTAL QUALITY</td></tr>
<tr><td>Air quality</td><td>• There will be slight increase in the pollution level of the air in a few places</td><td>• Construction of the highway will allow optimum speed of fast moving vehicles
• Tree plantation scheme will be implemented</td></tr>
<tr><td>Noise level</td><td>• The noise level might be increased slightly in area due to machinery</td><td>• Construction of the highway will allow optimum speed of fast moving vehicles</td></tr>
</table>

Environmental Issue/Component	Impact Description	Remedial Measure
	activities	• Tree plantation scheme will be implemented. • Temporary noise barriers should be provided surrounding the high noise generating construction equipment during work near to settlement area
6. UTILITIES		
Relocation of utility lines/community utilities	• Short time negative impact during transitory phase of shifting of utility lines • No impact on shifting wells, hand-pumps etc.	• All utilities to be relocated with prior approval of the concerned agencies • All community utilities such as sources of water to be relocated to suitable places. • Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any.
7. CULTURAL HERITAGE		
Relocation of cultural properties	• Most of the temples being small the issue is not a sensitive one	• Community meetings to be held before relocation or shifting • Provision of enhancement of religious structures, and access road • Noise Barrier / Boundary Wall will be constructed near sensitive receptors.
8. ENVIRONMENTAL SAFETY		
Accidents	• Moving of fast moving & slow moving vehicles in market places will enhance chances of accidents • Poor visibility causes more accidents	• Segregating the slow moving traffic in the market places by developing the service lanes • Provision of wider median in rural stretches and plantation of shrubs/under trees in it to avoid the gear of vehicles moving in opposite direction • Signals to be erected to reduce speed • Proper light arrangement to be made

Environmental Issue/Component	Impact Description	Remedial Measure
CONSTRUCTION PHASE **1. SOIL**		
Soil Erosion	• Removal and cleaning of tree line, herbaceous and shrubby covers from embankment will increase soil erosion • Excavations of borrow pits will increase soil erosion	• Turfing of road embankment slopes with herbs, shrubs and grasses • In borrow pits, the depth of the pit should be regulated so that the sides of the excavation will have a slope not steeper than 1 vertical to 4 horizontal from the edge of the final section of bank • The device for checking soil erosion include the formulation of sediment basins, slope drains etc. Such works and maintenance thereof will be deemed as incidental to the earthwork • Cutting of trees in phases
Loss of top soil	• The loss of top soil is considerable as the proposed alignment is passing through agricultural field.	• The borrow pit areas could be developed into ponds for fisheries • Land taken for borrow area should be infertile
Compaction of soil	• The excavations in borrow areas may lead to marginal loosening of soil • The compaction of soil may not be affected largely	• It should be ensured that the stability of excavation of fills is maintained • Construction vehicles, machinery and equipment shall move, or be stationed in the designated area • If operating from temporarily hired land, it will be ensured that the topsoil for agriculture remains preserved & not destroyed by storage, material handling or any other construction related activities • The topsoil from all areas of cutting and all areas to be permanently covered shall be stripped to a specified depth of

Environmental Issue/Component	Impact Description	Remedial Measure
		150 mm and stored in stockpiles of height not exceeding 2 m • Cut and fill should be equalized as per design • Earth, if required, should be dumped in selected & approved area by the engineers.
Borrowing of earth	• Large quantities of earth is needed for raising the level of road, its expansion and embankment	• No earth should be borrowed from within the ROW • If new borrow areas are selected, there should be no loss of productive soil, and environmental considerations are met with • If vehicles are passing through some villages, the excavation and carrying of earth will be done during day time only • The borrow areas should not be dug continuously, and the size and shape of borrow pits to be decided by the engineer • Borrow pits should be redeveloped by dumping of spoils; by creating a pond for fisheries, etc. or by leveling an elevated, raised earth mounds.
Contamination of soil from fuel and lubricants	• The impact will be negligible since the chemical nature of the soil will not change much • Negligible impact on the growth of vegetation	• Vehicles and machines are maintained and refilled in such a fashion that diesel spillage does not contaminate the soil • Fuel storage and refilling sites should be kept away from cross drainage structure and important water bodies • spoils shall be disposed off as desired and the site shall be fully cleaned before handing over
Contamination of soil from construction wastes	• The impact will be marginal on the soil quality • The growth of vegetation will be partially disturbed	• The construction wastes should be dumped in selected pits, developed on infertile land • Follow the norms of SPCB • Borrow pits to be filled by such wastes
2. WATER		
Water bodies	• Effect on surface water.	• Any source of water for the community such as ponds, wells,

