UJVN LIMITED

WILDLIFE MITIGATION PLAN

FOR

JIMBAGAD SMALL HYDRO PROJECT

(3 X 4 MW)

OFFICE OF EXECUTIVE ENGINEER (CIVIL-SHP)
UJVN LTD.
DHARCHULA, PITHORAGARH.

NOV - 2022

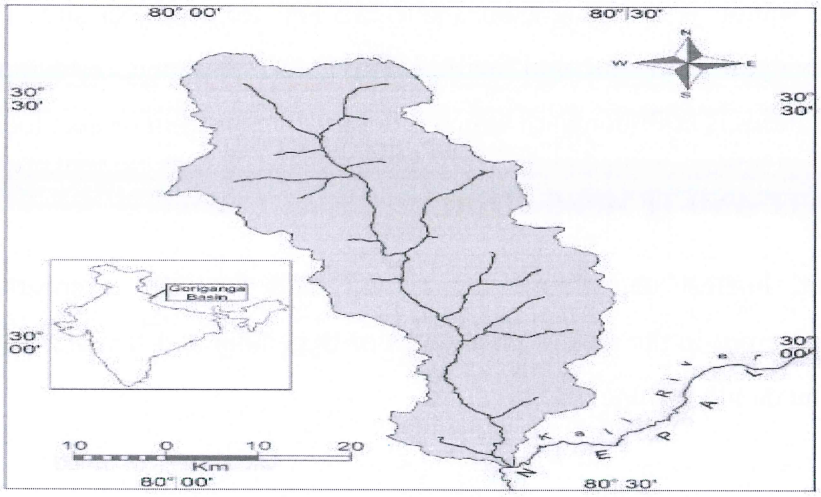
INTRODUCTION

1.1 GENERAL:-

Jimbagad is a Run-of-the river type small hydro power development scheme utilizing water flow limited to the rated capacity of the plant, from the natural flow of the river without any storage. The project envisages utilization of a gross head of 276m and design discharge of 5.40 Cumecs for the generation of 12MW. Trench type weir is proposed to divert 5.40 Cumecs design discharge at an elevation of 1610m. The discharge is being released back in to Jimba stream near power house at an elevation of 1334m.

Jimbagad is a perennial stream. It originates from the high peaks having an elevation of EL. 5773 m. above Mean Sea Level (MSL). The catchment area above the proposed Diversion Barrage of Jimbagad Hydel Power Project is 121.17 Sq. km., which is rugged and hilly.

A considerable portion of the catchments is covered with forest land on left bank and barren land on right bank; rest of the catchment is rocky, barren and steep. The mountains in the upper region are snow clad and provide perennial flow in stream. There is negligible seepage in catchment terrain and most part of the rain fall and snow melting results in run-off in the stream. The diversion structure is proposed below the confluence of Jimbagad with Bujani stream. Hence Bujani stream is also contributing towards the flow for this project.



Map showing the location and extent of the Goriganga Basin

Forest of various compositions and types occurs in the catchment of river Goriganga. These ranges from alpine meadows below Unta Dhura to sub alpine, temperate and sub tropical coniferous and deciduous forests.

1.2 TOPOGRAPHY: The proposed project is situated in Goriganga basin. Jimbagad is a tributary of river Goriganga. Gorgiganga river originate from milam glacier at an elevation of 6070m above mean sea level. Catchment area of Jimbagad SHP lays in between 80^0-22'-37.45" to 80^0- 29'-30" East and latitude from 30^0-0'-0" to 37^0-15'-19.56" North. Jimbagad originate from an elevation of 5773m above mean sea level and join river Goriganga at an elevation of 1120m after traversing a distance of about 25 Km. The slope of the Jimba stream in upper reaches is very steep but of lower reaches it becomes flatter. The slope of the stream in upper reach is nearly 1:5 and at the project location it is about 1:10 and it is about 1:18 below the proposed power house location. Catchment area is rugged and hilly with mostly barren land on right bank and forest land on left bank. The slopes on the right bank are steep and encompass by numerous cliff.

1.3 ACCESS: - The project site is accessible throughout the year except during monsoon as due to heavy rains approach road mostly remain broken and accessible is difficult. The power house site is approximately 250 Km from Tanakpur and 285 Km from Haldwani. It is a approximately 30 Km from Munsyari. The nearest functional airport near to the project site is at Pantnagar about 310 Km. One airstrip is also at Pithoragarh but it is still not operational. The nearest railway station is at Kathgodam about 282 Km from project site. The Munsyari is a tourist place having all infrastructural facilities like hotel, telephone, restaurant etc. Other place having good facilities is at Pithoragarh which is about 105 Km from project location.

1.4 CLIMATE AND TEMPERATURE

The lowest and highest temperature are (-) 2^oC and (+) 35^oC respectively. The lowest temperature is received in the area in the months of December and January. Highest temperature is recorded in the month of June.

