

### Impact of water management transfer

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**Abstract:** Basically, water management is critical to the economic growth and environment protection. Its optimization is one of the general global strategies. In this regard, it is needed to develop local management and devolution of the operation and maintenance of water installation in the developing regions. This study surveys the effects of devolution of irrigation management to water users association to improvement of management on the water conveyance and water distribution in a case study, Qazvin plain, Iran. They investigated several eco-geographical variables including land and canal geographical location and beneficiary's habitats' area as travelling for water provision. The research was developed based on experimental investigation method to reduce the transportation of 3000 stockholder to headquarter office in the capital of the province. As a result, the function of water user assassinations was indicated travelling for water provision had reduced 75% because of shortening in distance in the every watering year. Overall, the feedback of users was investigated by comparing the users' satisfaction degree between before and after irrigation management transfer. The outputs showed that the travelling dimension for water provision is more important and significant. By the other means, users prefer to recourse to water local management bureaus as WUAs unions rather than long travelling to headquarter.

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#### 1. Introduction

The world's climate is changing as a rate unprecedented in human history. It's risks are global, real and apparent in natural resources as components that constitute the livelihood (Nail, 2003). In addition, misuse of water has increased risk of human wellbeing, food security, and the ecosystems (UNESCO, 2003). In other words, it is needed to promote our societies' capacity on participation of environment protection and climate as the context of sustainable development (Sullivan, 2003; FAO, 2001). It is proven that the sustainable development's objectives and climate change are common and interlinked. Local participation yields high economic and environmental returns in implementing programs of management on water, sanitation, drainage, and etc. (World bank, 1992).

Optimization of water resources management is one of the committals to achieve the environment protection as one of infrastructural goals on sustainable development (World bank, 1997). By the same token, it is a global strategy as it starts by capacity building on human forces to the implementation of local water management.

Moreover, management reform strategies vary dramatically hence accomplished various results (Vermillion, 1999). Overall, a participatory water management process is essential for both of the environment stability and economic development (World bank, 2003). It is run based on the enhancement devolution plan, operation and maintenance, O&M, on water installation to water users. As a result, natural resources are needed to be managed more effectively now and beyond the past (UN documents, 1992; Hamdy, 2007).

On one hand, Taleghan river basin extends almost 900 km<sup>2</sup> which is in the north western of Tehran, Iran. It is computed the participation is 697.2 mm where is the climate relatively moisture in the Taleghan highlands (Soltani, 2011). Therefore, different development which contains animals and plants and lots of spring, grass land, wildlife and some spring improve operational pasture and livestock productivity. It is the water resources zone at the upstream. On the other hand, Qazvin plain is a semi-arid zone which is the water consumption area as downstream. It is one of the developed zones in Iran. They were the Talegan reservoir dam with 460 Million Cubic Meters, MCM, which has been

allocated annually for a part of Tehran drinking water (150 MCM), irrigating (287 MCM), artificial recharge (20 MCM) and traditional water rights and environmental requires at downstream (12MCM). The hug irrigation network (Length; 1200 KM, Capacity; 30 M3/S) and several hydro-mechanical equipment have implemented to water distribution for delivering to 30,000 farmers. The buildings and water utilities were built and operated since 1975 (Ghasemi, 1994).

Irrigation Management Transfer, IMT, plan included design and implementation of the process of devolution of O&M to local communities institutions. Since it was formed, the Water Users

Association, WUAs, was mandated by O&M. At present, 161 WUAs and 12 associations' unions and a Federation United (FUWUAs) play role of water management in Qazvin province. They are stated by capacity building of human resources of the 88 habitats in the suburbs. Formation had the biggest NGOs participation as the provincial federation in the agricultural section during three years, 2002 to 2004. The Qazvin Pilot Project, QPP, has been developed from bottom, land level to the provincial level (Ghasemi, 2005).

