

Community Participation in Watershed Management Programs

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Abstract: Problem statement: Several studies in other countries had shown the influence of socio demographic, knowledge, satisfaction and attitudinal factors in level of community participation in development programs. The question here is, whether these factors would also be effective on community participation in WMP in Iran? **Objective:** Determine the factors which are influence community participation in order to enhance their participation in Watershed Management Programs (WMP) in Iran. **Approach:** A cross sectional survey design was carried out for this study. Data were collected from 200 respondents which are randomly selected from three villages in Hable-Rud basin. Data were gathered through personal interviews by using a questionnaire. Descriptive analysis, Pearson correlation analysis and regression analysis were employed to analyze the data. **Results:** Findings of this study showed that satisfaction of prior programs had highest relationship with level of participation ($r = 0.518$, $p = 0.000$), and followed by attitude toward WMP ($r = 0.489$, $p = 0.000$) knowledge of WMP ($r = 0.435$, $p = 0.000$), total monthly income ($r = 0.177$, $p = 0.012$) and alternative monthly income ($r = 0.158$, $p = 0.025$). However multiple regression analysis discovered that, four independent variables are important for explaining variation in the level of participation. These variables were; satisfaction of prior programs, attitude toward WMP, knowledge of WMP and alternative monthly income, and these variables explained 43.6% of variation in level of participation. **Conclusion/Recommendations:** The results of this study indicated that high level of satisfaction of prior programs, positive attitude toward WMP, high knowledge of WMP and high level of alternative income increase level of community participation in WMP in Iran. This study also provided a number of implications and recommendations to increase the level of community participation in WMP.

Key words: Iran, Hable-Rud, Participation, Watershed Management Programs

INTRODUCTION

The change in development thinking over the past years represent a fundamental shift away from the technology-dominated paradigm developed in the 1960s toward a more people centered approach of sustainable growth. Along this a new development paradigm has emerged that fits well with this current form of populism^[2]. This approach calls for local people's direct involvement in development activities while at the same time promoting both economic and social development^[3,15]. Rural area in developing countries closely linked with agriculture, consequently

to bring progress in the rural area requires changes and improvements in the agricultural sector. In the other side agriculture is strictly linked with land and water resources, without land and water, agriculture are not possible.

The Islamic Republic of Iran is located in south west of Asia on the arid belt of the world and covers a land area of 165 million ha. Iran is a country composed of several climatic divisions, more than 90% of which comprises arid to semi-arid conditions. Thus, as a result of the climatic conditions and dominant natural characteristics, a major part of the country is very sensitive and susceptible to degradation. During the last

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years land and water resources in Iran have suffered severe degradation. According to statistics average soil erosion in Iran is about (30 t ha⁻¹) in a year and sediment rate is about (10 t ha⁻¹) per year, consequently the area that have potential for flash floods in Iran is about 90 million ha. These land degradations caused to waste annually 22 billion sq m water per year, due to continuing the land degradation, this amount increases annually 6 billion sq m⁻¹ in year. Moreover, degradation of land and water resources has caused to decrease forest area from 18 million ha in 1970-12.4 million ha in 2005^[6]. Over the last 30 years there has been also a major decline in the quality and productivity of the country's rangeland resources. Statistics shows that good-fair rangelands area in Iran has declined from 14 million ha in 1974 to 9.3 million ha in 2005 and also fair-poor rangelands area has declined from 60-37.3 million ha^[6].

All of these realities have placed Iran's land and water resources in a challenging position. In the other side due to some socio economic limitations, government of Iran for managing of watershed area has a limit budget, according to statistics, the annual budget for this purpose is about 987140 Million Rial year⁻¹. In this regard with this amount of budget government manage 900,000 ha while the potential degraded area which need to managing and protection is about 90 million ha. In other word with this amount of budget, government can manage and protect only 10% of this area and 90% of area still remains to protect and conservation, which is impossible to government due to economic limitations.

