प्रारुप–26

परियोजना का विवरणः–माननीय मुख्यमंत्री घोषणा संख्या–305/2014 के अन्तर्गत जनपद टिहरी गढ़वाल के विधानसभा क्षेत्र नरेन्द्रनगर के अन्तर्गत शिवपुरी से जाजल तक रोड का डबल लेन में निर्माण कार्य। (लम्बाई 7.250 कि0मी0)

(परियोजना के राष्ट्रीय पार्क/वन्य जीव अभ्यारण्य के अन्तर्गत प्रस्तावित होने अथवा राष्ट्रीय पार्क/वन्य जीव अभ्यारण्य की सीमा के 10.00 किमी0 की परिधि के अन्तर्गत होने की दशा में लागू) है

संलग्न है

~~–लागू नहीं है –~~

कनिष्ठ अभियन्ता
निर्माण खण्ड,लो0नि0वि0
नरेन्द्रनगर।

सहायक अभियन्ता
निर्माण खण्ड,लो0नि0वि0
नरेन्द्रनगर।

अधिशासी अभियन्ता
निर्माण खण्ड,लो0नि0वि0
नरेन्द्रनगर।

मुख्य वन्य जीव प्रतिपालक

कार्यालय मुख्य वन्यजीव प्रतिपालक, उत्तराखण्ड

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पत्रांक 2933 /12–1 देहरादून दिनांक 25 मार्च 2021

सेवा में,

वन संरक्षक,
भागीरथी वृत्त,
मुनिकीरेती।

विषय :– मा0 मुख्यमंत्री जी की **घोषणा संख्या– 305/2014** के अंतर्गत जनपद टिहरी गढ़वाल के विधानसभा क्षेत्र नरेन्द्रनगर के अंतर्गत **शिवपुरी से जाजल** तक मार्ग का डबल लेन निर्माण हेतु वन भूमि हस्तान्तरण प्रस्ताव।

संदर्भ :– आपका पत्रांक–1433/12–1 दिनांक 01/3/2021

महोदय,

मा0 मुख्यमंत्री जी की **घोषणा सं0– 305/2014** के अंतर्गत जनपद टिहरी गढ़वाल के विधानसभा क्षेत्र नरेन्द्रनगर के अंतर्गत शिवपुरी से जाजल तक मार्ग का डबल लेन निर्माण हेतु वन भूमि हस्तान्तरण हेतु प्रस्तावित स्थल की राजाजी टाइगर रिजर्व से निकटतम हवाई दूरी **6.20 किमी0** है तथा ईको सेंसटिव जोन के अंतर्गत पड़ने के कारण संदर्भित पत्र के माध्यम से मानव वन्यजीव संघर्ष को नियंत्रित करने हेतु उक्त परियोजना के सापेक्ष **मु0 67.10 लाख रूपये** का वाइल्डलाइफ मिटीगेशन प्लान (Wildlife Mitigation Plan) तैयार कर संस्तुति सहित अनुमोदनार्थ प्रस्तुत किया गया है। विषयक परियोजना हेतु मु0 **67.10 लाख** रूपये का वाइल्डलाइफ मिटीगेशन प्लान अनुमोदित कर अग्रेत्तर कार्यवाही हेतु मूल में संलग्न कर लौटाया जाता है।

