

**Non Economic Factors Effecting on Farmers Attitudes towards Participatory Irrigation Management
(Case Study: Golestan Province, Iran)**

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Abstract: The present study is the kind of descriptive–correlation and the purpose of this study is to investigate and analyze non economic factors effecting on farmers attitudes towards participatory irrigation management. On the basis of Kochran formula, the numbers of 190 persons are accidentally selected by the using stratified sampling and cluster random sampling and finally 186 questionnaires are analyzed. The farmers as members of Golestan province water users' association made up the statistical population of this research. The tool of research was questionnaire which its reliability approved by the masters and knowledgeable persons and its validity computed 0.77. The data analysis is accomplished by using the SPSS 13 software. The research results shown that there was a significant relation among the term of farmer's 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 of management. The gotten results from stepwise regression shown social solidarity, farm distance to the nearest agricultural service center and the level of using of informational resources forecast 32% of changing the farmer's attitudes toward participatory irrigation of management.

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Introduction

Increasing agricultural production in Iran for various reasons including, price stability, the improvement of per capita income sector workers and increasing needs of society to non-oil foreign exchange resources, has become an inevitable necessity and since that not easily has changed obtained the volume of water equivalent to 130 billion cubic meters per year the only way will remain is efficient using of water[22]. Human Development Report 2008 - 2007 UNDP also expressed that until 2080, climate change is capable to increase the number of people around the world face water shortages, to around 8/1 billion[18]. The major challenges' facing the dilemma of the country is water. When there is a water problem, agriculture as an employment industry of the country would be stopped [15]. Experts say the country's water resources management is not appropriate in current circumstances has led to decline in recent years groundwater resources and reducing agricultural acreage in some areas[2]. The agricultural sector due to reasons such as; loss of water supply source to local consumption, high water losses in agricultural fields, inappropriate shape and size of farms with irrigation water, lack of farmers knowledge of making optimum use of water, depletion rapid

infrastructure, low quality and lack of using appropriate irrigation network methods, low irrigation efficiency and irrigation losses are very high[11]. The principles of sustainable development essential for the water industry and should have looked it as a business opportunity not limitation and on the other hand to achieve sustainable development of water needed for a more comprehensive approach that the issue of water management along with institutional mechanisms of participation, according to a new organization will seek [3 and 8]. Therefore, in order to water sustainability, water management overall system should be designed to look like that all farmers are more eager to participate in productivity and production advantage of water resources [9].

According to the pre challenges on water management in Iran are necessary, using appropriate methods of irrigation and improved agricultural water management for increasing agricultural production and improve the environment, making effective use of agricultural water. On the other hand, considering that irrigation system has designed by the government without the participation of farmers, Organization of Water Affairs is facing to heavy costs of operation and maintenance because farmers don't feel responsibility about

it[1]. Thus, participation of farmers through new participatory irrigation management approach is importance in improving agricultural water management[10]. The term participatory irrigation management (PIM) refers to farmers participate in all levels of management including planning, design, construction, operation and maintenance and investment, decision rules and monitoring and evaluation of irrigation systems. On the other hand participatory irrigation management in a manner usually refers to the participation that will increase operational authority and responsibilities farmers in the management process [19 and 14]. Reviewing a literature was clear that some researchers are following implemented particular stage in this study. Shahrodi *et al*[17], Norozi *et al*[13], YaghobiNejad[21], Khoshab and Namazi[12], Aminian and Khayati [1], Chizari and Noroozi[7], Rahman *et al*[16], Damianos and Giannakopoulos[7], Vermillion [20], Ben-Ayed[5] and Bagdi[4].

This research also in line with previous studies in response to this question is designed that if politicians want a part of general or regional water management to farmers should leave what incentives is effective on their attitude towards participatory irrigation management? The present study aimed noneconomic factors affecting on attitude of farmers towards participatory irrigation management has been implemented and it consists of specific objectives:

- 1-Describe the noneconomic characteristics of farmers.
- 2-Relationship between the attitudes of farmers towards participatory irrigation management with noneconomic characteristics.
- 3-Predict changes in attitudes of farmers towards participatory irrigation management based on noneconomic characteristics.

Methods

The current study is used descriptive and correlative methods. Statistical society of the research includes all farmers that are members of cooperative water users in Golestan (N=11417). Sample size is estimated 190 persons by Cochran formula. Stratified cluster proportion and randomly sampling method is used. As such, desired townships are formed the population of classes. Next, using cluster random sampling with regard to each class to act as a cluster sampling was attempted. As such, a cooperative from each cluster was selected and with using of simple random sampling in cooperative action was collected the desired information. Finally, 186 questionnaires were analyzed. Questionnaire was the most important tool of data collection. In order to confirm the appearance and content validity of the questionnaire several versions of questionnaire gave to extension and agricultural educational professors and a number of experts of

agriculture organization of Tehran province and Golestan province and after several stages revised final approval was obtained. To test reliability, 30 questionnaires completed by farmers and cooperatives members and Cronbach alpha were obtained 0/90. For analysis the statistics of mean, standard deviation, coefficient of variation and linear regression data was used using SPSS version 13.

