

EXECUTIVE SUMMARY OF HEMKUND ROPEWAY PROJECT



In
District Chamoli, Uttarakhand

FOR
Uttarakhand Infrastructure Project Company Private Limited
88, Govind Nagar, Race course
Dehradun- 248 001

Reference TOR no- F.No. 10-56/2013-IA.III Dated-14-11-2013

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EXECUTIVE SUMMARY

INTRODUCTION:

Government of Uttarakhand, as an initiative to provide safe and convenient means of travel to the tourists visiting this place, wish to develop a passenger ropeway system on a world class technology from Govindghat to Hemkund Sahib.

Uttarakhand Infrastructure Project Company Private Limited has been mandated to develop the said project on Public Private Partnership format for Uttarakhand Tourism Development Board (UTDB), GoU. The project is proposed to be developed in 2 phases:

Phase 1 shall be running from Ghangaria to Hemkund Sahib is being taken up for development in Phase I which is a single independent section.

Phase 2 comprises of three sections. The three sections between Govindghat and Ghangaria are connected with each other. Section I is between Govindghat & Bhiundhar; Section II is between Bhiundhar & Laxman Ganga bridge; Section III is between Laxman Ganga bridge and Ghangaria.

PURPOSE

The way from Govind Ghat to Hemkund Sahib is a 19 km steep and tough foot track and takes about 12 hours to reach the Shrine. There is a steep rise in elevations starting from 6000 ft. at Govindghat to 10,000 ft. at Ghangaria and reaching to 15,000 ft. to Hemkund Sahib. No pilgrim is allowed to stay at Hemkund Sahib after 2 pm every afternoon. From Govindghat, one has to travel 12 km to reach Ghangaria. The journey takes about 8 hours. One has to stay here overnight. Helicopter services also operate from Govindghat to Ghangaria. From Ghangaria, the 5 km trek entails a steep climb of about 5,000 ft and has to be covered on foot, palanquins or pony and it takes about 4 hours. The ponies also do not reach Hemkund Sahib due to hard frozen ice patches in upper reaches, which becomes very slippery. Therefore the last leg of the track is to be done on foot or palanquins.

The time of travel from Govindghat to Hemkund Sahib would reduce from 12 hours to about 1.5 hours by the proposed ropeway.

Social aspects of the project

The Hemkund Ropeway project is a big advantage to the local as well as the visitors of the site. Purpose of the proposed ropeway is to benefit the visitors to Hemkund Sahib and indirectly the local people will also be benefitted. The tourist traffic statistics of 2002-2012 indicates that the cumulative annual growth rate of tourists (both domestic and foreigners) visiting Shri Hemkund Sahib have been in the range of 2.8% in the last 10 years i.e. since 2002. Many of the willing people could not visit Hemkund Sahib due to the strenuous trek or steps which will now be convenient for them due to the ropeway.

The ropeway will provide direct or indirect employment to the local people of the area as construction phase shall involve about 75-100 skilled and un-skilled people and the un-skilled labor can be procured

from the local villages / towns. During the operation phase, about 200 persons would be required for technical and administrative functions in two shifts.

LOCATION OF THE PROJECT

The project is a 13 Kms long alignment which stretches from **Govind Ghat** (about 275 km from Rishikesh) to **Hemkund Sahib**. The entire alignment falls under the Nanda Devi Biosphere Reserve.

Site Location

Village : Govind Ghat, Bhiundhar, Pulna, Ghangaria

Tehsil : Joshimath

District : Chamoli

State : Uttarakhand

Latitude and longitude of base station and terminal station are as follows:

Base Station (Govind Ghat) - 30° 37' 24.8" N; 079° 33' 29.2"E

Terminal station (Hemkund Sahib)– 30°41'59.982"N; 79°36'56.014"E

TERMS OF REFERENCE

This Environment Impact Assessment (EIA) study is based on:

- Presentation made to the Committee for grant of TOR on 29-10-13.
- Terms of Reference issued by MOEF vide TOR no. F.No. 10-56/2013-IA.III Dated-14-11-2013.