संलग्नः–यथोपरि ।

भवदीय,

(**जे0एस0 सुहाग**)
मुख्य वन्य जीव प्रतिपालक,
उत्तराखण्ड
25/3/21

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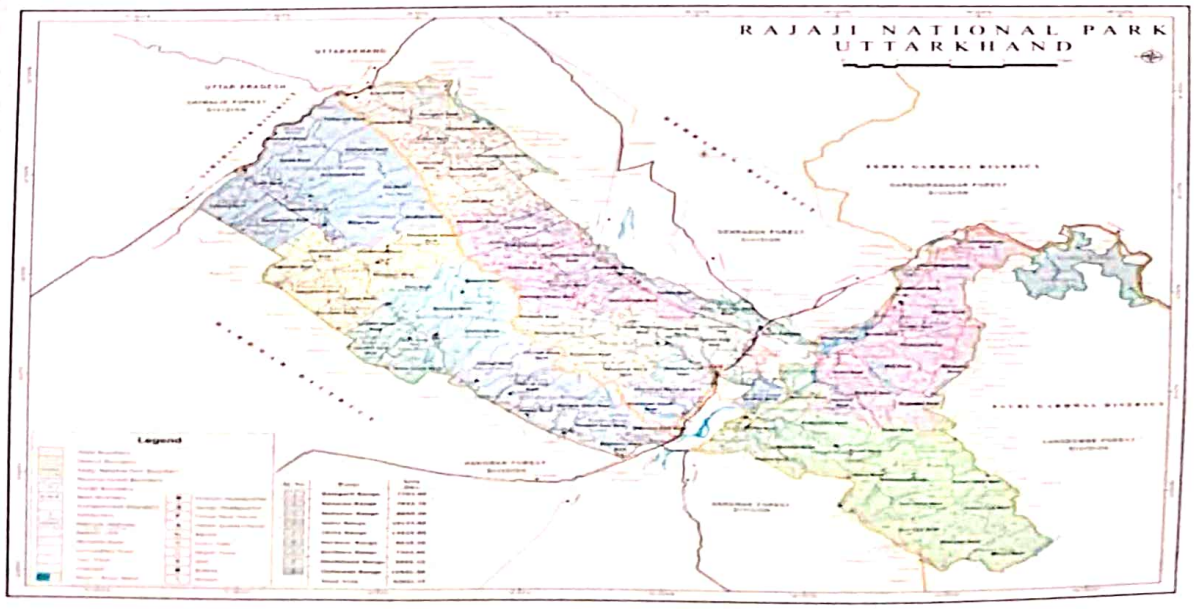
CHAPTER – 1

INTRODUCTION

Location of the Proposal Passing through Rajaji National Park

The proposed Location of the Motor Road through Rajaji National Park from km 10+000 to km 17+250. The total area to be diverted 0.00 Ha inside the Park. The map showing the Highway passing outside within 3.80 km through the Rajaji National park.

Topo Map for Location of Highway Passing through Rajaji National Park



Rajaji National Park Map

CHAPTER – 2

GENRAL DESCRIPTION OF THE PROJECT AREA

Introduction

The intent notification of Rajaji National Park (henceforth also referred to as the Park) was issued on 12 August 1983. The Park extends over the Shivalik Range from the Dehradun-Saharanpur road in the north-west to the Rawasan River in the southeast, with the Ganges dividing it into two parts. Some of the basic features of the Shivalik formations are to be seen in the Park and it is rightly known as a veritable storehouse of Shivalik biodiversity and eco-systems. River Ganga bifurcates the Park into two parts: the eastern part, consisting of the Chilla and Gohri ranges, stretches from the left bank of the Ganges to Rawasan River in the east and Shyampur Range of Hardwar Forest Division to the South. The northern boundary of the eastern portion of the Parkis defined by Laxmanjhula beat of Gohri Range of thePark

The western part of the Park consists of the Ramgarh, Kansrao, Motichur, Hardwar, Dholkhand and Chillawali Ranges.

The 10-20 million years old Shiwaliks are composed of sedimentary rocks such as sandstone, clay and conglomerates and are very rich in fossils. The hill ranges vary from 200m at the terminal slope to 1,000m at the peaks. The alluvial nature of the soil makes the Shiwalik very fertile as they are the first formidable barriers to the monsoon clouds that sweep through the plains and bring good showers in the region. The foothills of the Shiwaliks and the continuing plains are called 'bhabar', characterized by very low water table and boulder strewn seasonal streams called 'raus' and 'sots' with comparatively less debris. The river Ganga along with the various seasonal rau's and sot's (perennial streams) quench the reserve forest, providing for a rich habitat to support the extensive biodiversity of the reserve. It decides the reserve into two halves as it flows for about 25km through the reserve.

Climate andTemperature

The three main seasons in the Himalayan foothills are: winter, summer and monsoons. The best time for a safari or a bird watching trip is during winter (November to February) when the days are pleasant (12 - 25 degree Celsius), nights cold and humidity is low. Temperature rises rapidly to 38-40 degree Celsius in the hot season (May to June) but the wild life sighting is good around water holes and rainfall increases with the occasional thunderstorm after June. Humidity is high in the rainy season (June to September), with over 750 mm of precipitation in July to August, and there is little temperature variation. Annual rainfall ranges from 1200-1500 mm.

Terrain

The **Rajaji Tiger Reserve** is located in the foothills of the Shiwaliks ranges which extended over 1500 km in **India**and 600 km in**Nepal**. The Shiwaliks hills are one the most prominent and well vegetated area in **Uttrakhand**and Rajaji boasts of being the only **rajaji tiger reserve**in its lap. The 10-20 million years old Shiwaliks are composed of sedimentary rocks such as sandstone, clay and conglomerates and are very rich in fossils. The hill ranges vary from 200m at the terminal slope to 1,000m at the peaks.

