

---

***COMPLIANCE TO PARA 35 OF DRAFT AIDE  
MEMOIR OF WORLD BANK MISSION 29<sup>th</sup>  
JANUARY TO 9<sup>th</sup> FEBRUARY 2007***

## **Compliance to para 35 of draft aide memoir of World Bank mission 29<sup>th</sup> January to 9<sup>th</sup> February 2007.**

### **Additional empirical data**

Wildlife movement is not predictable to specific points in general unless these are constrained with limited openings and induced environment for movement. Such inductions are for migration to breed, feed, hibernate, escape or find new territory.

In case of inter tidal swamps, wet land habitats, flood plains this movement is wide spread during rainy season and high flood and limited to few inter tidal plains drainage channels, canals and ponds & wet land habitat. Therefore the direction of movement in coastal plains is multifaceted and scattered compared to the hills and upland forested habitat.

In forested habitat the movement is due to water, salt lick, pasture, hunting ground, agricultural crops, forest fire, illicit felling, haunting, encroachment, mining and movement of heavy machinery. Here also movement can't be predicted for certain through a particular opening round the year as rapid changes are taking place on account of population explosion, PMGSY, rural roads development, destruction of vital food source of birds, rodents, amphibians, reptiles, and herbivorous animals thoughtlessly in the name of development of Industry, road connectivity, SEZ, ports, Railways, settlements within forest areas & non provision of relocating the displaced PAPS in and around project sites (which were the cause of their losing foot hold and encroaching into govt. forests) for habitat destruction.

Keeping these factors in mind it appears totally futile to predict the movement direction and purpose as the wildlife is threatened at all corners from above activities.

The movement is therefore a hypothecated assessment and not empirical to remain confined to specific locations predicted in this report. Off late Orissa has been experiencing this again and again. We have seen panthers entering into Cuttack, Berhampur, and other populated area. Elephants moving into Bhubaneswar, Delanga, Badabil, Dhenkanal, NH-5, Joshipur, Barunei, etc. during the last 5 years. Even king cobra and pangolins, civets have now entered households in Bhubaneswar. This is an ominous sign of distress to wildlife and it appears to be more pronounced in the days to come.

The writings are clear on the walls. As more and more roads are built, SEZs, Factories, Thermals, open cast mines, Irrigation canals and ports develop, more people from out side come and settle in the areas ignorant about the typical balance between the nature & the wildlife habitat, there will be wide spread loss of forest, vegetation, food source leading to this catastrophe. Orissa has to pay very heavily for this where the sufferer most unfortunately will be the poor tribal or settlers on the fringe of forests or animal territory. Therefore action plan to help wild life habitats remain intact and highly developed in a holistic manner has become more essential.

Orissa was a rich maritime country having river navigation the main mode of transport, trade and commerce with hinterland. These silted up drainage channels criss crossing the flood plains of Orissa's East coast especially the confluence of

rivers and the sea are open to wide spread flood during rains and tidal inundation during rest of the year. These drainage basins developed for navigating country boats have latter on transformed into wet land habitat supporting the migration, breeding, spawning, nesting and hunting of aquatic, amphibian and reptilian species. These are the streams through which the tidal surge of the sea influences the river mouth ecosystem by creating lagoons and inter tidal swamps, mangroves, mud flats etc.

We are only concerned with the inter tidal flood plains far away from the river mouth where water becomes murky and salty during high tide and flood in rainy season and after ebb. Thus the movement of aquatic life forms with amphibians, reptiles, birds, rodents, occurs with clock like precision. In rainy season the movement is from right to left of the road on SH-9 (Bhadrak to Chandbali) and vice versa, synchronized with the flow of flood water from right to left and reverse flow during ebb.

The tendency of mating, spawning upstream in a rapidly flowing water current attracts the fish, crustacean and mollusks to move across from left to right and right to left spread out in the inundated flat terrain of this zone in search of new colonies, new food source and mates continues throughout the year .The predatory birds, snakes, other reptiles, mongoose, monitor lizards, bandicoots, rats, fishing cats, jackals all congregate to haunt and survive in this zone during rains and their nesting, resting perching feeding habitat is thus on both sides of the road can be seen especially in rainy season.

This is reversed in areas affected by inter tidal inundation through out the year and continues as such through out the year, more so during full moon and new moon days or 2 to 3 days before and after when tidal surge inundates the ditches, drainage channels, navigation paths, through the culverts and bridges bringing in fish, shrimp, crustaceans, mollusks, and their predators on land and sky for proliferation and growth. When the ebb comes these channels become shallow and the men living around have contrived ditches & ponds to harbor the aquatic life and earn a living out of these bounties of nature besides agriculture.

The flood water moves from left to right in Bhadrak - Anandpur (SH-53part) in case of Bramhapur – Taptapani (SH-17) and Bhawanipatna – Khariar (SH-16) prompting aquatic life moving with flood waters to flood plains and vice versa, their predatory life forms moving to and fro on either side of the corridor in search of food. Only in extreme summer there is movement towards water sources on either side of these corridors at places. The details of each wildlife underpass has been indicated in the corridor strip maps (**Annexure-XXV—A to D.**)

**Table showing location specific movement of wildlife along SH-9, SH-53 (Part), SH-16 and SH-17 (Part), of OSRP Phase-I Year-I roads with reason of movement. With reference to strip map.**

Corridor	Name of the Road	Length in km	Study area in km.	1 <sup>st</sup> package in km	Concentration of WL movement recorded along survey	Location of underpass /via duct in km	Species found most commonly	Movement details with reasons	
								Left	Right
SH-9	Chandbali – Bhadrak	52.6	0 to 53 beyond Chandbali bridge	0 to 45	25 to 29	26.4 and 28.8  box culvert with additional hume pipe vents and trap drains connected to via duct.	Fish, Shrimp, Mollusk, Land monitor lizard yellow monitor lizard, Civets, Water snakes, Rat snake, Fishing cats, Bull frog, Water skippers.	Baitarani on the right. Flood inundates both side and the road facilitating movement of fresh water species of fish, crustacean, mollusk, amphibians and reptiles to spawn migrate feed and develop on the fertile humus rich ditches, ponds, creeks and canals. In winter and summer movement of jackles, hayena, snakes, civets, otters, fishing cats from left to right and right to left takes place in search of food and water.	Flood discharge from NH-5 up land flows to left. Small animals amphibians, reptiles rodents washed ashore due to flood during rainy season.
					30 to 32 km	30.05 and 31.6 box culvert with additional hume pipe vents and trap drains connected to via duct.	Fish, Shrimp, Mollusk, Land monitor lizard yellow monitor lizard, Civets, Water snakes, Rat snake, Fishing cats, Bull frog, Water skippers, Turtles, Terrapins.	Baitarani on the right. <b>Flood and tide</b> inundates both side of the road facilitating movement of fresh water and brackish water species of fish, crustacean, mollusk, amphibians and reptiles to spawn migrate feed and develop on the fertile humus rich ditches, ponds, creeks and canals. In winter and summer movement of jackals, hyena, snakes, civets, otters, fishing cats from left to right and right to left takes place in search of food and water in the inter tidal zone through out the year.	Flood discharge from NH-5 up land flows to left. Small animals amphibians, reptiles rodents washed ashore during flood in rainy season. Rest of the year the inter tidal inundation occurs from right to left every fort night bringing aquatic creatures to spawn, breed and grow, hatchlings which restocks the river basin with fish, shrimp and mollusks for 10 thousand fisherman along the corridor and beyond up to the sea and Bhitarkanika sanctuary and national park.
					35 to 46 km	36.05, 40.95, 45.20	Fish, Shrimp, Mollusk, L. monitor lizard yellow monitor lizard, Civets, Water snakes, Rat snake, jackals, Hyena, Reticulate python, Kraits, Fishing cats, Banded kraits, Vipers, Mongoose, Water monitor lizard, Terrapin, Turtles, Rats,	Baitarani on the right. <b>Flood and tide</b> inundates both side of the road facilitating movement of fresh water and brackish water species of fish, crustacean, mollusk, amphibians and reptiles to spawn, migrate feed and develop on the fertile humus rich ditches, ponds, creeks and canals. In winter and	Flood discharge from NH-5 up land flows to left to right and vice versa. Small animals amphibians, reptiles rodents washed ashore due to flood during rainy season. Rest of the year the inter tidal inundation occurs from right to left every fort night bringing aquatic creatures to spawn, breed and grow,

							Otters and Palm civets etc.	summer movement of jackals, hyena, snakes, civets, otters, fishing cats from left to right and right to left takes place in search of food and water in the inter tidal zone through out the year.	hatchlings which restocks the river basin with fish, shrimp and mollusks for thousands of fishermen along the corridor and beyond up to the sea and Bhitara Kanika sanctuary.
SH-53	Bhadrak – Anandapur – Karanjia	57.6 +65	57.6+65	0 to 50	12 to 14	12.2	Jackals, Languor, Apes, Civets, Water snake, Reticulate python, Viper, Rana, Rat snake, Cobra, Kauthia, Fresh water turtle, Bull frogs, Rats, Mongoose.	From left to right during monsoon months along the flood plains of Baitarani and canals of Salandi irrigation system. There are the lower catchments of Salandi connecting the out flow of Baitarani.	Right to left during winter for food, fodder, and nesting, hunting along the area.  Summer movement is negligible except for hunting and predating.
					13 to 15	17.2 21.75	Small animals like Jackals, Hyena, Mongoose, Gray monitor, Civets, Palm civets, Rat snakes, Water snakes, Reticulate, Python, Naga, Cobra, Viper, Russels viper, Krait & banded krat, Rats, Bandicots, Bull frogs, Fish & crustacean.	From left to right during rains only in search of new pasture and by the seer force of water with one small drainage cut nala.  Regular movement of Snakes, Lizards, Rats and frogs rest of the year for food only.	From right to left for spawning and new colonization though no permanent wetland exists here except only roadside wetland drainage area with ponds in between.
					23 to 34	23.5 34.0	The check gate at 34 <sup>th</sup> km is shifted to the road from Hadagarh sanctuary to SH-53.	Unified check gate of Bhadrak, Keonjhar Forest (WL) Divisions and Toll gate of OWD combined together at the Toll Plaza.	To cut down cost and repetition of delay on account of several check gates within a short span of 8 kms. with lot of infrastructure that would have been required to be built up including additional land acquisition.
					38 to 41	41.1	Wild cats, Rattles, Boars & Porcupines, Civets, Palm civets, Jackal, Hyena, Mongoose, Hares, Rat snakes, Cobra, Python, Krait, Banded krait, Keoutia, Bull frog.	The flood waters of Baitarani crosses the road at Ambagadia and inundates vast stretches both side. Movement of aquatic creatures, rodents, amphibians, reptiles from left to right with flood water during rainy season flow into the paddy fields and villages during rains and entering the lower catchments of Salandi on the right side of the road.	The flood water from left enters the nalas and river in spate bringing in fish, snake, rodents, amphibians and they take shelter in the shrubs, bashes and field bunds around.  Resident rodents, Snakes, borrow animals come out and move to wards the

								Left to right movement only during flood. Seasonal movement during the summer towards river from right side in search of water and garbage along habitations by scavenging animals and birds.	river Baitarani during Summer nights when other sources are dry.
SH-16	Bhawanipatna – Khariar	70	02 to 70 = 68km		4 to 5	4.1	Civets, Jackals, Hyena, Pangolin, Mongoose, Reticulate Python and Python, Cobra, Viper, Russell's viper, Rat snakes, Water snake Hares, Field mouse.	From Brahmani RF seasonal and winter movement for food, water and procreation mostly left to right during pre monsoon, winter & summer, crossing the nala running parallel between the RF and road.	Movement to and from Dumla PF during monsoon, winter and summer months by rodents, hyena, jackals, mongoose occurs some of which are the resident animals of the R.F Brahmani other side.
					18 to 20	18.85	The existing culvert was the conduit between Brahmani RF & Adhamunda Hill lock on left & right. Hares, Jackals, sloth bears, Rattle, Mouse, Bandi koot, Python, Cobra, Mongoose, Water snakes, Monitor lizards Pangolin.	Move out of the Brahmani RF for food, water and hunting along the periphery of habitation. Concentration of wildlife is low on hills on left with scrub forests and water harvesting structure for irrigation across the road on the right.	Seasonal cross over during winter and summer by mainly Hyena, Bear and Python in search of water and food. Concentration is low on hills both side on right and left with exposed boulders.
					21.5 to 23	22.15	The existing culvert was the conduit between Brahmani RF & Adhamunda Hill lock on left & right. Hares, Jackals, sloth bears, Rattle, Mouse, Bandi koot, Python, Cobra, Mongoose, Water snakes, Monitor lizards Pangolin.	Kumkot RF with Kandalihar seasonal spring, Siyaljhudingi PF on left and river Tel parallel to the road crossed for food during summer months on the right.	Chhagaon PF on right side of the road and low hills on the left. Both side movement is a daily affair for Hyena, Jackals, Bears in winter and summer.
					4 to 5 17.5 to 20 21.5 to 23 53.5 to 55 64.5 to 66	4.1 18.85 22.15 54.35	Hyena, Jackals, Bear, Pangolin, Mongoose, Snakes, Python, Porcupine, Hares, Rats, Jungle cats	Choura RF on left.  The animals move during late rains, winter and summer months in search of food and water from left to right.	Open Scrub forest on hill locks on right with semi Perennial nala and Sunder river.  The Scavengers have no limits of movement. They cover long distance in search of food and occasional mahula tree, mango & ficus, attracts bears, porcupine, rodents, alike. Snakes like reticulate Python and Python are common which cross over, cobra and Keoutia are rare to confront other than at

