ENVIRONMENTAL IMPACTS

DUE TO THE PROPOSED HUBLI-ANKOLA RAILWAY LINE

The proposed Hubli-Ankola railway line project joins the town of Hubli in Dharwad district with the coastal town of Ankola in Uttara Kannada district. Hubli is about 637m above MSL and Ankola is about 18.7m above MSL. The proposed alignment has to traverse the Western Ghats, a continuous range of hills having peak of elevation ranging from 10m to 250m above GL, in order to negotiate this height. The proposed line partly is in the Ghat section and partly in plateau section. A rough estimate of breakup of length between ghat section and partly in plateau section is -

- Plateau region: - From 0 km to 76 km and 136 km to 168 km; length = 108 kms
- Ghat region:- From 76 km to 136 km; length = 60 kms.
- Forest region:- From 42.0 km to 16.4 km, excluding plateau and revenue lands; length = 112 km.

The proposed alignment passes through the Western Ghats forests and the region is part of **Bedthi conservation reserve** (at Yellapur), closer to **Dandeli Hornbill Conservation reserve** and located in the buffer region of **Anshi Dandeli Tiger Reserve** (is about 6.5 km from Anshi Dandeli Tiger reserve).The entire region of the section receives copious rainfall under the South West monsoon during the months of June and September. Rainfall under the North West monsoon also occurs between October and December in the eastern slope of the Western Ghats. The climate in the region is generally moderate with short spell of hot summer. The general type of soil met with in plateau region is of Red soil with laterite. Arecanut and Cashew nut are main crops in the section. Paddy is also grown in some areas of this plateau region. The higher range of Ghat section is full of dense mixed jungle and there is no planned cultivation in the forest area.

Bedthi Conservation Reserve (Government of Karnataka, 2011): As per Section 36A of The Wild Life (Protection) Amendment Act, 2002, the State Government may, after having consultations with the local communities, declare any area owned by the Government, particularly the areas adjacent to National Parks and sanctuaries and those areas which link one protected area with another, as a conservation reserve for protecting landscapes, seascapes, flora

and fauna and their habitat. In the Uttara Kannada district, three forest blocks which form critical links in the matrix of habitats linking protected areas in the north of the district to ones in the south, facilitating the movement of tiger and other threatened species, were **declared as Conservation Reserves by the Karnataka Forest Department**, Government of Karnataka in 2011. These sites are Aghanashini Conservation Reserve (15,000 hectares), Bedthi Conservation Reserve (6,500 hectares) and Dandeli Hornbill Conservation Reserve (6,200 hectares). The Bedthi River Conservation Reserve includes Tengina mudi and Bili halla Valley areas. Bili halla is a tributary of Bedthi river which is rich in biodiversity and is one of the less studied forests of Uttara Kannada. This region has rare and endemic palm species – Talipot Palm (*Corypha umbraculifera*). This forest connects to the forests of Magod and Bedthi valley.

Dandeli Hornbill Conservation reserve (Government of Karnataka, 2011): The forests of Dandeli serve as a very important habitat for four different types of hornbills – Common Grey Hornbill (*Tockus birostris*), Malabar Grey Hornbill (*Tockus griseus*), Malabar Pied Hornbill (*Anthracoceros coronatus*) and Great Pied Hornbill (*Buceros bicornis*). Of all the four Malabar Pied Hornbill is found in good number in the vicinity of Dandeli. Hence, it is very essential to protect these natural habitats for proper survival of these hornbills whose population might dwindle very fast if due care is not taken. Hence, the Dandeli Conservation Reserve will help in providing adequate protection to these species along with the involvement of local community and will also help in disseminating information regarding hornbills and their habitats.

Anshi Dandeli Tiger Reserve (ADTR): Dandeli Wildlife Sanctuary (DWS) and Anshi National Park (ANP), encompassing 475.02sq.km and 339.87sq.km respectively, were declared as Anshi Dandeli Tiger Reserve (ADTR) on 4th January 2007 (Vide GO No. FEE 254 FWL 2006) with total area of 814.89sq.km. This region falls in the Western Ghats Protected Area Network. DATR is located in Uttara Kannada district of Karnataka state between 14.9564°-15.33227°N latitude and 74.2521°-74.7196°E longitude. In 1956, DWS was declared as a game sanctuary covering an area of 127.71sq.km. In 1975, the area was declared as a wildlife sanctuary and it was expanded to 5,729.07sq.km. In 1987, the wildlife sanctuary was divided into two protected areas: ANP and DWS, reducing the area of DWS to 834.157sq.km. In 1994, DWS was reduced again to 475.02sq.km. The present DATR boundary is based on Govt. of Karnataka order in 1998 (Figure 1). For more detailed account please refer Tiger Conservation Plan (2008-2018). DATR forms major catchment area for River Kali with tributaries like Nagazhari and Kaneri.

