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IMPACT OF WATER USER'S ASSOCIATION ON THE FARM ECONOMY - A CASE STUDY

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The farms sampled from the watercourse with effective WAU (Category I) compared with those sampled from other two categories with ineffective WUA (11) and without WUA (Ill) had higher, land use intensity by 3.1% and 7.6%, area under cash crops by 9.7% and 23%, cropping intensity by 18.3% and 26.2% and input cost by 15.5% and 29.2%. Average yield of sugarcane was found higher on Category I by 12% and 33% of cotton by 12% and 21% and of wheat by 10% and 20%, which resulted in 11.5% and 29.8% more gross income. Relatively the number of watercourse clcanings was found to be higher by 30.8% and 53.8%, extent of farmer participation in the cleaning programme by 16% and 57% and per hour irrigated area by 28% and 40% for Category I samples.

INTRODUCTION

Agriculture in Pakistan depends to a large extent upon the canal water supply. At present canal diversions are 92 MAF, of which only 42 MAF water is consumed by crops and the rest is wasted in canals and watercourses (Cheema, 1982). The extent of conveyance and application losses is estimated to be about 60%. Watercourse improvement is not an end in itself, continuous efforts are required to maintain it in proper shape. The formation of Water User's Association (WUA) which is a prerequisite to watercourse lining, is an alternative for better management, planning, designing, realignment, maintenance and construction of watercourse on scientific lines for the purpose of maximising irrigation efficiency, and thus the income of the farmers.

In view of the important role of the WUA in watercourse improvement, the government has given a legal coverage through promulgating a Water User's Association Ordinance, 1981 (Anonymous, 1984). Till December, 1989, 5190 WUA's had been registered in Pakistan (Anonymous, 1990).

For the purpose of investigating whether these WUAs have been working effectively and have created any impact, this research study was conducted at micro-level leaving a scope for macro-level study to be attempted by some research organisations.

MATERIALS AND METHODS

This research study was conducted in tehsil Alipur of district Muzaffargarh. Since all the required conditions were not available in one village, three watercourses were selected in different villages. It was certified by the water management personnel that one watercourse had effective WUA, the other ineffective WUA and the last without a WUA and were located, respectively, in villages Mudwala, Hamzewal and Bucani. These sites had almost uniform type of soil, rainfall, topography, socio-economic and cultural conditions. For the purpose of comparison, forty-five respondents were selected

at random from each watercourse with due regard to size and location of the farm on the watercourse.

The sample farms were compared in respect of their land use pattern, intensity of land use, cropping pattern, intensity of cropping, level of input use, average yield, gross income, level of education and efficiency of cleaning and maintenance programme.

RESULTS AND DISCUSSION

The intensity of land use on the watercourse with effective WUA (I), ineffective WUA (I1) and without WUA (Ill) averaged to be 97.6%, 94.6% and 90.0%, respectively (Table 1). Anwar (1981) also concluded similar results. The area under cash crops was found to be 65.2, 55.5 and 42.2% of their respective total cropped areas for Categories **I, II** and **III,** respectively. The cropping intensity averaged 136.8%, 118.4% and 108.6%, respectively on the I, 11 and III categories. Anwar (1981) reported slightly different results which may be ascribed to variation in time and location factors. This increased cropping intensity may be attributed to the relatively higher double cropped area which in turn may partly be due to greater availability of irrigation water in case of the category I farms.

The seed cost per hectare averaged to Rs. 654.5, 529.7 and 472.9 for the I, 11 and III farm categories, respectively. The higher seed cost could be attributed to the difference in adoption of modern technology. The cost of farm-yard manure has been worked out as Rs, 139.0, 127.9 and 95.2 ha-t for the **I, II** and **III** categories, respectively. The per hectare cost of fertilizer was calculated to be Rs. 769.1,659.0 and 485.4 for the **I, II** and III categories, respectively. The increased fertilizer use in case of farms category I may be attributed to greater availability of irrigation supplies caused due to effective functioning of WUA.. The per hectare cost of plant protection measures has been worked as Rs, 323.7, 276.8 and 181.7 for **I, 11** and **III** categories, respectively. The higher cost may be attributable to relative increase in the general standard of agricultural technology in case of sampled farms of the improved watercourse.

