# The Factors Affecting Economic Resilience of Rural Settlements after the Earthquake (Case Study: Silahkhor Rural District, Dorood)

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## 1. Introduction

Natural disasters are fundamental obstacles to achieve the sustainable development of human societies. Since natural hazards have the potential to cause risky and devastating disasters in the absence of risk-decreasing systems for human societies and rural regions (Davis & Izadkhab, 2006), understanding problems of villages and presenting regional strategies for them is one of the basic measures for sustainable rural development. To decline the effects of such disasters, the resilience approach is introduced. The world resilience means return to the past which is from Latin root "Resili" that means jump to the past. For the first time, the term is used by Hauling in 1973 in a paper titled "Resilience and Sustainability of Ecological Systems" having an environmental point of view. Resilience is a multi-dimensional concept that include social, economic, institutional, and physical-peripheral dimensions (Klein, R. J, 2003). Resilience in the economic dimension is defined as people and societies reaction and compatibility in such a way that they are able to reduce the effects and consequences of actual damage caused by disasters and can be measured under the influence of various factors such as savings, level of damages, ability to return to working and living conditions, insurance, recovery of post-accident economic activities, financial services, access to facilities, diversification of economic activities, the existence of alternative ways of earning income, external resources, employment and income, ownership, and so on (Rafiian et al., 2010). Considering geographical situation and its location on the earthquake belt and climate variation, Iran has faced natural and unnatural hazards in various periods. Among them, earthquake as a natural hazard more or less has effects and consequences in different dimensions such as social, economic, environmental ones, especially in rural regions. In the current study, the considered area includes the village settlements of the village of Silakhor that has 20 villages and 1539 householders based on 2016 census. The occurrence of a 6-Richter earthquake on 31st March, 2006 had economically caused

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damage to the rural settlements of the region with different severity and weakness. Over 10 years, some parts of these villages were rebuilt which could somehow return to their previous condition but some others could not return to the previous conditions before the disaster and had to adapt themselves to the conditions that have been affected by their economic and social foundations. Given the importance of resilience, the purpose of the present study is to evaluate the factors affecting economic resilience of rural settlements after earthquake in Silakhor province. Regarding the difference in degree and the ability to return or the inability to return to pre-earthquake conditions, in other words, the resilience of settlements, the present research seeks to answer the following questions:

1. What is the status of economic resilience of rural settlements in Silakhor rural district?
2. Which factors are contributed to the severity and weakness of the economic resilience of rural settlements in the village of Silakhor?

## 2. Materials and Methods

The present study is an applied one with a descriptive-analytical method. Methods and tools for collecting data in this study include both library and field methods. In this paper, the population include rural settlements in Silakhor (Dorood County) having 1539 households based on 2016 census. Depending on Cochran's test, a sample of 308 households being affected by 2006 earthquake is selected. The indicators studied in this research include (economic capital and assets, employment, cost and income, damage, capacity and ability to compensate, ability to return to working conditions and appropriate income, and the use of banking resources). One-sample t-test was used in the villages of Silakhor rural districts to examine the resilience situation. Furthermore, exploratory factor analysis is also used to identify the factors that affect the resiliency.

## 3. Results and Discussion

A one sample t-test was used to assess the economic resilience. Findings show that in economic dimension, Kangane is the only village that is in good resilience condition while the villages of Azna, Alamabad, Upper Laban, Azizabad, and Jahan Abad are in low resilience in economic terms, and the rest of the villages are somewhat resilient. To answer the question, what factors did contribute to the severity and weakness of the resilience of rural settlements in the village of Silakhor, the exploratory factor analysis is used. The two effective identified factors in economic resilience were economic and employment context and the income and facility capacity. It can be inferred that the characteristics and indicators of employment, cost and income, economic capital, and damage in this field have a positive role. These features have formed the main factor in the context of economic resilience that called the factor of economic and employment fields with 2.741 factor load. In addition, the indicators such as capacity and ability to compensate for losses, use of banking resources and the ability to return to appropriate working conditions and income have significant role which can influence the resilience of residents in Silakhor Plain in which it is the former actor of income and facilities with 2.111 factor load.

**4. Conclusion**

Nowadays, the analysis and increase of resilience to natural disasters has become an important and widespread field. The purpose of this study is to assess the economic resilience of rural settlements in rural areas as well as to study the factors affecting this vibration. The results of the research show that only the village of Kanganeh has a good resilience condition and the villages of Azna, Alamabad, Upper Lebanon, Azizabad, and Jahan Abad have a low resilience in economic terms while the rest of the villages are somewhat resilient in this regard. In general, the studied rural settlements are somewhat resilient. The results of exploratory factor analysis represent that indicators of employment, cost and income, economic capital, and losses in this field have a positive and effective impact, and the main factors in the context of economic resilience are the economic and employment grounds. Moreover, indicators of capacity and ability to compensate, the use of banking resources, and the ability to return to working and income conditions have a significant role and effect on the resilience of residents, which is the factor of income and facility capacities. Generally, according to the results of this research, the above-mentioned factors have a significant role in the return of residents of rural areas to normal conditions, therefore, identifying these factors can be used to strengthen and increase the resilience of rural settlements in this area while it is also useful in other areas exposed to natural disaster. In this way, the damage caused by these disasters that is considered as one of the main obstacles to sustainable development in disaster-prone communities will be prevented.

**Keywords:** Sustainable rural development, Natural hazards, Resilience, Resilience indicators, Silakhor village.

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