Environmental Issue/Component	Impact Description	Remedial Measure
		tube-wells, nallah etc. lost incidentally shall be replaced immediately. • Provision of silt fencing near water bodies to control run-off. • Earthworks and stone-works to be prevented from impeding natural flow of streams or existing drainage system. • All desired measures will be taken to prevent temporary or permanent flooding. • Oil Interceptor at Camp site has been proposed to control the entry of oily waste in nearby water bodies.
Other water sources	• The lost sources of water like wells and tube-wells are going to affect the community adversely • Loss of source of irrigation	• Any source of water for the community such as ponds, wells, tube-wells etc. lost incidentally shall be replaced immediately • All desired measures will be taken to prevent temporary or permanent flooding
Drainage and run-off water	• The flow of run off water will not be affected largely, excepting certain stretches where the drainage problem already exist	• At cross drainage channels, etc. the earth, stone or any other construction material should be properly disposed of so as not to block the flow of water • All necessary precaution shall be taken to construct temporary or permanent device to prevent water pollution (due to increased situation and turbidity)
Contamination of water from construction waste	• The construction wastes may increase the suspended matter and clay in stagnant water bodies • There will be very little increase in toxicity • The community dependent on such water used for purposes other than drinking	• Construction work close to the streams or other water bodies shall be avoided, especially during monsoon period • All waste arising from the project is to be disposed of, as per norms of SPCB • Waste products must be collected., stored and taken to approved disposal site

Environmental Issue/Component	Impact Description	Remedial Measure
	may be affected	
Contamination of water from fuel and lubricants	• The fuel and lubricants may affect the both component of water bodies • The community may be slightly affected	• The slopes of embankment landing to water bodies should be modified and re-channelized so that contaminant may not enter the water body • To avoid contamination from fuel and lubricants, the vehicles and equipment shall be properly maintained and refilled
Sanitation and waste disposal in construction camps	• The absence of sanitation may lead to many human diseases which are mostly water-borne • No communicable diseases are going to be spread	• The construction laborers camp shall be located away from the densely habitation areas. • Septic tank with soak pit / biotoilet will be provided in construction camp. • The sewage system for such camps shall be properly designed and built so that no water pollution takes place to any water-body or water course • The workplace shall have proper medical approval by local medical health or municipal authorities
Use of water for construction	• The use of water from sources, already in use by local community may cause scarcity of water for community • The easy availability of surface water will not affect the communities	• Arrangement for supply and storage of water will be made by the contractor in such a way so that the water availability and supply to nearby communities remain unaffected. If a new tube-well is to be bored, proper sanction and approval by Underground Water Department is needed • The wastage of water during the construction should be minimized
3. AIR		
Emission from construction vehicles and machinery	• Effect on human health • Dust settled on leaves may reduce growth rate of the plants	• All vehicles, equipment and machinery used for construction shall be regularly maintained to ensure that the pollution emissions levels are as per norms of SPCB

