

The Relationship Between Knowledge of Watershed Management Operation And Level Of People Participation

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Abstract: Recent studies in many countries had revealed the impact of many factors including: Satisfaction, Knowledge, Demographic and Attitudinal variables in level of people participation. The main question here is, whether these factors would also be effective on people participation in Iran? The purpose of this research was to investigate communication factors influencing knowledge of farmers' application of Watershed Management Operations (WMO) in the Kushk-Abad watershed in Khorassan Razavi Province of Iran (85km²). The main purpose of this study is to assess factors that influence people's participation in Iran. The study consist of all farmers in watershed study (N = 1500), of which 200 is selected through proportionate stratified random sampling technique (n = 200). The study was a descriptive-co relational, survey research. In fact, this research was designed to assess relationship between Knowledge of Watershed Management Operations (WMO) and the level of participation in WMO in Iran. In order to obtain this objective, a cross sectional survey was conducted. Data for this research collected through personal interviews from three villages in Kushk-Abad sub basin in Iran. The scale of Knowledge of WMO and Participation in WMO were in order 0.90 and 0.92. Findings in the study indicated that a majority of the farmers have Knowledge of WMO. The results showed that the level of the participation of WMO is moderate and there is a significant and positive correlation between farmers' Knowledge of watershed management operations. However according to the findings, the levels of economical participation of people are the more than social and environmental participation. In addition, the results clarified that the level of the respondents' Knowledge of WMO is low to moderate. This study also proved that participation in WMO is positively and significantly correlated with Knowledge of WMO ($r = 0.611$, $p = 0.000$).

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1. Introduction

Natural resource degradation especially soil erosion is one of the most important problems all over the world especially in Iran. Although, many projects in Iran have been conducted over several decades including watershed and range management projects. But, after more than 40 years, it seems that these projects could not reach to their objectives, because of increasing amount of the degradation and erosion processes (Mohseni et al., 2008). In other hand people participation can be important in successes of watershed management. Therefore, it is necessary to assess these projects to recognize the reason of their failure. The main purpose of this research was to assess people participation in watershed management. User's

partnership in revisory and reviver of pasture and watershed management is a necessary matter caused an important part of project success. Today, people participation role in revision, revival and natural resources management is touchable, a new event of county watershed and Range management organization (Hematzadeh and Khalighi, 2006).

One of the major communicative subjects in different implication and developmental activities is global participation, because the basis for development in a region depends not only on public pleasure but also on their participation and the objective of conducting any contractures and developmental project, are people and exploitants. Like development the concept of participation has more extensive and

general concepts that its nature depends on one hand to economic and communicative conditions and on the other hand depends on objectives, drawing on and different programs and the necessity for sustainable development and participation is systematic and comprehensive perception. The two properties of watershed management activities are the essence of water and soil management in extensive area and high costs associated with these types of activities. If the scientific researches and technologies not transferred to applied stage than it will be in advantage and for this reason the results of agricultural research in all situations should be used by the majority of people especially by villagers (Karimzade, 2010).

The term people participation has gained a lot of popularity during the last few years, particularly in reference to sustainable Natural resources and rural expansion projects. At the past time, emphasis was on people participation. In the past decade the promotion of people participation in development has been increased and the focus has extension to include other stakeholders as well (Karl, 2000).

According to Wainwright and Wehrmeyer (Wainwright and Walter, 1998), participation by farmers and users presents an essential concept and strategy for planners, designers, community organizers and government officials. According to Searle (1990), Nurick (1982); Hunter (1982) participation in decision making reflects the opportunities for influence and as a result, need satisfaction. In this regard and with reference to the above mentioned, the degree of people participation in development programs is a major determinant of success or failure, but many opportunities for people participation are met with little enthusiasm or cooperation by citizens (Wandersman and Gary, 1980) and the policy which makes people participation efforts successful still remain a mystery this study is an attempt to revealing this mystery.

Many researchers have been shown that participation may depend on individual characteristic such as Knowledge, income, household size, Marital, age, gender, satisfaction and Knowledge of Watershed Management Operation(WMO) in the many countries (Dolisca et al., 2006; ILbery, 1978; McDowell and Sparks, 1989). Some studies have shown that Knowledge of about Watershed Management Operation(WMO) issues make people more positive in their views (Gvancheng,2004; Heinen, 1993; Karimi,2006; Karimi and Chizari,2007; Karimi and Lari,1995; Bagherian et al., 2009; Faham, 2008; Zare, 2008; Amori and Makinde, 2012; Amori et al., 2012; Hossini, 2011; Gerali and Siyar,2011).