					66 to 68				waterfronts, water harvesting structure.
						65.1	Jackals, Hyena, Mongoose, Snakes.	RF on left near Lachhipur. Animals cross over to the ponds, on either side of the road between Risigam to Dohelpada during summer for water and scavenging for food.	Only agricultural fields and rodents, frogs, land monitor lizard, rat snakes, cobra abound which move towards water spots on both side of the road left and right. Reticulate python and Russell's vipers on exposed boulder out crops on the right and agricultural fields on the left.
						67.85	Jackals, Hyena, Mongoose, Snakes.	RF on left near Lachhipur. Animals cross over to the ponds, on either side of the road between Risigam to Dohelpada during summer for water and scavenging for food.	Only agricultural fields and rodents, frogs, land monitor lizard, rat snakes, cobra abound which move towards water spots on both side of the road left and right. Reticulate python and Russell's vipers on exposed boulder out crops on the right and agricultural fields on the left.
SH-17 & SH-4	Berhampur to Bangi Jn. Bangi Jn. to Rayagada	201.6	0 to 41	150	1.5 to 2.5	2.140	Rodents, Rattle, Snakes (Python, Viper, Cobra, Russell's, Krait, Branded krait, Rat snakes) Wild cats, Jackal (occasional) reticulate python, civets, Bull frog, Otter Hyena, Hare.	Ramaguda RF and hill from which animals cross over to the MIP across the road in winter and summer for food and water.	Water harvesting miner irrigation tank adjacent to road and agricultural land, Rusikulya canal system. The animals from left come over for food and water.
					9 to 11	9.810	Wild boar, Porcupine, Bandicoot, Bears, Rattle, Pangolin, Cobra, Viper, Kraits, Banded kraits, Rats, occasional sloth bear, python, all types of snakes, other than water snakes.	Mahughara hills on the right and open fields on the left with scrub forest and small hillock.	Animals come over from Mahughara hills on this side and cross over to the left during crop season for foraging and hunting and in summer for water in several ponds. Mostly at night time.
					25.0	25.0	Forest check gate at Punji kayan.	Road junction at Digapahandi with Chikiti connecting NH-5 and with Aska on the other side.	A bus Truck lay bye with check gate barrier prior to the road crossing pre existing here, which has to be developed for checking removal of forest products along with the Toll plaza at this junction.
					26 to 28	26.1	Sloth bear track.	Bears move from Changudidei hills 500mtrs to 1.5km away from road on left side and cross over the road towards Jagannathpur PF on the right km 6 to 8 away across Ghodahada river, traversing paddy and sugar cane, pea nut cultivation	Adult and sub adult males only cross over the long distance from Changudidei hill on the left and return from Jagannathpur hills (PF) during early rains or late summer after pre monsoon

								area during winter mating season. Female bears are seen moving around at right in paddy and peanut fields, scrub forests, around water spots, ponds, small springs in search of food and water on left and right side of the road after crop cutting in winter till harvest of pea nuts.	sowers.
						30.72 41.35	Hyena, Jackal, Civets, Wild boar, Porcupine, Python, Cobra, Keutia, Rat snake, Mongoose, occasional deers bears and sloth bear are encountered in this zone with mouse deer and barking deer.	Chandragiri RF block 1.5kms to 2kms away with shrubby under growth and agricultural land in between over a thin strip, a semi perennial nala runs at this location. Elephants rarely come to this area during summer for water in the nearby Guharikhol MIP.	Wildlife move from Gobindpur PRF side to Taptapani PRF side and return back across the road. Both side to be barricaded at this turning after the nala bridge to facilitate road crossing under the bridge by easing out the left embankment of the nala either side of the bridge.

### **Relocation of the young avenue trees, shrubs and bushes all along the corridor and cost of such activity.**

Trees below 30 cm dia, all shrubs yielding NTFP or evergreen and flowering type requiring removal from ROW are to be uprooted with roots and ball of earth intact through Shovel operators, pruning the lower branches up to 2mtrs and relocated in identified locations nearby for animal under pass, site enhancement and such other activity on all corridors .The Tree species which can be successfully relocated are Acacia, Eucalyptus, Sisoo, Strobilium asper, Crateva nurula, Terminalia arjuna, T.tomentosa, T.belerica, T.chebula, Phyllanthus emblica, Azadirachta indica, Ficus species, Albizia lebeck, Shorea robusta, Mimosa elengi, Feronea liminea, Tamarindus indica, Cizygium cumini, Bombax ceiba, Ceiba patendra, Peltoferum feruginum, Acacia nilotica, A.leocophlea, Aegle marmelus, Butea frondosa, Holoptilia integrifolia, Annogessus acuminata, Alstonea scholaris, Mytragyna parviflora, Adina cardifolia, Spathodia companulata, Putranjiva roxburghi, Mangifera indica, Ingadulsis, Buchnanian lanjan, Madhuca latifolia etc.

The medium trees, shrubs, bushes are Nictanthes arbortistis, Soyimida fabrifoga, Cassiaria tomentosa, Delonix regia, Pongamea pinnata, Samania saman, Cleistanthes colinus Schleicheria oleosa, Wood fordia fruticosa, Embelia tsjeriam, E.ribes, Tabernamentana coronaria, Hibiscus rosasinensi, Hollarhaena antidysenterica, Combretum decandrum, Ixora, Gardenia gummifera, Lanea grandis, Murayya coingii, Muraya exotica, Messua farrea, Zizyphus, Cypedesa fruticosa.

### **Bushes and Grass**

Eulaliopsis binata, Vetiver zizanoides, Sacchrum munj, Broom grass, Flaucortia catafracta, F.romantai, Randia dumetorum, R.tetrasperma, Adhatoda vasica or Justacea adhatoda, Jatropha curcas, Glycosmis pentaphylla etc.

### **Method of planting.**

Pits of 1m<sup>3</sup> at 1mtr interval from edge to edge or 2 mtr interval from centre to centre in the area to be vegetated on the nala & river banks, water harvesting structures, base of embankments in a single or multiple row are dug up by shovel operator and the Top soil on one side and bottom soil on another side.

The trees shrubs, bushes and clumps of grass to be relocated by removal from RoWare to be selected close to the planting site by peg marks with red flags on the trees at BH.. The shovel operator has to dig up the marked tree/shrub/clump only after marking its surrounding ground with shovel while keeping a ball of earth (minimum 0.3<sup>3</sup> mtr wide) at the base so that when the tree /shrub is lifted the ball of earth remains intact. The ball of earth with the plant are then lifted and covered with a thin Hessian cloth (onion bags) or similar material and tied to the stem of the plant at collar and lifted to haulages vehicle. For easy carriage except the top ends many of the larger side branches at times have to be pruned to reduce the volume of biomass and reduce loss of moisture and stored food.

These plants with ball of earth are then unloaded at the planting site and transferred to the pit manually or through crane or shovel and the topsoil is then pushed into the pit. The pit is thus half filled and then watering done. The bottom soil heap together with compost

/cowdung manure one basket, Carbendazim and Mancozeb 5gms /pit, Chloropyrophos 50 gms per pit mixed together and filled into the pit and spread around the plant. The soil around the plant is then pressed by toe so as to make a depression and firm the base around the plant and balance spread out like the shape of a saucer to promote water accumulation in hilly and draught prone area..The relocated plants are then watered adequately .The exposed roots out side the ball of earth are pruned with sharp seckature or bill hook and smeared with anti fungal paint or coal tar.

Regular planting of one clump of grass alternating with shrub and bushes has to be done and then the 2<sup>nd</sup> and 3<sup>rd</sup> row in succession. The work should be taken up in early rainy season 1<sup>st</sup> of July to end and once the tree starts showing secondary growth (after 20 to 30 days of planting) well digested slurry containing 20 kg cow dung, 20 kg. Bhuin neem fermented in an open vat mixed with 2000 liters of water is applied at the base of each plant @ 2 litre per plant twice a month up to end of October, followed by summer watering from mid February onwards at fort nightly interval (to encourage rapid growth) up to end of 15<sup>th</sup> June next year during the 1<sup>st</sup> year of planting.

Un -wide, bent, deformed, damaged, diseased plants should not be selected for relocation.

In areas affected by high velocity wind the relocated trees /shrubs/bushes are to be provided with forked bamboo” stay” to prevent up rooting in the first year.

No up rooted plant for relocation be kept under direct sunlight or dry condition for days together. It has to be planted the same day in the field or in case of delay kept under shade with sprinkling of water and covering of wet Jute gunny bags/wet paddy straw at least for a day only. The ball of earth with covered gunny bag is to be sprinkled with water so as to keep it moist.

Though it is best to uproot plants when these are leafless to have minimum food and transpiration loss and stress to the plant, on account of summer heat ahead, this is not recommended.

Per plant cost will come down to Rs.500/-(Rs.150/-per clump for shrubs and bushes) minimum including the cost of shovel operation, carriage and after care for 3 years only. Other incidental charges can be worked out depending on the site condition and distance to be covered from the site of removal up to site of planting if it is more than 10 Kms.

Compared to a 10 year waiting period and uncertainty over actual growth the relocation of lower girth trees, shrubs and bushes, grass clumps along the side of the existing road using the existing corridor wise vegetation makes it more impressive and eco-friendly without the ugly sign of destruction and denudation besides saving time and environmental requirements.

While the work is in progress at least the site enhancement near Temples, Market places, Hospitals, River &, nala banks, approaches of feeder roads, schools, colleges, hostels can be under taken in the first phase. Improvement of barren, eroded patches can also be achieved in such manner to get an extra facelift of the area.

There should be some gaps left intermittently on each line of planting (re location) to introduce bamboo rhizomes / rooted bamboo off sets put inside earth filled gunny bags (Dwarf thorny bamboos of *Bambusa arundinacea*, *Cephalostachium*, *Salia*.) *Narium oleander*, *Bignonea*, *Adanthera pavonina*, *Bauhinia variegata*, *B.racemosa*, *B.purpuria*, *B.retusa*, *Lagerstromea indica*, *L.parviflora*, *Michelia champaka*, *Mangifera indica*, *Mallotus philipinensis*, *Madhuca indica*, *Nyctanthus*, *Schleichera*, *Alstonea* pot plants as site enhancers. These plants flower at different time of the year to add beauty to the corridor.

These works are to be taken up simultaneously through independent agency except on forestland where MoU for speedy implementation of habitat development in consultation with the Environment supervision consultant and local DFOs may be arranged.

Relocation of *Streospermum acerifolium*, *Sterculia urens*, *Cyzigium cumini*, *Putranjiva* can be planted in the 2<sup>nd</sup> row and long bamboo, *Semul*, *Mango*, *Palmyra* palm, *Caryota urens*, *Terminalia arjuna*, *T.alata*, *T.catappa*, *T.belerica*, *T.chebula*, can be raised on the 3<sup>rd</sup> row of avenue planting where land is available beyond the 16mtr width for planting.

No planting or relocation activity to be undertaken below any power transmission line or over the Fiber optic cable routes.

No relocation should be carried out in shallow soil and rocky out crops or dry land areas other than near water sources and water bodies. In all such cases the surplus soil can be spread in layers and plantation can be taken up with shrubs and grasses.

### **Guide Lines for Tree Felling and Removal**

1. All trees above 30 cm girth at Breast height (measured 1.35 mtr) above ground level on the down hill side.
2. Trees which are finally selected to be felled as per offset from centre line shall be given a blaze mark at BH (1.015 mtr.) and at the base of the tree (blaze size 15X15 cm) cutting away and removing the bark portion. The blaze marked trees are then branded with a property hammer duly registered with the local Divisional Forest Office for such purpose as per Orissa Timber and other Forest Produce Transit Rules 1982 to identify such trees as the trees to be felled.
3. Any tree, which is forked below the BH (1.35 mtr.) shall be having blazes on as many numbers of trunks for branding each trunk separately as a separate tree.
4. All such blaze marks shall be painted with coal tar or black paint on the border of the blaze.
5. All trees marked for felling and removal shall be enumerated jointly by representatives of the PIU, Local Range Staff of Forest Deptt, local divisional field staffs of Orissa Forest Development Corporation Ltd. and entered in a register of trees in Triplicate as per the Performa given below duly countersigned by the enumerators and their superior supervising officer who are to counter check

some of the measurements and other details at random not below 1% of the total trees so marked.

