Environment and Social Management Framework (Main Volume)

Jharkhand Urja Sancharan Nigam Limited

Final Draft Report

September 2017

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FINAL DRAFT REPORT

Jharkhand Urja Sancharan Limited

Environment and Social Management Framework (Main Volume)

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The Government of Jharkhand with active support of the Government of India has planned for implementing 24x7 Power for All in the state. The program is aimed at achieving 24x7 reliable powers for all the households by FY 2019. The PfA roadmap includes interventions in generation, transmission, distribution and energy efficiency and is proposed to be implemented during FY16 to FY19.As part of this initiative Government of Jharkhand through Jharkhand Urja Sancharan Nigam Limited (JUSNL) has planned to develop the transmission infrastructure in the State. This transmission infrastructure development is being funded from different sources e.g. domestic fund, Public Private Partnership (PPP) and multilateral funding. The Jharkhand Urja Sancharan Nigam Limited (the state run power transmission utility company) has approached the World Bank for assistance to fund a part of the transmission infrastructure development/upgradation under the Jharkhand Power System Improvement Project (JPSIP).

The project, Jharkhand Power System Improvement Project or JPSIP, would include:

- Creation of 25 new 132 kV substations, and
- Development of associated 132 KV transmission lines of around 2000 Kms.

These transmission lines and substation have been divided into packages. Since the proposed sub-projects are yet to be conceptualised /designed Project level Environment and Social Impact Assessment (ESIA) are not feasible. An overarching framework has thus been designed to define a mechanism for integrating environmental and social concerns into the planning, designing and implementation of JPSIP. The ESMF has thus not only defined process for planning and implementing the environmental and social safeguards in subprojects but also provided guidance to the planning and designing of transmission lines and substation so as to avoid or minimise project footprint into environmentally and socially sensitive areas e.g. forest, sanctuaries, sacred groves, settlements etc. The framework has further defined the institutional mechanism for implementing the E&S safeguards during the entire lifecycle of the project.

THE REFERENCE FRAMEWORK

The ESMF identifies the national and state level legislation rules and guidelines which would be applicable to JPSIP. It has also identified the World Bank Policies and guidelines which are applicable in JPSIP. The ESMF also goes on to suggest additional efforts which have to be undertaken by JPSIP during the implementation to ensure equivalence between the World Bank Policies and National Legislations. The important electrical, environmental social and labour related legislation and World Bank Policies and guidelines are provided below:

- **World Bank Policies/Guideline:** OP 4.01 Environmental Assessment, OP 4.04 Natural Habitats, OP 04.10 Indigenous People, OP 4.11 Physical Cultural Resource, OP 4.12 Involuntary Resettlement, OP 4.36 Forest, IFC/WB General EHS Guideline, IFC/WB Guidelines for Power Transmission and Distribution.
- **Electricity related Legislation:** Electricity Act 2003, Technical Standards for Construction of Electrical Plants and Electric Lines Regulations, 2010 and Measures relating to Safety and Electric Supply Regulations, 2010.
- **Environmental Legislation:** Environment Protection Act, 1986; Forest Conservation Act, 1980; Jharkhand Timber and Other Forest Produce (Transit and Regulation) Rules, 2004; Wild Life Protection Act, 1972; Ancient Monuments & Archaeological Sites and Remains Act, 1958; Indian Treasure Trove Act, 1878; Jharkhand Ancient Monuments and Archaeological Sites, Remains and Art Treasures Act, 2016; Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; E-Waste (Management) Rules, 2016; Battery (Management & Handling) Rules, 2001; Ozone Depleting Substances (Regulation and Control) Rules, 2000 and Central Ground Water Authority (CGWA) Public Notice dated 4th January 2017
- **Social Legislation:** The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013; The Chota-Nagpur Tenancy Act, 1908; Santhal Parganas Tenancy Act, 1949; Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006
- **Labour Related Legislation:** The Child Labour (Prohibition and Regulation) Act, 1986; Contract Labour (Regulation & Abolition) Act 1970; Minimum Wage Act, 1948; Bonded Labour System (Abolition) Act, 1976; Grievance Redressal Policy under Industrial Disputes Amendment Act, 2010; Employees' Provident Fund and Miscellaneous Provisions Act, 1952; The Payment of Wages Act, 1936, amended in 2005; Workmen's Compensation Act, 1923;Maternity Benefit Act, 1961; Employees State Insurance Act, 1948; Inter-state Migrant Workmen Act 1979 and Intimation of Accidents (Forms and Time of Service of Notice) 2004

COMPENDIUM OF ENVIRONMENTAL AND SOCIAL SENSITIVITIES

A compendium of the bio-physical and social sensitivities in the State of Jharkhand has been compiled to provide an understanding of scale and magnitude of sensitivity/vulnerability of ecological, physical and social environment.

Ecological Sensitivities: The state of Jharkhand has 23,478 km^2 forest area which is 29.45 % of the state's geographical area. Of the total recorded forest area, Reserved Forests constitute 18.58%, Protected Forests 81.28%, and Unclassed Forests 0.14%. The GM Land (Jungle Jhari) are also considered as deemed forest and adds on to the forest cover in Jharkhand. There are 12 Protected Area in the state consisting of 1 National Park (NP) and 11 Wildlife

Sanctuaries (WLS), 1 Elephant Reserve and 1 Tiger Reserve. Eco-sensitive zones have been declared only for Dalma WLS and are in the draft stage for the Palamau Tiger reserve and the Hazaribagh WLS. For the remaining WLS the area of 10 km around the boundary would be considered as Eco-Sensitive Zone as directed by the Hon'ble Supreme Court.

In Jharkhand there are number of elephant corridors which connects the different elephant habitats. The important elephant habitats in the state are located in Belta National Park, Palamu Tiger Reserve in the western districts of Latehar, Gumla and Lohardaga and the Dalma Wildlife Sanctuary including the forests of Saranda, Porhat, Kolhan, Saraikela and Dhalbhum Forest Divisions in the districts of East and West Singh hum and Saraikela – Kharsawan. JPSIP would avoid these areas during the planning phase in order to reduce it ecological foot print. In case it is unavoidable to be align routes through these ecologically sensitive areas special mitigations would be planned.

Resource Vulnerability: Physical resources like water is considered important in JPSIP since water would be required during civil work of transmission line and substation. In the operation phase of substation, water would be required for the residential quarters. The water would primarily be sourced from ground water as most of the rivers are rain-fed. Ground water resources in eight blocks in Jharkhand are already in stress. Ground water resource utilisation in JPSIP needs to be controlled in these areas.

Socio-Economic Sensitivity: The socio-economic baseline conditions show that the Scheduled Tribes constitute 26.2% of the entire population of the state. There are 32 Scheduled Tribes in Jharkhand. In the state, the right of the tribal are also protected by Chota-Nagpur Tenancy Act (CNT), 1908 and Santhal Parganas Tenancy Act (SNT), 1949 in addition to the national legislations. The tribal population have specific cultural and religious heritage e.g., sacred groves; special care needs to be taken to reduce the impacts on the tribal while planning of lines/ substation through these areas.

POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACT AND MITIGATION

The key environmental and social issues associated with installation of transmission lines and substations are discussed. The corresponding preventive and/ or mitigation measures are designed applying the principle of mitigation hierarchy: "Avoid, Minimise, Mitigate and Offset". The potential issues and the mitigation measures are presented in Table below.

Potential Environmental and Social Impact and Mitigation

Potential Impacts	Mitigation Measures
Visual and Aesthetic New tall steel structures may seem out of proportion and not compatible with landscapes especially when located around areas with archaeological monuments or natural landscapes as it would degraded the	Electric transmission lines may be routed to avoid areas having scenic beauty. In avoidable circumstances number of towers may be avoided by using natural topography / sag curve or by camouflaging the towers.

Potential Impacts	Mitigation Measures
view of such areas.	
Soil The impact on soil occurs primarily due to mixing of subsoil with the productive soil during the excavation for tower foundations. The excavation for tower foundation would also aggravate soil erosion especially in districts which are sensitive to gully erosions. The movement of vehicle over the agricultural land to access the construction site would also cause compactions of soil and affect soil fertility.	To prevent impact on soil/land during construction of transmission lines/substation i) excess excavated material from tower footing has to be removed by the contractor before completion of tower construction. ii) The cut and fill slopes would be protected using standard engineering practices including bio-engineering techniques wherever feasible; iii) All internal drainage channels from the substation site would be connected to a peripheral site drainage channel. A sedimentation tank should be provided at the end of the peripheral drainage before the water is discharged to adjoining areas.
Terrestrial Flora Transmission line construction causes disturbance of RoW soils and vegetation due to movement of people and vehicles along the RoW, access roads, and laydown areas. In addition, to facilitate stringing operation and also to maintain the safety distance the trees within the RoW would be felled. The clearance of vegetation can also contribute to the spread of invasive species. Once introduced, invasive species will likely spread and impact appropriate habitat.	Wherever possible, JPSIP would use the existing path/access roads for the movement of man and machinery. Further, i) in areas having good vegetation cover JPSIP would encourage use of extended/ special tower to reduce felling of trees in RoW and thereby reduce impact on trees within the RoW ii) have specific clauses in the contract document to prevent felling of trees during stringing unless it becomes absolutely necessary iii) For any transmission line passing through forest areas (NP, WLS, PF, RF, and Jungle Jhari) construction would be undertaken only after clearance under the Forest Conservation Act 1980 is obtained.
Terrestrials Fauna Large animals such as elephants might get electrocuted due to sagging of powerlines. In case of transmission line cutting across elephant corridor the mandatory ground clearance may be compromised in case of 132 KV line (mandatory ground clearance = 6.1 m. Further), Transmission line through National Park, Wildlife Sanctuaries, Elephant Reserve, Tiger Reserve and wildlife corridor, would cause disturbance to wildlife habitats.	JPSIP would make efforts to prevent intrusion of transmission line into wildlife habitats through optimization of route alignment. Further for transmission passing through elephant habitat/corridor, suitable design modification in the tower e.g. increasing the tower height would be undertaken. Temporary woven wire mesh guards of about 2.4 m high will be put around the excavated areas for tower foundation to prevent small wild animal from falling.
Avian Fauna Likelihood of avian collisions is high especially when transmission lines are located near migratory bird corridors, foraging grounds or nesting and roosting sites. The incidences of electrocution of birds are rare as the distance between the conductors in case 132 KV (1.12m) lines are usually more than the wing span of most of the birds in the state.	To prevent adverse impacts to birds the ESMF suggests that: i) The transmission lines would avoid such areas with known avian populations e.g. nesting grounds, foraging grounds, migration corridors; ii) provide bird guards and markers in transmission lines as per the specification provided in IS-5613 (Part-II) to prevent electrocution of birds.
Emission and Discharges (During Construction) The emission and discharges during the construction are likely from the solid and liquid waste generated form construction camps, laydown areas and fly camps. The construction machinery in case of substation and winching machinery are the only potential source of noise. They produce more	To prevent adverse impacts following mitigations measures are suggested i) Septic tanks and soak pits/modular bio-toilets would be provided at all construction camp lay down area and fly camp; ii) to prevent air pollution the vehicle carrying construction material and machinery would move along the existing access road; iii) to prevent excessive noise during stringing of transmission line, the

Potential Impacts	Mitigation Measures
than 70 dBA. The impact on air quality will be only limited to construction period and will be limited to location near the construction site of substation.	winching machine would be kept at least at a distance of 500 m away from the nearest habitation.; iv) regular maintenance of the machinery used in substation construction should be carried out to prevent excessive noise.
Emission & Discharge (During Operation) The used transformer oil is categorized as hazardous wastes. The Poly chloro-biphenyl in the transformer oil has good dielectric property but bio-accumulates in the food chain and is not at all biodegradable. Similarly, electrical and electronic equipment (EEE) have hazardous / toxics substances in the components which may cause harm/pose risk to health and environment during handling. The SF6 gas used in circuit breakers is a highly potential Green House Gas (GHG).	To prevent these harmful impacts: i)the procurement contract for transformer oil in JPSIP would have specification that the oil should contain PCB less 2 mg/kg; ii) used transformer oil would be disposed in accordance to the Hazardous Rules, 2016. JUSNL would also obtain necessary authorisation from JSPCB; iii) strict and well defined procedure would be put in place for storage, handling and refilling of SF6 gas cylinders.
Ground Water Resources Construction of substation would require water for concreting, curing as well as for domestic purpose. There are 8 blocks in Jharkhand are either over-exploited or semi-critical or critical. For operation phase the water would be required only for domestic purpose. The water for construction and operations would be primarily sourced from groundwater.	To prevent misuse of ground water the following mitigations have been proposed; i) ground water abstraction permission would be obtained from CGWA for all bore wells; ii) ground water usage for construction work would be reduced by adopting practices e.g., use buckets to wash tools instead of using running water, use of auto shut off taps in labour accommodation etc.
Community Health and Safety During the construction of the foundation for the tower footing the excavation can pose potential safety concerns for the inhabitants in the locality. This would be more relevant when the construction is carried out near a settlement or along a foot track or existing village road.	During the construction period the entire construction areas shall be barricaded. To facilitate easy identification of these areas during the night, reflective tapes would be placed on the boundary so that the people can be easily warned.
Standing Crop The construction of the transmission tower foundation, erection of towers and stringing of transmission lines involve movement of men, machinery and equipment across agricultural fields leading to the tower locations, thereby causing potential damage to the standing crops in adjacent agricultural plots due to movement of the vehicle and equipment and construction workers.	Mitigation measures to reduce impact on loss of standing crop: i) Constructions to be undertaken during the lean agricultural season after the harvest are over; ii) use of village roads and earth bunds between agricultural plots for movement of equipment and workers; iii) when damage to standing crops cannot be avoided, the farmer will be compensated based on the entitlements as mentioned in the Resettlement Framework.
Restriction on Land use It is estimated that more than 6000 towers would be constructed under the project. In addition, JPSIP would also require a right of way for transmission line. This would lead to an adverse impact on the value of land parcels due to physical obstruction to use of land falling under the tower footprint.	Following measures would be adopted: i) the payment of compensation for the damages would be made transparent.; ii) if required a negotiated settlement may be carried out by the district level committee setup for JPSIP with the landowner to compensate for damages during the project construction. The District level Committee would be chaired by the Deputy Commissioner and have Chief Engineer of the respective circle and Deputy District Commissioner as members.
Loss of Land Land requirements for each substation (new 25 new substations) would vary from 8-	Measures to mitigate loss of land are as follows; i) JPSIP would endeavour to use non-forest government land and avoid any irrigated

Potential Impacts	Mitigation Measures
12acres depending on the capacity of the substation and other technical considerations. Effort will be given to procure government land for substation. However, there may be some cases where private will be procured. This may result in loss of livelihood of land owner.	agricultural land; ii) where procuring private land cannot be avoided and it is done through a negotiated settlement /land acquisition process., The land owner will be duly compensated as per the provisions mentioned in the Entitlement Matrix in the Resettlement Framework (RF). In case of procurement of land through negotiated settlement, JPSIP shall ensure that compensation/rate for land is not less than the market value of land. Details of the process are presented in the Resettlement Framework. The price of land would not be less that the price of land calculated by the RFCTLARRA, 2013. The affected persons will also be compensated for the loss of income and common property resources.
Common Property Resources During construction phase due to the movement of the construction related vehicle and machinery common property resource e.g., road, culvert etc may be damaged.	Where ever required in JPSIP before using village road, minor improvement would be carried out. In case of damage to the road or culvert or any common utilities during the construction activities it would be the responsibility of the contractor to repair the same.
Interference with utilities and traffic and blockage of access way During the stringing operations when the transmission line crosses any road/ railways line, hindrance may be caused to the movement of traffic. In some instances temporary closure of the road/railway line may be required to facilitate stringing activities.	Stringing at the construction stage would be carried out during lean traffic period in consultation with the District Administration and local office of the utilities and angle towers would be planned during the design phase to facilitate execution of work.
Tribal Communities and Their Cultural Properties Sacred Groves are of great cultural importance to the tribal population. These groves may potentially get impacts during the stringing operation from one transmission tower to another.	Once tribal populations affected by a subproject are identified a Tribal Development Plan would be prepared and implemented by JPSIP to ensure that affected tribal population are provided with special assistance, receive adequate protection against project adverse impacts on their culture identities etc.
Chance find of archaeological artefacts, treasure etc. during excavation For developing the foundation of the towers 2-3 m deep excavations have to be carried out. During such excavation there may be a possibility of 'chance finds' of any archaeological artefacts, treasure etc.	Possibilities of such phenomenon in transmission project are quite remote. However, in case of such findings, JPSIP would follow the procedure as laid down in the Section 4 of Indian Treasure Trove Act, 1878 as amended in 1949. The Contractor shall also be liable to follow provisions of this Act.
Women Work Participation and Decision Making The average female work participation in all the blocks is 41.20 percent (which is higher than the national rate of 25.6 percent). However, work participation of female workers in power sector, especially transmission line projects are considerably less.	Women involvement will be ensured through formal and informal group consultations so that their participation is ensured during implementation of the project. For women labour employed at construction site, separate arrangement like toilet facility, rest area etc. would be made for them. Also there will not be any discrimination for men and women worker. A Gender Action Plan has also been prepared for JPSIP to integrate these issues into planning and implementation

E&S SAFEGUARDS IMPLEMENTATION PROCESS

To ensure that the E&S safeguards are integrated in the process of JUSNL the ESMF has proposed mechanism to be implemented during the different stages of the project namely:

- Project Conceptualisation
- Project Planning
- Detailed Design and Tendering
- Project Implementation
- Project Operation and Maintenance

The specific actions during each of these project stages are presented in the sections below.

E&S Safeguards in the JUSNL Process

Project Conceptualisation

During the Project Conceptualisation stage when the route alignment are being identified it is proposed that three alternatives including the BEE line would be developed. The alternative would be analysed for environmental and social sensitives including presence of Protected Areas, ESZ, Notified sacred groves and major habitation. Presence of any of these would be communicated to the Technical consultant for developing alternatives to exclude the same. These environmental and social inputs along with the techno-commercial inputs would be used for developing the final alignment.

Project Planning

The second level screening of the two stage screening process (first part of the screening process would be carried as part of the Screening of Alternatives during the Project Conceptualisation) would be carried out for the final alignment .In consultation with the Technical Consultant efforts would be made to avoid forest (including *Jungle Jhari*), sacred groves, religious and cultural areas, elephant corridors etc through realignment and/or alternative design.

Subsequently, an Initial Environmental and Social Assessment (IESA) of the selected site/ transmission line would be carried out to ascertain whether specialised studies (e.g., Resettlement Plan, Biodiversity Assessment, and Tribal Development Plan) have to be conducted. The scope of the ESIA studies would also be defined through the IESA. Considering the scope of studies (defined through the IESA) for each substation/transmission line, baseline information would be collected from surveys, field studies and secondary sources. The baseline information would be used for the development of the project specific ESIA and site specific ESMP.

During the detailed surveys stage if forest land (including GM Forest land) is unavoidable either for the substation or for the tower footing, the process of forest clearance as per the provisions of the Forest Conservation Act 1980 would be initiated

Detailed Designing and Tendering

For the purpose of tendering the subproject specific ESMP (including the ecological management plan if required) would be part of the contract document for the Contractor. Similarly for the implementation of the Resettlement Plan, Tribal Development Plan an Involuntary Resettlement Implementing Agency would be selected through tendering process.

Project Implementation

The construction phase would begin with the check survey being carried out by the contractor. During this survey the Contractor would confirm the exact location of the tower footing and also identify the ownership of the land with the help of the Circle Office of the Revenue Department. Simultaneously consultations would be held with the land owner to understand his willingness to take part in the process of negotiations for damages in lieu of uptake of land.

The land for the tower footing would be primarily procured through a process of negotiated settlement but JUSNL would also be free to acquire this land under the provisions of RFCTLARRA 2013. The negotiation for uptake of land would be carried out by the District level Committees under the Chairmanship of the Deputy Commissioner. The Deputy District Commissioner (Land Revenue), GM cum Chief Engineer of the respective circle and the Circle officers of the affected areas would also be members of the committee. Two rounds of negotiations would be held with the affected persons and if an amicable settlement is not reached the case would be referred to the Divisional Commissioner for adjudications. The Divisional Commissioner after hearing all the parties i.e. land owners and JUSNL may suggest on a top up price after consultation with JUSNL. A Letter of Consent would be obtained by JUSNL from the landowner after successful completion of the negotiations. The Implementing Agency would carry out a socio-economic survey to assess profile and vulnerability (if any) of the affected population. An independent party would also be hired by JPSIP to document the negotiation and settlement processes. The IR Implementing Agency would also be responsible for implementing the Resettlement Action Plan and the Tribal Development Plan. The site specific ESMP would also be implemented by the Contractor.

The Contractor would be responsible for carrying out regular reporting of ESMP implementation to Division/Circle Office of JUSNL while the IR Implementing Agency would report the progress of implementation of Resettlement Action Plan and Tribal Development Plan to the Division/Circle Office of JUSNL. In turn, the Circle/ Division Office of JUSNL would report the same to the JPSIP PIU.

Project Operation

JPSIP PIU through the Division/Circle offices will continuously monitor implementation of environment and social safeguards of transmission lines

and substations including encumbrance on the RoW, disposal of used transformer oil, e-waste etc.

Grievance Redress Mechanism

A three tier Grievance Redress Mechanism is being proposed by JPSIP. The system would be used by the stakeholders including affected/displaced persons to flag-off any concerns/grievance/disputes in the project and seek redressal of the same thereby ensuring effective participation. Three tier Grievance Redress Mechanism has been proposed for JPSIP i.e. Circle, Zone and Head Quarter level. If the grievance/ complaint is not resolved at GRC Level or the complainant is not satisfied with the solution provided by GRC, the affected person may approach the Court of Law.

Consultation and Disclosure:

Through the process of consultation and disclosures, JPSIP would envisage to build participation of stakeholders' at each stage of project planning and implementation. A consultation framework has been drawn up by in JPSIP to ensure that effective participation by stakeholder and integration of the feedback received from stakeholder into the project plans where it deems fit.

Information Disclosure

JPSIP would also provide citizen-centric information on the policies and the details of subprojects along with its implementation process in accordance to the provision of the Right to Information Act 2005 and World Bank Policies on Information Disclosure. An Information Disclosure Plan has also been Prepared as part of the ESMF.

IMPLEMENTATION ARRANGEMENTS

The organisational structure for E&S safeguards implementation at JPSIP including the mechanism for monitoring, supervision and reporting of the E&S safeguards implementation is described in the subsequent sections.

Institutional Arrangement

For effective implementation of the different activities specified in these three process mentioned above and also implementing the provisions in the ESMP, SIA and RAP it is proposed that the Project Implementation Unit of JPSIP (PIU- JPSIP) would be adequately equipped. Presently the PIU-JPSIP is housed at the JUSNL headquarters in Ranchi and includes the following personnel:

- Chief Engineer (Transmission; O&M)
- Superintending Engineer
- Executive Engineer
- Junior Engineer

To specifically address the environmental and social concerns in the project it is proposed that an Environmental Officer and Social Officer should also be

included in the PIU JPSIP. Further, to handle forest related issues an officer of the rank of the Divisional Forest Office (DFO) should also be deputed in the project for the purpose of coordination.

In addition during the implementation of JPSIP since the Junior Engineer of the respective section would be responsible for the supervision of implementation of the subproject it proposed that he should also be trained on E&S Aspects. The Contractor would also play a crucial role in case of negotiated settlement; he would carry out the first level of consultation to understand the willingness of the landowner to be involved in the negotiated settlement process. It is thus proposed that the Contractor's team should also have a Social Officer so that the consultation process can be handled sensibly. In addition to the above it is proposed that an Involuntary Resettlement (IR) Implementing Agency would be appointed by JPSIP to assist them with the implementation of the Resettlement Action Plan and Tribal People Plan

Training

Considering the present capacities of JUSNL a training plan has been drawn up for the JUSNL personnel involve in the project implementation. The training will focus on the environmental and social issues associated with the transmission sector in general and JPSIP in particular. A training plan has been drawn for JPSIP which would include:

- **Sensitisation Training:** A half day training to the JUSNL Senior Management and JPSIP PIU including divisional offices(SE/EE) on WB Policies, ESMF Requirements and coordination with other department
- **ESMF Implementation Training:** A series of five one-day training in each zone to all JPSIP Professionals and JUSNL Divisional Offices and the team involved in Project Implementation on Reference Framework for ESMF, implementation of the Environmental and Social Mitigation Measures and Grievance Mechanism
- **Project Implementation:** One refresher training each year to discuss on the observation from last year's monitoring report. The participant would be selected based on the E&S performance of the projects being executed by the division.

Monitoring and Reporting

The JPSIP PIU through the respective Division/ Circle Offices would monitor the implementation of the environmental and social safeguards in all the subprojects to ensure conformity to the requirements of the ESMF. The reporting would be carried out subproject wise every month by the respective contractors. These reports would be collated into Monthly Progress Reports (MPR) and would be submitted by the Division/Circle Offices of JUSNL implementing the subproject to the JPSIP PIU. The Environmental Officer and Social Officer of the JPSIP PIU would also visit the site regularly for the purpose of monitoring and supervision.

The JPSIP PIU would review these monthly reports and identify technical, managerial or regulatory and safe guard issues with regards to the compliance of the ESMF provisions. The identified technical, managerial or regulatory related issues will be duly assessed by the PIU and a corrective action plan developed. These interventions would be conveyed to the JUSNL Management through a Quarterly report for approval and subsequently implemented by JPSIP PIU. The PIU would also prepare a Half-yearly internal monitoring report and present it to the JUSNL Board for approval and subsequently report to the World Bank.

Evaluation

In addition to the internal monitoring an external evaluation of the ESMF would be carried out by an independent agency. The external evaluation will be undertaken semi-annually during the implementation of the project and at the end of the implementation. The External Evaluation Report would evaluate the process of E&S Implementations e.g. Land Procurement/Acquisition, Forest Clearance, ESMP Implementation, Resettlement Plan, Tribal Development Plan Implementation. This would this help the JPSIP PIU to identify areas where the E&S Implementation needs to be strengthened.

1 PROJECT OVERVIEW

The Government of Jharkhand with active support from Government of India's has planned for implementing 24X7 Power for All (PfA)(1) in the state. The program is aimed at achieving 24x7 reliable powers for all the households by FY 2019. The PfA roadmap includes interventions in generation, transmission, distribution, renewable energy and energy efficiency and is proposed to be implemented during FY16 to FY19.As part of this initiative Government of Jharkhand through Jharkhand Urja Sancharan Nigam Limited (JUSNL) has planned to develop the transmission infrastructure in the State. This transmission infrastructure development is being funded from different sources e.g. domestic fund, Public Private Partnership (PPP) and multilateral funding. The Jharkhand Urja Sancharan Nigam Limited (the state run power transmission utility company) has approached the World Bank for assistance to fund a part of the transmission infrastructure development/upgradation under the Jharkhand Power System Improvement Project (JPSIP).

1.1 POWER TRANSMISSION IN SCENARIO IN JHARKHAND

The State of Jharkhand has quite a different scenario compared to the remaining states on India. Even though it is located in the energy rich eastern region of the country, the demand supply gap in the state is higher than that of the national average.

The supply of power in Jharkhand is undertaken by five distribution licensees namely Damodar Valley Corporation (DVC) in the DVC Command Area, Jamshedpur Utilities and Services Company Limited (JUSCO), Tata Steel Limited (TSL), Steel Authority of India Limited (SAIL) in the respective industrial areas under their jurisdictions. The remaining area of the state is catered by state distribution licensee Jharkhand Vidyut Bitaran Nigam Limited (JVBNL). All utilities in the State, except JVBNL, are largely able to meet their peak requirement. The State distribution licensee, JVBNL, has faced peak deficit of nearly 310 MW during FY15. A review of the power supply position in JVBNL area, over the last five years shows that there has been a shortfall in both peak and energy terms, over the past five years at the tune of 13.8 -16.4 percent.

The demand for power in JVBNL area has grown gradually at 4.3 percent year on year (YoY) over the last few years and stands at 2,120 MW during FY15. The power supply has not been able to keep pace with the demand, with peak deficit remaining consistently in the range of 14 to 16 percent. This deficit may not only be attributable to irregular load requirement but also due to non-reliable generation sources and the T&D network constraints in the State.

(1) 24x7 - Power for All (24x7 PFA) is a Joint Initiative of Government of India (GoI) and the respective State Governments with the objective to provide 24x7 power available to all households, industry, commercial businesses, public needs, any other electricity consuming e

Notably, in Sahibganj, Garhwa and Ranchi area the deficit is majorly on account of transmission constraints.

The State Transmission Utility, JUSNL presently has 4,930 MVA substation capacities at 220kV and 132kV with 36 numbers of GSS and 3,392 ckm of transmission lines. The intrastate transfer of power within the state of Jharkhand is being done by JUSNL or DVC, while the inter-state transfer is largely done by the Inter State Transmission system (ISTS) of Eastern Regional Grid and to some extent by DVC. The intra-state transmission is adequate for meeting the existing demand of the distribution utilities in the State and operates at an annual average availability of 98% and at a technical loss of approximately 5%.As the power demand is projected to increase more than two folds in the coming year fuelled by the dual forces of urbanisation and industrial growth, significant investments are required in the intra-state transmission systems in Jharkhand.

1.2 THE BACKGROUND OF THE PROJECT

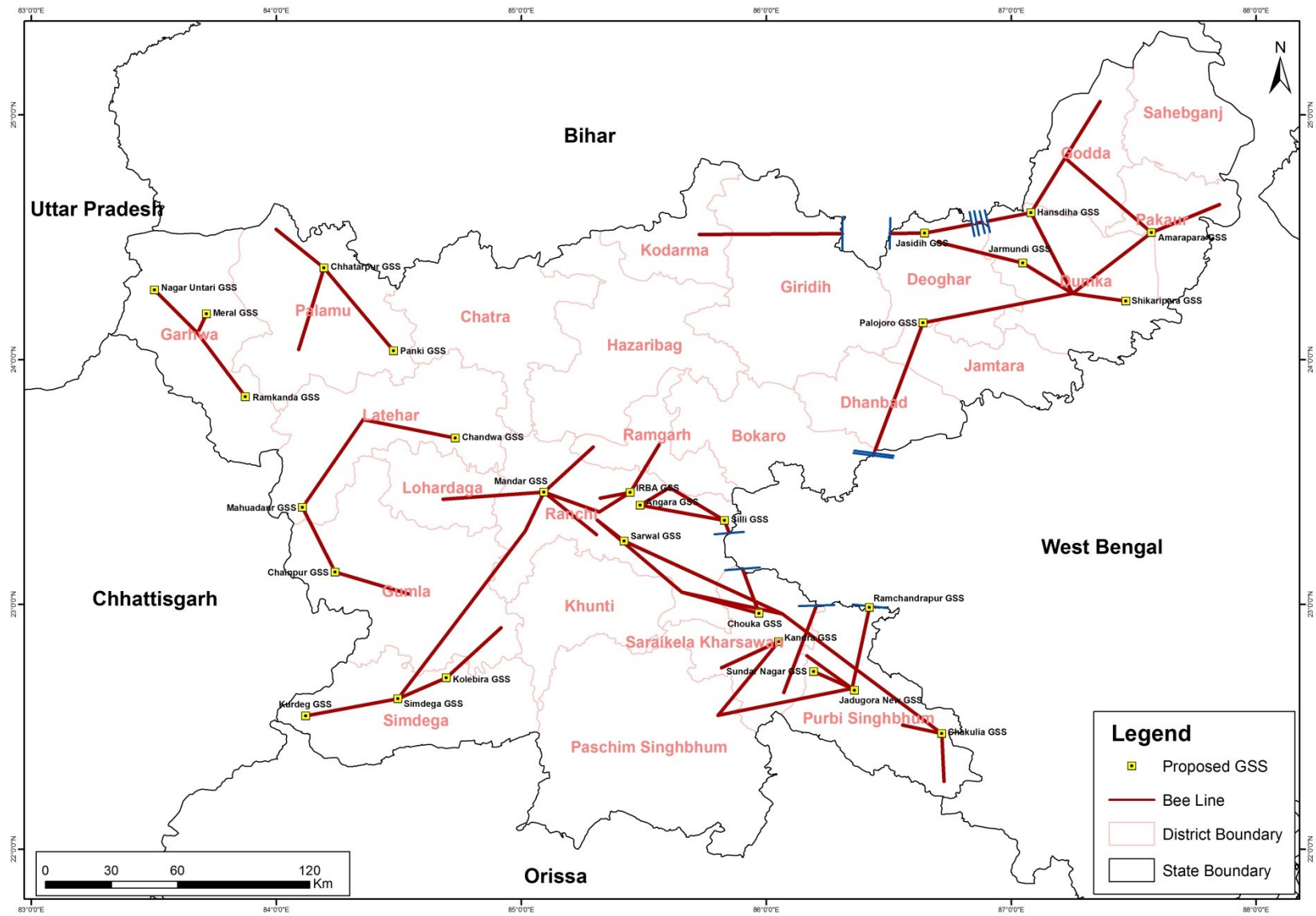
To meet Power for All (PFA) target and improve quality power supply to Industrial & Domestic users in Jharkhand by 2018-19, JUSNL, has taken up massive plan for augmenting the transmission infrastructure in the State. For this, new substations (including GSS) and intra-state transmission lines have been planned. At present JUSNL has a scheme ongoing for development of 3315 cKm of transmission lines and transformational capacity of 5160 MVA through development of 16 nos. of substation either through domestic funding or PPP Model. In addition, it plans for developing transformation capacity of 4270 MVA (30 nos. of substation) and 4180 ckms of transmission line in FY 2017-18, 18-19, 19-20. For strengthening and augmenting a part of the power transmission network in the state, Government of Jharkhand (GoJ), through Department of Economic Affairs, Government of India (GoI), has requested the World Bank for financial and technical assistance under the Jharkhand Power System Improvement Project (JPSIP).The project, Jharkhand Power System Improvement Project or JPSIP, would include:

- Creation of 25 new 132 kV substations, and
- Development of associated transmission lines of around 2000 Kms.

1.3 DESCRIPTION OF PROPOSED PROJECTS IN JPSIP

The approximately 2000 km of transmission lines have been divided into packages covering most of the areas of the state except for the DVC command arears. Each package would contain one or more transmission lines and substation or subprojects. The 25 numbers of substations which are being considered are all new and thus land would be required for each of them. A schematic of the new transmission line which would be developed are presented in Figure 1.1 and the details of the lines and substations are provided in ***Annexure 1***.

Figure 1.1 Schematic of the New Transmission line



1.4 OBJECTIVE FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

The ESMF would define a mechanism for integrating environmental and social concerns into the implementation of JPSIP. The ESMF would thus not only define process for planning and implementing the environmental and social safeguards in subprojects but also provide guidance to the planning and designing of transmission lines and substation so as to avoid or minimise project footprint into environmentally and socially sensitive areas e.g. forest, sanctuaries, sacred groves, settlements etc.

As a project planning level guidance the ESMF would propose a two stage screening framework to identify environmental and social sensitivities during alignment identification and substation site selection. To facilitate this process tools e.g. analysis of alternative alignment for transmission lines and the sites for substation; would be designed in the ESMF which would provide inputs into environmentally and socially sustainable design. Simultaneously as part of the processes for the implementation of environmental and social safeguards the ESMF would also provide the triggers for conducting subproject specific environmental and social assessment and specialised studies e.g. Resettlement Plan, Tribal Development Plan and Biodiversity Studies. It also defines the reference framework for JPSIP by identifying the provisions of the national and state level legislations, guidelines and the OP's of the World Bank which have to be complied with during the lifecycle of JPSIP.