Environmental Impacts of the proposed project

The proposed project is likely to induce changes both positive and negative, in the eco-system and life of the community. Though this rail link is likely to accelerate urbanization affecting both the physical and human environment in terms of productivity of land, settlements, and socio-economic and cultural characteristics, this will mostly be limited to the plateau section in Kalghatgi, Yellapur and Ankola regions.

In this report the direct, indirect and cumulative environmental and social impacts expected from the project were studied as under:

- Biotic components (flora and fauna)
- Animal movement paths
- Humans (rehabilitation, human-wildlife conflicts, etc.)
- Land use/ Land cover of the region
- drainage of streams
- Landslide susceptibility
- Impacts due to solid and liquid waste generated
- Impacts due to location of work force colonies in sensitive locations
- Impacts of tunneling on biotic and abiotic elements
- Economic feasibility of the project

The impact matrix pertaining to environmental Impact is given in Table 1 considering all phases of the project.Table 2 details the nature of positive and negative impacts of proposed Hubli-Ankola railway line project.

Table 1: Impact matrix for proposed Hubli-Ankola railway line project

Parameter	Negative Impact	No Impact	Positive Impact	Short Term	Long Term
A. Impacts due to Project Location.					
a) Changes in land use/land cover	●			●	●
b) Displacement of people				●	
c) Loss of trees/forests	●			●	●
d) Impact on wild fauna	●			●	●
e) Animal movement paths	●			●	●
f) Drainage problems	●			●	
g) Risks due to landslides, mudslides	●			●	●
h) Risk due to earthquakes		●			
i) Buffer region of Anshi-Dandeli tiger reserve	●			●	●
j) Bedthi Conservation reserve	●			●	●
k) Smuggling of timber and forest goods	●			●	●
l) Contamination of land and water	●			●	●
B. Impacts due to Project Construction					
a) Workforce colonies inside forests	●			●	●
b) Workforce colonies – without basic amenities (sanitation, fuel, education of children)	●			●	●
c) Human –animal conflicts, members of workforce trespassing into forests	●			●	●
d) Smuggling of forest goods, hunting of wild fauna	●			●	●
e) Pollution at construction sites	●			●	●
f) Soil removal (tunnels, etc.), erosion and sedimentation of streams and river, alterations in topography due to soil disposal	●			●	●
g) Soil disposal problem	●			●	
h) Problems due to geological faults		●			
i) Health risk and cultural hazards	●			●	
j) Loss of habitat of wild animals	●			●	
k) Blasting – impact on wild fauna	●			●	
l) Loss of carbon sequestration ability – removal of	●			●	●

tree vegetation					
C. Impacts due to Project Operation					
a) Impact of plastic waste on wild fauna	●			●	●
b) Solid wastes	●			●	●
c) Contamination of water due to liquid waste	●			●	●
d) Smuggling of forest goods	●			●	●
e) Animal movement and related accidents	●			●	●
f) Noise (impact on wild fauna)	●			●	●
g) Non-evacuation of workforce colonies	●			●	●
h) Cascaded developmental activities	●			●	●
i) Triggering landslides, mudslides	●			●	●
j) Oil pollution	●			●	●
k) Accident hazards	●			●	
l) Further fragmentation of forests - encroachments	●			●	●
m) Fog visibility	●			●	
n) Biodiversity loss	●			●	●
a) Economic viability in absence of large scale cargo movements	●			●	●
D. Positive Impacts					
b) Employment opportunities			●		●
c) Benefits to economy			●		●
d) Quick service and safety			●		●
e) Less fuel consumption- Reduction in Green House Gases emissions			●		●
f) Less air pollution compared to road transport			●		●
g) Avoiding widening of NH 63 to 4 lane			●		●
h) Mass transportation at Lower commuting expenses			●		●
i) Establishment of connectivity of West Coast with hinterland and consequent stoppage of other Railway projects in ecologically sensitive region (such as Sharavathi valley, habitat of Lion Tailed Mackaque in Talguppa-Honnavara connectivity) and road widening projects			●		●

j) Port connectivity			•		•
k) Link to naval harbor and industrial areas			•		•
l) Easy movement of raw materials			•		•
m) Link to Vasco and Mangalore ports through Konkan railway			•		•
n) Movement of extra iron ore traffic from Bellekeri Hospet sector to either Mangalore or Goa port			•		•
o) Passenger connectivity to other parts of the country			•		•
p) Transport of coal/coke imported through Murmagoa or Mangalore port to steel industries, and coal based thermal power stations at Bellary and Hospet			•		•