6. The serial number as per the enumeration list shall be continuous and separately maintained for left and right side of the road from starting point of each (Territorial /wild life) divisional jurisdiction (Forest Division wise) as the case may be. The blazes at BH and base of the tree shall be branded with digit hammer to impress the serial number of the tree trunk (Digit hammers from 0 to 9) and sound /unsound nature of the tree trunk (S/D).
7. The species of tree to be felled shall be mentioned.

The enumeration list shall contain the following information. Chainage details km to km, Tree Sl. No., species, Girth class 30-60, 60-90, 90-120, 120-150, 150-180, 180-210, 210-240 >240 in Cm., approximate length of clear bole, Hollow, sound /unsound (H/S/D) condition of tree trunk. To determine the sound and unsound nature of trees to be felled the following procedure to be followed.

- (a) If there is any cavity or hollow visible at the base, middle or cutaway portion of the clear bole or forked branches. -----H
- (b) If the tree trunk when struck with axe or hammer gives a hollow sound or muffled sound. -----H
- (c) If the sound is like a drum ----- H
- (d) If the timber is rotten and visible to naked eye. -----D
- (e) If it is buttressed, ridged and furrowed with irregular protuberances and epicormic branches or cancerous out growths like warts on the tree at several places. -----D
- (f) If mushroom fruit bodies or out growths are visible at several places on the tree trunk locally known as a "Chhatu" or Sambar eye in shape of Black or brown /dark brown colour.-----D
- (g) If the trunk is split, half burnt or half cut and removed. --D

At the end of the enumeration list there shall be an abstract of total trees to be felled in each girth class.

The enumeration of trees to be removed from forestland has to be made separately irrespective of its location indicating the name of the forest (as per Govt. records submitted for forest clearance maintaining separate serial for each separate forest block of village forest, protected forest, Reserved Forest, proposed reserved forest). In all such cases forest department marking hammer shall be used to brand the identified trees to be felled and the work has to be carried out meticulously taking only those trees coming within the Ro W including diversion for traffic at identified places. Other than these trees, other natural growth to be felled within hilly and forested track beyond the existing ROW recorded in the same format as was previously explained in clause 1 to 7 stating the chainage detail.

All the copies of the enumeration list shall be compiled together on the Register of trees to be felled and jointly signed in each page of original, duplicate and triplicate by the respective field staffs of Forest Dept., OFDC Ltd & PIU and supervising officer who has checked the same. After enumeration the trees are to be handed over to the OFDC and proper receipt obtained to that effect from the designated officer receiving the trees for removal in such cases the Sub Divisional manager and section supervisor of OFDC Ltd.

### **Felling and Removal**

Felling of trees shall commence in forest and non forest land in phased manner so as not to obstruct the entire traffic flow. After the overhead transmission and entertainment cables are removed the trees shall be felled. The forest corporation shall engage dozer /poclain or such other machines for the removal of heavy tree trunks from the work area and ROW including diversion to facilitate easy flow of traffic and use devices so as to control the direction of felling to avoid damaging other trees, buildings and other infrastructure along the road those are to be retained.

In case of trees to be felled which are adjacent to Temples, schools, residential or community /Govt. structures the felling has to be controlled and executed after due compensation has been paid by PIU for the damages/acquisition and the site vacated by the occupiers. Till that time such trees shall not be felled. In all such Pvt. Property, the values of the trees are to be evaluated and compensation paid prior to felling. No private sale of any tree allowed in favor of any individual/institution/community/group/club etc. to avoid pilferage, duplication and misappropriation.

In all the cases after felling the trees are to be converted into log sections and fire wood stacks of 1mX4mX1mtr. size on level ground and all logs are to be serially numbered with branding of tree No, log No., one end of each log. The log serial number of the total lot worked out by OFDC has to be written on the cut end of each log in black /blue paint which should tally with the entries in the conversion register. The tree number log serial numbers and log section numbers are to be written in English on the cut surface of the stump and the log ends. The same has to be copied into 4 spare copies and one original for passing by designated forest officer as decided by the concerned Divisional Forest Officer having jurisdiction when an application to that effect is made to him as per Orissa Timber and other Forest Produce Transit Rules etc by OFDC. The fire wood stacks should be serially numbered and stacks size 1mX1mXmtr made near stamp sites. All logs and fire wood billets which are more than 1mtr girth to be branded with the property hammerer mark of OFDC registered for the purpose and the conversion list submitted to the officer for passing. The conversion register should also contain the list of firewood stacks obtain from a group of trees adjacent to each other on either side.

The passing has to be carried out by the designated officer of Forest Dept. on Top priority so as to facilitate road construction activity, by branding all the firewood above one mtr girth and up to 1 mtr. length by passing hammer and all the logs and billets branded with the property hammer of OFDC Ltd.

After passing is made permits shall have to be issued by the concerned OFDC official or an officer of forest department specially engaged for this purpose for passing and

issue of perennial for immediate removal of the converted and passed material. Only after removal of the passed materials from the stump site the contractor for going ahead with the roadwork can uproot the stumps. Such stumps can be sold in public auction by the PIU /OFDC as the case may be, or some such stumps may be preserved on cemented platforms as showpiece for the road users and posterity to appreciate the colossal nature of the trees those were existing on the avenue.

Heavy cranes may be required for lifting and loading the huge logs to trucks for transport and OFDC shall be responsible for arranging the same and removing the logs within a fort night to one month from the site after the materials are passed. Felling operation has to be started in order of preference near bridges, culverts, open country with sufficient scope for diversion of traffic and one side of the road where the site Engineer, Contractor and Supervision Consultant decide to start the work first. However instead of continuous stretch of many kms 1km stretches with 2 km gap has to be considered while phasing out cutting operation and after completing one reach the other reach is taken up. All young below 30cm girth plants, which can be relocated at approach to bridge, culvert and animal under, passes are to be shifted first of all during early rains when there are frequent showers by using shovel operators and removals from the proposed ROW for unloading at relocation sites. In all such cases the heavy side and lower branches of such trees are to be cut /pruned for easy removal. Such trees which could not be felled due to constraints of damaging life and property has to be removed in dismembering, the top branches if it is so required and then main tree trunk felled and removed.

The OFDC shall be responsible for timely felling, logging and removal of logs firewood from the work place where as the Forest Deptt shall be solely responsible for passing of timber and the fine wood and issue of permits to that effect. Any undue delay or stoppage of passing and issue of permits for transport is likely to escalate the project cost and the forest department should be held responsible for such additional expenditure to state exchequer.

The expenses may differ from place to place and depending on number of higher girth class trees. Estimate of working cost shall have to be submitted by the OFDC to the PIU after taking delivery of stock of trees to be felled and the same may be examined by the PIU for sanction of approval and release of funds to remove the trees. Where such funds are not released by PIU the royalty value of the trees calculated on unit basis has to be assessed and deducted from the total working cost of the estimate and balance released in phased manner on the basis of progress of work. Only royalty for the trees to be removed from forestland has to be assessed along with natural tree growth beyond the old ROW in forested areas. All other trees which are growing within the existing ROW and which are compensated, for being the property of OWD should not be levied with any royalty by forest department. Therefore separate tree serial, separate conversion and passing list has to be made for calculation of royalty of forest trees and natural growth outside ROW within forested tracts, Jungle blocks etc.

The royalty of the growing stock on acquired forest land to be removed is to be calculated by the PIU with the help of the D.F.O having jurisdiction to settle the royalty and the same should be based on prevailing royalty levied on OFDC for NH widening activity within a year or so. The sale proceeds of the converted materials obtained from the trees minus the working cost as decided divided by the PIU and OFDC on 50% share basis as would be decided by the respective departments of

Works, Forest and OFDC management has to be settled before felling operation takes places and the final royalty should be calculated on the basis of actual passing of saleable materials in the field.

The OFDC shall be held responsible for theft of trees or felled materials and should employ watch and ward to ensure safety and security besides stock piling of such materials at strategic location or its depot.

The un salable trees /felled materials if any shall be finally inspected by a joint team of officers from OFDC, Forest Department and PIU after passing at the time of field inspection and recorded on the conversion register & passing list for reference and record.

All uprooting of stumps shall be so done that it goes 60 cm to 1mtr deep below the formation level or 30cm below the sub grade level which ever is lower.

The OFDC ltd. shall remove the materials to nearest depots for disposal and deposit the royalty as will be agreed upon by the respective authorities or as in vogue for such other projects.

The trees on Pvt. land and Govt. forest land are to be worked out separately as some are purchased by the OWD and handed over to the OFDC for felling and some are compensated by depositing the NPV with forest Deptt. In both the cases the sale proceeds minus the handling charges to be shared by 70:30 between PIU and OFDC ltd. respectively after accounting for the cost of the trees in addition to working cost approved for such trees to be removed.

The uprooted stumps can be dumped /stock piled at a place in heaps and sold in public auction for use as ornamental structures or fire wood as the case may be which shall be the responsibility of the PIU as uprooting has to be only carried out after the removal of staked materials of fire wood and timber from work site.

Tripartite discussion has to be made between OWD /PIU, Forest Deptt. OFDC ltd for setting the nity gritty of the operational details at high level so as to avoid delay and communication gaps, official red tapisim and beurocratic mishandling at all level and facilitate smooth removal of tree growth.

All trees those are retained shall have to be serially numbered from chainage 0 to end of the road and register maintained to that effect for reference, follow up action and disposal when any one is required to be removed etc. by maintaining separate serial number for the left and right side of road centre line.

For this all trees are to be provided with Aluminum foil punch marked numbers fixed to each tree by nailing at a height above 1½ mtrs. from down hill side visible to the road.

The record keeping shall be in the following manner, while carrying out the enumeration of trees to be retained.

Sl. No. of trees	Species	Girth at BH on the date of enumeration	Height of clear bole	Condition of the tree Hollow /Unsound /sound	Estimated quantity of fire wood	Remarks
------------------	---------	--	----------------------	---	---------------------------------	---------

The pits formed due to removal of stumps shall be filled up with 20 cm layers of suitable Granular sub-base material and compacted.

All trees which have lost their major root system due to excavation of the road base for relaying if giant and old standing opposite to wind flow from North West or South East shall have to be carefully retained as there is a tendency of these old trees toppling down during local whirl winds or cyclone. The site Engineer and the Environment and Biodiversity supervision consultant shall decide the cause of action in such cases when removal of any such retained tree is considered imminent.

In all such cases a joint list of such trees are to be made again by local Forest, OFDC and site Engineer to obtain cutting and removal permission from the Forest Deptt. and Plant adequate number of avenue plants in lieu there of.

Felling of Ficus Kadamba, Mango, Arjun trees having birds nesting area may be delayed to wards the end of winter when the new borns are ready to fly out so as not to destroy the wild life concentration along the corridor.

Branch cuttings and offsets of all types of Ficus, Bamboo, Mango, Tamarind, Jack fruit etc. has to be taken for bud grafting in the nursery to retain the genetic diversity and to treat the cuttings directly with rooting hormone and grow rooted offsets in the nursery under mist chamber so that replica of the existing, vegetation can be recreated in the adjacent degraded forest lands and waste lands along the corridor for the wild life and site enhancement.

#### **Precaution during felling and conversion of trees.**

- ❖ All workers must wear safety helmet or “hard hat” (miners helmet).
- ❖ Traffic movement should be restricted when posting Traffic control operators with red flags so that they can warn the moving traffic to stop instantly is cutting down trees.
- ❖ No tree felling during rains and windy days to prevent accidental fall.
- ❖ There should be ropes tied to the Tree trunk at reasonable ht. in order to control the fall by operating through chain pully combination anchored to another stable tree or farm structure like pillars, posts, rock out crop crow bars as iron pegs pushed into the ground at 30<sup>0</sup> incline.
- ❖ One centry is posted near the felling site to sought with a mouthpiece so that others at the traffic signal stop the traffic momentarily and the tree is brought down.
- ❖ The supervisor, hand sawer, axe or power chain saw operator should be so positioned that in case of sudden fall of the tree or any eventuality they can leave

the site for safety and the leaning direction, probable fall directions are well estimated ahead of cutting to locate the vintage points of cutters position and escape route ahead of cutting.

- ❖ Cleavages, Sun hemp or, HDPE ropes of required size depending on the girth and height of the tree with sufficient spare length have to be used for safety and reliability.
- ❖ The flying splinters and broken branches are widow makers and therefore should be watched out at the time of felling of trees so that workers, passers by and on looks are at safe distance.
- ❖ As soon as the tree falls, the side branches must be cut down with power chain saw or axe and billhook and removed from the road. Portable generators and power chain saw, wedge and axe, raker tooth saw, Bow saw should be kept ready at the work site for immediate action to clear the road with sufficient spare blades, chains, pulley and P.O.L.

Rescue and first aid kits, gumboots, tight fitting gloves are to be used at the worksite by the organization for safety and to avoid freak accidents.

