

## Research Paper

# Investigating the Changes in Agricultural Water Resources and Its Relationship with Economic and Social Indicators (Case Study: Rural district of Neyzar, Salafchegan District, Qom Province)

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## ABSTRACT

According to studies conducted by the International Water Management Institute, 65 countries with a population of over 7 billion will be facing water scarcity in 2050, which means that even with the highest efficiency and productivity, there will be a problem to meet the water needs. About 25 percent of world population, including Iran, is in this group. In this research, the indices were identified for measurement using the library method and the research background. Measurement of the indices and changes was done through the data from the general census in 2006 and 2016, comparing aerial photos, questionnaires, and field studies. Changes in access to water resources have led to different reactions to balance and adapt to new conditions. Investigating the sample population of the study showed that the change in agricultural water resources did not significantly change the population in rural areas, which could be due to different conditions of the region, including its proximity to Qom and its effects. Increasing the cost of exploiting water resources, such as increasing the depth of wells, dredging of aqueducts, and covering creeks, etc. are also associated with the change of water resources, and more importantly, these measures are related to life satisfaction and the immigration incentives and job opportunities. Generally, it is concluded that facilitation measures should be taken for producers to reduce their operating costs, to increase life satisfaction level and job opportunities and as a result to decrease immigration incentives.

### Key words:

Water, Salafchegan, Neyzar Village, Qom

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## Extended Abstract

### 1. Introduction

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over 7 billion will be facing water scarcity in 2050, which means that even with the highest efficiency and productivity, there will be a problem to meet the water needs. About 25 percent of world population, including Iran, is in this group.

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Qom Province and rural district of *Neyzar* like many areas of water scarcity, in addition to the shortage of rainfall that have a long history, have suffered from lack of surface water due to various reasons such as droughts and the construction of Panzdah-e Khordad dam on the Qomrood River in the last 20 years.

The villages of the studied area are the first villages in the province alongside the Qomrood River that have been affected by the reduction of agricultural water resources. Given the high dependence of villages on agriculture and water resources, it is necessary to examine the various dimensions of water resources and finally to answer the question whether there is a significant correlation between the change in access to agricultural water resources and other changes has occurred in the villages of the study area.

## 2. Methodology

In this research, the indices were identified for measurement using the library method and the research background. Measurement of the indices and changes was done through data from the general census in 2006 and 2016, comparing aerial photos, questionnaires, and field studies.

In the first stage, at the beginning and the end of the temporal period (2006 to 2016), the variables of population, the number of available water resources, and under cultivation area of each of the villages and their changes were counted. In the second stage, the questionnaire was used to measure the viewpoints of villagers about other indicators and events related to water resources, and in the third stage, using appropriate statistical tests, the correlation between the index of change in water resources and the 10 indicators were investigated to confirm or reject the research hypotheses.

The statistical population of the study consisted of 12 villages in *Neyzar* rural district, Salafchegan, Qom province with a total population of 1304 households and 4242 people by the census of 2016.

For quantitative indicators and changes in agricultural water resources, demographic changes, changes in under cultivation area, practical and real data were collected through field operations and questionnaires.

## 3. Results

Among the indicators of social damages in the village level, the lowest mean is for the increase in the social class

gap and the highest mean is for the decrease in life satisfaction. The overall mean of the relevant indicators is 3.42 and the standard deviation is 0.730. Also, in the general scale of economic problems in the rural level, the lowest mean is 2.58 for changing the pattern of cultivation, the highest mean (3.82) is for the reduction of job opportunities, the overall mean in the scale of economic disadvantages is 3.18 with a standard deviation of 0.707 and less than the overall mean of social problems.

Correlation between changes in water resources and population change was tested by Pearson nonparametric correlation test, which showed a low-level negative correlation with a correlation coefficient of -0.289 and therefore, this correlation is not significant. Of course, in investigating the relationship between different variables of the research, it was determined that there is a significant relationship with the confidence of 99% between the distance from Qom city and the population change index and the results of the test showed a reverse correlation coefficient of 0.928. The result is that the more the place is far from Qom city, the less the population index is, which suggests an increase in the population of villages near the city of Qom. In the following, it was found that there is a significant relationship at 95% confidence level between the distance from Qom city and the index of job losses with a coefficient of correlation of 0.613 and also between the immigration incentive index with a correlation coefficient of 0.699, which means that villages that are far from the city of Qom have faced a reduction in employment opportunities and an increase in the immigration incentive.

## 4. Discussion

Changes in access to water resources have led to different reactions to balance and adapt to new conditions. Investigating the sample population of the study showed that the change in agricultural water resources did not significantly change the population in rural areas, which could be due to different conditions of the region, including its proximity to Qom and its effects.

The increase in social stress caused by water scarcity is another result of this research. Also, the decrease in life satisfaction, as an indicator of social tensions, was identified. Immigration, as a way to escape from inappropriate conditions, has always been one of the pillars of studies on the effects of water scarcity on villages, which is confirmed by the research, and the correlation of this indicator with other aspects such as satisfaction and especially decreasing job opportunities indicates the importance of the issue.

Reducing the under cultivation area as the initiator of the impacts cycle also has a close relationship with the number of water resources available to the villages, which was also confirmed in this study, as well as other studies in this field.

## 5. Conclusion

According to the investigated issues in this research, the change in access to water resources should lead to a change in the cultivation pattern, but the results showed that this has not yet happened, which means the villagers are not adapted enough to the new water shortage conditions, and this lack of change is a reason to pay attention to the need for proper policy and serious attention to this issue.

Measures are needed to strengthen the adaptability of villagers. These measures include short-term strategies such as activating and using the capacity of agricultural cooperatives, water users' organizations, rural cooperatives, and the mutual cooperation of governmental institutions and farmers in order to improve the cultivation pattern, to improve the traditional irrigation system in the fields and gardens, and to take attention to create capacity in the villages for new activities that are appropriate to the conditions of the villages.

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## Conflict of Interest

The authors declared no conflicts of interest