Soil

The alluvial nature of the soil makes the Shiwalik very fertile as they are the first formidable barriers to the monsoon clouds that sweep through the plains and bring good showers in the region.

Flora

Rajaji Tiger Reserve_, comprising of varied ecosystems like grasslands, river in forests and the slopes of the Shiwaliks make it a storehouse of **floraland faunal** diversity. The trees, shrubs, orchids, fungi, mammals, birds, amphibians, reptiles and insects make exploring the reserve an adventurous experience. Rajaji represents floral elements of both the Himalayan and the Upper Gangetic Plains. Owing to its location between both these bio- **geographic regions,** it is home to one of the most diverse ranges of **wildlife**habitats in the country. The eight major forests types including the Western Gangetic Moist, Northern Dry Deciduous and Khair-Sissoo forests in the southern slopes, the Low Alluvial Savannah Woodlands in the southern margins of the reserve, and the ShiwalikChir-Pine forests in the higher reaches of the hills makes this area rich of biodiversity.

The majestic sal along with its associates dominates most of the forests in the gentler northern slopes of **Rajaji Tiger Reserve**. Some trees grow up to 80ft with a girth of 5 ft. The sal trees shed their leaves between February to March and soon changes hues from brownish red to pale green to dark green. During March and April the forest is filled with the mild scent of the sal trees in full blossom. There are a lot of fruit bearing trees which are a treat to watch with several birds and animals feeding on them. The fruits of the harar and behera trees are eaten by birds and animals ranging from elephants to mice. Jamun, Chilla, Ber, Lassora, Aonla, Ficus, Bel, Sisham are few out of the 30 species of fruit-bearing trees found in reserve.

Rajaji National Parkalso harbours some of the rare and threatened plants which include Catamixisbaccharoides (Asteraceae), Eremostachys superba (Lamiaceae), Euphorbia fusiformis (Euphorbiaceae), gloriosa superba (Colchicaceae) etc.

Of these E. superb is one the most beautiful tuberous native species of the region and is known only from the area around Mohan. Other interesting species C. baccharoides, represented by a single species all the world is found on the steeply lower slopes of lower Shivalik. Tubers of E.fusiformis and G. superb are generally used for medicinal purposes. Since Rajaji is a rich repository of both floral and faunal elements, it is necessary to conserve these by inside conservation practices. Rajaji is a home to 36 species of orchids which is a reflection of the pristine habitat. One can find several species of fungi in the reserve. Their ability to re-cycle the food locked in dead and decaying matter offer conducive breeding ground for several insects such as moths and beetles which in turn have great relevance in maintain the balance of the ecosystem.

Fauna

In **RAJAJI NATIONAL PARK**, More than **50 species of mammals** including the highly endangered **Asian Elephant and Tiger** found in the Park. Besides tiger, **leopard, Himalayan Black bear, sloth bear, Civet, Marten, Jackal, Hyena** etc, it is estimated that there are more than 350 Asian elephants in the park. Goral (Mountain Goat) - a characteristic mammals of the lower Himalayas abound in the precipitous slopes of the Shivalik hills. Three species of deer - **Sambhar, Spotted Deer (Cheetal) and Barking Deer (Kakar)** and animals like Wild Boar, Neel Gai. Langoor, Black Napped Hare, Jungle cat etc are also found. Tiger population so only confined to Chilla and Gohri ranges and the buffer zone of thereserve

Over **300 species of birds** are reported from Rajaji National Park, making it an important birding area in the Country. Of these, about **90 species are migrants**, which include **Pochards, Gulls, Mallards, Teals and Shellducks**that visit the water bodies of Bhimgora and Virbhadra Barrage and wetlands of river Ganga. The resident Birds include **Pea Fowl, Jungle Fowl, different Parakeets, Woodpeckers, Kingfishers, Thrushes, Warblers, Barbets** and Finches etc. Great Pied Hornbill occupies a place of pride among the different Hornbills found in thePark.

The **reptilian fauna** of the Park is represented by various species of lizards, snakes and tortoise. The area is also known for its rich population of **Pythons, Cobras and King Cobra**. The rivers of the Park are rich in aqua fauna like Golden Mahseer and otherfishes.

CHAPTER-3

IMPACTS OF THE PROJECT ON THE HABITAT, FLORA AND FAUNA

PositiveImpact

Construction of Motor Road is necessary due to Minor landslide at whole project and Motor Road is important as it leads cashflow by inflow of tourists and pilgrims and increase Financial support to Uttarakhand.