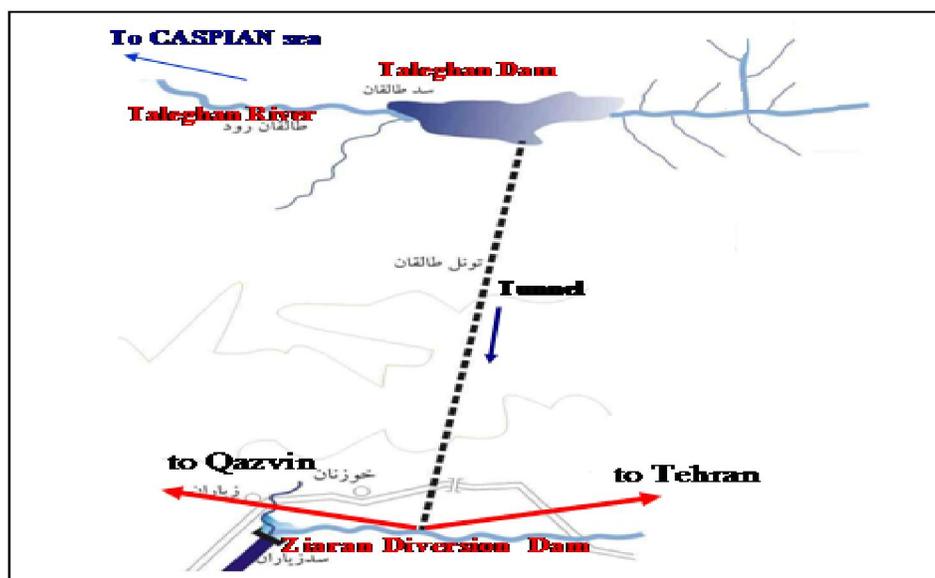


Fig1. Location of case; Taleghan river basin & Qazvin plain (Sumiani, 2008).

## 2. Material and Methods

The study measured some geographical factors and it surveyed the impacts of implementation of WUAs on the users' satisfaction. It investigated the faction of participatory irrigation project on the water users travelling for water provision in that case. The beneficiaries' satisfaction was served into two sections before and after the implementation of IMT project and were compared. Some eco-geographical variables include canal and turn-out geographical location and water user's habitats were assessed by experimental design. Data collection which included, questionnaire and interviewer were discussed with theselected WUAs' representatives, WUAs' staffs, key stockholders, and members of the Qazvin Irrigation and drainage company. Sample size was computed for finite population on data collection.

161 WUAs were used for sampling size to be filled up by one of the representatives in the any WUAs. It had been confirmed by a typical formula which is verified by the reliability of the sampling method (Arkin, 1963). As a result, the statistical population contained 161 samples among 3000 water users' stockholders. The questionnaire format was organized in a bisectional format, which was divided depended on before and after the devolution of O & M services. The amount of shortening distance and satisfaction's levels due to saving time and cost were investigated. It was exercised by statistical socio-economic pattern for data analysis.

## 3. Results

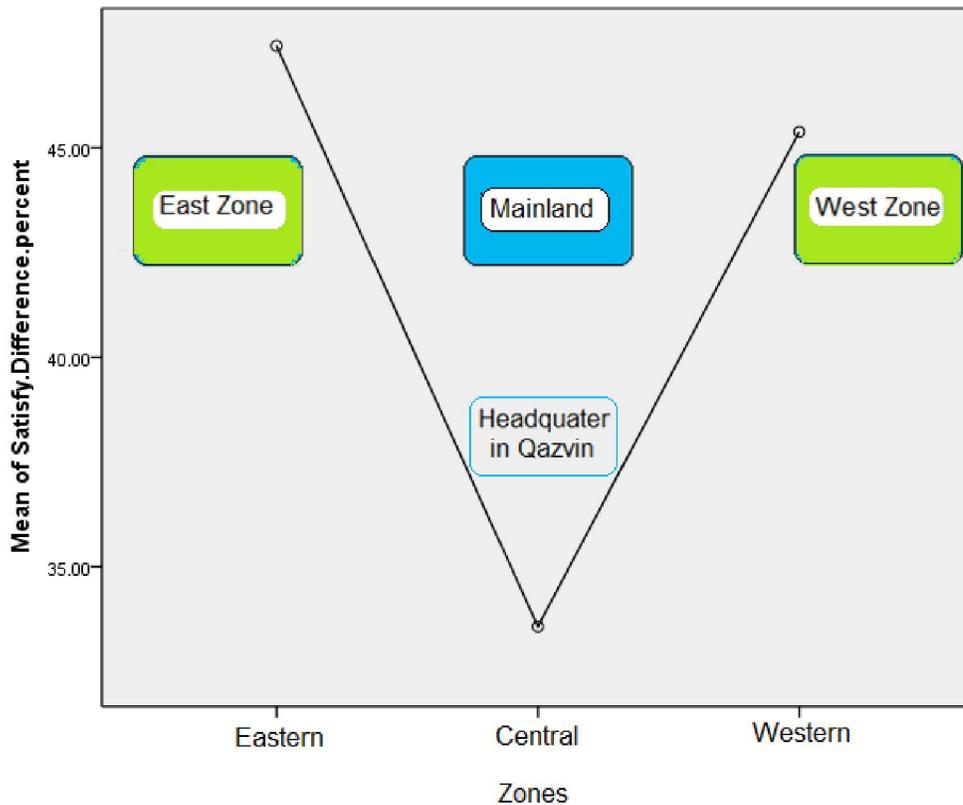
The irrigation and drainage network were expended by 94 km as the main canal which includes suburbs as east and west zone and mainland as

