

Factors Affecting Attitude Change of Bojnourd Township Wheat Farmers toward Participatory Management of Agriculture Water Resources

Seyed Jamal F. Hosseini¹, Najmeh Daryaei^{2,*}, Abdi Rahnama²

¹Department of Agricultural Extension and Education, Tehran Science and Research Branch, Islamic Azad University, Tehran, 1477893855, Iran

²Department of Agricultural Development, Tehran Science and Research Branch, Islamic Azad University, Tehran, 1477893855, Iran

Abstract The purpose of this study was to assess the factors affecting attitude change of Bojnourd township's wheat farmers toward participatory management of agriculture water resources. The simple random sampling technique was used to select 120 wheat farmers in Bojnourd township in north Khorasan province. Data was gathered by using questionnaire. The findings of the study showed that educational level and knowledge about water participatory management had positive and significant correlations with attitude toward participatory management of water resources. Also the number of household members, farming experience, the total area of the water shed lands and irrigated lands had negative and significant correlation with attitude toward participatory management of water resources. Results of stepwise regression analysis also showed that the total area of the water shed lands, farming experience and number of household members explained approximately 43 percent of changes in attitude toward participatory management of agriculture water resources.

Keywords Participatory management of water resources, Attitude, Wheat farmers, Bojnourd

1. Introduction

Iran is one of the driest regions in the world and the lack of water is a major bottleneck for the development of agriculture. So based on the index of the United Nations and the International Water Management Institute, Iran located in the state of water crisis. Obviously, from about 37 million hectares of agricultural lands due to water restrictions, only 7.8 million hectares are irrigated land, which provide 90% of the country's food products. On the other hand, 93.5% of water in Iran is used in agriculture. Therefore, a comprehensive and holistic approach to water management improvements can dramatically increase the productivity and efficiency of water use in the country [1]. Participation in water resource management has gained increasing momentum over the last decades. Key water policy documents such as the European Water Framework Directive and Federal Clean Water Act put great emphasis on the role of stakeholder and public involvement in water management [2]. The role of subsistence farmers in management of water resources could not be ignored, since they have stronger motivation to manage water resources.

Although coherent and consistent participation of farmers in water management requires appropriate legislation and government support, but the willingness of farmers to participate in water management is necessary.

Shahroudi and Chizari (2008) in his research of factors influencing farmers' participation in irrigation management network (case study Khorasan Razavi province in Iran) found that there were significant and positive relationships between variables, namely farmers' behavior regarding the best farm water management practices, extension contacts, communication channels, social capital components and farmers' attitudes regarding Water Users' Association (WUA) with farmers' participation status in irrigation network management. Also, the classification of the results by using forward stepwise logistic regression model analysis indicated that the most important discriminating factors of two groups of farmers who participate in WUA and Non-WUA include farmer's age, annual income, social solidarity and the status of farmers' participation in irrigation network management. Generally, these variables could correctly classify some 75.8% of all the subjects [1]. Azizi Khalkheili and Zamani (2010) in the research in structures of participation of farmers in irrigation management using path analysis in Doroodzan Dam Irrigation Network in the Fars province in Iran showed that farmers' attitude towards participation and problem perception had the greatest direct affect on farmers' participation (FP) in irrigation

* Corresponding author:

n.daryaei2007@yahoo.com (Najmeh Daryaei)