R. Singh

1.5 RIVER BASIN

It is proposed to install Jimbagad HEP of 12 MW plant capacity on Jimba stream. It is proposed to install 3 units of 4MW each keeping in view the discharge, operational aspects and transportation limitation. Other projects in the vicinity are

i) Painagad SHP (15.00MW)(Under Planning Stage)
ii) Motighat SHP (5.00MW)
iii) Tanga SHP (5.00MW)

1.6 GEOLOGY AND SEISMICITY

The state of Uttarakhand, constituting the Himalayan tectonogene, comprises rock types of late Proterozoic to Phanerozoic in age and extends from the Yamuna River in the west to the Kali River in the east. Three parallel ranges, roughly trending East - West, represent Higher Himalaya, Lesser Himalaya and Outer Himalaya. Older rivers like the Kali, the Ganga and the Yamuna have cut through these ranges forming deep gorges to enter into the Ganga Plain. The Higher Himalaya is the northern most range with general relief varying between 4800 m and 6000 m. This range abound with lofty snow covered peaks including Banderpunch, Kedarnath-Chaukhamba, Kamet and Nandadevi peaks, and are separated by transverse gorges of Bhagirathi, Alaknanda and Dhauliganga rivers. The Lesser Himalaya in general forms alternating ridges and valleys with an elevation of about 1000 to 5000 m. The Outer Himalaya is the southernmost range and is composed of fluvial deposits of Middle Miocene to Lower Pleistocene.

The area of investigation forming a parts of Great Himalaya and Lesser Himalaya falls in topographical sheet number 62 B/8. The area forms a part of the Gori valley and located south east of Madhkot of Munsyari Tehsil District Pithoragarh. The area can be approached from Munsyari and Pithoragarh by about 40 km long metalled road

2.0 DETAILS OF PROTECTED AREA

Askot Wildlife Sanctuary is situated in Pithoragarh District of Uttarakhand State. The Sanctuary was established *vide* Government Order No. 3239/X-2-2013-19 (1) 2002 dated the 25th July, 2002 in 2013, whereby 290.914 square kilometers Reserve Forest area of 12 forest blocks of Askot and Dharchula Ranges of Pithoragarh Forest Division

R. Singh

and 309.086 square kilometers area of protected forest comprising areas of Van Panchayats and unclassified civil land were included. As such the Askot Wildlife Sanctuary was established in an area of 600 square kilometers. The principal objective for the formation of the Sanctuary was conservation of the wide variety of flora and fauna in the area;

Askot Wildlife Sanctuary is home for a large number of rare and endangered plant and animal species. In the sanctuary there are 2600 plants, 250 birds and 37 mammal species like snow leopard *(Panthera uncia),* Himalayan black bear *(Selenarctos thibetanus),* musk deer *(Moschus chrysogaster)*, Himalayan tahr (*Hemitragus jemlahicus*), blue sheep *(Pseudois nayaur),* serow *(Capricornis sumatraensis)*. Among the fauna are species like loong, monal (*Lophophorus impejanus*), kalij pheasant (*Lophura leucomelanos*), cheer pheasant (*Catreus wallichii*) and musk deer (*Moschus spp.*) the flag species. The Askot Wildlife Sanctuary is also known as Musk Deer Park. Van ranjees, Vyasi, Rangdarma, Chaudasi, Rangbhotiya, Anwal and other backward class communities live in the Wildlife Sanctuary area. Bhotiyas migrate in the high Himalayan areas seasonally and are involved in activities like farming, wool trade, handicraft, sheep and goat rearing and collection of herbs and shrubs;

Askot Wildlife Sanctuary is spread between the heights of 600 meters to 7000 meters and is located mostly in the watershed areas of the river Kali and its tributaries; the tributaries Dhauli and Gauri are to the north below the Rungling block above the river Kali at 1582 meters. Almost all the hill ranges are spread in the north- west and the first main range separates the upper Kali and Dhauli river catchment areas. Its highest points are Rungling peak 4075 meters and the lowest point is Tawaghat at 1108 meters. The valley areas are difficult and steep slope which are the series of forest blocks viz, Hiragumri, Jyotigaad and Rungling. The second main range separates the catchment areas of Dhauli and Gauri Ganga. In the forest blocks the highest point is Dug peak 4560 meters and the lowest point Jauljeevi and Chhiplakot at 4499 meters. The area is highly steep till 2100 meters but below that point is in gentle slope and the section are comprises of the forest blocks of Payya, Majtham, Daphiyadhura, Thakla, Dug and Sobla. The third group falls between the river Gauri, Ramganga and Kali and it has

R. Singh

main peak Ghandhura at a height of 2501 meters;

Due to biotic interference and unnatural activities possibilities of man-wildlife conflict are rampant, there is need for controlling excessive grazing, lopping, fire incidence unscientific exploitation of land, mining and other activities associated with development in the Askot Wildlife Sanctuary;

To conserve and protect the area, The Eco-sensitive zone around Askot wildlife Sanctuary was notified by the Central government vide notification dated 02-12-2021.