PROJECT DESCRIPTION:

Project Details:

Particulars	Existing Details
TOTAL AREA	142,150 sq m (14 ha)
CAPACITY	500-1000 person per haulage
LENGTH	13 KM
LEVEL DIFFERENCE	2743 M (Approx.)
HAULAGE ROPE	42mm dia, 6x19
NO. OF GROUPS OF CABIN	4
NO. OF CABINS PER GROUP	3 Cabins in each group [for 8 seated]

CABIN CAPACITY	8 seater
SOURCE	Uttarakhand Power Corporation Limited (UPCL)
MAIN DRIVE MOTOR	2500 KW
DG SETS	4 x 750 KVA and 1 x 200 KVA
WATER REQUIREMENT	64 KLD
WASTE WATER	60 KLD
TOTAL SOLID WASTE GENERATED	634 kg/day

Approach to Site

The nearest railway station to the project site is *Rishikesh Railway station* which is approx 288 km from the site. Nearest Airport is *Jolly Grant Airport*, Dehradun (approx 304 Km). One can approach Govind Ghat (the base terminal) via the *Badrinath highway (NH 58)* along the Alaknanda River.

Land details

The project site falls under the buffer zone of Nanda Devi Biosphere Reserve. Diversion of forest land will be done for the construction of the ropeway. Tree cutting will be done as per as per the Forest (Conservation) Act, 1980 and associated guidelines in this respect. Compensatory afforestation plan has been developed in the ratio of 1:2 and accordingly 5 hectare of civil soyam land has been earmarked for Phase I of the project to be transferred to forest dept. for afforestation purposes.

Power Supply

2500 KW of Power shall be supplied by Uttarakhand Power Corporation Limited (UPCL). DG sets of 4 X 750 KVA & 1 X 200 KVA capacity will be used as power failure backup.

Water Supply

Water requirement during construction as well as operation phase shall be met by River Laxman Ganga.

Total water requirement has been estimated to be 64 KLD as per detailed below and will be met by Laxman Ganga River. Water shall be used mainly for flushing, drinking and washing. Total quantity of wastewater generation is 60 KLD. The generated sewage will be treated in the STP of 80 KLD capacity. The treated water will be reused for flushing purposes.

Atmospheric Emissions

During the construction activities for the proposed terminal stations there will be fugitive emission such as particulate emission etc. on small scale.

The operation of the proposed ropeway will not involve major air emissions. Four DG sets of capacity 750 kVA and one DG set of 200 KVA are proposed as power backup. The proposed ropeway operation will not cause any significant effect on the ambient air environment.

Ecological Environment

The project lies about 50 meters from the Valley of Flowers National Park & is rich in flora & fauna.

Solid and Hazardous Waste

Construction Phase: Wastes which are likely to be generated during the construction of terminals include the following:

- **Municipal Waste:** Site clearance
- **Construction Waste:** Construction materials arising from the construction may include waste timber work, spent concrete and cement screening and material and equipment wrappings.
- **Excavated materials:** Excavation during pillar foundations will lead to generation of excess soil. Top soil will be used for landscaping and left out soil will be used for land filling.
- Local labors will be preferably employed; no labour camp will be setup at the site. Approx. 90 Kg/day wastes will be generated which will be sent to solid waste/landfill site.

Operations Phase: During operation phase, solid waste will be generated by ropeway users, employee, etc. The total **634 Kg/day** of waste will be generated due to the proposed development

Project Cost

The total cost of the project will be Rs. 320 Crores. Based on the project cost & other costs, tariff (to and fro) of Rs. 600 per head have been proposed in the first year of operation i.e. estimated to be 2018 with an escalation of 5% per annum for a period of 15 years.

ENVIRONMENTAL SETTING

Study Period

The study period as per TOR is for three months and Hemkund Sahib is inaccessible from October end to April. Hence the season beginning of October 2013, May 2014 & June 2014 has been taken as study period. The EIA is based on baseline data collected during September-October'2013.

Study Area

The study area is defined as area within 10.0 Km radius from proposed site, which is as per the MoEF guidelines. Air, Water, Soil, and Noise sample were collected within 10 km detail study of the area given in Baseline chapter of EIA report.