Environmental Issue/Component	Impact Description	Remedial Measure
	• Crowded market places and construction sites will have higher degree of emission	• Monitoring of suspended particulate matter to be conducted at least once a month at the sites where crushers are used • The human settlements should be at least 500 m downward wind direction of asphalt mixing plant
Dust and its treatment	• The impact of dust at construction sites is rather adverse, but localized in nature • No serious health problem is likely to be caused	• Precautions to reduce the level of dust emissions from the hot mix plants shall be taken. • The hot-mix plants should be located at least 500 m from the nearest habitation. They should be filled with dust extraction unit • Water should be sprayed in the line and earth mixing sites, asphalt mixing site and service roads. In filling subgrade, water spraying is needed to solidity the material. After the impacting, water should be sprayed regularly to prevent dust • Vehicles delivering material should be covered
4. NOISE LEVELS		
Noise from vehicles, asphalt plants and equipments	• The activities of using heavy machinery and equipments are localized and intermittent • No serious impact on human health like loss of hearing ability though some sleep disorders may result	• The parts and equipments used in construction shall strictly confirm to CPCB noise standards • Vehicles and equipments used should be fitted with silencer • Noise standards or industrial enterprises will be strictly enforced to construction workers from damage • In construction sites with 150 m where, there are human settlements, noisy construction should be stopped between 10:00 pm and 8:00 am • Noise to be monitored at construction sites
5. BIOLOGICAL ENVIRONMENT		
Loss of damage to	• The loss of trees, shrubs and herbal	• Areas of tree plantation cleared will be replaced according to

Environmental Issue/Component	Impact Description	Remedial Measure
vegetation	cover may lead to higher degree of soil erosion • The loss of shade and other benefits due to loss of trees • The air quality may decline • There will be no loss or damage to hydrophytes	Compensatory Afforestation Policy under Forest Conservation Act-1980 • Trees should be removed in phases
Compaction of vegetation	• The effect on compaction will not be much severe • There will be no loss of biodiversity	• The removal of vegetation is confined along the proposed project. • Replantation of tree species along ROW • Plantation of shrubs and under trees in the median
Loss, damage or disruption to fauna	• There will be no loss, damage or disruption to fauna	• Construction workers should be educated not to disrupt or damage any fauna • Hunting is strictly prohibited
6. *OTHERS ISSUES*		
Accident risk from construction activities	• The type of accidental risks may be due to ill-maintained machines and vehicles, due to poor light conditions at the work place, or due to carelessness and poor management of the work involved	• To ensure safe construction in the temporary accesses during construction, lighting devices and safety signal devices shall be installed. Traffic rules and regulations to be strictly followed • Safety of workers under various operations during construction should be ensured by providing them helmets, masks, safety goggles etc • The electrical equipment should be checked regularly to avoid risks to workers
		• At every work place, a ready available first aid unit including an adequate supply of dressing materials, a mode of transport

Environmental Issue/Component	Impact Description	Remedial Measure
		(ambulance), nursing staff and an attending doctor to be provided • Lighting device and signals at workplace to be installed
Health issues	• The unhygienic conditions at work place of construction workers • The non-availability of potable water	• At every workplace, the potable, and sufficient water supply shall be maintained to avoid waterborne diseases and securing the health of workers • Adequate drainage, sanitation and waste disposal to be provided at workplace • Medical care to be provided to workers in case of medical requirements
Damage or loss of cultural properties	• No existence of archaeological sites in proposed alignment • No monument exists in the corridor	• Relocation of cultural properties to be done after consultation • All necessary and adequate care should be taken to minimize the impact on cultural properties • If valuable or invaluable articles such as fabrics, coins, artifacts, structures or other geographic or archaeological rare discovered, the excavation should be stopped and archaeology department to be contacted • Archaeologist will supervise the excavation to avoid any damage to the relics
Roadside landscape development	• The positive impact will be on bio-aesthetics and beauty • Landscaping and beautification of ponds, and access roads will improve aesthetic considerations	• Avenue plantation of foliage, shade trees mixed with flowering trees, scented plants to be done
Roadside amenities	• People will be largely benefitted by the comfort and use, provided by these	• Construction of new / improvement of existing bus shelters, bus bays and truck stoppage sites

