

## **A Study of Effects of Resettlement Models on Changes of Quality of Life in Earthquake-Stricken Villages of Iran, Case Study: Earthquake-Stricken Villages of East Azerbaijan Province**

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### **ABSTRACT**

To improve the quality of rural life, considering the dimensions and effects of resettlement projects as the main rural communities is indispensable. The present study was conducted to investigate the effect of resettlement on quality of life and explain factors affecting it in the resettled villages in East Azerbaijan Province. The research methodology is descriptive and analytical and the required data were collected using the questionnaire tool. The study population was 37902 people living in 45 resettled villages of East Azerbaijan Province. The sample size was 400 people who were randomly selected. The questionnaire validity was confirmed by experts and its reliability was obtained 0.895 using Cronbach Formula. Results indicate that life satisfaction in Likert six-point scale was equal to 3673 and the highest and lowest levels of satisfaction are related to the areas of infrastructure and employment and income. In addition, the results of the factorial analysis were identified in nine dimensions for quality of life so that six factors of physical development, welfare services, housing quality, relations with neighboring cities and villages, hygiene and well-being totally explain 65.5% of the variance of quality of life. With respect to the importance of quality life in the development and welfare of human societies, in resettlement projects, it is necessary to considerate effects and consequences on the quality of rural life in addition to selecting the optimal rural site in order to improve the residents' wellbeing while identifying the strengths and weaknesses of these projects.

**Keywords:** Resettlement, Quality of Life, Rural Settlement, East Azerbaijan, Iran

### **INTRODUCTION**

When man came into life on Earth, nature has always challenged him. Studying the history of life on Earth also suggests that unwanted events of natural origin such as flood, earthquake, hurricane, lightning, landslides and hail have constantly challenged man's material and spiritual life (Bathrellos et al., 2012, p. 539). Earthquake has existed over the life of the earth -as the receptive and non-preventive phenomenon. This natural disaster has always been a serious threat to human societies and has torn apart the headband of many communities (Blaikie et al., 2014, pp. 111-112). In order to prevent further losses of life and property, displacing and changing the location of the villages affected by natural disasters or implementing economic projects or even some natural, social and political become inevitable (Tashi & Foggin, p. 136). Locating and displacing rural settlements without conducting a detailed study will have different economic, social, political, and environmental and physical consequences of so that these interventions can lead to the instability and confusion of

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rural environment (Fan et al., 2015, p. 146). These conditions cause economic, natural and physical values of land such as the natural beauty, spirit and identity of places to experience erosive process (Xu et al., 2011, pp. 59-60).

The main purpose of rural resettlement is paving the way for the establishment of villages located in high-risk areas and villages that for various reasons, their displacement is necessary so that the residents' livelihood and well-being improve from different aspects after displacing and time passing. Thus, it is essential to resettle and locate the villages based on appropriate methods consistent with environmental characteristics (Connell, 2012, p. 129). Displacing human often is along with anxiety, increase of costs and delay of actions, while inevitable displacement can be an opportunity for development. In displacement, the beneficiaries should participate in programs. This close relationship causes to overcome problems easier. Spending more time and effort at this stage will reduce many of future issues (Dunford & Li, 2011, pp. 999-1000). Displacing population is not a purely physical phenomenon and the nature of economic and social organization, especially in rural environments with the natural environment has a twofold action. With regard to the close relationship of rural communities with the natural environment and the fact that a major part of villages are formed and affected by natural factors such as rivers, spring, and mountain, displacing and transport them to another location certainly break their social, economic, and natural bonds with nature and raises some problems concerning residents' acclimatization to a new environment (Wilmsen et al., 2011, pp. 22-23). In addition, projects entitled "rural integration" have been implemented in Iran that their most important goals was to establish towns and assemble scattered and sparsely populated villages in order to facilitate the provision of services, expand productive activities, provide the welfare of the population and reduce in discriminate rural migration (Afrakhteh, 1996, p. 88).

In general, in reconstructing damaged regions and especially in improving earthquake-stricken villages, several executive policies are suggested. Therefore, while new practical models can be implemented in the damaged community, reconstructing and renovating in the unsuitable place can be prevented (Wang, 2015, pp. 12-13).

