

A SURVEY AND ANALYSIS ON INSUFFICIENCIES IN PARTICIPATORY MANAGEMENT OF WATER RESOURCES IN MASHHAD PLAIN ,USING SWOT MODEL

UTILISATION DU MODELE SWOT DANS L'ENQUETE ET L'ANALYSE DE L'INSUFFISANCE DE LA GESTION PARTICIPATOIRE DES RESSOURCES EN EAU DANS LA PLAINE DE MASHHAD

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ABSTRACT

The arid and semi arid lands had always been confronted with water stress. By the beginning of the third millennium, water problems have become serious in most of the semi arid and arid regions of the world, including Iran. Rather than showing any sign of relief, the seriousness is increasing as the time passes by due to increasing demand and consumption of water. Mashhad city, a semi arid area, located in the north eastern part of Iran where the amount of renewable water is less than of 400 m³ per capita per year, is also confronted with this problem. In this situation, controlling the water crisis is a significant issue to solve the social and economical problems. One of the successful solutions to reduce problems, as experienced in many parts of the world, is participation of water users and other stakeholders in water resources management. In this article the results of a research on capacities and insufficiencies of participatory management of water resources, using SWOT model, using descriptive and analytical methods will be presented.

One of the important findings of the study is that the participatory management will be successful through proper training and this is expected to ease the water scarcity problem of the Mashhad city.

Key words: *participatory management, Mashhad plain, Associations' success.*

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RESUME ET CONCLUSION

Tout au cours de l'histoire, les terres arides et semi-arides ont été affectées par le stress hydrique. Au début du troisième millénaire, les problèmes d'eau sont devenus critiques dans la plupart des régions arides et semi-arides du monde, y compris l'Iran. La ville de Mashhad, zone semi-aride située au nord-est de l'Iran où la quantité d'eau renouvelable est inférieure à 400 m³ par habitant par an, est également affectée par la situation critique de l'eau. Dans cette situation, le contrôle de l'eau est une question importante pour résoudre les problèmes sociaux économiques.

La participation des usagers de l'eau et d'autres responsables dans la gestion des ressources en eau est une solution efficace pour réduire les problèmes d'eau dans nombreuses régions du monde. Dans cet article, sont présentés les résultats d'une recherche menée sur les capacités et les insuffisances de la gestion participatoire des ressources en eau en utilisant le modèle SWOT avec une méthode de description.

L'un des résultats de cette enquête montre qu'avec la formation appropriée des usagers d'eau, il sera possible de résoudre les problèmes de pénurie d'eau de la ville de Mashhad avec la gestion participatoire de l'eau.

Mots clés : *Gestion participatoire, plaine de Mashhad, réussite des Associations.*

1. INTRODUCTION

Fresh water is a limited natural resource in the Middle East. Hence, the scarcity of potable water in this region is an important subject of discussion. The inhabitants of this dry and semi dry region have always depended on their traditional wisdom to tackle the water scarcity problem. Public participation and mutual cooperation in the Iranian society had contributed to the success of earlier methods and technologies to cope up with the perpetual water scarcity problems. Kadivar (2009), citing from various sources has mentioned about the formation of elaborate governmental network in the Middle East to ensure water supply. The water situation now is, however, has become much complicated mainly due to population growth and the requirement of more water to meet the water demand of the agriculture and other developing sectors. As a result, there is a crisis situation with respect to the water scenario in Iran these days. Therefore, all agriculturist and water experts advise people to be more prudent in water use, particularly in industry and agriculture where most of the available fresh water is consumed (Javan and Fal Soleyman, 2008). The population in Mashhad plain has grown tremendously during the last fifty years. Increasing population has accompanied with increasing health and welfare risks due to a lack of adequate fresh water. Indiscriminate withdrawal from the groundwater reservoir has caused decline in water level and has exposed saline groundwater, which is per force also lifted for diversion to agriculture. It is intended to address the above mentioned issues and problems in this paper. Our attention will be focused on two major issues and they are:

1. What are the main problems in development of participatory management in Mashhad plain?
2. What are the capacities for developing participatory management in Mashhad plain?

2. BACKGROUND INFORMATION

The government involvement in water affairs has developed in the world so that different countries even in Europe where the water was not a scarce commodity for now, it is looked upon as a tradable commodity, albeit indirectly, by invoking the concept of virtual water. Accordingly, water has become an important issue for them also.