Environmental Issue/Component	Impact Description	Remedial Measure
	amenities	• Footpaths, railings, traffic signs, Underpasses, speed zone, signs etc. shall be provided
Cultural properties	• The enhancement of cultural properties will bring harmony, goodwill and coherence amongst communities	• Enhancement of all cultural properties and access road shall be completed as per design
Contamination from spills due to traffic and accidents	• The chances of accidents are likely to be reduced with improved quality of the road. The contamination of soil and water due to spills will be minor	• Cleaning of the spills at the accidental site by a workforce provided by state PWD The left over spill may be scrapped to a small nearby pit with ROW
Dust generation	• Though dust is a common feature of tropical climate, yet the situation will be improved by developing vegetation cover	• Roadside tree plantation to be provided • New sites (for example, gram panchayat land etc) near the road to be discovered for afforestation
Air pollution	• The degree of air pollution is likely to be on a lower scale with improvement in road surface	• Vehicular emissions of SPM, RSPM, CO, SO_2, NO_x to be checked • Roadside tree plantation to be done and maintained • Atmospheric pollution to be managed and monitored • Public awareness programme to be launched
Water	• Due to construction of highway as per design, the water logging during monsoon will not take place • Proper drainage will be provided for better water flow	• The drainage system should be periodically cleared • Public awareness programmes to be launched for maintaining clean drinking water
Flora and Fauna (key stone species)	• The loss of trees, shrubs and herbs will not affect the keystone species and bio-diversity	• The afforestation scheme, containing keystone species should be strictly implemented • Improvement of density of vegetation by planting such species
Accidents involving hazardous materials	• The chances of such accidents will minimum, yet not unavoidable	• The rules as defined in Environmental (Protection) Act, 1986 should be compiled • For delivery of hazardous substances, concerned license need

Environmental Issue/Component	Impact Description	Remedial Measure
		to be taken • Vehicles delivering hazardous substances will be printed with unified signs • Public security, transportation and the firefighting departments will designate a special route for these vehicles • The project hazardous substances will be administrated by highway management department registration system • In case of spillage, the report to relevant department to be provided and instructions to be followed
Traffic & Road Safety	• The chances of accidents will be less due to construction of highway as compared to small width road	• Traffic management plan to be developed, especially in congested locations • Traffic control measures including speed limits to be enforced strictly • Growth of encroachment and squatting on ROW to be discouraged • Proposing service lanes in markets and near schools • Providing proper median • Putting warning signals and signboards
Skill Development Programme for workers	-	• For indigenous people in villages, living within 10 km boundary off project highway on either side, skill development course for 5 days per workshop including road construction skills to be organized. • The cost for carrying out skill development at 16 locations once in a year for two years is about **Rs. 3.20 Crores**.
Selection of Dumping Sites	Lots of muck will be generated due to the tunnel activities	• Approved municipal dumping grounds to be first preferred through payment to municipal bodies • Unproductive / waste lands shall be selected for dumping sites, only if municipal body not available within 25 Km radius after

Environmental Issue/Component	Impact Description	Remedial Measure
		approval of PMC / SC /AE • Away from residential areas and water bodies • Public perception and consent / approval from the village panchayats and other concerned authorities should be obtained before finalizing the location
Disposal of debris from dismantling structures and road surface	-	• All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the work and will be planned and implemented by the contractor as approved and directed by the Environmental Expert of AE. • The pre-designed disposal locations will be a part of Comprehensive Solid Waste Management Plan to be prepared by Contractor in consultation and with approval of Environmental Expert of AE. • Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area.
Other Construction Waste Disposal	-	• The pre-identified disposal locations will be a part of Comprehensive Waste Disposal Management Plan to be prepared by the Contractor in consultation and with approval of Environmental Expert of AE. Location of disposal sites will be finalized prior to initiation of works on any particular section of the road. • The Environmental Expert of AE will approve these disposal sites after conducting a joint inspection on the site with the Contractor.