Governments of Iran have established several policies to protect and manage the natural resources during the last decades. Most of these efforts have taken top down strategy and often have proven

unsustainable and unsuccessful. In recent years government of Iran has developed new approaches to solve this problem. Along this a people centered program for sustainable management of land and water resources was initiated, as a joint program of UNDP and the government of Iran in 1997. Kushk-Abad watershed management operation is one of these attempts to sustainable management of land and water resources in Iran which is limited as a joint program of UNDP and Islamic Republic of Iran in 1997. This area includes the region that is characterized by high population density, natural resources degradation and declines in agricultural productivity, posing significant challenges to rural people to provide for the growing people participation while maintaining the productivity of land and water resources. This study was designed to analyze the role of this theory in explaining people behavior to people participation in WMO in Kusk-Abad basin in Iran.

2. Material and Methods

Population of this study include heads of households were living in the area Kardeh which had participated in the WMP plan. The total population which had participated in the program is 3600 people that is comprised six villages. Data for this research were collected from 200 respondents, through personal interview based on questioner in 3 rural village including Kusk- Abad, Goosh and Bahreh from July to August 2011. The Cronbach alpha for Knowledge of WMP and participation in WMP are in order 0.73 and 0.92 which are more than 0.70 and proves high reliability of dimensions those make up these variables (Georg and Mallery, 2001).

Three set of instruments were conducted to collect data in this research. A total of 10 questions were structured to measure the knowledge of WMP. The sub scores constitute two items on the general knowledge of WMP. Four items were used to elicit information about the knowledge of WMP objectives. Another four items were utilized to gain details about the knowledge of WMP components. Each correct response was assigned one point, while an incorrect response was given zero. As noted, these questions have been combined by using factor analysis and finally their standard score were derived. For the knowledge score to yield group, the ordinal variable was created from the continuous variable "knowledge of WMP" using combination of two categories and multi answer questions.

Then, by using the following formula, scores of knowledge of WMP were distributed between 0 to 100. Knowledge = ((Zscore-Minimum)*100)/(Maximum-Minimum)

The second instrument, which has 18 questions, is dedicated to data collection about measure of respondent's participation in the watershed management

plan. To measure these questions, 5 point Likert scales are considered based on participant's previous experience, from very less 1 to very much 5. This variable has three dimensions which include: 1. Social participation (8 items) 2. Economical participation (6 items) 3. Environmental participation (4 items) based on the model proposed by Dolisca et al. (2006). These questions have combined by using factor analysis and finally their standard scores were derived. Then, by using the following formula, scores of participation in WMO and its subscales were distributed between 0 to 100.

The third instrument was composed of 16 questions focus on individual profile of respondents such as gender, age and education. The level of measurement of these questions is ordinal and nominal. Several statistical methods according to need and appropriateness such as descriptive statistics, factor analysis, Independent sample t test, Analysis of Variance (ANOVA) and Pearson correlation were used to analysis of collected data (Hair et al., 1998; Guilford, 1956).

Factor analysis was applied to measure the level of validity of participation in WMP as the main variable and identify latent dimensions underlying the variables which assessed the level of participation. Before the interpreting the factor analysis, Measure of Sampling Adequacy (MSA) was considered by the researcher. According to (Hair et al., 1998) if MSA is greater than 0.50, the result for factor analysis is an appropriate method for this aim. The value of Kaiser's Overall Measure (KMO) for this analysis is 0.778. It means the collected data for this research are appropriate for factor analysis.

3. Results and Discussion

3.1 Socio Demographic Characteristics

The findings of study revealed that responder's age mean was approximately 45 years old. Also based on the results the majority of respondents (82%) were male and married (79%). The data revealed that 21% of respondents had high school education, diploma and bachelor degree. In addition, the finding indicated that 59% of responders had families with 4-6 members. Also, based on the results, 61.5% of respondents had 1-3 sons above 15 years and 21.5% of them had more than 3 sons in this category of age.

As results revealed, farming was the Main occupation of most responders (48%) while livestock was the alternative occupation of 43.5% of responders. About half of responders (48%) had within 3-4 million Rial of income per month from the main occupation while nearby one third of responders (30%) had within 2-3 million Rial of income per month from the alternative occupation. As finding showed more than one third of responders (43%) had less than 2 hectares irrigated agriculture land. However, about half of them

(46%) had more than 4 hectares rain fed agriculture land. Finally, the most important institution to motivate respondents to participate in WMP was Village council (32.5%). Based on the finding, 31% of responders were member village council. 19.5% of them were member of village security guard. Also, 11.5% of responders were members of consumers' cooperatives. Moreover, minority of responders (9%) were members of teacher and parent association.

