



The Evaluation of the Irrigation Ratio in Irrigation Schemes Developed by State Hydraulic Works (SHW)

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Abstract Irrigation is the largest agricultural input contributing to the protection of food safety against increased population and pollution. Irrigation schemes are carried out with large investments but they are not at the desired performance level.

In this study, irrigation ratios in large irrigation schemes which bigger than 1000 ha located in Turkey were examined in 25 basins. As a result of the research, the average irrigation rate was found as 65% in 25 basins. In addition, the basins 23, 5 and 17 were found to be below the critical threshold of 30%.

Keywords SHW, irrigation, performance, irrigation ratio, Turkey

1. Introduction

Irrigation has played a vital role in the growth and development of agriculture in TURKEY. Economically irrigable lands of Turkey are 8.5 million hectares and all of this land is planned to be irrigated by the year 2023 [1]. Until now, approximately 6.5 million hectares' area opened to irrigation in Turkey. 2359053 ha of this area is developed by The State Hydraulic Works (SHW). SHW currently operates 93605 ha of this area and has transferred 2265448 ha to different institutions. But expected benefit cannot fully be ensured in irrigation schemes which established by huge investment. Currently, total irrigation rate is merely 65% in irrigation developed by SHW.

Irrigation ratio is one of the most used criteria for use to evaluate the performance of the irrigation schemes [2]. It tells the degree of utilization of the available irrigable area at a particular time. While there are several factors contributing to the variation in IR, availability of irrigation water is the major one, but even under sufficient water supply low figures can be caused as a result of misuse [3].

In this study, 2359053 ha irrigation area developed by SHW in Turkey in 25 basins, irrigation activities have been evaluated by examining irrigation rates

2. Method

Irrigation ratio (IR) is the ratio of currently irrigated area to the command area. IR can be calculate as shown below equation [4];

$$IR(\%) = \frac{\text{Irrigated area (ha)}}{\text{Command area (ha)}}$$

Where; IR is irrigation ratio, command area is irrigable area and irrigated area is total irrigated area.

3. Results and Discussion

In 2017, irrigation ratio of irrigation schemes located in 25 basins are given in Figure 1.



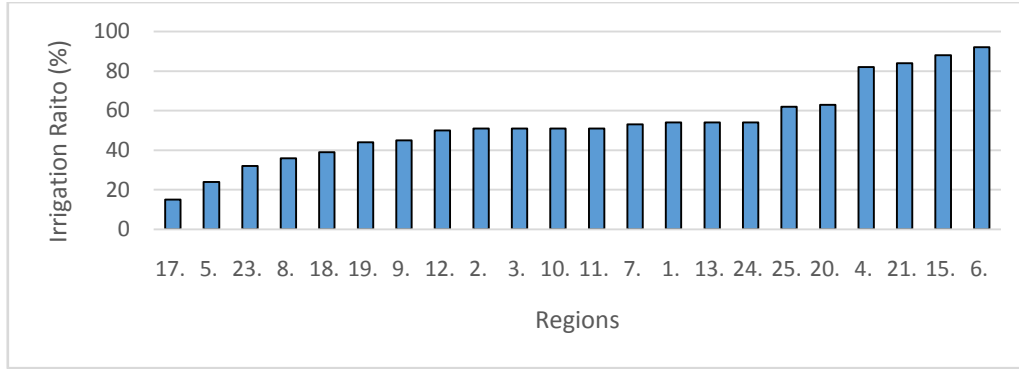


Figure 1: Determined irrigation ratios in the 25 basins in Turkey in 2017

When the results of the basins were examined, it was seen that irrigation rates ranged between 15-92%. The total irrigation rate was 65% in irrigation areas that were developed by SHW, in 2017 [5]. According to this, it was seen that only 4 of the 25 basins were above the national average. Regions with low irrigation ratios are 6, 15, 21 and 4th regions and irrigation ratios are 92, 88, 84 and 82 respectively. Three regions were determined less than 30% which is accepted as the critical threshold. These are 23, 5 and 17th are regions. The irrigation ratios for these regions were determined as 32, 24 and 15, respectively. It was accepted that the irrigation ratios increase due to the increase in the amount of water available and the decrease in water fee.

[6] described the irrigation ratio as less than 30% weak, 30-40% acceptable, 40-50% satisfactory and good for over 50%. [1] stated that the irrigation ratio of Başören irrigation cooperative was 71.4%. [7] reported that irrigation ratio in Antalya Valley ranged from 12 to 84%. [8] stated that the irrigation ratio was between 8-98% in Kızılırmak Basin. [9] taken attention to irrigation ratio increased from 62% to 68% by programme for the efficient use of water resources in Agriculture. [10] stated that the irrigation ratio was just 12.5% in East Mitidja Scheme in Algeria

4. Conclusion

In order to recovery of investment made in irrigation schemes, it is aimed to increase the quality and profitability of each product through irrigation activities. despite this, the entire scheme is not irrigated due to lack of infrastructure, farmers' possibilities and cultural reasons or economic reasons. This situation leads to the failure to meet the expected benefits of irrigation schemes.

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