

Analysis of Factors Influencing Rural People's Participation in National Action Plan for Sustainable Management of Land and Water Resources in Hable-Rud Basin, Iran

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Abstract: The purpose of this study was to analyze factors influencing rural people's participation in National Action Plan for Sustainable Management of Land and Water Resources (NAP-SMLWR) in Hable-Rud Basin. This study is a case study of Arou village in northern Hable-Rud basin. The statistical population includes head of households who dwelling in Arou village and participate in this project. Available participants were selected that the number of individuals has been 60. The main instrument of the survey was questionnaire that its validity was established by an experts' panel consisting of specialists in natural resources extension. Instrument reliability was established by calculating Cronbach's alpha coefficient for measuring level of rural people's participation in NAP-SMLWR, which its extent was 0.78. The findings of research showed that household size, times of traveling to town, level of participation in previous projects, awareness of plan goals, awareness of degradation impacts of natural resources, need to social solidarity, contact with technical experts and visit of sample projects are positively and significantly ($p < 0.01$) correlated with level of rural people's participation in SMLWR. Level of participation in extension-education classes and level of contact with extension agents are positively and significantly ($p < 0.05$) correlated with level of rural people's participation in NAP-SMLWR. The result of multiple regression indicated that variables of household size, level of contact with technical experts, times of traveling to town and level of awareness of plan goals could explain 50.3% of the variation in the level of rural people's participation in NAP-SMLWR.

Key words: Watershed management, participation, local communities

INTRODUCTION

Since, human innovated agriculture on land, environment was able to sustain its ecosystem. But during centuries, exploitation of environment has been enhanced by increasing population, over intervention of human in environment and lack of attention to its capacity; also soil erosion and degradation of natural resources have been emerged by overexploitation of farm lands and forests, overgrazing and disregarding to principles of range management^[15]. These problems are global phenomena that endanger the livelihoods of rural people. With attention to progress of degradation and with emphasis on this matter that water and soil are basic resources of agricultural activities in rural areas, therefore importance must be given to the conservation and sustainability of these resources.

Sustainable Land Management (SLM) is defined as a knowledge-based procedure that helps integrate land,

water, biodiversity and environmental management to meet rising food and fiber demands while sustaining ecosystem services and livelihoods. SLM involves preserving and enhancing the productive capabilities of land in cropped and grazed areas that is, upland areas, downslope areas and flat and bottom lands; sustaining productive forest areas and potentially commercial and noncommercial forest reserves and maintaining the integrity of watersheds for water supply and water conservation zones and the capability of aquifers to serve farm and other productive activities. SLM is necessary to meet the requirements of a growing population. Improper land management can lead to land degradation and a significant reduction in the productive and service functions of watersheds and landscapes^[18]. Furthermore, the purpose of Sustainable Water Management (SWM) is simply to manage our water resources while taking into account the needs of

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present and future users. It attempts to deal with water in a holistic fashion, taking into account the various sectors affecting water use, including political, economic, social, technological and environmental considerations^[3].

In constitutional law of Islamic Republic of Iran, principle has been mentioned that emphasizes on environment and natural resources conservation, so in the second and third five-year socio-economic development plans have been emphasized on sustainable agriculture through water and land management^[7]. Hence, the National Action Plan for Sustainable Management of Land and Water Resources (NAP-SMLWR) was initiated as a joint program of United Nations Development Program (UNDP) and the Government of the Islamic Republic of Iran in 1997. Its purpose was to contribute to a better understanding of the problems associated with the sustainable management of the country's land and water resources, by using the 1.2 million hectare hydrological basin of the Hable-Rud watershed as a pilot study area. The aim of the original program was to develop appropriate methods, technologies and tools for overcoming: (i) the continuing degradation of land and water resources, (ii) limited community participation in decision-making, (iii) a lack of holistic and integrated approaches to development programming, (iv) institutional and human resource weaknesses and (v) unsustainable planning and management of the resources^[17].