3.2 Results of factor analysis

According to factor analysis finding, a three factors including (social, economical and environmental) are provided for participation variable. In this research study, only factors with eigenvalues of 1.5 or greater were examined and then confirmed by a scree plot test **Fig. 1**.

A criteria loading of 0.40 was applied to determine which items were included in each factor. Results from factor analysis using the varimax rotation shows that these three factors provide 64.5% percentage of the total variance **Table 1**.

The **Table 1** illustrates that, factor one is related to social participation that is composed of eight items: "attendance in WMO meetings" (factor leading = 0.80); "influence the decision" (factor leading = 0.82), "discussion in the meeting" (factor leading = 0.70), "make suggestion during the meetings" (factor leading = 0.72), "giving new idea during the meetings" (factor leading = 0.69), "Discuss the project progress with member" (factor leading = 0.75), "Discuss the project progress with people" (factor leading = .76) and the "Discuss the project progress with family" (factor leading = 0.75). Then factor 1 entitled social participation and shows 29.91 % of total variance

Moreover as can be seen from the **Table 1**, factor two is related to environmental participation that is composed of six items: "Contribute to the tree plantation activities" (factor leading = 0.83); "Contributing in the check dams (Gabion and ...)" (factor leading = 0.88); "Contributing in the seeding activities" (factor leading = 0.88); "Contributing in the dike activities" (factor leading = 0.79); and "contributing in the Road repair and structuring" (factor leading = 0.88). Then factor 2 entitled environmental participation and shows 22.88 % of total variance. Factor three is related to economical participation that is composed of four items: "benefit from project road of WMP" (factor leading = 0.84); "benefit from the technical assistance of WMP" (factor leading = 0.83); "benefit from personal advices of WMP" (factor leading = 0.82); and "benefit project Credit of WMP" question (factor leading = 0.79). Then factor 3 entitled economical participation and shows 11.71 % of total variance.

3.3 Level of Participation in WMO

Descriptive analysis of data revealed that the level of the Overall participation of WMO is moderate. Also the table shows that 48% of respondents got scored moderate scores while 23.5% of them obtained low

scores. Contrary, 19% of respondents achieved high scores. Also, 7.5% of respondents obtained very low scores while 2% of them got very high score.

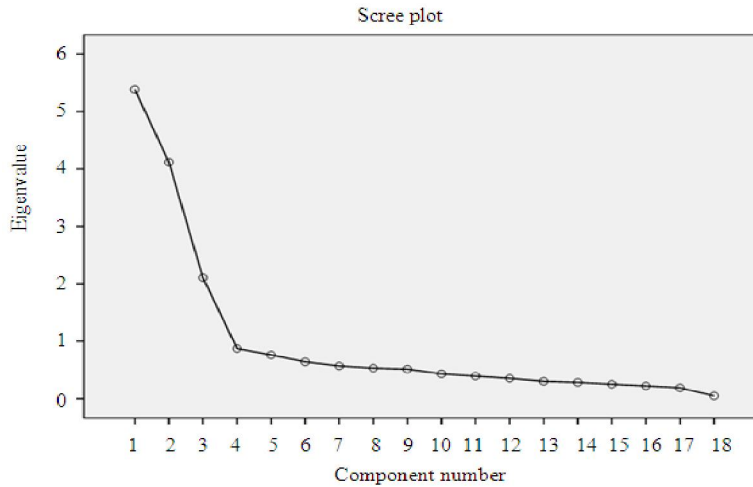


Fig. 1. Scree plot of factors of participation variables

Table 1. Varimax rotation factor pattern of people participation in WMO

Statements	Factor 1	Factor 2	Factor 3
Attendance in WMP meetings	0.798		
Influence the decision	0.816		
Discussion in the meeting	0.701	0.186	
Make suggestion, during the meetings	0.718		
Giving new idea during the meetings	0.691		
Discuss the project progress with member	0.752		
Discuss the project progress with people	0.764		
Discuss the project progress with family	0.753		
Benefit from project road of WMP		0.106	0.843
Benefit from the technical assistance of WMP		0.147	0.831
Benefit from personal advices of WMP		0.204	0.821
Benefit project Credit of WMP		0.194	0.79
Contributing in the tree plantation activities		0.834	
Contributing in the check dams (Gabion and ...)	0.152	0.877	0.172
Contributing in the seeding activities		0.884	0.115
Contributing in the dike activities		0.768	
Contributing in the Rangeland	0.121	0.786	0.237
Contributing in the Road repair and structuring		0.755	0.156
Eigenvalnes	5.38	4.12	2.11
Percentage of variance	29.91	22.88	11.71

*Values in bold show the factor loading

The mean and Standard deviation of overall participation were in order 51.80 and 20.81%. However, the **Table 2** shows that the level of economical participation of people is the more than social and environmental participation. The **Table 2** reveals that the mean scores of respondents' participation in economical activities was 65.25% that is moderate to high.

