International Journal of Advanced Research in Management and Social Sciences
ISSN: 2278-6236

FARMERS' AWARENESS AND APPLICATION OF IMPROVED WATER MANAGEMENT PRACTICES

Ijaz Ashraf*

Bilal Muneer*

Sher Muhammad*

Fariha Rehman**

Abstract: *Water scarcity is becoming an issue of immense importance for many developed as well as developing countries. The limited fresh water resources present the world with a major challenge to feed everybody and sustain the economy and the environment. Pakistan is not an exception in this regard especially in agriculture context. In such conditions, we need to conserve the available water for irrigation purposes and also to minimize the losses in this regard. The present study was designed to investigate into the awareness of improved water management practices among farmers and their application by them. A sample of 125 respondents was selected at random from five union councils of tehsil Burewala selected at random. The data were collected with the help of a pre-tested and validated interview schedule and were analyzed using computer software Statistical Package for Social Sciences (SPSS). Descriptive statistics were used for data analysis. The result showed that majority of the respondents was aware of most of the improved water management practices. However, there was a large proportion of the respondents who did not apply the water management practices like cleaning and maintenance of improved watercourses, laser land leveling, and cleaning and maintenance of farm ditches for the efficient use of irrigation water. The major factors that had impeded the application of improved water management practices were lack of technical knowledge, costly technology and non-cooperation of extension staff.*

Keywords: *Water management practices, Factor hindering application of water management practices, Awareness and application of water management practices*

*Institute of Agri. Extension and Rural Development, University of Agriculture, Faisalabad – Pakistan

**Univ. College of Agri. and Environmental Sci., Islamia Univ. of Bahawalpur, Bahawalpur– Pakistan

INTRODUCTION

Water shortage is becoming an issue of immense importance allover the world. The fundamental fear of food shortages encourages ever great use of water resources for agriculture. The finite nature of irrigation water resources is one of the great challenge faced by the world to feed the population and to achieve sustainability in economy & environment. The International Water Management Institute (IWMI) has estimated that by 2025 1.8 billion people will live in countries, which will face irrigation water scarcity for their agriculture sector (Seckler *et al.,* 1999; IWMI, 2000). As a result, such countries will lack sufficient water resources to produce and sustain their per capita food production from irrigated agriculture, unless they would have highest irrigation efficiency to reasonably meet water requirements for their agriculture. Pakistan is also not an exception, as far as shortage f irrigation water is concerned.

Pakistan is blessed with various natural resources required for agriculture including favorable climatic conditions, fertile land and irrigation water. Among these water, which is the life blood of agriculture has become scarce resource mainly due to mismanagement especially at farm level. In Pakistan, out of estimated water resources up to 142 MAF, only 42 MAF is available for agricultural purposes. Therefore, a huge amount of irrigation water goes to waste in our deteriorated irrigation system causing water logging salinity problems in our agricultural land (Ahmad *et al.*, 2011).

Irrigation network of Pakistan comprises of barrages, headworks, main canals, distributaries, minors and watercourses. The irrigation in Pakistan is generally done by flood method as a common practice. This practice not only affects adversely crops but also cause water logging and salinity besides making a huge loss to water resources especially when the fields are not properly leveled. Land leveling, therefore, is extremely important practice which should be adopted for uniform application of water at farm level. There is a great need in Pakistan for precision land leveling to save water. The traditional method of land leveling practiced by common farmers in the country lacks precision. Similarly considerable quantity of precious water goes into waste during the transference of irrigation water in the irrigation network including the watercourses. Twenty five to thirty percent of water is wasted only in the watercourses due to poor management and maintenance by farmers. According t an estimate, in the Punjab this loss is 10 MAF (Govt. of Punjab, 2010).

Considering the huge water loses, the government of Punjab-Pakistan launched an On-Farm Water Management Project in 1976-77 to minimize the water losses beyond outlet (Mogha). It was ever first project designed in Pakistan where the beneficiaries (farmers) were fully involved and contributed almost 50% cost of the project. Through this programme, use of precision land leveling technology was introduced in the Punjab during 1985. This technology has a great potential for becoming proved highly beneficial because it minimizes the cost of operation, insures high degree of precision, helps in uniform application of irrigation water, improves seed germination, enhanced fertilizer use efficiency, and consequently increases crop yield (Hammad, 2000).