- Strategic importance due to international border withChina, and also Decrees the Distance From NH-58(New No -07) to NH-94 by 15 Km (Shivpuri Situated at NH-58 and Jajal Situated at NH-94)
- Serves as main pilgrimage and tourist route to Badrinath, hemkund, KedarnathMandir.
- No violation of the Wildlife (Protection) Act, 1972 or Forest Conservation Act,1980

NegativeImpact

The project will lead to increased inflow of tourists and pilgrims to the area, which will in turn lead to disturbance to the ecosystem of Rajaji National Park area which was established for the conservation of different species of Birds and animals, along with other wildlife as well as their habitat.

Dust. - The project shall generate lot of dust. This will cover the leaf surface and affect photosynthesis of plants with in the radius of 0.25 km.

Noise: - Movement and operation of heavy machineries and of transport vehicles shall generate some noise. Noise induces some physiological and behavioral changes. Controlled blasting should be done which will result in considerably less noise pollution.

Lighting: - The fixed lights and head lights of vehicles will illuminate forest area and likely to disturb the night life of wild animal.

Forest Fire: - Due to increase in human activities, negligence etc. Forest fire may take palace. Forest fire mostly is anthropogenic in origin. This, in turn, may deprive wildlife of their cover and food.

Smoke: - The vehicles deployed for the project may generate a lot of smoke which will pollute the air and affect forest areas and heavy traffic movement after the completion of the project may also result in more airpollution.

The concern project is in the periphery of Rajaji National ParkTherefore, Wildlife Mitigation Plan along with RET SpeciesConservation Plan is being prepared. All these perceivedimpacts/threats due to this project needs to be removed throughdifferent measures to improve the habitat for wildlife so that theirstatus can be enhanced, and healthy environment is created. Themeasures for the same have been outlined in the Nextchapter.

CHAPTER – 4

IMPACT MITIGATION PLAN

Components:

Animal PassagePlan

There is engineering (Structural measures) to be carried out by the user agency at its own cost to mitigate the negative effects the accrue due to the implementation of the proposal on ground. The user agency has to make funds available their project for all these structures and should abide by all recommendations with respect to numbers, location and dimensions of the structural features stipulated by wildlife Institute of India.

Wildlife ConservationPlan

There are mostly related to the infrastructure improvement inside the park area, providing rescue and rehabilitation facilities and other conservation and awareness related measures which will be carried out by the Department of Rajaji National Park, Forest and Wildlife Preservation out of the funds deposited by the user agency to address all the issues related to conserving wildlife inside thePark.

The User Agency, while implementing the proposal and while carrying out the engineering works should take care of the mitigating the following impacts at its own cost along with this Animal Passage plan.

Additional Mitigation measures while carryingout constructionactivities

Dimension and locations of structures like animal crossing pointsetc.:

The Dimensions, structures and locations proposed by the WII team has to be strictly adhered by the User Agency to avoid any negative impacts on wildlife management in the park.

Dust control

Dust generated due to face activities and due to movement of vehicles affects the wild animals and plants. This will be generated by sprinkling of water thrice daily. Precaution will also be taken while transporting and dumping. Sprinkling with water shall prevent the fugitive emission of dust.

NoiseControl

Noise due to machine operation and vehicles is likely to disturb wildlife. This would be minimized to least possible level. This would be achieved by proper maintenance of machinery and use of efficient mufflingdevice.

ForestProtection

No damage to any green cover other the proposed project area should be done by the user agency Rigid protection will be given to the natural forms and plantation for their effectiveness as shelter belt.

Smokecontrol

Generation of Smoke adversely affects the flora and fauna. efforts should be taken by the user agency to use standard machineries and vehicle and no smoke generating activities will be carried out.

Firecontrol

The accidental fires in the project area shall be extinguished immediately. Hence in project area no fire will be allowed to spread to any part including nearest vegetation.

Conservation Plan for Management ofWildlife

Considering the anticipated impacts posed by the project as indicated, It is necessary to take suitable amelioration measures to see that the assessed impacts on the wildlife and its habitat, due to project is minimized. It will be necessary to manage the perceived adverse impact in such a manner that this does least possible harm despite the project. The strategy of conservation measures will be properly juxtaposed within the cruising radii of wild animals. The Vegetation will be maintained in optimum level of interspersion as regards density cover and stand height.

The conservations plans aims at Maintaince of optimal habitats in proper stage of productivity and repair of damages already done or that may be done to the habitatactivities.

