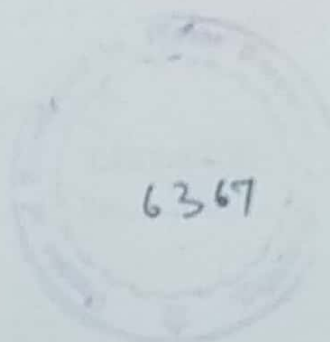


THESIS

**A PRE-FEASIBILITY STUDY OF MINI HYDEL POWER  
STATION AT CHIAN WALI ON MAIN LINE LOWER OF  
UPPER CHENAB CANAL**



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## ABSTRACT

Construction of large dams has become controversial at international as well as national level. Due to abnormal delay in building of any high head project, the electric tariff had already gone so high that adequate use of electricity by a common man in Pakistan has become almost impossible. This situation diverted the attention of the government towards exploitation of low head potential. There are already a number of low head hydel stations installed on various canals, which are contributing a lot towards the overall generation of hydropower in Pakistan. Keeping in view the state of affairs prevailing in the country, government of Pakistan decided during 1985 to get low head potential of canals and barrages studied by WAPDA.

Since then WAPDA has identified many sites on various canals and barrages all over the country for the development of low head hydropower projects. It has also provided ranking of the projects. On the basis of this ranking, low head projects like Chashma has been completed and is functioning successfully whereas Jinnah and Rohri hydropower projects are going to be implemented very shortly.

Planning of low head project at fall RD 128+000 Main Line Lower of Upper Chenab Canal is one of the many sites which have been identified by WAPDA. The canal is situated in the Punjab province traversing through Districts Sialkot, Gujranwala and Sheikhupura. Originally Upper Chenab Canal was designed to serve dual purposes of irrigation and transferring of discharge from River Chenab to River Ravi. Later on Marala Ravi Link canal was constructed and now this canal is being used mainly for irrigation purpose and only balance supply is transferred to River Ravi.

It has two parts viz. Main line upper and Main Line Lower. Main Line Lower off takes from Bombanwala Head from where Bombanwala Ravi Bedian Depalpur (BRBD) and Nokhar Branch Canals are also off taking. The designed discharge of Main Line Lower at its head is 322.104 cumecs. It has tail at RD 283+100 having total length of 86.28 km.

There are already two low head hydropower stations, viz. Nandipur and Chichokimallian working at RD 44+000 and RD 221+000 of the Main Line Lower with installed capacity of 13.6 MW and 13.0 MW respectively. There are still four more sites available on this canal for development of low head hydropower projects. Main objective of this study was to investigate whether the two falls i.e. RD 128+000 and 164+400 can be combined for hydropower development.

Results of the study showed that development of two independent projects on the above mentioned falls is not feasible and combined head is to be utilized. Further

Main objective of this study was to investigate whether the two falls i.e. RD 128+000 and 164+400 can be combined for hydropower development.

Results of the study showed that development of two independent projects on the above mentioned falls is not feasible and combined head is to be utilized. Further it was found that the proposal regarding combining the head at fall RD 128+000 is more feasible.

Three Pit type turbine units with 39 cumecs (1377 cusec) design discharge have been proposed for this project. Power Potential has been estimated as 4.728 MW producing energy of 36.878 GWh per annum.

With project proposal at RD 128+000, the bed of canal shall be excavated from RD 128+000 to 164+400 by 1.585 m (5.20 ft). Finally it has been concluded that planning of hydel station at RD 128+000 Main Line Lower of Upper Chenab Canal combined head shall be useful and it is recommended to take up this site for feasibility study.