Published online at <http://journal.sapub.org/ije>

Copyright © 2014 Scientific & Academic Publishing. All Rights Reserved

management. Farmers' sociability and attitude towards personnel of Extension and Agricultural Service Centers had the greatest indirect affect on FP in irrigation management, and showed the greatest direct affect on farmers' attitude in this regards [3]. Afshar and Zarafshani (2011) in a study analyzed the tendency toward participatory irrigation management (the case of water user cooperative Sefid-Barg and Sarab-Bas in the Kermanshah province in Iran), and found that by using the results of stepwise discrimination analysis, variables such as the dry farming area, education, irrigation facilities, attitude towards participatory irrigation management and age were significant factors in predicting farmers' inclination towards participatory irrigation management [4]. Anwar et al (2008) in a study examined the attitudes of farmers on participatory irrigation management in Punjab, Pakistan and found that not only Farmers have been prepared to take responsibility for the deployment and protection of the water distribution network, but are prepared to accept the responsibility for collecting water pricing [5]. And Rahman and Yamao (2010) in a survey of farmers' attitudes toward participatory management of resources to achieve sustainable development of agriculture found that among the variables, only education level have a positive correlation with the variable of attitude toward participatory management of resources, this means that improve the level of education of farmers provides to improve their attitude towards participatory resource management [6]. Bagherian et al (2011) in a study examined the relationship between attitudes toward watershed management programs and participate in Hablehrud. The results showed that respondents' attitude towards watershed management programs is relatively high and there are significant correlation between the level of participation and attitude towards watershed management [7]. The results of Mirzaei et al (2012) study showed that there was a significant relation among the terms of farmers' membership in water users' association, farm distance to the nearest agricultural service center, level of using the informational resources, level of extensional contacts, social participation and solidarity with farmer's attitudes towards participatory irrigation management in the Golestan province of Iran. The gotten results from stepwise regression showed that social solidarity, farm distance to the nearest agricultural service center and the level of using of informational resources forecast 32 percent of changing the farmer's attitudes toward participatory irrigation management [8]. Jacobs and Buijs (2011) in a study examined the stakeholders' attitudes toward water management interventions (role of place meanings) and showed that Five categories of place meanings emerged from the analysis: beauty (esthetic judgments), functionality (ways of use), attachment (feelings of belonging), biodiversity (meanings pertaining to nature), and risk (worries about current or future events). These categories reflect the basic dimensions of sense of place. The results suggested that stakeholders' attitudes toward proposed interventions, derived from their place meanings.

Discussing place meanings during participatory planning processes could contribute substantially to successful water management [9]. Rezadoost and Allahyari (2013) in their study identified effective factors on optimum agricultural water management based on opinions of farmers in Amlash in the Guilan province of Iran and found that based on opinions of farmers, six factors (mechanization, technical, economic, social, knowledge and experience) affect the optimum agricultural water management. These factors account for 71.50 percent of variance of effective factors on optimum water resource management [10]. Ker Rault et al (2013) in a study demonstrated that the readiness and willingness of the public to participate in integrated water management in the Levant (Eastern Mediterranean) and found that the public is willing to participate and knowledgeable about water management challenges at about the institutional and household level. These conditions for participation are particularly present in countries where water stress is high [11]. Chifamba (2013) in his study found that the water resources management cannot be successful and sustainable without the support and participation of water resource users and the promotion of participation in water resources management is long and time consuming process that requires appropriate means. Natural resources management related policies including water require the use of knowledge, experience and opinions of local communities who are the key stakeholders in resource conservation and community participation can foster better adaptation of management and policy responses to emerging water crisis [12].

With regard to the importance of a positive attitude towards participatory management of water resources for agricultural operators, the present study investigated the factors influencing farmers' attitudes of Bojnourd township on participatory management of agriculture water resources. Therefore, the overall objective of this study was to investigate the factors affecting attitude change of Bojnourd township farmers about participatory management of water resources in agriculture.

2. Materials and Methods

This research is applied type research and the data collected by using questionnaires. The total population of study in this research were all wheat farmers in Bojnourd township in the North Khorasan Province. According to Cochran formula [13], 120 farmers were selected by using simple random method. Validity of the questionnaire was approved by panel of experts. Questionnaire reliability was confirmed by Cronbach's alpha coefficient. Cronbach's alpha values for different sections of the questionnaire calculated between 0.70 to 0.82.

The data was analyzed by using Pearson and Spearman correlation coefficients and stepwise multiple regression method. SPSS_{Win18} software has been used for this purpose.