In 2004, the Government of Pakistan launched nationwide project captioned as "National Program for Improvement of Watercourses (NPIW)" in Pakistan. It envisages the improvement of 28,000 watercourses and 2000 irrigation schemes in the Punjab province involving a total cost of Rs. 550.70 million. In the Punjab, so far 19,944 watercourses have been improved under this program against the assigned target of 19,350. Over all achievement comes to 103%, which is indicative of excellent efforts made by the (Govt. of Punjab, 2010).

The National Rural Support Program (NRSP) and Punjab Rural Support Program (PRSP) are also performing their role for the improvement of watercourses. The NRSP and PRSP are basically focusing on poverty alleviation through micro financing. Under NPIW, 2,000 watercourses are to be improved through Community Organizations (COs) formed by the NRSP and PRSP while 5,000 watercourses will be improved under district government system (NRSP, 2012).

How far the above mentioned programmes have been sucessesful, seems to be an important area to be looked into. That is why the present study was designed to investigate into the farmers' awareness of improved water management practices and their application by them besides looking into the hurdles that impede the application of improved water management practices.

MATERIALS AND METHODS

The study was conducted in tehsil Burewala, district Vehari, which consists of thirty two union councils. Five union councils were selected randomly and one village was selected at random from each selected union council. From each selected village, 25 farmers were

taken randomly, thus the total sample size comprised 125 respondents. The data were collected with the help of a pre-tested and validated interview schedule and were analyzed using computer software Statistical Package for Social Sciences (SPSS). Descriptive statistics such as simple frequency and percentage were used.

RESULTS AND DISCUSSION

Awareness of respondents about water management practices

The respondents were asked whether they were aware of improved water management practices or not. The information obtained is given in Table I.

Table I: Distribution of the respondents according to their awareness about improved water management practices

Water management practices	Frequency	%
Land leveling with tractor and dozer blade	103	82.4
Laser land leveling	35	28.0
Re-shaping of traditional fields into level furrow	111	88.8
Cleaning and maintenance of improved main water courses	63	50.4
Cleaning and maintenance of farm ditches	59	47.2
Use of siphon tubes in leveled furrows for irrigation	45	36.0
Hoeing and intercultural practices for increasing moisture holding capacity	81	64.8
Maintenance of optimum plant population for the maximum use of irrigation water	79	63.2
Irrigating the fields according to soil moisture contents	93	74.4
Scheduling the irrigation turn according to crop needs	113	90.4

Source: Field data

Table I revealed that a vast majority (90.4%) of the respondents was aware of scheduling the irrigation turn according to crop needs. Wahaj and Asghar (2002) in their study also emphasized about the value of irrigation scheduling for different crops, the awareness about which was already very high among the respondents. Similarly 88.8% respondents were also aware of re-shaping of traditional fields into level furrow, 82.4% of the respondents were aware of land leveling with tractor and dozer blade and about three-fourths (74.4%) of the respondents were aware of irrigating the fields according to soil

moisture contents. These findings are quite encouraging with respect to water management. While about 47% respondents were aware of cleaning and maintenance of farm ditches, about 41% respondents were aware of laser land leveling and only about 26% respondents were aware of use of siphon tubes in leveled furrows. It clearly indicates that with regard to these practices majority of the respondents was quite unaware.

Extent of application of water management practices

The respondents were asked about the extent of application of water management practices. The information in this regard are presented in Table II.

Table II: Distribution of the respondents according to extent of application of different water management practices

Water management practices	Extent of application			
	Use regularly		Use occasionally	
	No.	%	No.	%
Land leveling with tractor and dozer blade	4	3.2	91	72.8
Laser land leveling	16	12.8	39	31.2
Re-shaping of traditional fields into level furrow	6	4.8	67	53.6
Cleaning and maintenance of improved watercourses	18	14.4	36	28.8
Cleaning and maintenance of farm ditches	10	8.0	46	36.8
Use of siphon tubes in leveled furrows for irrigation	6	4.8	39	31.2
Hoeing and intercultural practices for increasing moisture holding capacity	14	11.2	60	48.0
Maintenance of optimum plant population for the maximum use of irrigation water	44	35.2	30	24.0
Irrigation of fields according to soil moisture contents	34	27.2	59	47.2
Scheduling the irrigation turn according to crop needs	18	14.4	58	46.4

Source: Field data

Table II shows that a large proportion of the respondents used occasionally the water management practices like land leveling with tractor and dozer blade (72.8%), followed by re-shaping of traditional fields into level furrow (53.6%), and hoeing and intercultural

practices for increasing moisture holding capacity (48.0%). While only 35.2% of the respondents used regularly the maintenance of optimum plant population for the maximum use of irrigation water, 27.2% used irrigation of fields according to soil moisture contents, and equal percentage (14.4%) used cleaning and maintenance of improved watercourses and scheduling the irrigation turn according to crop needs. Analysis of the data clearly indicates that large proportion of the respondents did not use the water management practices like laser land leveling (56%), and cleaning and maintenance of farm ditches (55.2%).