1.5 SCOPE OF THE ENVIRONMENTAL AND SOCIAL SAFEGUARDS FRAMEWORK

Since the details of the subprojects are not yet known carrying out subproject specific EA and SA is not be possible at the inception of JPSIP. The ESMF would provide guidance for assessing sub project specific E&S Impacts and also provide triggers for specialised studies e.g. RAP, TDP and Biodiversity Assessment to be conducted when the subprojects have been designed. The framework would further define the institutional mechanism for implementing the E&S safeguards during the entire duration of the project.

The Environmental and Social Management Framework for the interventions in JPSIP would include process for:

i) Identification of the environment and social sensitivities in the project influence areas so that these sensitive areas can be avoided during the planning and designing of the subprojects;

ii) Development of a reference framework for JPSIP covering the national and state level environmental and social legislations and the World Bank's safeguard policies. The gaps in the existing legal system and the World Bank Policy framework would also be identified to develop additional processes which would be implemented during the planning, designing, construction

and implementation of the interventions in JPSIP. This would ensure that the project also attains compliance to World Bank norms;

iii) Identification of potential environmental issues and social impacts which are likely during the implementation of the interventions planned in JPSIP. The framework would further provide for the mechanism for detailed analysis and assessment of the environmental and social issues on the natural and social environment during the planning and designing stages of the subproject. The framework would also provide generic mitigation measures which would be further customised for defining subproject specific management plans during the design phase of the subproject. Special emphasis would be given to understand the impacts on tribal people and developed measures to reduce the same;

iv) develop a mechanism for participation and consultation with the stakeholder in general and the project affected persons in particular during the entire lifecycle of JPSIP;

v) Develop a mechanism for Redressal of Grievances of all the stakeholders associated with JPSIP;

vii) Suggest an institutional arrangements and capacity building mechanism for JUSNL for successful implementation of the ESMF in JPSIP.

2 THE POLICY & REGULATORY FRAMEWORK

This section highlights the environmental and social policies and regulations, World Bank guidelines applicable to the Project i.e. JPSIP. The regulatory framework focuses on:

- Applicable national and state level environmental and social regulations for the project;
- Institutional Framework for the implementation of the regulations;
- International Standards and Conventions; and
- Applicable Environmental and Social Guidelines

2.1 REVIEW OF POLICIES, LEGISLATIONS AND GUIDELINES

The legislations and policies which have been identified for JPSIP are presented in ***Figure 2.1***. A review of the policies, national and state level legislation and guidelines are presented in ***Annexure 2***.

Based on the review of the applicable legislations a comparative analysis has been carried out with the World Bank Policies to understand any gaps between existing regulation World Bank Policies and develop suitable changes in the existing practice to address these gaps. The ***Annexure 3*** shows the equivalence between the country level regulations and the World Bank Policies.

Figure 2.1 Policies and National and State level Legislations which would be applicable to JPSIP

World Bank Policies/ Guideline	Electricity related Legislation	Environmental Legislation	Social Legislation	Labour Related Legislation
OP 4.01 Environmental Assessment	Electricity Act 2003	Environmental Protection Act 1986	LARR, 2013	The Child Labour (Prohibition and Regulation) Act, 1986
OP 4.04 Natural Habitats	Technical Standards for Construction of Electrical Plants and Electric Lines Regulation, 2010	Forest Conservation Act 1980	The Chotanagpur Tenancy Act, 1908	Contract Labour (Regulation & Abolition) Act 1970
OP 4.10 Indigenous People	Measures relating to safety and Electrical Supply Regulation 2010	Wild Life Protection Act 1972	Santhal Pargana Tenancy Act 1949	Minimum Wage Act 1948
OP 4.11 Physical Culture Resources		Hazardous and Other Wastes (Management and Transboundary Movement Rule ,2016)	Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006	Bonded Labour System (Abolition) Act, 1976
OP4.12 Involuntary Resettlement		E-waste (Management) Rules, 2016		Grievance Redressal Policy Under Industrial Disputes Amendment Act 1976
OP 4.36 Forests		Battery (Management & handling) Rules 2001		The Payment of Wages Act 1936 amended in 2005
IFC/WB General EHS Guideline		Ozone Depleting Substances (Regulation and Control) Rules, 2000		Compensation Act, 1923
IFC/WB Guidelines for Power Transmission and Distribution		Ancient Monuments & Archaeological Sites and Remain Act, 2010		Maternity Benefit Act, 1961
		Indian Treasure Trove Act 1878		Employees State Migrant Workmen Act, 1979
		Jharkhand Ancient Monuments and Archaeological Sites, Remain and Art Treasures Act 2016		Intimation of Accident (Forms and Time of Service of Notice) Rules, 2004

2.2 *APPLICABLE POLICY AND LEGISLATION FOR JPSIP PROJECTS*

As described in the sections above the JPSIP project envisages the following activities

i) development of new transmission lines;
ii) development of the new substations and;
iii) operation and maintenance of lines and substations.

Considering the project intervention an attempt has been made to map the policies and regulations which are applicable. The applicability of the regulation for different project activities is presented in ***Table 2.1***

Table 2.1 The Reference Framework for JPSIP and its Applicability in the Project

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
World Bank Operational Policies				
OP 4.01 Environmental Assessment	✓	✓	✓	The Bank requires environmental assessment (EA) of projects under Bank financing to help ensure that they are environmentally sound and sustainable. EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and transboundary and global environmental aspects. *For each of the subprojects (substation and transmission lines) an EA and SA would be carried out covering all the phases of the project*
OP 4.04 Natural Habitats	✓	✓	✓	This policy provides for the conservation of natural habitats, which is essential for long-term sustainable development. The Bank supports the protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. *Efforts would be made in this project to avoid such natural habitats through careful planning. However, if unavoidable for subprojects in natural habitats a separate Biodiversity Assessment would be carried out and management plan would be developed*
OP 4.10 Indigenous Peoples	✓	✓	x	This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. The Bank provides project financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
				Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and inter generationally inclusive. The project shall ascertain broad community support for the project based on social assessment and free prior and informed consultation with the affected Tribal community, if any. *For subprojects in JPSIP which are likely to have impact on the tribal community a Tribal Development Plan would be developed and implemented.*
BP 4.11 Physical Cultural Resources	✓	✓	x	This policy requires Bank financing projects to assess impacts on physical cultural resources at the earliest possible stage of the project planning cycle. Environmental assessment involves the preparation of a physical cultural resources management plan that includes (a) measures to avoid or mitigate any adverse impacts on physical cultural resources; (b) provisions for managing chance finds; (c) any necessary measures for strengthening institutional capacity for the management of physical cultural resources; and (d) a monitoring system to track the progress of these activities. *The EA carried out for the subproject would also identify the physical cultural resource in the project areas and would develop safeguards to prevent any adverse impacts on the same.*
OP 4.12 Involuntary Resettlement	✓	✓	x	This policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by the involuntary taking of land. To avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. *For subprojects in JPSIP involving involuntary*

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
				resettlement a separate Resettlement Action Plan would be developed and implemented before construction of the project.
OP 4.36 Forests	✓	✓	x	This policy contributes to Bank's mission of poverty reduction and sustainable development through management, conservation and sustainable development of forest ecosystems and their associated resources. *Through a process of screening efforts would be made to avoid intrusion of the subprojects in the forest areas. However, if unavoidable specific measures would be made in the ESMP and the Bidding document to prohibit any activity which can be in contravention to the Bank policies on Forests.*
IFC/WB General EHS Guidelines	✓	✓	✓	During the construction, operation and eventual decommissioning of the site, this guideline will need to be followed. *These recommendations of these guidelines would be used to develop the conditions in the Environmental and Social Management Plan for the subproject. The ESMP would be made part of the contract document.*
IFC/WB Guidelines for Power Transmission and Distribution	✓	✓	✓	This guideline provides information relevant to power transmission between a generation facility and substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas. *JPSIP would include the provisions of safety and other aspects (IFC/WB Guidelines) in the ESMP.*
National and State Regulation				

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
Electricity Act 2003 and Indian Telegraph Act 1885	✓	✓	✓	• As per the Electricity Act, JPSIP requires to pay full compensation to be paid for any damage, detriment or inconvenience caused by him or by anyone employed by him; • The Electricity Act requires reasonable compensation to be paid to the owner, in case of any existing trees/structures/ objects which have to be removed from the RoW. • The Electricity Act and Telegraph Act define the compensation payable for damages to crops/ trees and structures. *JPSIP would ensure that all individuals adversely affected by the project are duly compensated as per the provisions of this act.*
Environment Protection Act, 1986 and as amended	✓	✓	✓	Discharge/ emission standards have been laid down by CPCB under EP Act, 1986 for different type of source (e.g., DG sets). *JPSIP would ensure that all these standards are compiled during the planning, construction and operation of the project. The ESMP would develop activity specific guidance which would be carried out during the project implementation to ensure compliance with the standards specified under the legislations.*
Technical Standards for Construction of Electrical Plants and Electric Lines Regulations, 2010; Measures relating to Safety and Electric Supply Regulations, 2010	✓	✓	✓	The Central Electricity Authority has also formulated regulations for safety of transmission lines. JUSNL would abide by provisions of these Regulation to ensure safety of human as well as wildlife. *All the activities which would be planned or undertaken in the project would comply with these standards.*
Forest Conservation Act, 1980 Jharkhand Timber and Other Forest Produce (Transit and Regulation) Rules, 2004 as amended	✓	✓	x	When any transmission line traverses through forest land, prior clearance will be required from Ministry of Environment and Forests (MoEFCC), GoI under the Forest (Conservation) Act, 1980. *For subprojects passing though /in forest including Jungle Jhari land necessary clearances would be obtained by the project. All the activities would be carried out in compliance to the provisions suggested in the clearance.*

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
				For felling of trees (such as Sal, Sagwan, Karam, Asan, Khair, Rosewood, Salai etc.) permission need to be obtained from DFO or authorized ACF. Also, Gram Sabha will give certificate of ownership of trees on private land. *Tree felling permission would be obtained in accordance to the provisions suggested in the said Rule.*
Wild Life Protection Act, 1972, as amended	✓	x	x	Transmission projects involving diversion of land within any notified ecologically sensitive areas viz. National Parks, Wild Life Sanctuaries etc. will require permission of Standing Committee of National Board of Wild Life (NBWL) as per the W.P and associated Court rulings. *Efforts would be made to avoid any activity in National Parks, Wild Life Sanctuaries etc. However if unavoidable, JPSIP would obtain wildlife clearance as stated above for activities in the National Parks, Wild Life Sanctuaries etc. The conditions proposed in the clearance would also be followed during project implementation stage.*
Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006	✓	✓	x	The applicability of the act linked with forest clearance process under Forest (Conservation) Act, 1980 shall be followed by JPSIP. *As part of the forest clearance process necessary permission would also be carried out to comply with the provisions of the act.*
Ancient Monuments & Archaeological Sites and Remains Act, 1958; Indian Treasure Trove Act, 1878; Jharkhand Ancient Monuments and Archaeological Sites, Remains and Art Treasures Act, 2016.	✓	✓	x	Ancient Monuments & Archaeological Sites and Remains Act, 1958 and Jharkhand Ancient Monuments and Archaeological Sites, Remains and Treasures Act, 2016 prevents construction of any structure or carrying out mining, quarrying, excavating, blasting etc. near or inside archaeological site. Indian Treasure Trove Act, 1878 provides for procedures to be followed in case of finding of any treasure, archaeological artefacts etc. during

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
				excavation. *JPSIP shall follow provisions of these Acts. There would be specific provisions in the Environment and Social Management (ESMP) for subprojects which has such sensitivities to prevent any damage to such property*
The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013; The Chota-Nagpur Tenancy Act, 1908; Santhal Parganas Tenancy Act, 1949	✓	✓	x	RFCTLARRA, 2013 provides for compensation and assistances measures and adopts a consultative and participatory approach in dealing with the Project Affected Persons. *JPSIP would comply with relevant provisions of the Act in case the land is acquired.* CNT Act 1908 regulates sale and purchase of tribal land from tribal to non-tribal for industries and agriculture. As per provision of this Act, State Government has the unfettered power to acquire land in 'public interest. *JPSIP would follow the provisions of this Act to purchase tribal land.* SPT Act, 1949 prohibits transfer, settlement or lease in any manner, unless the right to transfer is recorded in the record of rights, in respect to any raiyati holding. *JPSIP would follow the provisions of this Act.* *During transfer of tribal to nontribal or JPSIP the permission of DC is necessary as per the CNT Act 1908 and SPT Act, 1949. Application to this affect has to be made by JUSNL and the condition imposed by the DC has to be complied with.*
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	x	x	✓	Generation of waste oil and used transformer oil at site attracts the provisions of Hazardous Waste and other waste Rules, 2016. The hazardous wastes have to be disposed through CPCB/SPCB approved recyclers only. *JPSIP would obtain authorization for hazardous waste under this Rule. JPSIP would also have to maintain record*

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
				of hazardous waste and submit the desired return in prescribed form to JSPCB.
E-Waste (Management) Rules, 2016	x	x	✓	JPSIP, being the bulk consumer of electrical and electronic equipment will ensure that e-waste generated is channelized through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler or recycler.
Battery (Management & Handling) Rules 2001	x	x	✓	It is the responsibility of the bulk consumer (JPSIP) to ensure that the used batteries are deposited with the dealer, manufacturer, or registered recycler for handling and disposal. A half-yearly return is to be filed as per the rule to JSPCB.
Ozone Depleting Substances (Regulation and Control) Rules, 2000	x	x	✓	JPSIP shall follow the provisions of the notification and shall phase out all equipment, which uses these substances, and shall aim for CFC free organisation in the near future.
The Child Labour (Prohibition and Regulation) Act, 1986; Contract Labour (Regulation & Abolition) Act 1970; Minimum Wage Act, 1948; Bonded Labour System (Abolition) Act, 1976; Grievance Redressal Policy under Industrial Disputes Amendment Act, 2010; Employees' Provident Fund and Miscellaneous Provisions Act, 1952; The Payment of Wages Act, 1936, amended in 2005; Workmen's Compensation Act, 1923; Maternity Benefit Act, 1961; Employees State Insurance Act, 1948; Inter-state Migrant Workmen Act 1979; and Intimation of Accidents (Forms and	✓	✓	✓	These regulations shall be applicable for labourers and employees engaged by JPSIP and its Contractor in the subprojects. *JPSIP and its contractors would comply with the requirements of these regulations. For this purpose, JPSIP would incorporate requirements of these regulations in contract document and technical specifications of procurement.*

Applicable WB OP's /Indian Legislation/Guidelines	New Transmission Lines	New Substation	Operation and Maintenance	Applicability
Time of Service of Notice) 2004				
Central Ground Water Authority (CGWA) Public Notice dated 4th January 2017	x	✓	✓	Permission for installation of bore well and abstraction of ground water need to be obtain from State Level Ground Water Resources Development Authority and Central Ground Water Authority. *JPSIP and its Contractor would comply with the requirements of this notification.*

Considering the activities envisaged under the JPSIP and the environmental and social setting of Jharkhand the potential environmental and social issues are discussed in the sections below. The potential mitigation measures to manage these issues/impacts are also discussed.

3.1 ENVIRONMENTAL AND SOCIAL SENSITIVITIES IN JHARKHAND

A compendium of the bio-physical and social sensitivities in the State of Jharkhand has been compiled to provide an understanding of scale and magnitude of sensitivity/vulnerability of ecological, physical and social environment.

3.1.1 *Ecological Sensitivity*

The State of Jharkhand has a geographical area of 79,714 km² constitutes 2.42% of the country's area. As per State of Forest Report 2015 of Forest Survey of India, forest cover in Jharkhand is 23,478 km2 which is 29.45 % of the state's geographical area. Of the total recorded forest area, Reserved Forests constitute 18.58%, Protected Forests 81.28%, and Unclassed Forests 0.14% (1). The GM Land (*Jungle Jhari*) are also considered as deemed forest and adds on to the forest cover in Jharkhand.

It has been observed that state has considerable coverage of Protected Area Network including Wildlife sanctuaries and National Park and this need to be avoided. There are 12 protected area networks (refer ***Section 4.1.7*** of ***Annexure 4***) consisting of 1 National Park (NP) and 11 Wildlife Sanctuaries (WLS), 1 Elephant Reserve and 1 Tiger Reserve in Jharkhand. Similarly there are eco-sensitive zones around wildlife sanctuaries where special care needs to be taken to prevent unwarranted impacts. Eco-sensitive zones have been declared for Dalma WLS and are in the draft stage for the Palamau Tiger reserve and the Hazaribagh WLS. For the remaining WLS the area of 10 km around the boundary would be considered as Eco-Sensitive Zone as directed by the Hon'ble Supreme Court (2) .

Jharkhand has two distinct elephant populations, in Palamu and Singh hum. The elephant population is located in two areas namely the Belta National Park, Palamu Tiger Reserve in the western districts of Latehar, Gumla and Lohardaga and the Dalma Wildlife Sanctuary including the forests of Saranda, Porhat, Kolhan, Saraikela and Dhalbhum Forest Divisions in the districts of East and West Singh hum and Saraikela –Kharsawan. There are several elephant corridor in Jharkhand which connecting different elephant habitats. Some of these elephant corridors are also located in the project area.

(1) http://www.jharkhand.gov.in/about-forest-department
(2) Vide Order dated 4th December 2006 (W.P 202)

3.1.2 Resource Vulnerability

In addition to ecological resources, physical resources like water is considered here since there would be consumption of water both during civil work of transmission line and substation and operation phase of substation. It has been observed that majority of the rivers in the state are rain fed and thus domestic water requirement is dependent on groundwater. Here it should be mentioned that ground water resource in eight blocks in Jharkhand are already in stress (1). Jharia, Jamshedpur Sadar, Godda and Kanke block selected for subproject (substation) are overexploited whereas Chas and Ratu are Semi-Critical and Dhanbad and Ramgarh are Critical. Ground water resource utilisation in these areas needs to be controlled.

3.1.3 Socio-Economic Sensitivity

The socio-economic baseline conditions show that the Scheduled Tribes constitute 26.2% of the entire population of the state. The state has a total of thirty two (32) Scheduled Tribes. The right of the tribal are protected by Chota-Nagpur Tenancy Act (CNT), 1908 and Santhal Parganas Tenancy Act (SNT), 1949. The Santhals are the most populous tribe with a population constituting 34% of the total ST population of the State (refer ***Section 4.2.2.*** of ***Annexure 4***). The Oraon, Munda and Ho are ranked next in terms of population. The tribal population have specific cultural and religious heritage e.g., sacred groves; special care needs to be taken to reduce the impacts on the tribal while planning of lines through these areas. There a number of archaeological monuments in Ranchi, Sahibganj, Dumka Pakur districts within the Project's Area. The subprojects in these areas also have to take these into consideration while planning and construction activities.

The environmental and social sensitivities in Jharkhand has been identified and presented in ***Annexure 4***.

3.2 ENVIRONMENTAL ISSUES

In the section key environmental and social issues associated with installation of transmission lines and substations are discussed. The corresponding preventive and/ or mitigation measures are designed applying the principle of mitigation hierarchy: "**Avoid, Minimise, Mitigate and Offset"**.

3.2.1 Visual & Aesthetics

Impact on Visual & Aesthetics

The overall aesthetic effect of a transmission line is likely to be negative to most peoples, especially where transmission proposed lines would cross natural landscapes and the places of tourist attraction. New tall steel

(1)Block-wise Dynamic Ground Water Resource Estimation, by Central Ground water Boards till 2009 has classified 8 blocks in Jharkhand in Semi-critical, Critical and Over exploited

structures may seem out of proportion and not compatible with natural landscapes. The visual impacts of tower would also depend on the perception of the local community.

Jharkhand has a number of archaeological monuments which are protected by the Archaeological Survey of India. These protected monuments are located in Ranchi, Singh hum, Dumka and Sahibganj [(1)]. In addition there are places of scenic beauty e.g. waterfalls. The transmission line near these monuments/ landscapes can affect the aesthetics by degrading the view.

Mitigation Measures

Electric transmission lines may be routed to avoid areas having scenic beauty. Transmission line route can be chosen to avoid areas of natural beauty. In addition, during transmission line design flowing measures would be adopted:

- Minimizing construction of additional towers by using natural topography / sag curve;
- Towers may be painted grey or green to merge with the background.

3.2.2 Soil

Impact due to Disturbance to Soil

Impact on soil may occur both due to the construction of transmission line tower and substation. In case of transmission lines the erection of towers may result in:

- Soil Mixing: The excavation depth for tower foundations varies depending on the capacity of the transmission line, type of soil and type of towers. The depth can vary between 3 to 5 m. Some of the excavated soil is backfilled but there may still be some left over excavated material. Excavated material is primarily subsoils if mixed with top-soils can reduce the fertility of soil.
- Erosion: The excavation for tower foundation would expose the soil. Thus the tower construction would aggravate the problem of erosion especially in districts which are sensitive to gully erosions e.g. Giridih, Hazaribagh, Chatra, Deoghar, Latehar and Daltonganj districts. This would result in sedimentation in the adjoining fields.
- Compaction: The movement of vehicle over the agricultural land to access the construction site would also cause compactions of soil and affect soil fertility.

In case of substation site located on slopes, benches or revetment would be developed by cutting and filling inside the substation site to ensure proper placement of equipment. The planned cutting and filling will lead to soil erosion caused by runoff. This may result in sedimentation of the adjoining agricultural field and waterbody (if available) from the eroded material.

(1)http://www.asi.nic.in/asi_protected_monu_jharkhand.asp

In addition, there may be possibility of excess excavated material from the substation sites. If these excess excavated material is disposal on agricultural land it may result in loss of productivity of land.

Mitigation Measures

Mitigation measures which would be considered to reduce impacts on soil during construction of transmission lines/substation are given below:

- Excess excavated material from tower footing has to be removed by the contractor before completion of tower construction. The excess excavated material may be used for repairing of bunds of the agricultural fields or for strengthening of shoulders of village roads;
- Siting of the transmission tower or substation should avoid water logged/steep sloped site. In case such sites are selected, the cut and fill slopes would be protected using standard engineering practices including bio-engineering techniques wherever feasible.
- In case of substation located on slopes in addition to using standard engineering techniques bio-engineering techniques (***Annexure 5***) would be adopted for slope stabilisation.
- All internal drainage channels from the substation site would be connected to a peripheral site drainage channel. The peripheral site drainage channel would be provided with a sedimentation tank and oil-water separator to prevent sediments and oil & grease to be carried away by the runoff.

3.2.3 Terrestrial Flora

Impact on Vegetation

Major habitat alterations are not expected in transmission lines since most transmission line route would avoid forest or natural habitats. Potential impacts on natural habitat may be more significant during construction and installation of tower footing and stringing of transmission line. As per the State of Forest Report 2015 of Forest Survey of India (FSI), forest cover[1] in Jharkhand is 23,478 km^2 which is 29.45 % of the state's geographical area. The GM Land (*Jungle Jhari*) are also considered as deemed forest and adds on to the forest cover in Jharkhand. Transmission line construction causes disturbance of RoW soils and vegetation due to movement of people and vehicles along the RoW, access roads, and laydown areas. In addition, to facilitate stringing operation and also to maintain the safety distance the trees within the RoW would be felled. The clearance of vegetation can also contribute to the spread of invasive species. Parts of plants, seeds, and root stocks can be carried by construction equipment or vehicle when it travels through such cleared stretches. Once introduced, invasive species will likely spread and impact appropriate habitat.

[1] All lands, one hectare and more in area, with a tree canopy density of 10 percent or more irrespective of ownership and legal status. Such lands may not necessarily be a recorded forest area. It also includes orchards, bamboo and palm (ISFR, 2013); http://www.jharenvis.nic.in/WriteReadData/CMS/jharkhand%20at%20glance.pdf

Mitigation measures

Following measures would be adopted during planning and construction of transmission line and substation.

- JPSIP, wherever possible, would use the existing path/access roads for the movement of man and machinery so that vegetation clearance is not required for accessing construction sites.

In areas having good vegetation cover (1) JPSIP would encourage use of extended/special tower to reduce felling of trees in RoW and thereby reduce impact on trees within the RoW.

- Contract document for the construction of transmission line would include specific clauses would be incorporated to prevent felling of trees during stringing unless it becomes absolutely necessary. Only those trees for which tree felling permission has been obtained from the Forest Department under the Jharkhand Timber and Other Forest Produce (Transit and Regulation) Rules, 2004 would be felled.
- After completion of stringing, natural regeneration or dwarf tree/medicinal tree plantation would be allowed to heights as per the standards mentioned in IS: 5613.
- For any transmission line passing through forest areas (NP, WLS, PF, RF, and Jungle Jhari) clearance under the Forest Conservation Act 1980 would be mandatory. Construction can only after necessary clearance is obtained.

3.2.4 *Terrestrial Fauna*

Impact on Wildlife

Transmission line if it passes through National Park, Wildlife Sanctuaries, Elephant Reserve, Tiger Reserve and wildlife corridor, would cause disturbance to wildlife habitats. Also, large animals such as elephants might get electrocuted due to sagging of powerlines. In case of transmission line cutting across elephant corridor the mandatory ground clearance may be compromised (2) in case of 132 KV line (mandatory ground clearance = 6.1 m (3)).

There are 14 protected area networks consisting of 1 National Park (NP) and 11 Wildlife Sanctuaries (WLS), 1 Elephant Reserve and 1 Tiger Reserve in Jharkhand. In this state there are two distinct elephant populations, viz. Palamu and Singh hum. The Palamau population occupies about 1200 km^2 of the Belta National Park, Palamu Tiger Reserve and adjoining areas. The Singh hum population occupies about 2570 km^2 of the available forest area of Dalma Wildlife Sanctuary and forests of Saranda, Porhat, Kolhan, Saraikela and

(1) Very Dense Forest (VDF) > 70 percent crown density and Moderately Dense Forest (MDF) 40-70 percent crown density. http://fsi.nic.in/sfr2003/forestcover.pdf

(2) The height of the Asiatic Elephant is 3.5-4.0 m (https://www.worldwildlife.org/species/indian-elephant). The trunk length would be similar. Thus the height of the elephant + height of the trunk would thus be greater than the minimum ground clearance.

(3)http://www.ptcul.org/pdfs/clerance.pdf

Dhalbhum forest divisions. Also there are 14 identified elephant corridor (1) in Jharkhand which connects elephant habitats not only in Jharkhand, but also adjoining state of Orissa and West Bengal. In addition to these identified elephant corridors, there are several elephant corridor which are identified by Division Forest Office. Transmission lines passing through these wildlife habitats pose potential risk to wildlife.

In case of areas where there is other wildlife (involving smaller animals) the risk are primarily due to falling of the animal into the excavation carried out for tower foundation.

Mitigation Measures

JPSIP would make efforts to prevent intrusion of transmission line into wildlife habitats through optimization of route alignment. It would use modern tools like GIS/GPS and other modern techniques such as alternative route analysts to carry on the avoidance exercise. For transmission passing through elephant habitat/corridor, suitable design modification in the tower e.g. increasing the tower height would be undertaken. The height above the ground at the lowest point of the lowest conductor or grounding wires (i.e., at maximum sag point) of power lines shall be:

- a minimum of 20 feet (6.6 metres) above ground on level terrain (slope <20 degrees)
- a minimum of 30 feet (9.1 metres) above ground on steeper terrain (slope > 20 degrees) (2)

Temporary woven wire mesh guards of about 2.4 m (8 ft.) high will be put around the excavated areas to prevent small wild animal from falling. No harm would be done to the animal if they are trapped in the excavated area. The contractor in association with JUSNL and Forest Department would ensure safe release of the animal.

3.2.5 Avian Fauna

Impact on Bird

In transmission line bird deaths may be caused from collisions with the conductors. The likelihood of avian collisions is high especially when transmission lines are located near migratory bird corridors, foraging grounds or nesting and roosting sites. The incidences of electrocution of birds are rare in case of transmission lines as the distance between the conductors in case 132 KV (1.12m) lines are usually more than the wing span of most (3) of the birds in the state.

(1) Right of Passage: Elephant Corridors Of India

(2) http://www.moef.nic.in/sites/default/files/FIRSTDraft%20guidelines%20roads%20and%20powerlines.pdf <http://www.moef.nic.in/sites/default/files/FIRSTDraft guidelines roads and powerlines.pdf

(3) Darter (Anhinga melanogaster), White neck Stork (Ciconia episcopus), Lesser adjutant Stork (Leptoptilos javanicus) etc have wider wing span than 1.2m

The Asian Bird Survey 2015 (1) conducted in 25 selected waterbodies /reservoirs in Jharkhand had identified 78 species of wetland bird's species belonging to 19 families. Of these 26 species were resident birds and 23 were resident migrants. Among them 11 species are threatened birds [Black-bellied tern (*Sterna acuticauda*), Darter (*Anhinga melanogaster*), White neck Stork (*Ciconia episcopus*), Lesser adjutant Stork (*Leptoptilos javanicus*) etc]. The survey also found that the reservoirs with notable bird population include Udhwa Lake, Tilaya Dam, Maithon Dam, Chinda Dam and Getalsud Dam.

Transmission lines located in and around these water bodies and migratory bird corridors pose risk to the bird population primarily due to the collision.

Mitigation Measure

Following prevention and control measures would be undertaken to minimize avian collisions:

- The transmission lines would avoid such areas with known avian populations e.g. nesting grounds, foraging grounds, migration corridors etc.;
- Provide bird guards and markers in transmission lines as per the specification provided in IS-5613 (Part-II) to prevent electrocution of birds.

3.2.6 Emission and Discharges from Construction Activity

During construction phase of the project i.e. construction of substation and transmission line pollution is expected. This would include water pollution form the construction camp, lay down area and fly camps and fugitive and exhaust air pollution from the movement of vehicle carrying construction material and machinery used during site clearance and levelling of site for substation etc.

The labour camps would be setup for the construction of the substation and the fly-camps would be developed at different location for the erection of the towers and stringing. These camps would generate solid and liquid waste. These wastes have potential to contaminate the soil and the water bodies around the site if it is not properly handled. The issues related to labour is presented in ***Annexure 11.***

The principal source of noise during construction of transmission lines would be from operation of winching machine during stringing of transmission lines. In case of substation, the operation of the earth moving machineries has potential to generate high noise levels. These machineries produce noise level of more than 70 dB (A). This can cause disturbance to the settlement, if located near (within 500 m) substation sites.

The impact on air quality will be only limited to construction period and will be limited to location near the construction site of substation. During

(1) http://www.jharwildlife.in/images/docs/pdf/Asian_Waterbird_census_AWC-2015.pdf

operation stage air or noise emissions are not expected form transmission lines but the transformer in the substation is likely generate noise.

Mitigation Measures

Although pollution is not major issue with transmission projects still JPSIP will make efforts to further minimise it. JPSIP would implement measures stated in the ESMP (which will be prepared as part of the ESIA for each subproject) for pollution prevention. The ESMP would be made part of the standard bidding document of contractors.

Septic tanks and soak pits/modular bio-toilets would be provided at all construction camp, lay down area and fly camp. At the completion of the construction activities construction site would be cleared of all the leftover materials and debris to avoid any chance of pollution.

To prevent air pollution the vehicle carrying construction material and machinery would try and move along the existing access road. To the extent practicable new roads would not be constructed and movement of vehicles through agricultural fields would be discouraged.

To prevent excessive noise during stringing of transmission line, the winching machine would be kept at least at a distance of 500 m away from the nearest habitation. Regular maintenance of the winching machine would be carried out to prevent excessive noise. Also, for machineries involved in substation construction, maintenance schedule would be prepared and maintained by the contractor. Night time construction activity would be prohibited in case settlement/habitation is located within 500 m of the construction site. These measures as discussed above would also be made part of the Standard bidding document of Contractor involved in JPSIP.

3.2.7 Emission and Discharges from Operation and Maintenance Activity

Disposal of Hazardous Chemical and Waste

Potential Impact

As a part of routine maintenance, transformer oil would be changed every 10-15 years. The used transformer oil is categorized as hazardous wastes as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and its unscientific disposal may lead to soil and water contamination. Further, transformer oil would contain some concentration of Polychlorinated biphenyls (PCBs). PCB's have high dielectric strength and are not flammable which make them suitable for use as transformer oil. However PCB's bio-accumulates in the food chain and is not at all biodegradable. Further it is difficult to dispose of safely.

Similarly, electrical and electronic equipment (EEE) have hazardous / toxics substances in the components which may cause harm/pose risk to health and environment during handling after its expiry & full usage.

Mitigation Measures

JPSIP would ensure that used transformer oil is disposed in accordance to the Hazardous and Other Wastes (Management and Tran's boundary Movement) Rules, 2016. JUSNL would also obtain necessary authorisation form Jharkhand State Pollution Control Board (JSPCB) under this regulation and comply with the responsibilities of generator i.e. maintaining of records, submission of annual returns. Similarly e-waste generate would be governed by the provisions of the E-Waste Management rules 2016. The procedure for handling both hazardous waste and e-waste are presented in ***Annexure 6***.

For transformer oil, JPSIP would procure them from the supplier identified under this project. The procurement contract would have specification that the oil should contain PCB less 2 mg/kg (non –detectable level).

Emission of Green House Gas (GHG)

Potential Impact

SF6 gas, a highly potential Green House Gas (GHG) is being used in Circuit Breaker. Mishandling and leakage etc. can lead to its escape into the atmosphere increasing GHG emission.

Mitigation Measures

JPSIP would make efforts to reduce the leakage through installation of gas pressure monitor/ leak detectors in Circuit Breakers and regular monitoring. Strict and well defined procedure would be put in place for storage, handling and refilling of SF6 gas cylinders. Every refill would be documented and any unusual variation in gas volume would be reported to JPSIP for review and rectification. Each and every leakage will be promptly detected, addressed and documented and reported to the JUSNL Management.

3.2.8 Ground Water Resource

Depletion of Ground Water

It has been observed that 8 blocks in Jharkhand are either over-exploited or semi-critical or critical. Since the domestic water requirement in all these blocks are dependent on groundwater, excessive uses of water in these area can be a cause of concern and lead to depletion of natural resources.

During construction phase of substations and tower, water would be required for construction work as well as for domestic purpose. Water would also be used for earthwork, levelling, concreting and curing of concrete. Water from this purpose would be mainly sourced from ground water. During operation phase ground water would be used for domestic purpose for office and residential quarter at substation site. Further, water would be required for earthling pit located at substation site. For this purpose at each substation site bore well would be constructed to meet water requirement. For ground water abstraction permission would be required from Central Ground Water Authority (CGWA) as per the CGWA Public Notice dated 4th January 2017.

Mitigation Measure

Ground water usage for construction work would be reduced by adopting following best practices:

- Use buckets etc. to wash tools instead of using running water;
- Use of auto shut off taps in labour accommodation;
- Install water metres with main supply pipes/water tanks/bore well to assess quantity of consumed water and
- Use of admixture in the concrete production to reduce water consumption.

During the operation of the substation efforts would be made to efforts would be made for harvesting rain water. The harvested water would either be used for ground water recharge/reuse depending on the feasibility.

For construction of bore well at substation permission from CGWA would be obtained. Each of these bore wells would be fitted with water meter to monitor ground water abstraction.

3.2.9 Occupational Health and Safety

Occupational Health and Safety Risks

The occupational risk related to the construction of transmission lines is primarily due to fall from heights which might cause serious injuries. Transmission towers would be of different heights and minimum height of the tower would be 25 m in case of 132 kV transmission line. Similarly there are risks of fall in the excavation created for tower footing and substation. During operation and maintenance of lines and utilities there are high risks of electrical shock and resultant injuries unless safety protocols are followed.

Safeguard from Occupational Health and Safety Risks

To mitigate such risks all personnel working at a height of more than 6ft would be provided with full body harness (as per IS 3521: 1999). Workers at construction site would be provided with safety helmets as per (IS 2925: 1984). Also, general PPE's like reflective jacket, industrial shoe etc. would be provided to all construction workers.