Environmental Issue/Component	Impact Description	Remedial Measure
		• Contractor will ensure that any spoils of material unsuitable for embankment fill will not be disposed off near any water course, agricultural land, and natural habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and low-lying areas located in barren lands along the project corridors (if so desired by the owner/community and approved by the Environmental Expert of AE). • All waste materials will be completely disposed and the site will be fully cleaned and certified by Environmental Expert of AE before handing over. • The contractor at its cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.
OPERATION PHASE		
Air Quality	Air pollution due to vehicular movement	• Avenue plantations shall be maintained. • Regular maintenance of the road will be done to ensure good surface condition • Ambient air quality monitoring as per Environmental Monitoring Plan. If monitored prescribed limit, suitable control measures must be taken. • Road signs shall be provided reminding the motorist to properly maintain their vehicles to economize on fuel consumption and protect the environment.
Noise Quality	Noise due to movement of traffic	• Effective traffic management and good riding conditions shall be maintained to reduce the noise level throughout the stretch

Environmental Issue/Component	Impact Description	Remedial Measure
		and honking restrictions may be enforced near residential areas. • The effectiveness of the multilayered plantation should be monitored and if needed, solid noise barrier shall be placed. • Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building close to the road • Noise monitoring as per Environmental Monitoring plan • Provision of Noise Barrier at sensitive receptors likely to experience high noise
Flora	Loss of Vegetation	• Planted trees, shrubs and grasses to be properly maintained • The tree survival audit to be conducted once in a year to assess the effectiveness
Fauna	Wildlife	• Accidental road-kill record must be documented and maintained.
Maintenance of Right of Way and Safety	Accident Risk due to uncontrolled growth of vegetation	• Regular maintenance of plantation along the roadside • Efforts shall be made to make shoulder completely clear of vegetation
	Accident risks associated with traffic movement	• Traffic control measures, including speed limits, will be enforced strictly. • Monitor/ensure that all safety provisions included in design and construction phase are properly maintained • Tow-away facility for the break down vehicles

9.7 GREEN BELT DEVELOPMENT PLAN

Certain species are listed in **Table No. C9-7** for developing green belt with the objective of pollution control, carbon sequestration and as source of food especially for birds and amenity purpose. The list is neither complete nor exhaustive. Depending upon the suitability, availability and desirability, other local species should also be considered. The work of green belt development should be taken up by the project proponents with guidance from the Forest Department of the Government of Odisha. Minimum 3 nos. of row, (@10 m distance) of trees on either sides of the proposed highway shall be planted and approx. 2,01,150 nos. of tree will be proposed. It is stated that the indigenous species of local economic and ecological (soil and water conservation) importance need be given priority over commercial and non- native species.

Table No. C9-7: Suitable plant species for green belt along the project

LOCAL NAME	BOTANICAL NAME	FAMILY
Amba	*Mangifera indica*	Anacardiaceae
Aswastha	*Ficus religiosa*	Moraceae
Acacia	*Acacia mangium*	Fabaceae
Baula	*Mimusops Elengi*	Sapotaceae
Champa	*Micheliachampaca*	Magnoliaceae
Chatiana	*Alstonia scholaris*	Apocynaceae
Gambhari	*Gmelina arborea*	Verbenaceae
Jamun	*Syzygiumcumini*	Myrtaceae
Neem/Limba	*Azadiracta indica*	Meliaceae
Palasa	*Butea monosperma*	Fabaceae
Krushnachuda	*Delonix regia*	Fabaceae
Sishu	*Dalbergia sissoo*	Fabaceae
Panasa	*Artocarpus hetrophyllus*	Moraceae
HERBS AND SHRUBS		
Ashoka	*Saraca asoca*	Caesalpinlaceae
Arakha	*Calotropis procera*	Asclepiadaceae
Kaniyari	*Cascabela thevetia*	Apocynaceae
Barakoli	*Ziziphus mauritiana*	Rhamnaceae
Ata	*Annona squamosa*	Annonaceae
Bana tulasi	*Ocimum gratissimum*	Lamiaceae

9.7.1 Plantation operations and practices for Greenbelt and open space replantation

The plantation strategy should include operations, such as, Development of seedlings/saplings of the tree and shrub species, Land/site preparation for transplanting/seeding, Transplanting, and Post-transplanting maintenance under

the guidance of a field –oriented botanist or agriculture professional or field staff of the Forest Department.

