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Water Use Efficiency of Paddy Crop under Narsapur Canal Irrigation System

G Sunil Kumar Babu and S M Shareef
Cost of Cultivation Scheme, APRRI and RARS, Maruteru 534 122, Andhra Pradesh

ABSTRACT

The study on the water use efficiency at farm level in Narasapur canal irrigation system in West Godavari district of Andhra Pradesh. The study revealed that the irrigation intensity and cropping intensity were more in the large sized farms. The Cobb-Douglas production function was used to analyse the water use efficiency. The analysis revealed that there exists scope for correction in usage of canal water for paddy crop for better productivity.

Key words : Irrigation, Paddy, Rice, Water Use

Water is the most precious gift of nature and most crucial for sustaining life and is required in the almost all activities of man for drinking, municipal uses, for irrigation to meet the growing food and fiber needs, for industries, power generation, navigation and recreations. Concerted efforts must be made to make the best use of available water to make possible a high level of continuous production per unit volume of water, per unit area of cropped land per unit time. In India, canal irrigation systems were designed and being operated with the aim of providing a certain amount of water per hectare to meet the crop water requirements.

In general, location of field determines the availability of water to the farmer. The location of field is reflected in the cropping pattern, because the farmers who are adjacent to the water resources are able to grow high water demanding crops than the farmers at a distant location. The size of the farm will also influence the cropping pattern, irrigation intensity etc. An attempt has been made in this paper to study the pattern of water use and productivity of water for middle region in Narsapur main canal irrigation system in West Godavari district of Andhra Pradesh. The data required for the study were obtained for the year 1995-96.

MATERIAL AND METHODS

The total length of the Narsapur main canal irrigation system was divided into three regions namely head, middle and tail based on the distance from the off-take point. In tail region one distributory was selected for the study. From the chosen distributory, 40 beneficiaries were selected randomly. The water used by the farmers and time taken to irrigate the crop was compiled by fixing a v-notch at different locations (Hellegeril *et al,* 2007). Cobb-Douglas production function of the following type was used for estimating the water use efficiency (Palanaswami and Thomton, 1981).

$Y = ax_1^{b1} x_2^{b2} \ldots\ldots\ldots\ldots X_a^{bn}$

Y = Gross returns in rupees per ha.
X1 = Irrigation water in ha-cm
X2 = Labour cost in rupees
X3 = Seed cost in rupees
X4 = Manure cost in rupees
X5 = Fertilizer cost in rupees

RESULTS AND DISCUSSION

Water use efficiency could be studied more reliably with the help of marginal productivity analysis.A perusal of Table 1 revealed that the regression coefficients of irrigation water and fertilizer cost were found significant at 1 per cent level. This would indicate that for very increase in one rupee of irrigation and fertilizer the gross value of output increased by 0.1262 per cent and 0.1912 per cent, respectively (Shareef, 1989).

The Table 2 indicated that the ratio of marginal value product to factor cost was found to be higher than unity for irrigation water and fertilizer indicating scope to increase the use of these inputs in order to obtain higher returns and profits.

The analysis of water use for paddy crop at different locations indicated that water use was more at the starting point of the supply channel and less at the tail point of supply channel. This situation calls for rationalization of water distribution. The Government of Andhra Pradesh has already established Water Users Associations (WUA's) whose members are elected democratically. These

Table1. Results of regression analysis on paddy crop

Particulars	Variables	bi	S.E.	t-value	Significant level
Gross return (Rs.)	Y				
Irrigation water(ha.c.)	XI	0.1262	0.0300	4.208	*
Labour cost (Rs.)	X2	0.0520	0.1174	0.443	NS
Seed cost(Rs.)	X3	0.1976	0.0682	0.2895	NS
Manure cost(Rs.)	X4	0.0261	0.0185	1.4140	NS
Fertilizer cost (Rs.)	X5	0.1912	0.0368	5.1943	*

R2 = 0.56, * = Significant at 5 per cent level NS = Non-significant

Table 2. Marginal value product to opportunity cost for paddy crop

S.No	Particulars	MVP	OC	MVP/OC
1.	Irrigation water(X1)	11.75	1.00	1.75
2.	Labour (X2)	0.12	1.00	0.12
3.	Seed (X3)	0.82	1.00	0.82
4.	Manure (X4)	0.73	1.00	0.73
5.	Fertilizer (X5)	2.32	1.00	2.32

MVP = Marginal value product

associations are further to be strengthened. There should be coordination between WUA's and the rural panchayats. Warabandi system of water allocation was followed since several decades, which need proper implementation. The conveyance and sewage losses are to be effectively controlled by lining. The farms size and location- wise analysis revealed that the productivity of wet and irrigated dry crops were higher, wherever irrigation from canal and tube well water existed. This suggested large scale ground water development to supplement the canal water. Further, farmers also need a continuing programme of information, guidance and education on water management and irrigated agriculture under the existing irrigation systems for better productivity.

LITERATURE CITED

Hellegeril P J C J, Perry C J and Berkolf J 2007. Water Pricing in Haryana, India. The gap between theory and practice. Irrigation Water Pricing.

Palanaswami K and Thomton D S 1981. Research methodologies for improved irrigation system managment Paper presented at international seminar on field research methodologies for improved irrigation system management, College of Agricultural Engineering, Tamilnadu Agricultural University, Coimbatore.

Shareef S M 1989. Water and it's optimization at farm and regional level in K C canal irrigation system in Andhra Pradesh. Unpublished Ph.D dissertation Dept of Agricultural Economics, Tamilnadu Agricultural University, Coimbatore.

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