150 MW
Sharmai HPP

PROJECT PROFILE

PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION

ENERGY & POWER DEPARTMENT

GOVERNMENT OF KHYBER PAKHTUNKHWA

APRIL 2016

Brief Summary of Sharmai HPP

Introduction

Khyber Pakhtunkhwa has many sites, which have considerable potential for hydroelectric development, by virtue of their favorable topographical and geological features, together with a suitable reservoir area and adequate and dependable runoff.

The rapid and continuing increases in the demand for electricity in Pakistan, coupled with recent huge increases in the cost of energy generation at thermal stations, has made some of these hydro projects very attractive when compared with alternative thermal stations. The development of favorable hydroelectric projects must therefore be treated as a matter of urgency, the total time required to investigate, design and construct a hydroelectric station is appreciably longer than is needed for an equivalent thermal station.

The control and use of the waters of the Panjkora River and the development of the adjacent river basins to its fullest extent is therefore a necessity for the future prosperity of the province and for the achievement of national plans for development and expansion of the northwestern area in conjunction with an adequate electricity system throughout Pakistan.

Location and Access to Project Site:

The Project area is located in the northern portion of the province, the Intake of the project is on Dir- Sheringal Road having approximate location coordinates 35°10'16.28"N, 71°56'33.37"E while the Power House of the project is on the main GT road N-45 near Darora village and on the confluence of Usherai Khwar and Panjkora River having approximate location coordinates 35° 6'23.10"N, 71°59'13.21"E.

The heavy equipment, machinery and construction material will be transported through the national road N-45 from Peshawar to Dir City.

The access road to the dam site starts from the branch with provincial road N-45 crossing the bridge of Dir Khwar and goes along a local road of the right bank of the Panjkora River about 5 km, then reaches a branch point to the dam site. From the branch, about 3 km long road have to be newly constructed to provide access of a suitable standard for all construction traffic as well as for permanent maintenance and operation of the Project.

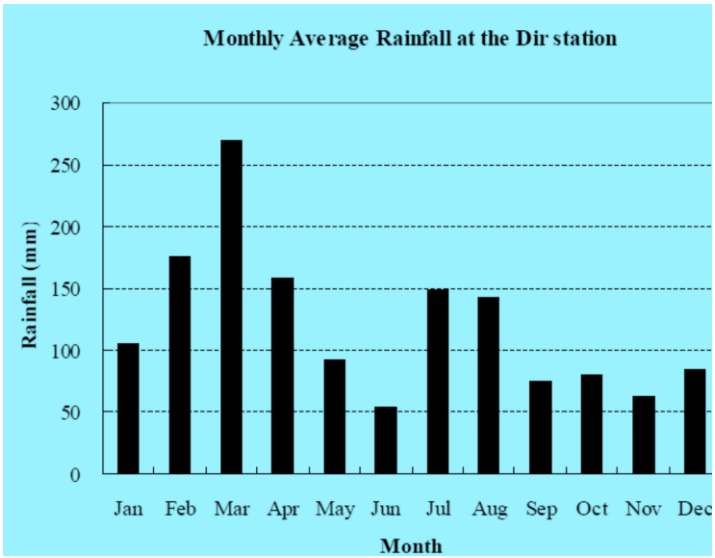
The local road to the surgetank site branches from N-45, about 2 km downstream of the Bibior town. It is almost unpaved gravel road and partly narrow where only four wheel-drive cars can go through. Therefore, the road improvement including widening of road is needed to pass construction equipment through. Powerstation is located along N-45 near the confluence of the Panjkora and the Ushiri Khwar. There is no need to construct new access road to powerstation accordingly.

Several potential dam sites and power station sites, possessing favorable topographical and geological conditions have been identified in the gorge about 10km southeast -15km northeast of the Dir City. The best of these is located about 5 km upstream of the Panjkora and the Dir Khwar junction referred to as the Sharmai dam site, and near the Panjkora and Ushiri Khwar junction referred to as the Darora power station (about 16 km downstream of the dam). The dam site controls a catchment of about 1,900 km2, which are about one third of the total basin area. There are no sites further downstream below the gorge where a major dam could be constructed. Location map is shown at figure 1 and Figure 2.

Climate:

According to the Koppen-Geiger climate clarification, the project area mainly belongs to the "Dsb (snow-steppe-warm summer)" climate zone, where the basin climate is mainly determined by the high altitude of surrounding mountains.