This program is one of the solutions of integrated rural development that its basis is community-based approaches^[13]. Experiences of countries that have implemented land and water management indicate that conservation and development of these resources are possible through public participation. Whereas in Iran, one of the essential challenges in rural development is sustained and organized participation of people in monitoring and managing natural resources; therefore understanding approaches, process and contexts of participation are necessary and can ensure succeed of projects of water and land management and other rural development projects^[7]. One of the subjects that help us for understanding mentioned matters is recognition of factors influencing participation. This matter can be important and necessary for continuing process of participatory projects such as phase II of Hable-Rud plan.

For formation to theoretical framework of research was used of studies done in relation to participation. Based on some done studies, participation of rural people in land and water management or watershed management may differ among farmers according to

their socio-economic backgrounds. The influence of age on participation is not clear. Whilst some of the researches found that age had no influence on participation^[12], other researcher reported that age is an important variable in explaining participation^[16,14]. Household size influence social level of participation in participatory programs^[4]. Level of awareness of plan goals has been reported to influence villagers' participation in rural plans^[9,5,10]. Karegar and Abedi Sarvestani^[11], in a study on people's participation in natural resources plans, found that participation in previous projects stimulates participation in other projects. Times of traveling to town influences villagers' participation in rural development activities^[6,8]. According to the study done^[2], level of participation in extension - education classes and level of contact with extension agents are effective factors on villagers' participation. Visit of sample projects influences people's participation in rural participatory plans^[10]. Ebrahim Pour^[5] confirmed that level of awareness of degradation impacts of natural resources is one of the effective factors on participatory action of people in watershed management projects. Study done by Abedini^[1] represented that level of contact with technical experts influences participation. These individual characteristics influence decision-making regarding household behavior, including the decision about whether or not to participate in rural development programs. The participation of rural people is the cornerstone for sustainable participatory management of land and water resources. The main purpose of this study is to determine the factors influencing rural people's participation in National Action Plan for Sustainable Management of Land and Water Resources (NAP-SMLWR) in Hable-Rud Basin.

MATERIALS AND METHODS

This study is an applied research, which was carried out by survey method and is descriptive-correlation. The statistical population includes all head of households that participate in Hable-rud plan who dwelling in Arou village.

Hable-rud Basin has been located in Tehran and Semnan Provinces. Arou village has located in northern Hable-rud Basin and Hable-rud Sub Basin in Tehran Province and Damavand County. This village is one of the eight pilot villages in NAP-SMLWR in Tehran Province^[7].

Available participants were selected for sample. Therefore, sample included 60 head of households. We collected data from the individual by means of a

questionnaire. For determining the validity of questionnaire, the content validity was used that was obtained by an experts' panel consisting of specialists in natural resources extension. Cronbach's alpha was used to measure reliability of the index of level of participation in NAP-SMLWR that its extent was 0.78 and showed that mentioned variable has high reliability.

Independent variables are: age, household size, level of literacy, level of annual income, times of traveling to town, level of participation in previous projects, awareness of plan goals, awareness of degradation impacts of natural resources, need to social solidarity, participation in extension - education classes, contact with extension agents, contact with technical experts and visit of sample projects. For measuring mentioned variables, the respondents were asked questions in relation to each variable.

In addition, by inspiration of participation levels of Uphoff and Cohen (1977) that had stated four levels for participation, for measuring rural people's participation in NAP-SMLWR, six statements were defined. These statements were rated on a six-point scale from 0 to 5. Total score of statements organized final score of this variable. These statements are listed in Table 1.

For the data analysis were used descriptive and inferential statistics. Descriptive statistics such as mean, standard deviation and coefficient of variation (CV) were used in the descriptive section. Correlation coefficient and multiple regression analysis (stepwise method) were used in the inferential analysis section. In applying these statistical techniques, version 11.5 of the Statistical Package for Social Science (SPSS) is used.