The plan provides for the protection and conservation of all important species of wildlife and its habitat.

The components of the conservation plan are related to the infrastructure improvement inside park, providing rehabilitation facilities and other conservation and awareness related measures which will be carried out by the Department of Forests and Wildlife Preservation out of funds deposited by the user agency mainly to address all the issues related to conserving wildlife inside thepark.

Goals

"To Conserve, the Flora and Fauna"

Objective

1. To prevent death of wild animals due to roadsaccidents
2. Protection and improvement of eco system through mitigation measures
3. Increase awareness on wild lifeConservations

Plan Period

10 Years

AwarenessGeneration

No effort to protect wildlife and its habitat shall succeed without active involvement of public and the wildlife staff. Hence it is important to create awareness among them. For this purpose lectures, observation of different functions like wildlife week, competition like debate, essay, and quiz, film show, painting and distribution of literature can be taken.

ExtensionActivities

The Plan also provides for awareness and training camps for staff and villages community in protected areas with publications, information brochures, documentaries etc. in all the protected areas.

Conclusion

The Mitigation measures and conservation plan are proposed to prevent the adverse effects of the proposed project on both Flora and Fauna of the Park areas of the Rajaji National Park division and it is extremely important for the conservation of wildlife habitat.

PlanCost

Total Cost of Plan has been worked out to be .....

Monitoring

It will be difficult to access the result of this plan unless the statues of wild animals and flora is monitored on annual basis. This can be done through experienced wildlife personnel or competent institutions and result submitted to the monitoring committee for bringing about course correction if required.

Indicators ofSuccess

The Following will be taken as indicators of success of Plan

Decrease in accident rate of wild animals that cross the roads
Local people awareness about wildanimals
Restoration of ForestCover
Employment opportunity to the localpeople
The Over all health of theecosystem

CHAPTER – 5

Rare, Endangered and Threatened Species Conservation Plan

(Being affected in NH-94 widening)

Rare, endangered and threatened plants (RET) are an integral component of the local flora and vegetation, and the disappearance of these species can lead to loss of biodiversity. Habitat assessment is a fundamental requirement for species conservation. It has been observed that the rare and threatened species showed more habitat specialization than the commonly occurring ones. Therefore the knowledge of particular habitat type and the specific requirements of a species is the prerequisite for the conservation of that species. Specialization of habitat has caused much extinction. Species that depend on a certain type of habitat and cannot adjust to alterations, whether natural or human-caused such as road widening NH-94, are much prone to extinction. Many endangered plants require specific soil type, climate, drainage and sunlight exposure. The ex-situ conservation of such habitat specific species requires comprehensive knowledge of their particular habitats and the specific requirements that need to be met for their survival in their new environment.

According to the Global Strategy for Plant Conservation, 60% of threatened plant species should be accessible in ex-situ collections by 2010, preferably in the country of origin. Priority should be given to the conservation of Critically Endangered (CR) species in their countries of origin. Genetically representative ex-situ collections provide material for research and minimize impact to wild plant populations, offer potential adaptive management options for in-situ work and maintain stock to produce material for education, reintroduction and otheractivities.

NH -

The data related to specific habitat requirements (altitude range, slope aspect, soil pH, moisture etc.) of the selected species shall be collected during the field surveys to make necessary arrangements prior to the collection of propagating materials from the field. Field tours would be conducted to locate the species in their natural habitats along the national highway No.-58 and propagating materials would be collected in a sustainable manner. Application of different propagation protocol for each species shall be followed.

Since most of the selected species are found on rocky slopes of calcareous and sedimentary rocks along the NH-94 are as below:

1. **Catamixisbaccharoides**Thomson
   Family: Asteraceae
   Vernacular Name: Vishpatra, for the plant is believed to be highly toxic.

Conservation status & threats: Critically Endangered, due to narrow range of occurrence and population decrease due to habitat loss. Habitat: Exposed, dry, sandstone cliffs of lower Shivalik belt.

Propagation Strategy: Propagating material viz. seeds and stem cuttings would be collected from the natural habitat along NH-94. The seeds would be sown in vermiculite, sand and coconut peat medium. Cuttings would be planted in pots taking pure sand as growing medium. Seed

germination is recorded to be ca 45–60 % in 7 days whereas rooting percentage of cuttings is ca 25–30 % in nearly 60 days.