3. Results

Descriptive findings of this study showed that the average age of the respondents was about 43 years. Their average work experience was about 15 years. Majority of respondents had a high school diploma. The respondents' attitudes on participatory management of agricultural water resources examined in five categories. ISDM¹ method was used to assess these variables. This variable grouped according to the mean, standard deviation and using the following formula:

$$\begin{aligned} A &= \text{Low} & A &< \text{Mean} - \text{SD} \\ B &= \text{Relatively Low} & \text{Mean} - \text{SD} &< B < \text{Mean} \\ C &= \text{Relatively High} & \text{Mean} &< C < \text{Mean} + \text{SD} \\ D &= \text{High} & \text{Mean} + \text{SD} &< D \end{aligned}$$

Table 1 shows that 18.3 percent of respondents have low attitude, 30 percent have relatively low level of attitude, 39.2 percent have relatively high attitude and 12.5 percent of respondents have high attitude about participatory management of agricultural water resources.

The results of correlation between dependent and independent variables showed that there were positive and significant correlation between educational level, knowledge level and attitude about participatory management of agricultural water resources. There was also negative correlation between number of farmer household members, farming experience, the irrigated farming area and water

shed farming area and attitude about participatory management of agriculture water resources.

Table 1. Attitudes of respondents about participatory water resources management

Attitude Levels	Frequency	Percent	Cumulative Percent
Low	22	18.3	18.3
Relatively Low	36	30	48.3
Relatively High	47	39.2	87.5
High	15	12.5	100
Total	120	100	

Maximum = 29
Minimum = 18

Mean = 24.73
sd = 2.29

In order to predict the variability in attitudes about participatory management of agriculture water resources by the independent variables, stepwise regression method was used. Based on the regression coefficients (B) and constant coefficient calculated, regression equation is as follows:

$$Y = 28.099 - 0.117X_2 - 0.311X_3$$

The results showed that the irrigated farming area, farming experience and number of household members explained about 43% of the changes in attitudes of respondents toward participatory management of agricultural water resources (Table 3). Also, based on the Beta coefficients to determine the contribution of independent variables in explaining the dependent variable, the number of household members had the most important role in explaining this variable.

Table 2. Correlation between dependent and independent variables

Variable	Correlation Coefficient	Significant	Type of Correlation Coefficient
Age	-0.005	0.953	Pearson
Level of education	0.178	0.05	Spearman
Number of household members	-0.433	0.000	Pearson
Farming experience	-0.309	0.001	Pearson
Irrigated farming area	-0.512	0.000	Pearson
Water shed farming area	-0.484	0.000	Pearson
Number of family labor	-0.069	0.456	Pearson
Wheat yield	0.123	0.333	Pearson
Access to training and extension factors	0.125	0.173	Pearson
Level of participation in rural organization	0.028	0.939	Pearson
Knowledge about participatory management of agricultural water resources	0.393	0.000	Pearson

Table 3. The results of stepwise regression

Independent Variable	B	SE B	Beta	T	Tsig	R	R ²	R ² Adj
Irrigated farming area	0.000	0.000	-0.489	-6.288	0.000	0.510	0.260	0.254
Farming experience	-0.117	0.025	-0.342	-4.632	0.000	0.640	0.410	0.400
Number of household members	-0.311	0.121	-0.200	-2.558	0.012	0.665	0.443	0.428
Constant	28.099	0.577	-	48.708	0.000	-	-	-

F = 29.645

Signif = 0.000

4. Discussion and Conclusions

The structural reform of water resources management, organizing the utilization systems of water resources, strengthening public participation and increasing the economic efficiency of water especially in the agricultural sector are basic orientation of economic, social and cultural development in the Islamic Republic of Iran. While this orientation, shows the bottlenecks and barriers in the development of water sector, the need for cooperation and participation of the people and especially the key beneficiaries in water resources management will be emphasized [14].

Descriptive results of the survey showed that more than 50 percent of the respondents have high and relatively high attitudes about participatory management of agriculture water resources. Findings of the correlation analysis also showed that between the level of education of farmers ($r = 0.178$), knowledge of participatory management of agriculture water resources ($r = 0.393$) and variable of attitude about participatory management of water resources, there is a positive and significant relationship. In other words, with increasing level of education and knowledge of participatory management of water resources improved attitude of farmers towards participatory management of water resources. The findings of Rahaman and Yamao (2010) and Rezadoost and Allahyari (2013) supported this finding. Between variables of the number of household members ($r = -0.433$), farming experience ($r = -0.309$), the irrigated farming area ($r = -0.512$), the water shed farming area ($r = -0.484$) and attitude toward participatory management of water resources there are a negative and significant correlation.

