### Project Summary

#### Project Background

The growth in population and increased economic activity has resulted in a rapidly rising demand for electricity in the Ghanche District of Gilgit Baltistan. The situation becomes critical in winter when there is a sudden peak in demand compared to the rest of the year. While at the same time, the generation of electricity from existing hydropower plants drops down owing to significantly reduced water flow, resulting in acute power shortages.

To address this situation, the Water and Power Department of Gilgit Baltistan (Client) has developed a 1.2 MW hydropower station on the right bank of Hushe Nullah and another 6 MW hydropower project (stage-I & II) has been planned on the left bank of Hushe Nullah in Balaygon village (it is currently in stage-1 and with 2 MW generating capacity and is under implantation). However, there exists no proper diversion weir and peaking reservoir for these power stations due which the required power generation could not be attained. In light of this, the Client intends to develop a weir cum mini dam upstream the intakes to act as diversion weir as well as peaking reservoir of appropriate capacity to enable the two power plants to generate power at their optimum capacities.

#### Project Objectives

The objective of the project is to prepare a feasibility study and PC-1 for construction of a weir-cum-dam on Hushe River and the left bank tributary of Shayok River to act as water diversion for the two hydro power stations. The weir should fulfill the flow requirements of 11m³ located on either bank and serve as a peaking reservoir of at least 40,000 m³ water storage to meet the daily flow requirement of peak hours during the evening time. The improved availability of power will directly improve the livelihoods of the surrounding village both in terms of domestic consumption as well as productive uses of electricity.

#### Project Results

Detailed feasibility study and PC-1 for a weir-cum-dam on Hushe River and the left bank tributary of Shayok River.

### Services Provided

- Detailed Topographic Survey: topographic mapping, measurement of head and selection of best suitable site for the project
- Geological Investigations: mapping of geological features for planning the location of civil/hydraulic structures
- Sub Surface Soil Investigations: carried out using Odex method
- Sampling and laboratory tests: for grading, density, plastic properties, permeability, shear strength
- Hydrological Investigations: measurement of minimum and maximum flow and generation of flow duration curve and hydro graphs
- Financial and Economic Analysis: calculation of financial parameters such as internal financial rate of return (IFRR), internal economical rate of return (IEER), net present value (NPV), benefit cost ration (BCR); the cash flow study is to be analysed keeping in view the requirements and guidelines of clear development mechanism (CDM)
- Environmental Impact Study: detailed environmental and social impact assessment including evaluation of preventive, mitigation and compensatory measures, and management of resettlement issues
- Preliminary Design and Cost Estimation: preliminary design of the civil and hydraulic structure; preparation of Bill of quantities (BOQ) and PC-1 stage Engineers Estimate
- Preparation of Tender Documents: for the procurement of required equipment and services

### Pakistan

#### Feasibility Study for Construction of Weir for two Hydropower Stations

**Client**

Water & Power Division Ghanche; Gilgit Baltistan

**Duration**

10/2016 - 09/2017

**Personnel**

- 4 internat. STE (8 PM, (Team Leader, Design Specialist Civil, Design specialist Electrical/ Mechanical, Geologist)
- 6 nation. LTE (40 PM, (Survey Engineer, Hydrologist, Geo-Technical specialist, Environmental specialist, Economist/ Financial specialist, Surveyor)