Conservation efforts: Since the species is habitat specific and grows on steep rocky slopes, the propagated saplings are planted in pots containing sand, soil and farmyard manure in the ratio of 5:1:1 respectively. Also the saplings are planted on the artificially created rocky mound in the garden.

2. **Incarvillea emodi** (Royle ex Lindl.)Chatterjee
   Family: Bignoniaceae
   Vernacular Name: Kaud; Kadu, Lahsu, Karoliya (Uttarakhand)

Distribution: Western Himalaya (Afghanistan, Pakistan, India and W. Nepal) from an altitude range of 500-2500 m. The species is reported from very few localities (< 20) in India from Jammu & Kashmir, Himachal Pradesh and Uttarakhand.

Conservation status & threats: Vulnerable. Due to habitat loss, anthropogenic activities and low regeneration potential, the population of this species is rapidly decreasing from all the limited localities of its occurrence.

Habitat: Dry, exposed or semi exposed cliffs of calcareous or sedimentary rocks.

Collection & Propagation: The stem cuttings and seeds would be collected from natural habitats near Devprayagof Uttarakhand. The collected seeds will be sown in sandy medium for germination. The cuttings treated with different concentrations of phytohormones (IBA and NAA) gave best rooting result >70% when planted in pure sand and vermiculite in less than 30 days. Non treated cuttings also rooted well in the similar medium in more than 45days.

Conservation efforts: The rooted cuttings and seedlings would be first shifted to polybags filled with pure sand and a little amount of crushed limestone in the ratio 7:1. These saplings would thenbe shifted to pots and would also be planted on the artificially created mound after 3-4 months.

3. **Incarvillea arguta** (Royle)Royle
   Family: Bignoniaceae
   Vernacular Name: MaruwaPaati (Nepal)

Distribution: India (Jammu & Kashmir, Himachal Pradesh and Uttarakhand), Nepal, Bhutan, Tibet and China from an altitude range of 1600-3200 m. The species is reported from very few localities inIndia.

Conservation status & threats: Vulnerable, mainly due to habitat loss. Habitat: Similar to I. emodi but comparatively moist habitats of shaded or exposed rocky slopes.

Collection & Propagation: The stem cuttings and seeds were collected from natural habitats near area. The seeds sown in sandy medium readily germinated within 7 days whereas the phytohormone treated stem cuttings also rooted well (approx. 90%) in the nutrient deficit sandy medium. Conservation efforts: The propagated saplings were planted in same manner as that of I. emodi. The plants propagated through cuttings which flowers in the month of May and June but have resulted in no seed set.

4. **Phlomoides superba** (Royle ex Benth.) or Eremostachys superbaRoyle

Family: LamiaceaeVernacular Name: Ban muli

Distribution: Western Himalaya from an altitude range of 400-800 m. The species is reported from nearly ten localities inIndia.

Conservation status & threats: Endangered. Due to habitat loss, over exploitation and low regeneration potential the species is depleting from all the known localities of its occurrence in India.

Habitat: Exposed to semi exposed gentle slopes of forest edges in sandy, well-drained soil.

Collection & Propagation: The seeds would be collected from the type locality of the species i.e.Mohand Pass. The healthy seeds to be treated with 15 days of cold stratification under 4-5 °C germinated in less than 20 days and could show nearly 45-50% germination.
Conservation efforts: The propagated saplings were planted in gentle slopes and raised garden beds in three different parts. The saplings planted in shady, moist and nutrient rich soil have showed luxurious growth in comparison to those planted in dry places. The propagated plants flowered after 2-3 years resulting in production of good percentage of viableseeds.

5. **Pittosporum eriocarpum**Royle**Family:**Pittosporaceae
Vernacular Name: Meda-Thumri, Tomdi, Raduthiyo

Distribution: Endemic to Western Himalaya India (Uttarakhand and Himachal Pradesh) and Nepal at an altitude range of 800-2500m.

Conservation status & threats: Endangered (IUCN, 1997). The species is mainly facing threats due to habitat loss and low regeneration potential.
Habitat: Dry, exposed, steep rocky slopes of limestone rocks.
Collection & Propagation: The propagating material viz. seeds, stem cuttings and root cuttings would be collected from the wild habitat. To break the dormancy, the seeds shall be treated with cold stratification under 4-5°C which resulted in nearly 95% germination. **Conservation efforts:** The propagated saplings would be planted in garden and also in wild to estimate the survival percentage. The survival percentage is <10 in wild and < 65% in ex-situ conservation. The planted saplings flowered after four years of planting with satisfactory seed formation is observed.

