Factors affecting the conveyance of irrigation and drainagenetworks management to the villagers. Case Study: NEHZATABAD Village of Esfahan

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ABSTRACT

Nowadays, planners are constantly looking for a way to create the spirit of cooperation and collaboration among the villagers to reduce the financial and management burden of government as well as giving some parts of management of development activities to the villagers. Dam and its irrigation networks in Nehzat Abad village located in Isfahan, is one of this development plans to supply agricultural water for the residents of that area. Government tends to give management, protection and maintenance of these networks into the hands of inhabitants of that village and performs it through formation of water users cooperatives in this village. Therefore, the aim of this research is to study the regional conditions and available evidences in order to identify the important factors causing to increase and decrease the participations of the village residents in construction of network and Dam. So, 50 villagers were selected and interviewed. In this study, age, level of education, dependency to government, adoption of innovation, fatalism, motivation, trust between people, tending to do teamwork and empathy among people were considered as the independent variable and the amount of their participation as the dependent variable. The results indicate that all the people tend to participate in the plan and the age, level of education, motivation, a willingness to work together, trust and empathy among people are the most important factors in villagers' participation. Also, the studies show that the main obstacles to form the water users cooperatives are the inability of the villagers, dependence on the government, adoption of innovation, fatalism, insufficient Cultural efforts for making water users' association, legal and educational restrictions in process of making WUA.

Key words: Participation, management of irrigation and drainage network, Nehzat Abad village.

Introduction

Iran is located in one of the driest regions in the world. Thus constantly faced with the problem of watersupply that causes a strong effect on the country's agriculture development. Because agriculture is one of the major sectors of using water, therefore the planners are always looking for the ways to deal with this problem. One way to confront the problem of water shortage is preservation, storage and distribution of water resources. Thus, many efforts have been made to control surface water. But water is wasted due to insufficient and incomplete development of irrigation systems and low-level of management, protection and utilization of irrigation systems. An experience in the world has shown that transferring these network managements to water users can solve this problem. These organizations have an important role in the proper utilization of water resources and reduce loss of them. This issue is possible through the farmers' participation in decision making, planning and executing irrigation schemes. The positive results of this project are Increasing yields, improving water use efficiency and improving the maintenance of water networks in rural areas. By noting the passage of legislation about having farmers' cooperation in construction, utilization and preservation of irrigation networks and optimal use of water, fifth development plan tried to provide the legal fields of organizations of farmers. Generally, there are two goals to create WUAs:

A- WUAs to participate in the implementation and operation of irrigation schemes

B- Farmers' organizations to participate in utilization and maintenance of the networks that have been previously built by government

In the first case, the participation rate is higher. Because the rate of using water from water supplies and receiving public assistance and facilities to establish network encourage farmers to organize and participate. Consumers Agreement in order to increase the probability of formation of WUAs in irrigation networks is an important task in construction.
and should be done Step BY STEP in enough time. In general, different methods for transferring management to the private sector has been tested in various countries. Unfortunately, despite the efforts of the authorities in Iran, because of the different reasons, notable successes have not been achieved. The existence of proper organizations and a strong management on these organizations cause achieving the desired goals, enhancing the quality of the network utilization and maintenance and reducing financial costs of irrigation systems. Therefore, because of its necessity, studies of social participation has become a part of water projects in the Nehztabad network and dam. In this regard, the present study has been undertaken of the Nehztabad network and dam.

Theoretical background of the research:

According to the importance of participation in development plans, there are lots of studies on this issue in the below:

Khoshhab&Namazy during a research on irrigation and drainage network, landcover of Band amirolFars Regional Water Organization, have found that despite the high percentage of people willing to participate in Network building, some reasons such as land ownership, water rights, the cultural problems in rural and farmers’ communities, farmers’ lack of confidence in the plans submitted by executive agencies, involving financial costs, the laws, regulations and administrations, high initial investment cost, manpower, payback time, the study and design problems, have limited their participation .

Ejlal & et al in their study entitled “The organization of WUAs to manage the maintenance and operation of irrigation and drainage projects in the comprehensive management of the AIBORZ” came to the conclusion that two important factors improve collaborative irrigation management.