### **Planting pattern at site enhancement locations**

#### **Bhawanipatna – Khariar road**

There are changes in the alignment of the road at sharp curves and accident spots at 37/650, 54/630, 58/275 chainage besides the approach to the new proposed Tel river bridge on Bhawanipatna side. On account of these there are some surplus land within the loop so formed which are to be developed into site enhancement structures by providing concretes walls 1½ mtr high around with entry points for road users. Here some flowering shrubs, trees, palms, ornamental hedges shall be planted after the loop is filled up with surplus excavated materials, road demolition wastes at the bottom and good soil on top of it, leveled properly with landscaping befitting to the rolling terrain. The borders are to be provided with *Duranta plumerai* /*Justicia* (black leaf) trimmed to the level of the concrete wall. The centre shall have *Pongamea pinnata*, *Putranjiva roxburghai*, *Michelia champaka*, *Muraya coingi*, *Mimosops elengi*, *Ficus variegeta*, *Ficus benjamina*, *Ficus vulgaris*, *Ficus glomerata*, *Ficus comosa* so that the area becomes a resting place with prefabricated R.C.C. benches fixed in position (Like in old railway stations) and paved with pebbles and boulders excavated from the road and river beds and river beds, and broken to rectangular or square shapes and embedded on C.C. (m-15).

Provision for locating sweet scented flowering plants and attractive flowering creepers such as *Begunia*, *Lavender*, *Quiscalis indica*, *Cana*, (near water fronts), *Ipomea hederacia*, on the out skirts on rocky and waste ground or pre welded G.I. domes can be made with sowing of *Vinca rosea* seeds on embankment slopes and leveled up areas to get round the year flower.

It has been decided to provide for a truck lay bye at 57 km to 58.3 km location where a loop is available for changing the road alignment near a nala bridge and therefore the site enhancement shall be modified as per the requirements of a truck lay bye and

as far as possible the villagers losing their land in the area have to be given preference for earning, with the option of commercial activity.

Detail designs are enclosed as drawing no. **OSRP/CEG /SH /ENV /01 to 12** for site enhancement, Bus and Truck lay bye, Toll plaza, hospitals, temples, village road inter sections, schools, market places (weekly) etc., which may be referred to.

Hexagonal or round and tapering pillars 1½mtr long are to be fabricated in R.C.C. (m-20) and fixed in position in C.C., (m-15) with name of the village, market place, school, Hospital, College, Temple, monument, Rest house etc. written in Oriya and English language on all road corridors. Such R.C.C. boards as per IRC standard can be manufactured on site and installed. The location shall be as per the road strip map.

The fixing of metal boards or fiberboards or Reflector boards are prone to damage by hooligans, are stolen or damaged due to vandalism and target practice by nuxals and young groups. Therefore the cement concrete frame works of such boards as per IRC design are proposed to be constructed on site. The writings can be painted with glow paints to dazzle during night. The pillars are to be painted with black and white reflector paint with the name boards containing the names in Black over White fluorescent paint letters.

### **Sequencing of Works of Biodiversity Action Plan and Environmental Mitigation Measures**

At the outset maximum care has to be taken not to dig up and disturb the entire area before actual work starts.

- Especially the wildlife under passes and length of road before and after such location has to be left un-worked till the under pass is completed with all details so that the wildlife movement continues unabated in the adjoining area without distress.
- The biodiversity corridor development for elephants and approach plantations for all wildlife under pass can be taken up in advance excluding 15mtrs. from the centre line of SH outwards for construction activity, diversion and stock piling or dumping of materials. The areas beyond this for another 35mtrs for elephants and 20mtrs for other animals can be planted up with trees, shrubs and bushes, bamboos as per the action plan design on either side of the water channel or opening as the case may be.
- **If such lands are Govt. land, the planting should be carried out along the nala towards the forest or water sources either side using rooted offsets, uprooted and to be relocated young saplings and small trees, bushes etc. as has been prescribed in the proposal for relocating young trees, so that the banks of drainage channels are camouflaged before the road work is complete.**
- The gully plugging and check damming of such drainage channels as per design has to be taken up simultaneously so that the run off is reduced improving ground water recharge.

- The sequencing of the Bear under pass beyond Digapahandi between 26.5 to 27.2 km may be taken up now at chainage km 27.02 avoiding the feeder road as mean while the OWD has built one new box culvert at previous locations on SH-17 (as seen during World Bank mission verification of the bear pass locality on 31<sup>st</sup> January – 1<sup>st</sup> February 2007). This culvert has no earth cushion or required opening to facilitate movement of Bears and no retaining walls provided for preventing the bear from coming over the State Highway - 17. There is no need of second bear pass after the proposed bear pass now suggested at 27.020 km chainage. As vast stretch Ghodahada river basin and bridge is there to provide the desired passage.

The sequencing of all wildlife under pass should be in alternate 2km chainage points i.e. there should be minimum 2km gap between two under pass while construction work is taken up including the road construction and under pass. When the gap is lower than 2km both should be taken up simultaneously after erecting one water storage tank down hill and uphill each side artificially away from the road for storing drinking water for the wildlife in lined Polly euro thane sheets built up as artificial ponds raised 50cm above ground and 20cm deep below. The contractor in non-forest Govt. land should carry this out through the local forest department in forested areas or small ponds at a level ground, so that summer distress on either side of the under passes can be prevented. Minimum size of the structure should be around 2000 litres capacity in the shape of an irregular ditch with earthen bunds and polythene sheet lining at the bottom as well as top of the embankment. The thickness of such structures shall be minimum 1mtr and maximum 3.25mtr at the bottom and 1mtr at the top at a maximum cost of Rs.3,000 each. These structures will serve as the water source for local cattle and wildlife for several years till they venture to cross over the road though the under pass. This will also help reduce the distress of wildlife during summer after a year when the road construction activity starts in full swing. However the storage capacity of tanks up hill should be limited to 1000 ltrs. for preventing drowning and flash flood, which may impact road construction activity.

- The gully plugging on high hills and RFs, PFs to be done by the forest department under the guidance of Supervision Consultant much before Tree felling and wildlife under pass activity starts.
- **In acute water scarcity areas these make shift ponds may be filled with water from near by water sources through tankers and the wildlife is saved from distress owing to construction activity. These structures are to be erected at those nalas where wildlife under pass has been provided in each corridor on hills, forested areas and plains.**
- **In inter tidal zones there should not be any provision for providing line drains on the down stream to prevent the damage to agricultural land near the culvert opening as this will obstruct tidal water flow to the other side permanently and thus result in water logging and salinity of the fields.**

**The result will be disastrous for breeding of aquatic, amphibian, reptilian as well as aviary fauna. In non inter tidal zone between 20 to 28 km stretch of Bhadrak – Chandbali SH-9 this will also create a head of water on the right side as build up of water level up to the height of the lined drain will be there**

**causing more flood damage than was previously occurring distressing more people including the land owner at bridge or culvert opening.**

- Such structures to reduce the velocity of flow can be provided in the exit points of new culverts on SH-53, SH-17, and SH-16 where the right side is higher than the left or vice versa (as the case may be).
- **There should be Trap drains for all under passes in Bhadrak – Chandbali, Bhadrak – Anandapur, Berhampur – Taptapani corridor under passes, where amphibians, reptiles and rodents move across the road near wet lands and water bodies early in the pre monsoon and monsoon season so as to prevent the death of agro friendly frogs, Bandicoots, Snakes, Monitor lizards under the wheels of moving traffic. These wildlife can be diverted to move under the culverts or through the via duct 600mm dia cement pipes as provided in the drawing no. OSRP/ CEG /SH/Bio /Reptile pass.**

The chainage locations are in the corridor strip map and Table of impact mitigation designs in **Annexure –XXV (A) to (D)** of Biodiversity report.

The Barricading, planting on the islands created at road junctions, site enhancement plantations along Temples, Hospitals, Market places, Bathing ghats, Water body embankments, river banks, nala banks, Bus and Truck lay bye are to be taken up with tree guards for single row plants and barbed wire fencing over long stretches for which separate cost and design of Tree guard has been provided in **Annexure XXXVIII** which is to be only provided for ornamental brows able species. Care has to be taken to plant all non brows able species to the extent possible like Kaner, Karbir, Kamini, Karanj, Collophyllum, Nictanthes, (Hara singar), Karada (cleistanthes), Acacia nilotica, A.leocophlea, Neem, Mahaneem, Mahala (Ailanthus excelsa), Bougainville, Premna tomentosa etc.

The costing will be at the same rate applicable for plantation @ of 1600 plants /ha without the cost of barbed wire or tree guard fencing i.e. @10/- per plant for three years including casualty replacement.

The cost per tree guard (square mesh to be embedded in c.c. on the ground level as per design drawing and specification is enclosed in **Annexure – XXXVIII**. Corresponding to drawing no. **OSRP /CEG /SH /ENV /08**.

**Tree cutting and removal from the RoW with up rooting of stumps and filling up of depression layer by layer as per instructions**

Sl. No.	Items of work	Unit	Rate	No.	Amount
1	<b>Cutting of Trees, including Cutting of Trunks, Branches and Removal</b> (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)				
(i)	<b>Girth from 300 mm to 600 mm</b>	each	80.00*	80	6400

(ii)	<b>Girth from 600 mm to 900 mm</b>	each	162.00*	70	11340
(iii)	<b>Girth from 900 mm to 1800 mm</b>	each	285.00*	100	28500
(iv)	<b>Girth above 1800 mm</b>	each	515.00*	582	299730
2	<b>Clearing Grass and Removal of Rubbish</b>	hectare	29138.00*		

\*Refer Sl. No. 2.1 & 2.3 of Rate Analysis corresponding to MoRTH specification No. 201. **The rates are subject to change according to the local conditions of the trees and the rates submitted by the OFDC for approval before commencement of tree felling.**

**Table: Schedule of Forest Land as per Land Records Available from Revenue Authority**

Sl. No.	Name of the village	Plot No.	Kisam	Proposed area to be acquired (in ha.)	Village sheet no.	Tahasil
1	Baghajhari	1059	Village forest	0.05	05	Berhampur
2.	Baghajhari	1116	Village forest	0.102	05	Berhampur
3.	Baghajhari	Illegible	Village forest	0.132	05	Berhampur
4.	Mahugharahill	463	Village forest	0.043	04	Berhampur
5.	Balipada	Illegible	Village forest	0.124	03	Berhampur
6.	Nabarangapur	1080	Village forest	0.018	03	Digapahandi
7.	Nabarangapur	952	Patharabani (PB)	0.045	03	Digapahandi
8.	Nabarangapur	1154	Patharabani (PB)	0.016	03	Digapahandi
9.	P.laxminarayanpur	388	Village forest	0.07	02	Digapahandi
10.	P.laxminarayanpur	390	Village forest	0.02	02	Digapahandi
11.	P.laxminarayanpur	436	Village forest	0.005	02	Digapahandi
12.	P.laxminarayanpur	392	Village forest	0.013	02	Digapahandi
13.	Rajanpalli	7	Village forest	0.0333	01	Digapahandi
14.	Rajanpalli	9	Village forest	0.0267	01	Digapahandi
15.	Rajanpalli	234	Village forest	0.0768	04	Digapahandi
16.	Rajanpalli	169	Village forest	0.0288	03	Digapahandi
17.	Rajanpalli	575	Village forest	0.007	06	Digapahandi

18.	Rajanpalli	617	Village forest	0.0648	06	Digapahandi
19.	Rajanpalli	92	Village forest	0.0152	06	Digapahandi
20.	Rajanpalli	90	Village forest	0.0164	03	Digapahandi
21.	Rajanpalli	230	Village forest	0.0044	04	Digapahandi
22.	Rajanpalli	1161	Village forest	0.0044	01	Digapahandi
23.	Rajanpalli	1160	Village forest	0.0164	01	Digapahandi
24.	Rajanpalli	1159	Village forest	0.026	01	Digapahandi
25.	Daseipur	39	Village forest	0.0552	03	Digapahandi
<b>Total</b>		<b>25 Plots</b>	<b>23 VF &amp; 2 PB</b>	<b>1.0134</b>	<b>9</b>	<b>Berhampur -5 plots  Digapahandi -20 plots</b>

The maps of Mahugarahill, the hills at Tikarpada and Balipada on the left and right along with the forest land on the left opposite the Padarbali village and Mahurikalua road junction have not been accounted for as the detail map corresponding to the land schedule of the villages were not available. This will be added after the published maps are made available by Survey and Map publication Govt. of Orissa. This shows the total forest land affected comes within 1.0134ha. which is within the power of State Govt. under forest conservation act guideline to be release for road improvement activity.