With respect to the importance of quality of life in the development and welfare of human societies, measuring quality of life and explained its effective factors are highly important. Therefore, it is necessary to analyze villagers' life status in addition to selecting the optimal location of the village, after the resettlement of the villagers (Tersoo, 2014, p. 28). Quality of life is an interdisciplinary issue and a multidimensional and dynamic concept that is composed of objective and subjective dimensions (Poomalar & Arounassalame, 2013, p. 137). Quality of life is affected by the time and geographical location the value system of the society and refers to individual's satisfaction feeling of life conditions (Rezvani, 2012, p. 17). Finally, the subjective indicators of quality of life are obtained from the survey of residents' perception, assessments and satisfaction of life, while objective indicators are relevant to observable facts, which are often obtained from secondary data (Petrosillo et al., 2013, pp. 610-612). Therefore, according to the avoidance of the displacement and resettlement of some villages as well as due to the necessity and importance of examining its effects on the quality of rural life, the main objective of this paper is to examine and answer this basic question that what the effects of rural resettlement are on the quality of rural life. Thus, the overall satisfaction with the quality of life and areas as well as dimensions and factors affecting quality of life in the resettled earthquake-stricken villages of East Azerbaijan Province are studied and analyzed.

## **THEORETICAL PRINCIPLES**

Quality of life is a multifaceted and relative concept affected by the time and place, personal and social values, which covers objective and external as well as subjective and internal. Pacione believes that the term quality of life refers to the environmental conditions in which people live such as pollution and housing quality as well as some of the traits and characteristics of people like health and access (Pacione, 2003, pp. 19-30). Historically, the first attempts to measure the quality of life are rooted in the movement of social indicators (Biderman, 1974, p. 27). In addition to the problem of the definition of quality of life, various discussions are suggested regarding the areas used in the study of quality

of life. Micheal (2000) depicts the areas of quality of life as security, health, personal development, social development, physical environment and natural resources, goods and services. Henderson et al. (2002) have proposed twelve areas including education, work, energy, environment, health, human rights, income, infrastructures, security, reforms and housing to measure quality of life. Hagerty et al. (2001) stated that seven areas including relationships with family, emotional well-being, physical well-being, health, labor and productive activity, sense of belonging to society and personal security can cover the space of quality of life (Hagerty et al., 2001, p.1).

Ballesteros (2002) considers nine areas of economic resources and consumer conditions, labor and employment status, education and access to schools, health and access to health services, life and social relations, housing and its facilities, culture and leisure, personal security and resources and political resources and participation. From the perspective of sustainable rural development, some criteria are effective to measure quality of life. In this general framework in order to reach rural social stability, the component of quality of life is defined, which includes criteria of the quality of employment, income, services and housing (Liu et al., 2013, p. 313). From another perspective, the indices effective in measuring quality of life can be divided into several categories. These indices are:

- Bioenvironmental indices such as protected areas, environment pollutants and natural landscapes;
- Indicators related to natural disasters such as zoning (floods, earthquakes, etc.);
- Economic indices such as the distance from agricultural lands and active place of residence, economic value of land in a new location of establishment and land ownership of the mentioned lands;
- Social indicators such as ethnic and cultural issues and social acceptance of new place by residents, dependence on previous place and rate of willingness to displace;
- Physical indices such as way of accessing roads, upstream service centers, plans and programs of executive departments in the new settlement location (Kolodinsky et al., 2013, pp. 115-118).

In recent studies, quality of life is measured in two methods. The first method uses objective indicators to measure quality of life. Measurable objective, social and economic indices are to reflect the total amount of satisfying human needs that are analyzed using official reports and statistics. In the second method, subjective indices exist that evaluate individuals and groups' satisfaction levels, which are called "subjective well-being (Costanza, 2007, p. 267).