6. **Sophora mollis**(Royle) Baker
Family: Leguminosae
Vernacular Name: PeeliSakina

Distribution: Western Himalaya [India (Jammu & Kashmir, Himachal Pradesh and Uttarakhand), Pakistan, Afghanistan and China] at an altitude range of 700-1500 m. **Conservation status & threats:** Endangered. The species is mainly used as fodder by local people which resulted in depletion of its population from wild habitats.
Habitat: Semi-exposed to shaded moist slopes of forest edges.
Conservation efforts: The saplings were planted on raised garden beds for ex-situ conservation. The propagated plants started flowering after 2 years of plantation also resulting in good seed set.

7. **Selaginella aduncaA**.Braun ex Hieron.
Family: Selaginellaceae
Vernacular Name: Sinduri, for sometimes the microspores are used as red dye.

Distribution: Endemic to Western Himalaya, India (Uttarakhand and Himachal Pradesh) and West Nepal from an altitude range of 700-1800m.
Conservation status & threats: Endangered (IUCN, 1998). The species is mainly restricted to small patches in certain localities of its occurrence that are prone to habitat loss in future. **Habitat:** Exposed, dry, slopes of sandstone cliffs of lower Shiwalik near Kaudiyala.
Conservation efforts: The propagated plants would be planted in pots and on the mound to meet the specific requirements. The species is survives very well in both the conditions and also propagating vegetatively.

8. **Dioscoreadeltoidea**Wall. ex Griseb.
Family: Dioscoreaceae
Vernacular Name: Harvish, Shingli-mingli
Distribution: Himalaya from an altitude range of 500-2000 m.
Conservation status & threats: Endangered, due to overexploitation for medicinal use.
Habitat: Shaded to semi shaded, moist localities on slopes of temperate forests.

Conservation efforts: The saplings propagated through seeds and tubers would be planted in pots and raised garden beds near some climbing support. The propagated saplings survives well in ex-situ condition and propagating vegetatively but not forming fruits.

9. **Schreberaswietenioides**Roxb.

Family : Oleaceae
Common name : Ghant (local), Banpalas or Banda (Hindi), Mokha (trade name), Weaver's Beam Tree (English).
Description: A medium sized handsome tree with distinct ashy bark. Leaves oblong, acuminate, entire, base acute or obtusely cuneate, soft ly pubescent on both surfaces, middle pair of leaflets normally the largest, oft en accompanied with rust spots. Flowers 0.5 inches, white, fragrant, in lax terminal cymes. Capsule pear shaped, 2.5 to 3 inches long, splits to release winged seeds.

Distribution: Extremely rare in Uttarakhand restricted to ridges of Shiwalik hills. A few individuals have been located along the NH-94. The distribution of the species is wide as in addition to Uttarakhand it is reported from Rajasthan, Chott a Nagpur, West Bengal and the Deccan Plateau. However, nowhere has it been observed to be common and is difficult to be met with in the wild. Uttarakhand is the north western most limit of the distribution of thetree.

Endemism: Near endemic to Indian sub-continent, Central – South India.

Threats: Decreasing numbers lead to eventual extinction of a species due to restrictedgene variability and habitatloss.

10. **Gentianakurroo**Royle
Scientific Name : Gentiana kurrooRoyle
Family : Gentianaceae
Common name : Karvi, Kamalphul, Nilkanth (Hindi), Trayaman (Sanskrit) Indian Gentian (English)
Local Name : Karru
Description: Perennial spreading herbs with bunched roots. Basal leaves 10–12 cm, linear – lanceolate, extremely bitt er in taste. Roots branched, white, fleshy and stout. Spectacular flowers of this species are deep blue, spotted with green and white in the throat, usually two or more on a stem, sometimes solitary. Corolla narrow, funnel shaped up to 5 cm, triangular with acute lobes

and sharp pointed lobules. The flowers of Gentiana kurroo are visible from August to October in cascading groups that wither with the onset of winter to yield capsules containing fine seeds.

Distribution: This beautiful gentian is known to occupy precipitous south and south-west facing limestone outcrops at approximate altitudes of 1700 -2100 m. In Uttarakhand it is chiefl y found as scattered populations in Narendra Nagar Forest Division and Deoban hills in Chakrata Forest Division.

Endemism: Endemic to Western Himalaya.

Threats: The existing habitats of this species are vulnerable to pilferage, degradation, road widening etc.

