

The Effects of Barrages/Head works on Rivers in Punjab Pakistan on Water Quality Parameters measured through One-Way Repeated Measures ANOVA

Abstract-The river system of the agricultural country Pakistan comprises mainly of five rivers with mainstream flow in the largest province: Punjab. The water quality is determined by the various standard quality parameters that may vary country wise in the world. A longitudinal data was collected for three main water quality parameters by the Pakistan Bureau of Statistics Islamabad measured in eighteen sampling season from Jan 2011- Dec 2013 at the head works and barrages of two major rivers of Punjab. The data was analyzed for its impact on agricultural land and quality of water. The data has been worked out with One-Way Repeated Measures ANOVA for the three main chemical water quality components: the pH level, Electrical Conductivity and Sodium Adsorption Ratio. The study empirically demonstrated that each of the three parameters varies widely at different barrages and head works of the same river in different sampling seasons influencing the agricultural land nearby and alkaline status of the ground water. Along way it is observed that the distances among the barrages and head works may be another contributive factor in the variation found.

Key Words: Water Quality parameters, Exploratory Data Analysis, Longitudinal Data, One Way Repeated Measures ANOVA, Pakistan Bureau of Statistics.