A - The hardware components formed by physical infrastructure structure of irrigation and drainage that are rebuilt or made.

B - Software components that mainly include organization-social activities - particularly those associated with farmers and beneficiaries.[6]

Chizari in a study entitled “Factors Affecting Farmers’ Participation in Management of Irrigation Networks Case Study in Khorasan” concluded that there is a significant positive relationship between the farmers operation in the water field management, the first contact promotion, channels, components of social funds, farmers’ attitude towards unions Water users and participation of farmers in managing irrigation systems.

Also there are significant differences between the mean rate of farmers participation in irrigation networks in two groups of farmers with WUA and without it. [5]

Arabi & Mohebbi in handling the process of establishing WUAs and challenges in the fields of irrigation and drainage network in DAsht Abbas came to the conclusion that:

In this study the existence of experts, description of research services and road mapping, water users trust, creating a proper relationship, using the approaches, proper collaborative & educational techniques and methods and use of local capacity are facilitating factors. [2]

Khaiaty & Amini (investigated the causes of cooperative water users projects failure in Jarghoyeh region in the form of Five factors. their knowledge, participation, economic incentives, social incentives and mutual relationship between farmers and organizations, were investigated using number 3 Fuzzy regression and symmetric and asymmetric number 4 triangular fuzzy. The results indicate that economic incentives, not only are explained to beneficiaries, but also practical measures have not been done in this regard, and the effect of other factors in the formation of cooperatives is evaluated “very low”. [9]

Arryesh& Hosseini. examined the factors affecting people's participation in conservation and development of renewable natural resources in Ilam province. The results showed that the level of education, the media, the confidence of users in the use of natural resources, consultation with users before running the program, Number of cows, occupation, the user’s membership in public institutions and organizations user’s social status, users’ technical knowledge, political support of users and amount of loan received by the users and the nature organization, have an important effect on public participation in the conservation, development and use of renewable natural resources. [3]

Thakur and Brahmi in their research as “Factors influencing people's participation in the Hariyali project” came to the conclusion that through 22 factors affecting people’s participation, factors such as lack of awareness about the program, low economic level, lack of confidence in government programs, illiteracy, dare culture, rural policy, the low portion of the project's profit and lack of transparency had a significant role in reducing residents’ partnership. Factors such as lack of flexibility in cost due to the field conditions, Diversity in paying wage and not paying prepayment cause people’s disaffiliation in the plan and considering these factors increase their partnership. [4]

Ahmad and Hafiz examined the factors influencing the participation of people in Lahore. Their results indicate that: social participation of older persons is significantly associated with their socioeconomic status and the factors that may limit the participation are sex and marital status. Chronological age can greatly reduce participation in social life. However, they found that respondents’
socioeconomic status and gender are important factors in determining social participation of older people. [1]

**Materials and Methods**

Special techniques were used to achieve the study objectives. These methods include using a variety of methods and sources of information in the form of written documentation and interviews with local officials, administrators, knowledgeable and reliable local people and filling of questionnaires. Therefore, in this study was used survey data collection methods, observation and group meetings with representatives of the peasants.

All residents living in the study area are 500 people, according to local circumstances; ten percent (50 patients) were selected and interviewed. Thus, the most important factors that increase and decrease the residents' participation in the network construction project were cleared.

The questionnaire was designed in two parts. A section on general questions about education level, age, and ... And the second part contains specific questions about the amount of contribution and factors involved in increasing and decreasing rural population participation in the project. The purposes of these questions are, identification of individual’s willingness to participate in the project and evaluation of region’s capacity in order to transfer the management and maintenance of networks to the peasants and identify the most important factors influencing the participation of the villagers. Finally, the questionnaire included the following questions about rural participation in protection and maintenance of irrigation systems:

1. The different ways villagers desire to participate in.
2. The Factors that may decrease the participation of villagers.
3. Having satisfaction of governmental activities and also the kind of governmental organization that satisfy villagers more.
4. The desire to participate in orientation meetings for network construction.
5. The willingness of villagers to be consulted and asking their views about the dam.