The Central Government notifies an area to an extent varying from 0 (zero) to 22 kilometres around the boundary of Askot Wildlife Sanctuary, in Pithoragarh District in the State of Uttarakhand as the Askot Wildlife Sanctuary Eco-sensitive Zone details of which are as under, namely: -

Extent and boundaries of Eco-sensitive Zone. – The Eco-sensitive Zone shall be to an extent of 0 (zero) to 22 kilometres around the boundary of Askot Wildlife Sanctuary and the area of the Eco-sensitive Zone is 454.65 square kilometres. Zero extent of Eco-sensitive Zone towards Southern, Western and Eastern side of the Sanctuary is due to international border; whereas, in other places, the zero extent is due to the resolution taken during the public consultations with local community and primitive tribal groups (Van Raaji) habituating in the area. There is no village falling inside the Eco-sensitive Zone of Askot Wildlife Sanctuary.

3.0 STRUCTURES OF THE PROJECT FALLING IN THE ECO-SENSITIVE ZONE

i) 20 % area of protection works at headworks.

ii) 15 % area of D-Tank.

iii) 50 % area of flushing pipes of D-tank.

iv) 76 % area of tunnel i.e. about 1 hectare land.

v) 53 % area of approach roads of the project i.e. about 1.6 hectare land.

For development of the project 8.50 hectare land has to be acquired. Out of which only 3.706 hectare land falls in the eco-sensitive zone of Askot wildlife sanctuary. Out of

R. Singh

3.706 hectare land 2.6 hectare falling in eco-sensitive zone belongs to tunnel and approach roads of the project.

4.0 LIKELY IMPACT OF THE PROJECT ON THE ENVIRONMENT

The proposed project is located around 4.6 km away from the boundary of Askot Wildlife Sanctuary. Project is located on the boundary of eco-sensitive zone around Askot Wildlife Sanctuary. For development of the project 8.50 hectare land has to be acquired. Out of which only 3.706 hectare land falls in the eco-sensitive zone of Askot wildlife sanctuary. Major components of the project viz. power house, switchyard, penstock, surge shaft, part of the tunnel, headworks, intake channel of the project are located outside the eco-sensitive zone. In view of major construction activities lying outside the eco-sensitive zone, there will be no significant adverse impact on wildlife and forest. Major portion of tunnel of the project is falling in the eco-sensitive zone which is underground; therefore, project will have negligible environment impact on the eco-sensitive zone of the Askot wildlife Sanctuary.

5.0 POSITIVE IMPACTS OF THE PROJECT

i) Project will generate 62.32 Million Units of clean energy annually, which will further augment the clean energy generation. It is a renewable energy project and will help the government in achieving its target to cut its emissions to net zero.

ii) Project will uplift the socio economic condition of people in the area.

iii) The approach road to the project will also serve as a connecting road for village Farveot which is located near the project area.

iv) The project will also involve local labour and will therefore augment the livelihood through employment generation

6.0 PROPOSED MITIGATION MEASURES FOR PROTECTION OF FOREST AND WILDLIFE :-

There will be no submergence due to diversion structure of the project, therefore, during operation phase no major impacts are envisaged on environment. No heavy machinery is required for construction of the project as it is a small hydro project therefore; impact on

R. Singh

the environment will be minimal. Pollution generation mainly during construction phase will be in the form of air and noise pollution; which shall be mitigated by adopting various mitigation measures during construction activities as discussed below

Air Pollution:

The various sources causing air pollution during construction phase are as follows

- **Particulate Matter (PM)** : Various activities such as, transportation of material in open trucks, open dumping in muck disposal sites, vehicle movements, operation of diesel generator sets etc.
- **Oxides of Sulphur (SOx)** : SOx is released into the air from vehicular exhaust, Diesel Generator Sets, coal burning chulahs. etc.
- **Oxides of Nitrogen (NOx)** : Motor vehicle and fuel burining are generally responsible for the release of oxides of nitrogen into the ambient air.

Control of Air Pollution:

For control of air pollution during construction phase of the project, it shall be made mandatory for the contractor's engaged in the construction works to ensure the following conditions. Necessary clause shall be incorporated in the contractor's agreement.

- The chimneys of the diesel generator sets should be kept at height as per environment protection rules. The DG sets should be properly maintained.
- Regular water sprays at the excavation, dumping sites as well as on roads should will be ensured.
- Dust masks shall be provided to the workers and staff.
- Controlled blasting during construction activities will be ensured.