Table 2: Positive and negative impacts of the proposed project

BIOTIC		IMPACTS
Mammals	Humans	300 families likely to be displaced due to this project
	Elephant	The Kalghatgi and Kirwatti forest ranges form a vital link for the Bhagwati – Kalghatgi – Kirwatti – Mundgod – Katur – Hanagal elephant movement path since time immemorial
	Tiger	A small family of Tiger is reported to be residing in the Yellapur forests.
Birds		Some impact expected on about 70 species of birds including IWPA scheduled birds like Hornbills, Barbets, Babblers etc.
Reptiles		8 different species of reptiles will be affected including Red listed and Scheduled species like King Cobra, Reticulated python, etc.
Amphibians		33 species of amphibians of which 55% are endemics to the Western Ghats will be affected.
Flora		43 families, 106 genera and 134 species of trees, 58 families, 128 genera and 146 species of shrubs and 10 species of pteridophytes will be affected. Total number of trees to be cut down for this project is approx. **1.94 lakhs**. Note: It is difficult to state that all will be affected – many

	may increase on opening up of canopy
ABIOTIC	
Rehabilitation / resettlement of human settlements	Rehabilitation and resettlement is a major issue which will affect nearly 300 families who will be displaced from their original habitats.
Land use changes	The railway project would aid is catalyst in drastic land cover changes (to the order of 16% removal of forests). For example, near proosed railway stations, many service centres would crop up gradually impinging on the forests.
Encroachment	Likely encroachments due to connectivity to the forest area surrounding the railway land which will have negative impact on flora and fauna.
Landslide	The Vajralli and Yellapur villages in Yellapur taluk are landslide prone areas in the presence of triggering factor such as high intensity rainfall.
Drainage problem	Improper soil conservation and management will lead to excavated soil getting into the streams causing sedimentation
IMPACTS DURING PROJECT CONSTRUCTION	
Movement of Heavy Vehicles	Widening of existing roads (of current 6 m width) and consecutive removal of trees
Construction of new roads	Construction of new roads has also been proposed near places like Ramanguli which will affect the biodiversity
Workforce colonies in forest area	Labourers straying into forests and encounter with wildlife leading to human-animal conflicts
	Removal of trees for firewood
	Higher instance of smuggling of forest goods
	Lack of sanitation would contaminate the land and water (Bedthi river)
	Lack of education facility for the children of work force
Health risk and cultural hazards	Lack of proper sanitation and food facilities might lead to widespread disease problems. Migration of labourers from one place to another might lead to cultural conflicts.
Soil disposal	Large quantity of excavated rock and soil dumping would alter the drainage pattern, leading to silt

	transportation in the catchment and hence, sedimentation in Bedthi river. This would affect the benthic organisms.
Tunneling in undulating terrain	Blasting would affect the fauna
	Temporary storage of soil and rock of the tunnel excavations would lead to removal of ground flora and trees
	During monsoon, soil gets eroded to nearby streams
	Lack of appropriate arrangement with the contractors might lead to illegal transportation of natural resources including rock and soil to other localities
	Tunneling might induce landslides due to movement of heavy machinery and high intensity blasting
Removal of trees during construction	Loss of habitat for endemic species of fauna such as Malabar Pied Hornbill, etc.
	Removal of trees during the breeding time of endemic species might have adverse impacts on them
IMPACTS DURING OPERATION PHASE OF PROJECT	
Illegal forest activities	Smuggling of forest goods and violation of Biodiversity Act, 2002
Impacts due to movement of trains	Landslide and stoppage of movement of trains in undulating terrain due to triggering factors such as high intensity rainfall
Solid and liquid waste management	Maintenance of locomotives at workshops, cleaning of compartments, platforms, and yards will generate waste water and solid waste which require proper disposal.
Impacts due to train movement	Vibration due to train movements might induce mud slides during monsoon in locations like Vajralli and Yellapur
Blockage of animal movement path	The proposed alignment passes through age-old traditional elephant movement paths in Kalghatgi and Kirwatti ranges which will disrupt their movements. If the recommended measures are not employed, it may lead to animal deaths due to train hits as well as give rise to human-animal conflicts in surrounding areas.
Failure to evacuate work force colonies after completion of work	This would lead to the large scale land cover changes leading to deforestation in the region