Other species :

List of Rare, Endangered and Threatened Species along the NH-94 stretch getting affected by Road widening/cutting: -

1. *Catamixisbaccharoides*
2. *Berberisosmastonii*
3. *Microschoenusduthiei*
4. *Cyanathus integra*
5. *Aphyllorchisgollani*
6. *Archineottiamicroglottis*
7. *Caanthepachystalix*
8. *Pittosporum eriocarpum*
9. *Pecteilis gigantea*
10. *Eleagnusumbellata*
11. *Rosemarinusofficinales*
12. *Woodfordiafruticosa*
13. *Urtica dioca*
14. *Prinsepia utilis*
15. *Desmodiumgangeticum*
16. *Solanum indicum*
17. *Randiadumetorum*
18. *Vitex negundo*
19. *Xathoxylumarmatum*
20. *Cornus capitata*
21. *Meizotropispellita*
22. *Cornusmicrophylla*
23. *Hymenodictyonexcelsum*
24. *Murrayakoenigii*
25. *Tabernaemontanadivaricata*
26. *Rubus ellipticus*
27. *Solanum nigrum*
28. *Callicarpa macrophylla*
29. *Alpinia galangal*
30. *Pogostemonpatchouli*

31. *Rhynchostylis retusa*
32. *Vanda roxburghii*
33. *Pholidota articulata*
34. *Argyreia nervosa*
35. *Ganjaru*
36. *IpomoeaTurpethum*
37. *Leptadenia reticulata*
38. *Paederiafoetida*
39. *Dioscoreabelophylla*
40. *Cissampelos pareira*
41. *Ichnocarpus frutescens*
42. *Smilax aspera*
43. *Mucuna pruriens*
44. *Pueraria tuberosa*
45. *Holostemma annulare*
46. *Capparis horrida*
47. *Ficus hederacea*
48. *Cryptolepisbuchananii*
49. *Hedera helix*
50. *Smilax zeylanica*
51. *Passiflora incarnata*
52. *Rosa setigera*
53. *Actinidia deliciosa*
54. *Spatholobusparviflorus*
55. *Vitisspp.*
56. *Rhapidophora spp.*
57. *Dysoxylumbinectariferum*
58. *Ardisia elliptica*
59. *Caesalpinia sappan*
60. *Garcinia gummi-gutta*
61. *Ciccaacida*
62. *Gmelina arborea*

Budget (Financial) Requirement for the RET Project

Sl.No.	Particulars	Amount (in Lakh Rs.)
1	Field Survey	0.30
2	Identification and Marking of trees	0.45
3	Transplanting Work	2.15
4	Germplasm Collection Work	0.75
5	Establishment of a High-Tech Nursery for RET Species	2.15
6	Propagation and Multiplication of RET Species	1.45
7	Planting and field trials	1.45
8	Expert Field assistant for 03 yrs	0.90
	Total	**9.60**

वन क्षेत्राधिकारी
नरेन्द्रनगर राजि
नरेन्द्रनगर (टि0 ग0)

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शिवपुरी रेंज
नरेन्द्रनगर वन प्रभाग
मुनि-की-रेती

उप प्रभागीय वनाधिकारी
(देवप्रयाग)
नरेन्द्रनगर वन प्रभाग

प्रभागीय वनाधिकारी
नरेन्द्रनगर वन प्रभाग
मुनि-की-रेती

Chapter-6

Budget Requirement/ Financial Forecast of the Complete Project

The Financial Outlay of the Impact Mitigation cum Wildlife Conservation Plan is as follows:-

Sl. No.	Description of Work	Amount (In Lakh Rs.)
1	Creation of waterholes for wildlife and Restoration of water streams along the road. (10 Nos. Water Pond)	5.00
2	Staff wages (10,000 X 12 Month X 02 Laborer X 10 Year) for rescue and rehabilitation and other works for conservation of wildlife.	24.00
3	Human-wildlife conflict Mitigation and Patrolling vehicle and an animal ambulance and Rescue kit.	4.30
4	Tree Plantation of fruit and shade trees for improving wildlife habitat (around 2000 Plants including 05 Years Maintenance)	6.00
5	Construction of Elephant Protection Wall along the road.(0.3 Km)	15.00
6	RET Species Conservation Plan	9.60
7	Office expenses and Contingency (05% of total financial outlay)	3.20
	Grand Total	67.10
The conservation plan period works and the amount are subject to revision as per field condition and subject to approval by Chief Wildlife Warden.		

Divisional Forest Officer
Narendranagar Forest
Division

शिवपुरी रेंज
नरेन्द्रनगर वन प्रभाग
मनि की रेती

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मुख्य वन्यजीव प्रतिपालक
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