During the past years, government of Iran has developed community based-natural resources management in several rural areas. These initiatives attempt to combine both conservation and development initiatives into an integrated approach, aimed at promoting rural development-based on natural resources as well as encouraging natural resources conversation awareness. In this regard a people centered program for sustainable management of land and water resources was initiated as a joint program of UNDP and the government of the Islamic Republic of Iran in 1997 in Hable-Rud basin. The degree of popular participation in such programs is a major determinant of success or failure, but the factors which makes participation efforts successful still has remained a mystery, specially in Iran participation is quite a challenge for country with a long tradition of top-down management. This study was designed to analyze people participation in WMP and explore to factors that significantly influence people participation in Watershed Management Program (WMP) in Hable-Rud basin in Iran.

Many studies have shown that level of participation may differ among the people based on their socio demographic characterizes. Several studies have shown that participation may depend on individual characteristic such as age, gender, marital status, household size, income^[4,9,13]. Knowledge is important factor that effect on people participation. People cannot be expected to exhibit positive attitudes toward watersheds if they are unaware of the benefits and cost associated with their participation. Some studies have shown that knowledge about forest conservation issues make people more positive in their views^[4,5,7,10]. An attitude is a hypothetical construct that represents an individual's degree of like or dislike for an item. Attitudes are generally positive or negative views of a person, place, thing, or event-this is often referred to as the attitude object. Attitudes are generally viewed as one's relatively enduring affective, cognitive and behavioral dispositions toward various aspects of the world including persons, events and subjects. It has been generally believed that attitude change is necessary before other behavioral modifications can be effected. Kraft *et al.*^[12] found that' farmers with a negative attitude toward governmental involvement with wetland regulations were less likely to want to participate in the water quality incentives program. Rishi^[17] outlined that understanding of attitudes is one of the central concerns in social life and is vital for bringing desired change in the behavior. Social actions of people or program personnel are directed by their attitudes. By knowing the attitudes, it may be possible to do something about the prediction and control of their behavior, which may be ultimately useful for the more successful implementation of programme. Shahroudi and Chizari^[19], in their study in Iran found that there is significant and positive relationship between farmer's attitude and their participation in irrigation networks management. Vicente and Reis^[21], expressed, positive attitudes toward recycling and information are important factors in explaining recycling participation.

Blau^[16] outlined that; individuals will enter into and maintain a relationship as long as they can satisfy their self-interests and at the same time ensure that the benefits outweigh the costs. In terms of continuing relationships, Blau believed that individuals will try to maintain those exchanges which have proven to be rewarding in the past, to break off those which proved to be more costly than rewarding and to establish new relations which have a good chance of being more rewarding than costly. Indeed fulfillment of a motivational desire, after need satisfaction has occurred, there is no further motivation for gratifying that need. Many studies also have shown the

importance of people previous experience on decision of participation in the current projects^[8].

MATERIALS AND METHODS

Hable-Rud basin located in north part of Iran, between altitudes 51.39' and 53.08' north and longitudes 34 26' and 35 57' east. This area has 57000 household distributed in 704 villages and includes the region that is characterized by high population density, land and water resource degradation and declines in agricultural productivity; posing significant challenges to rural peoples to provide for the growing population while maintaining the productivity of natural resources. Based on literature review, a set of factors were adopted as independent variables to examine their relationship with level of people to participate in WMP. Data in this study mainly drawn from the survey questionnaire. Development of the survey instruments was formed based on literature review and interviews with program staffs and also with participants in three villages in study is prior to actual data collection. Based on above procedure, specific questions addressing some of the measurements of the independent and dependent variables were extracted to test their relationship with level of participation.