During the testing and charging of electrical lines and substation, electricity insulating protective equipment like footwear (ISO 20345: 2004 Part-2), rubber gloves (IS 4770: 1991) would be provided to workers. In addition, provisions of the "Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010" would be adhered to.

3.2.10 Community Health and Safety

Community Health and Safety Issues

During the construction of the foundation for the tower footing the excavation can pose potential safety concerns for the inhabitants in the locality. This would be more relevant when the construction is carried out near a settlement or along a foot track or existing village road.

During operation phase, Electro Magnetic Field (EMF) created by the transmission line and substation cause inconvenience on the surrounding community. These may include disturbance in radio signal, television, mobile phone network, GPS signal etc.

There have been some concerns about the possibility of an increased risk of cancer from exposure to electromagnetic radiation from overhead transmission lines. However, a review by the World Health Organization (WHO) held as part of the International EMF Project (1996), concluded that "From the current scientific literature there is no convincing evidence that exposure to radiation field shortens the life span of humans or induces or promotes cancer".

Mitigation Measures

For the towers being constructed near settlement or access road there are chances of accidents. During the construction period the entire construction areas shall be barricaded. To facilitate easy identification of these areas during the night, reflective tapes would be placed on the boundary so that the people can be easily warned.

Currently no EMF exposure guidelines have been framed in the country. However, international guidelines in this regard are detailed below:

- State Transmission Lines Standards and Guidelines in the USA;
- International Commission on Non-Ionizing Radiation Protection (ICNIRP);
- US National Council on Radiation; and
- American Conference on Government and Industrial Hygiene (ACGIH).

The ICNIRP guideline for the general public (up to 24 hours a day) is a maximum exposure level of 1,000 mG or 100 μT. JPSIP shall follow the above guidelines while designing its system to maintain acceptable prescribed EMF level.

3.3 SOCIAL ISSUES

3.3.1 Standing Crop

Damages to the Standing Crop

The construction of the transmission tower foundation, erection of towers and subsequently stringing of transmission lines involve movement of men, machinery and equipment across agricultural fields leading to the tower locations. This may cause potential damage to the standing crops in agriculture field not only at the tower base and RoW of the transmission line but also may cause damage to the crops in adjacent agricultural plots due to movement of the vehicle and equipment and construction workers. This damage to crops will result in temporary loss of income for the cultivators. However, the extent of losses (total or partial crop loss) can only be assessed during project implementation.

Mitigation

A review of the Census of India 2011 indicates that 80% of working population in Jharkhand is involved in agriculture or agriculture based activities. The loss of standing crop may cause significant losses. Mitigation measures to reduce impact on loss of standing crop:

- Constructions to be undertaken during the lean agricultural season after the harvest are over.
- Use of village roads and earth bunds between agricultural plots for movement of equipment and workers, wherever possible.
- When damage to standing crops cannot be avoided due to the construction work, the farmer will be compensated based on the entitlements as mentioned in the Resettlement Framework (described in ***Annex Volume 1: Resettlement Framework***).

3.3.2 Land use

Restriction on Land use

It is estimated that more than 6000 towers would be constructed under the project. In addition, JPSIP would also require a right of way of 27 m for 132 KV transmission line.

There would be some physical obstruction to use of land falling under the tower footprint but the impacts would not be pronounced as non-mechanised agriculture is carried out in Jharkhand. The land owner would be able to use the land under the tower for agricultural purpose. There would however be some restriction with regard to undertaking any structural construction(s) either beneath the tower footing or in the RoW as per provisions of the Electricity Act 2003. Further in JPSIP since most of the lines would pass through agricultural field the decrease in values of land parcels falling within the RoW would be minimal.

It must be noted, that as per existing practice, only the rights to the use of land for the tower footprint is obtained from the land owners (typically by invoking the provisions of the Indian Telegraph Act, 1885) on whose lands the towers are to be constructed – no land purchase or acquisition leading to a transfer of ownership is involved in the process. However the ownership of land remains with the landowner.

Mitigation Measures

To ensure that the landowner receives due compensation for the damages sustained by him during the construction of transmission lines in JPSIP:

- The payment of compensation for damages would be made transparent.
- If required a negotiated settlement may be carried out by the District level Committee setup by JPSIP.

3.3.3 Loss of Land

Potential Impact

Land requirements for each substation (25 new substations) would vary from 8-12 acres depending on technical considerations. Where ever possible the project will try as much as possible to use non-forest government land, to minimise involuntary land acquisition. Where it will not be possible, private land may be procured for the project either through involuntary land acquisition or negotiated settlement for the substations.The land for the substation would be procured from owners and the ownership would be transferred to JUSNL against payment of compensation. Land secured for construction of substations will be no longer be accessible to the existing owner. The potential social impacts related with the establishment of new substations are as follows:

- Loss of land
- Loss of livelihood due to acquisition of private agricultural land. Homestead land would not be used for the setting up of substation or the transmission towers; and
- Loss of common property resources due to procurement of government land.

Mitigation Measure

Measures to mitigate loss of land are as follows;

- Efforts may be made by JPSIP to utilise non-forest government land for constructions of substations as much as possible and to reduce uptake of private land especially irrigated /double cropped agricultural land.
- Where procuring private land cannot be avoided and it is done through land acquisition process, the land owner will be duly compensated as per the provisions mentioned in the Entitlement Matrix in the Resettlement Framework (RF).

- In case of procurement of land through private purchase, JPSIP shall ensure that compensation/rate for land is not less than the market value of land (details are presented in ***Annex Volume 1: Resettlement Framework***). The price of land would not be less that the price of land calculated by the RFCTLARRA, 2013.
- The affected persons will also be compensated for the loss of income and common property resources.

3.3.4 Impact of Labour Influx

Labour would be required for construction of the substation and erection of transmission lines. Unskilled labour would be required for civil work and would be preferably sourced from local areas. However skilled labour required for erection of transmission tower, commissioning of the substation stringing of transmission lines. etc. The skilled workers would be primarily migrant labours from places outside the state of Jharkhand.

The basic issues related with migrant labour may include:

- Conflict amongst workers, and between workers and local community, based on cultural, religious or behavioural practices.
- Discontent amongst local community on engagement of outsiders.
- Mild outbreaks of certain infectious diseases due to interactions between the local and migrant populations. The most common of these are respiratory (TB), vector borne (Malaria, Dengue), water borne (Stomach infections, typhoid) and sexually transmitted diseases (HIV, Syphilis and Hepatitis).
- Security issues to local women from migrant workforce.
- Use of community facilities such as health centres, temples, transport facility etc. by migrant labour may lead to discontent with local community.
- In case contractors bring in unskilled migrant labour, there stands the risk of exploitation of a labourer. This can happen in the form of hiring underage labourers, low and unequal wage payments, forced labour and discrimination on basis of the basis of caste, religion or ethnicity

Mitigation Measure

Measures to mitigate impacts from labour influx and related issues are presented in **Annexure 11.**

3.3.5 Impacts due to cumulative labour at site

The project plans to maximize local involvement in the employment during the construction phase, however migrant labours will also be recruited. It will be the responsibility of the contractor for provision of labour lamp to accommodate migrant labour. The construction may start simultaneously for several tower footings which can lead to increase in migrant labour. This could result in stress on local resources, disruption in community relations, and movement of labours. The other impacts are:

Community Infrastructure

Influx of migrant workers may strain existing infrastructure of local community. Drinking water arrangement for labour camps will be met through prevailing ground water in the area which is also a potential water sources for local community. Workers can also utilize local transport for commuting to nearby areas thereby increasing risks such as road accidents, and other detrimental consequences of increased traffic generated by the project (dust, noise, and pollution).

Community Service and Facilities

There can also be increase in stress on medical or recreational facilities prevailing in nearby residential areas if appropriate services are not provisioned in the project area itself.

Local Business

Local businesses such as shops are likely to benefit from their proximity to labour camps that will be provided to accommodate migrant workers. However, there can be negative issues due to different lifestyles or cultural backgrounds of migrant workers.

Mitigation Measure

Measures to mitigate impacts on community due to influx of labour are presented in **Annexure 11.**

3.3.6 Common Property Resources

Impact on Common Property Resource

For access to tower location or transmission lines, the contractor would use the existing road i.e. existing National/State highway or village road. During construction phase due to the movement of the construction related vehicle and machinery some of the roads especially village roads may get damaged. Additionally some village roads may not be in a condition that it can be used for movement of construction vehicle. In such conditions the use of such roads would further lead to deterioration of the common property resources. Some culvert or any common utilities e.g. distribution poles may also get damage during the construction activities causing hardship to the community in general.

Mitigation Measures

Where ever required before using village road, minor improvement would be carried out by JPSIP. However, no major construction of roads would be carried out either during construction or as a part of maintenance procedures. In case of damage to the road or culvert or any common utilities during the construction activities it would be the responsibility of the contractor to repair the same.

3.3.7 Interference with utilities and traffic and blockage of access way

Potential Impact

The stringing of the transmission lines in some cases would cross existing roads including village and districts road, state and national highways and railways.

During the stringing operations when the transmission line crosses any road/ railways line, hindrance may be caused to the movement of traffic. In some instances temporary closure of the road/railway line may be required to facilitate stringing activities. This disruption in movement would cause inconvenience to the local population as access would be interrupted temporarily.

Mitigation

When a transmission line crosses any road/ railways line, adequate care/caution would be taken so as not to cause any hindrance to the movement of traffic. Stringing at the construction stage would be carried out during lean traffic period in consultation with the District Administration and local office of the utilities and angle towers would be planned during the design phase to facilitate execution of work.

3.3.8 Tribal Communities and Their Cultural Properties

Potential Impact

The project on transmission lines would usually bypass settlements where the habitations are dense, and generally tends to pass through rural areas where they can easily access to large stretches of land devoid of structures. As the baseline section indicates major ST population resides in rural areas of the state, it may potentially impact the tribal population and their domains.

Tribal people communities are closely tied to ancestral domains and natural resources, including land, forest, water, and others. Hence, their ties in terms of their customary rights to these ancestral domains which they traditionally own, use, or occupy, and where access to natural resources is vital for their survival and livelihood system may potentially get impacted due to erecting tower footings and stringing of operations of transmission lines.

Sacred Groves are of great cultural importance to the tribal population - the groves, which they call Sarnas, are cluster of at least five Sal trees that are worshipped by them. These groves may potentially get impacts during the stringing operation from one transmission tower to another. The branches of the trees may have to be chopped during the stringing of the conductors. In the state of Jharkhand 29 sacred groves have been identified, all in the district of Palamu – but there may be more of it across the state.

The project will require land for the substations and tower footings. Loss of land customarily owned, used or occupied by the tribal population may take place in the process.

Mitigation Measures

To preserve the cultural identity of the tribal population a Tribal Development Planning Framework (TDPF) (refer ***Annex Volume 2: Tribal Development Framework***) is prepared for this project. Further, there are regulatory provision in place for protection of the tribal culture, practices and traditions. The Tribal Development Planning Framework has been developed in compliance with OP4.10. Tribal People Plans (TPPs) will be developed in consultation with tribal population as enshrined in RFCTLARRA, 2013.

In subprojects located outside the Scheduled Areas tribal people may also be affected. In such areas provisions of the Fifth Schedule will not apply. Once tribal populations affected by a subproject are identified a Tribal Development Plan would be prepared and implemented by JPSIP to ensure that affected tribal population: i) are adequately and fully consulted, ii) receive benefits and compensation at par with other affected people as per the legal requirement., (iii) are provided with special assistance as per laws and policies (iv) receive adequate protection against project adverse impacts on their culture identities.

3.3.9 Chance find of archaeological artefacts, treasure etc. during excavation

Potential Impact

For developing the foundation of the towers 2-3 m deep excavations have to be carried out. During such excavation there may be a possibility of 'chance finds' of any archaeological artefacts, treasure etc.

These archaeological artefacts, treasure are national resources and protected under the Indian Treasure Trove Act, 1878 as amended in 1949. Efforts should be made to prevent damage to such artefacts.

Mitigation Measures

Possibilities of such phenomenon in transmission project are quite remote. However, in case of such findings, JPSIP would follow the procedure as laid down in the Section 4 of Indian Treasure Trove Act, 1878 as amended in 1949. The Contractor shall also be liable to follow provisions of this Act.

3.3.10 Women Work Participation and Decision Making

Potential Impacts

Analysis of the workforce involvement in the Blocks of Jharkhand indicates that female work participation is highest (65.54 percent) in Sonahatu block (Ranchi district) and lowest (11.20 percent) in Golmuri cum Jugsalai block (West Singh hum district). The average female work participation in all the

blocks is 41.20 percent (which is higher than the national rate of 25.6 percent). However, work participation of female workers in power sector, especially transmission line projects are considerably less.

Mitigation Measures

Adequate measures will be undertaken to safeguard gender issues in the project area as outlined in ***Annex Volume 3: Gender Action Plan (GAP).*** Women involvement will be ensured through formal and informal group consultations so that their participation is ensured during implementation of the project. For women labour employed at construction site, separate arrangement like toilet facility, rest area etc. would be made for them. Also there will not be any discrimination for men and women worker.

4 E&S SAFEGUARDS IMPLEMENTATION

4.1 E&S SAFEGUARDS IN THE JUSNL PROCESS

The typical project cycle of JUSNL includes seven stages. The stages of the JUSNL project cycle for developing transmission lines and substations include:

- Project conceptualisation;
- Project planning;
- Approval and clearances;
- Project tendering;
- Project implementation; and
- Operation & maintenance

As part of each of the process, E&S safeguards have been incorporated in the workflows. The measures are incorporated have been described in the sections below and illustrated in ***Figure 4.1***.

4.1.1 *Project Conceptualisation*

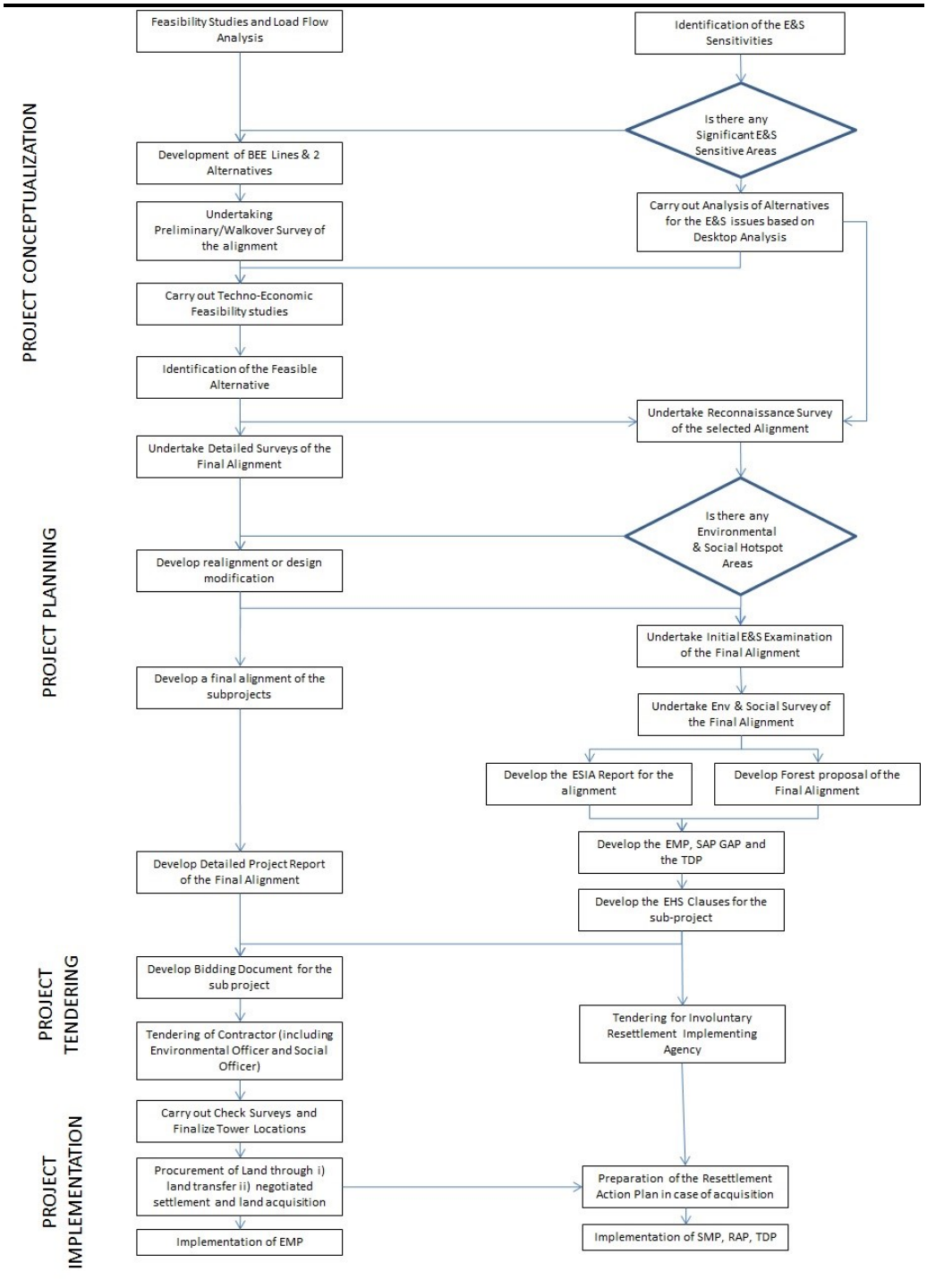
A power transmission project in the state is identified considering 'the source of generation/evacuation of power and the load centres /centres of consumption of electricity e.g. (industrial region, domestic/commercial centres). To identify the need for system strengthening and augmentation of transmission infrastructure in Jharkhand, a detailed load flow analysis and transmission system study was carried out by JUSNL in close consultation with the Eastern Regional Power Committee (ERPC)/ Central Electricity Authority. The subprojects which have been identified in ***Annexure 1*** are outcome of the above study.

After identification of subproject, a Feasibility Study would be carried out. The feasibility study besides analysing the technical/engineering and financial and economic aspects would essentially include environmental and social considerations. The feasibility study would consider technical justifications, economic and financial performance and environmental and social constraints mapping for analysing each of the subprojects. The subprojects would then be prioritised based on demand of consumers (in this case 24x7 Power for All) business needs, external environment factors and environmental and social complexities involved.

As a part of the Feasibility study, JUSNL (through its Technical Consultant) would develop three alternatives for each of the subprojects. As a first level screening (refer ***Figure 4.2***) these alternatives would be screened for "Significant Environmentally and Socially Sensitive Areas" or "Exclusion Zones" e.g. National Parks, Wild Life Sanctuaries , Eco-Sensitive Zones , major habitations etc. These would be identified from secondary literature and using Survey of India Maps/ Google Earth and Forest Atlas and communicated to

the Technical Consultant of JUSNL. Through the screening process efforts would be made to avoid these "Significant Environmentally and Socially Sensitive Areas" or "Exclusion Zones". At this phase, at least 3 (three) alternative alignment s would be marked by the Technical Consultant on toposheet, subject to site verification.

Figure 4.1 JUSNL Work Process with E&S Safeguards



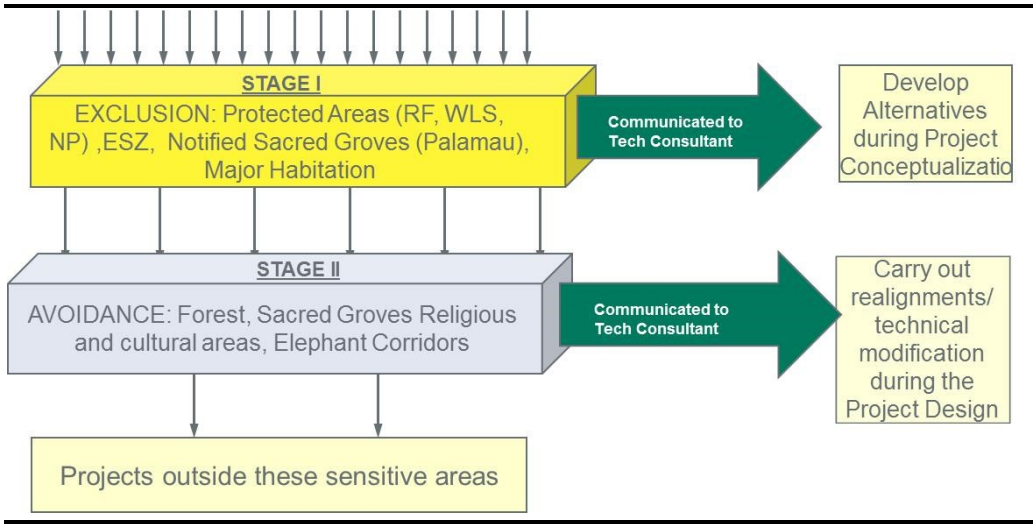
Subsequently, a preliminary survey/walkover survey would be conducted to identify forest, sacred grove, archaeological sites, historical and cultural places etc. In case additional environmentally or socially sensitive areas are identified during the survey the same would be informed to the JPSIP PIU and the Technical Consultant for initiating actions for avoidance or necessary

corrective actions. Using the information gathered from the preliminary survey, an analysis of alternative alignment would be carried by the E&S Consultant out as per the format provided in ***Annexure 7 Part A*** for identification of the best suited alternative.

Similarly, based on the information gathered from walkover survey at different candidate location for substation, a similar analysis of alternative substation site would be carried out using the format presented in ***Annexure 7 Part B*** to identify the best location for the substation.

Based on the above studies, a State level Transmission Investment Plan would be prepared by the Technical Consultant identifying the final alignment/final substation location, incorporating all the environmental, social and techno-economic inputs gathered during this stage. Approval of the "State level Transmission Investment Plan" would then be obtained from the Board of Directors of the JUSNL. This "State level Transmission Investment Plan" after the appraisal/ recommendation of JUSNL management, would be forwarded to GoJ for the in-principle approval and subsequent budgetary allocation.

Figure 4.2 ***Two Stage Screening Process***



4.1.2 Project Planning

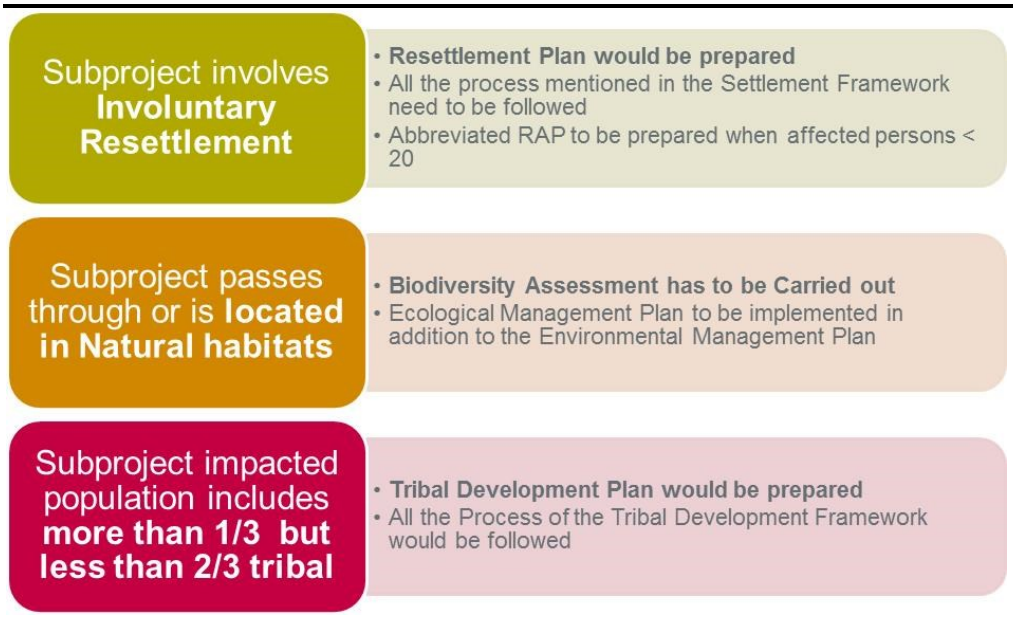
The project planning stage would include all activities related to preparation of Detailed Project Report (DPR) for both transmission line and substation. The environmental and social assessment of the final transmission line alignment and substation location would also be carried out during this stage.

During this stage of the project, Technical Consultant would carry out detailed survey of the final alignment identified from the Analysis of Alternative Alignment during the Project Conceptualisation using DGPS including digitized profiling along selected route and computer aided tower spotting and optimization, pillaring of important locations such as angle points & major crossings including latitude & longitude for each transmission line and substation.

As part of the environmental and social (E&S) studies a second level screening (refer ***Figure 4.2***) of the final alignment would be conducted to identify environment and social hotspots [(1)].The hot spots on the alignment would then be communicated to the Technical Consultants for avoidance through realignment and/or alternative design.

An Initial Environmental and Social Assessment (IESA) of the selected site/ transmission line would be carried out to ascertain whether specialised studies (e.g., Resettlement Plan, Biodiversity Assessment, and Tribal Development Plan) need to be conducted. The scope of the ESIA studies would also be defined through the IESA .A generic Terms of Reference for the Environmental and Social Assessment (ESIA) is presented in ***Annexure 8.***

Figure 4.3 Triggers for Specialised Studies



Considering the scope of studies (defined through the IESA) for each substation/transmission line, baseline information would be collected from surveys, field studies and secondary sources. This baseline information would be utilised for carrying out the Environmental and Social Assessment and for preparation of Environmental and Social Management Plan. In case any specialised studies are required the following actions would be undertaken;

- ***Tribal Development Plan***: The TDP would be developed to manage/mitigate impacts on indigenous people from subprojects. The plan would address developmental needs of indigenous people/ tribes and help them to preserve their distinct cultural identify. Framework for preparation of Tribal Development Plan is provided as ***Annex Volume 2: Tribal Development Framework***.

Forest, Religious and Cultural Areas, Elephant Corridors, Wetlands, Community Land, Cultural Properties (Religious Places, Cultural Gathering), International Bird Areas, Industrial Areas, Cluster of Trees, Cluster of Houses, Community Infrastructure (Schools, Hospitals)

- ***Resettlement Action Plan***: In case of substation where resettlement cannot be avoided, a Resettlement Action Plan (RAP) would be prepared. The plan would identify all people affected by the project and justify their displacement after consideration of alternatives that would avoid or minimize displacement. It would also present the entitlements for each of the project affected persons. Framework for preparation of Resettlement Action Plan is provided as ***Annex Volume 1: Resettlement Framework***. An estimation of the quantum of impact on land (by different land use) along with an estimate of the number of people likely to be affected would be prepared as part of the Resettlement Plan.
- ***Biodiversity Assessment Study:*** This study would aim at identifying potential impacts on flora and fauna and to suggest relevant compensatory and mitigation measures to protect /conserve biodiversity in the areas likely to be impacted along RoW of transmission line due to the project activity. Terms or reference for biodiversity assessment study is provided as ***Annexure 9***.

If forest land (including GM Forest land) is unavoidable either for the substation or for the tower footing, the process of forest clearance as per the provisions of the Forest Conservation Act 1980 would be initiated by the E & S Consultant. As part of the forest proposal, JPSIP would provide an undertaking to bear the cost of compensatory afforestation, Net Present Value (NPV) etc. as per the guidelines (1) of MoEFCC.

Before finalisation of the Detailed Project Report, JPSIP would inform general public about the project and would invite their suggestion. The suggestions would be recorded as part of the Disclosure Process and due consideration would be given to the concerns and suggestions given by stakeholders during finalisation of DPR.

The final DPR along with the Environmental and Social Management Plan and Resettlement Action Plan, Ecological Management Plan & Tribal development Plan (if required) would be sent to the JUSNL Board of Directors for approval. Once approved, it would be forwarded to the Government of Jharkhand (GoJ) for funding. In case of JPSIP, the same would also be forwarded to the World Bank for concurrence.

4.1.3 Detailed Design and Tendering

JPSIP would start the tendering process after detailed design, finalization of specifications for line and substation. The contracts would be awarded to competent contractors through bidding process. The subproject specific ESMP (including the ecological management plan if required) would be part of the contract document for implementation by the contractors/subcontractors executing the subprojects. Similarly, an Involuntary Resettlement

(1) Rates of NPV Applicable for Different Class/Category; Forests by Centre for Ecological Services Management (CESM), Indian Institute of Forest Management (IIFM), Bhopal in collaboration with Forest Survey of India (FSI), Dehradun November 2014

Implementing Agency would be selected through tendering process for implementation of Resettlement Action Plan and Tribal Development Plan.

4.1.4 Project Implementation

The construction phase would begin with the check survey being carried out by the contractor. Through the check survey the contractor would verify the ground profile and the tower footing (as provided in the DPR) and make necessary changes wherever required. Once the tower locations are finalised, JPSIP would approach the District Administration for assistance in procuring the land. The owner of the land would be identified with help of the District Land Revenue Department.

Simultaneous to the process of identification of the ownership of land, consultation would be carried out with the land owners by the Contractor with oversight of respective Division/ Circle Office of JUSNL. These consultations would primarily be focused on the making land owners aware of the process of negotiated settlement for damages and also to get an understanding of their willingness to participate in the negotiated settlement process. In case there are any grievances regarding the tower location, consultation would be held between land owner and Contractor with involvement of respective Division/Circle Office of JUSNL. However, in case even after all these efforts there is a failure to come to a consensus, then the tower locations may be shifted after meeting all technical requirements.

The land for the tower footing would be primarily procured through negotiated settlement. In case land cannot be procured through negotiated purchase, the same may be acquired under the provisions of RFCTLARRA 2013. Detailed processes involved in land procurement/acquisition are presented in ***Annex Volume 1: Resettlement Framework***. Civil construction work would be initiated after the land owner has provided his/her consent and the compensations for damages have been paid. The stringing of the transmission line would be carried out after the erection of the towers.

Due care would be taken by the Contractor to implement the Environmental and Social Management Plan (including ecological management plan) to minimize/mitigate environmental and social impacts. Occupational and community health & safety aspects would also be given due importance by the Contractor during construction work. JUSNL would also have oversight on the implementation of all these activities. Implementation of Resettlement Action Plan and the Tribal Development Plan would be taken up by the Involuntary Resettlement Implementing Agency prior to the initiation of the civil works.

The Contractor would be responsible for carrying out regular reporting to Division/Circle Office of JUSNL for the implementation of the ESMP in the format specified in ***Annexure 10.*** Similarly ***t***he IR Implementing Agency would also report the progress on implementation of Resettlement Action Plan and

Tribal Development Plan to the Division/Circle Office of JUSNL. In turn, the Circle/ Division Office of JUSNL would report to JPSIP PIU.

4.1.5 Project Operation & Maintenance

JPSIP PIU will continuously monitor implementation of environment and social safeguards of transmission lines and substations including encumbrance on the RoW. Any encumbrance on the RoW e.g. trees or bamboo thicket would be immediately lopped to maintain requisite safety distance as per guidelines (IS 5613/MoEFCC, GoI Circular 7-25/2012-FC dated 5th May 2014). The Division/Circle Offices of JUSNL would assist the JPSIP PIU to carry out monitoring of the subprojects. In addition, for routine issues e.g. disposal of used transformer oil, e-waste the JPSIP PIU would direct the Division/Circle Office as per the provisions Standard Operating Procedures presented in ***Annexure 6***.

4.2 THE SAFEGUARDS IMPLEMENTATION PROCESS

During the planning and designing of subprojects the safeguards planning would involve conducting Environmental and Social Impact Assessment including additional specialised studies (if required) and application for Forest Clearance. However, during the project implementation the focus of safeguards would be primarily on:

- Procurement /Acquisition of Land
- Implementation of the Environmental and Social Management Plan

The mechanism adopted for ensuring safeguards are implemented during these processes is described below:

4.2.1 Process for Procurement/Acquisition of Land

Different methods that would be adopted in JPSIP for procurement of land for the subprojects (substation and transmission lines) are presented in Figure 4.4 below. In case of substations efforts would be to procure contiguous parcels of lands which belong various government departments including the forest department. Unless it is extremely necessary private land would not be procured. JPSIP PIU in association with the Circle/Divisional Offices of JUSNL would coordinate with the District Administration the land procurement process. Necessary clearance from relevant department including the Forest Clearance (in case the land for the substation belongs to the Forest Department), would be obtained by JPSIP PIU before construction of substation can commence.

Box 4.1 Timelines for obtaining Forest Clearance

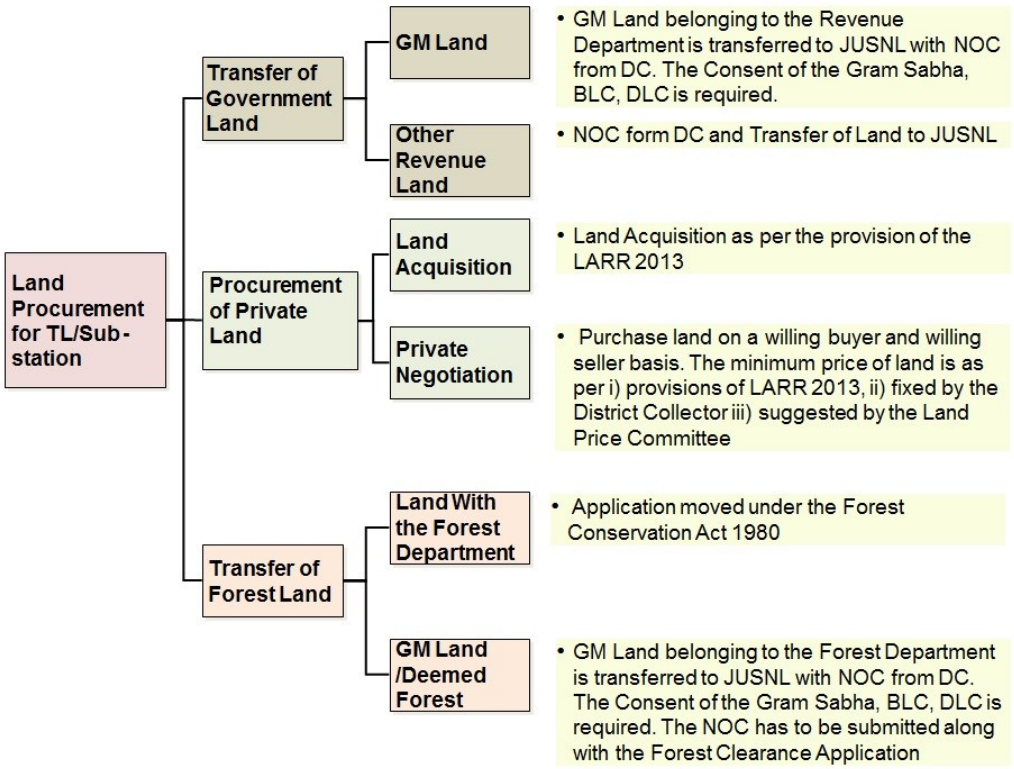
The guidelines for forest clearance issued by MoEF&CC, indicate that the time required for forest clearance would vary depending on the area of forest land being diverted. It has been estimated by MoEFCC that in case of diversion involving less than 5 ha of forest land 110 days would be required. However the number of days would increase with the quantum of forest land involved. It has been proposed that the time required would be 300 days in case of diversion of more than 100 ha of forest land. (http://forestsclearance.nic.in/writereaddata/Frequently%20Asked%20Questions.pdf). These timelines are however subject to the acceptance of the proposal by the Nodal Office and DFO. However a review of the timelines of the forest clearance in Jharkhand for transmission lines (http://forestsclearance.nic.in/) indicate that for diversion of less than 5 ha of forest land the average time taken for only Stage I clearance is 200 days while for larger tracts e.g. 26 ha approximately 400 days is required for Stage I Clearance.