**Table showing abstract of biodiversity survey conducted on Phase-I road July to September 2007**

Sl. No.	SH No.	Name of the SH	Particulars of stake holders interviewed					Total
			Forest Employees	Residents	Commercial establishment	Pedestrians	Auto mobiles	
1	SH-9	Bhadrak – Chandbali	5	30	10	5	15	65
2	SH-53	Bhadrak – Anandapur – Karanjia	5	45	15	15	10	90
3	SH-49	Karanjia – Tangabila (Jashipur)	1	5	3	5	10	24
4	SH-17	Berhampur – Bangi Jn.	11	65	20	45	25	166
5	SH-4	Bangi – Rayagada	4	18	11	10	8	51

6	SH-5 & 6	JKPur – Muniguda – Bhawanipatna	8	12	10	10	10	50
7	SH-16	Bhawanipatna – Khariar	4	15	9	27	8	63
8	SH-65A to 64	Daspalla – Gania – Nuagada – Hindol – Mahidharpur – Angul	6	20	12	35	5	78
9	SH-7	Aska – Bhanjanagar	4	12	10	7	8	41
<b>Total</b>			<b>48</b>	<b>222</b>	<b>100</b>	<b>159</b>	<b>99</b>	<b>628</b>

- The result of the survey conducted involving 628 personalities of diverse background and views on wildlife indicated that many persons are having rudimentary ideas on need of wildlife and environment other than opining for protection of forest and preventing wildlife to come out of forest. Many persons declined to sign the documents and did not answer the forms given to them. In such cases their statement only recorded on the forms and it was reflected on the corridor strip map for wildlife survey.
- The survey could not provide specific information on accident of wildlife on the road, though lots of frogs, lizards, snakes, birds and small mammals reportedly come under the wheels near wet land habitat, water body, culverts, agricultural fields. The common man does not consider these creatures wildlife.
- The movement of tiger was not reported from any quarter through panthers were reported to be present in Satkosia RF and Chheratangara RF of Karanjia, nala ghat of Parelekhemundi, Saradhapur RF and Makundapur ghat of Rayagada forest divisions. Similarly movement of elephants, gaur, sambar, dear and Nilgai were reported from Taptapani to Bangi, Bangi to Rayagada, Bhawanipatna to JKPur, Narsinghpur to Hindol, Anandapur to Karanjia.
- The presence of civets, pythons, palm civets, fishing cats, otters, turtles, crabs, monitor lizard, yellow monitor and gray monitor, cobra, rat snake, jungle cat, jackals were reported from Chandbali – Bhadrak – Anandapur zone.
- Bears were singularly reported to be a threat for human beings between Digapahandi to Maulabhanja Bridge on SH-17, Anandapur to Kodapada on SH-53.
- The man animal conflict has been very severely affecting the economy of farmers and tribals within the forest and on the out skirts of forest where entire paddy crop and vegetable gardens of Potato, pumpkin, water melon, musk melon, cluster bin, asparagus bins, tomatoes, cauliflowers were devastated along with destruction of their house and store harvested paddy in Ganjam, Gajapati, Rayagada, Keonjhar, Mayurbhanj, Cuttack, Dhenkanal and Angul district. The steps to provide wildlife

underpass at specific points is therefore likely to influence adverse public opinion in elephant and bear menace sites along the corridor.

**Number of Medium and Giant trees likely to be removed from the RoW as per proposed centre line of the SH-17 (Part) from 0/0km to 41/0 km**

**TREE COUNTING (KM 0-41)**

<b>BERHAMPUR-TAPTAPANI(0.0km TO 41.0km)</b>				
<b>SI No.</b>	<b>CHAINAGE</b>	<b>LEFT</b>	<b>RIGHT</b>	<b>TOTAL</b>
1	0.0-1.0km	1	0	1
2	1.0-2.0km	3	0	3
3	2.0-3.0km	4	4	8
4	3.0-4.0km	8	11	19
5	4.0-5.0km	2	6	8
6	5.0-6.0km	13	18	31
7	6.0-7.0km	11	12	23
8	7.0-8.0km	10	8	18
9	8.0-9.0km	7	7	14
10	9.0-10.0km	4	8	12
11	10.0-11.0km	3	4	7
12	11.0-12.0km	1	2	3
13	12.0-13.0km	0	4	4
14	13.0-14.0km	3	1	4
15	14.0-15.0km	1	1	2
16	15.0-16.0km	1	2	3
17	16.0-17.0km	4	7	11
18	17.0-18.0km	1	7	8
19	18.0-19.0km	8	4	12
20	19.0-20.0km	4	3	7

21	20.0-21.0km	3	4	7
22	21.0-22.0km	2	7	9
23	22.0-23.0km	5	2	7
24	23.0-24.0km	8	3	11
25	24.0-25.0km	9	15	24
26	25.0-26.0km	7	2	9
27	26.0-27.0km	14	7	21
28	27.0-28.0km	9	7	16
29	28.0-29.0km	6	3	9
30	29.0-30.0km	2	6	8
31	30.0-31.0km	17	29	46
32	31.0-32.0km	34	27	61
33	32.0-33.0km	34	8	42
34	33.0-34.0km	15	29	44
35	34.0-35.0km	8	10	18
36	35.0-36.0km	21	16	37
37	36.0-37.0km	23	14	37
38	37.0-38.0km	36	10	46
39	38.0-39.0km	5	10	15
40	39.0-40.0km	16	13	29
41	40.0-41.0km	22	24	46
Total		385	355	740

**Total no. of plants 2220 to be planted @1,84,900/- per 400 plants per km =Rs.10,26,195/-**

There are 740 no. of trees about to be sacrificed on account of road improvement as per the final layout plan showing the proposed centre line. The left side of the corridor contains 385 such trees and the right side 355 trees. The actual number of trees may vary depending on the additional survey of tree growth that will be acquired and compensated for being the property of private parties, which has not been

evaluated and the trees over forest land, which has not been identified and enumerated due to want of Sabik, Kisam and plot numbers as per Sabik RoR corresponding to the Hal RoR. The above table shows the km wise number of trees belonging to the OWD with a girth at BH (breast height) ranging from 1000 mm to 2400 mm and above. Compensatory plantation of 3 times the total number of trees (740X 3) or 2220 plants shall be taken up along the corridor including site enhancement plantations, so as to improve the environment.

The cost of such plantation shall be as per the cost norm furnished in accordance to in **Annexure – XXXVI (A) to (F)** of this report and the cost of fencing with painted wire mesh gabions @500/- per gabion as per design details in drawing no. **OSRP /CEG /SH /ENV /08**. (Cost norm details are in the DPR, which includes the materials, with cost of fabrication, painting, carriage and embedding in cement concrete M-15 at the planting site in a circular shape)

SL No.	ITEM	Unit	No	Length	Width	Area in sqm.	Rate /Sqm.	Amount	Total no.	Cost in lakh
1	Tree Guard including cost of fabrication, carriage, painting, installation & embedding in cement concrete	Kg	1	2.1mtr	0.75 mtr	4.95	150.00	743.00	2496	18.55

### NO OF TREES FROM CH.2.000km TO 69.400km

#### BHAWANIPATNA-KHARIAR

(As per proposed centre line)

SI No.	CHAINAGE	LEFT	RIGHT	TOTAL
1	2.0-3.0km	32	14	46
2	3.0-4.0km	33	22	55
3	4.0-5.0km	23	20	43
4	5.0-6.0km	51	28	79
5	6.0-7.0km	46	33	79
6	7.0-8.0km	58	14	72
7	8.0-9.0km	54	30	84
8	9.0-10.0km	29	22	51
9	10.0-11.0km	17	23	40
10	11.0-12.0km	31	32	63
11	12.0-13.0km	35	34	69
12	13.0-14.0km	22	25	47

13	14.0-15.0km	34	37	71
14	15.0-16.0km	33	39	72
15	16.0-17.0km	41	38	79
16	17.0-18.0km	19	27	46
17	18.0-19.0km	35	27	62
18	19.0-20.0km	38	32	70
19	20.0-21.0km	37	18	55
20	21.0-22.0km	34	17	51
21	22.0-23.0km	41	36	77
22	23.0-24.0km	33	38	71
23	24.0-25.0km	17	14	31
24	25.0-26.0km	31	30	61
25	26.0-27.0km	23	12	35
26	27.0-28.0km	3	4	7
27	28.0-29.0km	0	0	0
28	29.0-30.0km	0	2	2
29	30.0-31.0km	2	9	11
30	31.0-32.0km	1	1	2
31	32.0-33.0km	8	6	14
32	33.0-34.0km	7	5	12
33	34.0-35.0km	3	2	5
34	35.0-36.0km	6	5	11
35	36.0-37.0km	3	4	7
36	37.0-38.0km	11	11	22
37	38.0-39.0km	23	24	47
38	39.0-40.0km	21	22	43
39	40.0-41.0km	9	13	22
40	41.0-42.0km	4	2	6

41	42.0-43.0km	5	4	9
42	43.0-44.0km	7	7	14
43	44.0-45.0km	24	10	34
44	45.0-46.0km	6	10	16
45	46.0-47.0km	12	13	25
46	47.0-48.0km	7	5	12
47	49.0-50.0km	2	5	7
48	50.0-51.0km	11	9	20
49	51.0-52.0km	17	26	43
50	52.0-53.0km	23	15	38
51	53.0-54.0km	7	6	13
52	54.0-55.0km	8	10	18
53	55.0-56.0km	14	7	21
54	56.0-57.0km	15	7	22
55	57.0-58.0km	90	31	121
56	58.0-59.0km	0	1	1
57	59.0-60.0km	5	1	6
58	60.0-61.0km	4	6	10
59	61.0-62.0km	27	25	52
60	62.0-63.0km	6	7	13
61	63.0-64.0km	8	5	13
62	64.0-64.4km	6	3	9
63	65.0-66.0km	10	8	18
64	66.0-67.0km	2	2	4
65	67.0-68.0km	9	15	24
66	68.0-69.0km	0	4	4
67	69.0-69.4km	1	2	3

**Total no. of plants 6870 to be planted @1,84,900/- per 400 plants per km =Rs.31,75,6571/- or 31.75lakhs**

There are 2290 no. of trees about to be sacrificed on account of road improvement as per the final layout plan showing the proposed centre line. The left side of the corridor contains 1274 such trees and the right side 1016 trees. The actual number of trees may vary depending on the additional survey of tree growth that will be acquired and compensated for being the property of private parties, which has not been evaluated and the trees over forest land, which has not been identified and enumerated due to want of Sabik, Kisam and plot numbers as per Sabik RoR corresponding to the Hal RoR. The above table shows the km wise number of trees belonging to the OWD with a girth at BH (breast height) ranging from 1000 mm to 2400 mm and above. Compensatory plantation of 3 times the total number of trees (2290X3) or 6870 plants shall be taken up along the corridor including site enhancement plantations, so as to improve the environment.

The cost of such plantation shall be as per the cost norm furnished in accordance to in **Annexure – XXXVI (A) to (F)** of this report and the cost of fencing with painted wire mesh gabions @500/- per gabion as per design details in drawing no. **OSRP /CEG /SH /ENV /08**. (Cost norm details are in the DPR, which includes the materials, with cost of fabrication, painting, carriage and embedding in cement concrete M-15 at the planting site in a circular shape)

**Formation of Monitoring committee to Stream line and facilitate speedy implementation of the corridor development through inter and intra departmental coordination.**

The inter agency coordination to oversee the environment and biodiversity related matter may be tackled by formation of committee under the;

- Chairmanship of local Conservator Forest
- Executive Engineer of the project as convener cum members secretary.
- Divisional Forest officer, wildlife /territorial division.
- Zonal manager OFDC ltd.
- Divisional Manager (commercial) OFDC ltd.
- Local Tahasildar
- Supervision Consultant of OWD

This committee will look after the identification of forestland, speedy enumeration of tree growth over such land, preparation of a register to record the number of trees to be retained along the corridor.

The committee will fix up modalities for early issue of felling, logging and passing orders by the concerned Divisional Forest Officer having jurisdiction over the area as soon as the clearance under forest (conservation) act is obtained from the competent authority and the enumeration list jointly prepared by the local forest department, PIU

of OWD and divisional staff of OFDC entrusted with the job of tree felling and removal.

The committee will take necessary steps for appointment of a specific officer of forest department not below the rank of a Range Officer to take up passing of converted trees within the acquired forest and non forest land from time to time.

The committee will fix up the modalities of passing at regular interval of 15 days and issue of permits by the passing officer, where the logs and fire wood is removed from the forest land, revenue land and other Govt. of private land.

The committee will assign specific tasks and agency to local Divisional Forest officer /Bana Samrakshayana Samiti to take up activities like plantation in degraded forest land adjacent to the corridor of wildlife movement, camouflage corridor planting on either opening of wildlife underpass, gully plugging and check damming other soil and water conservation measures in forest land and Podu ravaged areas, which shall be open to inspection and monitoring by the supervision consultant /environment expert of the OWD and the site engineer of OWD.

The committee will deliberate on difficulties and draw backs in the implementation and settling of all differences and bottlenecks in the field and office level.

The other invited member may be the contractor of the package, who has been interested with the job of avenue plantation and corridor soil and water conservation measure, habitat development as well as site enhancement activities within the RoW and up to the boundary of forest land beyond RoW.