Hardoy and Satterthwaite believe that in the past, resettlement and displacement have been from high to low and government-led and refused public participation, therefore, it led to housing that people were reluctant to accept it in the place where no one wanted to live there (Hardoy & Satterthwaite,

1993, 11). Currently, planned displacement is continued in many developing countries in various forms. Based on the politics and strategies of the World Bank, resettlement sites should be in consultation with the displaced individuals and host communities. The resources and plans for land-use should be fully evaluated. Site selection, available options for shelter and infrastructure used in the new site should be reflected in terms of people's preferences and the best opportunities for the timely reconstruction of living site. Locating and protecting the community are among the most important fields considered in the resettlement site selection. Thus, resettlement sites should provide people with access to productive resources, employment and business opportunities (Xu et al., 2011, p.57). In this context, examining the experience of the examples of India, Bangladesh, Philippines and Thailand showed that resettlement benefits included legal popularity of land or housing to ensure the tenure and improve the body and the infrastructure. However, these projects failed in poor location, lack of employment opportunities and high cost of transportation. Based on the lessons learned from the resettlement program in Dhaka, it was concluded that five key forces including organizational issues, resources, cultural understanding, use of appropriate technology and public participation constitute the process for the implementation of any resettlement program. The consideration of the issues relevant to the enhancement of resettlement discussions, nature of the settlement process and significant beneficiaries has become a key to the success or failure of the projects (Townsend et al., 2014, pp. 602-604). Operational policies for reconstruction are assembly and integration, displacement or transmission and reconstruction that their dimensions are analyzed as follows:

### **Assembly and Integration**

One of the executive policies in the reconstruction of damaged region due to natural disasters (case of earthquake) or human accidents is the policy of integrating damaged residence regions. In this way, small and disperse settlements, especially the settlements with massive damage or those with major problems due to great distance in terms of providing new services and infrastructures are assembled in a new site (without previous residence) or several villages are assembled in one village and reconstruction is conducted in that particular site (Birch, 2012, p. 648).

### **Reconstruction**

In this method, a village is reconstructed in its original location. Reconstruction operations (without changing site) are implemented in order to promote the quality of environment and available infrastructure, prepare social services and implement economic plans for people's welfare. Reconstruction policies are implementable in cases where:

- The previous village texture is garden house and family's dependence on the area of the existing house is high;
- Destruction resulted from calamities is less and excavation is economic;
- No suitable land exists for reconstruction close to the settlement or transfer is not needed.

### **Displacement and Transfer (Resettlement)**

The resettlement of destructed residence centers is among other conducted ways in damaged areas depending on the site and sometimes due to inattention. In this method, owing to the high volume of destruction or intensive movements and ground sliding (concerning earthquake) in case of the appropriateness of lands surround the village, the residence site would be transferred to a location adjacent to the previous site and reconstructed (Chung, 2010, pp. 422-423). Generally, along with displacement plan, individuals' health and economic status should be controlled and they should be

informed of the public interest of national development plans and their identity should be maintained. Many people, especially the elderly, have emotional attachment to the place where were born and grown. Therefore, in these cases, they should be treated with care and respect and compulsion should be always avoided. On the contrary, they should be encouraged to displace in order to enjoy higher living standards so that they are ensured that resettlement is on their behalf to improve their conditions. Therefore, they should participate in it (Ibid., p. 432). The monitoring indicators (assessing the potential effectiveness) of resettlement programs from the perspective of the World Bank (1996) (1993) include the following cases:

- How is the enjoyment amount of the affected society?
- Is the quality of built houses standard?
- Is the dislocated site selected and developed according to the standards?
- Are displaced persons resettled in new houses?
- Are assistance measures implemented for the host communities?
- Are repair and reconstruction measures implemented for social and servicing infrastructure?
- Have the resettled communities' access to schools, services, health and cultural activities sites?
- Are income and livelihood restoration activities (such as alternative land use, restarting production and training individuals) included in the program?
- What changes have occurred in employment patterns, production and use of resources compared to the previous status?
- What changes have occurred in the cost of living and income compared to the time before the project?
- What changes have occurred in social and cultural parameters associated with living standards?
- What changes have occurred for vulnerable groups? (Wilmsen et al., 2011, pp. 25-28).