(a) Development of planting material

For tree and shrub species, the seedlings and saplings could be raised in nursery in poly bags of standard size or root trainer trays. The healthy certified seed material should be used for this purpose. These materials can also be arranged on demand from the nurseries owned by Forest Department or private organizations. Healthy and disease-free planting material is pre-requisite for success of the plantation**.**

(b) Site preparation

This activity need be undertaken well in advance before monsoon for rainy season species and during October –November for winter species. Thorny bushes and weeds need to be removed completely from the site. It should be followed by soil and water conservation work using physical measures, such as, surface rain water harvesting, trenches, stone bunds; engineering structures, such as, small check dams; and biological devices, such as, planting of fast spreading grass and leguminous species and bushy materials**.**

For planting seedling/sapling, pits of appropriate size (1×1×1m for tree species, 0.5×0.5×0.5 m for shrub species) need be prepared well in advance. The top soil of 30 cm depth need be kept aside for mixing with FYM to promote microbial growth for nutrient recycling.

After digging, the pit must be kept unfilled and uncovered so that sterilization through sun rays could occur. It should follow by filling stone –free soil (3 part) and well-decomposed weed-free compost or dump manure (1 part). For improving soil fertility, neem/castor/ground cake can be used. The basal dressing of urea, ammonium phosphate, potassium sulphate or DAP could be applied in morning hours at appropriate interval.

(c) Seeding and Transplanting

This operation must be done after rain showers. In case of grass and leguminous species, direct seeding could be practiced to establish a surface cover to check soil loss and grass growth for herbivores and nesting sites for birds.

The plantation should be done in rows following 5×5 spacing both row to row and plant to plant using healthy seedling/sapling. While planting, the poly bag should be moistened first. The poly bag should not be removed completely, only the bottom part of it should be removed by cutting it with a sharp blade without disturbing planting material. The planted material should be watered slowly to avoid soil disturbances.

(d) Post-planting maintenance

The transplanted material needs attentive care for complete one year at least, followed by care during stressful seasons particularly. The maintenance operations include watering, removal of weeds, prevention and control of diseases and pests using bio-pesticides preferably, and trimming, and fertilization. No specific amount could be mentioned for watering, etc., as it is selective to species, hence, based on field conditions, the maintenance activities should be done. The fertilization could be carried out at an interval of 30 days avoiding occurrence of rains. The gaps caused on account of mortality, should be filled by replanting the same species.

Above all, the development of green space must get value similar to Highway development.

9.8 WATER CONSERVATION PLAN

The following are the water conservation plan to be provided by the contractor:

1. The ponds situated within 5 km lateral distance from the proposed RoW will be desilted up to 0.6m to 1m as per IRC guidelines in consultation with the local authorities on government land. The desilted material will be used during construction for the highway so that there will be zero discharge. The cost of desilting of ponds on Government land is about **Rs 2.00 crores**.

2. Rainwater harvesting structures shall be provided at the interval of 500 m on either sides of carriageway as per availability of RoW and depending on the water table of first aquifer. The cost for construction of 180 rainwater harvesting structures is **Rs 9.00 crores** including its maintenance.

3. Contractor will construct hand pump in consultation with appropriate authorities like district administration/panchayat on government land at every village along the road within 1 km lateral distance from the RoW. The approximate cost for providing 130 nos. of hand pumps is of **Rs. 0.65 Crores.**

4. The water holes will be constructed by contractor in consultation with the forest officials at interval of 2 km in forest patches on either side of the road and at a distance of 1 km lateral distance of the proposed RoW for drinking purpose of animals. The 30 nos. of water holes will be constructed by the contractor in consultation with the forest officials of Nabrangpur division. The cost for construction of water holes is about **Rs 1.50 Crores.**

