The Assessment of Post-Earthquake Relocation of Rural Settlements
(Case study: Estalkhkooh Village after 1990 Earthquake of Guilan – Zanjan)

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Extended Abstract

1. INTRODUCTION
Reconstruction programs after disasters are accomplished by two approaches, in-situ reconstruction site or relocation. Different global experiments are shown lack of acceptance in relocation programs and most of the new sites are left by residence. Meanwhile, the experiment of Estalkhkooh, in Gilan province of Iran, is different. The residents have accepted the new site after relocation. The purpose of this article is to evaluate the 20 year old reconstruction process of Estalkhkooh to discover the reasons for acceptance of the relocation.

2. THEORETICAL FRAMEWORK
Relocation for future risk reduction is one of the most common solutions that governments provide to the affected areas. However, lack of attention to the various requirements necessary to carry out the planning process, might lead to physical, economic and social problems for residents. Loss of livelihoods, rising infrastructure costs, environmental problems, social and cultural alienation, loss of cultural cohesion, disruption in families and communities, are a number of side effects of world experience that related to relocation.

3. METHODOLOGY
The methodology of this study is qualitative. The research data is collected by observation, deep interview, mid-deep interview and literature review. Due to the lack of written documents in reconstruction process of the study area, deep interview with people, especially members of the village council, was carried out. Afterwards, the reconstruction documents of the village have been gathered by transcribing and comparing the recorded interviews.

According to the aforementioned facts, it seems that five aspects including geographical location, socio-cultural, political factors, economic factors, physical characteristics (texture and housing), and agents involved in the reconstruction, can be used in evaluating the relocation process. These aspects are used for assessing the Estalkhkooh relocation, as well.

4. DISCUSSION
Estlakhkooh is one of the villages of Khorgam Rural district in Gillan province. This village is located in the rugged and mountainous part of the southern extent of the district and also in a seismic zone with a relatively high risk of earthquake. Aerial photo shows that in 1347, Estalakhkooh had a compressed and organic texture with no vegetation and single houses were distributed on a sloping land. Village houses were often built on two floors. Estalakhkooh houses, like most villages in Gillan, had been made up of stone or wood foundation, sloping roof, wood pile and Zigali system.

There was a severe earthquake in the provinces of Gilan and Zanjan on the 31th of Khordad in 1990 (20 June 1990) that destroyed hundreds of villages. In that earthquake, Estalakhkooh Village faced with some losses and damages. According to the interviews, nearly 30 people lost their lives in that disaster and except from two houses, other buildings were ruined.

In order to make decisions for in-situ reconstruction or relocation of villages, research was undertaken. The results of these studies suggest that the village is located between the main fault and a few minor faults. Ultimately, the village reconstruction program was developed based on the relocation for reasons as disturbed...
ownership, located in a dangerous zone, and difficulties related to collapse of construction. Housing Foundation of Mazandaran province was responsible for undertaking the relocation program, planning to the purchase of land from the owners, preparing the required maps, and separating the land.

5. CONCLUSION

In general, this reconstruction seems to have its own pros and cons. The relocation of this village was due to the tectonic reasons and to be near the faults; nevertheless, geological and climatic studies about the research study area hadn’t been conducted vastly.

The villagers are complaining about strong winds and monsoon which are due to the village relocation from foothills to plain and also un-compressed context of the village map. Improper waste disposal problem due to soil type and site flatness is another problem of the New Estalkhkoh. However, the position of the village in the plane site will accelerate and facilitate site construction activities such as plumbing, electricity, water, and so on. Moreover, being close to the old site not only protects the physical and mental conditions of the residents, but also makes it a suitable place in accessing the farmlands. Using local technique of construction with connection improvement in long term has led to independence of the residence in this respect. On the other hand, being afraid of falling from two-story building made the villagers build their houses in the horizontal plane rather than in the height. Participation of residences and also members of village council in the process of reconstruction, like choosing the location of the new sites, preparing for construction and etc. can be named as one of the reasons for accepting the new site. Generally, it seems that planning for reducing the risk, especially before occurring the disaster—especially in relocation cases, is effective in minimizing the negative aspects of it.

**Keywords:** Reconstruction, relocation, Estalkhkooh, Gilan-Zanjan earthquake.

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