**PROJECT DESCRIPTION**

**SURNAYAGAD Hydropower Project**

**Location**

The SGHPP is located in Baitadi districts of Sudur Pashchim Province in Far-Western Region of Nepal. The proposed Surnayagad Hydropower Project is a run-of-the-river (RoR) project. Surnayagad Hydropower Project lies in Shivnath Rural Municipality ward No. 2 and 4, Baitadi district. The source river is Surnayagad, a tributary of Mahakali River. It flows from North to South and it enters to Mahakali River at Kopare Village, approximately 6km downstream from proposed powerhouse site. The proposed project lies between the latitudes 29°19'30"N to 29°20'40"N and longitudes 80°21'10"E to 80°22'30"E respectively.

All the information provided in this section is based on the previous pre-Detailed Feasibility studies reports. In actual; information provided regarding the projects may be varied as per actual field conditions.

**Hydrology and Sediment**

Surnayagad, which is one of the tributaries of Mahakali River is rainfall-fed river. Total catchment area at intake site is 767.40 km². The total area of the catchment basin fall below 3000m. There is no discharge measuring gauge station and no any study records are available in the Department of Hydrology and Meteorology on this river. The discharge near the proposed intake site of of the Surnayagad Hydropower project has been measured during the field visit on 17 March 2019. The discharge at intake site was measured 2.71 cumecs.

According to pre-Detailed Feasibility study report, design discharge of the project is 18.60 m3/sec at 40% flow exceedance using CAR method. Annual suspended sediment yield of the river estimated at project is 1.07 million tons per year.

**Geology**

According to pre-Detailed Feasibility study report, he projects area mainly comprises of the gneiss rock as the country rock belonging to the Dadeldhura Group of Lesser Himalaya Crystallines. The gneiss rock of Sallyani Gad Formation is mostly exposed within the whole project. Intercalation of gneissic schist and granite gneiss can be observed within the gneiss rocks of the project boundary. Quaternary deposits of clay, silt, sand, gravel and conglomerates have been exposed on the both banks of Sunaya Gad River. From the geological point of view, the project area lies has normal sequence of stratigraphy, which is devoid of major geological fault. However, well-defined and extensive folded structures are present within the north part of project boundary.

**Power and Energy**

Surnayagad hydropower project is a Run-of-River (ROR) type project. According to the pre-Detailed Feasibility study, the available gross head is 50 m and the design discharge is 18.602 m3/sec, giving a total installed capacity of 7.65 MW and 44.112GWh total energy. Two units each of 3,826 kW, 600 rpm Francis turbines with horizontal shaft have been proposed for the given gross head of 50 m and rated flow of 9.30 m3/s. Two units of 4,600 kVA each, three-phase, brushless, synchronous type generators with generating voltage of 6.6 kV have been proposed.

**Layout**

A diversion weir will be constructed to divert water towards desilting basin at the right bank of Surnayagad river side intake. From the desilting basin headrace canal of length about 150m is proposed to feed the water to the 1,625m D-shaped headrace tunnel. The water from surge tank at the end of headrace tunnel will feed to the surface powerhouse is proposed at the right bank of Surnayagad through 185m penstock pipe. A rectangular tailrace canal discharges water coming out of the turbine towards the source river, Surnayagad.

**Access**

From Kathmandu to Amargadhi, the district headquarters of Dadeldhura which is about 770 km, can be reached by night bus and day services from Kathmandu. From Amargadhi, Dadeldhura to Radiel Village of Baitadi (on the bank of Surnaya river), which is about 28 km earthen road, hired jeep or public transport can be used. Proposed project headwork is about 5 km walking distance from the nearest road head.

**Transmission**

At present there is no transmission line available to evacuate the power generated from the project. The power generated from the Project shall be evacuated to the INPS through 33 kV single circuit transmission line of length 29 km to the proposed Syaule sub-station at Amargadhi.

**Project Layout**