Climatology

- Site-specific meteorological data shows that Wind speed normally was in the range of 3.0 Km /hr in August to 7.9 Km /hr in March km/hr. Wind speed was high during February to April.
- The Maximum temperature of the area in 20 Years, was recorded as 34.2 deg C in June 1974, where as the minimum temperature of the area was recorded as -15.1 deg C in January 1972.
- The Mean Maximum relative humidity was recorded as 91%. Mean Minimum relative humidity was recorded as 41%.
- The maximum rainfall was recorded in July (upto 273.0 mm) in 1970. From data it is clear that maximum time of year Have rainfall. That the wet months exceed dry months. The July, August & September are the wettest months and are considered as monsoon season.

Ambient Air

The ambient air quality monitoring was done to assess the ambient air quality of the year. Monitoring was carried out at five stations, two locations at Govind Ghat, one at Govind Dham, one at Pandukeshwar village and one at Pulna Village in **October 2013**. As the source is line source, monitoring stations were selected in upwind and downwind from line source. **The parameters monitored were Particulate Matter (PM10), Particulate Matter (PM2.5), Sulphur Dioxide (SO₂) & Nitrogen Oxides (NO_x).**

Average results of parameters monitored in the study areas (nearby villages) are below the permissible standards prescribed by the CPCB.

- The average concentration of PM10 was in between 47 µg/ m³ to 63 µg/ m³.
- The average concentration of PM2.5 was in between 20.5 µg/ m³ to 28.2 µg/ m³.
- The concentration of SO₂ and NO_x was observed in between 3.3 µg/ m³ to 4.5 µg/ m³ and 8.9 µg/ m³ to 17.4 µg/ m³.

Noise

At each station noise level was monitored for 24-hours simultaneously. For each measurement, dB (A) readings was taken for every 15 minutes for 24 hrs ones in a season to get Leq values.

The ambient noise results at day time of village Gangharia, Pulna, Pandukeshwar are within the limits whereas in Govindghat noise level is more than standard of residential standard, as Govindghat is between Alaknanda river at one side, NH-58 on other side and due to commercial activities occurring at Govind Ghat.

Water Environment

To assess the water quality of the proposed area, 7 stations were selected. Samples were collected from different locations. As per the standard practice one grab sample from each location out of 7

locations was taken Grab Sampling was done by standard sampling techniques as per the Standard Methods (IS & APHA, 21st Edition 2005).

Water collected from natural source where as pH ranges from 7.1-7.6. Other parameter like T.D.S, Alkalinity and Hardness are also within the limit of drinking water standard. Calcium & magnesium for the same sectors are within the standard limits.

Soil

Soil profile and quality was studied at 7 different locations. The results show that Color varies from Light Brown to Blackish Brown. pH ranges from 7.0 -7.7 Amount of primary nutrients like Organic matter ranges from 0.49 % - 0.83 %, the available nitrogen ranges from 64.4- 92.4 mg/kg, the available Phosphorus varies between 10.8-24.8 mg/kg and the amount of available Potassium is between 12.1-29.0 mg/kg. Primary nutrient profile shows that soil is low in fertility due to the low amount of Nitrogen & potassium. Adding bio fertilizer will enhance the fertility of soil.

Biological Environment

The complete stretch of ropeway will be passed over Pandukeswar Reserve Forest and buffer zone of Nanda Devi Biosphere reserve.

Flora studied in core zone:

S.No.	Botanical name	English Name	Habit
1.	<i>Buluta utilis</i>	Bhojpatra	Tree
2.	-	Jamnoi	Tree

Shrubs like

simru and ghinu were also seen.

Flora Study in Buffer Zone: Buffer zone is considered as 10 km from the alignment of the ropeway, 10 km has following reserve forests and dense jungles, they are as follows Valley of flower, Pandukeshwar reserve forest, Urgam reserve forest, Joshimath reserve forest, Dasoli reserve forest, Painkhamra Malla reserve forest, Mixed jungle mainly Deodar, Mixed jungle mainly pine.

Fauna of Buffer Zone:

The region is rich in fauna and has been the habitat, from time immemorial, of a large variety of mammals, various species of birds, reptiles and fish.