Results and Discussion

Describe the personal characteristics of farmers

The results showed that the average age of farmers was 45.91 and they have 24.69 years of agricultural activities. The average of duration of farmers' membership in the water users' association was 9.60 years respectively and the average of farm distance to the nearest agricultural services was 55.10 km (Table 1).

Table 1
Farmers' personal characteristics (n=186)

Variables	Mean	Standard Deviation	Min	Max
-Age (Year)	45.91	11.98	24	81
-Agricultural experience (Year)	24.69	36.13	3	70
-Duration of farmers' membership in the water users' association (Year)	9.60	5.34	1	18
-Distance between farm and agricultural service centers (Km)	10.55	9.70	1	30

Describe characteristics determine the educational

To determine farmers used the source of agricultural information 7 source of information are defined and for assessing exposure of agricultural extension to farmers, six items mentioned that farmers answer questions from any to very high. Ranking statistics shows that the most important source of information both local farmers and neighbors, and the least important source of agricultural programs are radio (Table 2). The most important type of extensional contact with extension agent in central services and the least important of this type were studied extension publication (Table 3).

Table 2
Classification of farmers' using source of information (n=186)

Information sources	Mean*	Standard Deviation	CV	rank
-The local farmers and neighbors	3.41	1.16	34%	1
-Progressive farmers	3.53	1.45	41%	2
-Agricultural TV programs	2.52	1.74	69%	3
-Advised of local leaders	2.34	1.91	81%	4
-Recommended of council place	1.78	1.69	94%	5
-Agricultural radio programs	1.38	1.42	102%	6

*any=0, Very little=1, little=2, moderate=3, high=4, and very high=5

Table 3
Classification of various type of farmers' extensional contacts (n=186)

extensional contacts	Mean*	Standard Deviation	CV	rank
-Meeting extension agent at Agricultural Service Center	3.20	1.57	49%	1
-Attending in educational extensional classes	2.81	1.95	69%	2
-Extension agent meet you in the village	2.54	1.79	70%	3
-Representation of extensional films	2.34	1.91	81%	4
-Recommended of Islamic Consultative of village	1.78	1.69	94%	5
-Study extension publications	1.46	1.67	114%	6

*any=0, Very little=1, little=2, moderate=3, high=4, and very high=5

Describe the social characteristics of farmers

For measuring social characteristics were used two components of social solidarity and social participation, for this purpose to measure social solidarity were used the six items and for social participation were used 10 items from any to very high. Table 4 shows the priority of each these indicators. So that the first priority in the social solidarity items is helping other farmers in case of problems and the last priorities allocated to disputes over everyday farmers issues and in social participation variable the first priority was allocated to consultations on everyday problems and the last priorities was allocated to cooperation with the mobilization site.

Table 4
Classification of social solidarity and social participation among farmers (n=186)

Social Solidarity	Mean*	Standard Deviation	CV	rank
-To help other farmers in case of problems*	4.60	0.83	18%	1
-Mass fighting in the village**	4.53	0.91	20%	2
-To help other farmers in the farm affairs*	4.43	0.91	20%	3
-Participate in celebrations and religious ceremonies in the village*	4.47	1.01	22%	4
-Participation in educational –extensional classes along with other farmers*	4.33	0.99	22%	5
-Disagreements over daily issues with other farmers**	3.62	1.27	35%	6
Social Participation	Mean*	Standard Deviation	CV	rank
-Talk about everyday problems with other farmers*	4.04	1.01	25%	1
-Cooperation with organizations and institutions below: Mosque attendance*	4.24	1.22	28%	2
Cooperation with village centers*	3.77	1.21	32%	3
Cooperation with the Agricultural Service Center*	3.72	1.25	33%	4
Collaboration with rural cooperative *	3.63	1.43	39%	5
Cooperation with the Islamic Consultative of village*	3.55	1.41	39%	6
-Negotiate with officials regarding the village problems*	3.70	1.5	40%	7
-Express ideas and opinions while attending in educational classes*	3.63	1.51	41%	8
-Association in cooperation with parents and school teachers*	3.31	1.77	53%	9
-Collaboration with site mobilization*	2.76	1.80	65%	10

*any=0, Very little=1, little=2, moderate=3, high=4, and very high=5

**any=5, Very little=4, little=3, moderate=2, high=1, and very high=0

Describe the attitude of farmers towards participatory irrigation management

To measure attitudes of farmers towards participatory irrigation management was mentioned seven items to respondents' rate their approval or opposition idea and expressed them from completely disagree to completely agree. Increased farmers sense of responsibility in cooperation with each other in water management and reduce disputes concerning problems related to water management, allocated respectively the first and the last priority (Table 5).

