

## Research Paper

## Farmers' Strategies in the Face of Droughts and Examination of the Factors Affecting Those Strategies: A Case Study of Roshtkhar County

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**ABSTRACT**

In recent years, repeated droughts have had negative impacts on agricultural products. Farmers can reduce the effects of droughts by using adaptive strategies. The aim of this study was to investigate farmers' strategies in response to drought consequences and to examine the factors affecting the use of these strategies. In terms of purpose, the study is an applied one, and the method is descriptive-analytical. The data gathering tool was a questionnaire and interviews. The statistical population of the research consisted of the rural households in Roshtkhar County (N = 13716). Using the Cochran formula, 373 farmers were selected as the sample. For data analysis, the unlimited exploratory uncertainty test and the binary logistic model (LM-Newton-Marcard-Raphson method) were used. The results showed that decreased water resources (0.882), reduced crop area (0.735) and increased living expenses (0.698) were the most important consequences of drought. Drought-tolerant plants such as saffron, irrigation, and non-agricultural jobs were the most important strategies adopted by the farmers in response to drought consequences. Variables such as age, sex, indigenous knowledge, labor force, income, farmers' experience, and farm size were significantly associated with the application of strategies. The results of the research can be used for more adaptation of farmers to drought consequences in the villages of the county.

**Key words:**

Climate change, Drought, Agriculture, Adaptation strategies, Roshtkhar County

**Extended Abstract****1. Introduction**

**D**rought has always been a major concern for researchers. Developing countries are more affected by draught risks than developed countries. The greater vulnerability of these countries is because the agricultural sector is the main source of income

for many households, and drought has its greatest impact on that sector. In areas where rainforest farming is done, draughts have more negative effects. The countries in the south and southwest of Asia, such as Iran, are dry regions that are always subject to severe droughts. Due to the close relationship of agriculture and draught, when a draught occurs, its consequences are quite evident in agricultural products, livestock, and hydrological systems. What a draught leads to is reduction of the quality and quantity of products, farmers' income, and lowered stan-

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dards of living. Therefore, it is necessary to study the effects of drought and the strategies to cope with them in order to maintain sustainable livelihood.

## 2. Methodology

The present study is applied in terms of purpose and descriptive-analytical in terms of data analysis. Both documents and fieldwork were used to collect the data. Theoretical studies were reviewed and documented, and field data were collected through a questionnaire. The statistical population included farming households in *Roshkhar* County (N = 13716). As for the sample size, 373 farmers were selected using the Cochran formula and a simple random sampling method. Levels and scales of data were sequential and distant, and most of the variables had a normal distribution. Statistical analyses (descriptive statistics and inferential statistics) were conducted to answer the research questions and examine the research variables. To identify the most important consequences of drought and farmers' strategies in response to those consequences, an unlimited exploratory uncertainty test (Johansen method) was used. Also, a binary logistic model was applied to investigate the factors affecting farmers' decision to use the coping strategies.

## 3. Results

The findings showed that farmers considered the decrease of water resources with a special value (0.882) as the most serious consequence of drought occurrence. The decrease in the level of cultivation (0.735), the increase in living expenses (0.698), and the decrease in income (0.641) were in the next ranks. The lowest numerical coefficient was related to changes in livestock composition (0.098). The values of 24 strategies for coping with drought consequences indicated that the farmers made the best use of drought-tolerant plants such as saffron (0.620). Lowering the irrigation frequency (0.578) and doing non-agricultural jobs besides agriculture (0.575) were at the next-ranking strategies. The lowest numerical coefficient was related to soil stabilization (0.046), use of new irrigation methods (0.066), and artificial feeding of groundwater aquifers (0.086). Variables such as age, sex, indigenous knowledge, size of the labor force, income, farmers' experience, and farm size were significantly related to the application of adaptation strategies.

## 4. Discussion

According to the results, a drought in the region had significant negative effects on crop production, but the use of coping strategies by farmers to reduce these effects

was not satisfactory enough. Most farmers stated that they could hardly deal with the effects of droughts. The main reasons as why the farmers could not efficiently use of the strategies were lack of access to financial and credit resources, lack of training by the corresponding organizations (such as agricultural Jihad), lack of farmers' information, lack of their participation, lack of understanding of the coping strategies, and small and scattered pieces of land. The best use of drought-response strategies by farmers related to cases that did not require much capital and technical skills. The farmers practiced methods that were low-cost and based on indigenous and local knowledge.

## 5. Conclusion

The results showed that, out of 373 farmers in the study sample, only 198 (50%) used strategies that did not require much funding, credit, expertise, or technical knowledge. Out of 24 strategies examined in the research, only five were used widely. They included cultivation of drought-resistant plants such as saffron, less frequent irrigation, doing non-agricultural businesses along with agriculture, using polymer and cement pipes to carry water, and storing farming water. There were also eight variables closely associated to the adoption of strategies against draught consequences. They included age, sex, indigenous knowledge of farmers, size of labor force in the family, farm income, non-farm income, and farmer's experience. In addition, field size was found to have a positive and significant relationship with farmers' use of strategies to cope with drought consequences. Of the five general factors including economic, personal, psychological, social and physical factors, economic and personal factors played a major role in adopting strategies against buckling.

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## Conflict of Interest

The authors declared no conflicts of interest.