Therefore, since in the resettlement of villages, the environmental changes are to improve the infrastructures and increase local residents' quality of life of, environmental sustainability will be ensured only when beneficiaries' views including local residents, spatial planners, farmers, managers and other groups are considered. When the plan indices of rural settlements cover different stages from understanding to executive management, the efficiency and effectiveness of these projects will be better.

## **METHODOLOGY**

The objective of this study was to investigate the impact of resettlement on the quality of life in the resettled villages in the displacement method, resettlement with integration and the complete reconstruction of earthquake-stricken villages in 2013 in East Azerbaijan Province. In this way, the indices affecting the quality of life were determined through various aspects of library studies and reviewing the literature in different parts of Iran and the world. By studying the research literature, seven areas including housing, infrastructure, environment, utilities, information and communications, well-being and employment and income were selected to analyze the negative and positive consequences of resettlement and their effect on the quality of rural life in order to identify the principles and criteria that should be considered in resettlement projects better. The research statistical population is the households living in the resettled villages.

**Neghabi, Mahbubeh et al. “A Study of Effects of Resettlement Models on Changes of Quality of Life in Earthquake-Stricken Villages of Iran, Case Study: Earthquake-Stricken Villages of East Azerbaijan Province”**

The research methodology is descriptive-analytical and to conduct the research using Cochran Formula, 400 samples were randomly selected among the population of the villages’ residents. Their quality of life was studied using subjective indicators. The data collection tool was the questionnaires that researchers prepared it according to the research objectives. In addition to completing the questionnaire, a qualitative approach of field research, case and group interviews with the villages’ residents and local officials as well as reviewing available documents were used and the information of the two communities was collected.

The used questionnaire included closed questions with answers in six Likert scales (completely satisfied 6 to completely dissatisfied 1), which the questions were defined within seven major areas of life. In order to measure the internal validity, first content validity was used to increase the questionnaire validity. In this method, using tested scales in the researches of quality of life and professors and experts’ views, the first step was taken. Then, the developed questionnaire was completed in two introductory and final levels and with studying the answers obtained from 40 questionnaires and performing appropriate statistical calculations, the final questionnaire was formulated. Alpha’s Cronbach was employed to measure the reliability of the research tool (Tab 1).

**Table1.** *Indices of quality of life*

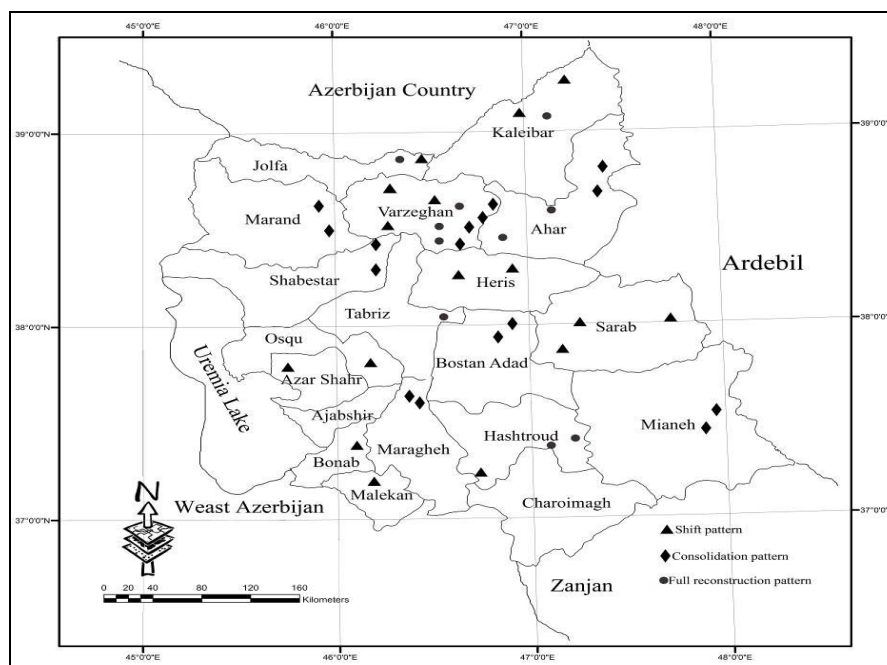
Areas	Indices
Housing	Quality of housing in terms of used materials , housing facilities (bathroom, kitchen etc.), housing area, proportion of the number of rooms to the number of households, housing position to environmental and noise pollution, feeling peace and convenience in house, people’s ability to provide appropriate housing, supervising housing construction, status of registering residential estate
Infrastructures	Condition of drinking water in the village, providence of oil products for cooking and heat, quality of power and lighting in houses and public passages, condition of roads to villages, quality of passages, streets, alleys and squares of villages, making villages safe against natural disasters normal such as flood and earthquake, distance between life location and agricultural lands and gardens, status required of water for watering farms and gardens
Environment	Condition of collecting and discharging surface waters, collecting and discharging sewage, collecting and discharging garbage disposal, cleaning streets, sidewalks and alleys, quality of natural and artificial landscapes of villages, quality of life environment beautification
Welfare services	Access to health facilities such as doctor and pharmacy, access to educational facilities such as schools, access to cultural facilities such as public library, access to recreational and sports facilities, access to food stores such as bakery, butchery, and supermarket
Information and communications	Access to public transportation and telecommunications facilities such as phone, access To postal facilities such as post box and post office, access to the Internet, News paper, magazine, village residents’ relationships with adjacent villages
Well-being	Feeling security in village, family health condition, relations with neighbors, feeling attachment to village, trustworthiness of villages’ residents
Income and employment	Household income, household saving, household properties such as housing, land, and car, people’s economic condition, job security