In case of transmission lines both private and government land would be procured. The contractor constructing the transmission line would carry out the process of identifying owner of the plots on which the tower would be constructed with the help of the District Revenue Department. He would also be responsible for carrying out the negotiations with the land owner. In case of land belonging to other departments except forest department the contractor with assistance of JPSIP PIU will obtain necessary clearance before construction. For land under the ownership of the Forest Department the forest clearance process would be completed. It may be recalled (Section 4.1.2) that the forest clearance proposal for the same has already been submitted by E&S Consultant.

Acquisition of land would be carried out only if it is extremely necessary and would be used as a last resort. The acquisition would be carried out under the provision of RFCTLARRA 2013. In case of land acquisition JPSIP PIU would coordinate with District Administration to facilitate the process. JPSIP PIU would deposit the cost of land as per award issued under the said Act to concerned authority/State Government.

In all the above processes JPSIP PIU would be responsible for overseeing the process of negotiated settlement, cost of land and R & R benefits to affected persons. JPSIP PIU would also ensure that the construction would initiate only after the land owner has receive the compensation due to him.

Figure 4.4 Process of Land Procurement in JUSNL



4.2.2 *EMP Implementation*

During the construction stage of the substation and transmission line due care is taken to minimise/ mitigate environmental impacts. JUSNL would also give utmost importance to health & safety of workers, employees and nearby communities as described in the Environment and Social Management Plan. The implementation of the Resettlement Action Plan and the Tribal Development Plan (if required) would be carried out by the IR Implementing Agency.

JUSNL Division/Circle would maintain close watch on the environmental and social safeguards implementation through a system of Monitoring & Review which is described in Section 5.3 .

4.2.3 *Grievance Redress Mechanism*

A systematic Grievance Redress Mechanism would be setup for JPSIP which would help in resolving grievance/disputes related to the environmental and social performance of the project. The system would be used by the stakeholders including affected/displaced persons to flag-off any concerns/grievance/disputes in the project and seek redressal of the same thereby ensuring effective participation. A three tier grievance mechanism has been considered in JPSIP and would be active for the entire life of the project.

Three tier Grievance Redress Mechanism of JPSIP is presented in **Box 4.2**

Box 4.2 Three tier Grievance Redress Mechanism of JPSIP

Tier1: Circle Level: The aggrieved stakeholder can file a complaint with the respective Junior Engineer in charge of the site or at the Divisional/Sub-Divisional Offices of JUSNL. The complaints would be attended to by the respective Electrical Superintending Engineer of the Division and all the Executive Engineers and Assistant Engineers in the circle within 21 days of the filing of Compliant. In case the aggrieved is not satisfied with the solution provided Tier 1 he may escalate it to Tier 2: Zone Level.

Tier 2: Zone Level: The Chief Engineer cum GM of the respective Zone and all the Superintending Engineers of the Zone would be the members of Tier 2 level. They would hear the aggrieved and also review the proceedings of the Division Level and provide relief to the aggrieved. The entire process would be completed within 45 days of the compliant being referred to Tier II. Unsatisfied with the solution the Complainant can approach the Tier III: GRC Level.

Tier 3: Grievance Redresses Cell (GRC): The GRC for JPSIP would be housed at the JPSIP-PIU. The cell would be headed by the Managing Director or his representative not below the rank of Director (Projects). It would have the Director Projects, JUSNL Chief Engineer (Transmission (O&M), Superintendent Engineer, JPSIP-PIU, Executive Engineer (JPSIP-PIU) as members. The respective Chief Engineer of the Zone from where the complaint has been lodged would be an invited member. Hearing the compliant the GRC would provide its decision. The process at the GRC would be completed with 60 days of the complaint being registered in Tier 3.

Court of Law: If the grievance/ complaint is not resolved at GRC Level or the complainant is not satisfied with the solution provided by GRC, the person may approach the Court of Law.

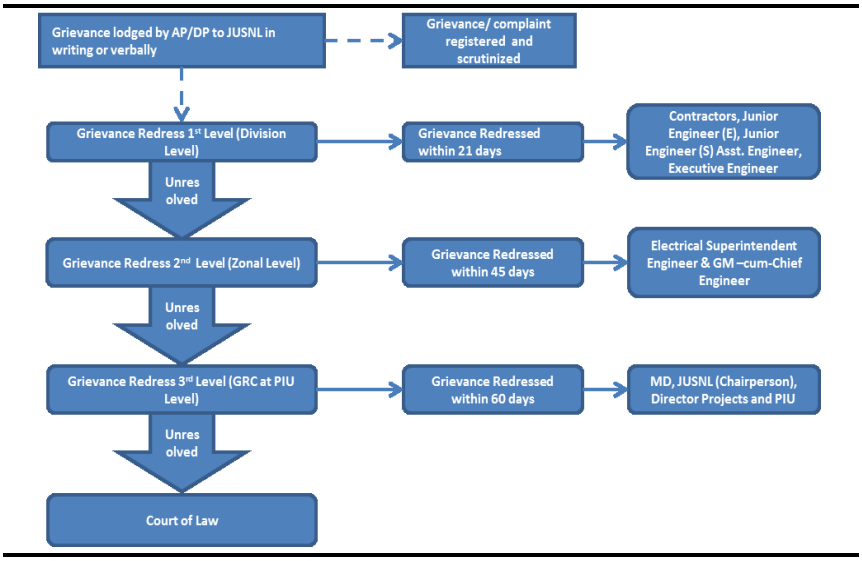
Mechanism for GRM

All complaints would be registered respective Junior Engineer in charge of the site. The complaints can be registered verbally (in person), in writing or by mail. The addresses of the Tier 1: Divisional Office /email would be displayed at the site. The complaints received would be record in a Register of Complaints along with the description of compliant, date, Name of the Aggrieved along with the contacts. The decision/s regarding the complaint would also be recorded in the register. The decision regarding the Grievance would be communicated to him by Speed Post within 7 days of the decision being reached. The complaint would have 7 days from the receipt of the letter to approach the next level for reconsideration.

GRM Budget

All costs involved in resolving the complaints/grievances (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned JPSIP; while costs related to escalation of grievances to Court of Law would be met by JUSNL. Cost estimates for grievance redress are included in resettlement cost estimates.
The grievance redressal process is illustrated in. **Figure 4.5.**

Figure 4.5 Grievance Redress Process



4.3 CONSULTATION AND DISCLOSURE

Through the process of consultation and disclosures, JPSIP would envisage to build participation of stakeholders' at each stage of project planning and implementation. JPSIP would be responsible not only for ensuring participation of the community in the consultation process but to make it effective ensure integration of the feedback received from stakeholder into the project plans where it deems fit.

4.3.1 *Consultation*

A Consultation Framework has been prepared to ensure involvement of stakeholders' at each stage of project planning and implementation. To ensure community participation at different stages of the project the Consultation framework for JPSIP has been proposed in Table 4.1.

Table 4.1 Summary of Consultation Framework

Project Phase	Activity	Details	Responsible Agency	Target Stakeholders
Conceptualisation	Screening Surveys	Identification of the Environmental and Social Sensitive Areas which needs to be excluded	Environmental and Social Consultant	JUSNL Circle/Divisional Office, Forest Department, District Land Revenue Office.
	Stakeholder Mapping	Cross-section of stakeholders to be identified in order to facilitate their participation in the subproject	Environmental and Social Consultant	JUSNL Circle/Divisional Office, Forest Department, District Land Revenue Office.
	ESMF Disclosure	Reference	Environmental	JUSNL

Project Phase	Activity	Details	Responsible Agency	Target Stakeholders
		Framework for JPSIP Environmental & Social Sensitivities Issues and & Mitigations in JPSIP Procedures to be followed	and Social Consultant	Circle/Divisional Office, Divisional Forest Office, District Land Revenue Office, District Magistrate
Planning	Detailed Surveys	Identification of the Environmental and Social Sensitivities which needs to be avoided	Environmental and Social Consultant	Local Land Revenue officer , Village Panchayat, Local Community people
	Stakeholder meetings	Stakeholder meetings for determining land compensation value	Contractor along with JUSNL Sub-Division/ Division Level and IR Implementing Agency	
Implementation	Check Surveys	Identification of sensitivities along RoW Identification of land owners	Contractor along with the JUSNL Circle/Divisional along with IR Implementing Agency	Community People especially the Land Owners, Local Land Revenue officer , Village Panchayat
	Disclosure of Final Compensation or any other entitlements	Dissemination of translated (in local language) entitlement / compensation details along with process of disbursement		

4.3.2 Information Disclosure

The information disclosure would provide citizen centric information on the policies and the details of subprojects along with its implementation process of JPSIP. It would be carried out in accordance to the provision of the Right to Information Act 2005 and World Bank Policies on Information Disclosure. The JPSIP Information Disclosure Procedure would ensure that information concerning the JPSIP's activities is made available to the public in the absence of a compelling reason for confidentiality.

The type and timing of the disclosure, channels to be used, frequency and duration of disclosure in JPSIP are presented in

Table 4.2 Summary of Information Disclosure Plan

Project Phase	Documents to be disclosed	Frequency and Duration of Disclosure	Channels of Disclosure
Project Planning	ESMF Disclosure including the Resettlement Framework, Tribal Development Framework and Gender Action Plan	Once, after it is approved by JUSNL Board and will remain disclosed for the entire life of the project	Website of JUSNL World Bank Info shop Information leaflet to be provide during consultation meeting
Planning	Environment and Social Impact Assessment including the Environment and Social Action Plan	Once, after it is formally accepted by JUSNL and will remain disclosed during the entire lifecycle of project	Website of JUSNL World Bank Info shop JUSNL Divisional Circle Office.
	Resettlement Action Plans (if required) and Tribal Development Plans	Once, after it is formally accepted by JUSNL and approved by World Bank and will remain disclosed during the entire lifecycle of project	Website of JUSNL World Bank Info shop JUSNL Divisional Circle Office. The client would make the RP and TDP available at places such that affected persons or any other stakeholder related to the project or any civil society organisation may get access to it and in local language. Places like – DC's Office, local Gram Panchayat or Municipal Office, Section Office of JUSNL or Contractor's Office, if any
Tendering	Grievance Redresses process	Once it is formally accepted and institutionalised	JPSIP PIU, JUSNL Divisional Circle Office, Contractor's Office, local Gam Panchayat or Municipal Office
Implementation	Information regarding Land losers and their entitlements in local language (in case of land acquisition by LARR 2013/ JhLARR 2015)	Once at the start of the project and as and when demanded by the PAP	Through leaflets, or other IEC materials, especially developed for the purpose in local language One to one consultations with project affected people APs) Community consultations List of land losers along with the compensation amount to be put up at JPSIP

Project Phase	Documents to be disclosed	Frequency and Duration of Disclosure	Channels of Disclosure
			PIU, JUSNL Divisional Office /Sub-Divisional Office
	Information regarding negotiated settlement (only names of land owners)	Once at the start of the project	List of persons selling land with *Daag* Number, *Khatian N*o. and Name of Mouza will be put up at JPSIP PIU, JUSNL Divisional Office or Sub-Divisional Office
	EMP , RP/TDP Implementation Report	At regular intervals	Extracts put up at JPSIP PIU, JUSNL Divisional Office Full Report available on JPSIP/JUSNL website
Operations	Information of Hazardous Waste Generation and Disposal	Continuously for the entire life of JPSIP	JPSIP/JUSNL website and respective facilities.

4.3.3 Feedback Mechanism

The feedback of the project affected persons/citizens would be captured through the Division/Circle offices of JUSNL and conveyed to JPSIP PIU for necessary action. The feedback mechanism as discussed in the Grievance Redresses Mechanism would be used.

5 IMPLEMENTATION ARRANGEMENT

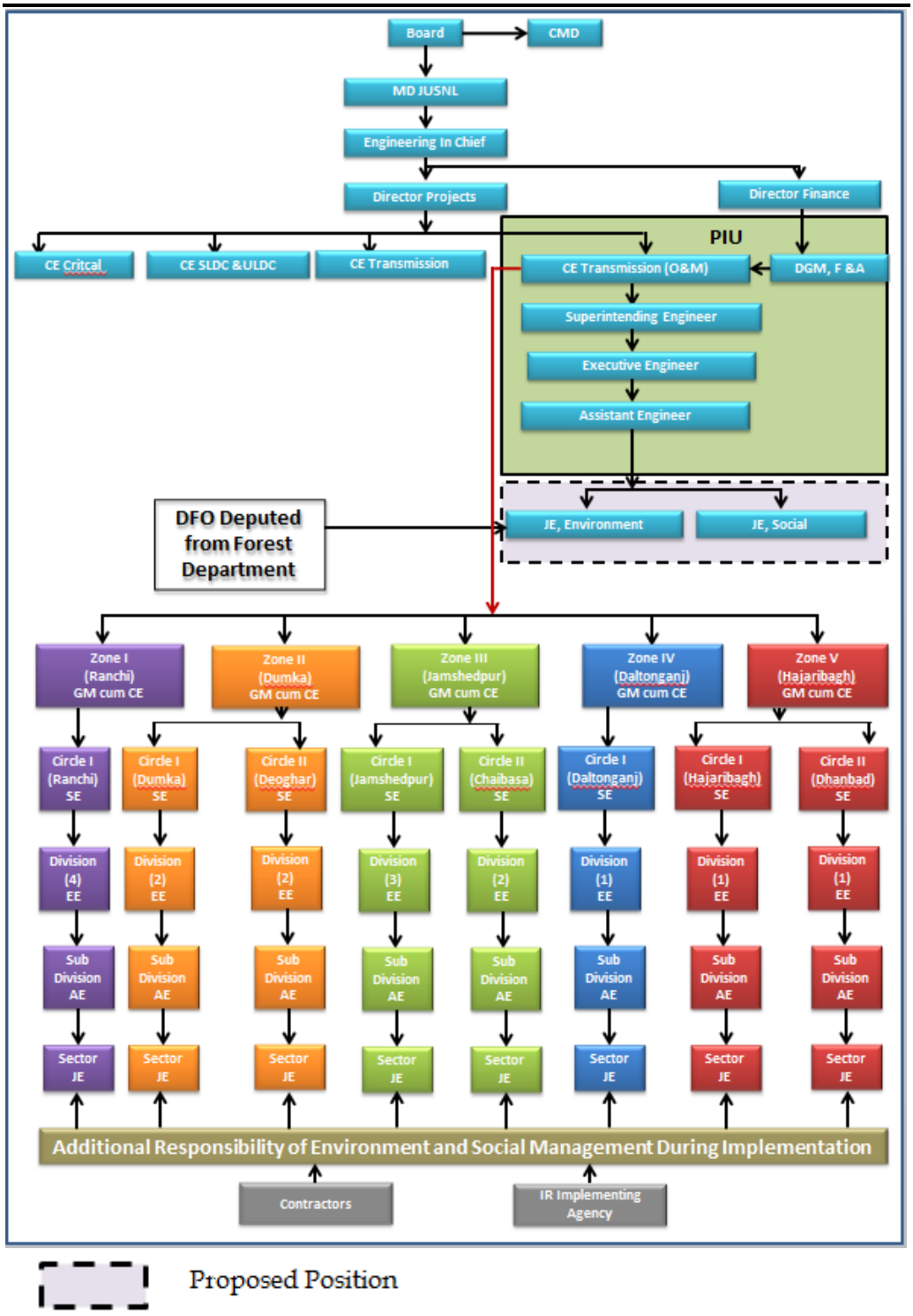
Subsequent to the detailing of safeguards measures and process which would be followed for environmental and social safeguards implementation it is necessary to define the structural mechanism for its successful implementation. The organisational structure for E&S safeguards implementation at JPSIP including the mechanism for monitoring, supervision and reporting of the E&S safeguards implementation is described in the subsequent sections.

5.1 INSTITUTIONAL ARRANGEMENT

For the implementation of the Jharkhand Power System Improvement Project JUSNL has developed a Project Implementation Unit (JPSIP PIU) .The JPSIP PIU is located at the JUSNL headquarters in Ranchi and is headed by the Chief Engineer (Transmission O&M) i.e. the Project Director(PD). Presently it includes four other members as presented ***in Figure 5.1***. The JPSIP PIU would also be responsible for driving the implementation of the E&S safeguards in JPSIP. At the field level the Divisional/ Circle offices of JUSNL who would be responsible for implementing the technical aspects of the JPSIP would also be responsible for the implementation of the E&S safeguards. In addition the Contractor implementing the subprojects would also have an Environment and Social personnel to actually carry out the E&S safeguards on the ground. The JPSIP PIU would also be assisted by Involuntary Resettlement (IR) Implementing Agency to implement the Resettlement Plan.

Further, to handle forest related issues an officer of the rank of the Divisional Forest Office (DFO) should also be deputed in the project for the purpose of coordination between JPSIP and Forest Department.

Figure 5.1 Institution Arrangements



The IR Implementation agency would assist in the implementation of the Tribal development plan, Resettlement Plan (if required).

5.2 CAPACITY BUILDING

The capacity building for the JPSIP would include both augmentation of the present institutional structure of JPSIP PIU as well as carrying out training of

the personnel to be involved in the project implementation on E&S issues in JPSIP.

5.2.1 Staffing

For the implementation of the E&S safeguards the JPSIP PIU would be additionally supported by an Environmental Officer and Social Officer of the rank of Junior Engineer. These personnel would preferably from within JUSNL having requisite qualification and experiences. However, at the field level no additional personnel would be involved in implementation of the E&S activities. The E&S safeguards implementation would be carried out by the Junior Engineer attached to the Division/Circle implementing the project. The Junior Engineer however would be trained on E&S aspects and the implementation requirements of the ESMF in JPSIP.

The Contractor would also have an Environmental Engineer and a Social Officer in the team who is implementing the project. The Environmental Engineer would be responsible for the implementation of the Environmental Management Plan and also coordinating with the Forest Department for necessary statutory clearances. Since the Contractor would also be working with JUSNL for the procurement of land the Social Office/ Officers of the Contractor would be assisting in the process of negotiations with the land owners. The preliminary consultation for the negotiated settlement would be carried out by the social officer/s of the Contractor with the oversight/supervision of the Division/Circle Office of JUSNL implementing the project.

The Resettlement Plan Implementing Agency, preferably an NGO would be primarily assisting the JPSIP PIU with the implementation of the Tribal Development Plan. However in case, some of the land for the project has to be acquired through the LARR Act 2013 the agency would assist the JPSIP PIU with the development of the resettlement plan.

The E& S responsibilities of each of the personnel their qualification required is described below:

- **Environmental Officer (Electrical Engineer with post-graduation in Environmental Engineering/Science/Management) and Social Officer (Master Degree in Social Science):**
    - Shall be responsible for providing JPSIP PIU with E&S inputs on the planning and implementation of the project;
    - Shall coordinate with the Circle/Division Offices of JUSNL in case of land procurement by negotiated settlement and guide them on the documentations required for the negotiated settlement process.
    - Shall be responsible for supervising the implementation of the Environmental and Social Management Plans including the Resettlement Plan, Ecological Management Plan and the Tribal Development Plan;

- Shall be responsible for coordinating training sessions and awareness campaigns for improving awareness on E&S Issues in the organisations i.e. JUSNL;

- Shall formulate training modules and impart training for Division Level staff;

- Shall be coordinate with the divisions for imparting such training;

- Shall be responsible for coordinating between different departments i.e. the Land Revenue Department and the Forest Department for land procurement and forest clearance respectively;

- Shall be the custodian of the Grievance Redresses Mechanism of JPSIP and maintain the process of grievance redressal. They shall maintain the records of all the grievance and action taken;

- Shall be responsible for monitoring the E& S safeguards implementation and reporting that same back to the JUSNL management and the World Bank Periodically;

- Shall coordinate with the different agencies appointed by the JPSIP PIU, for the implementation of the E&S safeguards;

- **Junior Engineer (Graduate in Electrical Engineering with training in E& S aspects)**

    - Shall liaison with the Forest department at the Divisional level to obtain Forest Clearances;

    - Shall coordinate with the Local Land Revenue Department for identification of the land owners;

    - Shall supervise the process of consultation carried out by the Contractor for obtaining the willingness of the land owner to sell the land;

    - In case of Land Acquisition (through LARR 2013) would provide the JPSIP-PIU field level inputs for verification of the Resettlement Plan

    - Shall provide the Environmental and Social Officers with technical and environmental inputs for each of the subprojects;

    - Shall provide inputs on implementation of Environmental and Social Management Plans (including Ecological Management Plan) and the Resettlement Plan and Tribal Development Plan for each subprojects;

    - Shall supervise the contractor and the implementing agency for ESMP and RP and /or TDP implementation respectively;

- Shall be the first point of contact for the Grievance Redressal Mechanism;

- Shall assist the JPSIP PIU in developing and imparting training;

- Shall send report of the Implementation of the E&S Safeguards to the JPSIP PIU;

- Shall participate in the discussion with the External Consultant for the Monitoring and Evaluation;

- **Environmental Officer(Contractor)**

    - Shall be responsible for planning and implementation of the EMP (including Ecological Management Plan if required);

    - Supporting the JUSNL Divisional Office to coordinate with the forest department for forest clearance and other statutory clearance e.g. tree felling;

    - Reporting the ESMP Implementation to the JUSNL Divisional Office;

    - Coordinate with the External Agency the process and progress of the implementation of the ESMP;

- **Social Officers (Contractor) (Degree in Social Sciences or Communication)**

    - During the carrying out of Check Surveys, liaison with the local revenue department for identification of the owners of the land parcel on which tower footing is proposed;

    - Supporting the JUSNL Divisional Office to coordinate with Land Revenue Department;

    - Carrying out consultation with the landowner to make them aware of the process of negotiated settlement and also understand their willingness to participate in the process;

    - Documenting the entire process of negotiation with land owners;

        - Provide the Third Party Assurance Agency with necessary documentation of the Land Negotiation process;
    - Reporting the ESMP Implementation to the JUSNL Divisional Office;

5.2.2 Training

Considering the present capacities of JUSNL it is also highly recommended that the JPSIP personnel including the JPSIP PIU would need additional training in the implementation of the ESMF. Institutions in the country who have substantial experience in the environmental and social management in the transmission sector including a good understanding of the WB/IFC safeguard requirements, shall conduct classroom training sessions for all staff likely to be involved in subproject planning & implementation. The training will focus on the environmental and social issues associated with the transmission sector in general and JPSIP in particular. The training which would be conducted at different stages of the project namely conceptualization, planning, implementation etc. have been described in ***Table 5.1***

Table 5.1 Training Details

Phase of Project	Type of Training	Target Group	Number of Training	Frequency	Content of Training
Conceptualisation	Sensitization	JUSNL Senior Management and JPSIP PIU including divisional offices(SE/EE)	One	Half Day	WB Policies, ESMF Requirements, Coordination with Other Department
Detailed Design	Training Workshop on ESMF Implementation	JPSIP Professionals and JUSNL Divisional Offices and the team involved in Project Implementation	Five (one in each Zone)	One day	Reference Framework for ESMF, Implementation Environmental and Social Mitigation Measures, Grievance Mechanism
Project Implementation	Refresher Training	Selected based on the E&S performance evaluated from the Monitoring and Evaluation	One every year (need based)	One day	Discussion on the observation from last year's Monitoring report

5.3 MONITORING AND REPORTING

The JPSIP PIU through the respective Division/ Circle Offices would monitor the implementation of the environmental and social safeguards in all the subprojects to ensure conformity to the requirements of the ESMF. The monitoring would be carried out through the subproject wise Monthly Progress Reports (MPR) submitted by the Division/Circle Offices of JUSNL implementing the subproject. The Environmental Officer and Social Officer of the JPSIP PIU would also visit the site regularly for the purpose of monitoring and supervision. The reporting would capture information from the Contractors and IR Implementing Agency to Division/Circle Offices and

through a graduated process of consolidations, analysis and assessment, a monthly progress report will be send by the Division Office to the Environment and Social Officers at JPSIP PIU.

The JPSIP PIU would review these monthly reports and identify technical, managerial or regulatory and safe guard issues with regards to the compliance of the ESMF provisions. The identified technical, managerial or regulatory related issues will be duly assessed by the PIU. A corrective action plan would be developed by the JPSIP PIU and debated internally to determine the appropriate interventions. These interventions would be conveyed to the JUSNL Management through a Quarterly report for approval and subsequently implemented by JPSIP PIU. The PIU would prepare a Half-yearly internal monitoring report and present it to the JUSNL Board for approval and subsequently report to the World Bank

The monthly reports will use a set of progress and output indicators to compare the progress of the project to targets set up at the commencement of the project. ***Table 5.2*** presents the Monitoring Indicators, Responsibility and Timeline for Environmental and Social Monitoring.

Table 5.2 Monitoring Indicator

Sl. No.	Project Activity/ Stage	Monitoring Indicator	Frequency	Responsibility
1	Conceptualization	• E&S Screening and Alternative Analysis considered during route selection	Concurrent Monitoring	JPSIP PIU
		• % of Projects – E&S Screening and Alternative Analysis done and it is part of Investment Report	Monthly Monitoring	JPSIP PIU
		• % of Projects where E&S Sensitive Areas have been avoided	Quarterly Monitoring	JPSIP PIU
2.	Planning	• Hotspots identified and communicated by E&S Consultant to Technical Consultant intervention identified	Concurrent Monitoring	JPSIP PIU
		• RP, TDP prepared and included in DPR		
		• % of Projects in which Hotspot Analysis carried out	Monthly Monitoring	JPSIP PIU
		• % of Projects for which ESIA, RP and TDP being prepared		
		• % of Projects in which hotpots have been avoided	Quarterly Monitoring	JPSIP PIU
		• % of Projects for which RP and TDP have been prepared		
3.	Approval & Clearance	• Forest Clearance contain all the requisite information required	Concurrent Monitoring	JPSIP PIU
		• JUSNL board approval in ESMP, TDP and RP		
		• % Projects in which Forest	Monthly	JPSIP PIU

Sl. No.	Project Activity/ Stage	Monitoring Indicator	Frequency	Responsibility
		Clearance Proposal has been prepared and submitted	Monitoring	
		• % of project which has received Stage I and Stage II forest Clarence		
		• % Projects ESMP, RP , Tribal Development Plan (if required) has been approved by JUSNL Board and Funding Agency	Quarterly Monitoring	JPSIP PIU
4.	Tendering	• Tender for IR Implementation Agency clearly indicating the deliverables	Concurrent Monitoring	JPSIP PIU
		• Tender includes provision of ESMF/ESMP		
		• Number of IR Implementing Agencies expressed interest	Monthly Monitoring	JPSIP PIU
		• Reviewing of the credentials of the IR Implementing Agenesis		
		• % of projects where ESMP has been included		
		• % of projects where RP Implemented	Quarterly Monitoring	JPSIP PIU
		• IR implementing agency on board		
		• % of project where bidders have raised quarry on ESMP clauses		
5.	Implementation	• Environmental and Social Safeguard mitigation measures implemented (RP & TDP implementation)	Concurrent Monitoring	JPSIP PIU
		• E&S implementation monitoring conducted concurrently		
		• Compensation paid as per norms		
		• Monthly monitoring reports received from IR Implementing Agency		
		• % of Projects where RP & TDP implementation process have started	Monthly Monitoring	JPSIP PIU
		• % of Projects where entitlements have been disclosed with Angle Points		
		• No. of Projects where compensation has been paid before construction		
		• No. of grievances per project registered & redressed		
		• % projects when noise monitoring carried out		
		• % of project where disposal of excavated soil carried out		
		• % of Projects implemented with safeguard compliance	Quarterly Monitoring	External Agency
		• % of Projects implemented and ready for start of construction work		

Sl. No.	Project Activity/ Stage	Monitoring Indicator	Frequency	Responsibility
		• Number of projects effectively implemented in compliance with safeguards based on the close monitoring and evaluation		
6.	Operation	• Maintenance of ground clearance to comply with limits of EMF	Concurrent Monitoring	JPSIP PIU
		• Noise level at boundary nearest to substation	Monthly Monitoring	JPSIP PIU
		• Compliance with transmission tower set back condition	Quarterly Monitoring	JPSIP PIU

5.4 EVALUATION

In addition to the internal monitoring an external evaluation of the ESMF would be carried out in JPSIP. The external evaluation would be carried out by an independent agency appointed by JPSIP. The external evaluation will also be undertaken semi-annually during the implementation of the project and at the end of the implementation. During implementation of the project, meetings would be organized by JUSNL PIU inviting all Division/ Circle Office for providing information on the progress of the project work to the External Evaluation Consultant.

The External Evaluation Report would evaluate the process of E&S Implementations e.g. Land Procurement/Acquisition, Forest Clearance, ESMP Implementation, Resettlement Plan, Tribal Development Plan Implementation. This would this help the JPSIP PIU to identify areas where the E&S Implementation needs to be strengthened. The External Consultants in consultation with the JPSIP PIU would propose corrective actions to overcome the bottlenecks in the process of E&S Safeguards Implementation.

In addition to the external agency, a Third Party would be also be appointed by JPSIP to review the process of land purchase. They would oversee the process of consultation and engagement with the land owner during the land procurement and certify the process of purchase of land has been free, fair and transparent.

5.5 COSTING FOR ESMF IMPLEMENTATION

Estimated cost of ESMF implementation is INR 1, 26, 20, 000/- considering the period of implementation of two years. Details area presented in

Table 5.3 ESMF Implementation Budget

	Item	**Details**	**Amount in INR**
1	Training	One Training at Every Zone every years for Two years (Total 50 Trainee) including training of the Environmental Officer and Social	2500000

	Item	Details	Amount in INR
		Officer for PIU JPSIP	
2	Information Disclosure	Distribution of ESMF kit to JUSNL Employee	200000
2.1		Stakeholder meeting	1000000
2.2		Disclosure of ESMF, Resettlement Plan, TPPF, GAP	1000000
3	Resettlement & Rehabilitation	Tobe estimated during ESIA	0
4	Monitoring Cost for PIU		1920000
5	IR Implementing Agency	Would be implemented in all project district	2500000
6	External Monitoring Agency	Four Half Early and End term Monitoring	3500000
		Total	12620000

Annex 1

List of Sub Projects in JPSIP

Annexure 1: Phase-wise World Bank Funded Project List

PHASE-I

1	132/33 Kv GSS Irba (2x50 MVA)	100	Zone-I Transferred
2	132 kV D/C Irba-Ramgarh Trans. line		50
3	132 kV D/C Irba-Kanke Trans. line		13
4	132 kV D/C Irba-Ratu Trans. line		25
5	132/33 kV GSS at Shikaripara (2x50 MVA)	100	Zone-II Transferred
6	132 kV D/C 3 Ph. Dumka - Shikaripara Trans. line		40
7	132/33 kV GSS at Silli (2x50 MVA)	100	Zone-I Transferred
8	132 kV D/C 3 Ph. Silli - Chouka Trans line		46
9	132 kV D/C 3 Ph. Silli - Sikidiri Trans line		32
10	132/33 kV GSS at Mahuadanr (2x50 MVA)	100	Zone-IV Transferred
11	132 kV D/C 3 Ph. Latehar– Mahuadanr Trans line		45
12	132/33 kV GSS at Angada (2x50 MVA)	100	Zone-I Transferred
13	132 kV D/C 3 Ph. Silli–Angada Transmission line		43
14	132 kV D/C 3 Ph. Angada–Sikidiri Trans. line		50
15	132/33 kV GSS at Jarmundi (2x50 MVA)	100	Zone-II Transferred
16	LILO of 132 kV D/C 3 Ph. Dumka–Deoghar Transmission line at GSS Jarmundi		6
17	132/33 kV GSS at Chakuliya (2x50 MVA)	100	Zone-III Transferred
18	132 kV D/C 3 Ph. Chandil–Chakuliya Trans. line		65
19	132 kV D/C 3 Ph. Bahragora–Chakuliya Trans. line		60
20	132 kV D/C 3 Ph. Dhalbhumgarh–Chakuliya Trans. Line		25
21	132/33 kV GSS at Hansdiha (2x50 MVA)	100	Zone-II
22			Transferred
23	LILO of 132 kV Lalmatia-Dumka Trans Line at GSS Hansdiha		35
25	132 kV D/C Hansdiha-Jasidih Trans Line		52
26	132/33 kV GSS at Amarapara (2x50 MVA)	100	Zone-II
27			Transferred
28	132 kV D/C 3 Ph. Amarapara–Godda Transmission line		80
29	132 kV D/C 3 Ph. Amarapara - Pakur Trans. line		45
30	132 kV D/C 3 Ph. Amarapara–Dumka Transmission line		50

PHASE-II

1	132/33 kV GSS at Chainpur (2x50 MVA)	100	Zone-I Identified
2	132 kV D/C 3 Ph. Chainpur-Mahuandanr Tran. line		42
3	132 kV D/C Chainpur-Gumla Trans. Line		50
4	132/33 KV GSS Sundarnagar (2x50 MVA)	100	Zone-III Transferred
5	132 kV D/C 3 Ph. Sundarnagar - Jadugoda		30
6	132/33 kV GSS at Ramkanda (2 x 50 MVA)	100	Zone- IV Not Identified
7	132 kV D/C 3 Ph. Ramkanda - Garhwa Trans line		60
8	132/33 kV GSS at Chhatarpur (2x50 MVA)	100	Zone-IV Identified
9	132 kV D/C 3 Ph. Chhatarpur–Daltonganj Transmission line		50

10	132 kV D/C 3 Ph.Chhatarpur-Japla Trans.line		40
11	132/33 kV GSS at Kolebira (2x50 MVA)	100	Zone-I Identified
12	132 kV D/C 3 Ph. Kolebira–Kamdara Transmission line		40
13	132 kV D/C 3 Ph. Kolebira–Simdega Trans. line		70
14	132/33 kV GSS at Chouka(2x50 MVA)	100	Zone-III Identified
15	132 kV D/C 3 Ph. Chouka - Tamar Trans. line		40
16	132 kV D/C Chaibasa-Chakradharpur Trans. Line		22
17	132 kv D/C Nowamundi- Chaibasa Trans. Line		80
18	LILO of one ckt of 132 kV D/C 3 ph Nowamundi-Chaibasa Trans Line at 132/33 kV GSS Kendposi including 2 nos 132 kV bays		14
19	LILO of one ckt of 132 kV D/C 3 ph Chaibasa-Manoharpur Trans Line at 132/33 kV GSS Goelkera including 2 nos 132 kV bays		14
20	132 KV D/C Jadugoda old - Jadugoda New T/L		15

PHASE-III

1	132/33 kV GSS at Meral (2 x 50 MVA)	100	Zone-IV Not Identified
2	132 kV D/C Meral - Garhwa Trans. line		20
3	132/33 kV GSS at Panki (2x50 MVA)	100	Zone-IV Not Identified
4	132 kV D/C Panki - Chhatarpur trans. line		50
5	132/33 kV GSS at Nagar Untari (2 x 50 MVA)	100	Zone-IV Identified
6	132 kV D/C 3 Ph. Nagar Untari-Garhwa Trans. line		40
7	132/33 kV GSS at Kandra (2x50 MVA)	100	Zone-III Not Identified
8	LILO of 132 kV Chaibasa-Rajkharsawan at Kandra		10
9	132/33 kV GSS at Kurdeg (2x50 MVA)	100	Zone-I Identified
10	132 kV D/C 3 Ph. Kurdeg–220/132 kV Simdega GSS Transmission line		45
11	132 kV GSS at Chandwa (2x50 MVA)	100	Zone-IV Identified
12	132 kV D/C Chandwa – Latehar Trans. Line		30
13	132/33kV GSS at Sarath (2 x 50 MVA)	100	Zone-II Identified
14	132k DC Sarath-Palojori TL		24
15	132k DC Sarath-Madhupur TL		30
16	132k DC Sarath-Chitra TL		20
17	132/33kV GSS at Surda (2 x 50 MVA)	100	Zone-III
18	132k DC Surda-Jadugoda TL		19
19	132k DC Surda-Musabani (DVC) TL		5
20	132/33kV GSS at Naudiha (Palamu) (2 50 MVA)	100	Zone-IV
21	132k DC Naudiha-Panki TL		74
22	132k DC Naudiha-Chhatarpur TL		19
23	132/33kV GSS at Narayanpur (Devipur) (2 x 50 MVA)	100	Zone-II
24	LILO of 132kV DC Jamtara-Madhupur TL at Narayanpur (Devipur)		12

Annex 2

Policies and Regulations Applicable to JPSIP

The policies of the World Bank for environmental and social safeguards are presented in the following sections:

WORLD BANK POLICIES

OP 4.01: Environmental Assessment

The policy on environmental assessment (EA) states that all projects proposed for financing by the World Bank would require an EA to ensure that they are environmentally and socially sound and sustainable. Various instruments are used to perform the EA depending on the complexity of the project. The level of assessment required would be determined by a screening and scoping exercise.