Fog visibility	visibility problems dur to seasonal heavy fogs may lead to hits on wild animals and domestic cattle
Economic viability in post mining ban scenario	675 rakes are required to carry 27 MT (million tons) of freight per annum. Iron ore was the major commodity transported to the coast. In the scenario of mining ban, or slow down these rakes will be affected, causing heavy losses.
POSITIVE IMPACTS	
Reduction in Green House Gases emissions	Compared to truck movement, goods train save 65% of fuel annually and hence, reduce the GHG emissions.
Employment Opportunities	Various employment opportunities will be generated for a large mass of local people during the construction and operation phases of the project.
Economical Travel Opportunity	As compared to the road transport, train will provide a more economical means of transportation to local people.
Port connectivity	Connection to Karwar, Tadri Belekeri and Mangalore ports
Link to naval harbor and industrial areas	Vital link to connect east and west coast
Easy movement of raw materials	Movement of materials, equipments and work force of various projects like Project Seabird, Kaiga Nuclear Power plant, etc. and nearly 10,000 small and medium industrial units of Uttara Kannada with consumer markets in Hubli and other Deccan towns
Link to Vasco and Mangalore ports through Konkan railway	Transport of imported coal/coke from Murmagoa and Mangalore ports to steel industries, coal based thermal power plants (Bellary, Hospet, etc.). Transport of imported timber and oil and gas from Mangalore port and MRPL, Mangalore
Passenger connectivity to other parts of the country	Betterconnectivity for the people of densely populated west coast with, Deccan region, central, north and north-east India.

Impacts of the proposed project on Western Ghats Biodiversity

Biodiversity or Biological Diversity refers to the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of

ecosystems (Hamilton, 2005). Biodiversity through time and space has provided the panorama of the genesis and diversification of various life forms, their interdependence, and link between life and life support systems, triggering a holistic approach to knowledge-building focused on various aspects of human affairs (Ramachandra *et al,* 2010). However, extensive anthropogenic interventions in the natural ecosystems in recent times have been resulting in loss of biodiversity. The most important threat to the tropical forest biodiversity is habitat loss, particularly the loss of natural forest cover. Most of the developmental activities, when carried out in inappropriate and unsustainable fashion, lead to significant degradation in the original ecosystem of a particular region which affects the species composition and its ecology.

The proposed Hubli-Ankola railway line passes through different types of forests including evergreen, semi-evergreen, moist deciduous and dry deciduous . The total forest area to be utilized amounts to 727 ha with a total of approximately 1,94,828 trees would be removed from their natural habitat. The overall floristic diversity in Hubli-Ankola railway zone constitutes of 43 families, 106 genera and 134 species of trees and 58 families, 128 genera and 146 species of woody ground flora of shrubs and regenerating tree stocks. Besides this, 10 species of pteridophytes belonging to 9 families and 9 genera are also enumerated in the Ghat section.

The Western Ghats stretch from Yellapur to Sunksal is rich in floral diversity, endemism and evergreeness with a high tree density and basal area. The natural forests in this region are of evergreen to semi-evergreen types characterized by several endemic tree species such as *Myristica malabarica, Polyalthia fragrans, Cinnamomum macrocarpum, Holigarna grahami, H. arnottiana, Hopea ponga* etc. Many trees in this region also harbor a rich flora of epiphytes (orchids) including endemic species such as *Aerides crispa, Cleisostoma tenuifolium, Oberonia brunoniana, Porpax jerdoniana*, etc. The ecological condition of this region supports a rich ground flora which involves a good number of endemic and medicinal herbs.

Unplanned developmental activities in the region will diminish the biodiversity (most importantly the endemic and endangered species), hydrology and ecology of the region. The destruction of forests and cutting down of trees on large scale will alter the species composition of the region and alter the overall ecological and hydrological regimes of the existing biomes. The sector-wise details of trees (botanical name, local name, girth class distribution, enumerated by the Karnataka Forest Department), that gets affected due to the project in **Kalghatgi-Hulginkoppa** region are listed in Table 3, **Siddhanabhavi** region in Table 4 and **Karagooda region** in Table 5. Tree details chainage (kilometer-wise), girthclasswise are given in Tables 6 to 55. Sectorwise numbers of trees are listed Table 56.