Subjective approach was used to measure quality of life. For this purpose, in measuring the overall quality of life, intuitive and logical responses were used. First, in the overall quality of life questionnaire, the respondent was questioned and after raising questions concerning satisfaction with various areas of life, respondents ‘overall quality of life was asked again. The first and second questions were considered as intuitive quality of life and logical quality of life, respectively.

Descriptive statistics, factorial an alysisand regression analysis were used to summarize the results of the survey, identify the quality of life dimensions, establish a causal model of quality of life or identify factors affecting quality of life the SPSS Software, respectively.

## THE STUDY AREA

East Azerbaijan Province as one of the provinces of the northwestern of Iran has experienced numerous earthquakes. The last earthquake higher than 6 degrees on the Richter scale in the province was within the surroundings of cities of Varzaqan and Ahar that damaged more than 200 villages causing financial and life losses. Aside from this earthquake, since 25 years ago, various earthquakes occurred that have led to the resettlement of 45 villages in the entire province, which are studied in the present research. Among these villages, 10, 18 and 16 villages were in the form of displacement, integration and complete reconstruction, respectively.



**Figure1.** Study area

A total of 45 villages in this study had 37902 people and 7782 households. Among the number, 29, 46 and 25 percent of people are resident in assembled, reconstructed, and displaced villages, respectively. The other characteristics of the study villages have been as Table 2 shows.

**Table2.** Social profile rural area

Type of village	Percentage of males	Percentage of females	Employment of males	Employment of females	Literacy of males	Literacy of females
Displaced villages	50.45	49.55	82.20	75.31	64.40	57.50
Reconstructed villages	54.5	46.50	84.24	80.50	68.15	59.15
Assembled villages	52.25	47.75	83.15	78.11	71.30	62.2

**Source:** Authors' calculations, 2016

## RESULTS

According to the literature, seven areas of quality of life were identified and used to analyze the positive and negative consequences of resettlement and its effect on quality of life.

### Life Satisfaction

To measure life satisfaction, the method proposed by Fu (1998), Ibrahim and Chang (2002), and Das (2008) was used. In this method, two questions in Likert six scales (from 1 for completely dissatisfied to 6 for completely satisfied) were used at the beginning and end of the questionnaire. The proposed questions at the beginning and end of the questionnaire were considered intuitive and logical answers,

respectively. The value of the average of answers to these two questions shows the rate of life satisfaction in the study area. Using intuitive and logical responses to measure life satisfaction in addition to compare the two answers, provides the opportunity to a more accurate and more confident answer regarding individuals’ overall quality of life. The data analysis indicated that the average value of life satisfaction in terms of intuitive answer in the studied villages is 3.677. According to the intuitive answer, in the all studied villages, 38.8% of respondents were dissatisfied with their life in general. The average value of life satisfaction in terms of logical answer did not show much change in relation to the institutive answer so that average life satisfaction in the entire studied in terms of logical answer is 3.669. According to the logical answer, in the all studied samples, 37.688% of respondents were dissatisfied with their life in general.