OP 4.04 Natural Habitats

This policy affirms World Bank's commitment to promote and support natural habitat conservation and improved land use, and the protection and rehabilitation of natural habitats and their functions in project financing. The Bank does not support projects that involve significant conversion or degradation of critical natural habitats.

OP 4.10 Indigenous Peoples

The World Bank Operational Policy (OP 4.10) on tribal population contributes to the mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of tribal People (Indigenous Peoples). For all projects that are proposed for Bank financing and affect Tribal (Indigenous) Peoples, the Bank requires the borrower to engage in a process of free, prior, and informed consultation. The Bank advocates free, prior, and informed consultation results in broad community support to the project by the affected tribal peoples. Policy includes (a) avoid potentially adverse effects on the Tribal (Indigenous) Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Tribal People receive social and economic benefits that are culturally appropriate and gender and intergenerational inclusive.

The policy suggests the following for project preparation:

Early Screening: Early in project preparation, a screening is carried out to determine whether Tribal Peoples are present in, or have collective attachment to, the project area;

Social Assessment: Based on the screening the Borrower needs to undertake social assessment to evaluate the project's potential positive and adverse effects in the Tribal Population (TP).

Consultation and Participation: Where the project affects Tribal Peoples, the borrower engages in free, prior, and informed consultation with them.

Indigenous Peoples Plan/ Tribal Development Plan (TDP): On the basis of the social assessment and in consultation with the affected Tribal (Indigenous) Peoples' communities, the borrower prepares an Tribal Development Plan (TDP) that sets out the measures through which the borrower will ensure that (a) tribal Peoples affected by the project receive culturally appropriate social and economic benefits; and (b) when potential adverse effects on Tribal Peoples are identified, those adverse effects are avoided, minimized, mitigated, or compensated for. The TDP is to be integrated into project design.

OP 4.12: Involuntary Resettlement

The policy tries to avoid or minimize involuntary resettlement to the extent feasible exploring all viable alternative project designs. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs. Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

OP 4.11 - Physical Cultural Resources

The policy tries to preserve Physical Cultural Resources (PCR) and in avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic, or other cultural significance.

OP 4.36: Forests

The objective of this policy is to realize the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests.

WB EHS Guidelines for Electric Power Transmission

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new

facilities by existing technology at reasonable costs. The EHS Guidelines for Electric Power Transmission include information relevant to power transmission between a generation facility and a substation located within an electricity grid.

The environmental issues which need to be addressed during the construction and decommissioning phases of power transmission systems include:

- Construction site waste generation;
- Soil erosion and sediment control from materials sourcing areas and site preparation activities;
- Fugitive dust and other emissions (e.g. from vehicle traffic, land clearing activities, and materials stockpiles);
- Noise from heavy equipment and truck traffic;
- Potential for hazardous materials and oil spills associated with heavy equipment operation and fuelling activities.

Environmental issues during the construction phase of power transmission and distribution projects specific to this industry sector include the following:

- **Terrestrial habitat alteration:** The construction and maintenance of transmission line rights-of way, especially those aligned through forested areas may result in alteration and disruption to terrestrial habitat, including impacts to avian species and an increased risk of forest fires.

- **Avian and Bat Collisions and Electrocutions:** The combination of the height of transmission towers and distribution poles and the electricity carried by transmission and distribution lines can pose potentially fatal risk to birds and bats through collisions and electrocutions. Avian collisions with power lines can occur in large numbers if located within daily flyways or migration corridors, or if groups are traveling at night or during low light conditions (e.g. dense fog). In addition, bird and bat collisions with power lines may result in power outages and fires.

- **Aquatic habitat alteration:** Power transmission and distribution lines, and associated access roads and facilities, may require construction of corridors crossing aquatic habitats that may disrupt watercourses and wetlands, and require the removal of riparian vegetation. In addition, sediment and erosion from construction activities and storm water runoff may increase turbidity of surface watercourses.

- **Electric and magnetic fields:** Although there is public and scientific concern over the potential health effects associated with exposure to EMF (not only high voltage power lines and substations, but also from everyday household uses of electricity), there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern.

- **Hazardous materials:** Hazardous materials in this sector include insulating oils / gases (e.g. Polychlorinated Biphenyls [PCB] and sulfur hexafluoride [SF6], and fuels, in addition to chemicals or products for wood preservation for poles and associated wood construction material. The use of herbicides for right-of-way vegetation maintenance is discussed in the above section on 'Right-of– Way Maintenance'.

Occupational health and safety hazards specific to electric power transmission and distribution projects primarily include:

- Live power lines
- Working at height
- Electric and magnetic fields
- Exposure to chemicals

In addition to general health and safety standards outlined in the General EHS Guidelines, the operation of live power distribution lines and substations may generate the following industry-specific impacts:

- **Electrocution:** Hazards most directly related to power transmission and distribution lines and facilities occur as a result of electrocution from direct contact with high-voltage electricity or from contact with tools, vehicles, ladders, or other devices that are in contact with high-voltage electricity.

- **Electromagnetic interference:** The corona of overhead transmission line conductors and high frequency currents of overhead transmission lines may result in the creation of radio noise. Typically, transmission line rights-of –way and conductor bundles are created to ensure radio reception at the outside limits remains normal. However, periods of rain, sleet or freezing rain sharply increases the streaming corona on conductors and may affect radio reception in residential areas near transmission lines.

- **Visual amenity:** Power transmission and distribution are necessary to transport energy from power facilities to residential communities, but may be visually intrusive and undesirable to local residents.

- **Noise and Ozone**: Noise in the form of buzzing or humming can often be heard around transformers or high voltage power lines producing corona. Ozone, a colourless gas with a pungent odour, may also be produced.

- **Aircraft Navigation Safety:** Power transmission towers, if located near an airport or known flight paths, can impact aircraft safety directly through collision or indirectly through radar interference.

INDIAN LEGAL REQUIREMENTS-ENVIRONMENT

Constitution of India

Article 51 A of the Directive Principles of State Policies indicate that it will be the duty of each citizen of India has to protect the natural environment including the forest lakes rivers and wildlife and to have compassion for all living creatures.

Article 47 of the Constitution requires not only a protectionist stance by the state but also seek the state to seek improvement of the polluted environment. To uphold the principle, legislations have been enacted which have implication of the planning, construction, operation and maintenance of transmission lines. The spirit of the legislation has further been clarified through administrative notifications and judgements in different courts of laws. These legislations, notifications and judgements pertaining to environmental protection are described below.

The Electricity Act 2003

This Act provides the framework for power sector development by measures conducive to the industry. However, the Act does not explicitly deal with environmental implications of activities related to power transmission and construction of substation. JPSIP shall integrate the environmental and social protection/aspects as a part of its project activities while planning, designing, implementation operation and maintenance of its transmission and substation schemes. The applicable legal provisions under the act are:

- **Section 68 – Under the provisions of EA, 2003:** Prior approval of the Govt. of Jharkhand under section (u/s) 68(1) of EA, 2003 is a mandatory requirement to undertake any new transmission project in the State which authorizes JUSNL to plan and coordinate activities to commission a new Transmission project.

- Section 164 – Under this section Jharkhand Government, may by order in writing, authorize JUSNL for the placing of electric line for the transmission of electricity confer upon licensee (i.e. JUSNL) in the business of supplying electricity under this act subject to such conditions and restrictions, if any, as Jharkhand Government may think fit to impose and to the provisions of the Indian Telegraph Act, 1885, any of the power which the Telegraph authority possesses.

Rights of Way and Compensation under Electricity Act, 2003

The act has a provision for notifying transmission company under section 164 (B) to avail benefits of eminent domain provided under the Indian Telegraph Act, 1885.

The Biological Diversity Act 2002

The GoI has enacted the Biological Diversity Act, 2002, following the Convention on Biological Diversity signed at Rio de Janeiro in 1992 of which India is a party.

This act is not directly applicable to transmission projects because it deals with the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith. However, JUSNL is fully conscious of the provisions of this enactment and will avoid locating projects in areas identified for conservation.

Jharkhand Biological Diversity Rules 2007

Pursuant to the provisions of the Act, the State is empowered to formulate the rules. The state is empowered to "lay down procedure and guidelines to govern the activities" in areas which are rich in bio-diversity.

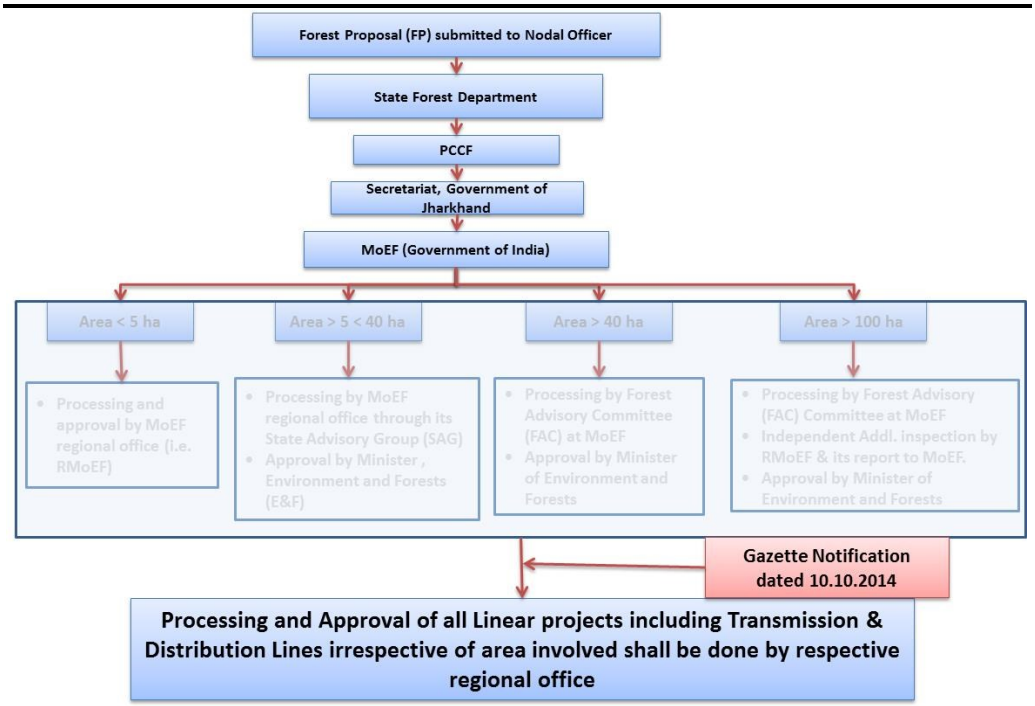
Wild Life Protection Act, 1972, as amended

The Act provides for the protection of wild animals, birds and plants; and would also include the activities which can have impacts on wildlife. The provisions of the Wildlife Act have father been elaborated through the different judgments in the Courts of law and the notifications issues by MoEF from time to time. JUSNL would abide by the provisions of the act as also the judgment/circulars provided under the Act. Supreme Court in its order dated 13th November 2000 adjudicated that for consideration of transmission projects involving diversion of land within any notified ecologically sensitive areas viz. National Parks, Wild Life Sanctuaries etc. recommendation/ permission of Standing Committee of National Board of Wild Life (NBWL) is mandatory as per the WLP and associated Court rulings.

Forest Conservation Act, 1980 & Forest Conservation Rules, 2003 (as amended) & corresponding orders and judgements

This Act provides for the conservation of forests and regulates the diversion of forest land to non-forestry purpose. When any transmission line traverses forest land, prior clearance is mandatorily required from Ministry of Environment and Forests (MoEF), GoI under the Forest (Conservation) Act, 1980. The approval process of forest clearance in brief, as per set procedure in the guideline under the act and rules is shown in figure below.

Forest Clearance Approval Process



Note: MoEF has made online submission of application mandatory w.e.f. 15th August 2014

Guidelines for Laying Transmission Lines through Forest Areas

Efforts are usually made to avoid forest areas during the planning of transmission lines. However, if it is unavoidable the efforts should be made to adopt such a route of transmission line which involves minimum disturbance to the natural habitats. Guidelines to these effects have been issued by MoEF. JPSIP would follow those guidelines for maintaining width of RoW and also vertical clearance between trees and conductors keeping in view sag and swing of the conductors.

Right of Way (RoW) Way for the transmission line is dependent on the line voltage. The maximum permissible width of RoW on forest land and minimum clearance between Trees and conductors as specified in IS: 5613 and by MoEF guidelines are presented in table below respectively.

Width of ROW of transmission line passing on forest land

Sl. No.	Transmission Voltage (In kV)	Width of Right of Way (RoW) (in meter)
1.	33 kV	15
2.	66 kV	18
3.	110 kV	22
4.	132 kV	27
5.	220 kV	35
6.	400 kV S/C	46
7.	400 kV D/C	46
8.	+/- 500 kV HVDC	52
9.	765 kV S/C (with delta configuration)	64
10.	765 kV D/C	67

Sl. No.	Transmission Voltage (In kV)	Width of Right of Way (RoW) (in meter)
11.	+/- 800 kV HVDC	69
12.	1200 kV	89

Source: Guidelines for diversion of forest land for non-forest purposes under the Forest (Conservation) Act, 1980- Guidelines for laying transmission lines through forest Areas - reg., F. No.7-2s/29I2-FC, Government of India, Ministry of Environment and Forests (FC Division), Dated: 5a May, 2014

Clearance between conductor of transmission line and trees

Sl. No.	Transmission Voltage (In kV)	Minimum clearance between conductor and trees (in meter)
1.	33 kV	2.8
2.	66 kV	3.4
3.	110 kV	3.7
4.	132 kV	4.0
5.	220 kV	4.6
6.	400 kV S/C	5.5
7.	+/- 500 kV HVDC	7.4
8.	765 kV	9.0
9.	+/- 800 kV HVDC	10.6
10.	1200 kV	13.0

Source: Guidelines for diversion of forest land for non-forest purposes under the Forest (Conservation) Act, 1980- Guidelines for laying transmission lines through forest Areas - reg., F. No.7-2s/29I2-FC, Government of India, Ministry of Environment and Forests (FC Division), Dated: 5a May, 2014

Ancient Monuments & Archaeological Sites and Remains Act, 2016

The Act has been enacted to prevent damage to archaeological sites and its maintenance. It also places restriction on activities which can cause harm to the monument /property. The law is however applicable only in monuments identified by the Archaeological Survey of India.

Indian Treasure Trove Act, 1878

This act interprets treasure as anything of value hidden in the soil and provides for procedures to be followed in case of finding of any treasure, archaeological artefacts etc. during excavation.

Jharkhand Ancient Monuments and Archaeological Sites, Remains and Art Treasures Act, 2016

This Act prevents construction of any structure or building or carrying out mining, quarrying, excavating, blasting or any operation of a like nature inside archaeological site.

Environment (Protection) Act, 1986

The Environment (Protection) Act 1986 was introduced as umbrella legislation for the protection and improvement of environment. The Act and the Rules require that environmental clearance is obtained for specific types of new projects or expansion of existing projects (addressed under Environmental Impact Assessment Notifications, 1994 and 2006) and for submission of an environment statement to the State Pollution Control Board (SPCB) annually.

However, Environmental clearance is not applicable to power transmission project.

Transmission lines are not listed as an activity under the EIA Notification 2006 and hence do not require an EIA to be conducted. However, they require complying with some of the provisions of the Environment (Protection) Act 1986. JPSIP will comply with these provisions and will function within permissible standards of ambient air quality and noise levels as prescribed by national laws.

The other relevant rules and regulations under the Environment (Protection) Act 1986 applicable to the operations of JPSIP are described below:

Ozone Depleting Substances (Regulation and Control) Rules, 2000

By notification dated 17th July, 2000 under the Environment (Protection) Act 1986, the MoEF has notified rules for the regulation/ control of Ozone Depleting Substances (ODS) under the Montreal Protocol. As per the notification, certain control and regulation has been imposed on manufacturing, import, export, and use of these compounds.

JUSNL shall follow the provisions of the notification and shall phase out all equipment, which uses these substances, and shall aim for CFC free organisation in the near future.

Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

These rules classify used oil as hazardous waste, thus would require proper handling and disposal. JUSNL would abide by the provisions of these rules during the handling of used transformer oils. In case it is decided to outsource the process of recycle of used oil to registered recycler as per the provisions of notification. JUSNL shall submit the desired return in prescribed form to concerned State Pollution Control Board at the time of disposal of used oil.

E-Waste (Management) Rules, 2016

It is the responsibility of the bulk consumer to ensure that e-waste generated is channelized through collection centre or dealer of authorised producer or dismantler or recycler or through the designated take back service provider of the producer to authorised dismantler or recycler. JUSNL, being a bulk consumer of electrical and electronics equipment shall maintain the record as per Form-2 for scrutiny by State Pollution Control Board. JUSNL, being the bulk consumer of electrical and electronic equipment listed in Schedule I of the Act, shall file annual returns in Form-3, to the Jharkhand State Pollution Control Board on or before the 30th day of June following the financial year.

Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006

The act recognizes and vests the forest rights and occupation in forest land to forest dwelling. Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded, and provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land.

The definitions of forest dwelling Schedule Tribes, forestland, forest rights, forest villages, etc. have been included in Section 2 of the Act. The Union Ministry of Tribal Affairs is the nodal agency for implementation of the Act while field implementation is the responsibility of the government agencies. The applicability of the act linked with forest clearance process under Forest (Conservation) Act, 1980 shall be followed by JUSNL.

LEGAL REQUIREMENT –SOCIAL

Fifth Schedule

The basic thrust of the Fifth and Sixth Schedule of the constitution is the protection of cultural distinctiveness of Tribal. It also provides protection to the tribal on account of their economic disadvantages so that they could maintain their tribal identity without any coercion or exploitation. The interests of Schedule Tribes outside the North east is protected by Fifth Schedule The fifth schedule designates "Schedule areas" in large parts of India in which the interests of the "Scheduled Tribes" are to be protected. The Scheduled area has more than 50 percent tribal population.

The Fifth Schedule being a very important provision of the constitution deals with the control and administration of the Schedule Areas. Some of the important features of the Schedule are:

- It deals with provision for the constitution of a Tribes Advisory Council.
- The Governor has the power to adapt laws passed by Parliament and State legislature in such a way that it suits these areas.
- It provides Governor with the power to make regulation for good governance and peace for the area.

The Fifth Schedule also deals with the extension of direction by the Union to a State for the administration of the Schedule Areas.

5.5.1 The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR 2013)

(i) Govt. of India has notified the RFCTLARRA, 2013 for acquisition of private land and resultant rehabilitation and resettlement to the project affected

persons. This act has replaced the old Land Acquisition Act, 1894. The act has come into force from 1st January 2014. The aims and objectives of the Act are:

- To ensure, in consultation with institutions of local self-government and Gram Sabhas established under the Constitution of India, a humane, participative, informed and transparent process for land acquisition for industrialization, development of essential infrastructural facilities and urbanization with the least disturbance to the owners of the land and other affected families.

- To provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or are affected by such acquisition.

- To make adequate provisions for such affected persons for their rehabilitation and resettlement.

- To ensure that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post-acquisition social and economic status.

- The act also includes not only the title holders but also those who are likely to lose their livelihoods as a result of the project intervention induced land acquisition.

The act i.e. RFCTLARRA, 2013 authorizes State Govt. or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Action Plan for R&R (i.e. Rehabilitation and Resettlement) & its implementation. JUSNL's responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation.

(ii) Safeguards against land acquisition: Conducting Social Impact Assessments (SIA) has been made mandatory under this new act and results of these assessments are shared with all the stakeholders and public hearing held which makes the process transparent and informed. Subsequently, an entitlement package that includes both compensation (for land/structure and assets to land and structure) and R&R as necessary is prepared. Further to this individual awards are passed and all documents are disclosed in the public domain through local administration and internet.

The requiring body (i.e., in this case the JUSNL) will initially identify and select the required land in consultation with Revenue Department and submit the requisition to provide necessary land for establishing a substation. The State Government shall identify or establish State Social Impact Assessments Unit (SIA), which shall be responsible for ensuring

that Social Impact Assessments are conducted by such person or bodies other than the Requiring Body as per the provisions of the Act for all cases of land acquisition under the Act. The SIA shall analyze the impact of such land acquisition and the kind of resettlement and rehabilitation required and shall also include compensation and assistances towards land acquisition or loss of any assets or livelihood for all categories of people being affected due to land acquisition. This also includes additional provisions, if applicable, for the Scheduled Tribes. No acquisition of land can be made by the State government authorities unless all compensations are paid and until resettlement and rehabilitation of the affected people is done, in consultation with the affected families/ persons.

Flow chart of the land acquisition process with schedule prescribed for various activities is illustrated in figure below.

The entitlements with regard to compensation and assistances towards land acquisition or loss of any assets or livelihood for all categories of people being affected due to land acquisition is briefly outlined in table below:

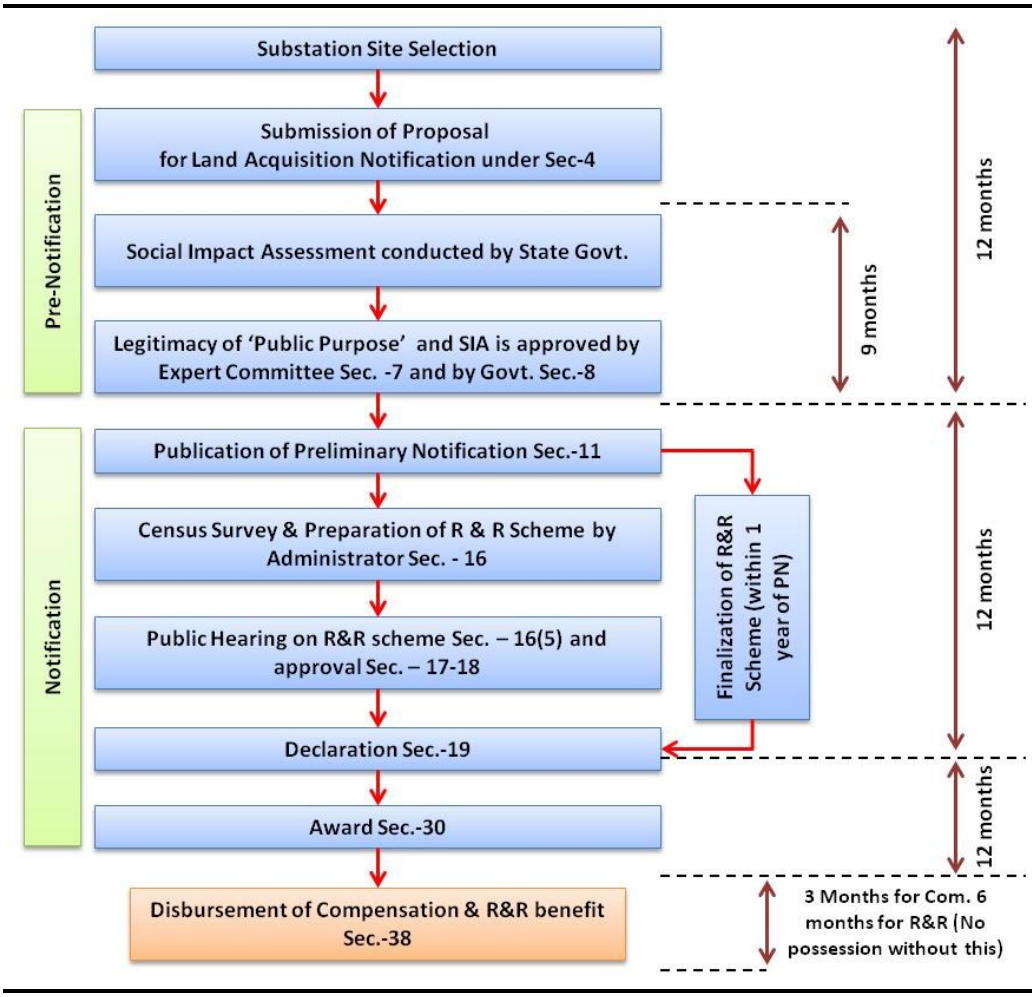
Minimum Compensation for Land Acquisition

A Comprehensive Compensation Package (First Schedule)	
The affected families Land Owners: 1. Family or company whose land/other immovable properties have been acquired; 2. Those who are assigned land by the Governments under various schemes; 3. Right holders under the Forest Rights Act, 2006	1. **Market value of the land:** a) the minimum land value, if any, specified in the Indian Stamp Act, 1899 for the registration of sale deeds in the area, where the land is situated; or b) the average of the sale price for similar type of land situated in the immediate areas adjoining the land being acquired, ascertained from fifty per cent of the sale deeds registered during the preceding three years, where higher price has been paid; or whichever is higher: Provided that the market value so calculated for rural areas shall be multiplied by a multiplier factor or scale (*) of up to 'two'. **2. Value of the assets attached to land:** Building/Trees/Wells/Crop etc as valued by relevant govt. authority; Total compensation = 1+2 **3. Solatium:** 100% of total compensation Therefore, Actual Land compensation to Affected family = 1+2 + 1x(1+2) as above

(*) Precise scale shall be determined by the State Govt.
The multiplier factor will gradually rise from 1 to 2 as we move away from Urban locations into Rural areas

Radial Distance from Urban area (Km)	Multiplier Factor
0-10	1.00
10-20	1.20
20-30	1.40
30-40	1.80
40-50	2.00

Comprehensive R&R Package (Second Schedule)		
Sl. No.	**Elements of R& R Entitlements**	**Provision**
1.	Subsistence grant/allowance for displaced families	Rs. 3000 per month per family for 12 months
2.	The affected families shall be entitled to:	a) Where jobs are created through the project, mandatory employment for one member per affected family or b) Rupees 5 lakhs per family; or c) Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; *The option of availing (a) or (b) or (c) shall be that of the affected family.*
3.	Housing units for displacement: i) If a house is lost in rural areas: ii) If a house is lost in urban areas	i) A constructed house shall be provided as per the Indira Awas Yojana specifications. ii) A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area. **In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family.** The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body
4.	Transportation cost for displaced families	Rs 50,000/- per affected family
5.	Resettlement Allowance (for displaced families)	Onetime Rs 50,000/- per affected family
6.	Cattle shed/ petty shop cost	Onetime financial assistance as appropriate for construction as decided by St. Govt. subject to minimum of Rs.25,000/-
7.	Artisan/small traders/others (in case of displacement)	Onetime financial assistance as appropriate as decided by St. Govt. subject to minimum of Rs.25,000/-
9.	Special Provisions for SCs/STs In addition to the R&R package, SC/ST families will be entitled to the following additional benefits: 1. One time financial assistance of Rs. 50,000 per family; 2. Families settled outside the district shall be entitled to an additional 25% R&R benefits; 3. Payment of one third of the compensation amount at very outset; 4. Preference in relocation and resettlement in area in same compact block; 5. Free land for community and social gatherings; 6. In case of displacement, a Development Plan is to be prepared 7. Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.	



Chota- Nagpur Tenancy Act, 1908

The following sections of the **CNT Act** describe the land holding and the transfer of land:

Section 4 of the CNT Act describes the classes of tenants.

Section 46 and 49 of the CNT Act regulates sale and purchase of tribal land.

Section 46 allows tribal to tribal land transfer but with the permission of Deputy Commissioner (DC).

Section 49 of the CNT Act allows transfer of land from tribal to non-tribal for industries and agriculture. As per the section tribal land can be sold to non tribals too but only for the purpose of putting up industries or for agriculture work — but in this case the permission requirement has been changed. Rather than Deputy Commissioners (as provided in the original Act), permission is needed from the revenue department.

However, the State has the unfettered power to acquire land in 'public interest'.

Santal Pargana Tenancy Act, 1949

The following sections of the **SPT Act** describe the land holding and the transfer of land:

Section 20 of the SPT Act, 1949 prohibits transfer, settlement or lease in any manner, unless the right to transfer is recorded in the record of rights, in respect to any raiyati holding.

Section 42 of the SPT Act is one such provision which permits eviction and restoration of possession of encroached agricultural land. The power under this Section is not administrative but statutory and has to be exercised according to the right of the parties.

HEALTH SAFETY REQUIREMENTS

Contract Labour (Regulation & Abolition) Act 1970

The Act applies to every establishment in which 20 or more workmen are presently employed or were employed on any day on the preceding 12 months as contract labour. It however does not apply to establishments where the work performed is of intermittent or casual nature. JUNSL and its contractors or sub-contractors would abide by the provisions of the act.

The Child Labour (Prohibition and Regulation) Act, 1986

This Act prohibits employment of children below 15 years of age. JUNSL its contractors and sub-contracts would abide by the provisions of the act. No child labour would be directly or indirectly employed in the project.

Minimum Wage Act, 1948 and Contract Labour Revised Wage Notification of Government of Jharkhand dated 14th December 2016

This Act provides for fixing minimum rates of wages in certain employments. Based on this Act, Jharkhand Government notifies minimum wage rate from time to time. JUSNL and its contractor would pay to all the labourers as per the minimum wage notified by labour department of Government of Jharkhand.

The Payment of Wages Act, 1936, as amended

As per the notification dated 28th January 2017 of Government of Jharkhand, every industry or other establishment should pay wages to all the employees by the cheque or by crediting the wages in his/her bank account.

Bonded Labour System (Abolition) Act, 1976

This Act provides for abolition of bonded labour system with a view to preventing the economic and physical exploitation of the weaker sections of

the people. JUNSL and its contractors would abide by the provisions of the act.

Grievance Redressal Policy under Industrial Disputes Amendment Act, 2010

Industrial Disputes Amendment Act, 2010 provides for establishment of Grievance Redressal Committee for the resolution of disputes arising out of individual grievances. JUNSL and its contractors would abide by the provisions of the act.

Employees' Provident Fund and Miscellaneous Provisions Act, 1952

This Act mandates provision of provident in all the establishment employing 20 or more persons. This Act will be applicable to JUNSL's contractor employing 20 or more persons.

Employees State Insurance Act, 1948

This Act provides for certain benefits to employees in case of sickness, maternity and 'employment injury '. As per provision of this Act, an employer is liable to pay his contribution in respect of every employee and deduct the employee's contribution from wages bill and shall pay these contributions to the ESI Corporation within 21 days of the last day of the Calendar month in which the contributions fall due. Contractors of JUNSL would abide by the provisions of the act.

The Workmen Compensation Act 1923

The Workmen's Compensation Act, 1923 provides for payment of compensation to workmen and their dependants in case of injury and accident arising out of and in the course of employment and resulting in disablement or death. JUNSL would ensure that the conditions of contracts incorporate the provisions of this act.

Maternity Benefit Act, 1961

This Act provides to regulate the employment of women in every establishment from certain periods before and after child birth and to provide for maternity benefit and certain other benefits. JUNSL's contractors would abide by the provisions of the act.

Inter-state Migrant Workmen Act 1979

This Act is formulated by GoI to regulate the employment of inter-State migrant workmen and to provide for their conditions of service. JUNSL's contractors would abide by the provisions of the act.

Intimation of Accidents (Forms and Time of Service of Notice) 2004

Taking the power from the Electricity Act 2003 these rules is formulated. It requires that any accidents related to the transmission have to be reported to the Inspectorate. JUNSL would set up procedures to comply with the provisions of these rules.

Technical Standards for Construction of Electrical Plants and Electric Lines Regulations, 2010

The Central Electricity Authority of India (CEA) is a statutory organisation constituted under the Electricity Act 2003 and advises the government on matters relating to the Policy and perspective plans for development of electricity systems. Technical standards for construction of electrical plants, electric lines and connectivity to the grid have been prepared by CEA. Even though the technical standards do not specifically deal with environment they provide guidance for planning of transmission lines.

Measures relating to Safety and Electric Supply Regulations, 2010

The Central Electricity Authority has also formulated regulations for safety of transmission lines. JUSNL would abide by these provisions to ensure safety of human as well as wildlife.

Annex 3

Equivalence of the National and State level Environmental & Social Rules and Regulations and World Bank Operational Policies

Equivalence of the National and State level Environmental & Social Rules and Regulations and World Bank Operational Policies

Sl. No.	World Bank Policy	Indian Laws	Equivalence	Comments	Additional action to ensure full equivalence
1.	<u>*OP 4.01: Environmental Assessment*</u> The OP 4.01 mandates that an environmental screening be carried out to assess the appropriate extent and type of environmental assessment required. The screening would help in categorization of the project into A, B and C. The Analysis of Alternatives conducted during the Environmental screening should also provide inputs into Techno-Economic feasibility. <u>*OP 4.02: Environmental Action Plans*</u> The OP 4.02 requires preparing and implementing an appropriate Environmental Action Plan (EAP) and revising it periodically as necessary.	• The Environment (Protection) Act, 1986. • The Environment Impact Assessment Notification, 2006 and amended till date.	Partial	The Act is overarching and the proponent need to ensure that it does create any adverse environmental and or social imapcts However as the EIA Notification 2006 the Transmission projects do not feature in the activities listed in the said notification. Therefore, carrying out an Environmental Assessment for transmission project is not mandatory.	OP 4.01 requires an Environmental Assessment to be carried out. Likewise an environmental screening would be carried out for all the sub projects as per the provisions of OP 4.01 to decide on the category of the project. The Environmental and Social Alternative analysis should be linked to the Techno-economic Feasibility analysis. The Environmental Action Plan should be prepared for the projects and to treat environmental issues. The plan need to be approved by JUSNL and be part of the Contract Document and also revised as is necessary
2.	OP 4.04 - Natural Habitats The project needs to be planned avoiding natural habitats/areas[1]. A precautionary approach needs to be adopted as pointed out in the OP 4.04. Thus alternatives alignment and design needs to be identified and assessed through a	• The Biological Diversity Act 2002 • Jharkhand Biological Diversity Rules 2007 • Forest Conservation Act, 1980 • Forest Conservation	Full	The Constitution of India states that the State and the related legislation endeavour to protect and improve the environment and to safeguard the forests	-

[1] The Draft Guidelines for linear infrastructure intrusions in natural areas: roads and powerlines (October 2013) defines natural areas as follows: 1) National Parks, 2) Wildlife Sanctuaries,3) Tiger Reserves,.4) Elephant Reserves and designated corridors,.5) Community Reserves,.6) Conservation Reserves,.7) Reserved Forests,.8) Protected Forests,.9) Unclassified State Forests,10) Wetlands and rivers,.11) Important Bird Areas,.12) Ecologically Sensitive Areas,.13) Coastal Regulation Zone,14) Grasslands of importance,.15) Other sites as may be notified by the Ministry of Environment and Forests. from time to time. In addition, areas lying in the vicinity of natural areas, lying within a 10 km radius from the boundary of the above-mentioned natural areas, except for Reserved Forests, Protected Forests, Unclassified State Forests.