Schedule I:

Several mammals and eight birds are endangered species. Mammals include Snow leopard, Black bear, Musk deer and Himalayan tahr.

Endangered bird species include the monal pheasant, koklas pheasant, western tragopan, snow- cock, golden eagle, steppe eagle, black eagle and bearded vulture.

Infrastructure

The base station of the project site, i.e. Govind ghat is well served with infrastructural facilities such as roads, power and telecommunication facilities. Whereas the route to Hemkund Sahib does not have much facilities.

ENVIRONMENTAL IMPACT IDENTIFICATION, PREDICTION AND MITIGATION

○ **Ambient Air**

Construction Phase

During construction phase, impacts on ambient air would be mainly due to dust emissions and movement of vehicles. However these impacts would be short term in nature and limited only to the construction period.

Operation Phase

The operation of the proposed ropeway will not involve major air emissions. Ropeway operation is an environment friendly non-polluting transport system. The only source of air pollution are the four DG sets of capacity 750 KVA and one DG set of 200 KVA which will be bought acoustically enclosed and will be operated only at the time of power failure.

○ **Water Environment**

Construction Phase

Waste water generated during construction phase would be domestic waste water and this would be disposed off through soak pit/septic tank. Waste water generated from construction area like equipment washing, hand washing etc will be collected in impervious collection pit for reuse in curing activity.

Operation Phase

The total water requirement has been estimated to be 64 KLD and waste water generation will be of 60 KLD which will be treated in the STP of 80 KLD.

The treated effluent would be reused for flushing purposes & excess treated water of shall be disposed off to the soak pits.

- **Land / Soil**

No major impact is likely to occur on the soil quality during construction and operation phase. However, all precautionary measures will be strictly controlled.

- **Noise Levels**

Construction Phase

During the construction phase, source of noise will be of construction equipment's, vehicles for transportation of raw material and DG sets. However noise during this phase would be only for specific period of construction.

Operation Phase

During operation phase, the source of noise will be operation of DG set in case of power failure. DG sets will be bought with acoustic enclosures.

- **Solid Waste**

Construction Phase

The waste generated during construction will be treated by the pyrolysis method. The top soil will generated during excavation will be used for landscaping and left out soil will be used for land filling. Muck and slurry generated will be used as backfilling material to raise soil levels in nearby areas.

Operation Phase

Municipal Solid Waste: 634 kg/ day of solid waste will be generated during the operation phase of the project. The waste will be collected in colored bins provided at different locations at each station and will be treated through Pyrolysis method.

Used Oil: The waste oil generated from D.G sets and other machineries during construction as well as operation phase will be stored in leak proof containers and will be sent to registered recyclers for hazardous waste authorized by CPCB.

- **Flora and fauna**

Construction Phase

The proposed Ropeway project involves the diversion of the forest land and hence some flora will be lost during construction. But the same will be compensated by planting more trees along the terminals of the Ropeway. However, no fauna has been found to be affected during the construction of the Ropeway.

Operation Phase

Analysis of abiotic factors reveals that ambient air and water quality will remain practically unaffected, thus indirect adverse impact on flora and fauna is ruled out.

○ **Socio-economic environment**

There will be no displacement or immigration of the human population due to the proposed project. Wherever, elderly, children and disabled people, who have to climb the arduous trek, will be able to take safe and convenient travel to the holy place. And, there would be generation of direct or indirect employment to the people.

Thus a positive benefit is likely to be created to the socio-economic environment.

RISK ASSESSMENT

Ropeways are liable to suffer from environmentally induced threats, risks and hazards as well as human -caused occurrences. Natural disasters include earthquakes, landslides, rock falls, storms, avalanches, lightening etc and technical failures may include rope with broken wires in service, drive / return sheave shaft failure / tension system failure, mount assembly parts failure, over speeding of ropeway / brake failure, rollback, slippage / fall of cabin, entanglement of cabin, swinging of cabin resulting in fall of passengers outside cabin, cabin derailment at station etc. while accidents include fire in fuel storage areas.