After the end of the second world war when many small countries got their independence, there existed a great economic difference between wealthy and developed countries and the developing nations. A new perception of the economics of the developing nations grew, particularly in the USA. This perception gradually gave rise to exporting water consuming goods from those countries where water was not scarce to the developing nations where water was scarce and importing from them less water consuming products such as crude, natural gas, fabric, finished industrial goods etc. In the developing countries, the government took over the control of water resources and water management became a fully governmental activity (Heydarian, 2007). As a result, people's participation in managing water dwindled and the traditional wisdom of water management was forgotten. Common man, particularly the agriculturists suffered due to this and they were against the development by the government and this was a barrier in development (Volkak, 2007).

In Iran too, 50 years ago, the above new look to social and native traditions caused a barrier between the government and the people. Little by little the native knowledge and traditions were put away and modernization in the name of development came into the developing programs in which people had no role and participation, either in decision making or in actual management of the water resource. Government in Iran assumed the responsibility of water supply, water distribution and water control but did not take into confidence the major water users, such as the farmers. Investigation in Iran shows that by and large, the successive governments were not successful in water development due to keeping aside the major stake holders from the process of development (Heydarian 2003). In due course, taking into consideration the cases of successful water resource development and management in other countries such as in Latin America and south east Asia who gave importance and emphasis to participatory water management, in Iran too the process of involving people started from about the year 2000. A new initiative for the development of government – people participation in Khorassan, was the establishment of water users' cooperatives in this area. The new approach towards participatory water management had an in-build feature of people's participation in decision making and people's shares in governmental investment and responsibility (Homayoonpoor, 1380). In new management programs attention to the interest of all the stake holder groups and at all levels of activities is given. In preparation of models for participatory management in Mashhad plain, the models should be based upon strengthening of social groups accompanied with various economic activities to decrease the water demands particularly in agriculture and as a result less stress on the water resources. With people's participation and readiness to cooperate of the water users, the ground for optimum water use and ideal water management will be prepared.

3. THE METHOD OF INVESTIGATION

The investigation was made using the SWOT model. In local and field survey 45 local authorities including village leader and the village Islamic councils of the study area filled the questionnaire

and answered the oral questions. The questionnaire consisted of five sections where section one was public information and in the four other sections a total of 34 important points namely, the weak points, strength points, opportunities and threats. Considering information collection and authority's views using analysis for SWOT model, useful and suitable strategies were proposed so that optimum and sustainable use of environmental facilities and limited capacities of the study area could be achieved. To evaluate the investigation instrument reliability the Cronbach's alpha was used.

Table 1. Cronobach's alpha

Total mean	External factors		Internal factors	
	Threats	Opportunities	weaknesses	strengths
74	80	74	70	72

Source: investigation founds 1389

SWOT is a suitable instrument that uses all factors in different locations to provide acceptable strategies in an acceptable level in the region (Musavi, 2009). SWOT is abbreviation for four words: Strengths, Weaknesses (as internal factors of study area), Opportunities and threats (as external environmental factors). In this model opportunities and threats represent desired or undesired challenges, which we confront with and Strengths and weaknesses show our possibilities, capabilities and deficits inside the study area.

The matrix of strengths, weaknesses, opportunities, Threats (SWOT)

This matrix is an important instrument that managers can make a good comparison of information and provide four strategies.

Table 2. Matrix of strengths, weaknesses, opportunities and threats

Weaknesses (W)	Strengths (S)	Internal factor/ External factor
WO strategies	SO strategies	Opportunities (O)
WT strategies	ST strategies	Threat (T)

Source: Fred R. David, 1367: 367

1. SO strategies: researcher using internal strengths points tries to utilize the external opportunities.
2. ST strategies: researcher using strength points tries to reduce or omit the effects of existing threats in external environment.
3. WO strategies: researcher using existing opportunities in external environment tries to reduce or omit his own weaknesses.
4. WT strategies: researcher tries to reduce internal weaknesses and avoids from threats caused by external environment.

4. THE STUDY AREA

The study area falls within 36° 35' to 38° 57' N latitude and 59° 25' to 60° 59' E longitudes. The mean yearly precipitation is 250 mm; varying from 400mm in high lands of about 3000 m altitude to minimum 150 mm in low plains. Metropolitan Mashhad with 2.7 million inhabitants together with six small towns and 800 villages are located in this plain (Khorassan governor office -2007).