The committee will entrust the job of monitoring the movement of wildlife after the project work is completed through the local range officer and the assistant engineer of the OWD together with any environment and Wildlife Expert /NGO active in the field of monitoring wildlife issues for evaluation of various biodiversity an environmental structures proposed to be erected as mitigation measures.

There shall be a district level committee under the Chairmanship of district Collector for monitoring and speedy implementation of activities relating to:

- Shifting of utilities
- Relocation of tube wells, stand posts, statues, religious structures.
- Shifting of the boundary walls, gates and other utilities of schools, colleges, hospitals, old age homes, burial grounds, water bodies, diversions etc.
- Monitoring the activities related to removal of trees and plantation activities along the corridor.
- Establishment of check posts on the proposed road.

The members of the committee shall be all the district level heads of authority relating to forest, wildlife, electric supply, water supply, health, community development, endowments, labour welfare, regional transport authority, police, panchayatraj

institution, education, tourism, district level disaster mitigation authority, prominent environment experts, non govt. agencies active in health and sanitation, socio economic development of rural areas. The sitting of both the committee shall be once every month to review the activities, progress and bottleneck for finding out the expeditious solutions for early disposal of the activities.

Schedule of plantation to be raised along the water bodies by relocating trees from the avenue and planting on the embankment of ponds, rivers, streams and wildlife underpass

**Table showing right and left side Avenue planting**

Sl. No.	Left Chainage		Total length (in mtr)	Right Chainage		Total length	No. of plants at 5mtr X5mtr	No. of shrubs /small trees at 5mtrX5mtr spacing
	From	To		From	To			
1	0.120	0.150	30	0.140	0.250	110	28	28
2	0.270	0.450	180	0.600	1.000	400	116	116
3	2.200	2.500	300	1.000	1.605	605	181	181
4	2.600	2.930	330	1.600	2.100	500	166	166
5	3.440	4.000	560	2.180	2.340	160	144	144
6	4.000	4.300	300	3.500	4.000	500	160	160
7	5.000	5.220	220	4.000	4.300	300	104	104
8	5.000	5.400	400	4.440	4.542	102	100	100
9	6.200	6.900	700	5.000	5.950	950	330	330
10	7.400	7.700	300	6.000	6.750	750	210	210
11	8.000	8.200	200	7.300	7.350	50	50	50
12	8.400	9.800	400	7.450	7.700	250	130	130
13	10.600	11.000	400	8.000	8.300	300	140	140
14	11.000	11.200	200	8.350	9.800	450	130	130
15	11.350	11.600	250	10.670	11.000	330	116	116
16	11.900	12.000	100	11.000	11.200	200	60	60
17	12.000	12.700	700	11.350	11.630	280	196	196
18	13.000	13.100	100	11.900	12.700	800	180	180
19	13.700	14.000	300	13.000	13.050	50	70	70
20	14.000	15.000	1000	13.700	14.000	300	260	260
21	15.300	15.600	300	14.000	14.100	100	80	80
22	16.000	17.000	1000	14.200	14.800	600	320	320
23	17.480	17.800	320	15.300	15.620	320	128	128
24	17.950	18.150	200	16.000	17.000	1000	240	240
25	19.150	20.000	850	17.450	17.800	350	240	240
26	20.000	20.400	400	17.950	18.150	200	120	120
27	21.100	21.600	500	19.180	19.250	70	114	114
28	22.000	22.200	200	19.900	20.000	100	60	60
29	22.250	22.525	275	20.390	20.590	200	95	95
30	24.800	24.900	100	21.100	21.650	550	130	130
31	25.500	25.900	400	21.800	21.900	100	100	100
32	26.000	26.350	350	22.000	22.200	200	110	110
33	26.550	26.800	250	22.250	22.700	450	140	140
34	27.000	28.000	1000	23.000	23.100	100	220	220
35	28.500	29.000	500	25.550	25.700	150	130	130
36	29.000	29.250	500	26.000	26.100	100	120	120
37	29.700	30.000	300	26.475	26.700	225	105	105
38	30.200	30.900	700	27.000	28.000	1000	340	340
39	31.550	32.000	450	28.500	29.000	500	190	190
40	32.500	32.230	270	29.000	29.250	250	104	104
41	32.230	32.300	70	29.600	30.100	500	114	114
42	33.333	33.700	377	30.200	30.295	95	94	94
43	33.700	34.050	350	31.550	32.000	450	160	160
44	34.900	35.700	800	32.050	32.230	180	196	196
45	36.145	36.204	59	32.300	32.350	50	22	22
46	36.400	36.600	200	33.350	33.700	350	110	110

47	36.800	36.950	150	33.700	33.960	360	102	102
48	36.210	38.200	1990	34.950	35.650	700	538	538
49	39.000	39.140	140	36.145	36.200	55	39	39
50	39.400	40.000	600	36.450	36.630	180	156	156
51	40.300	40.400	100	36.850	36.900	50	30	30
52	40.525	41.000	475	36.210	38.500	2290	553	553
53	-	-	-	38.600	38.800	200	40	40
54	-	-	-	40.300	40.500	200	40	40
55	-	-	-	40.700	40.890	190	38	38

Cost of planting with relocation of species brought from the avenues with 3-year maintenance

@500/- each

8189 no. of trees= Rs.40,94,500

@150/- each

8189 no. of shrubs & bushes = Rs.12,28,350

The costing for corridor camouflage plantation shall be as per the cost norms of plantation furnished at **Annexure XXXVI (C)** @15900/- per ha. which shall be calculated as below for wildlife underpass in forested areas plantation of 10mtr X 50mtr on either side will be carried out leaving the culvert and streams open, so as to allow free movement of wildlife. There are all total 20 such locations as per the table no. **XXV (B) to (D)** for year-1 roads excluding the underpasses on Chandbali – Bhadrak and Bhadrak – Anandapur corridor, where there will be 1 wildlife underpass plantation at 40.242km chainage before Anandapur

---

***QUESTIONNAIRE FOR WILD LIFE SURVEY***

### Annexure 1: Questionnaire for Wild Life Survey (Discussion at Institutional Level)

The Foresters, Rangers and Forest Officers will be requested to provide specific information about the floral and faunal inventory in the area, location of water holes, location of road crossing, etc.

1	Do you know about OSRP? Yes / No	Yes
2	Which are the predominant wildlife species present in your area and provide species wise inventory.	Elephant, Tiger, Panther, Bear, Sambar, Dear, Barking dear, Monkey, Rattle, Hare, Snake, Mongoose, Monitor lizard etc.
3	Which are the identified wildlife corridor in the range under your jurisdiction? What is periodicity of movement of wildlife in these corridors?	Only 1 bear pass at 27km and occasional elephant crossing at 41km to 42km Movement during yearly winter up to end of summer i.e. mid September to mid June.
4	Which floral species are available in your range?	Trees like Sal, Sisoo, Biza, Tik, Arjun, Kadamba, Fasi, Asan, Pipal, Banion, Mahul, Mango, Tamarind etc. There are climbers, shrubs and herbs of many varieties.
5	What are the medicinal plants species available in your area?	Bel, Neem, Amla, Sandal wood, Ankula, Asperagus, Bridhadarak, Raulvolfia, Apamarga.
6	Kindly mark locations of water holes on a sketch with approx. distance from project road and size of the water hole.	There are no specific water holes except the river basins and ponds on either side of the road from 0km to 41km, which are used as water hole during summer by the wildlife.
7	Please give your suggestions for protection of wildlife and forests.	People participation in forest management, allowing farm forestry in podu cultivation areas, encouraging private plantations and removing restrictions on felling and transport of private grown timber and fire wood.
8	What are reasons of wildlife crossing in your opinion?	Search for mate, food and fodder, search for shelter and water, running away from forest fire, hunter, mining explosion, highway development and fragmentation of corridor.
9	Have you noticed any change in wildlife behavior, movement, multiplication in the past? In case yes, what are possible reasons for	Yes, Wildlife is entering into habitations and

	these changes?	agricultural area more frequently even though there is no food source in the field, because of the loss of habitat and biotic interference.
--	----------------	---

## Details official contacted

<b>Name:</b>	<b>Designation:</b>	<b>Date:</b>
S.C.Behera	Range officer Mohana	July 27 2006
R.C.Mohapatra	Range officer Digapahandi	July 27 2006
Suresh Mishra	Range officer Podamari	July 29 2006

## Biodiversity Survey of Different Corridors

Berhampur Range

1. A. What are the wild life found in the area	Elephant, Bear, Rattel, Jackal, Hyena, Civet, Otter, Hare, Porcupine, Fox, Snakes, Bull frogs, Toad, Monitor lizard, Fresh water fish etc.
B. Timing of sighting animal	Night/Late Night, Dawn/Early Morning occasionally in the evening.
C. Where mostly found crossing of road	Chainage 1.52km to 2.5km, 9.0km to 10.0km, 13.0km to 17.0km
D. Season of crossing	Winter/Summer/ Rainy season
E. Reasons of Wild life movement	Mating, Feeding, Hunting, Nesting, Scavenging, escaping.
1. Traditional or Sporadic /Specific	Less Traditional more Sporadic or Specific at places
a. Annual migration b. Seasonal Migration	Seasonal
2. Summer movement for food /water.	Summer
3. Winter movement for crops foraging and feeding or hunting.	Yes
4. Under threat:	
a. Forest Fire	Yes
b. Podu Cultivation	Yes
c. Chased by hunters/ Predators	Yes
d. Man animal conflict.	Yes
5. For Salt lick and water holes.	For water holes.
6. Destruction of habitat / Stone quarry/ Movement of heavy machinery/ destructions of habitat.	Yes, Stone quarry, Destruction of habitat
Development project work/ any other factor	N.A.
F. Location of Perennial /Seasonal water source/ Waterholes/Salt licks/ponds/Marsh land a. Name of River/ Nallah / Spring / Pond / Artificial departmental water holes/ salt licks etc. b. Distance from the road.	Dakhinapur MIP and Rusikulya canal system. Lanjia ponds, Tikarpada MIP, Within the corridor limits.

G. What are the preventive measures to be taken to Prevent Wild life crossing the road and to record their causative factors of movement more precisely a. Departmental Community oriented/ signage etc. b. Protection measures like Food and Water source development. c. Development of the saltlick with water source in the forest. d. Optical illusion effects /Reflector /holographic reflectors.	No comments  Development of habitat through protection of natural forest growth Not required  It will have no effect.
H. From which area to which area across the road annual movement is noticed Name of forest blocks/ Rev. Village/ Chainage to be furnished as per the corridor length.	From Ramaguda RF on the left and water bodies on the right at Dakhinapur /Lanjia /Tikarpada /Padar bali.
1. Any damage to life and property by wild animals during last 3 years?	Elephants have done damaged property and life of human beings in Dakhinapur during the past 2 year and current year 2006.
2. Are there Forest fire? Yes /No Reasons Time of fire Month	Yes, Hardly any vegetation worth the name to be destroyed other than the rooted wastes of natural forest.
1. Do forest fires occur frequently? Yes /No	No,
When / How	Forest fire during winter and early summer for collection of fire wood, hunting of small animals like hare, porcupine, fox and civets for collection of mahua flower and seeds, mangoes.
Month of fire	February to April
a. Accidental	•
b. Natural	•
c. By food gathers	•
d. Podu cultivators	•
e. Hunters/NTFP gatherers	Yes
f. Tourist and local vandalism	•
g. Lightning effect	•
3. Dependence on forest as a source of lively hood	•
1. Food/Fodder/Fire wood	Yes, Fire wood
MFP/NTFP	Yes, NTFP
2. Eco tourism	No
Protection measures suggested	
1. Creation of water holes on site of corridor	There are number of natural water holes.
2. Creation of barriers/Vertical retaining walls on road side	Not required
a. Reflectors mounted on roadside.	Yes
b. Raising of food parks	It will not be effective due to grazing.

c. Road under bridge for free passage with vertical wing walls.	Yes
d. Formation of village committees to prevent hunting and destruction of habitat/forest fire.	Yes
e. Voluntary conservation of rooted wastes to allow forest growth and restocking	Yes
f. Supplement gaps with source of food chain specific plantation of species, which are the source of food for wild life by educating the locals and residents alike on importance of wild life habitat and wild life for socio-economic and aesthetic consideration.	By conservation of natural growth with soil and water conservation measures in the nala and stream beds, creeks, prevention of erosion.
g. Creation of medows.	Not applicable.
h. A gavae planting in staggered manner along with tribulus territories herbal seed sowing to prevent elephant crossing.	Not required
i. Changing over to other crop	Not required

Name and address of the : Ramchandra Gouda, Dakhinapur, Ganjam  
Pratam Kumar Ratha, Checknakaguard  
Brundabana Gouda, Tikarpada, Po.Balipada, Ganjam  
Minaketan Das, Lanjia, Po.Lanjia, Ganjam  
27/09/2006

