

Summary

use of phosphate fertilizer, but these should give about a 30 percent net increase. Finally, the less tangible factors of better cultivation practices must be included, such as better grading for irrigation, better seed bed preparation and more timely planting, row planting and cultivation, proper spacing of seeds, more uniform application of fertilizer, and the timely application of irrigation water made possible by tubewells.

Because of the high rate of evapotranspiration and the extremely low rainfall in the Former Sind, an additional acre foot of irrigation water cannot by itself produce as large benefits as in the northernmost part of the Indus Plain. Developments that will permit reorientation from subsistence to a market economy are thus even more essential for a more prosperous agriculture than in the Former Punjab. However, application of relatively small amounts of tubewell irrigation water to smooth out the irregularities of the canal flow could be extremely beneficial. Our computations show that for an area of 260,000 acres in the Khairpur region of Former Sind, a shift in the cropping pattern toward market products such as sugar, oil seeds, vegetables, orchard crops, and livestock, plus a 30 percent increase in gross sown area, could be obtained by an addition of tubewell water equal to only 15 percent of the canal supplies. The net value of production could be increased from \$6 million (Rs 29 million) to \$13 million (Rs 63 million) or 117 percent.

Application of nitrogen and phosphate fertilizers, plant protection, improved seeds, and better farming practices to the new cropping pattern and the enlarged gross area sown would bring further increases in Khairpur just as in the Former Punjab and Former Bahawalpur. The principle of interaction among all the factors of production would apply with equal force.

With the present inadequacy of information about water supplies and soil conditions, it is impossible to generalize from Khairpur to the major part of Former Sind. From the data already available, however, it is clear that the foreseeable supply of canal water will limit the area of intensive cultivation in Former Sind to around eight million acres. Probably between 4 and 12 million acre feet of groundwater can be produced by wells near the bed of the Indus. This would enable the area of intensive cultivation to be raised to between 9 and 11 million acres. Before new projects are undertaken, thorough investigation is needed of these possibilities for groundwater development. Other measures for improvement include reduction in field percolation and non-beneficial evapotranspiration losses through consolidation of the cultivated areas and intensification of cultivation, drastic modification of cropping patterns in the rice-growing areas