

RESPONSE OF AGRICULTURAL YIELDS TO WATER IN THE
FORMER PUNJAB

By

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The tubewell projects planned will increase the annual supply of irrigation water and will increase man's degree of control over the timing of irrigation water supplies. The economic consequences of this improvement were discussed in Chapter 5, where we pointed out that the economic benefits of increased water supply are based on the physiological responses of the plants to additional water. In Chapter 5 we made use of some estimates of these physiological responses to derive economic forecasts; in this appendix we discuss the derivation of these estimates and summarize available data on present water supplies and crop yields.

We need not repeat the discussion in the text to the effect that water supply influences plant growth and crop yields only via its effect on soil moisture content. In a general way the physiological relationship between crop yield and soil moisture content is universally valid; plants follow the same laws of growth in the Former Punjab that they do in Utah. The quantitative relationship, on the other hand, will differ from place to place and time to time in response to many local factors such as seed varieties, methods of cultivation, amount of fertilization, and so on. Besides, the relationship between water supply and soil moisture content varies from locality to locality because of such factors as soil texture and permeability, humidity, timing of rainfall and irrigation, and many others. Therefore quantitative data on the relationship between water supply and crop yields cannot be transported safely from one agricultural environment to another, and it is necessary, in spite of all difficulties, to base estimates on indigenous data.

The basic data available for estimating the response of yields to water in the Punjab are the historical series on crop yields, data on diversions into major canals, and series on farm and wholesale crop prices.⁽¹⁾

Data on the yields of major crops by district are available in many sources, for example, Crops, Vegetables and Fruits in Pakistan (Karachi: Ministry of Food and Agriculture, 1959). All are derived from the reports of the revenue patwaris who annually estimate the acreage under each crop

(1) The relevance of the price statistics will become evident below.