

## **Analysis of the Resilience of Rural Settlements with Emphasis on Earthquake (Case Study: Homeh District Lamerd Sub-Province)**

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### **Abstract**

The occurrence of natural hazards such as floods and earthquakes in human settlements causes irreparable damage. Hence, in order to reduce its effects, attention has been paid to the resilience approach. In this regard, the present study seeks to measure and assess the resilience of rural settlements in the suburbs of Lamerd County in four dimensions of economic, infrastructural, social, and institutional management. The research method was descriptive-analytic, which was done in both documents, and field (questionnaire). The statistical population of the study was rural villages in the suburbs of Lamerd city, with 14 villages having 20 households as samples, and the unit for analyzing the supervisors of households living in sample villages. Based on Cochran method, 355 supervisors were selected, and randomly assigned to the proportion of households in rural areas that was distributed and completed. The results of one-sample t-test indicate that the resilience of the studied villages is low, so that the social index with the mean of 3.8 was the highest. The economic, infrastructural and managerial-institutional indicators were respectively 2.79, 58 / 2 and 30/2 are lower than the average of the test (number 3). In the next step, using the path analysis model, the effect of each of the four indicators on the resilience of the settlements was investigated. Economic and institutional-managerial indices with the coefficient of 361/0 and 282/0 respectively, were the most and the least coefficient of influence. At the end of the research, strategies for re-stabilizing villages are presented in accordance with the research findings.

### **Introduction**

Every year, millions of people all over the world die out of the natural and abnormal events of the year. The problem of natural hazards has long been a human being, and has always been a part of the history of human life. In the meantime, hazardous, devastating earthquakes are responsible for the largest number of human and financial losses, and the number of human casualties in

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developing countries is several times higher in developed countries. Given the seismic state of our country and the vulnerability of cities to earthquakes, today one of the most important approaches of urban planners to address this phenomenon is addressing the issue of urban immunization and preventive measures to reduce the damage caused by earthquake. In this regard, the role of resiliency is considered as one of the preventive approaches to reduce the damage caused by the earthquake. This concept, with its development in engineering science and then in the social sciences, has created a new approach to crisis management that manages crisis management from passive reaction and planning to reduce vulnerabilities to empowering communities in confronting crisis and their capacity to restore their conditions. In general, there are two types of natural disaster strategies that include prediction strategies and resiliency strategies; the first is to deal with known problems, and the latter to deal with unknown problems. In the meantime, resiliency means improving the community's ability to plan, prepare for absorption and improvement, and more success in coping with the unplanned consequences of accidents, and repairing and improving the socially, economically, ecologically, and physically damaged community.

### **Methodology**

Among the residential places in this village, 14 villages have 20 households and more (Zanganeh, Ghaleh Mozaffar, Lashkhun, Noorabad, Hassan Abad, Tarman, Qala Ali Baba, Kachalha, Lashkhareh, Navbandi, Khalifeha, Sabkhi, Qala of Ghulam Abdullah, Mirhassani) are selected as sample villages. Regarding 958 households in these fourteen villages, using the Cochran sampling formula, the sample size was determined by 242 people, who were selected as the statistical sample to achieve more accurate results to 355 (headed households), and the questionnaire was selected in a simple random manner, which was distributed to rural households in proportion to households. To obtain a general picture of the level of resilience of rural settlements in the four indicators, one sample T-test was used. In the second stage, using the path analysis model, the relationship between each of the four indicators with the index of the stabilization of the settlements was studied, so that the indicator of settlements stabilization in a separate process as a dependent variable and four indicators of research were considered as independent variables.

### **Discussion**

The results of one-sample t-test indicate that the social index with an average of 3.8 is the highest, and the economic, institutional, and institutional indicators are lower than the test hypothesis. In analyzing the relationship among the four indicators (economic, social, infrastructural, and institutional-managerial) with the indicator of the stabilization of settlements, economic and institutional-

managerial factors with the coefficient of 361/0 and 282/0 have the highest and lowest coefficients of influence. Therefore, in the path analysis of the factors, the economic factor was considered as the dependent variable and other factors as independent variables. The result of the analysis shows that the independent variables have a significant effect on the dependent variable.

### **Conclusion**

In this research, based on the theoretical and experimental bases of natural disaster resilience (earthquake) in relation to the selection of suitable indicators for measuring the resilience of rural settlements in the rural districts of Lamerd city, the four dimensions (economic, social, infrastructural, and institutional-managerial) were used. The results of one-sample t-test indicate that the overall resilience of the rural settlements of Lamerd city is in the lower reaches, so that the social index with the highest average of 3.8, and the economic indicators, infrastructures, and institutional-managerial with an average of 2.79, 2.58 and 2.30, respectively, are lower than the expected assay. Therefore, the results of this study are consistent with the results of Ghaffari et al (2017), Roustae et al. (2017), Moazami and Rahimi (2016), and confirm the results of previous research. In the next step, using the path analysis model, the effect of each of the four indicators on the resettlement of the settlements was studied. Economic and institutional-managerial indices with the highest and lowest coefficients were 361 and 282/0 respectively, had influence coefficient on the resilience of the settlements.

**Keywords:** Natural hazards, Resilience, earthquake, Lamerd city.