

# IRRIGATION, FARM SIZE, AND ECONOMIC EFFICIENCY: AN ANALYSIS OF FARM LEVEL DATA IN HARYANA (INDIA) AGRICULTURE

F. S. B A G I

The artificial irrigation is very important for Indian agriculture because, the rainfall is not evenly distributed over the year. The most of the rainfall occurs during the monsoon season, while crops need water at regular intervals throughout the year. Therefore, only irrigation can supply the necessary moisture for crops during the remainder of the year, and hence can reduce the uncertainty of crop production and lower the risk. This can lead to an increase in agricultural productivity in a number of ways. One, it leads to higher yields even without any increased use of inputs. Two, it lowers the risk and uncertainty and hence encourages more intensive use of inputs. Three, it makes multiple cropping, and production of high-value crops possible. Four, agricultural production becomes more responsive to relative price changes, and is less affected by the weather uncertainties. Therefore, it is very likely that irrigation may affect both the technical and allocative efficiencies of the farms. This study is aimed at varifying this relative economic efficiency differences among the irrigated and unirrigated farms. But in addition, we would study the relative economic efficiency of irrigated small and large farms.

The economic efficiency has two components: the technical efficiency, and allocative efficiency. The absolute as well as relative allocative efficiency can be analyzed in the production function. The technical efficiency however, is quite sensitive to the specification of the production function. If one just assumes, without testing that the underlying production function is linear homogeneous, one may be led to believe that the differences in allocative efficiency and in the configuration of input and output prices are responsible for any differences in yields and factor intensities, while actually the answer lies in the technological differences between the distinct groups of farms (Barnum and Squire 1976). In this study, therefore, we first examine the assumptions of linearity and homogeneity of the production function describing the nature of our sample farms. The assumption of linearity is satisfied if the elasticity of (returns-to-) scale is unity. Hence, we estimate the returns-to-scale, and test the homogeneity assumption, and only then, we proceed to analyze the technical and allocative efficiencies of the irrigated and unirrigated farms, and irrigated small and large farms.