Socio demographic characteristics were measured depending on its appropriateness. Knowledge instrument were employed two point scales for measurement, attitude instrument were employed five point likert scales for measurement and satisfaction of prior programs instruments were employed three point scales and level of people participation were measured with five point scales. Once the instruments were developed, it was reviewed by a panel of experts in UPM and SCWMRI, FRWMO, in Iran to ensure the content validity of the instruments. A pilot test was carried out among thirty respondents during the August 2008. The Cronbach Alpha that is greater than 0.70 was used to measure the reliability of the instruments. Results of the computed reliability coefficients were 0.812, 0.806, 0.937 and 0.903 for knowledge, attitude toward WMP, satisfaction and participation in WMP, respectively. The selection of a sample for this study was included multi stage random sampling procedures. In the first level, the name of villages and number of total population of program area was obtained from project office and Statistics Center of Iran (SCI) and based on Israel, Glenn^[11] adequate sample size determined for gathering data.

Based on the above procedure and with regarding to population of study area, a total of 200 respondents were determined as sample size of this study. In the

second level based on the completion and extent of project activities in study area, three villages selected randomly to get determined sample size. In the last level, list of all participants' households in the WMPs in each selected villages were obtained from project office. Finally respondents randomly were selected from each selected villages. Data for this study were collected through personal interviews by using a questionnaire during the August and September 2008. A number of statistical test were performed to provide an understanding of the data and the relationships among the variables. Parsons product moment correlation and regression analysis was used to analyze the data.

RESULTS

In this study respondents were asked a set of questions about their socio demographic characteristics, knowledge of program, attitude toward program and satisfaction with prior programs. Findings of study showed that majority of the respondents were male (93%) and married (93.5%). Data showed that average household size in study area was 5.2 members in a family. Educational level in study area was relatively high (18% diploma and high) and mean of respondents age was 46 years. Study also showed that main occupation of the majority was farming (55%) and average of their total monthly income was 3.5 Million Rial per month. Findings of study also showed that 58% of respondents were member at least in one local group and 47.5% of respondents were joined to program with their self interest.

Result of study also showed that level of respondent's knowledge of WMP was low, but they were indicated positive and relatively high level attitude toward WMP. Findings of study showed that respondent's satisfaction of prior programs were moderate to high. Study also showed that level of overall participation in WMP was moderate, however people were preferred more involvement in social activities rather than economical and environmental. Pearson correlation analysis showed that, income, satisfaction of prior programs, attitude toward WMP and knowledge of WMP all have significant and positive relationship with level of participation in WMP. Table 1 shows the summary of the correlation analysis between independent variables and level of people participation in WMP. Based on Table 1 satisfaction of prior programs have highest relationship ($r = 0.518$) with level of participation and followed by attitude toward WMP ($r = 0.489$), Knowledge of WMP ($r = 0.435$) and alternative income ($r = 0.158$).

Table 1: Correlation between independent variables and level of community participation in WMP

Independent variables	(r)	(p) (2- tailed)
Age	-0.065	0.358
Household size	-0.050	0.480
Main income	0.013	0.859
Alternative income	0.158*	0.025
Total income	0.177*	0.012
Land ownership	0.073	0.307
Knowledge of WMP	0.435**	0.000
Attitude toward WMP	0.489**	0.000
Satisfaction of prior programs	0.518**	0.000

*: Correlation is significant at the 0.05 level; **: Correlation is significant at the 0.01 level

Table 2: Multiple regression of independent variables on level of community participation in WMP

Variables	Standardized beta	r	R	R ²	R ² change
Satisfaction of prior WMP	0.322	0.518	0.518	0.268	-
Attitude toward WMP	0.183	0.489	0.603	0.363	0.095
Knowledge of WMP	0.248	0.435	0.642	0.412	0.049
Alternative income	0.159	0.158	0.661	0.436	0.024

The stepwise method was employed in this part to determine the significant contributions among the predictor variables in explaining participation, it is a method that adds and removes individual variables until a model is reached in which no more variable are eligible for entry and removed. First step of regression model was started with satisfaction variable based on zero order correlation that has highest correlation with participation ($r = 0.518$), other variables were chosen to enter the model was based on highest partial correlation. Finally with combination of five variables, model 5 with highest R square (43.6%) was chosen as a best model for this study. A summary of the stepwise multiple regression procedure is shown in Table 2.