**Results:**

In order to evaluate the affecting factors on Nehzat Abad’s beneficiary participation in execution and construction of dam and network, 50 of beneficiaries were interviewed by filling questionnaires. The agestructure ofthe respondentsis shown in graph number 1. According tothis graph, the mostabundance is for36 to 45and the least abundance is for 46 to 55. There were 13 respondents in the age of 56 to 65 and 12 respondents were more than 66.

![Fig. 1: The age of the questionnaire](image-url)

Evaluating the age of respondents shows that the questionnaires have properly distributed and there is a wide part of the decisive and active group age in the village.

1. Assessment of local characteristics and ethnic subcultures:

The project of NEHZATABAD Dam construction is influenced by a culture which is called peasant society subculture in Rural Sociology.
This subculture is expressed in various forms of different stages of Dam construction.

Subculture characteristics are similar in rural communities, but the percentage of patients with any attribute is different.

Understanding these attributes and paying attention to them, has a decisive role in achieving Nhzatabad Dam goals. Also ignoring the attributes can cause massive and unimaginable social problems.

To evaluate the subculture and ethnic characteristics of Nehzat Abad people, the questionnaires were included some questions, these questions assessed separately and were analyzed by SPSS software and the characteristics of the subculture were identified based on the analysis.

2-Grouping social status of beneficiaries:

Social status is derived from the person's position in the social hierarchy and is related to the value of his social role in society.

Since every community has hierarchies based on the value of individuals in the society, the community members are categorized in different classes of hierarchical according to their importance and value in the society. So those who have multiple roles in the society are in a higher socioeconomic position in Nehzatabad rural society. To measure this index, 3 variables have been used: 1.literacy 2.education 3.occupation

These three parameters were converted into social status indicators and the effects of this index were evaluated on the amount of participation. All of the respondents are employed in agricultural part. Some of the respondents have other jobs such as shopkeeper and …. Beside their role in governmental organizations like education, health services, So agriculture was figured as their second job. The number of these people is low and somehow negligible. But most of the respondents subsist only by farming and animal husbandry. In a sample of 50 patients, 41 were literate persons and only 9 of samples were illiterate.

Figure 2 shows the educational level of respondents. According to this chart, 41 of those questioned are literate. The most common level of education among educated people is higher than diploma. The lowest frequency is related to junior education level. After diploma and higher, Elementry School is the most prevalent and 6 men are in high school level of education.

![Fig. 2: Category questionnaires respondents according to educational level](image)

Study Field suggests that beneficiaries of Nehzat abad are classified in to three levels as high, medium and low groups based on their social position. The most abundance is for medium social position. Representatives who follow construction of Nehzat Abaddam, are in a high social position.

3-Dependency on government:

One of the characteristics of rural societies is misunderstanding of government resources. They recognize the government as an endless source of capital and know the government proceedings as their granted right. So beneficiaries of Nehzat abad try to use government funds to the extent possible. They always know the government as a power that should solve all of their problems, and believe that they themselves are unable to improve and solve the problems of the village. Relying on government resources and ignoring their role, is a serious barrier in evolution of the village. The people of Nehzat Abad count dam construction as the government’s
duty and know their financial capability nothing as compared with government’s funding.

According to the investigations, about 92% of peasants are trusting on government funds and 8% of beneficiaries notice their own role besides the role of government in improvement of the village and dam construction.

4-Innovation adoption:

The investigations on 50 people shows that the most abundance is for those who have high innovation adoption (29 person) and only 5 people have less tendency to innovate. 16 men are in an intermediate level for innovation. This point indicates that most of the people in Nehzat abad have the power to take risks, it means that they have tendency to accept the new issues. Therefore, the high and intermediate level of innovation adoption underlies success to construct dam.

5-Fatalism:

The study shows that 21 people believe a lot in destiny. 13 people are in medium level and 16 men have a little belief on destiny and think that there is no fixed law in the world and a man can change his destiny by effort. Decreasing the number of people with high belief in density and increasing the number with low and medium belief can underlie support and cooperation.

6-Enjoyment of motivation:

45 people of the sample have strong and enough motivation in construction of the dam project and 5 persons have no incentive for partnership. So because of a high motivation in respondents we can expect an extensive cooperation by beneficiaries in the project.