Sl. No.	World Bank Policy	Indian Laws	Equivalence	Comments	Additional action to ensure full equivalence
	screening study such that there is no significant conversion or degradation of natural habitats. For the purpose of the screening study key stakeholders e.g. forest department and local MGO's and local communities need to be consulted. A mitigation plan needs to be developed for the alternative which is identified through the screening study and disclosed to key stakeholder before the appraisal process of the funding agency	Rules, 2003 (as amended) • MoEFCC Guideline dated 5th May 2015 (letter no. F.No. 7-25/2012-FC) for laying transmission line through forest areas • Supreme Court Orders Dated 30.10.2002 in respect of Compensatory Afforestation Fund in I.A. No. 566 In WP(C) No. 202/1995; and Supreme Court's Order dated 1.8.2003 in I.A. No. 826 & 859 in I.A. No. 566 in Write Petition (Civil) No. 202 • Wild Life Protection Act, 1972, as amended till date • MoEFCC Guideline dated 9th February [F. No. 1-9/2007 WL-I (pt)] regarding guidelines for declaration of eco-sensitive zones around National Parks and Wildlife		and wildlife. The procedures of the Forest Conservation Act 1980 and the Wildlife protection Act 1972 ensure the projects are adequately screened and also the local communities especially those dependent on the forest are adequately protected in case a project is taken in a forest area.	
3.	*OP 4.10 - Indigenous Peoples* Screen early to determine whether Indigenous Peoples are present in, or have collective attachment to, the project	• Scheduled Tribes and Other Traditional Forest Dwellers	Partial	The provisions of the Chota Nagpur Land Tenancy Act and the Santhal Parganas Act	A Tribal Development Plan would be developed where there is significant impact on the tribal community. This would

Sl. No.	World Bank Policy	Indian Laws	Equivalence	Comments	Additional action to ensure full equivalence
	area. Indigenous Peoples are identified as possessing the following characteristics in varying degrees: self-identification and recognition of this identity by others; collective attachment to geographically distinct habitats or ancestral territories and to the natural resources in these habitats and territories; presence of distinct customary cultural, economic, social or political institutions; and indigenous language.	(Recognition of Forest Rights) Act 2006; and MoEF letter No. 11-9/98-FC (pt.) dated 5th February 2013 • The Wild Life (Protection) Amendment Act, 2002 • The Chota-Nagpur Tenancy Act, 1908 • Santhal Parganas Tenancy Act, 1949		ensure that the land and the right fo the tribal community are adequately protected. The cultural properties and the traditional livelihood of the tribal are to certain extent protected by the Forest Rights Act 2006 and he Wild Life Protection Act 2002.	be governed by the Tribal Development Planning Framework which is part of the ESMF.
4.	*OP 4.11 - Physical Cultural Resources* Use an environmental assessment (EA) or equivalent process to identify PCR and prevent or minimize or compensate for adverse impacts and enhance positive impacts on PCR through site selection and design.	• Ancient Monuments & Archaeological Sites and Remains Act, 1958 • Indian Treasure Trove Act, 1878 • Jharkhand Ancient Monuments and Archaeological Sites, Remains and Art Treasures Act, 2016.	Partial	Assess potential impacts of the proposed project on physical, biological, socio-economic and physical cultural resources, including trans-boundary and global concerns, and potential impacts on human health and safety. However, these laws do not protect the cultural resource which are not recognised but valued by the community.	The Tribal Development Framework and Social Impact Assessment which have bene planned as part of the JPSIP has developed mechanism which would ensure all physical and cultural resources irrespective of their protection status are not adversely affected by the activities undertaken by the project.
5.	*OP 4.12 - Involuntary Resettlement* Assess all viable alternative project designs to avoid, where feasible, or minimize involuntary resettlement. Consult project-affected persons, host	• The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act,	Full	The RTFCTLARR 2013 and the other acts ensure that a Social Assessment and Resettlement Framework are being	

Sl. No.	World Bank Policy	Indian Laws	Equivalence	Comments	Additional action to ensure full equivalence
	communities and local nongovernmental organizations, as appropriate. Provide them opportunities to participate in the planning, implementation, and monitoring of the resettlement program, especially in the process of developing and implementing the procedures for determining eligibility for compensation benefits and development assistance (as documented in a resettlement plan), and for establishing appropriate and accessible grievance mechanisms. Pay particular attention to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, Indigenous Peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation. Through census and socio-economic surveys of the affected population, identify, assess, and address the potential economic and social impacts of the project that are caused by involuntary taking of land (e.g., relocation or loss of shelter, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected person must move to another location) or involuntary restriction of access to legally designated parks and protected areas.	2013 (LARR 2013) • The Chota-Nagpur Tenancy Act, 1908 • Santhal Parganas Tenancy Act		prepared. Detailed consultation would need to be required. Assess all viable alternative project designs to avoid, where feasible, or minimize involuntary resettlement.	

Annex 4

Detailed Description of Environmental and Social Baseline

ENVIRONMENTAL BASELINE

Climate

The state falls under the Tropical Monsoon climatic region. The Tropic of Cancer cuts across the state passing through the middle of the Ranchi City. The average temperature of the state is 25° C, however it varies greatly from place to place because of varying topography. There are extremities in climate in the state in two seasons- summer and winter. The hottest areas are found towards the north western part of the state around Daltonganj) and around Jamshedpur and Dhanbad cities having more than 40° C temperatures. Similarly, the state gets affected by the cold waves with less than 5° C temperature (1).

The average annual rainfall in the state is 1400 mm with more than 4/5th rainfall occurring between June to September. It also gets rainfall from the branch of monsoon from the Arabian Sea. There are also variations in rainfall varying from below 1200 mm to 1800 mm.

Physiography

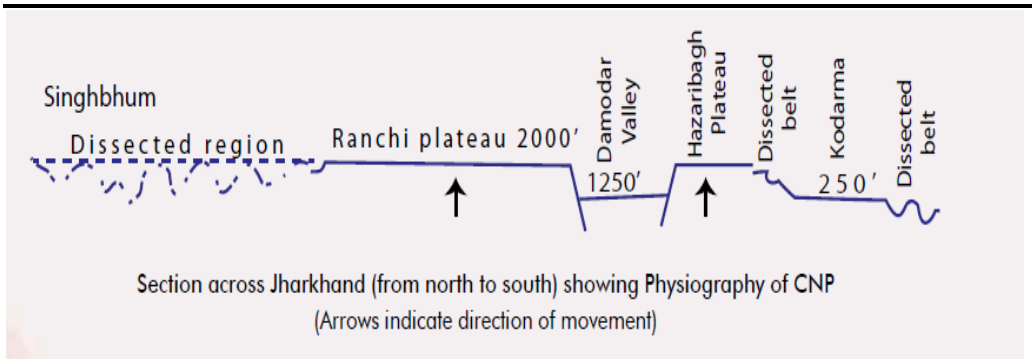
The spatial extent of Jharkhand State is approximately 21° 55′ to 25° 35′ North Latitude and 83°20′ to 88° 02′ East Longitude. The state shares its boundary with Orissa on the southeast, Chhattisgarh on the southwest, Bihar on the north, West Bengal on the east and Uttar Pradesh on the northwest.

The state of Jharkhand consists of a series of four plateaus with different heights. The highest plateau lies in the west known as Western or Higher Ranchi Plateau located at 2500 to 3600 feet above sea level covering northern part of the old Ranchi district and the southern edge of the old Palamu district. The region is full of dissected hills. The second plateau is known as Ranchi Plateau having a height of 2000 feet composed of gneisses and granites. This region is dissected at the edges caused by the waterfall at the edges. The Ranchi Plateau is separated from the Hazaribagh Plateau by the Damodar trough. The next plateau is Lower Chota-Nagpur Plateau consisting mainly of gneisses and granite and partly of schists and other Dharwar rocks. The other plateaus are the Rajmahal Hills and the Kaimur Plateau. These plateaus are separated by the narrow and steep slopes known as scarps.

Topographic cross-section of Jharkhand State is depicted in figure below.

(1) National Disaster Risk Reduction Portal, Jharkhand

Topographic Cross-section of Jharkhand



Section across Jharkhand (from north to south) showing Physiography of CNP
(Arrows indicate direction of movement)

The undulating terrain in the State of Jharkhand would influence on the planning of transmission line, if the line passes through these undulating terrain, as the mandatory minimum clearance can get compromised. Further, site preparation for transmission tower footing and substation on sloped area would increase soil erosion.

Ground Water Resources

The state of Jharkhand is primarily dependent on the ground water for drinking and agricultural purpose. In some cases industries are also dependent on ground water. Even though Jharkhand receives around 1100 mm to 1442 mm of rainfall due to is geographical setup most of it goes outside the State resulting in drought like conditions.

The state shows a 30% development of the ground water[1]. However, a block-wise Dynamic Ground Water Resource Estimation, by Central Ground water Boards till 2009 indicates that the following block of Jharkhand are over exploited, critical and semi critical stage.

Block falling under over exploited, critical and semi critical stage based on Dynamic Ground Water Resource Estimation

SL. No.	Block	District	Stage of Development	Categorization
1.	Chas	Bokaro	75.52%	Semi-Critical
2.	Ratu	Ranchi	72.49%	Semi-Critical
3.	Dhanbad	Dhanbad	92.15%	Critical
4.	Ramgarh	Ramgarh	94.29%	Critical
5.	Jharia	Dhanbad	105.63%	Over-Exploited
6.	Jamshedpur Sadar	East Singhbhum	131.39%	Over-Exploited
7.	Godda	Godda	117.39%	Over-Exploited
8.	Kanke	Ranchi	112.4%	Over-Exploited

Source: Water Resource Department, Government of Jharkhand (http://wrdjharkhand.nic.in/ground_water_resources.html)

[1] Source: Water Resource Department, Government of Jharkhand http://wrdjharkhand.nic.in/ground_water_resources.html)

It should be noted that till date none of the areas mentioned above have been notified for regulation of ground water development. During the construction of substation in these areas the use of ground water need to be restricted.

Soil Erosion

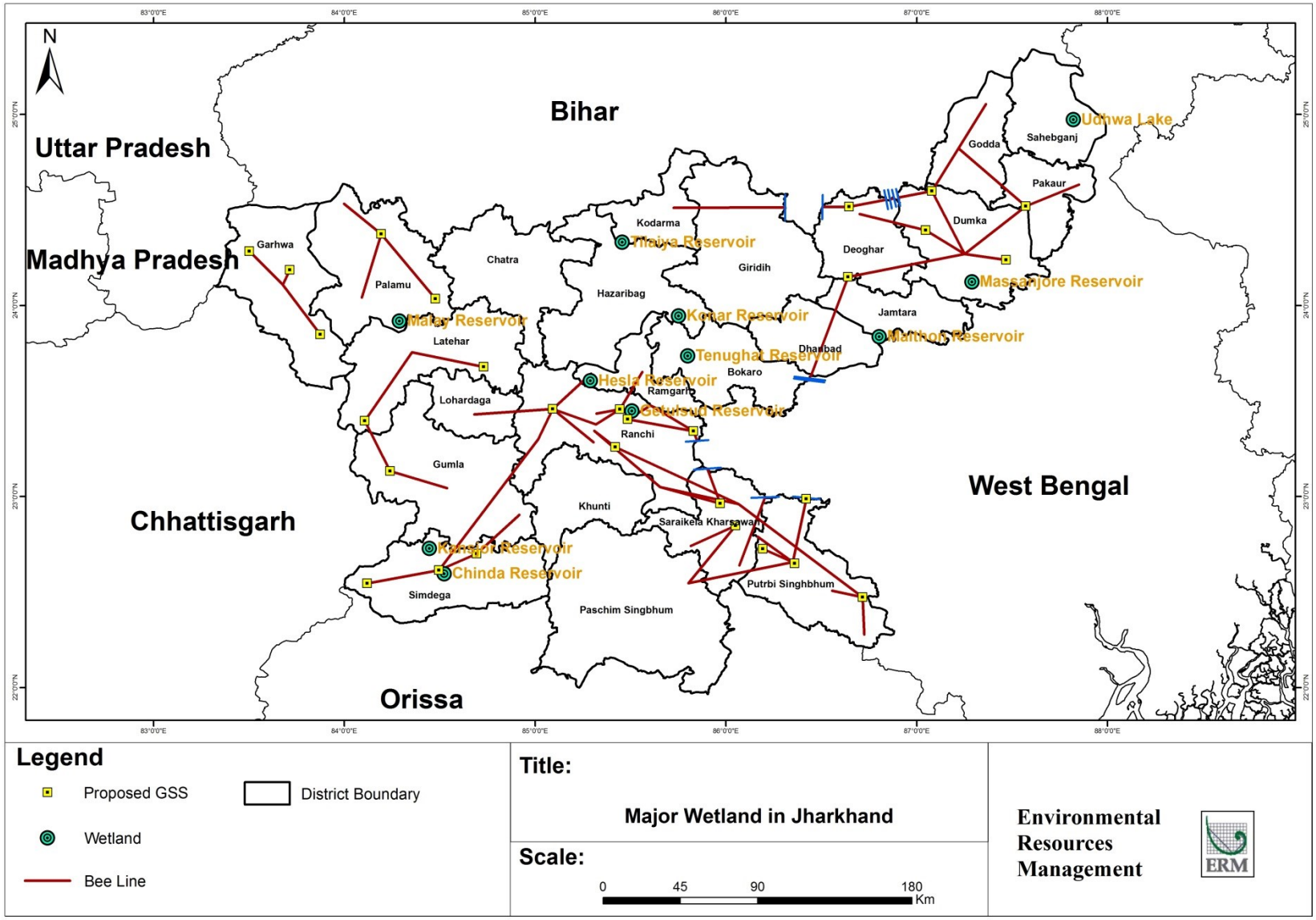
Mainly four type of soil erosion occurs in Jharkhand namely sheet erosion (1), rill erosion (2), gully erosion (3) and ravines (4). Sheet erosion is mainly observed in Pakur, Dumka, Deoghar, Giridih and Koderma district. Gully erosion can be found in Giridih, Hazaribagh, Chatra, Deoghar, Latehar and Daltonganj district. Essential precaution should be taken during planning phase to prevent erosion during the construction of the substation and towers in these areas.

Wetland

Wetland's importance to preserve biodiversity and wildlife and also support livelihood of indigenous people is unparalleled. In Jharkhand wetland, (primarily natural Lakes/Ponds, Cut-off meanders, Riverine wetlands, Waterlogged, River/Stream and manmade Reservoirs/Barrages, Tanks/Ponds, Waterlogged etc) accounts for about 2.1 % of geographical area. There are several important wetlands e.g., Udhwa Lake, Tilaya Dam, Maithon Dam, Chinda Dam, Getalsud Dam etc. present in Jharkhand. Wetlands in Jharkhand are presented in figure below.

All these areas would be sensitive in case there is significant migratory bird population in these areas. During the planning of transmission lines through these areas adequate precautions have to be taken to prevent bird hits.

(1) Sheet erosion is the uniform removal of soil in thin layers by the forces of raindrops and overland flow. It can be a very effective erosive process because it can cover large areas of sloping land and go unnoticed for quite some time.
(2) Rill erosion is the removal of soil by concentrated water running through little streamlets, or head cuts. Detachment in a rill occurs if the sediment in the flow is below the amount the load can transport and if the flow exceeds the soil's resistance to detachment.
(3) Gully erosion is the removal of soil along drainage lines by surface water runoff. Once started, gullies will continue to move by headward erosion or by slumping of the side walls unless steps are taken to stabilise the disturbance.
(4) A ravine is a landform narrower than a canyon and is often the product of streamcutting erosion. Ravines are typically classified as larger in scale than gullies, although smaller than valleys.


N
Bihar
Uttar Pradesh
Madhya Pradesh
Chhattisgarh
West Bengal
Orissa
Udhwa Lake
Sahebganj
Godda
Pakaur
Dumka
Deoghar
Jamtara
Massanjore Reservoir
Maithon Reservoir
Kodarma
Tilaiya Reservoir
Giridih
Chatra
Hazaribag
Konar Reservoir
Tenughat Reservoir
Dhanbad
Bokaro
Ramgarh
Hesla Reservoir
Garhwa
Palamu
Latehar
Lohardaga
Ranchi
Gumla
Khunti
Saraikela Kharsawan
Putrbi Singhbhum
Paschim Singbhum
Simdega
Chinda Reservoir
Legend
Proposed GSS
District Boundary
Wetland
Bee Line
Title:
Major Wetland in Jharkhand
Scale:
0 45 90 180
Km
Environmental Resources Management
ERM

Forest

As per the State of Forest Report 2015 of Forest Survey of India (FSI), forest cover (1) in Jharkhand is 23,478 km^2 which is 29.45 % of the state's geographical area. The GM Land (*Jungle Jharis*) are also considered as deemed forest and adds on to the forest cover in Jharkhand. District wise forest cover in Jharkhand is presented in table below.

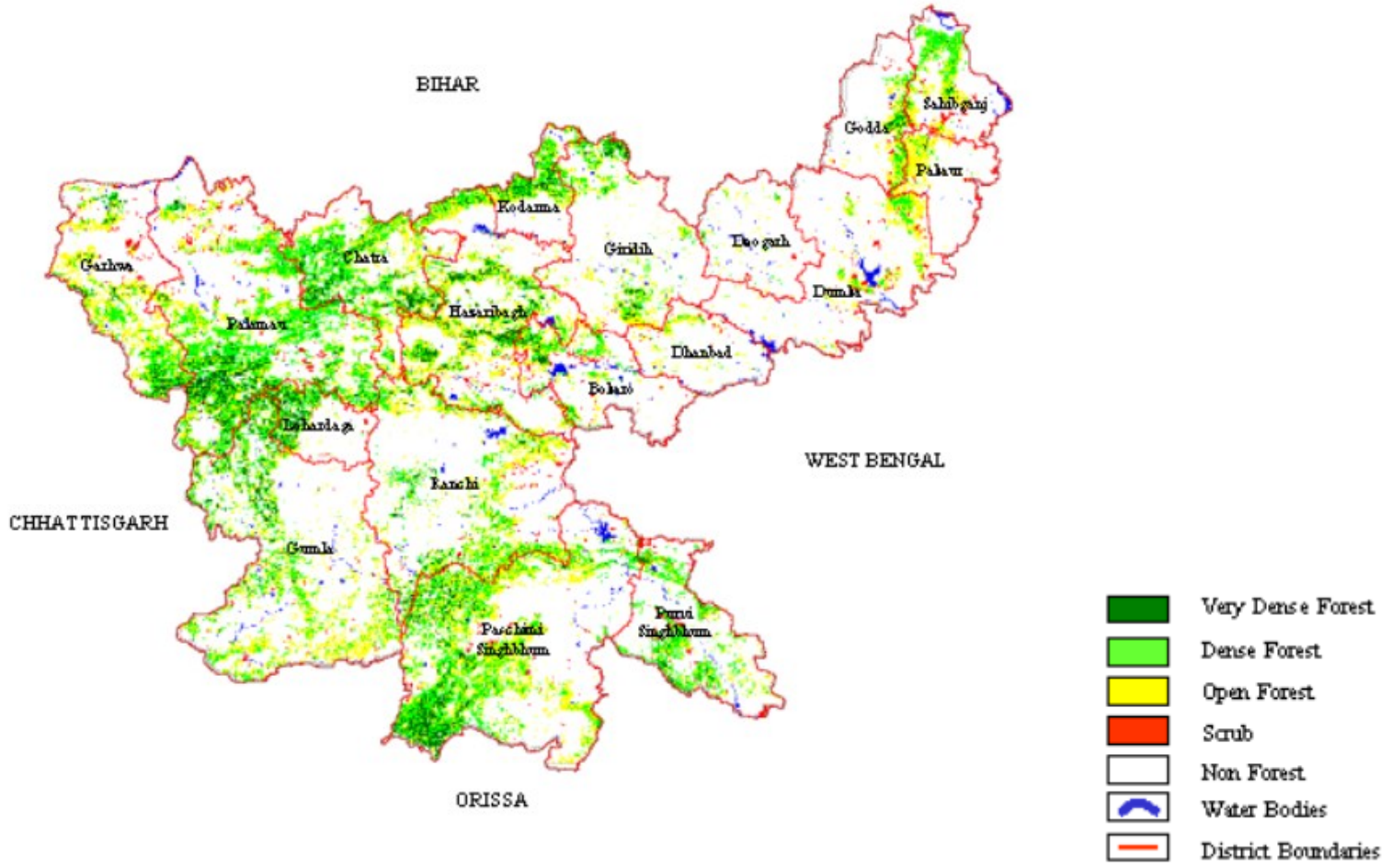
To facilitate stringing of transmission line and to maintain the safety distance the trees within the RoW would be felled. The clearance of vegetation can also contribute to the spread of invasive species. Parts of plants, seeds, and root stocks can be carried by construction equipment or vehicle when it travels through such cleared stretches. Once introduced, invasive species will likely spread and impact appropriate habitat.

Protected Area Networks

In Jharkhand 12 protected area networks consisting of 1 National Park and 11 Wildlife Sanctuaries are formed. Also there are 1 Elephant Reserve and 1 Tiger Reserve in Jharkhand. All these National Parks, WLS hold a large number of endangered and local species. All this area should be avoided during planning of transmission line to avoid impact on wildlife. The Protected area in Jharkhand is presented in figure below.

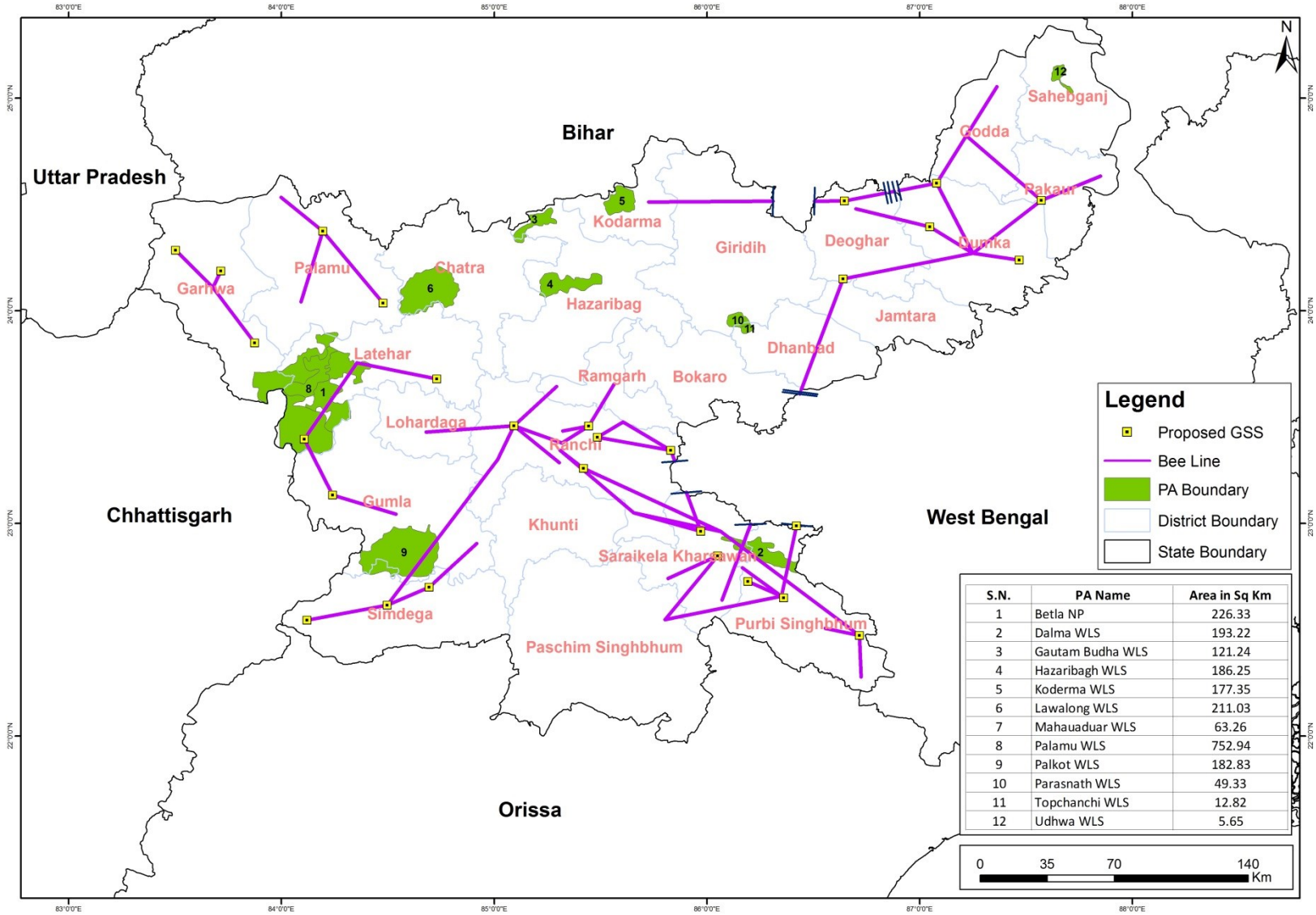
(1)All lands, one hectare and more in area, with a tree canopy density of 10 percent or more irrespective of ownership and legal status. Such lands may not necessarily be a recorded forest area. It also includes orchards, bamboo and palm (ISFR, 2013); http://www.jharenvis.nic.in/WriteReadData/CMS/jharkhand%20at%20glance.pdf

Forest Cover Map of Jharkhand



Source: http://www.fsi.nic.in/sfr2003/jharkhand.pdf

Protected Area in Jharkhand



S.N.	PA Name	Area in Sq Km
1	Betla NP	226.33
2	Dalma WLS	193.22
3	Gautam Budha WLS	121.24
4	Hazaribagh WLS	186.25
5	Koderma WLS	177.35
6	Lawalong WLS	211.03
7	Mahauaduar WLS	63.26
8	Palamu WLS	752.94
9	Palkot WLS	182.83
10	Parasnath WLS	49.33
11	Topchanchi WLS	12.82
12	Udhwa WLS	5.65

Elephant Corridors

Jharkhand has two distinct elephant populations, viz. Palamu and Singhbhum. The Palamu population occupies about 1200 km^2 of the Belta National Park, Palamu Tiger Reserve and adjoining areas. The Singhbhum population occupies about 2570 km^2 of the available forest area of Dalma Wildlife Sanctuary and forests of Saranda, Porhat, Kolhan, Saraikela and Dhalbhum forest divisions.

There are 14 elephant corridors in Jharkhand which connects elephant habitats not only in Jharkhand, but also of adjacent state of Orissa and West Bengal. In addition to these identified elephant corridors, there are several elephant corridor which are identified by Division Forest Office. Transmission lines passing through these wildlife habitats pose potential risk to wildlife. Some of these elephant corridors also recorded man-elephant conflict due to forest degradation and encroachment of corridor land by settlement and agricultural land. The location of the 14 elephant corridors in Jharkhand is presented in figure below and brief of these elephant corridors are presented in box below.

Brief of Elephant Corridor in Jharkhand

Mahilong-Kalimati: This corridor connects the forests of Mahilong Range (Jharkhand) with the Kalimati Reserve Forest (West Bengal). Length of the corridor is 7 km. and width is 2 km. Major Settlements in the corridor are Silli, Kitta, Pisca, Bhakudiha, Pusti, Kanakpur etc.

Chandil-Matha: This corridor connects the Chandil Reserve Forest (Jharkhand) with Matha Protected Forest (West Bengal). The corridor is almost degraded and has agricultural and settlement. Length of the corridor is 10 km. and width is 1-2 km.

Dalma-Chandil: This corridor connects the forests of Dalma Wildlife Sanctuary with Chandil Reserve Forest. Length of the corridor is 5 km. and width is 1 km. Major Settlements in the corridor are Patta, Chainpur, Rudia, Nagadi and Balida village.

Dalma-Rugai: This corridor connects the forests of Dalma Wildlife Sanctuary with the Rugai Protected Forest (Jorai Pahar). Length of the corridor is 1.5 km. and width is 1 km. Major Settlements in the corridor is Ramgarh village.

Jhunjhaka-Banduan: Elephant moves from Pagda and Chimti forest blocls of Dalma Wildlife Sanctuary to the Banduan Reserve Forest along this corridor. This corridor consists of patches of forest and agricultural land. Length of the corridor is 6-7 km. and width is 2 km. Major Settlements in the corridor are Jorisa and Sirka village.

Dolapani-Kankrajhor: This is the most frequently used elephant route from Dalma Wildlife Sanctuary to Midnapore district of West Bengal. Length of the corridor is 22-25 km. and width is 1-3 km. Major Settlements in the corridor are Amlasol, Makoli, Basadera, Ledasal, Burudi, Lukapani, Pachapani and Tarkadaha village.

Dumriya-Nayagram: This corridor helps to maintain connectivity of Dumriya Reserve Forest block 478 of Mosabani Forest Range with Nayagram Reserve Forest. Length of the corridor is 5-6 km. and width is 1.5 km. Major Settlements in the corridor are Rerua, Batapasi, Pukhuria, Mahulbari and Munidungri village.

Dumriya-Kundaluka and Murakanjiya: This corridor connects the Dumriya Reserve Forest with Kundaluka Protected Forest and Murakanjiya Reserve Forest. Length of the corridor is 7-8 km. and width is 2 km. Major Settlements in the corridor are Rangamati, Palasbani, Bara Kanjia, Chota Karanjia, Murakanjia, Chamraghutu, Chetamdahi, Tirildih, Mahuli and Baghasol village.

Leda-Bera: This corridor connects the elephant population of Kolhan and Porahat forest divisions. Length of the corridor is 1 km. and width is 0.3 km. Major settlements in the corridor are Jamdih, Kairam Amjharan and Torkodkocha.

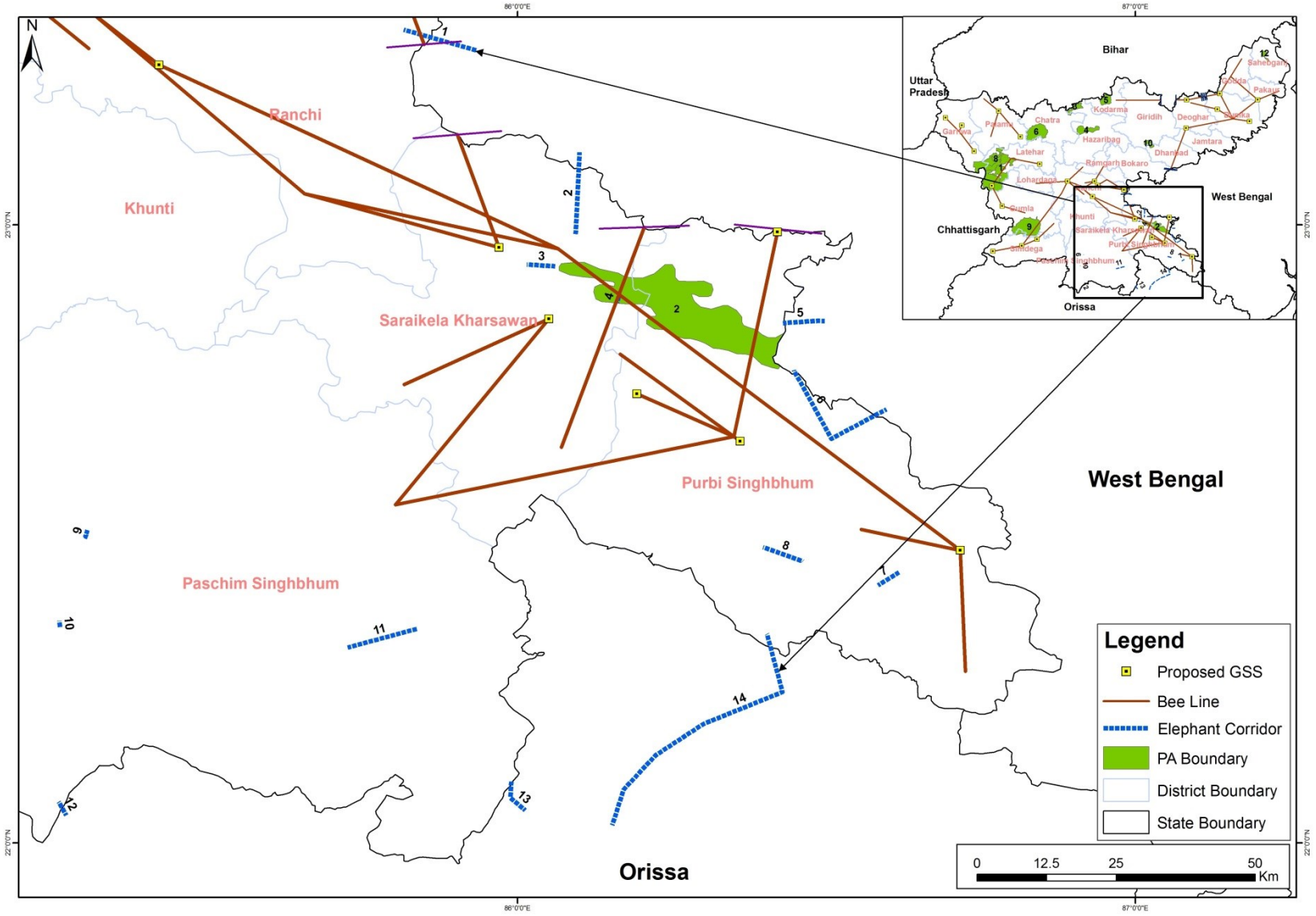
Ankua-Ambia: Elephant use this corridor to move from Saranda to Kolhan Forest Division. Length of the corridor is 1 km. and width is 2.5-3 km. There are no settlements in this corridor.

Anjadbera-Bichaburu: This corridor in South Chaibasa Forest Division connects the elephant habitats of Bichaburu Protected Forest with Anjadbera Protected Forest leading to main elephant habitat of Singhbhum Elephant Reserve. Length of the corridor is 12-13 km. and width is 2 km. There are no settlements in this corridor.

Karo-Karampada: Karo and Sidhamata Reserve Forest of Keonjhar Division (Orissa) acre connected to Karampada Reserve Forest of Saranda Division (Jharkhand) through this corridor. Length of the corridor is 2.5-3 km. and width is 2-3 km. There are no settlements in this corridor.

Badampahar-Dhobadhobin: This corridor connects Badampahar Reserve Forest of Orissa with Dhobadhobin Reserve Forest and Unduda Protected Forest of Jharkhand leading to the main elephant habitat of South Chaibasa and Kolhan. Length of the corridor is 4-5 km. and width is 1.5-2 km. Major Settlements in the corridor are Tangurusahi, Barsagutu, Jhatisere and Jatsring.

Badampahar-Karida East: This corridor connects Badampahar Reserve Forest (Orissa) with Karida East Reserve Forest (Jharkhand). Length of the corridor is 28-30 km. and width is 1-2 km. Major Settlements in the corridor are Dambeda, Kuajhari, Kendua, Tungru, Lado etc.


N
Ranchi
Khunti
Saraikela Kharsawan
Purbi Singhbhum
Paschim Singhbhum
West Bengal
Orissa
Bihar
Uttar Pradesh
Chhattisgarh
Legend
Proposed GSS
Bee Line
Elephant Corridor
PA Boundary
District Boundary
State Boundary
0 12.5 25 50
Km
86°0'0"E
87°0'0"E
23°0'0"N
22°0'0"N

Avian Fauna

The Asian Bird Survey 2015 (1) conducted in 25 selected waterbodies /reservoirs in Jharkhand had identified 78 species of wetland bird's species belonging to 19 families. Of these 26 species were resident birds and 23 were resident migrants. Among them 11 species are threatened birds [Black-bellied tern (*Sterna acuticauda*), Darter (*Anhinga melanogaster*), White neck Stork (*Ciconia episcopus*), Lesser adjutant Stork (*Leptoptilos javanicus*) etc]. The survey also found that the reservoirs with notable bird population include Udhwa Lake, Tilaya Dam, Maithon Dam, Chinda Dam and Getalsud Dam. Also, there are four important bird areas (IBAs) in Jharkhand viz. Hazaribagh Wildlife Sanctuary, Palamu Tiger Reserve, Udhuwa Lake Bird Sanctuary and Tilaiya Dam (2). Birds found in these IBAs includes Oriental White-backed Vulture, Lesser Adjutant, Pallas's Fish-Eagle, Greater Spotted Eagle, Green Munia, Black-necked Stork, Darter, Oriental White Ibis, Lesser Kestrel, Jungle Warbler, Indian Grey Hornbill, Sirkeer Cuckoo, Yellow-footed Greeen-Pigeon etc.