Findings of this study showed that, 5 variables, satisfaction of prior programs, total monthly income, alternative income, attitude toward WMP and knowledge of WMP, have significant relationship with level of people participation in WMP. However regression analysis discovered that, four independent variables provide the best prediction for level of participation and explained about 43.6% of variation in the level of participation. These four variables were; satisfaction of prior WMP, attitude toward WMP, knowledge of WMP and alternative income.

In this study influence of nine factors on level of participation were examined. Data showed that there is significant relationship between level of participation and five factors; satisfaction of prior programs, knowledge of program, attitude toward program, alternative income and total income. However multiple of regression analysis discovered that only four factors have significantly contributed in level of participation,

these factors explained 43.6% of variation in level of participation as dependent variable. Based on the findings of this study it can be concluded that, a person who was more satisfied with previous programs, more likely to participate in program activities, this is consistent with findings of Hussein^[8] and also person who have more knowledge about program, more likely to participate in program implementation, this also congruent with^[10,13,14,17,22] which found positive relationship between knowledge and level of participation. In addition people who has positive attitude toward program more likely to participate in program. These findings are consistent with results of^[1,12,17,19,21]. Finally, findings of study showed that a person who have high income more likely to participate in program activities.

DISCUSSION

In this study influence of some factors on level of community participation in WMP were examined. Data showed that there is significant relationship between level of participation and five factors; (1) Satisfaction of prior projects, (2) Knowledge of program, (3) Attitude toward program, (4) Alternative income and (5) Total income. However multiple of regression analysis discovered that among them only four factors have significantly contribution in level of participation, these factors explained 43.6% of variation in level of participation as dependent variable.

Based on the findings of this study it can be concluded that, a person who was more satisfied with previous programs, more likely to participate in program activities, this is consistent with findings of Hussein^[8] and person who have more knowledge about program, is more likely to participate in program activities, this also congruent with^[5,7,10,14], which found positive relationship between knowledge and level of participation. In addition people who have positive attitude toward program more likely to participate in program. These findings are consistent with results of^[1,12,17,19,21] that found significant relationship between attitude and level of people participation. Finally, findings of study showed that a person have high income more likely to participate in program activities.

CONCLUSION

This study investigated a survey in three villages were people's participation in watershed management is favored. A regression analysis showed that under which conditions people more likely to increase their participation. In conclusion, participatory watershed

management in Iran can be effective strategy for sustainable management of land and water resources for developing agriculture. For the strategy to succeed, a partnership between local participants and the watershed management department is required with regards to watershed management. For this partnership participants must have sufficient knowledge about program, in terms of objectives, component, function and general knowledge of program. Knowledge, awareness, attitudes and behavior are four interrelated components of an individual's action. According To Strauss^[20], prior to an individual's behavior, one has to have knowledge or awareness of the object, or problem under consideration. This study discovered that respondent's knowledge of WMP have a positive relationship with level of participation. Yet the overall people knowledge of WMP was relatively low. Thus more effort is needed for WMP management to deliver information on WMP to promote people participation in WMP. Similar research should be conducted in other WMPs to validate the findings of this study and a more in depth study should be done by incorporating other variables such as; people trust to government, people trust to project staff and attitude toward government and project staffs, to further enhance the identification of factors affect people participation in WMP development activities and improve the prediction of the level of participation.

RECOMMENDATIONS

The result of this study provided a number of recommendations on participation in WMP. Study showed that respondent's knowledge of WMP has positive relationship with level of participation in WMP, yet the overall knowledge of WMP among community was relatively low. Thus more effort is needed for program management to deliver information on WMP to promote people participation in WMP. Study also showed that respondent's attitude toward WMP has positive relationship with level of their participation. This is a potential to managers of program for developing such programs in study area. Thus more effort is needed for WMP management to Develop WMP activities in the study area. This study also recommends the need for future research on participation in WMP by considering other factors in other populations.

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