RESULTS AND DISCUSSION

Analyzing some key features of rural people: The average of ages of them was 49.57 years and ranged between 31 to 77 years. 18.3% of the respondents were illiterate and 25, 46.7, 1.7 and 8.3% of them had primary school (5 years of education), Secondary school, High school and Graduate and above respectively. The Household size equals 4 people. Rural people's experience in agricultural activities was ranged from 10 to 58 years (27.72 years, on average). The average annual family income of respondents was 25.3 (million Rials) and was ranged from 14 (million Rials) to 90 (million Rials). The average of times of traveling rural people to town was 152 times that its minimum and maximum were 20 and 300 times, respectively.

Priority setting of levels of rural people's participation in NAP-SMLWR: Table 1 shows that

Table 1: Priority setting of participation levels of rural people in NAP-SMLWR

Statement	Mean*	SD	CV	Priority
Participation in definition of problem	2.32	0.792	0.341	1
Participation in decision - making	2.40	0.827	0.344	2
Participation in explosion of projects	2.09	0.868	0.415	3
Participation in implementation of measures	2.32	0.968	0.417	4
Participation in protection and maintaining of projects	1.77	1.064	0.601	5
Participation in monitoring and evaluation of projects	1.63	1.262	0.774	6

*: Range of means is between zero and five

Table 2: Level of rural people's participation in NAP-SMLWR

Participation group	scale	No. of respondents	Percentage of respondents
Group 1 (lowest)	≤8.24	9	15
Group 2 (low)	8.25-12.56	26	43.3
Group 3 (high)	12.57-16.88	13	21.7
Group 4 (highest)	≥16.89	12	20
Total		60	100

Max: 24 Min: 4 Mean: 12.56 SD: 4.32 Scale: 0-30

participation in definition of problem has first priority because of having the lowest extent of coefficient of variation (CV = 0.341). Participation in decision-making (CV = 0.344), explosion of projects (CV = 0.415), implementation of measures (CV = 0.417) and protection and maintaining of projects (CV = 0.601) have allocated priorities from second to fifth, respectively. Furthermore, participation in monitoring and evaluation of projects with the highest extent of coefficient of variation (CV = 0.774) has allocated last priority to itself.

Level of rural people's participation in NAP-SMLWR: By grouping the respondents in terms of level of participation in NAP-SMLWR, it represents that level of participation of 15, 43.3 and 21.7% of respondents is lowest, low and high, respectively while this level for 20% of respondents was highest (Table 2).

Correlation analysis for independent variables and level of rural people's participation in NAP-SMLWR: Table 3 represents that household size was positively and significantly ($p < 0.01$) correlated with variable of level of rural people's participation in NAP-SMLWR that Dolisca *et al.*^[4] have confirmed this correlation. There is positive and significant correlation ($p < 0.01$) between times of traveling to town and level of rural people's participation in NAP-SMLWR. This result is accordant to the results of Effati^[6] and Ghasemi^[8]. There is positive and significant correlation ($p < 0.01$) between level of participation in previous projects and level of rural people's participation in NAP-SMLWR. This result is accordant to the study

Table 3: Correlation analysis between independent variables and level of participation in NAP-SMLWR

Independent variable	Label	r
Age	Age	0.033
Household size	HS	0.458**
Level of literacy	LIT	0.101
Level of annual income	AI	-0.195
Times of traveling to town	TOT	0.360**
Level of participation in previous projects	PIP	0.402**
Level of awareness of plan goals	APG	0.506**
Level of awareness of degradation impacts of natural resources	ADI	0.380**
Level of need to social solidarity	NSS	0.365**
Level of participation in extension-education classes	PEEC	0.282*
Level of contact with extension agents	CEA	0.280*
Level of contact with technical experts	CTE	0.476**
Level of visit of sample projects	VSP	0.392**