FACTORS IMPEDING THE APPLICATION OF WATER MANAGEMENT PRACTICES

The respondents were asked about the factors that impede in the application of improved water management practices. The data in this regard are presented in Table III.

Table III: Distribution of the respondents according to the factors that impede the impede of improved water management practices

Factor	Frequency	%
Lack of awareness	69	52.2
Lack of interest	52	41.6
Lack of time	80	64.0
Lack of credit facilities	52	41.6
Lack of subsidy facility	49	39.2
Lack of technical knowledge	97	77.6
Small land holding	74	59.2
Tenancy status	38	30.4
Non-availability of implement	56	44.8
Lack of technical labour	39	31.2
Poor financial position	52	41.6
Costly technology	95	76.0
Non-cooperation of extension field staff	85	68.0

Source: Field data

Table III shows that major factors which had impeded the application of improved water management practices were lack of technical knowledge, costly technology, non-cooperation of extension field staff, lack of time, lack of interest, and small land holding. Non-availability of implements, poor financial condition and lack of technical labour were the other factors which had impede the adoption of water management practices.

CONCLUSIONS

The results showed that a large proportion of the respondents had used occasionally the water management practices like land leveling with tractor and dozer blade, re-shaping of

traditional fields into level furrow, and hoeing and intercultural practices for increasing moisture holding capacity. While the practices which were used regularly included maintenance of optimum plant population for the maximum use of irrigation water, irrigation of fields according to soil moisture contents, cleaning and maintenance of improved watercourses, and scheduling the irrigation turn according to crop needs. However the practices which were not at all applied by a large proportion of the respondents included cleaning and maintenance of improved watercourses, laser land leveling, and cleaning and maintenance of farm ditches for the maximum use of irrigation water. The major factors that had impeded the adoption of recommended water management practices were lack of technical knowledge, costly technology and non-cooperation of extension staff.

RECOMMENDATONS

In the light of the discussion and the conclusions drawn, following recommendations are made to improve the adoption behavior of the farmers:

- Awareness among farmers should be created using all possible means such as mass media regarding water management practices like laser land leveling, use of siphon tubes, cleaning and maintenance of main water courses as well as from diches.
- Farmers should be motivated and encouraged for applictin of imprved water management practices through demonstrations or arranging field visits to those farmers where such practices are already in use.
- Extension staff should focus on water management practices which are either not used by the respondents or they used occasionally.
- The agencies dealing with farm machinery/implements should facilitate farmers through provision of required machinery/implements on subsidized rates.

REFERENCES

1. Ahmad, H., J.I. Bokhari, and Siddiqui Q.T.M. (2011); Flashflood risk assessment in Pakistan. Pakistan Engineering Congress, 71st Annual Session Proceedings, paper No. 707. pp: 696-708.
2. Hammad, R. (2000); The impact of watercourse improvement on farm production in tehsil Chak Jumra. M.Sc. Thesis, Dept. of Rural Sociology, Univ. of Agri., Faisalabad, Pakistan.

3. IWMI. (2000); Projected Water Scarcity in 2025. Available at: http://www.waternunc.com/gb/pws2025.htm
4. NRSP. 2012. Monthly Programme Update. Available at: http://nrsp.org.pk/Documents /Programme%20Update%20as%20of%20August%202012.pdf
5. Seckler, D., D. Molden, and R. Barker. (1999); Water scarcity in the twenty-first century. International Water Management Institute (IWMI), Colombo, Sri Lanka. Available at: http://pdf.usaid.gov/pdf_docs/PNACH595.pdf
6. Wahaj, R. and M.N. Asghar. (2002); Farmers' management responses to the gap between supply and demand of canal water in large scale irrigation system. Irrigation Advisory Services and Participatory Extension in Irrigation Management, Workshop organized by FAO-ICID 24th July, 2002, Montreal.
7. Daily Dawn. (2012); Ensuring better crop per water drop. 3 September, 2012. Available at: http://dawn.com/2012/09/03/ensuring-better-crop-per-water-drop/