Table 5
Classification of the farmers attitude towards participatory irrigation management (n=186)

Attitudes	Mean*	Standard Deviation	CV	rank
-Cooperation in utilization and maintenance of water causes a sense of responsibility and increase confidence in the farmers*	3.44	0.64	18%	1
-Water resources are a divine blessing that God has bestowed upon us and no need for grouping management and planning**	3.67	0.71	19%	2
-I know everything about agricultural water use and am not need any help from extension agents**	3.52	0.73	20%	3
-Farmers cooperation in using water caused the farmers a sense of independence and ownership of water resources *	3.37	0.76	22%	4

-How to cooperate in using agricultural water makes better use of water resources and reducing costs *	3.43	0.84	24%	5
-Do not intend to use a group of water resources**	3.22	1.09	33%	6
-With farmers cooperation, disputes about water problems is reduced*	2.87	1.31	45%	7

* Completely disagree=0, disagree=1, no opinion=2, agree=3, completely agree=4
 ** Completely disagree=4, disagree=3, no opinion=2, agree=1, completely agree=0

Relationship between attitudes of farmers towards participatory irrigation management and noneconomic variables

correlation coefficients shows that there was a positive and significant correlation between duration of farmers membership in the water users' association, use of information resources, the rate of extensional contacts, social solidarity and participation with farmers attitudes towards participatory irrigation management at 1 percent level. The relationship between the farm distance to the nearest agricultural services is negative and significant (Table 6).

Table 6
Correlation levels between attitudes of farmers towards participatory irrigation management and noneconomic variables

Variables	Farmers' attitude toward participatory irrigation management	
	r	p
-Age	-0.057	0.439
-Duration of farmers membership in the water users' association	0.345**	0.000
-Farming experience	0.013	0.861
-Distance between farm and agricultural service centers	-0.044*	0.000
-Using information sources	0.315**	0.000
-Rate of extension	0.285**	0.000

contacts		
-Social participation	0.461**	0.000
- Social solidarity	0.479**	0.000

** P ≤ 0.01

The following studies confirm the present results. Shahroudi *et al*[17] are considered that improving extensional contacts, expanding appropriate channels of information effect in the attitude of farmers in developing and implementing effective agricultural water management practices.

Norouzi *et al*[13] and Chizari and Noroozi[6] achieved positive and significant relationship between extensional contacts, the rate of using communication channel by Wheat farmers with their attitudes about agricultural water management.

Yaghoubi Nejad[21] found a positive and significant relationship between the use of extensional and educational services with increasing attitude of utilizations' towards the water.

Rahman *et al*[16] achieved significant relationship between the ages of farmers and their environmental attitudes.

Damianos and Giannakopoulos [7], Vermillion [20], Ben-Ayed[5] and Khoshab and Namazi[12] believed that there was a significant relationship between solidarity and correlation of rural people and willingness of them to participate in activities.

Bagdi[4] and Amin and Khayati[1] were found that increasing farmers' participation in social activities caused them more favorable view towards the participatory projects in rural places in their study.

Determine changes in farmers' attitude towards participatory irrigation management based on noneconomic variables

To determine estimating equation the attitude of farmers towards participatory irrigation management based on independent variables was used multiple regression analysis stepwise method. After entering all significant variables, level of social solidarity, the farm distance to the nearest agricultural services, usage of information sources remained in the equation. Ability of these variables explained 34% (R = 0.347) of changes in farmers' attitude towards participatory management of irrigation.

Table 6

Multiple Linear Regression stepwise Analysis dependent variables: farmers' attitude towards participatory irrigation management

Independent variable	R square	Adjusted R Square	B	Beta	T
Constant	-----	-----	1.587	-----	6.478
Social solidarity (X)	0.229	0.225	0.330	0.361	5.695
Distance between farm and agricultural service centers (X)	0.333	0.325	-0.017	-0.310	-4.835
Using information sources (X)	0.347	0.336	0.079	0.124	1.977

To forecasting estimating equation according to given data and regression analysis to be significant in this study, the following equation can be estimated farmers attitudes towards participatory management of irrigation:

$$Y = 1.587 + 0.330(X) - 0.017(X) + 0.079(X)$$

Conclusions and Recommendations

Results of stepwise multiple regression indicated that level of social solidarity, the farm distance to the nearest agricultural services, usage of information sources explained 34% of the variable of changes of the farmers attitude towards participatory irrigation management. Therefore recommended that:

-In order to increase and enhance participation and social solidarity among farmers is proposed that extensional programs be held for adoption advocacy of cooperative activities in the village.

-Explained intermediate representation in some remote areas of agricultural service centers and using more efficient extension agent and experts in order to create favorable perception of water shortage and formally applying modern methods of water management is suggested.

-To promote a favorable attitude of farmers towards participatory irrigation management advocates met extension agent with farmers, offering educational - extension classes necessary to formally cooperate in agricultural water management and use of communication channels such as local farmers and neighbors together and leading farmers and producing Local television and compile the best option in achieving these are important.

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