7-Trust between people:

Study on a sample of questionnaire respondents indicate that 30 people have enough trust to each other. 12 of them with moderate confidence. In other words, they trust others in certain circumstances, 8 people have less trust in others. Half of these people are illiterate and the other half have diploma and higher educational level.

8-Tendency to do group work:

Figure 3 shows the abundance of people for doing activities in a group work. As it is seen, the most and the least abundance is for those who relatively have high and low tendency for group work. 14 men have medium trend to do group works. So the region has a proper condition for forming cooperative water users.

9-Empathy between people:

Studies show there is a high empathy between rural people, so small differences between the people will not be a barrier to implement the project.

10. Assessment of farmers’ participation in the construction of the dam:
To achieve the kind and amount of Nehzat Abad beneficiaries’ partnership in the construction, maintenance and operation of the network, the questions in the questionnaire were designed; the type of partnership interest was recognized from the type of response. Each of these questions was separately analyzed and conclusions were determined based on the type and level of participation.

A – Passive participation:

In this type of participation the people notice the matters related to the project by executives. But they will not participate in the project. Studies show that all the samples tend to be aware of activities, even if they are not involved in the project process.

B - Participation in Informatics:

In this type of cooperation, peasants only answer to executives’ questions and have no hand in process. The results show that all the people are prepared to be an active participant in question and answer sessions established by executives.

C – Cooperation based on sharing advice and opinions:

In this way, people form groups to meet predetermined objectives. Table 2 shows that 25 of the respondents are inclined to participate by forming groups. 15 of them are in moderate tendency to form these groups and 10 have limited interest.

D- Participation form material incentives:

People’s cooperation is based on supplying sources such as working in exchange for cash or other material occurs. According to table (1), most people are willing to receive financial rewards for the work they have done.

E- Participation function:

The People without relying on external actors and institutions cooperate to take the initiative into their own hands and change the existing systems. They made contact with project managers. But they decide how to use the resources by their own. The results presented in Table (3) shows, the number of people who are willing to take the initiative themselves is low. Among 50 people, only 10 of them are willing to do this. 40 people have little desire to participate actively in their plan. The majority tend to have an inactive participation and are willing to consult and give their opinions. They do not want to involve themselves directly unless they receive financial incentives.

G - The general partnership:

According to the statistics presented in Table (4) a total of 34 people greatly tend to participate in the project. 16 people want to contribute in a moderate level. So all the people were motivated to participate in the operation and maintenance of the network of dams and Nehzt Abad.
Table 4: Frequency of individuals based on participating General partnership

<table>
<thead>
<tr>
<th>Percent</th>
<th>Frequency</th>
<th>General partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>34</td>
<td>High</td>
</tr>
<tr>
<td>32</td>
<td>16</td>
<td>Moderate</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>Low</td>
</tr>
</tbody>
</table>

Discussion:

Factors influencing the participation of villagers:

To determine the factors affecting the participation rate, the following variables as independent variables entered the model. Based on theoretical foundations and theoretical models in which the dependent variable (participation rate) is affected by the following variables, the model was run.

1. Willingness to work in a group
2. Trust between citizens
3. Having motivation
4. Fatalism
5. Innovation
6. Dependency on government
7. Social Status

The effect of independent variables on the dependent variable (level of participation) was cleared. Table 14 shows the results of the running model. According to this table, the relationship between independent variables and the dependent variable is significant at the 91% probability level. In other words, 83% change of the dependent variable is explained by the changing of independent variables.

Table 14: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>rR</th>
<th>Coefficient of determination</th>
<th>Test F</th>
<th>Degrees of freedom1</th>
<th>Degrees of freedom2</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0/91</td>
<td>0/83</td>
<td>18/7</td>
<td>4</td>
<td>45</td>
<td>91 percent</td>
</tr>
</tbody>
</table>

The correlation coefficient between the dependent and independent variables is 91 percent which is a high correlation coefficient.

Based on the results of Table (14), 83% of the variation in participation rates can be explained by the regression. The model F-test is significant at the 91% probability level.