Transmission lines located in and around these water bodies and migratory bird corridors pose risk to the bird population primarily due to the collision.

Aesthetic

Jharkhand has a number of archaeological monuments which are protected by the Archaeological Survey of India. These protected monuments are located in Ranchi, Singh hum, Dumka and Sahibganj (3) (refer table below**).** In addition there are places of scenic beauty e.g. waterfalls. The transmission line near these monuments/ landscapes can affect the aesthetics by degrading the view.

List of Monuments in Jharkhand

SL. No	Name of Monument / Site	Location	District/ Divisions
1.	Asura Sites	Hansa	Ranchi
2.	Asura Sites	Khunti Tola	Ranchi
3.	Ancient Stone Temple with a small Sivalinga inside	Khekpetta	Ranchi
4.	Asura Sites	Khunti Tola	Ranchi
5.	Asura Sites	Kunjla	Ranchi
6.	Asura Sites	Saridkel	Ranchi
7.	Ashoka inscription on the Chandan Shahid - hill	Ashikpur	Ranchi
8.	Ruins of Baradari buildings with probable underground cells and passage	Arazi Mukimpur	Santhal Parganas
9.	Jamma Masjid	Hadaf	Santhal Parganas
10.	1. Benisagar tank 2. Old remains of temple and sculptures on the south east bank of the above tank	Benisagar	Singhbhum

(1) http://www.jharwildlife.in/images/docs/pdf/Asian_Waterbird_census_AWC-2015.pdf
(2) Source: ENVIS Centre on Wildlife & Protected Areas (http://wiienvis.nic.in/Database/IBA_8463.aspx)
(3)http://www.asi.nic.in/asi_protected_monu_jharkhand.asp

SL. No	Name of Monument / Site	Location	District/ Divisions
11.	Site of an old fort	Ruam	Singhbhum
12.	Ancient Mound	Itagarh	Singhbhum
13.	Maluti Temple	-	Dumka
14.	Jagannathpur Temple	-	Ranchi
15.	Ancient Fort and Sangeet Dalan	-	Shobhabgunj

Source: Archaeological Survey of India (http://asi.nic.in/asi_monu_alphalist_jharkhand.asp)

SOCIAL BASELINE

Administrative setup

The state of Jharkhand consists of 24 districts grouped by 5 Administrative Divisions namely. Administrative structure of the Jharkhand state is presented in figure below.

Administrative Map of Jharkhand

Demographics

The table below gives some key demographic indicators in Jharkhand.

Demographic Profile

Particular	Census 2011	Census 2001
Population	32,966,238	26,945,829
Male	16,931,688	13,885,037
Female	16,034,550	13,060,792
Population Growth	22.34%	23.19%
Sex Ratio	947	941
Population Density (per Sq Km)	414	338
Literacy	67.63 %	53.56 %
Male Literacy	78.45 %	63.83 %

Particular	Census 2011	Census 2001
Female Literacy	56.21 %	38.87 %

Indigenous People

The state of Jharkhand has a considerable tribal population. The Scheduled Tribe (ST) population of Jharkhand State is as per 2011 census 8,645,042 constituting 26.2 per cent of the total population (3,29,88134) of the State. The growth of the ST population has been 17.3 percent which is lower by 5 percent if compared with the growth of the State's total population (22.42 per cent) during 2001-2011. The right of the tribal are protected by Choto-Nagpur Tenancy Act (CNT), 1908 and Santhal Parganas Tenancy Act (SNT), 1949.

Tribes of Jharkhand consist of 32 tribes. Among the thirty-two (32) Notified Scheduled Tribes (1) (refer table below), the Santhals are the most populous tribe with a population of 2,410,509, constituting 34% of the total ST population of the State. Oraon, Munda and Ho, are the next ranked in terms of population constituting 19.6, 14.8 and 10.5 per cent respectively of the total ST population of the state. Four other major tribes, Kharia, Bhumij, Lohra and Kharwar with population ranging from 164,022 too192,024 together with the Santhal, Oraon, Munda and Ho, constitute 89.1 per cent of the total tribal population. The Chero, Bedia, Mal Pahariya and Mahli tribes in the population range of 75,540 to 121,174 account for another 5.6 per cent; the remaining 18 tribes, along with the generic tribes constitute the balance 5.3% of the total ST population.

Notified Scheduled Tribes in Jharkhand

• Munda	• Santhal	• Oraon
• Kharia	• Gond	• Kol
• Kanwar	• Savar	• Asur
• Baiga	• Banjara	• Bathudi
• Bedia	• Binjhia	• Binjhia
• Birhor	• Birjia	• Chero
• Chick-Baraik	• Gorait	• Ho
• Karmali	• Kharwar	• Khond
• Kisan	• Kora	• Korwa
• Lohra	• Mahli	• Mal-Paharia
• Parhaiya	• Sauria-Paharia	• Bhumij

During the planning of the transmission line through areas which have considerable tribal population adequate care has to be taken to ensure that the tribal population and the cultural sites are not adversely affected.

Primitive Tribal Groups

Tribes like the Asur, Paharia, Sabar, Birhor, Birjia, Korwa, Mal Pahariya and Sauriya Paharia have been under special scrutiny on account of their

(1)Notified Schedule Tribes means tribal group notified under "The Constitution of Schedule Tribe Order" dated 6th September, 1950 and subsequent Amendments by Ministry of Tribal Affairs, Govt. of India.

primitiveness, backwardness and declining population. The eight tribes of Asur, Birhor, Birajia, Korwa, Savar, Pahariya (Baiga), Mal Pahariya and Souriya Pahariya out of the thirty-two tribes of Jharkhand fall under Primitive Tribal Group (PTG). Together they account for a population of 0.273 million (Census 2001) which is a very nominal part of the total tribal population. PTG's remain the most isolated and disadvantaged indigenous tribal groups with noticeable reduction in their population.

Sacred Grove

The tribal of Jharkhand worship their sacred groves (1) which are known as *Sarnas*. A *Sarna* is a cluster of trees where the *adivasis* worship on various occasions. Such a grove (among many others) must have at least five Sal trees held very sacred by the tribal. There are 29 sacred groves that have been listed in the state of Jharkhand and all are present in Palamu district (refer table below). In addition there would be non-notified sacred groves in Jharkhand.

List of Notified Sacred Groves Name

Sr. No	Location of Sacred Groves	District
1	Bariband	Palamu
2	Kabri	
3	Danarchampar	
4	Mahandbar	
5	Chiraiah	
6	Champi	
7	Simakhas	
8	Korwtola	
9	Lat	
10	Bandhuwa Karchha Gothaga	
11	Rol	
12	Sonwar Tola	
13	Ghasegara	
14	Mkanpur	
15	Baghmrawa	
16	Ghansee Tola	
17	Chhanchu	
18	Pathratu	
19	Cheerodih	
20	Bahertola	
21	Hanthtola	
22	Kotam	
23	Siram	
24	Hendehas	
25	Baigatola	
26	Jangharia	
27	Salwe	
28	Surkunni	
29	Maromar	

Sacred Groves are of great cultural importance to the tribal population. These groves may potentially get impacts during the stringing operation from one

(1) The sacred groves are an undisturbed patch of vegetation left on the outskirts of the villages in the plain or a part of a forested area. They are dedicated to local folk deities or ancestral spirits that are protected by the local people through social traditions and taboos incorporating spiritual and ecological values and are called sacred groves.

transmission tower to another. The branches of the trees may have to be chopped during the stringing of the conductors. In the state of Jharkhand 29 sacred groves have been identified, all in the district of Palamu – but there may be more of it across the state. All these *sarna sthal* (Sacred Groves) both listed and un-listed should be avoided during project planning.

Occupational Pattern of Jharkhand

Understanding of dependence of the local people on land is very important. Two main component of Jharkhand Power System Improvement Project are construction of Transmission Line and Substation. The area required for the substations is permanently lost and the private land owners are provided compensation. Similarly, in case of towers the land under the towers is only provided compensation for the standing crops.

Economic activity in Jharkhand is presented in table below. From below table it is apparent that majority of the workforce in Jharkhand is cultivator followed by agricultural labourers.

Economic Activity

Particular	Nos	Category of Workers	Nos
Total Workers	10,109,030	Cultivators (%)	3,889,506
Male Workers	6,659,856	Agricultural Laborers (%)	2,851,297
Females Workers	3,449,174	Household industries (%)	480,965
Work Participation rate (%)	37.5	Other Workers (%)	2,937,262
Number of main workers	6,446,782	Cultivators (%)	38.5
Number of marginal Workers	3,662,248	Agricultural Laborers (%)	28.2
Number of Non- Workers	16,836,799	Household industries (%)	4.3
		Other Workers (%)	29.1

Source: Jharkhand.gov.in

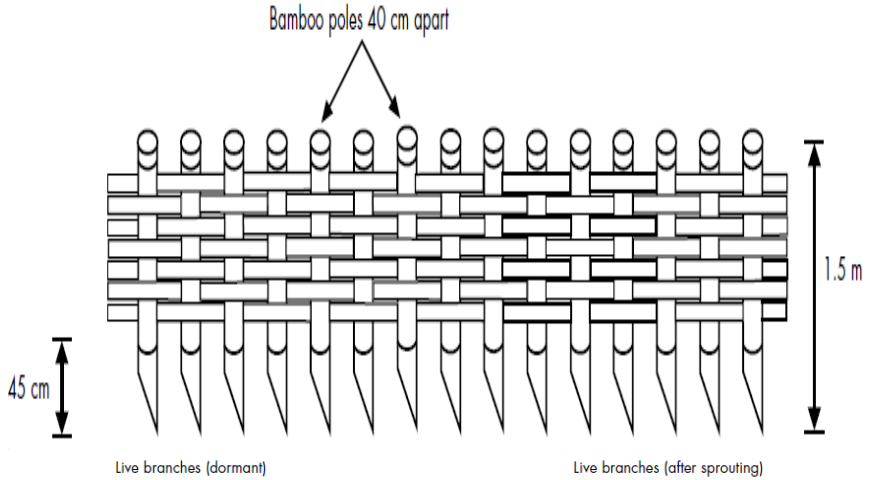
Two main component of Jharkhand Power System Improvement Project are construction of Transmission Line and Substation which require substantial amount of land. As most of the people are engaged in agricultural sector in entire state understanding of dependence of the local people on land is very important.

Annex 5

Bio-Engineering Techniques for Soil Stabilisation

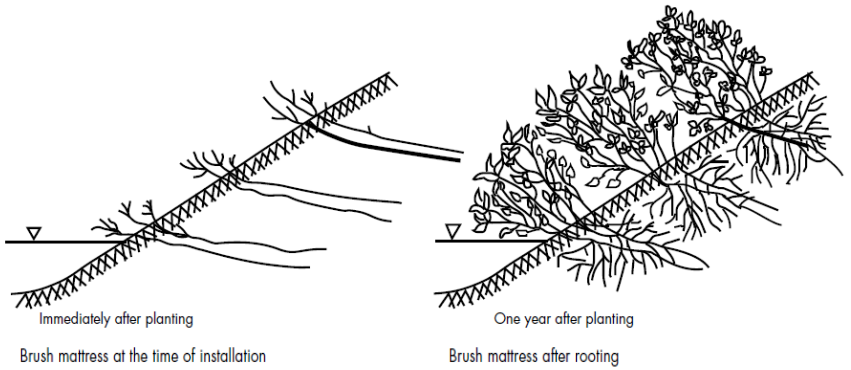
Bamboo fencing

Bamboo fencing can be used to prevent soil creep or surface erosion on a slope, to hinder gully extension, particularly in seasonal water channels, and to control flood waves along a river bank. Live bamboo pegs can be used for the main posts so that the whole structure becomes rooted. The growing bamboo can be further interleaved between the posts (as in a wattle fence) to increase the strength of the fence. Shrubs and grasses are planted on the upper side of the fence to hold small soil particles. The main purpose is to trap loose sediments on the slope, to improve the conditions for growing vegetation, and to reduce the surface runoff rate.



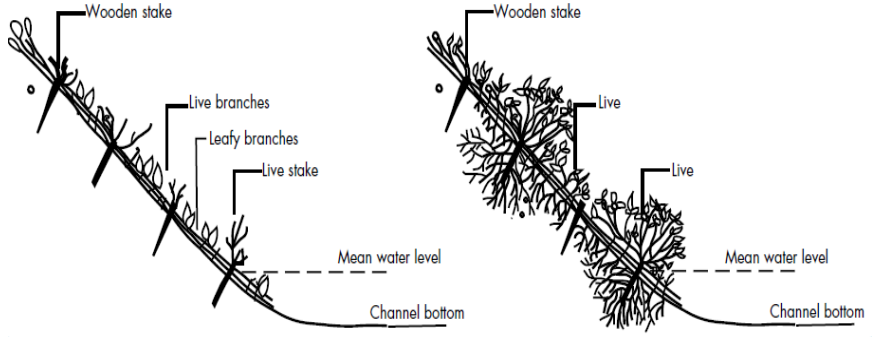
Brush layering

In brush layering, live cut branches are interspersed between layers of soil to stabilize a slope against shallow sliding or erosion. Fresh green cuttings are layered in lines across the slope. As the roots grow, they anchor and reinforce the upper soil layers (up to 2 m depth), and the foliage helps to catch debris. Some toe protection structures such as a wattle fencing, or rock riprap may be required to support brush layering.



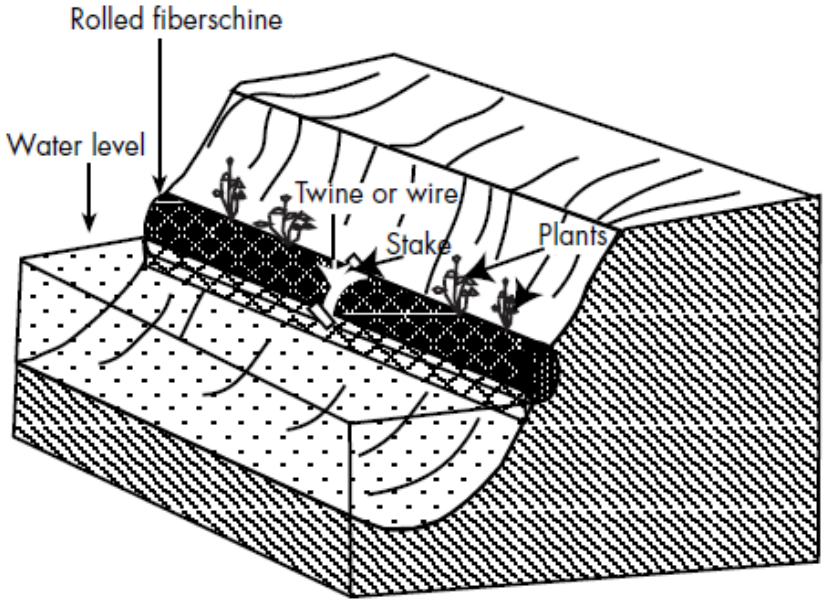
Brush mattress

A brush mattress is a layer of interlaced live branches placed on a bank face or slope, often with a live fascine and/or rock at the base. The aim is to provide a living protective covering to an eroding bank to hinder erosion, and to accumulate sediment. The mattress is generally constructed from live stakes, fascines, and branches from species that root easily, but can be made from any brushy and woody branches to provide immediate and effective protection. A layer of biodegradable material such as loosely woven jute can be placed under the mat on steep slopes to increase stability if the soil is very loose.



Fiberschine

Fiberschine is a roll of material made from coconut fibre used to form a toe protection structure on a slope and to trap any sediment derived from erosion. The most common use is to stabilize the base of a stream bank or shoreline, but it can also be used in slope stabilization to support other measures such as brush layering.



Jute netting

Jute netting is a useful way of stabilizing steep slopes of 35–80° where it is difficult to establish vegetation. Locally available woven jute net is used as a form of armour on the slope and low growing grass is planted through the holes.

Annex 6

Procedure for Management of Hazardous Waste and E-Waste

PROCEDURE FOR MANAGEMENT OF HAZARDOUS AND E-WASTE

PURPOSE

The purpose of this document is to control and minimize risks while collecting, storing and handling of hazardous waste and electronic waste in accordance to the Government Regulation [E-Waste (Management) Rules, 2016 and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016] and JUSNL's policies.

SCOPE

Scope of this document has been defined to consider hazardous waste (mainly used transformer oil) and e-waste (e.g., electronic appliances such as mobile phones, computers, printing machine, electronic medical equipment etc.) generated from substation. In case of any change or modification in the operation of JUSNL, waste inventory and this document shall be updated.

PROCEDURE

Procedure for Management of E-waste

- JPSIP shall identify and shall keep inventory of different type of electronic waste (refer table below) generated from its operation;
- JPSIP shall maintain record of e-waste in **Form-2** (***Appendix 2***) of E-Waste (Management) Rules, 2016 and shall make available such record for scrutiny by Jharkhand State Pollution Control Board (JSPCB), whenever requested for;
- For storing of e-waste, JPSIP shall follow following process:
  - E-waste should be stored in an area that is weatherproof and restricted for unauthorised person;
  - E-waste should be stored away from any storm water drains.
  - Sorting areas shall be regularly cleaned and at the end of the day the facility must be swept;
  - Make sure e-wastes are collected regularly or taken to a recycler on time;
  - Different e-waste items shall be stored separately in different container/designated storage area and there should be no mixing of different kinds of e-waste;
  - All the container/ designated storage area shall be clearly labelled;
- JPSIP shall channelize e-waste through collection centre or dealer of authorised producer or through designated take back service provider of the producer (1) to authorised dismantler or recycler;

(1) Agency authorised by the producer of the electronic item who take back the 'end-of-life' (the time when the product is intended to be discarded by the user) electronic item.

- JPSIP shall ensure that end-of-life (1) electrical and electronic equipment as listed in table below are not mixed with e-waste containing radioactive material as covered under the provisions of the Atomic Energy Act, 1962 and rules made there under;
- Discarded equipment containing radioactive material shall be treated/disposed as per the provision of Atomic Energy Act 1962 or provision of permission issued by Atomic Energy Regulatory Board (AERB);
- For electrical and electronic equipment listed in table below, JPSIP shall file annual returns in **Form-3** (***Appendix 3***) of E-Waste (Management) Rules, 2016 to the Jharkhand State Pollution Control Board (JSPCB) on or before the 30th day of June following the financial year to which that return relates.

Categories of electrical and electronic equipment including their components, consumables, parts and spares covered under the e-waste (Management) Rules, 2016

Sl. No.	Categories of electrical and electronic equipment	Electrical and electronic equipment code
i.	**Information technology and telecommunication equipment**	
	Centralised data processing: Mainframes, Minicomputers	ITEW1
	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	ITEW2
	Personal Computing: Laptop Computers(Central Processing Unit with input and output devices)	ITEW3
	Personal Computing: Notebook Computers	ITEW4
	Personal Computing: Notepad Computers	ITEW5
	Printers including cartridges	ITEW6
	Copying equipment	ITEW7
	Electrical and electronic typewriters	ITEW8
	User terminals and systems	ITEW9
	Facsimile	ITEW10
	Telex	ITEW11
	Telephones	ITEW12
	Pay telephones	ITEW13
	Cordless telephones	ITEW14
	Cellular telephones	ITEW15
	Answering systems	ITEW16
ii.	**Consumer electrical and electronics**	
	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology)	CEEW1
	Refrigerator	CEEW2
	Washing Machine	CEEW3
	Air-conditioners excluding centralised air conditioning plants	CEEW4
	Fluorescent and other Mercury containing lamps	CEEW5

Source: Schedule I of E-Waste (Management) Rules, 2016

(1) 'end-of-life' of the product means the time when the product is intended to be discarded by the user

Procedure for Management of Hazardous Waste

- JPSIP shall identify and shall keep inventory of different type of hazardous waste generated from its operation;

Type of Hazardous Waste

Sl. No.	Hazardous Waste
1	• Used oil and waste oil
2	• Empty barrels/containers contaminated with hazardous chemicals /wastes • Contaminated cotton rags or other cleaning materials
3	• Mercury-switches
4	• Activated glass cullets from cathode-ray tubes and other activated glass and PCB-capacitors
5	• Any component contaminated with cadmium, mercury, lead, polychlorinated biphenyl having characteristics as described in ***Appendix 1***.

Source: Schedule I, Schedule III and IV of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

- JPSIP shall obtain authorization for generation and storage of hazardous waste from JSPCB. For this authorization, JPSIP shall make an application to JSPCB in **Form 1** (***Appendix 4***) as prescribed in the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. In case of renewal, JPSIP shall make the application to JSPCB in **Form 1** (***Appendix 4)*** along with conditions specified in the authorisation for hazardous waste.

- For storing of hazardous waste, JPSIP shall follow following process:
  - The storage area should be provided with concrete floor;
  - The storage area floor should be provided with secondary containment;
  - Proper slopes as well as collection pit to be provided in the storage area to collect wash water and the leakages/spills etc.;
  - In case of leakage/spills, following procedure should be followed:
    - At the foremost, to try and eliminate the source of the spill by adopting any of the following measures e.g. i) up-righting drums or other containers, ii) closing valves, or other similar actions;
    - Prevent the oil from spreading or entering drains by absorbing flowing oil or diking the area with sand bags, jute/cotton mats, or berms;
    - Spread absorbent material e.g., sawdust over the surface of the spill from the perimeter of the spill to its centre; and
    - Contaminated absorbents containing diesel fuel etc., shall be stored in drums and disposed off as hazardous waste.

- Storage area should be provided with the flameproof electrical fittings;
- Automatic smoke, heat detection system should be provided in the sheds;
- Adequate firefighting systems (ABC type fire extinguisher) should be provided for the storage area; and
- The Storage area shall be designed in such a way that the floor level is at least 150 mm above the maximum flood level.

- JPSIP shall maintain a record of hazardous waste in **Form 3** (***Appendix 5***) of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and prepare and submit an annual return containing the details specified in **Form 4** (***Appendix 6)*** in this rule to the JSPCB, on or before the 30th day of June following the financial year to which that return relates.

- JPSIP shall make an agreement with authorised common Hazardous and Other Waste Treatment Storage and Disposal Facility (TSDF) (1) and handover hazardous waste to that TSDF, on or before 90 days last date of disposal or accumulated quantity of 10 ton whichever is earlier.

- JPSIP shall provide the transporter of the hazardous waste with the relevant information e.g., nature of the wastes and measures to be taken in case of an emergency, in Form 9 and shall label the hazardous and other wastes containers as per Form 8.

- While sending hazardous waste, JPSIP shall prepare and sign seven copies of the manifest in Form 10 comprising of colour code as indicated in below table:

Colour code of Manifests to generated /maintained

Copy number with colour code	Purpose
Copy 1 (White)	To be forwarded by the sender (JUSNL) to the State Pollution Control Board (JSPCB) after signing all the seven copies.
Copy 2 (Yellow)	To be retained by the sender (JUSNL) after taking signature on it from the transporter and the rest of the five signed copies to be carried by the transporter.
Copy 3 (Pink)	To be retained by the receiver (actual user or treatment storage and disposal facility operator) after receiving the waste and the remaining four copies are to be duly signed by the receiver.
Copy 4 (Orange)	To be handed over to the transporter by the receiver after accepting waste.

(1) common facility identified and established individually or jointly or severally by the State Government, occupier, operator of a facility or any association of occupiers that shall be used as common facility by multiple occupiers or actual users for treatment, storage and disposal of the hazardous and other wastes.

Copy 5 (Green)	To be sent by the receiver to the State Pollution Control Board.
Copy 6 (Blue)	To be sent by the receiver to the sender.
Copy 7 (Grey)	To be sent by the receiver to the State Pollution Control Board of the sender in case the sender is in another State.

- When an accident occurs at the JPSIP facility during handling of hazardous wastes, JPSIP shall immediately intimate the JSPCB through telephone, e-mail about the accident and subsequently send a report in **Form 11** (***Appendix 7***) of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

- JPSIP shall maintain a register to record all accident /incident during handling hazardous waste.

- All the workers involved in handling hazardous waste should be equipped with personnel protective equipment (gloves and boots).

5.6 RESPONSIBILITIES

- Environmental Officer, JPSIP PIU

- Junior Engineer/Assistant Engineer, Circle/Divisional Office

5.7 MONITORING FRAMEWORK

To review the implementation of this procedure following monitoring indicators can be initially considered. However these may be reviewed and changed as per the requirement in due course as mentioned in the Environment Health & Safety Management System.

Monitoring Indicator for Special Waste (Hazardous Waste, E-Waste, Municipal Waste)

Sl. No.	Monitoring Indicator	Monitoring Mechanism
A.	**E Waste**	
A. 1	Inventory of e-waste	Document review
A. 2	Record of e-waste generated from the substation	Document review
A. 3	Dedicated and restricted e-waste storage area with features e.g., weatherproof, away from any storm water drains, regularly cleaned, separately stored different e-waste items in different container/designated storage area etc.	Visual observation
A. 4	Labelling of all the container/ designated storage area	Visual observation
A. 5	Disposal of e-waste through collection centre or dealer of authorised producer or through designated take back service provider of the producer of the electronic items to authorised dismantler or recycler	Interview, Document review

Sl. No.	Monitoring Indicator	Monitoring Mechanism
A. 6	Submission of annual returns to the JSPCB	Document review
A.7	Use of Personnel Protective Equipment (Gloves, Shoes)	Visual observation, Interview
B.	**Hazardous Waste**	
B. 1	Inventory of hazardous waste	Document review
B. 2	Authorization from JSPCB	Document review
B. 3	Dedicated hazardous waste storage area with features e.g., concrete floor, appropriate slope with collection pit, flameproof electrical fittings, automatic smoke and heat detection system, firefighting system (ABC fire extinguisher) etc.	Visual observation, Interview
B. 4	Record of hazardous generated at substation	Document review
B. 5	Annual Return to JSPCB, on or before the 30th day of June following the financial year to which that return relates	Document review
B.6	Agreement with authorised Common Hazardous and Other Waste Treatment Storage and Disposal Facility (TSDF) for disposal of hazardous waste	Document review
B.7	Handover hazardous waste to TSDF, on or before 90 days last date of disposal or accumulated quantity of 10 ton whichever is earlier	Document review, Interview
B.8	Sharing of information on hazardous waste with hazardous waste transporter	Document review
B.9	Hazard waste manifest	Document review
B.10	Use of Personnel Protective Equipment (Gloves, Shoes)	Visual observation, Interview

5.8 REFERENCES (IF APPLICABLE)

1. E-Waste (Management) Rules, 2016
2. Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
3. Guideline for Storage of Incinerable Hazardous Waste, Central Pollution Control Board, November 2008
4. Guideline for Environmentally Sound Management of E-Waste, Central Pollution Control Board, March 2008

5.9 RECORD

JUSNL shall maintain the following record;

Form-1: ***Application required for grant/renewal of authorisation for generation or collection or storage or transport or reception or recycling or reuse or recovery or pre-processing or co-processing or utilisation or treatment or disposal of hazardous and other waste***

Form-3: ***Format for Maintaining Records of Hazardous and Other Wastes***

Form-4: ***Form for Filing Annual Returns of Hazardous and Other Wastes to JSPCB***

Form-11: *Format for Reporting Accident to JSPCB while Handling Hazardous Waste*

Form-2: *Form for Maintaining Records of E-Waste Handled or Generated*

Form-3: *Form for Filing Annual Returns of E-Waste to JSPCB*

5.10 REVIEW & UPDATE

This document shall be reviewed annually to determine its accuracy and relevance with regard to implications for the JPSIP, such as:

- Evolving regulatory requirements; and
- Changes to international standards and guidelines.

If such changes are identified, a brief Addendum to this document shall be prepared outlining the change and its key requirements.

Appendix1: List of Hazardous Characteristics

Code	Characteristic
H1	**Explosive** An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surrounding.
H3	**Flammable liquids** The word "flammable" has the same meaning as "inflammable". Flammable liquids are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc. but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5°C, closed-cup test, or not more than 65.6°C, open-cup test. (Since the results of open-cup tests and of closed-cup tests are not strictly comparable and even individual results by the same test are often variable, regulations varying from the above figures to make allowance for such differences would be within the spirit of this definition).
H 4.1	**Flammable solids** Solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction.
H 4.2	**Substances or wastes liable to spontaneous combustion** Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.
H 4.3	**Substances or wastes which, in contact with water emit flammable gases** Substances or wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.
H 5.1	**Oxidizing** Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion or other materials.
H 5.2	**Organic Peroxides** Organic substances or wastes which contain the bivalent-o-o-structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.
H 6.1	**Poisons (acute)** Substances or wastes liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact.
H 6.2	**Infectious substances** Substances or wastes containing viable micro-organisms or their toxins which are known or suspected to cause disease in animals or humans.

H 8 **Corrosives**

Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

H 10 **Liberation of toxic gases in contact with air or water**

Substances or wastes which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities.

H 11 **Toxic (delayed or chronic)**

Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity).

H 12 **Eco-toxic**

Substances or wastes which if released, present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation or toxic effects upon biotic systems or both.

H 13 **Capable,** by any means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above.

Appendix 2: Form-2

FORM FOR MAINTAINING RECORDS OF E-WASTE HANDLED OR GENERATED

Generated Quantity in Metric Tonnes (MT) per year

1.	Name & Address: Producer or Manufacturer or Refurbisher or Dismantler or Recycler or Bulk Consumer*		
2.	Date of Issue of Extended Producer Responsibility Authorisation*/Authorisation*		
3.	Validity of Extended Producer Responsibility Authorisation*/Authorisation*		
4.	Types & Quantity of e-waste handled or generated**	Category	Quantity
		Item description	
5.	Types & Quantity of e-waste stored	Category	Quantity
		Item description	
6.	Types & Quantity of e-waste sent to collection centre authorised by producer/ dismantler/recycler / refurbisher or authorised dismantler/recycler or refurbisher**	Category	Quantity
		Item description	
7.	Types & Quantity of e-waste transported*	Category	Quantity
		Quantity	
	Name, address and contact details of the destination		
8.	Types & Quantity of e-waste refurbished*	Category	Quantity
		Item description	
	Name, address and contact details of the destination of refurbished materials		
9.	Types & Quantity of e-waste dismantled*	Category	Quantity
		Item description	
	Name, address and contact details of the destination		
10.	Types & Quantity of e-waste recycled*	Category	Quantity
	Types & Quantity of materials recovered	Item Description	
		Quantity	
	Name, address and contact details of the destination		
11.	Types & Quantity of e-waste sent to recyclers by dismantlers	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		

12.	Types & Quantity of other waste sent to respective recyclers by dismantlers/recyclers of e-waste	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		
13.	Types & Quantity of e-waste treated & disposed	Category	Quantity
		Item Description	
	Name, address and contact details of the destination		

Note:-

(1) * Strike off whichever is not applicable

(2) Provide any other information as stipulated in the conditions to the authoriser

(3) ** For producers this information has to be provided state-wise

Appendix 3: Form-3

FORM FOR FILING ANNUAL RETURNS OF E-WASTE

[To be submitted by producer or manufacturer or refurbisher or dismantler or recycler by 30th day of June following the financial year to which that return relates]

Quantity in Metric Tonnes (MT) and numbers

1	Name and address of the producer or manufacturer or refurbisher or dismantler or recycler			
2	Name of the authorised person and complete address with telephone and fax numbers and e-mail address			
3	Total quantity of e-waste collected or channelized to recyclers or dismantlers for processing during the year for each category of electrical and electronic equipment listed in the Schedule I (Attach list) by PRODUCERS			
	Details of the above	TYPE	QUANTITY	NO.
3(A)*	BULK CONSUMERS: Quantity of e-waste			
3(B)*	REFURBISHERS: Quantity of e-waste:			
3(C)*	DISMANTLERS: i Quantity of e-waste processed (Code wise); ii. Details of materials or components recovered and sold; iii. Quantity of e-waste sent to recycler; iv. Residual quantity of e-waste sent to Treatment, Storage and Disposal Facility.			
3(D)*	RECYCLERS: i. Quantity of e-waste processed (Code wise); ii. Details of materials recovered and sold in the market; iii. Details of residue sent to Treatment, Storage and Disposal Facility.			
4	Name and full address of the destination with respect to 3(A)-3(D) above			
5	Type and quantity of materials segregated or recovered from e-waste of different codes as applicable to 3(A)-3(D)	Type	Quantity	

✔ Enclose the list of recyclers to whom e-waste have been sent for recycling.

Place_____

Date_____ **Signature of the authorised person**

Note:-

(1) * Strike off whichever is not applicable

(2) Provide any other information as stipulated in the conditions to the authoriser

(3) In case filing on behalf of multiple regional offices, Bulk Consumers and Producers need to add extra rows to 1 & 3(A) with respect to each office.

Appendix 4: Form 1

Application required for grant/renewal of authorisation for generation or collection or storage or transport or reception or recycling or reuse or recovery or pre-processing or co-processing or utilisation or treatment or disposal of hazardous and other waste

Part A: General (to be filled by all)

1. (a) Name and address of the unit and location of facility:

(b) Name of the occupier of the facility or operator of disposal facility with designation, Tel, Fax and e-mail:

(c) Authorisation required for (Please tick mark appropriate activity or activities:

(i) Generation ☐

(ii) Collection ☐

(iii) Storage ☐

(iv) Transportation ☐

(v) Reception ☐

(vi) Reuse ☐

(vii) Recycling ☐

(viii) Recovery ☐

(ix) Pre-processing ☐

(x) Co-processing ☐

(xi) Utilisation ☐

(xii) Treatment ☐

(xiii) Disposal ☐

(xiv) Incineration ☐

(d) In case of renewal of authorisation previous authorisation numbers and dates and provide copies of annual returns of last three years including the

compliance reports with respect to the conditions of Prior Environmental Clearance, wherever applicable:

2. (a) Nature and quantity of waste handled per annum (in metric tonne or kilo litre)
(b) Nature and quantity of waste stored at any time (in metric tonne or kilo litre)

3. (a) Year of commissioning and commencement of production:
(b) Whether the industry works:

(i) 01 Shift ☐

(ii) 02 Shifts ☐

(iii) Round the clock ☐

4. Provide copy of the Emergency Response Plan (ERP) which should address procedures for dealing with emergency situations (viz. Spillage or release or fire) as specified in the guidelines of Central Pollution Control Board. Such ERP shall comprise the following, but not limited to:

- Containing and controlling incidents so as to minimise the effects and to limit;
- danger to the persons, environment and property;
- Implementing the measures necessary to protect persons and the environment;
- Description of the actions which should be taken to control the conditions at events and to limit their consequences, including a description of the safety equipment and resources available;
- Arrangements for training staff in the duties which they are expected to perform;
- Arrangements for informing concerned authorities and emergency services; and
- Arrangements for providing assistance with off-site migratory action.

5. Provide undertaking or declaration to comply with all provisions including the scope of submitting bank guarantee in the event of spillage, leakage or fire while handling the hazardous and other waste.