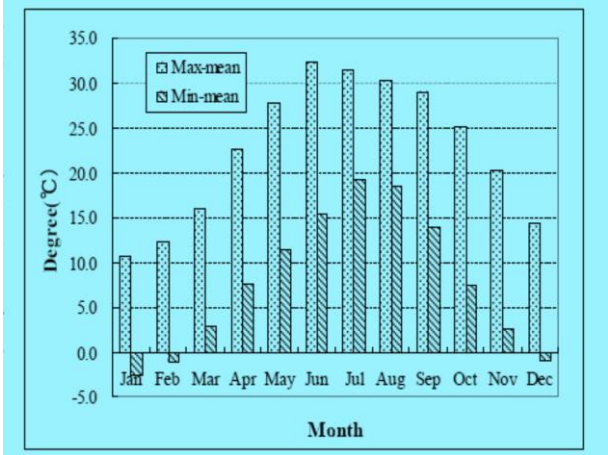
The monthly average rainfall observed at the existing Dir meteorological station is presented in the following figure. The Dir station is located near the proposed dam site, as shown in Figure below, and the station is located at El.1,369 m that is almost same as the proposed the full supply level (El.1,300 m) of the planned regulating pondage. The annual average rainfall at the station shows 1,428 mm according to the observation data for the



period from 1981 to 2006.

The period from September to November has low rainfall, and snow starts falling at upper elevation in November and remains until April. The river flow is largely influenced by the Snow melts in the region from March to August with effects by monsoon rains.

Air temperature records observed at the Dir station are summarized on monthly average basis in the right-side figure. The temperature during the winter months from December to February falls below freezing point, and during the summer months from June to August rises up to over thirty degrees. Also the difference on air temperature in a day seems comparatively large, and reaches around 15℃ in January and June, as shown in the figure.



(Source: Pakistan Meteorological Department)

Hydrology:

The discharge data and the water level records of Panjkora River are available at Bibior down stream of proposed Dam site are available since January 1971. The mean annual suspended sediment discharge is 3.45 Million Cumecs/year. The flood estimated by Regional method is highlighted in Table below.

Probable Peak Discharges at the project Area:

Return Period (Years)	5	10	50	100	200	1000	10000
Peak Discharge (Cumecs)	3020	3460	4400	4810	5200	6140	7660

Salient Features of the Project

The tentative salient features of the Project are as under: -

General:

- Project Name: Sharmai HPP
- River Name: Panjkora
- Distance: 248 KM From Peshawar
- Status: Raw Site

Technical:

- Capacity: 150 MW
- Design Discharge: 88 Cumecs
- Net Head 193.6 m
- Annual Energy Generation: 682 GWh
- Reservoir Capacity: 32.2 MCM
- Length of Power Tunnel: 7.803 Km
- Catchment Area: 1950 KM^2