General safety measures

- Suitable Information & sign boards will be displayed in prominent places to help and instruct the public.
- Operating procedures shall ensure the safety of staff involved in operation, inspection, examination, testing, maintenance & repair work and in emergency procedures.
- Proper operation manuals, design verification, test certificates (necessary to establish that the ropeway has been designed & installed in accordance with relevant IS codes) shall be obtained from the manufacturers.
- Every specified activity of the passenger ropeway should be supervised by the competent person.
- The safety related components should be regularly examined.
- Before the operation of the ropeway the ropeway should be thoroughly inspected by chief ropeway

inspector, GoU to ensure the ropeway project is safe for public use.

- Remote surveillance of Tower & Stations shall be done.
- Proper maintenance records should be kept.

Preventive Measures

- The cabins will be designed to be closed type.
- Cabins will be provided with oxygen cylinders for persons failing to breathe properly. The capacity of the cylinder will be sufficient to be used till the next station is reached.
- Each station will have a medical facility provided for emergency situations.
- The automatic lock system will be such that it cannot be opened by the passengers.
- Cabin shall be provided with dual fixed grip per cabin wherein each grip will be capable of taking the entire laden weight of the cabin with passengers.
- The ropeway system will be provided with minimum of two braking system; Emergency Brake and Service Brake. Both brakes should be capable of functioning automatically as per operational and program logic of control system OR manually, in case the need arises.

Rescue Arrangement

- Ladder rescue can generally be adopted for cabins which are stranded close to the ground.
- Other rescue arrangement is the Rope Rescue System which involves a winch and lowering rope.
- Diesel engine with independent drive, so that the ropeway system can be operated at reduced speed to bring stranded cabins to the terminal stations in case of failure of electrical power supply or main motor.
- The Auxiliary Drive with diesel engine enables the passengers to be evacuated in the event of power failure.

PROJECT BENEFITS

- The trekking time which is 12 hrs to reach Hemkund Sahib by foot will reduce to 1.5 hrs.
- The Proposed project will increase the socio-economic status of Chamoli District and especially of Hemkund Sahib Gurudwara.
- Elderly, children and disabled people, who have to climb the arduous trek, will be able to take safe and convenient travel to the holy place.
- New Infrastructure like toilets, medical facilities will be developed along the path.
- Considering more than half population is based on monsoon based farming, a positive impact is anticipated due to increased employment opportunities as more & more traveler will use the ropeway it will increase the revenue also. More & more pilgrims will be able to visit the holy place.
- The project would help in regulating the tourist/ pilgrimage traffic to Hemkund Sahib Shrine in an organized manner.

The jobs from which local community can be benefited, will be —

- ✓ Canteen services
- ✓ Maintenance services
- ✓ Grocery and vegetable shops
- ✓ Security services
- ✓ Traffic management

COST OF EMP

Total cost of the project will be 320 Crores out of which approx Rs. 68.6 Lacs/ year will be spent on Environment Management Plan

CORPORATE SOCIAL RESPONSIBILITY

1% of recurring cost will be spent on CSR activities which include:

- Vocational training to the local people for self help.
- Provision of Health checkup camps
- Provision of free medical facility to needy people.
- Assistance in rural water supply.

ENVIRONMENTAL MANAGEMENT PLAN

- Environment management cell will be created and specific responsibilities will be assigned to various members.
- Environment monitoring plan will be prepared for air pollution, water pollution and solid waste generation. Regular monitoring of pollutants will be undertaken during the operational phase of the project and the monitoring locations will be finalized in consultation with the SPCB.
- Safety aspects related to personnel and operation will be taken into consideration.

CONCLUSIONS

The study brings out the following points:

- Existing ambient air quality, water quality and noise levels are within acceptable norms and will continue to remain so, upon implementation of the proposed mitigation measures.
- Risk to flora, fauna and soil is negligible due to effective implementation of EMP.
- Socio-economic benefits are envisaged due to creation of direct/indirect employment and benefits to visitors by ease of the transportation way to Gurudwara.
- Thus, it can be concluded on a positive note that after the implementation of the mitigation measures and Environmental Management Plan, the normal operation of the

project will have negligible impact on environment and will benefit not only the local people but the visitors from far places as well.