## Biodiversity Survey of Different Corridors

Digapahandi Range

1. A. What are the wild life found in the area	Bear, Jackal, Hyena, Civet, Hare, Snakes, Bull frogs, Toad etc.
B. Timing of sighting animal	Night/Late Night occasionally in the evening.
C. Where mostly found crossing of road	Chainage 26.5km to 29.5km,
D. Season of crossing	Winter/Summer/ Rainy season
E. Reasons of Wild life movement	Mating, Feeding
1. Traditional or Sporadic /Specific	Traditional and Specific
a. Annual migration b. Seasonal Migration	Seasonal
2. Summer movement for food /water.	Movement for mating
3. Winter movement for crops foraging and feeding or hunting.	Yes
4. Under threat:	
a. Forest Fire	Yes
b. Podu Cultivation	No
c. Chased by hunters/ Predators	No
d. Man animal conflict.	Yes
5. For Salt lick and water holes.	For water holes.
6. Destruction of habitat / Stone quarry/ Movement of heavy machinery/ destructions of habitat.	Yes, Stone quarry, Destruction of habitat
Development project work/ any other factor	Development of road project work
F. Location of Perennial /Seasonal water source/ Waterholes/Salt licks/ponds/Marsh land c. Name of River/ Nallah / Spring / Pond / Artificial departmental water holes/ salt licks etc. d. Distance from the road.	Ghodahada river, Natural springs, Dug wells in sugar cane fields, Ghodahada irrigation canal.  More than 3km to less than 500mtr
G. What are the preventive measures to be taken to Prevent Wild life crossing the road and to record their causative factors of movement more precisely e. Departmental Community oriented/ signage etc. f. Protection measures like Food	Yes  Development of habitat through protection of natural forest growth

and Water source development. g. Development of the saltlick with water source in the forest. h. Optical illusion effects /Reflector /holographic reflectors.	Not required  Yes, It will have effect.
H. From which area to which area across the road annual movement is noticed Name of forest blocks/ Rev. Village/ Chainage to be furnished as per the corridor length.	From Changudidei hills (PF) on the left and Jagannathpur PF on the right 6km away across river and agricultural land.
1. Any damage to life and property by wild animals during last 3 years?	Bears have damaged sugar cane, pea nut, water melon, cucumber, crops as well as maimed local villagers all around.
2. Are there Forest fire? Yes /No Reasons Time of fire Month	Yes, this is a rocky exposure of boulders on either side hills (PF) with spa race vegetation, forest fires are rare.
1. Do forest fires occur frequently? Yes /No	No,
When / How	Forest fire during early summer rarely for collection of fire wood, hunting of small animals like hare.
Month of fire	March
a. Accidental	•
b. Natural	•
c. By food gathers	•
d. Podu cultivators	•
e. Hunters/NTFP gatherers	•
f. Tourist and local vandalism	•
g. Lightning effect	•
3. Dependence on forest as a source of lively hood	•
1. Food/Fodder/Fire wood	Yes, Fire wood
MFP/NTFP	•
2. Eco tourism	No
Protection measures suggested	
1. Creation of water holes on site of corridor	There are number of natural water holes.
2. Creation of barriers/Vertical retaining walls on road side	Not required
a. Reflectors mounted on roadside.	Yes
b. Raising of food parks	It will not be effective due to grazing.
c. Road under bridge for free passage with vertical wing walls.	Yes
d. Formation of village committees to prevent hunting and destruction of habitat/forest fire.	Yes
e. Voluntary conservation of rooted wastes to allow forest growth and restocking	Yes

f. Supplement gaps with source of food chain specific plantation of species, which are the source of food for wild life by educating the locals and residents alike on importance of wild life habitat and wild life for socio-economic and aesthetic consideration.	By conservation of natural growth with soil and water conservation measures in the nala and streambeds, creeks, prevention of erosion. Along with approach corridor development at either end of the underpass.
g. Creation of meadows.	Not applicable.
h. A gave planting in staggered manner along with tribulus territories herbal seed sowing to prevent elephant crossing.	Not required
i. Changing over to other crop	Not possible

Name and address of the : P.Narsingh Reddy, Moulabhanja, Po. Digapahandi, Dist-Ganjam  
 C.S. Rajababu, Dherendi, Po. Digapahandi, Dist-Ganjam  
 Sambaru Sabara, Indrabasa Po. Digapahandi, Dist-Ganjam  
 Laxmi Reddy, Moulabhanja, Po. Digapahandi, Dist-Ganjam  
 P.R.K. Patra, shopkeeper, Moulabhanja, Po. Digapahandi, Dist-Ganjam

## Biodiversity Survey of Different Corridors

### Podamari Range

1. A. What are the wild life found in the area	Bear, Jackal, Hyena, Civet, Hare, Snakes, Bull frogs, Toad, Fresh water fish, Turtles, Otters etc.
B. Timing of sighting animal	Night/Late Night occasionally in the evening.
C. Where mostly found crossing of road	Chainage 28km to 31km
D. Season of crossing	Winter/Summer/ Rainy season
E. Reasons of Wild life movement	Mating, Feeding
1. Traditional or Sporadic /Specific	Traditional and Specific
a. Annual migration b. Seasonal Migration	Seasonal
2. Summer movement for food /water.	Movement for mating and feeding
3. Winter movement for crops foraging and feeding or hunting.	Yes
4. Under threat: a. Forest Fire b. Podu Cultivation c. Chased by hunters/ Predators d. Man animal conflict.	Yes No No Yes
5. For Salt lick and water holes.	For water holes.
6. Destruction of habitat / Stone quarry/ Movement of heavy machinery/ destructions of habitat.	Yes, Stone quarry, Destruction of habitat
Development project work/ any other factor	Development of road project work
F. Location of Perennial /Seasonal water source/ Waterholes/Salt licks/ponds/Marsh land e. Name of River/ Nallah / Spring / Pond / Artificial departmental water holes/ salt licks etc. f. Distance from the road.	Ghodahada river, Natural springs, Dug wells in sugar cane fields, Ghodahada irrigation canal.  More than 3km to less than 500mtr
G. What are the preventive measures to be taken to Prevent Wild life crossing the road and to record their causative factors of movement more precisely i. Departmental Community oriented/ signage etc. j. Protection measures like Food	Yes  Development of habitat through protection of natural forest growth

and Water source development. k. Development of the saltlick with water source in the forest. l. Optical illusion effects /Reflector /holographic reflectors.	Not required  Yes, It will have effect.
H. From which area to which area across the road annual movement is noticed Name of forest blocks/ Rev. Village/ Chainage to be furnished as per the corridor length.	From Changudidei hills (PF) on the left and Jagannathpur PF on the right 6km away across river and agricultural land.
1. Any damage to life and property by wild animals during last 3 years?	Bears have damaged sugar cane, pea nut, water melon, cucumber, crops as well as maimed local villagers all around.
2. Are there Forest fire? Yes /No Reasons Time of fire Month	Yes, this is a rocky exposure of boulders on either side hills (PF) with sparse vegetation, forest fires are rare.
1. Do forest fires occur frequently? Yes /No	No,
When / How	Forest fire during early summer rarely for collection of fire wood, hunting of small animals like hare.
Month of fire	March
a. Accidental	•
b. Natural	•
c. By food gatherers	•
d. Podu cultivators	•
e. Hunters/NTFP gatherers	•
f. Tourist and local vandalism	•
g. Lightning effect	•
3. Dependence on forest as a source of livelihood	•
1. Food/Fodder/Fire wood	Yes, Fire wood
MFP/NTFP	•
2. Eco tourism	No
Protection measures suggested	
1. Creation of water holes on site of corridor	There are number of natural water holes.
2. Creation of barriers/Vertical retaining walls on road side	Not required
a. Reflectors mounted on roadside.	Yes
b. Raising of food parks	It will not be effective due to grazing.
c. Road under bridge for free passage with vertical wing walls.	Yes
d. Formation of village committees to prevent hunting and destruction of habitat/forest fire.	Yes
e. Voluntary conservation of rooted wastes to allow forest growth and restocking	Yes

f. Supplement gaps with source of food chain specific plantation of species, which are the source of food for wild life by educating the locals and residents alike on importance of wild life habitat and wild life for socio-economic and aesthetic consideration.	By conservation of natural growth with soil and water conservation measures in the nala and streambeds, creeks, prevention of erosion. Along with approach corridor development at either end of the underpass.
g. Creation of meadows.	Not applicable.
h. A gava planting in staggered manner along with tribulus territories herbal seed sowing to prevent elephant crossing.	Not required
i. Changing over to other crop	Not possible

Name and address of the : Ghanshyam Tripathy, Dengaosta, Po.Dengaosta, Ganjam  
 Rabindranath Patra, Dengaosta, Po.Dengaosta, Ganjam  
 Rarayan Gouda, Kansamari, Po.Podamari, Ganjam  
 N.Balkrushna Reddy, Podamari, Po.Podamari, Ganjam

**List of Biodiversity Structures and Signage as mitigation and management plan.  
Name of the road: SH – 17 (Part), Berhampur to Taptapani 0 to 41km**

Sl. No.	Chainage	Structures	Dimensions	Reference drawings no.	Remarks
1	2.137	Box Culvert with reptile pass viaduct either side and trap drain	1/23/0 – 600mm hume pipe, 1mtr /0.75 /1mtr trap drain 10mtr from the culvert either side. 2.117 to 2.136, 2.144 to 2.164 viaduct at 2.127 and 2.154	Annex.XXV C, OSRP /CEG /SH /Bio /REP-1  ER /BC /S/B/WC /XXVI B-1	Drain & viaduct  Culvert
2	9.780	Box Culvert with reptile pass viaduct either side and trap drain	1/23/0 – 600mm hume pipe, 1mtr /0.75 /1mtr trap drain 10mtr from the culvert either side. Drain at 9.806 to 9.786, 9.814 to 9.834 viaduct at 9.816 and 9.824.	Annex.XXV C, OSRP /CEG /SH /Bio /REP-1  ER /BC /S/B/WC /XXVI B-1	Drain & viaduct  Culvert
3	24.700	Forest check gate with check naka shed and lay bye for parking	Barrier across the road relocated from 24.350km to 24.7km on account of Punjikayan junction, Digapahandi	As will be designed and fixed by the forest department	To check movement of forest and wildlife products
4	27.026	Sloth bear underpass	1 /22 /0 new culvert with high retaining wall and barricade to prevent bear movement over road. Barricade 26.975 to 27.005, 27.031 to 27.061km both side	Annex.XXV C, ER /BC /S/B/WC /XXVI B-1	Culvert
5	36.750	Reptile and small animal underpass	1 /22 /0 Box culvert	ER /BC /S/B/WC /XXVI B-1	Culvert
6	36.900	Forest check gate Podamari	Relocated from 36.800 to 36.900km on account of acquisition of land and building of forest department	As will be required and decided by forest department	For checking movement of forest and wildlife products
7	26.976	Left	Wildlife signage	SP – 36	Traffic signage
8	26.996	Left	Wildlife signage	SP – 37	Traffic signage
9	27.076	Right	Wildlife signage	SP – 36	Traffic signage
10	27.056	Right	Wildlife signage	SP – 37	Traffic signage
11	27.006	Left	Wildlife signage	SP – 47	Traffic signage
12	27.046	Right	Wildlife signage	SP – 47	Traffic signage
13	2.130	Left	Wildlife signage	SP – 49	Traffic

					signage
14	9.780	Left	Wildlife signage	SP – 49	Traffic signage
15	30.700	Left	Wildlife signage	SP – 49	Traffic signage
16	2.150	Right	Wildlife signage	SP – 49	Traffic signage
17	9.820	Right	Wildlife signage	SP – 49	Traffic signage
18	30.740	Right	Wildlife signage	SP – 49	Traffic signage
19	2.120	Left	Wildlife signage	SP – 40	Traffic signage
20	9.790	Left	Wildlife signage	SP – 40	Traffic signage
21	2.160	Right	Wildlife signage	SP – 40	Traffic signage
22	9.830	Right	Wildlife signage	SP – 40	Traffic signage
23	24.550	Left	Forest check gate	SP – 50	Traffic signage
24	36.950	Left	Forest check gate	SP – 50	Traffic signage
25	24.700	Right	Forest check gate	SP – 50	Traffic signage
26	37.000	Right	Forest check gate	SP – 50	Traffic signage
27	24.560	Left	Forest check gate	SP – 51	Traffic signage
28	36.960	Left	Forest check gate	SP – 51	Traffic signage
29	24.690	Right	Forest check gate	SP – 51	Traffic signage
30	36.990	Right	Forest check gate	SP – 51	Traffic signage

---

***FORMATS FOR COMPLIANCE OF DATA  
REQUIRED UNDER FOREST (CONSERVATION)  
ACT 1980***

**Form No. FCA – 1**

SH No. \_\_\_\_\_ Name \_\_\_\_\_ Chainage from \_\_\_\_\_ to \_\_\_\_\_.