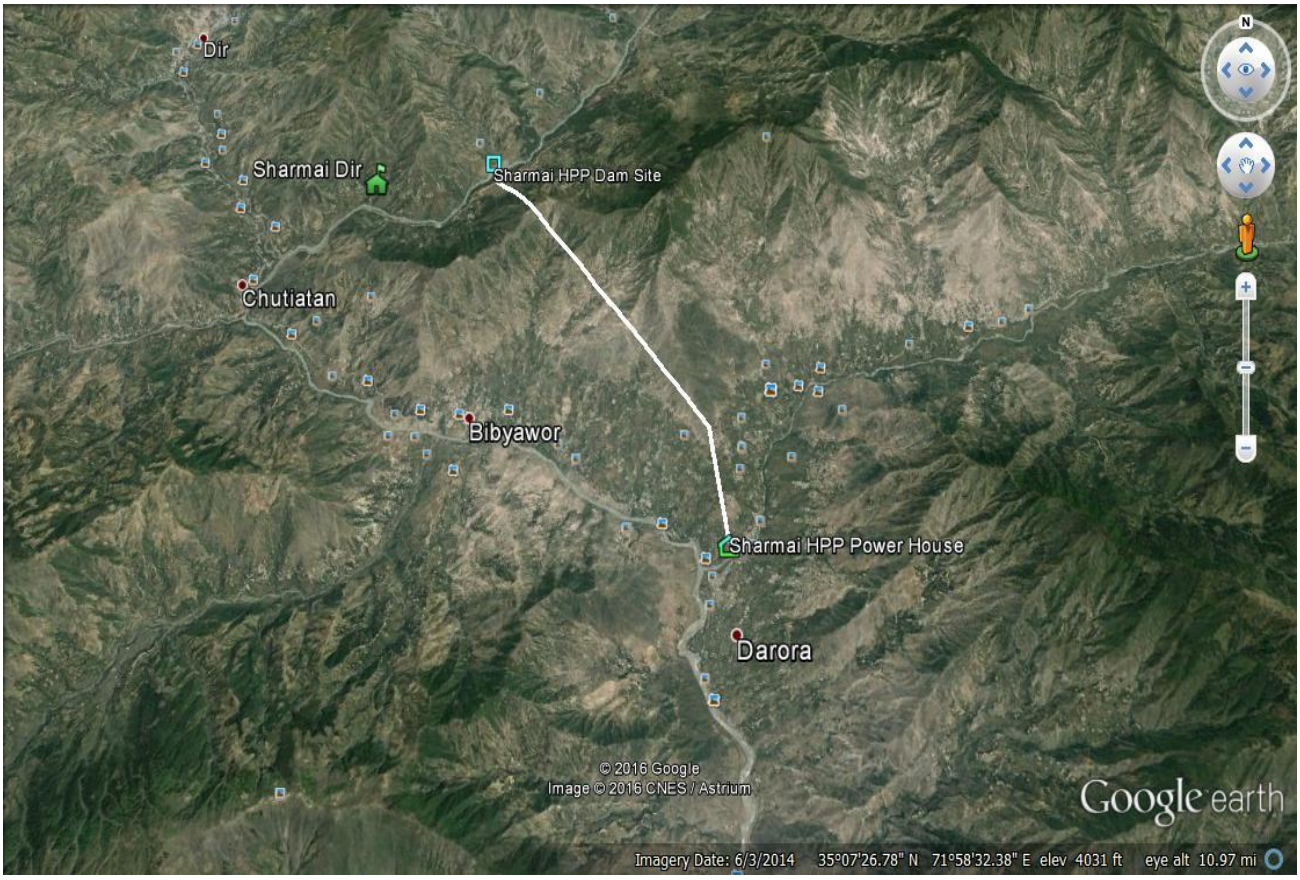


Figure 1: Location Google Map

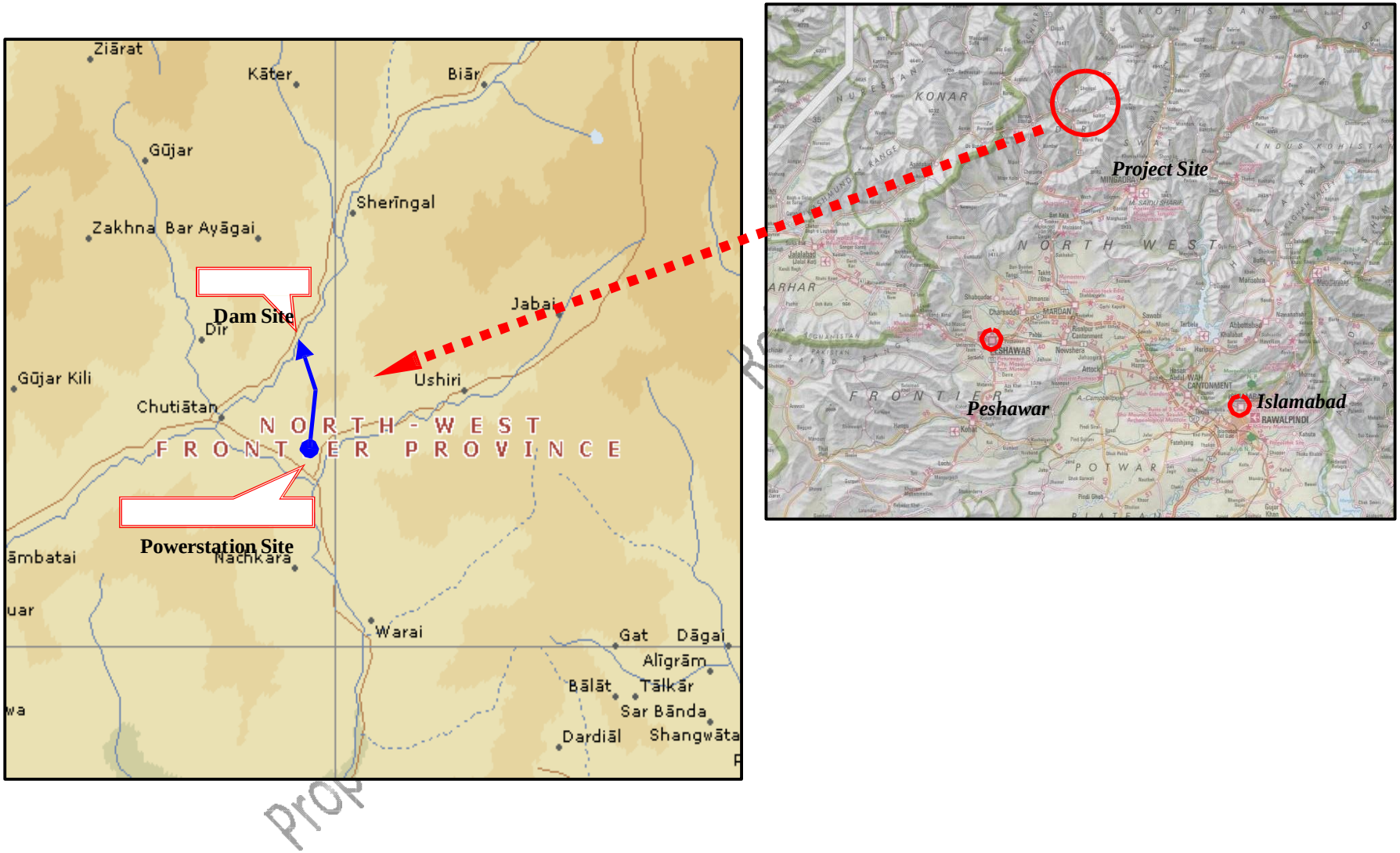


Figure-1: Site Location for Sharmai Hydropower Project