### **Satisfaction with Various Areas of Life**

Respondents’ satisfaction with various areas of life based on Likert six scales was questioned. The objective is to measure individuals’ satisfaction with study areas and identify the areas that individuals have the highest and lowest satisfaction levels with them.

The highest and lowest average values are relevant to the areas of infrastructures as well as employment and income. Approximately 78.5% of respondents were satisfied with the status of the infrastructures in their village, while only 16.5% of respondents were satisfied with the status of employment and income in these villages. The area of housing also shows a good condition and has an average value of 3.788 in the Likert six scales. While, the area of welfare services has an inappropriate condition with an average of 2.550 (Table 2).

**Table2.** Satisfaction with areas of quality of life

Domains of quality of life	Average	Quite satisfied	Very satisfied	Satisfied	Dissatisfied	Very dissatisfied	Completely dissatisfied
Housing	3.778	6.3	15.2	49.4	17.7	6.1	5.3
Infrastructure	3.549	5.1	27.8	45.6	7.6	6.3	7.6
environment	3.149	1.3	12.7	32.9	22.8	12.7	17.7
welfare Services	2.558	1.3	2.5	17.7	39.2	12.7	26.6
Information and communication	3.445	2.5	7.6	43.0	34.2	5.1	7.6
Welfare	3.554	7.6	11.4	43.0	13.9	13.9	10.1
Employment and income	2.567	1.2	2.6	12.8	41.7	18.7	23.1

**Source:** Research Funding, 2016

### **Quality of Life Dimensions**

According to the multi-dimensionality of the concept of quality of life, in this study, factorial analysis was used to identify the dimensions of quality of life. To identify the dimensions of quality of life, 37 subjective reagents studied in the survey of households, was used. In general, factor analysis is a statistical technique that is often used to extract the unclosed subsets of the reagents, which explain the observed variance in the initial data set. The value of KMO for this study is 0.855 and Bartlett’s test has a significance level of 0.000, which indicates that the data are suitable for factorial analysis. The results of factorial analysis are shown in Table 4.

The number of extracted factors by eigen value and scree plot is nine factors. The nine factors have explained 78.724% of the total variance of the data.

### **The First Factor**

This is the highest load factor for the indices of condition of roads to villages, distance between life location and agricultural lands and gardens, cleaning streets, sidewalks and alleys, making villages safe against natural disasters normal such as flood and earthquake, quality of natural and artificial



landscapes of villages, quality of passages, streets, alleys and squares of villages, collecting and discharging garbage disposal, and providence of oil products for cooking and heat. This factor is called “physical development”. The factor is loaded with eight factors with the eigen value of 5.015 explains 15.987% of variance.

#### **The Second Factor**

This is the highest load factor for the indices of access to recreational and sports facilities, access to the Internet, newspaper, magazine, access to cultural facilities such as public library, access to health facilities such as doctor and pharmacy, job security, and access to public transportation. Thus, this factor can be called “utilities”. The factor is loaded with six factors with the eigen value of 3.354 explains 11.365% of variance.

#### **The Third Factor**

This is the highest load factor for the indices of housing area, proportion of the number of rooms to the number of households, household facilities (bathroom, kitchen etc.), and people’s ability to provide appropriate housing. This factor can be called “household facilities”. The factor is loaded with four factors with the eigen value of 2.569 explains 9.328% of variance.

The Fourth Factor: This is the highest load factor for the indices of household saving, household income, as well as household properties such as housing, land, and car, people’s economic condition. This factor can be called “economic status”. The factor is loaded with four factors with the eigenvalue of 2.559 explains 6.875% of variance.

#### **The Fifth Factor**

This is the highest load factor for the indices of feeling attachment to village, trustworthiness of villages’ residents, relations with neighbors, family health condition and feeling security in village. This factor can be called “life well-being”. The factor is loaded with five factors with the eigenvalue of 2.247 explains 5.985% of variance.