The results showed that the independent variables of irrigated farming area, farming experience and number of household members explained about 43 percent of the variability in attitude about participatory management of water resources. Among these variables, the number of household members has the most important role in explaining the variability of participatory management of water resources.

The results of study showed that knowledge level contributed in changing the attitudes of farmers about participatory water management. So, informing and increasing knowledge of farmers through extension classed could change the attitude of farmers.

The findings suggested an important challenge for policy makers and program planners in agriculture sector of Iran, because farmers who utilized irrigation systems, did not have a positive attitudes about participatory management of water resources. Farmers should be encouraged to organize and participate in water users association.

REFERENCES

- [1] Shahroudi, A.A., and Chizari, M., 2008, Factors influencing farmers' participation in irrigation networks management (a case study of Khorasan-e-Razavi province, Iran), *Iranian Journal of Agricultural Economics and Development*, 39(1), 63-75.
- [2] Carr, G., Bloschl, G., and Loucks, D. P., 2012, Evaluating participation in water resource management: A review., *Water Resources Research*, 48, 1-17.
- [3] Azizi Khalkheili, T., and Zamani, GH.H., 2010, Factors affecting farmers' participation in irrigation management: the application of path analysis., *Journal of Economics and Agriculture Development*, 24(1), 83-90.
- [4] Afshar, N., and Zarafshani, K., 2011, Tendency toward participatory irrigation management (PIM): the case of water user cooperative Sefid-barg and Sarab-bas in Kermanshah province., *Iranian Agricultural Extension and Education Journal*, 6(2): 99-114.
- [5] Anwar, H. N., Perveen, S., Mehmood, S., and Akhtar, S., 2008, Assessment of farmers's attitude towards participatory irrigation management in Punjab-Pakistan., *Pakistan Journal of Life and Social Sciences*, 6(2), 121-126.
- [6] M.Z., Rahman, and M. Yamao, "Farmers' attitudes towards participatory resource management for sustainable farming development—a study from Bangladesh", *Univ. Of Hiroshima, Japan*, 2010.
- [7] Bagherian, R., Goodarzi, M., and Shadfar, S., 2011, Relationship between attitude toward watershed management programs and level of participation, *Middle-East Journal of Scientific Research*, 9(3), 324-329.
- [8] Mirzaei, A., Mirdamadi, M., and Alini, M., 2012, Non economic factors affecting on farmers attitudes towards participatory irrigation management (Case Study: Golestan province, Iran), *Life Science Journal*, 9(3), 981-986.
- [9] Jacobs, M. H., and Buijs, A. E., 2011, Understanding stakeholders' attitudes towards water management interventions: role of place meanings., *Water Resources Research*, 47(1), 470-477.
- [10] Rezadoost, B., and Allahyari, M.S., 2013, Farmers' opinions regarding effective factors on optimum agricultural water management., *Journal of the Saudi Society of Agricultural Sciences*, 13, 15-21.
- [11] Ker Raultt, P.A., Vreugdenhil, H., Jeffrey, P., and Slinger, J. H., 2013, Readiness and willingness of the public to participate in integrated water management: some insights from the Levant., *Water Policy*, 15, 101-120.
- [12] Chifamba, E., 2013, Community participation in integrated water resources management in the Save Catchment, Zimbabwe., *Journal of Environmental Science and Water Resources*, 2(10), 360-374.
- [13] Cochran, W. G. *Sampling Techniques*, New York: John Wiley & Sons, 1977, vol. 3.
- [14] Tahbaz Salehi, N., Koupahi, M., and Nazari, M.R., 2010, Investigating on the performance of participatory irrigation management in Iran: case study-Tajan water user association., *Journal of Economics and agriculture Development*, 24(2), 205-216.

ⁱ. Interval of Standard Deviation from the Mean