Noise Pollution:

Sources of noise will be the vehicles, equipments for excavation and construction at the project site. Due to construction activity in the area, noise levels will increase during the period of construction, however, they will remain limited to the work area.

R. Singh

Control of noise pollution:

Various measures for control of noise pollution in the project area are as follows:

- Diesel generator sets are to be placed in acoustic enclosures to reduce the noise.
- Ear protection aids such as ear plugs, earmuffs, etc, must be provided to the workers who have to work in the noise prone area.
- Proper and regular maintenance/lubrication of machines should be done.
- Salient machines and vehicles with high quality silencers should be used.
- Afforestation around the residential colonies and office complexes should be done.

Water Pollution:

Various sources of water pollution in the project area during construction phase include disposal of effluents from construction sites, sewage disposal from labour camps, excavation and other land clearing activities, washing of oil & grease from diesel generator sets, vehicles and other machinery etc.

Control of water pollution:

To avoid deterioration of water quality of the receiving water bodies following measures shall be adopted:

- Provision of septic tank/soak pit of adequate capacity for labour camp.
- Provision of sedimentation cum grease traps to prevent entry of contaminants to the water bodies.
- Residue of petroleum products will be disposed off in accordance with PCB guidelines.

Muck Management:

Muck disposal shall be carried out only in the approved and earmarked sites. The dumping sites are located sufficiently away from the HFL of the river. Efforts are made to reuse the muck for construction and other filling purposes and balanced be disposed of at the designated disposal sites. Once the muck disposal sites are inactive, proper

R. Singh

treatment measures shall be carried out so that sites are stabilized quickly. Detailed muck disposal plan is enclosed.

Forest Fire Control and Management specific to project area:

i) Maintenance of fire lines.
ii) Adoption of control burning practices.
iii) People participation and awareness generation programme shall be carried out in nearby villages.

MITIGATION MEASURES FOR ANIMALS

i) The excavated pits/foundations for structures shall be properly barricaded and fenced during construction stage so as to prevent accidental falling of the mammals.
ii) During Construction phase gates will be installed at the portals of the tunnel & adits to avoid movement of animals inside the tunnel.
iii) To avoid accidental drowning of animals during operation face Desilting tank having length of 58.8 m and width 9.0 m will be covered and iron fencing of appropriate height will be provided.
iv) Feeder Channel having length of about 89 m and width of 2.40 m shall be covered with R.C.C. slabs throughout its length to provide passage for movement of animals and to avoid accidental drowning of animals.

GENERAL MITIGATION MEASURES:

i) Before the start of work awareness campaign will be taken up by UJVN Limited in association with Forest Dept. to create maximum awareness among the construction workers regarding safeguard of forest and wildlife.
ii) No works shall be allowed at nights on the structures falling in the eco-sensitive zone.
iii) No labour camps will be set up in the forest area.
iv) Greater emphasis shall be given to engage local manpower/workers for construction activities. For specialized works like fabrication & erection of hydro mechanical works etc migrant labours shall be engaged.

R. Singh

v) Tree felling will be minimized and only those trees which are unavoidable for construction of structures will be felled under the supervision of forest department.

vi) To minimize the disturbance to wildlife, road barriers/gate shall be installed on approach road in the project area near power house site for restricting the un-necessary movement of vehicle in the eco-sensitive zone.

vii) Soil erosion and siltation will be minimized by providing vegetation cover wherever appropriate by creation of natural fences of shrubs, and grasses to reduce erosion during the construction period.

viii) Minimum environment flows (e-flows) in river downstream of diversion structure will be maintained as per the orders of Hon. National Green Tribunal and guidelines of MoEF & CC.

ix) During survey of 3.8 km length of river stretch between diversion structure and power house of the project no caves of animals were found on either banks of the river. Therefore, due to project no negative impact is assessed on the animals living in caves in the vicinity of river in the project area.

x) Work of transplantation of orchid plants affected by the project shall be carried out with forest department.

xi) All pollution related aspects and waste management will be duly taken care during the implementation of the project.

xii) In addition to above, any other measures as envisaged by the State Board of Wildlife and as per the provisions of wildlife (Protection) Act, 1972 will be strictly adhered during execution of the project by UJVN Limited.

UJVN Limited has made a holistic approach towards protection of the eco-sensitive zone through the principle of avoidance, minimization and mitigation in their project activity and committed for implementation of various mitigation measures in the project area for overall protection of the forest and wildlife in the eco sensitive zone of Askot wild life Sanctuary.

Therefore, it is summarized that the overall impact on biodiversity in the project area due to the proposed project is assessed as low which can be minimized through proper mitigation measures.

R. Singh

अधिशासी अभियन्ता (जानपद-लजविप)
यूजेवीएन लिमिटेड
धारचूला, पिथौरागढ़