#### **The Sixth Factor**

This is the highest load factor for the indices of supervising housing construction, quality of house in terms of used materials, and status of registering residential estate. This factor can be called “house resistance”. The factor is loaded with three factors with the eigenvalue of 2.120 explains 5.832% of variance.

#### **The Seventh Factor**

This is the highest load factor for the indices of condition of drinking water in the village, collecting and discharging sewage, and collecting and discharging garbage disposal. Therefore, this factor can be called “health status”. The factor is loaded with two factors with the eigenvalue of 1.897 explains 5.569% of variance.

#### **The Eight Factors**

This is the highest load factor for the indices of housing position to environmental and noise pollution, and feeling peace and convenience in house. This factor can be called “housing convenience”. The factor is loaded with two factors with the eigenvalue of 1.653 explains 4.874% of variance.

#### **The Ninth Factor**

This is the highest load factor for the indices of village residents’ relationships with adjacent cities as well as village residents’ relationships with neighboring villages. This factor can be called

**Neghabi. Mahbubeh et al. “A Study of Effects of Resettlement Models on Changes of Quality of Life in Earthquake-Stricken Villages of Iran, Case Study: Earthquake-Stricken Villages of East Azerbaijan Province”**

“relationships with adjacent cities and villages”. The factor is loaded with two factors with the eigenvalue of 1.374 explains 4.309% of variance.

**Table4.** Matrix of factorial loadings for quality of life

Variables	1	2	3	4	5	6	7	8	9
Condition of roads to villages	0.883								
distance between life location and agricultural lands and gardens	0.875								
cleaning streets, sidewalks and alleys, making villages	0.732								
safe against natural disasters normal such as flood and earthquake,	0.651								
quality of natural and artificial landscapes of villages,	0.645								
quality of passages, streets, alleys and squares of villages,	0.635								
collecting and discharging garbage disposal,	0.622								
providence of oil products for cooking and heat	0.510								
Access to recreational and sports facilities access to the Internet, newspaper, magazine access to cultural facilities such as public library access to health facilities such as doctor and pharmacy, job security access to public transportation		0.745 0.698 0.657 0.551 0.453 0.398							
Housing area proportion of the number of rooms to the number of households Household facilities (bathroom, kitchen etc.) people’s ability to provide appropriate housing			0.654 0.553 0.334 0.321						
Household saving household income as well as household properties such as housing, land, and car people’s economic condition				0.785 0.756 0.752 0.400					
Feeling attachment to village trustworthiness of villages’ residents relations with neighbors family health condition feeling security in village					0.750 0.639 0.628 0.464 0.460				
Supervising housing construction quality of house in terms of used materials status of registering residential estate						0.789 0.657 0.591			
Condition of drinking water in the village collecting and discharging sewage							0.569 0.502		
Housing position to environmental and noise pollution,								0.721 0.635	

**Neghabi, Mahbubeh et al. "A Study of Effects of Resettlement Models on Changes of Quality of Life in Earthquake-Stricken Villages of Iran, Case Study: Earthquake-Stricken Villages of East Azerbaijan Province"**

feeling peace and convenience in house									
Village residents' relationships with adjacent cities as well as village residents' relationships with neighboring villages									0.750 0.723
Eigen value	5.015	3.354	2.569	2.559	2.247	2.120	1.897	1.653	1.374
Variance percentage	15.987	11.365	9.328	6.875	5.985	5.832	5.569	4.874	4.309

**Source:** Research Funding, 2016

**Factors Affecting Quality of Life**

To determine the most important areas of subjective quality of life that explains the variance of satisfaction with quality of life, stepwise regression analysis was used. Logical quality of life was considered as the dependent variable. In addition, nine factors of subjective equality of life including physical development, welfare services, housing quality, economic status, well-being, housing resistance, hygiene, comfortable housing and relationships with neighboring cities and villages were used as predictors. In this model, six factors of physical development, welfare services, housing quality, relationships with neighboring cities and villages, hygiene and well-being explain 63.5% of the variance of logical quality of life. Regression analysis results are shown in Table 5. The adjusted coefficient also indicates that other variables have been in the rate of the quality of life in the study villages, which are not investigated in the present study.