5. RESULTS

In the past times, history of water resources in the north eastern part of IRAN shows two distinctive management periods and now a third period of water resources management is forming. These three periods are:

A. the tradition period before 1950

In tradition period people worked together with a systematic and cooperative management and they used the water and soil resources efficiently. These historical cooperatives were called "Sahra". In Sahra the works were distributed among people according to their expertise. All people gathered in one cooperative worked together under the leadership of one selected group for one year.

B. Modern period from 1950 to the end of 1990 decade:

With the end of Second World War and independence of many countries in different regions of the world, in addition to the formation of new governments, many social, economic, environmental and private bodies were also formed. In Iran, like other places a large and extended governmental organization and institutions were formed to develop and manage the water resources. In the Khorassan province of north eastern part of Iran, the government took control of water utilization and water distribution and gradually the people's cooperatives lost their interest to cooperate and as a result, the people's institutes that controlled and managed the water resources for many years, changed their attitudes and gave all responsibility and decision making to the government. In this period when governmental management used the modern water systems without people's involvement and cooperation, the environmental justice was overlooked and that was the beginning of many problems in water supply and water resources in the north east of Khorassan. Since people have no responsibility to control the water consumption, water in Mashhad plain were over used. In 20 years the level of groundwater declined dramatically and groundwater scarcity made the government prohibit any further well excavation. Figure 1 shows the aquifer drawdown in 2011 in Mashhad plain.

C. The post modern period started from the decade ending in 1990

At this time when the weakness of the government in managing water resources became apparent, a new discussion began among the hydrologist. The discussion was on the necessity of participatory management of water resources. The experiences of many countries such as Turkey, Indonesia, Mexico and Chile showed that with participation of farmers and

water users in water resource management, most problems could be solved. An analysis of information in Khorassan considering the weaknesses and strengths points in participatory water management and also analysis of opportunities and threats showed that participatory water management in Khorassan province could be beneficial both for government and for the people.

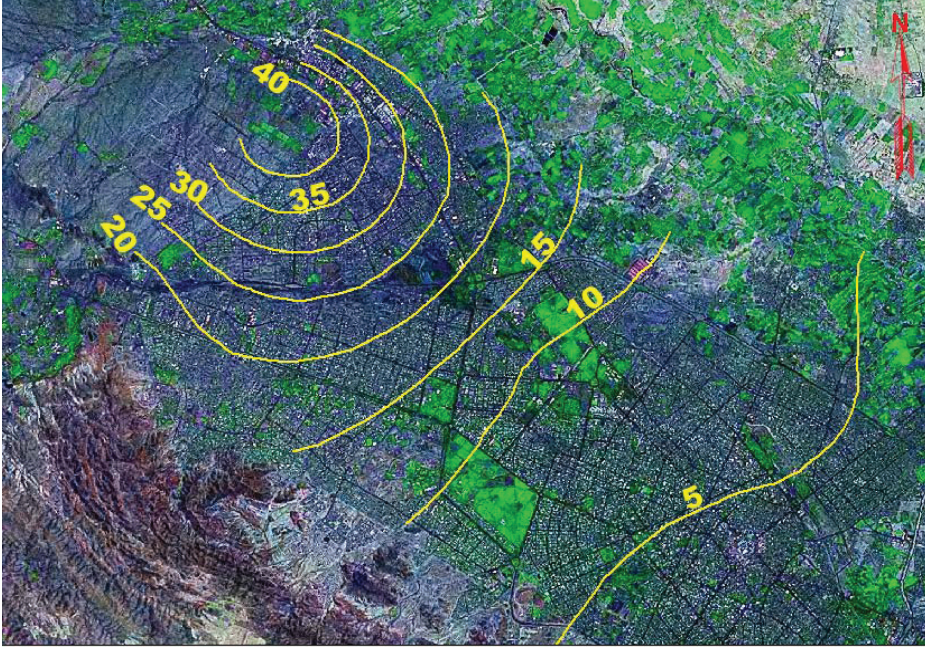


Fig. 1. Aquifer drawdown pattern in 2011 in Mashhad plain

(Source: Mehdi Janparvar, Saeed Nairizi, 2004, ToosAb Consulting Eng. Co. -Mashhad -IRAN)

SWOT analysis

Preparation of a Matrix for external factors (EFE): This Matrix is the result of a survey on external factors and it evaluate the opportunities and Threats of external environment.