*: p<0.05 and **: p<0.01

by Karegar and Abedi Sarvestani^[11]. Level of awareness of plan goals was positively and significantly (p<0.01) correlated with level of rural people's participation in NAP-SMLWR. Different studies have confirmed this result^[9,5,10]. There is positive and significant correlation (p<0.01) between level of awareness of degradation impacts of natural resources and level of rural people's participation in NAP-SMLWR. This result is accordant to the study done by Ebrahim Pour^[5]. There is positive and significant correlation (p<0.01) between level of need to social solidarity and level of rural people's participation in NAP-SMLWR. Research's Shahidi^[16] has confirmed this result. Variables of level of participation in extension - education classes and level of contact with extension agents are positively and significantly (p<0.05) correlated with variable of level of rural people's participation in NAP-SMLWR. These results are accordant to the results of research's Aboueih^[2]. There is positive and significant correlation (p<0.01) between level of contact with technical experts and level of rural people's participation in NAP-SMLWR. This result is accordant to the study done by Abedini^[1]. There is positive and significant correlation (p<0.01) between level of visit of sample projects and level of rural people's participation in NAP-SMLWR. Research's Hosseini Pour^[10] has confirmed this result.

Stepwise multiple linear regression: To explain variations in level of rural people's participation in NAP-SMLWR in Hable-Rud Basin in Iran, we have undertaken a multiple regression analysis. The Table 4 shows the data representing partial and cumulative R² as well as entered four explanatory variables in explanation of rural people's participation in SMLWR. These variables are household size (21.1%), level of contact with technical experts (16.8%), times of done

Table 4: Relative contribution (R²adj, partial and model R²) in explaining rural people's participation in NAP-SMLWR

Entered variables	Partial R ²	Model R ²
Household size	0.211	0.211
Level of contact with technical experts	0.168	0.379
Times of traveling to town	0.078	0.457
Level of awareness of plan goals	0.046	0.503

Table 5: B, beta and t-value of the entered variables to regression that can be used to explain variations in rural people's participation

Variables	Label	NAP-SMLWR		
		B	β	t
Constant		4.85		1.826
Household size	HS	1.142	0.341	3.356**
Level of contact with technical experts	CTE	1.627	0.370	3.831**
Times of traveling to town	TOT	0.01	0.235	2.373*
Level of awareness of plan goals	APG	1.018	0.233	2.226*

traveling to town (7.8%) and level of awareness of plan goals (4.6%). According to the results, four forgoing variables could explain 50.3% of variations in level of rural people's participation in NAP-SMLWR; According to Table 5, following model is estimated by using stepwise method:

$$Y = \text{constant} + \beta_1 \text{HS} + \beta_2 \text{CTE} + \beta_3 \text{TOT} + \beta_4 \text{APG} \quad (1)$$

Equation (1) shows that (Y) is used as dependent variable that representing level of rural people's participation in NAP-SMLWR in Hable-Rud Basin, (β_i) is the coefficient of independent variable. Consequently, final equation of multiple regression is:

$$Y = Y = 4.85 + 1.142 \text{HS} + 1.627 \text{CTE} + 0.01 \text{TOT} + 1.018 \text{APG}$$

CONCLUSION AND RECOMMENDATIONS

The results of research showed that level of rural people's participation in NAP-SMLWR is approximately low. One of the factors that has hindered the replication of the community-based approach to SMLWR has been that most senior officials and policy-makers are unfamiliar with the concepts and unaware of the potential benefits to be gained from empowering rural communities to take primary responsibility for the improved management of their local soil, water and vegetation resources. Therefore, is recommended for implementation a proactive program to sensitize and brief senior officials, policy-makers and administrators, at the central, provincial and local government levels.

According to the results, participation in monitoring and evaluation of projects has allocated last priority to itself among other levels of participation in

NAP-SMLWR. One of the causes of this matter is unaware of methods of monitoring and evaluation. Thus, is recommended for training participatory self-monitoring and evaluation to local communities through holding extension- education courses.

Whereas, level of contact with extension agents and technical experts influences participation of rural people, therefore, a range of capacity building activities should be undertaken to increase the number of technical experts, extension workers, community facilitators and local leaders with the skills needed to work in a participatory manner with rural communities.

Level of awareness of plan goals is an effective factor in participation of local communities in NAP-SMLWR. Attention to this finding is most important to implement Phase II and so to development of this plan in other places. Therefore, is recommended for building awareness of participants from projects goals before implementation of projects.

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