3.4 Level of Knowledge of Program

As presented above, a total of 10 items were developed and used to measure level of Knowledge of WMO. A three point scale were utilized for this instrument that ranged from 1- low to 3- high. All 10 variables were combined by factor analysis technique and were obtained their Z-Scores. After that, These values were standardized from 0 to 100. Hence, the minimum value for Knowledge of WMO is zero and the maximum value is 100. **Table 3** reveals the level of Knowledge of WMO. As can be seen from the table,

the total mean score is 60.02 and standard deviation is 34.50. Consequently, level of the respondents' Knowledge of WMO is moderate to high. The table shows that, Majority of respondents obtained high and very high scores (59.5%) while 22.5% of them got very low scores. Also, 18% of respondents obtained moderate scores.

3.5 Relationship between Participation and Knowledge of WMO

A appropriate statistical method as Pearson Correlation was used to test whether there is significant relation between Knowledge of WMO and participation factors.

Table 2. Level of respondents' participation in WMO (n = 200)

Level of participation	Frequency	Percent	Mean	SD
Overall participation			51.80	20.81
Very low	15	7.5		
Low	47	23.5		
Moderate	96	48.0		
High		38.0	19.00	
Very high	4	2.0		
Social participation			37.03	24.17
Very low	48	24		
Low	79	39.5		
Moderate	49	24.5		
High	20	10.0		
Very high	4	2.0		
Environmental participation			43.19	27.97
Very low	44	22.0		
Low	50	25.0		
Moderate	65	32.5		
High	31	15.5		
Very high	10	5.0		
Economical participation			65.25	22.6
Very low	10	5.0		
Low	18	9.0		
Moderate	75	37.5		
High	77	38.5		
Very high	20	10.0		

Table 3. Level of respondents' Knowledge of WMO (n = 200)

Level of Knowledge of WMO	Frequency	Percent	Mean
			34.68 29.47
Very low	75	37.5	
Moderate	59	29.5	
High	29	14.5	
Very high	31	15.5	

Table 4. Correlations between Knowledge of WMO and participation factors

Participation factors	r	P(2-tailed)
Social participation	0.651**	0.000
Economical participation	0.552**	0.000
Environmental participation	0.625**	0.000
Overall participation	0.611**	0.000

Table 4 presented the result of correlation test. As can be seen from the **Table 4**, there are appositive and significant correlation between Knowledge of WMO and social, economical and environmental participation in WMO, (r = 0.651, p = 0.000), (r = 0.552, p = 0.000) and (r = 0.625, p = 0.000). In general, overall participation is positively and significantly correlated with Knowledge of WMO (r = 0.611, p = 0.000). It means, moderately people who have more Knowledge of WMO, have more interest to participate in WMO, especially in economical and environmental activities.

4. Conclusion

In this research two model were examined and confirmed for measuring participation and exchange factors. In the first model result of this research confirmed the model of participation which was suggested by (Dolisca *et al.*, 2006), findings of this study showed that this model is an appropriate model

for measuring the participation. In the second model result of this research confirmed the model of exchange factors which was suggested by Searle (1990). Based on this model four hypotheses which are related to social exchange theory were examined and tested with level of participation. Findings of this study showed that exchange factors have significant relationship with level of participation. Based on this model, a person who was more benefited from program had more participation in program. The results of research showed that level of rural people participation in watershed study is approximately moderate. Based on the results, there is a significant correlation between Knowledge of WMO and participation in WMO, $r = 0.611$, $p = 0.000$. In other words, relationship between Knowledge of and participation in WMO is positive and moderate. It means, moderately, people who have more Knowledge of WMO, have more interest to participate in WMO. The results of this study indicate certain aspects that policy makers should take into account in planning the future WMO policy. This study has highlighted that the study of individual Knowledge of WMO remain important for understanding the participation behavior of certain group, but much study remains to be done to allow more general conclusion to be drawn. Thus social exchange theory can be considered as a main theory in people participation studies. Because, people participation is a complex issue and future researches might benefit from pluralistic approach and perspectives to explain the level of participation.

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