Matrix for evaluation of internal factors (IFE): This Matrix is the results of a strategic survey of internal factors and evaluates the weaknesses and strengths points.

After the preparation of internal and external Matrices, the required calculation was carried out and suitable strategies in connection of participatory management were determined (Table 4).

Firstly, discussion sessions were organized with the participation of local managers (village governor and the members of Islamic council of the villages in study area). During this discussion, external and internal factors were recognized and questionnaire on weaknesses, strengths, opportunities and threats were prepared with input from the audience. Then using SWOT analysis procedure, the strategies were written down. From the questionnaire the strengths and weaknesses points were found. At the end, using a four boxes table for external and internal factors (IE), the feasible strategies were selected and proposed for execution.

Table 4. Strategies of participatory management in Mashhad plain

items	Strategies	opportunities	Strengths
SO 1	Organizing applied training courses for water users particularly young and educated fellows	O 1,2,3	S 1,2
SO 2	Establishment of multipurpose people association	O 4,5,6,8	S 5,7,8
	S strategies	T threats	S strenghts
ST 1	Using and consolidate native knowledge with modern management system for optimum use of soil and water	T 6, 1	S 6, 7, 8
ST 2	Formation of associations suitable for the kind of utilization system (cooperatives, guild associations, and..)	T 2,3,4	S 1,4,7
ST 3	Creation and development the new procedures for utilization of resources	T 1,3,4	S 1,4
ST 4	Supporting the associations formed in connection to their relation to market, particularly to consumption cooperatives market	T 6,7	S 5,6, 7
ST 5	Development and creation the participatory management step by step in sample regions	T 2,3,4	S 4,5,6,7
	Strategies	T Threats	W weaknesses
WT 1	Improvement and approval of laws and regulation in relation to participatory management	T 1,5,6,7	W 1,3,5,9
WT 2	Development and promotion of required skills in connection to performance through organizing regional and local workshops	T 1,7,8	W 1,2,3,6,9
WT 3	Organizing training and justification courses for governmental water managers and experts	T 2,1,6	W 1,3,6
WT 4	To make the relation between people associations with international institutes to utilize the international capacity	T 3,1,5	W 2,3,4

6. CONCLUSIONS AND RECOMMENDATIONS

Today's , numerous problems such as poverty, non-employment and inequality and also a set of environmental risks , threats our human society particularly the rural regions .Many efforts have been made to alleviate rural problems but in most cases where government views on economic growth has not been based on real people participation, the development has not been sustainable and comprehensive. Lack of success in rural development was a result of governmental exclusive involvement in all responsibilities and execution of programs without cooperation and participation of people in social , economic and institutional activities.

The result of this investigation, that is based on views of the local managers, present new strategies concerning Mashhad plain capabilities and spatial – location problems in solution for a comprehensive development . Based on investigation results, the final grade for internal factors is more than 2.5 and the final grade for external factors is less than 2.5. Therefore the study area from the point of internal factors has an appropriate situation but from the external points of view has not a good situation. So, concerning the results of four box matrix of external and internal factors and focus of mean points in box number 3 (competitive box) and dispersion points in box No 1 (aggressive box) and No 4 (conservative) , the competitive strategies and participatory management should be selected as the first priority and conservative and defensive strategies be selected as the second priority.

On the basis of the study, the following strategies were considered acceptable and, therefore, are recommended for adoption:

1. Creation of jobs in the form of productive associations to reduce the pressure on soil and water resources.
2. Improvement of agricultural water utilization models using the new technologies.
3. Promotions and strengthening the mechanism of participatory management with participation of native, educated and skilled human power
4. Creation and development of multipurpose people's companies.
5. Improvement and approval of regulation and laws in connection to water resources management.
6. Development and promotion of required skills in the field of optimum utilization of resources through organizing local and regional training workshops.
7. Creation and development of agricultural product processing industries and packaging to add value to the raw products from agricultural and animal husbandry.
8. Creation of suitable guidelines to relate people's association with consumption market.

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