Part B: To be filled by hazardous waste generators

1. (a) Products and by-products manufactured (names and product wise quantity per annum):

(b) Process description including process flow sheet indicating inputs and outputs (raw materials, chemicals, products, by-products, wastes, emissions, waste water etc.) Please attach separate sheets:

(c) Characteristics (waste-wise) and Quantity of waste generation per annum:

(d) Mode of management of (c) above:

i. Capacity and mode of secured storage within the plant;

ii. Utilisation within the plant (provide details);

iii. If not utilised within the plant, please provide details of what is done with this waste;

iv. Arrangement for transportation to actual users/ TSDF;

(e) Details of the environmental safeguards and environmental facilities provided for safe handling of all the wastes at point (c) above;

2. Hazardous and other wastes generated as per these rules from storage of hazardous chemicals as defined under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

Part C: To be filled by Treatment, storage and disposal facility operators

1. Provide details of the facility including:

(i) Location of site with layout map;

(ii) Safe storage of the waste and storage capacity;

(iii) The treatment processes and their capacities;

(iv) Secured landfills;

(v) Incineration, if any;

(vi) Leachate collection and treatment system;

(vii) Firefighting systems;

(viii) Environmental management plan including monitoring; and

(ix) Arrangement for transportation of waste from generators.

2. Provide details of any other activities undertaken at the Treatment, storage and disposal facility site.

3. Attach a copy of prior Environmental Clearance.

Part D: To be filled by recyclers or pre-processors or co-processors or users of hazardous or other wastes

1. Nature and quantity of different wastes received per annum from domestic sources or imported or both:

2. Installed capacity as per registration issued by the District Industries Centre or any other authorised Government agency. Provide copy:

3. Provide details of secured storage of wastes including the storage capacity:

4. Process description including process flow sheet indicating equipment details, inputs and outputs (input wastes, chemicals, products, by-products, waste generated, emissions, waste water, etc.). Attach separate sheets:

5. Provide details of end users of products or by-products:

6. Provide details of pollution control systems such as Effluent Treatment Plant, scrubbers, etc. including mode of disposal of waste:

7. Provide details of occupational health and safety measures:

8. Has the facility been set up as per Central Pollution Control Board guidelines? If yes, provide a report on the compliance with the guidelines:

9. Arrangements for transportation of waste to the facility:

Signature of the Applicant
Designation

Date……..

Place……..

Appendix 5: Form 3

FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES

1. Name and address of the facility:

2. Date of issuance of authorisation and its reference number:

3. Description of hazardous and other wastes handled (Generated or Received)

Date	Type of waste with category as per Schedules I, II and III of these rules	Total quantity (Metric Tonnes)	Method of Storage	Destined to or received from

* Fill up above table separately for indigenous and imported waste.

4. Date wise description of management of hazardous and other wastes including products sent and to whom in case of recyclers or pre-processor or utiliser:

5. Date of environmental monitoring (as per authorisation or guidelines of Central Pollution Control Board):

Signature of occupier

Date……..

Place……..

Appendix 6: Form 4

FORM FOR FILING ANNUAL RETURNS

[To be submitted to State Pollution Control Board by 30th day of June of every year for the preceding period April to March]

1. Name and address of facility:

2. Authorisation No. and Date of issue:

3. Name of the authorised person and full address with telephone, fax number and e-mail:

4. Production during the year (product wise), wherever applicable

Part A. To be filled by hazardous waste generators

1. Total quantity of waste generated category wise

2. Quantity dispatched

   (i) to disposal facility
   (ii) to recycler or co-processors or pre-processor
   (iii) others

3. Quantity utilised in-house, if any –

4. Quantity in storage at the end of the year –

Part B. To be filled by Treatment, storage and disposal facility operators

1. Total quantity received –

2. Quantity in stock at the beginning of the year –

3. Quantity treated –

4. Quantity disposed in landfills as such and after treatment –

5. Quantity incinerated (if applicable) –

6. Quantity processed other than specified above –

7. Quantity in storage at the end of the year –

Part C. To be filled by recyclers or co-processors or other users

1. Quantity of waste received during the year –
   (i) domestic sources

(ii) imported (if applicable)

2. Quantity in stock at the beginning of the year –

3. Quantity recycled or co-processed or used –

4. Quantity of products dispatched (wherever applicable) –

5. Quantity of waste generated –

6. Quantity of waste disposed –

7. Quantity re-exported (wherever applicable)-

8. Quantity in storage at the end of the year –

Signature of the Occupier or
Operator of the disposal facility

Date……..

Place……..

Appendix 7: Form 11

FORMAT FOR REPORTING ACCIDENT

[To be submitted by the facility or sender or receiver or transporter to the State Pollution Control Board]

1. The date and time of the accident :

2. Sequence of events leading to accident :

3. Details of hazardous and other wastes involved in accident :

4. The date for assessing the effects of the accident on health or the environment :

5. The emergency measures taken :

6. The steps taken to alleviate the effects of accidents :

7. The steps take to prevent the recurrence of such an accident :

Date: Signature:
Place: Designation:

Annex 7

Format for Undertaking Alternative Analysis

Part A: Transmission Line Alignment;

Part B: Substation

SUPPORTING FORMATS

PART A: PRO-FORMA FOR ENVIRONMENT AND SOCIAL DETAILS FOR TRANSMISSION LINE

S.No	Environmental and Social details for Transmission Lines						
	Description	**Alignment -1**		**Alignment -2**		**Alignment-3**	
1.	**Route particulars**						
	Length						
	Terrain (Undulatin						
2.	**Environmental Details**						
	Towns /settlements in the alignment	Yes	No	Yes	No	Yes	No
	Monument of cultural or historical Significance (within 100 m)	Yes	No	Yes	No	Yes	No
	Cultural or Religious Areas related to the Tribal Community	Yes	No	Yes	No	Yes	No
	Public utility services like playgrounds, schools, other establishments	Yes	No	Yes	No	Yes	No
	National Parks, Wildlife Sanctuaries	Yes	No	Yes	No	Yes	No
	ESZ /Draft ESZ	Yes	No	Yes	No	Yes	No
3.	**Quantum of Forest land Involved**						
4.	**No. of Crossing**						
	Railway						
	Transmission line						
	River Xing etc						
5.	**Construction Problem**						
6.	**O & M Problem**						
7.	**Overall Remarks**						
8.	**Reasons for selection of final route:**						

PART B: PRO-FORMA FOR ENVIRONMENT AND SOCIAL DETAILS FOR SUBSTATION SITES

S.No	Environmental and Social details for Substation			
	Description	**Site -1**	**Site -2**	**Site-3**
1.	**Site particulars**			
	Length			
2.	**Environmental Details**			
	Terrain (especially considering erosion) (Hills/Undulating/Plain)			
	Drainage Channels (Water Channels/Water Bodies/Natural Drainage)			
3	Land Details			
	Type of Land (Irrigated/ Unirrigated)			
	Cropping Patterns (Single Cropped/Double Cropped)			
	Presence of Any Structure			
4.	**Socio-Economic**			
	No of Families Affected (estimated)			
	Presence of Common Property Resource(School, Pond, Grazing Ground Religious Place, Playground)			
	Presence of Community Infrastructure			
	Concentration of Tribal Population in the affected areas (Block Level)			
5.	**Trees (Natural vegetation/ Plantation/Orchards)**			
6.	**Cost of Land**			
7.	**Overall Remarks**			
8.	**Reasons for selection of final route:**			

Annex 8

Sample Terms of Reference (Tor) for ESIA Study

SAMPLE TERMS OF REFERENCE (TOR) FOR ESIA STUDY

The consultant would assist JUSNL in undertaking the environment and social impact assessments (ESIA) of the schemes identified for World Bank funding as per the ESMF. These assessments would be done on the basis of the detailed survey

In general, the ESIAs would include the following:

- Social Assessment– compiling socioeconomic profiles at state, district and village level;
- Carry out social and environment screening to identify any adverse or positive impacts;
- Stakeholder Analyses (Key Expectations, Impacts, Issues as related to each stakeholder) and public consultations;
- Impact Assessments of positive and negative social impacts/risks likely to occur for different sub-groups or beneficiaries as a result of project interventions; and suggest measures to avoid/minimize/mitigate negative impacts and derive the maximum from positive impacts;
- Institutional Arrangements – document the existing institutional and implementation arrangements, covering all key entities – government departments, sector institutions, political bodies etc.; The institutional arrangement to cover role and responsibility of various players at project, district and state level; grievance redress mechanism;
- Monitoring and evaluation plan including indicators; capacity building requirements to manage E&S issues; implementation schedule and budget;
- Analysis of citizen engagement and beneficiary feedback for incorporating at the design stage;
- The ESIA shall cover the project design, implementation and operation phases;

In particular, the ESIAs will include:

In case of substations,

- Details on the land identified/ or already in possession;
- Details of the families that would be economically or physically displaced, if any;
- Cost estimate of the securing the land;
- Impact on flora/ground cover on site, including trees, fauna using the site as habitat/foraging area, land slope and drainage, corridor for movement, land pollution due to chemicals, and health and safety of construction workers as well as nearby residents, and any other affected population or structures;
- Documentation of consultations with different village/ community members (to be done scheme wise);

In case of transmission lines:

- Based upon the route alignment suggested by the technical consultants, clearly depict the three alternative route alignments and the final proposed alignment with the end points, along with documentation of sensitive receptors in the vicinity of the proposed route – on topographical maps and Google Earth; (The technical consultants would provide the route alignment in the topographical map and google earth)
- The E&S consultant would determine the three co-ordinates (latitude, longitude, altitude) of all major features with latest details, up to 2 (two) km in case of normal routes and [4 (four)] km in case of presence of sensitive environment features, on both sides of selected routes' alignment.
- The consultant would also depict the selected route on Bird areas tool such as IBAT;
- An assessment of the damage to the type/number/quantity of standing crop/trees/flora/fauna along the route alignment as well as within the influence area of the activity, which would include haul roads, and other facilities required etc. (for transmission line);
- Assessment of the impact on the families (including estimate of the numbers) or structures (if any) in the proposed route alignment (tower footing and transmission line corridor);
- Estimated cost of compensation for damage to the standing crop/trees, compensatory afforestation, compensation to be paid for land under tower footing etc.
- Documentation of consultations with different village/ community members (to be done scheme wise)

Environmental Assessment and Environment Management Plan - Based on The ESIAs, the consultants would prepare Environment and Social Management Plans (ESMPs) for inclusion in each of the bidding packages. ESMPs would include identified impacts and their selected mitigation measures, time frame, institutional responsibilities for implementation, supervision and monitoring. If appropriate, focused plans like one for Safety of workers and general public in the area, would also be prepared. These would be referred in the ESMPs or annexed to the document. Cost estimates for the implementation and monitoring of the measures should also be included. Also some of the sample information that need to be included in the report are appended below..

- The consultants would also support JUSNL in discussing the feedback of the World Bank on the draft(s) and in suitably addressing the comments of the World Bank to get their clearance(s) on the same.

- The Consultant will also support JUSNL in preparation of an Executive summary of the draft and final report and translation of the same in local language.

- The Consultants will also support JUSNL in disclosure of the ESIAs at the offices of JUSNL, website of JUSNL and project areas.

SAMPLE PRO-FORMA FOR ENVIRONMENT AND SOCIAL DETAILS FOR TRANSMISSION LINE

Environmental and Social details for Transmission Lines				
Sn	**Description**	**Alignment-I -**	**Alignment-II**	**Alignment-III**
1.	Route particulars			
i.)	Length			
ii)	Terrain			
2	Environmental Details			
i)	Town in Alignment (Near By)			
ii)	House within ROW			
iii)	Forest In Km / Ha			
a)	Type of forest			
b)	Density of forest			
c)	Type of Fauna & Flora			
d)	Endangered species if any			
e)	Historical/Cultural monument			
f)	Any other relevant information			
3.	Details of families affected (if any)			
4.	Compensation cost			
i)	Crop			
ii)	Forest			
5.	No. of Crossing			
i)	Railway			
ii)	Transmission line			
iii)	River crossing etc.			
6.	Construction Problem			
7.	O & M Problem			
8.	Overall Remarks			
9.	Reasons for selection of final route:			

SAMPLE PRO-FORMA FOR ENVIRONMENT AND SOCIAL DETAILS FOR SUBSTATIONS

Environment and Social details for Substation					
Sl.	**Study Point**	**Alt. I**	**Alt. II**	**Alt. III**	**Remarks**
01.	Location				
02.	Village Name				
03.	Size of Land				
04.	Type of Land (Govt./Pvt./Others)				
05.	General Geography of Area				
06.	Agricultural/Cropping Pattern				
i)	Main types of crops				
ii)	Irrigation Facility				
07.	Socio-economic condition of area :				
i)	Profession of existing population Agricultural (Self employment, Merchants, manufacturer,				

Environment and Social details for Substation				
	Transporters & Handicrafts etc.)			
ii)	Wage Earner (Skilled/Unskilled Labour)			
iii)	Others if any			
iv)	Natural Resource Base			
v)	Political Influence			
08.	No./Name of villages effected I. Partly II. Fully			
09.	Total No. of families likely to be effected			
10.	No. of families whose part holding likely to be acquired			
11.	No. of families whose total holding likely to be acquired Land + Home Land Only Home only			
12.	Caste of PAPs/PAFs a) GC b) OBC c) SC/ST			
13.	General Pattern of Cultivation i.e. By owner On lease (Registered/ Un-registered)			
14.	Loss of Structure House/Shop along with the status of occupants (Owner/Tenant/ Lease holder/squatter)			
15.	Others a) Common property resources like School, Ponds Grazing Ground, Religious Places b) Drainage facility			
16.	Tree/Plantation/Orchards (Approx.)			
17.	Cost of Land			
18.	Reasons for selection/rejection			

STATEMENT FOR DETAILS OF SITES IDENTIFIED FOR SUB-STATIONS

Sl. No	Criteria	Site -1	Site -2	Site-3
1.0	Land			
1.1	Size (Acre) (M x M)			
1.2	Govt./Private/Forest land			
1.3	Agriculture/Wasteland			
1.4	Development			
1.5	Approximate cost			

Sl. No	Criteria	Site -1	Site -2	Site-3
1.6	Type of soil			
1.7	No. of owners			
1.8	Environment/Pollution in the vicinity			
1.9	Location with reference to nearest town			
1.10	H.F.L. Data			
1.11	Diversion of Nallah/Canal required			
1.12	Slope			
1.13	Extent of levelling required			
1.14	Land acquisition feasibility			
1.15	Rate of Govt. land			
1.16	No. of owners			
1.17	Exten. of approach			
1.18	Planned/unplanned development			
1.19	Size of sites			
1.20	No. of families displaced			
1.21	Required Government value			
1.22	Level of site with ref. to road level			
1.23	Distance from sea shore			
2.0	Approach			
2.1	What are the Obstacles in reaching site			
2.2	Approach road			
2.3	Length of approach road			
2.4	Distance from main road			
2.5	Unloading facility at Railway Station			
2.6	No. of Culverts required			
3.0	Community Facilities			
3.1	Drinking Water			
3.2	Drainage			
3.3 a)	Post Office			
b)	Telephone			
c)	Telex			
3.4	Market			

Annex 9

Sample Terms of Reference (Tor) for Biodiversity Assessment Study

SAMPLE TERMS OF REFERENCE (TOR) FOR BIODIVERSITY ASSESSMENT STUDY

BACKGROUND:

Power transmission is a less intrusive activity. Its operational activities are totally different from other linear transportation corridors. However, it may have some negative impacts on area it traverses and affect any sensitive receptors in its vicinity. This is more so especially for transmission lines passing through protected areas e.g. National Park and Wild Life Sanctuaries or through Eco-Sensitive Zones identified for each of these above. In order to ensure that there is minimum impact on any important biodiversity area encountered along the routes, if any, a specific Biodiversity Assessment Study for the stretch of transmission line through these areas shall be undertaken by independent agency to provide necessary mitigation measures that can be incorporated into overall Environment Management Plan (EMP) of the project.

OBJECTIVES & SCOPE OF THE STUDY:

The above study aims in identifying potential impacts on flora and fauna and to suggest relevant compensatory and mitigation measures to protect / conserve biodiversity in the likely impacted area along RoW of transmission line due to the project activity. To achieve this agency/consultant shall carry out a comprehensive study on biological, socio-economic aspects along the proposed routes (RoW) limited to affected biodiversity area and assess the potential impacts and risks (direct as well as indirect/ induced) due to the project activities and shall suggest appropriate measures for compensating & mitigating measures for managing the same. This study will describe the biodiversity values present on the development site and the impact of the project activity on these values and also identify reasonable measures and strategies that can be taken to avoid and minimise impacts on biodiversity.

APPROACH AND METHODOLOGY OF THE STUDY:

The study will essentially carried out in two parts:

- Baseline study in order to determine what flora & fauna species of concern might be found along the route in such sensitive areas through review of data from secondary sources like important data base (IBAT Business), using Satellite imaginary like GIS and GPS technique, IUCN Red data lists, other literatures/publications, various notifications/ gazette, forest/wildlife management plans and other studies, if available
- Field study and collection of primary data along the route in protected/sensitive areas on key parameters like

- Details of flora & fauna with special reference to endemic/threatened species population reported from the study area.
- Description of habitat for such endemic/threatened species, , ecology and like threat including the breeding, foraging pattern and its conservation plan/biodiversity action plan undertaken, if any

- Socio-economic values of the affected area vis-à-vis biodiversity values.

- Consultations with forest/wildlife officials, local communities, technical & managerial staff of Utility and survey team.

Output:

The agency will submit biodiversity assessment report including management plan broadly covering following aspects:

1. Baseline status of diversity values project affected area: Biodiversity assessment shall include details on forest/ tree cover with species and girth distribution, density/crown, description of understory and middle storey flora & fauna, if any, survey of fauna including species abundance, major habitats, current distribution etc. The study also cover distribution of species in terms of seasonal issues related to breeding and feeding ecology and geographical issues related with the movement of wild species including species from cryptic habitats. This study also identifies any rare, endangered, threatened, and endemic species of flora and fauna present along the route. If such species are present, the assessment shall also include geographical features and other associations important for survival of these species and their role in community ecology.

2. Study of ecological, environmental and socio-economic impacts: The study should concentrate on the likely impacts on flora & fauna including their role in community ecology due to project activities. The study shall include impact on socio-economic aspect and also impact on ancillary activities such as provision of access roads to site, on other resources on biodiversity value in the affected area.

3. Management Plan for bio-diversity conservation: Based on the assessment, suitable management plan shall be prepared describing adequate compensation, mitigation and management measures with respect to identified impacts, if any. It should focus on measures for conserving important resources, recommending avoidance of impacts by modifying design of specific activities/components if practical, minimum compensatory measures required by GoI/State government for mitigation and/or management measures for indirect or induced impacts, institutional arrangements including co-ordination

mechanisms that need strengthening, description of roles and responsibilities, and budgetary resources required.

Resource Requirements:

It is anticipated that the assignment will require a Biodiversity Expert assisted by a field team of support professionals including Ecologist, Wildlife Biologist, and Zoologist & Environmental Management/Planning Specialist etc.

Completion Schedule & Final Deliverables:

It is expected that the above study will be completed within 8-14 weeks from the date of issuance of Work Order. The agency will submit final report in both hard & soft copy with within 2 weeks of acceptance of report.

Annex 10

ESMP Supervision Checklist

1 ESMP SUPERVISION CHECKLIST

Sl.No	Items to be monitored	Response	Comments/Justification
A.	**Permit, licence and certificate (every six months)**		
1.	Does the construction company have valid registration certificate under "The Building and Other Construction Workers (Regulation of employment and conditions of Service) Act, 1996"?	**Y /N / NA**	
2.	Does the contractor have valid licence under "The Contract Labour (Regulation and Abolition) Act, 1970"?	**Y /N / NA**	
3.	Does the Construction Company/Contractor obtained registration under the Interstate Workmen (Regulation of Employment and Condition of Services) Act 1979	**Y /N / NA**	
4.	Are all register and document (payment of wages, attendance and etc.) properly maintained?	**Y /N / NA**	
B.	Community Safety and Site **Security**		
	For construction site/ tower footing located near the settlement/ pathways is it barricaded/ fenced?	**Y /N / NA**	
	In case the excavation for tower footing is close to a pathway are reflective strips provided?	**Y /N / NA**	
	Are warning signage placed around the construction sites and at appropriate location?	**Y /N / NA**	
C.	**Health and Safety of worker (Safety to be monitored separately)**		
	When working at height, are workers provided with full body harnesses and safety lifeline?	**Y /N / NA**	
	Are construction worker wearing helments?	**Y /N / NA**	
	Are general PPE's like reflective jacket, industrial shoe etc provided to all the construction workers?	**Y /N / NA**	
	Is first aid boxes provided and maintained by the contractors and is readily available during working hours?	**Y /N / NA**	
	Is fire fighting equipment kept at the construction site?	**Y /N / NA**	
	Is appropriate number of urinal provided for the workers? *((1 unit for 15 male and 1 unit for 15 female).*	**Y /N / NA**	
	Are toilets located away from the living quateres? *Toilet would be located from 30 to 60 m from rooms/ dormitories.)*	**Y /N / NA**	

Sl.No	Items to be monitored	Response	Comments/Justification
	Are suffecient quantities of drinking water provided to labours ? 21. Sufficient drinking water to be provided at camp site. *(5 L per person to comply with IS 10500: 2012- Drinking Water Specification).*	**Y /N / NA**	
	Are provisions of separate rest room crèche provided in case there are female workers	**Y /N / NA**	
D.	**Environmental Management**		
	Has the excess excavated material form tower footing been removed?	**Y /N / NA**	
	For substation located on slopes has erosion control measures been undertake?	**Y /N / NA**	
	Has bio-engineering techniques been employed as a Erosion control measure	**Y /N / NA**	
	Are excavated material properly kept such that they do not cause any abstruction to the community? (Please describe the measures taken in the comment box)	**Y /N / NA**	
	Have Sedimentation tank/ Oil water Separator been constructed in the substation?	**Y /N / NA**	
	Has tree felling permission been obtained for the subproject?	**Y /N / NA**	
	Is the number of trees felled more than the number specified in the permission? If yes specify reasons	**Y /N / NA**	
	For forest land involved in the sub-project has Stage II Clearance been obtained? In case construction has begun on plots without forest clearance specify the total area of the plots.	**Y /N / Partly**	
	For construction activity in forest areas has temporary woven wire mesh guards of about 2.4 m (8 ft.) high will be put around the excavated areas?	**Y /N / NA**	
	Has bird guards and markers in transmission lines as per the DPR specification (IS-5613 (Part-II)?	**Y /N / NA**	
	Is silent generator used at the construction site?	**Y /N / NA**	
	Are noise generating machineries kept away from sensitive receptor?	**Y /N / NA**	
	Is the time of concrete casting work strategically planned not to cause nuisance to the surrounding people and environment?	**Y /N / NA**	
	For sub-station locations close to settlements is night time work being undertaken? If yes are permission being taken from Division/ Circle Office?		

Sl.No	Items to be monitored	Response	Comments/Justification
	Has measures been adopted for reducing the usage of ground water for construction work? (Please mention the measures adopted)	**Y/N/NA**	
	Social Management		
	Has construction activities resulted in the loss of standing crops? If yes has crop compensation been paid to the affected person?	**Y/N/NA**	
	In case of Procurement of land through negotiated settlement has compensation been received by affected land owner before construction?	**Y/N/NA**	
	Has any common property been damaged/ destructed during the construction? If Yes please mention the state of the reconstruction?	**Y/N/NA**	
	Has grievances been registered & redressed? If Yes mention the cumulative and the no of cases this month	**Y/N/NA**	

Annex 11

Management Plan for Labour Influx

MANAGEMENT PLAN FOR LABOUR INFLUX

It is envisaged that during construction phase of the project, labourers for various jobs such as civil, mechanical and electrical works will be hired through authorised manpower agencies. The labour requirement will range from 10 to 15 construction of tower footings. Since these will be employed from outside the region and will therefore, be migrant labourers and hence, accommodation will be provided. These migrant labourers will be accommodated in a temporary campsite within the project area. This could result in stress on local resources, disruption in community relations, and movement of labours.

Objective:

The influx of migrant labour will have both negative and positive impacts on the nearby community and local environment. The labour will be accommodated in temporary campsite within the project boundary which can have significant interface with the nearby community. However, the influx of migrant workers would lead to a transient increase of population in the immediate vicinity of the project area for a limited time. This would put pressure on the local resources such as roads, fuel wood, water etc.

Hence, a plan has been designed to demonstrate the:

- Potential impacts associated with influx on the host population and receiving environment are minimized;
- Provision of safe and healthy working conditions, and a comfortable environment for migrant labour; and
- To ensure compliance with the IFC PS 2and 4 and national labour laws;

IFC Performance Standards:

International Finance Cooperation (IFC) Performance Standard 2- Labour and Working Conditions is specific to labour and working conditions. This Standard focuses on the protection of the basic rights of workers, fostering constructive worker-management relationships, as well as promoting fair treatment and the provision of a safe and healthy workplace. The basic provisions for migrant workers under PS 2 are enumerated below:

- As per the provisions of PS 2, the client shall identify migrant workers engaged through third party and ensure that they are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work (if any);
- The contractor shall ensure provision of adequate accommodation, transportation, and basic services including water, sanitation, and medical care for the workers working on that project;
- The compensation paid to the migrant workers should be non-discriminatory and the principle of equal opportunity and fair treatment to be followed; and
- Wastewater, sewage, food and any other waste materials are to be properly handled, in compliance with local standards– whichever is

more stringent – and without causing any significant impacts to the biophysical environment or surrounding communities.

IFC PS 4 – Community Health, Safety and Security carries health and safety through to the community environment. The objectives of the Performance Standard are:

- To minimise and manage health and safety risks to local communities; and
- To ensure that the project does not harm community health and safety.

General Requirements:

All migrant workers are envisaged to be accommodated in temporary campsite within the project area. If migrant workers are accompanied by their families, provisions should be made accordingly. Guidance on Workers Accommodation developed by IFC and EBRD is also referred for inclusion of requirements for labour camp to be established by contractor during construction phase of the project . Contractor shall ensure implementation of the following measures to minimise the potential negative impacts of worker accommodation and workers on local communities:

Cleanliness: Pest extermination, vector control and disinfection are to be carried out throughout the living facilities in compliance with local requirements and/or good practice.

Complaints and incident reporting: A formal Complaints Procedure will be implemented to ensure timely and transparent response to complaints as received from labour.

Labour education: The workforce will be sensitized to local social and cultural practices through provision of an induction course for all employees that stipulates expected behaviour;

Labour behaviour in campsite provided: A Code of Behaviour governing appropriate behaviour in the accommodation facilities to be kept in place and to be strictly enforced. The contractor shall ensure implementation of the "rules of engagement" between labours living in campsite and community and shall be implemented by construction contractors for all engaged labours.

Labour Compensation and Accommodation: Client shall ensure that labours are provided with benefits such as annual leave, weekly rest day, etc. Accommodation to be provided for the construction labour which cover facilities (including catering facilities, dining areas, washing and laundry facilities etc.) and supporting utilities.

Hiring and Recruitment Procedures:

The manpower contractor shall, wherever possible, locally recruit the available workforce and shall provide appropriate and requisite on job and EHS training as necessary. The following general measures shall be considered for the workforce during their employment tenure:

- Project should include a code of conduct relating to the accommodation to be signed with the contract document of contractor.
- The contractor shall not employ any person below the age of 18 years nor will have any forced labour;

- The construction labourers will be provided with documented information regarding their rights under national labour and employment law such as but not limited to Factories Act, Minimum Wages Act, Trade Unions Act and Workmen's Compensation Act;
- First priority for employment of labour should be given those impacted by the project such as landowners who have lost land or those who have their land parcels under ROW;
- No discrimination shall be done by the contractor with respect to recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, termination of employment or retirement, and disciplinary practices;
- The contractor to ensure that work hours are set at eight hours a day, 48 hours a week, with a weekly rest day for all engaged labours;
- Every labour is entitled for maximum of only two hours a day as Overtime (OT) work. OT pay is twice the hourly remuneration;
- Project shall ensure equal wages for male and female workers for work of equal nature or value is maintained;
- A grievance redress mechanism for workers shall be put in place by the contractor to raise workplace concerns. The workers will be informed about the grievance mechanism at the time of recruitment; and
- The Project shall ensure that the contractor develops and implement a procedure to review the performance of their sub-contractors, if any.
- The procedure developed should include regular inspection of the camp sites, maintaining information pertaining to labours sourced by sub-contractors;

Workers' Accommodation:

The Project will supervise and monitor the activities performed by their contractor and accommodation facilities provided in the campsite. The following measures shall be provided:

- The labour will be provided with accommodation on twin sharing basis made of insulated material and locally available building material, etc.;
- The migrant workers with families shall be provided with individual accommodation comprising bedroom, sanitary and cooking facilities;
- The units will be supported by common latrines and bathing facilities duly segregated for male and female labour;
- Adequate number of toilets shall be provided in the accommodation facilities. A minimum of 1 unit to 15 males and 1 unit for 10 females shall be provided;
- The contractor shall provide a kitchen facility for the construction workers and the food will be of appropriate nutritional value and will consider religious/cultural backgrounds;
- All doors and windows shall be lockable and mobile partitions/curtains shall be provided for privacy;
- Facilities for the storage of personal belongings for workers shall be provided within the campsite only;

- Dustbins shall be provided for collection of garbage and will be removed on a daily basis;
- It is also required to provide first aid box in adequate numbers; and
- Ventilation should be appropriate for the climatic conditions and provide workers with a comfortable and healthy environment to rest and spend their spare time.

Security:

The contractor shall put in place the following security measures to ensure the safety of the workers. The following measures shall be incorporated:

- Access to the campsite shall be limited to the residing workforce;
- The contractor shall be responsible for deploying adequate number of guards;
- Adequate, day-time night-time lighting shall be provided;
- The security personnel shall be provided with training to respect the community traditions and in dealing with, use of force etc.; and
- The rental accommodation shall be provided with firefighting equipment and portable fire extinguishers.

Provision of Drinking Water:

Access to an adequate and convenient supply of free potable water is necessity for workers. The domestic water supply shall be made available by the contractor.

- Safe drinking water conforming to the IS 10500:2012 for drinking water shall be provided;
- Private tanks can be utilized for provision of drinking water for the migrant labours;
- The direct usage of water from bore well should not be allowed and water shall be adequately treated;
- The Project should regularly monitor the quality of drinking water available. In case of non-compliance with the Drinking Water Specifications, additional treatment shall be provided or alternative sources of water supply shall be arranged; and
- All tanks used for the storage of drinking water are constructed and covered as to prevent water stored therein from becoming polluted or contaminated.

Cooking Arrangement:

The construction phase will involve engagement of large number of migrant people in the project area for a limited time. Hence, there shall be requirement of provision of cooking facilities (kitchen) as listed below:

- Places for food preparation are designed to permit good hygiene practices, including protection against contamination between and during food preparation;
- Adequate personal hygiene including designated areas for cleaning hands and cleaning of utensils; and
- All kitchen floors, ceiling and wall surfaces adjacent to or above food preparation and cooking areas are built using durable, non-absorbent, easily cleanable, non-toxic materials;

- Food preparation area to be durable, easily cleanable, non-corrosive surface made of non-toxic materials.

To ensure that the fuel need of labourers in the project area does not interfere with the local requirements, necessary arrangements for supply of cooking fuel to the labourers shall be done by the contractor. In case, fuel requirement for cooking purposes are only to be met by fuel wood then that must be purchased from authorized vendors.

Waste Water Generation:

There will of generation of wastewater from the campsite. About 80% of water used shall be generated as sewage/wastewater. Contractor shall ensure that the campsite are equipped with septic tank and soak pit for disposal of sewage or with mobile bio-toilets. It is also recommended that the storm water and sewage system should be separate. The surface water drainage shall include all necessary gutters, down pipes, gullies, traps, catch pits, manholes etc. Sanitary and toilet facilities are constructed of materials that are easily cleanable. Sanitary and toilet facilities are required to be cleaned frequently and kept in working condition.

Solid Waste Management:

The solid waste generated from campsite will mostly comprise of compostable wastes like vegetable residues (kitchen waste) and combustible waste like paper, cans, plastic and some non-degradable waste like glass/glass bottles. Improper disposal of solid waste will lead to environmental degradation and health hazards to labour as well as nearby community.

The following measures shall be adopted by contractors for ensuring effective management of solid waste:

- The solid wastes of domestic nature generated shall be collected and stored separately in appropriate containers with proper sealing on them;
- Separate bins with proper markings in terms of recyclable or non-recyclable waste shall be provided in the houses and kitchen premises in sufficient numbers for collection of garbage;
- Food waste and other refuse are to be adequately deposited in sealable containers and removed from the kitchen frequently to avoid accumulation; and
- It is the responsibility of contractor to ensure safe disposal of all wastes generated out of labour camps.

Medical Facility:

Effective health management is necessary for preventing spread of communicable diseases among labour and within the adjoining community. The following medical facilities shall be provided by contractors for the construction workers:

- A first aid centre shall be provided for the labour within the construction site equipped with medicines and other basic facilities;
- Adequate first aid kits shall be provided in the campsite in accessible place. The kit shall contain all type of medicines and dressing material;

- Contractor shall identify and train an adequate number of workers to provide first aid during medical emergencies;
- Regular health check-ups shall be carried out for the construction labourers every six month and health records shall be maintained;
- Labours should have easy access to medical facilities and first aid; where possible, nurses should be available for female workers;
- First aid kits are adequately stocked.
- Information and awareness of communicable diseases, AIDS etc. shall be provided to workers.
- Basic collective social/rest spaces are provided to workers.;

Inspection of camp sites:

- Campsite shall be inspected at frequent intervals to ensure that the facilities are well organized and maintained to acceptable and appropriate standards by the contractor. The key areas are:
- Daily sweeping of rooms and houses shall be undertaken;
- Regular cleaning of sanitary facilities shall be undertaken;
- The kitchen and canteen premises shall be established under good hygiene conditions;
- Daily meal times shall be fixed for the labour;
- Smoking and alcohol consumption shall be prohibited in the workplace;
- Water logging shall be prevented at areas near the accommodation facilities and adequate drainage is to be provided; and
- Checklists pertaining to the daily housekeeping schedule shall be maintained and displayed at houses, toilets and kitchen.

To limit the impact due to cumulative labour onsite during construction phase, contractor shall provide adequate number of labour camps which should be appropriate for its location and be clean, safe and, at a minimum, meet the basic needs of workers.

- Contractor should assess the location of labour camp, that it should not be constructed in immediate vicinity of any drainage channel;
- All tanks used for the storage of drinking and cooking water to be covered as to prevent water stored therein from becoming polluted or contaminated and all the migrant workers will be instructed accordingly;
- Contractor should ensure that accommodation which is provided is not overcrowded and does not pose a risk to the health and safety of workers;
- The labour camp will be equipped with sceptic tanks and soak pits and avoid presence of stagnant water is a factor of proliferation of potential disease vectors such as mosquitoes;
- Contractor should ensure that the disruption of local communities is minimum and if required limit the worker's movements in the nearby areas;
- Security staff should have a clear mandate and instructions about their duties and responsibilities such as not to harass, intimidate, discipline or discriminate against workers;

- Contractor should ensure that workers and members of the surrounding communities have specific means to raise concerns about security arrangement and staff;

Grievance Redress Mechanism:

A Grievance Redress Mechanism (GRM) shall be formulated for the construction labourers (local and migrant) comprising of a review committee including representatives elected by labour and management representatives. Project can extend the grievance mechanism developed for the project to the contractor also. A documented GRM shall have the following elements:

- Proper system for lodging grievances;
- Provision for raising anonymous complaints;
- Appropriate level of management for addressing concerns;
- Workers and members of the surrounding communities have specific means to raise concerns about security arrangement and staff;
- Provision for timely action and feedback;
- Monitoring and review of grievances raised and action taken; and scope for continual improvement of the system.



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