The results of estimating the model coefficients are determined by the following equation. Also in Table (15) the coefficients of independent variables and the significant variables are presented. According to significant dependent variables and their coefficients, the effective factors on participation are in below:

\[
Y = 0.15x_1 + 0.2x_2 - 0.1x_3 + 0.4x_4 + 0.23x_5 + 2.1
\]

Table 15: and p-values of the variables

<table>
<thead>
<tr>
<th>Factors</th>
<th>Coefficient</th>
<th>t test</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Constant coefficient</td>
<td>2/1</td>
<td>2/18</td>
<td>0.02</td>
</tr>
<tr>
<td>2. Innovation</td>
<td>0/23</td>
<td>4/4</td>
<td>0.00</td>
</tr>
<tr>
<td>3. Social base</td>
<td>0/4</td>
<td>3/067</td>
<td>0.01</td>
</tr>
<tr>
<td>4. Age</td>
<td>-0/1</td>
<td>4/7</td>
<td>0.05</td>
</tr>
<tr>
<td>5. Willingness to work in a group</td>
<td>0/2</td>
<td>1/8</td>
<td>0.03</td>
</tr>
<tr>
<td>6. Trust to each other</td>
<td>0/15</td>
<td>3/5</td>
<td>0.018</td>
</tr>
</tbody>
</table>

1- Trust to each other (x1): is considered as one of the contributing factors.

If people trust each other, the extent of their participation in the project will increase. Because of the trust that people have towards each other, Advertising is an important factor in a person’s presence for others. If they do not trust each other, they will face some problems in their team work; also Individuals cannot be used as an advertising agent for increasing the participation of farmers.

2- Willingness to work in a group (x2): it was studied as a factor influencing villagers’ participation rate. Studies show that this variable has a positive and significant relation with the level of participation by increasing tendency to group work the participation rate increase too.

Requirements to form cooperatives water users are empathy, integrity and willingness to do things in a team.

3- Age of beneficiary (x3): A negative correlation was observed between age and participation. Tendency to participate decreases by increasing age that is logically true. Since when the age increases, the rate of power risk and the ability to accept new issues decreases. Ahmad and Hafiz [1] in their research have concluded that the older people are less inclined to participate in the development projects. Ja'farinia stated that there is no relation between the age and the level of political participation.

4- Social base (x4): there is a positive and significant relation between the education and the level of participation. By increasing the literacy rate, the participation in the operation and maintenance of
the network increase. When the level of education is higher, people are more aware of their participation in the scheme and taking advantage of it and Planners can more easily communicate with them, tell them the problems facing the implementation process, ask for their help and consultation.

Arayesh, H. [3] concluded that education has an important role in the participation rate. Also, Hafez & Ahmed also noted that with increasing age, their social status will be more important in contribution. Ja'farinia [8] in his research came to the conclusion that education has an important role in the participation rate.

5- Innovation \((x_5)\): it has particular importance in the Nehzat Abad village.

Studies show that there is not any cooperative in the village. Thus it will be the first formal Cooperative water users in the village. The villagers should be of high innovation, to accept it as a new idea

6- Be dependent on Government: it was considered as one of the other factors, but it did not have a significant relation with the participation in this village. But Ghasemi [7] indicates in his study that depending on government is one of the important factors in the participation rate.

Other variables such as motivation, fatalism, and job are also influencing factors on participation rates but they were not the most important factors in contributing in Nehzatabad village and were not included in the model and did not show any significant relation with the level of participation.

6. Theproblemsthe Water users face:

Cooperative water users like any other new ideas when is running for the first time in the village, Will face challenges and difficulties in the early stages of implementation, we Must understand the ways with complete insight to get out of these problems. The following are some of the problems and consequences of rural participation:

1. Rural’s Excessive dependency on the state and its activities
2. Cultural insufficiency efforts to make
3. Having no role in the formation of community
4. Legal restrictions
5. Training Constraints on the formation and other stages of cooperative activities

Other factors that may be barriers to the participation of water users in the study area, Are not aware of the target group of beneficiaries with low social status of the cooperative, low power operation for Economic Plan is economic participation.

References