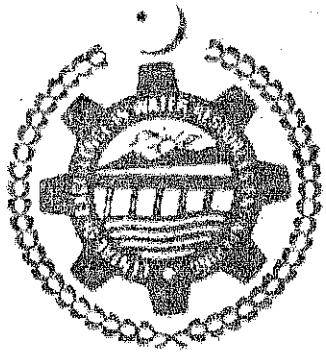
THESIS

PERFORMANCE AND ECONOMIC EVALUATION OF MOHAR LIFT IRRIGATION SCHEME, KHUSHAB



By

AZHAR IQBAL SHAD
2003-PG-WRM-14

For the Degree of

MASTER OF SCIENCE

IN

WATER RESOURCES MANAGEMENT

CENTRE OF EXCELLENCE IN WATER RESOURCES ENGINEERING
University of Engineering and Technology, Lahore

2007

ABSTRACT

Irrigation is inevitable for crop production and the survival of mankind on this planet. It has been practiced for growing more food and fruit for centuries throughout the world in different modes and different times. The development of new irrigation areas is declining due to the ever growing competition amongst agricultural, industrial and domestic demands, and the excessively expensive investment costs. Irrigation is an important means of increasing agriculture production. Pakistan is also an agricultural country. Its economy depends on the agriculture and 25% of gross domestic product is contributed by agriculture. However, agricultural production is much below the potential. In Pakistan, there has been no significant growth in irrigated area during the last decade. There is potential to increase the irrigated area. It can be done through large-scale as well as small-scale irrigation. Lift irrigation is resorted to when gravity flow is not feasible. It requires power at high running cost. Life irrigation systems are technically feasible wherever some source of water is available at lower elevation and there are adjacent lands at higher elevation. Lift irrigation systems convert the already un-irrigated lands into irrigated ones and crop yields are increased manifold than cost. The benefits generated are much higher than costs. Huge investments (mainly in the shape of loans) are made in constructing new irrigation systems and developing new areas for irrigated agriculture.

Mohar area is a very fertile belt of land, situated along foothills of the salt range running parallel to Thal Main Line Upper and Mohajar Branch starting from Indus on

North West to Jhelum River on the East. A total area of about 2.0 Lac acres is available with a lift ranging from 22 to 89 feet.

The area is described as tropical. Physiographically it is plan area in foothills with steep slopes and consisted of an area of 28508 acres with population of about 0.17 millions. People rely only on agriculture as a means of survival which largely depends upon rain. At present major crops are Wheat, Jawar and Bajra. Irrigation of this barren land will improve the socio-economic condition of the area as they will also be in a position to grow cash crops. Drainage of the area is natural. Soil is hard and loamy. Ground water is brackish.

Existing data about the cost and performance of the project was collected from Irrigation department and governing agencies of the project. The data included feasibility and design parameters etc.

Data required by CROPWAT (FAO) was collected for calibration and simulation i.e. reference crop evapotranspiration (ETo) values, cropped area for different crops, their planting and harvesting dates, duration etc, rainfall data, soil type information, scheduling criteria. Software package (CROPWAT) was calibrated using the data collected and then simulation will be performed.

Finally the economic analysis was performed for different simulation options and the best option will be suggested for planners.

Although the results of the cropwat programme show that the cropping pattern proposed by the irrigation department is in need of more water i.e. 282 cfs. The variation in the results might be due to the reason that the data to run the programme was taken from the PAF base in near by vicinity i.e. Skaser. Irrigation department

Another reason might be the greater proportion of the water loving crops in the cropping pattern i.e. sugarcane, rice etc. Irrigation department should develop the new patterns of crops for farmers using new and advanced methods of analysis like cropwat etc. The data used for analysis must be collected from the site area to get the accurate results and the resulted cropping pattern should be used for cost benefit analysis.

The government should arrange the guidance of the farmers in the light of the research about the better combination of the crops in the light of the available water. Although it is very difficult task to train/guide the farmers, who ambitiously are sowing the same cash crops as are in other water irrigated areas, about the new cropping pattern, even the agriculture department should be given the task of guiding the better cropping pattern to make the best use of available water.