The yield per hectare of stripped sugarcane averaged 55902, 49107 and 37140 kg; of cotton 2528, 2224 and 1994 kg; of wheat 2807, 2523 and 2250 kg; of rape and mustard 943, 804 and 686 kg in case of the **I, II** and **III** farm categories, respectively. The per hectare gross income from the **I, II** and **III** farm categories was estimated to be Rs, 12065.8, 10680.8 and 8473.0, respectively. Anwar (1981) reported much less gross income per hectare. The variation is imputable to technological change overtime, and increase in prices of outputs.

The higher income in case of the category I may be ascribed to their relatively better land use, cropping pattern, intensity of land use, level of inputs, better yields and availability as well as utilization of irrigation water.. Indirectly, all of it might have resulted due to the effective functioning of the WUA.. The gross income was found almost similar on head, middle and tail farms of the first farm category which is a sure evidence about the impact of the effective WUA which in turn may be attributable to their comparatively better cleaning and maintenance of the watercourse.

The level of literacy was found to be 35.6%, 26.6% and 8.8% in case of the I, 11 and III farm categories, respectively. The extent of meetings attended regularly by the management committee averaged 75% for the category **I,** while it was 25% for the second category. Quraishi (1991) concluded that the meetings of the managing committee were not held at regular intervals and whenever these were held, the rule of

presence of the majority of members was not cared properly.

and II categories under study. The farmer's participation in the watercourse cleaning

Table 1. Comparison of intensity of land use and cropping, input costs, yield, gross income etc. of the three farm categories

Parameter	Watercourse with		
	Effective WUA (I)	Ineffective WUA (11)	Without WUA (Ill)
Land use intensity (%)	97.6	94.6	90.0
Area under each crops as per cent of total cropped area	65.2	55.5	42.2
Cropping intensity (%)	136.8	118.4	108.6
Seed cost (Rs. ha^{-1})	654.5	529.7	472.9
Fertilizer cost (Rs. ha^{-1})	769.1	659.0	485.4
FYM cost (Rs. ha-i)	139.0	127.9	95.2
Plant protection cost (Rs. ha^{-1})	323.7	276.8	181.7
Yield of stripped sugarcane (kg ha-I)	55902.0	49107.0	37140.0
Yield of cotton (kg ha^{-1})	2528.0	2224.0	1994.0
Yield of wheat (kg ha^{-1})	2807.0	2523.0	2250.0
Gross income (Rs. ha-i)	12065.8	10680.8	8473.0
Literacy level (%)	35.6	26.6	8.8
Extent of meetings attended regularly by the management committee (%)	75.0	25.0	-
Number of watercourse cleanings per year	13.0	9.0	6.0
Extent of farmers participating in cleaning programme (%)	82.2	66.0	35.0
Area irrigated (ha hr^{-1})	0.45	0.32	0.27

The farm category I gave 30.8% and 53.8% more number of cleanings compared to II and III categories, respectively. Average interval between clcanings was found to be 28 and 50 days in case of the I programme was 82.2%, 66.0% and 35.0% for the I, 11 and III categories, respectively, The average area irrigated per hour was found to be 0.45, 0.32 and 0.27 hectares, respectively for the I, 11 and III categories.

Evidence from this inquiry concluded the fact that the effective WUA had a greater impact on the farm economy of the respondents. However, for organizational viability of WUA, there should be frequent meetings of the association to discuss the problems and their solutions. The On-Farm Water Management Staff should visit the improved watercourses and check the working of the associations. Water management extension service needs to be strengthened particularly for efficient use of saved water. The management committee must have greater representation of small farmers because large farmers are usually found to be among the trouble makers. Multipurpose associations instead of single purpose are expected to yield greater benefits.

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