5. The construction of bridge cum barrage structure for serving dual purposes i.e. to cross the water bodies as well as to store the water on upstream sides as per MoRTH Notification RW-NH-34066/59/2015-S&R (B) dated April 18 2017 in consultation and NOC of principle secretary/Secretary PWD and after obtaining the permission from irrigation, water resources, environment and local

administration. This will met the requirement of villages in and around upstream sides. In this regard the requirement of downstream side also to be taken care so that their demand should also be met. The additional cost for construction of 16 nos. of barrage structure underneath of bridge is about **Rs. 3.50 Crores.**

9.9 ENVIRONMENTAL MANAGEMENT PLAN BUDGET

The cost of environmental protection measures has been estimated **Rs 318.96 Cr** as per the following details. Total cost estimate on environment for present Section has been presented in **Table No. C9-8.**

Table No. C9-8: Environmental Management Plan Budget

Component	Stage	Items	Estimated Rate	Total Cost (Rs)
Water	Pre-Construction	Relocation and construction of affected hand pumps, water storage tanks, open wells, water taps, OHT etc. as per directions of the Engineer.	Covered in Utility Shifting Budget	--
Environmental Training	Construction	-	Lump Sum	10,00,000
Environmental Monitoring	Construction and Operation Period	Monitoring of air, water, soil, noise and Soil (Refer Table No. C6-2)	As per environmental monitoring plan	5,02,56,000
Skill Development	Construction	For indigenous people in villages, living within 10 km boundary off project highway on either side, skill development course for 5 days per workshop including road construction skills to be organized	At 16 locations @ Rs. 02 Crores	3,20,00,000
Air	Construction	Dust Suppression at the project site @ Rs 1500/trip x 24 trips/day x 365 days x 3 years	240.372 km	3,94,20,000
Solid waste	Construction	Demolition wastes and bituminous scrap disposal as per C& D rules 2016	Lump Sum	10,00,000
Muck disposal	Construction	Stabilization of muck disposal sites	As per Table No. C9-1	8,45,00,000
Plantation	Construction	Plantation of trees along the proposed highway i.e. 2,01,150 trees to be planted	Rs 1500/tree including tree guard	30,17,25,000
		Maintenance for the period of 3 years including causality replacement of tree	Lump Sum	30,00,000
		Ornamental Plantation on Cross Sections.	Lump Sum	10,00,000
		Shrub Plantation and grass carpeting in median	Lump Sum	10,00,000

Slope/Embankment protection	Construction	Turfing of embankment with grasses and herbs / other engineering measures	Covered in Engineering Cost	--
Safety	Construction	Demarcation of borrow areas clearly, using fencing if needed.	Lump Sum	3,00,000
		Provision of Hoarding /Posters at construction camps and provision of health checks at construction sites	Lump Sum	3,00,000
		Provision for helmet, gumboots, jackets, goggles etc. to labours	Lump Sum	2,00,000
Construction Camps	Construction	Sanitary Facilities	Lump Sum	2,00,000
Water Conservation Plan and Drinking water facilities	Construction	Details as per section 9.8		7,65,00,000
Soil & Ground water	Construction	Providing Oil Interceptors as per design and drawing at vehicle parking areas (12 nos)	Rs 25,000/number	3,00,000
Rain Water Harvesting	Construction and operation	Rainwater harvesting structures shall be provided at the interval of 500 m on either sides of carriageway as per availability of RoW and depending on the water table of first aquifer (Approx 180 nos. of structures including its maintenance)	Rs 5 lakh/structure	9,00,00,000
Wildlife	Construction & Post Operation	Conservation Plan duly authenticated by PCCF cum CWLW Odisha has been attached in Annexure-XV	Lump Sum	14,69,65,000

	Construction	25 Nos. of animal underpasses will be constructed for the safe passages of villagers and animals including noise barrier on underpass and either side 200 m on the ramp	Rs 8.2 Crore per structure	205,00,00,000
	Construction	20 nos. of canopy bridges will be constructed for monkey	Rs 10 lakhs per bridge	2,00,00,000
Total				**289,96,66,000**
Contingency @ 10%				**28,99,66,600**
Total				**318,96,32,600**
Say				**318.96 Cr.**