Sl. No.	Name of the village	Plot No.		Kisam		Proposed area to be acquired (in ha.)	Village sheet no.	Tahasil	District
		Hal	Sabik	Hal	Sabik				

The Sabik classification of all lands has to be verify as per the position of RoR entry prior to 1980 and those land, which were recorded as forest kisam of any description shall be brought under Sabik forest area going to be acquired in the project.

**Form No. FCA – 2****Abstract of total forest land proposed to be acquired.**

SH No. \_\_\_\_\_ Name \_\_\_\_\_ Chainage from \_\_\_\_\_ to \_\_\_\_\_.

Sl. No.	Name of Tahasil	District	Area under different Kisam of forest land					Total area
			RF	PRF	PF	VF /GJ	JB	

**Form No. FCA – 3**

Difference between Hal and Sabik forest area to be acquired.

Type of data.	Name of Tahasil	District	Area under different Kisam of forest land					Total area
			RF	PRF	PF	VF /GJ	JB	
Hal								
Sabik								

RF – Reserved Forest, PRF – Proposed Reserved Forest, PF – Protected Forest, VF /GJ – Village Forest /Gramya Jungle, JB – Jungle Block, PB – Pathara Bani.

**Form No. FCA – 4****Enumeration of growing stock on forestland to be acquired.**

Table – 1 for Sample enumeration in case of areas more than 5 ha.\*

Name of the forest block \_\_\_\_\_, Range \_\_\_\_\_ Division \_\_\_\_\_ From Chainage \_\_\_\_\_ to \_\_\_\_\_ SH No. \_\_\_\_\_  
Left / Right side of the road.

Sl. No.	Location chainage	Plot size	No. of plants under different category of girth class									Length of clear bole	Condition sound /unsound /others
			Species	30 – U/ 60cm	60 – U/90cm	90 – U/20cm	120 – U/150cm	150 – U/180cm	180 – U/210cm	210 – U/240	240 – and up		

*\*Note –The percentage of enumeration will decide the approximate number of trees per ha. which shall be 1% for a vast stretch of area, 5% for areas up to 10ha. and 10% for areas up to 5ha. and the figures multiplied after taking average of the enumerating results with total area. In case of areas 5ha. and below the total enumeration of trees has to be recorded. Separate enumeration list for separate type of forest land such as reserved forest /Proposed reserved forest /Protected forest /Village forest /Natural forest growth over non forest government land /plantation raised by forest department on any non forest land has to be prepared.*

*Similar exercise for avenue plantations along the corridor has to be made for left and right side of the road separately as per the range /divisional jurisdiction of forest department.*

**Form No. FCA – 5****Species wise abstract of trees to be felled**

Sl. No.	Class I /II /III	Name of the species	Girth Class						Total
			30 – U/ 60cm	60 – U/90cm	90 –U/20cm	120 – U/150cm	150 – U/180cm	180 – U/210cm	

Note – This should be for all types of enumeration carried out over all types of land shown separately as per the enumeration list and appended to the enumeration list.

**Form No. FCA –6**

Estimation of NPV (Net Present Value) of the forest land for the total forest area to be acquired as per the Forest conservation act guideline F.No.5-1/98-FC(PT-II) MOEF Govt. FC division dated 17/18 September 2003@Rs.5.8 lakh to Rs. 9.2 lakh per ha. depending upon the quantity and density of land in question to be converted for non-forest use (as ordered by the Honorable Supreme Court of India)

Sl. No. of the Plot	Kisam of land	Area	No. of plants of enumerated	Density of the crop (per ha.)	Rate of NPV assessed to be applicable	Gross total cost (net present value of the growing stock)

List of Wildlife underpass in the corridor to facilitate movement of wildlife through sequencing of operation in such a manner that, the fauna is not over stressed or starved due to the fragmentation of the corridor.

Sl. No.	Name of corridor	Package No.	Construction activity								
			1 <sup>st</sup> Phase			2 <sup>nd</sup> Phase			3 <sup>rd</sup> Phase		
			Chainage		Structure	Chainage		Structure	Chainage		Structure
			Existing	Proposed		Existing	Proposed		Existing	Proposed	
1	SH – 9 (Part)	1	26.400	26.430	1/22 /0 Box	28.800	28.837	3/33/0 Box	40.95	40.974	1/23/0 Box
			30.050	30.154	3/33/0 triple Box	45.200	45.202	1/23/0 Box	31.600	31.700	1/43/0 Box
			36.005	35.825	3/33/0 Box	-	-	-	-	-	-
2	SH – 53 (Part)	1	13.800	13.507	1Mtr dia Pipe	17.200	17.002	1/22 /0 Box	12.200	11.869	1MT dia single pipe

			21.750	21.024	1/22/0 Box	34.040	34.040	Forest check gate to be shifted to feeder road	23.050	23.390	Unified forest check gate at toll plaza
			-	-	-	-	-	-	40.200	40.242	1/43/0 Box
2	SH-17 (Part)	1	2.140	2.137	1/23/0 Box	9.810	9.786	1/23/0 Box	39.930	39.935	Forest check gate with barrier
			24.600	24.634	Forest check gate with barrier and checking station building	26.850	27.020	1/22/0 Box	-	-	-
3	SH-16	1	18.850		1/34/0 Box	4.100		1/1M Single pipe	22.150		1/34/0 Box
			54.350		1/34/0 Box	65.100	64.900	1/33/0 Box	67.850		1/23/0 Box

*Detail design of box culvert as per MOST specifications as per the Detail design furnished in the plan and profile of bridges and culvert drawings for each corridor. The special provision for wildlife shall be made as per the details of the drawings appended to Biodiversity Action Plan and Drawings of Bridges and Culverts.*

**Monitoring Form No.-1**

Record of site enhancement to develop camouflage corridor on either side of wildlife underpass structure in Phase-I roads. Progress of activity

SH No.	Name of the corridor	Total chainage	Location	Size of the Area planted	Species	Spacing	Total No. of plants	Date of planting	Date of completion

**Monitoring Form No.-2**  
**Progress of cultural operations**

SH No. \_\_\_\_\_, Name, \_\_\_\_\_ Annual maintenance \_\_\_\_\_

Inspected by \_\_\_\_\_ Designation \_\_\_\_\_

Date and time of visit \_\_\_\_\_

**Observations**

1. Survival % on the date of Inspection.....
2. Progress of expenditure.....
3. Progress of activity.....
4. Deviation made if any .....
5. Minimum and maximum height of plants.....
6. Name of the promising species ..... attaining maximum growth.
7. Incidence of pests and diseases.....
8. Control measures taken.....
9. Any damage by wildlife /cattle /human being.....
10. Cause and preventing measures under taken.....
11. Recommendation /suggestion /modification /proposed.....

Signature date and time

**Monitoring Form No.-3**

Relocation of plants below 300mm girth at breast height at embankments, recreation sites, bus stop, water bodies, religious places, burial ground, weekly market, eroded and barren landscape degraded areas.

SH No. \_\_\_\_\_, Name, \_\_\_\_\_ Annual maintenance \_\_\_\_\_

Inspected by \_\_\_\_\_ Designation \_\_\_\_\_

Date and time of visit \_\_\_\_\_

Location of the plantation \_\_\_\_\_

**Observations**

1. Date of planting .....
2. Survival % on the date of Inspection.....
3. Progress of expenditure.....
4. Progress of activity.....
5. Deviation made if any .....
6. Minimum and maximum height of plants.....
7. Name of the promising species .....  
attaining maximum growth.
8. Incidence of pests and diseases.....
9. Control measures taken.....
10. Any damage by wildlife /cattle /human being.....
11. Cause and preventing measures under taken.....
12. Recommendation /suggestion /modification /proposed.....

Signature date and time

**Monitoring Form No.-4**

Plantation in degraded /eroded sides /avenue plantations

**SH No.** \_\_\_\_\_, **Name,** \_\_\_\_\_ **Annual maintenance** \_\_\_\_\_

**Inspected by** \_\_\_\_\_ **Designation** \_\_\_\_\_

**Date and time of visit** \_\_\_\_\_

**Location of the plantation** \_\_\_\_\_

SH No.	Name of the corridor	Total chainage	Location	Size of the Area planted	Species	Spacing	Total No. of plants	Date of planting	Date of completion

**Observations**

1. Survival % on the date of Inspection.....
2. Progress of expenditure.....
3. Progress of activity.....
4. Deviation made if any .....
5. Minimum and maximum height of plants.....
6. Name of the promising species .....  
attaining maximum growth.
7. Incidence of pests and diseases.....
8. Control measures taken.....
9. Any damage by wildlife /cattle /human being.....
10. Cause and preventing measures under taken.....
11. Recommendation /suggestion /modification /proposed.....

Signature date and time

**Monitoring Form No.-5****Study of biodiversity structures during construction**

**SH No. and Name** \_\_\_\_\_ **Total chainage** \_\_\_\_\_ **Reference**  
**biodiversity structure No.** \_\_\_\_\_ **Date and time of inspection** \_\_\_\_\_ **Name**  
**of the inspecting officer** \_\_\_\_\_  
**Name of the executive agency** \_\_\_\_\_

**Observation Details:**

1. Whether location is as per the plan and design.
2. Date of commencement of work.
3. Progress made so far. (date of inspection)
4. Whether works are up to the specification and location specific.
5. Whether any temporary water holes have been erected on either side of the corridor to prevent stress of animals during pre and construction state.
6. Any modifications suggested in the design /location.
7. Recommendation /suggestion for improvement.
8. Probable date of completion.

Signature date and time

### Monitoring Form No.-6

Progress of tree felling along the corridor:

**SH No. and Name** \_\_\_\_\_ **Length** \_\_\_\_\_ **Report for the month ending** \_\_\_\_\_  
**From km** \_\_\_\_\_ **to** \_\_\_\_\_ **Left /Right**

Sl. No.	Chainage	Total no. of tree marked	Total No. of tree felled			Total no. of logs obtained			Volume of logs			No. of firewood stacks			No. of logs passed for removal			Fire wood stacks passed for removal			No. of logs removed		
			P	N	T	P	N	T	P	N	T	P	N	T	P	N	T	P	N	T	P	N	T
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

No. of fire wood stacks removed			Balanced trees to be felled	Balance logs to be removed	Balance fire wood stacks to be removed	Balance no. of trees to be felled	Reasons of non removal of materials
P	N	T					
25	26	27	28	29	30	31	32

Signature of the authority responsible for removal

**Monitoring Form No.-7**

For soil and water conservation measures including check dams, spurs gully plugging and embankment plantation along in the nala and gullies.

**SH No.** \_\_\_\_\_ **Name** \_\_\_\_\_ **Date of inspection** \_\_\_\_\_.

Sl. No.	Location chainage	Left /right	No. of check dams constructed	Type of structure	No. of spurs erected	Type of spur	No. of trees planted	No. of shrubs planted	Date of completion	Present position	% of survival of plants

The report has to be submitted quarterly by the implementing agency to the resident engineer of PIU /Supervision consultant for inspection and recording of his observation in a register maintained in the field for such purposes.

Signature of the authority responsible for execution  
/Inspecting authority

**Monitoring Form No.-8**

Post construction monitoring of wildlife movement

**SH No.** \_\_\_\_\_ **Name** \_\_\_\_\_ **Date of inspection** \_\_\_\_\_.

**Name of the officer recording the observations** \_\_\_\_\_

**Name of the inspection officer supervising the documentation** \_\_\_\_\_

Sl. No. of the structure	Wildlife expected to use the facility	Date completion of the construction	Date on which wildlife was sited near /under the structure	Direction of movement	Time of movement	Probable reasons of movement	Name of the species	Number of animals sighted	Number of animal found avoiding the undermass	Whether camouflage corridor is used	Comments of the inspecting officer

Signature of the Inspecting authority /enumerator

**Monitoring Form No. – 9**

Study of corridor development and alternate cropping to avoid elephant and other wildlife menace near wildlife underpass locations.

**SH No.** \_\_\_\_\_ **Name** \_\_\_\_\_ **For the qr. ending** \_\_\_\_\_

**Biodiversity structure no.** \_\_\_\_\_ **Location chainage** \_\_\_\_\_

**Officer monitoring the effect** \_\_\_\_\_

**Period of study** \_\_\_\_\_ **Designation** \_\_\_\_\_

Species of wildlife	Name of the village	Type of damage	Pattern of crops introduced	Results of damage recorded	Month of damage	Reasons	Suggestion for avoidance	Improvements /obstructions encountered	Local reaction if any

The date and period of collection of above data has to coincide with the season of movement of specific animal and period of previous damage pattern. The improvements suggested after minimum 3 years comprehensive study by motivating all the villagers /land owners to adopt uniform crop pattern, so as to repel the advance of wildlife to their area during the cropping season. The crops which were more susceptible to damage are to be identified out of the alternate crops recommended for introduction as a deterrent.

Signature of the reporting officer  
/search scholar /study group