nearby to headquarter in Qazvin city. The geographical location of canal users' residential area was computed for both times, before and after the IMT. Firstly, the total distance of 88 habitats to headquarter office in the capital of province was 102,106 km which had been travelled annually by water users in the past. Overall, the water provision process was quite complicated before implementing the QPP and it wasted much travelling time and costs for water users. The beneficiaries faced were related to the time and effort each farmer had to spend in travelling to fulfil his demand once every ten days during the every watering period, and paying the charges and then again providing the proof of payment for water release. Finally, that issue was resolved completely (Ghasemi, 2005; UI-Hassan, 2007). At present, annual transportation of 3000

stockholder to the 12 WUAs' unions as the local management is 25,698 km. As a result, the function of NGOs was indicated travelling for water provision had reduced 75% because of shortening distance of average 25.5 km for each stockholder in every watering year. In other words, the QPP could be stopped at minimum of 76,400 km travelling as an environment protection goal. In addition, the socio-economic factors including WUAs trustworthiness and travelling for water provision which led to saving time and cost were measured. As seen in Table1, the statistical assessment showed there was a significant relationship between the above factors and satisfaction level with p-value < 0.001.

**Table1.** The influence of shortening distance on satisfaction due to saving time/cost indicator.

Variable. Before,After	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)
WUAS Trustworthiness	0.835	0.066	- 19.258	160	0.000
Due to Saving Time & Cost	0.742	0.058	-24.975	160	0.000



**Fig2.** The influence of distance to O&M bureaus on satisfaction level in Qazvin Plain, Iran.

Satisfaction level due to distances in bisectional times, before and after the IMT on lateral canals in the QPP was compared. In comparison, the impact of implementation of WUAs on satisfaction was relatively large in the suburbs area include eastern and western zones. It is less growth in the mainland includes laterals of headquarters' around. Overall, data analysis revealed that satisfaction due to shortening distance resulted in the most significant as key indicator for assessing beneficiaries' priorities. It showed that the satisfaction level was high in influential indicators, because of shortening distance by decreased of travelling for water provision to local bureaus rather than to the headquarter. It was divided into two zones; rural and mainland around of headquarter as determinant of distance of canals location to O&M offices. It was over 45% satisfaction level in the far canals against 33% in the mainland zone, Figure2.

#### 4. Discussions

This paper investigated the implementation on participatory irrigation management in one of the famous plain in Iran. It was managed by the Qazvin Irrigation and Drainage Company since 2002. The QPP was made by empowerment of user's to achieve higher participatory knowledge during three years in the IMT process as the establishment of 161 WUAs, 12 local water management around of irrigation network. It was stopped by the transportation to headquarter in Qazvin by the formation of the local bureaus through saving time and cost of water users. As a main result, the average of shortening distance for each of 3,000 stockholders is 25.5 km in the year which was save travelling almost 75%. It was decreased more than 76,400 km transportation for water users who have water right on Qazvin irrigation system. In addition, the feedbacks of respondents affirmed, the FUWUAs' function on O&M had improvement on O&M services.

Overall, the outputs showed that most significant was the transportation dimension for water provision. In other words, water users prefer to recourse to WUAs' local bureaus rather than long travelling to headquarter. Now, that issue is resolved completely by an intelligent strategy on environment protection goals. As a suggestion, the governance must support WUAs financially rather than government organisations to prevent their interference of tasks.

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