

Economic Assessment of the Sprinkler Irrigation System as against the Basin in Red Onion Cultivation: A Case Study in the Northern Dry Zone of Sri Lanka

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A larger portion of fresh water is exhausted by way of irrigation. By introducing modern technology in irrigation the squandering of fresh water in agriculture could be greatly minimized. Considering the peninsular Jaffna unlike the rest of the dry zone it is solely dependent on ground water and rain which recharges the ground water and helps out with cultivation. The traditional irrigation methods carried out in the peninsula involve a great loss of water. Hence this research was carried out with the intention of assessing the economics of sprinkler as against traditional basin irrigation for red onion which is one of the dominant crops cultivated in the Jaffna peninsula. Primary data were collected by a questionnaire survey within the frame work of purposive random sampling technique. The sample consisted a total of 150 respondents and half of it belongs to traditional basin and the other half belongs to sprinkler. A stochastic frontier analysis was performed to obtain the technical efficiency of both irrigation systems. In addition allocative efficiency and irrigation efficiency were also estimated. The mean technical efficiency of the basin and sprinkler irrigation system is 60 percent and 85 percent respectively. Under both systems the mean allocative efficiency was found to be 0.343 for basin and 2.448 for sprinkler. This results indicates the over-utilization of ground water under basin and under-utilization of ground water under sprinkler irrigation system. Finally a higher mean irrigation efficiency of 3.3 was estimated for the sprinkler and only 0.63 was estimated for the basin. This is suggesting that all onion farmers those who have been practicing the traditional irrigation system are operating below the recommended physical water requirement and therefore technical level of output is lower than maximum. Paradoxically farmers those who have adopted sprinkler irrigation system operating above the recommended physical water requirement. The frontier analysis indicates that comparatively sprinkler irrigation is more effective, advantageous and efficient than basin irrigation in all respects and at all times. From this fact researchers recommend the use of sprinkler be extended to as many farmers as possible in the region.

Keywords: frontier analysis; technical efficiency; allocative efficiency; irrigation efficiency; sprinkler; basin irrigation