**Table5.** Predictors of subjective quality of life in the studied area

Predictors	R <sup>2</sup>	Adjusted R <sup>2</sup>	Beta	T	Significance
Physical development Welfare	0.551	0.512	0.654	19.85	0.000
services Housing facilities	0.481	0.412	0.452	14.23	0.000
Relationships with neighboring cities and villages	0.233	0.211	0.241	6.54	0.000
Hygiene	0.125	0.105	0.145	5.87	0.000
Well-being	0.098	0.084	0.105	4.96	0.013
	0.084	0.072	0.100	2.635	0.044

**Source:** Research Funding, 2016

**DISCUSSION AND CONCLUSION**

In the present research, quality of life and the factors affecting it in the resettled villages were measured and explained. The approach used to measure quality of life is subjective approach and emphasis on individuals' overall satisfaction with life and different areas of life. To measure individuals' overall satisfaction with life, intuitive and logical answers were considered. The results indicated that the average value of life satisfaction in terms of intuitive a sweris 3.677. The average values of life satisfaction in terms of logical a sweris 3.669. The comparison of scores related to intuitive and logical quality of life answers showed the low average value of quality of life versus intuitive quality of life. It shows that the respondents after considering all aspects and areas of life, changed their views on life satisfaction. However, the average value of3.673 for the entire studied sample represents average life satisfaction in the resettled villages. The average value of life satisfaction in terms of logical answer in the study of Fu (1998) using a Likert five scale, Ibrahim and Chang (2002) using a Likert five scale, Das (2008) using a Likert five scale and Rezvani et al. (2012) using a Likert ten scale was 3.65, 3.637, 3.37 and 6.56, respectively. The results of logical quality of life in the present study also showed almost the same status compared to the mentioned studies. To measure individuals' satisfaction with areas of life, seven areas including housing, infrastructures,

environment, utilities, information and communications, well-being and employment and income were considered. The results of respondents' satisfaction with the seven areas of life showed the highest satisfaction was related to the area of infrastructure with the average value of 3.949 and the lowest level of satisfaction was related to the area of employment and income with the average value of 2.557. The results of measuring respondents' satisfaction with the areas of life indicate the desirable plan and preparation of infrastructure and housing in the resettled villages, but only paying attention to some areas of life does not bring good quality of life for the residents. The area of income and employment in the resettlement of the studied areas are utterly ignored, since displacing many income sources has discredited households in the previous location on the one hand, and no program is designed for employment and income in the new location, on the other hand.

To identify factors affecting the quality of life in the resettled villages, stepwise regression analysis was used. Before stepwise regression, factorial analysis was employed in order to identify aspects of quality of life. The results of the factorial analysis provide us with components that are inconsistent and independent. Therefore, entering these components as independent variable in the regression analysis creates the possibility of establishing a causal model with the lowest error for us. The results of the factorial analysis identified nine components for quality of life in the studies area. These nine factors including physical development, welfare services, housing quality, economic status, well-being, housing resistance, hygiene, comfortable housing and relationships with neighboring cities and villages explain approximately 63% of the variance of the initial data. The results of regression analysis indicated that six factors of physical development, welfare services, housing quality, relationships with neighboring cities and villages, hygiene and well-being totally explain approximately 63.5% of the variance of logical quality of life.

In addition to the above-mentioned analysis results, group interviews with residents and local authorities, which were conducted with regard to the qualitative approach in these two villages, indicate the fact that rural communities are closely linked with their surrounding natural environment and a major part of villages are formed and affected by natural factors such as river, spring, and mountain. Therefore, displacing and transport them to another location certainly break their social, economic, and natural bonds with nature and raises some problems concerning residents' acclimatization to a new environment. In addition, according to the displacements, problems such as distance from agricultural lands, degradation of pastures and livestock due to lack of access to mountain and pastures and reduction of site attachment due to lack of collective memories of the past can be mentioned. Furthermore, with respect to the displacement and integration, problems such as disturbance of the neighborhood system, fading of social relationships due to the disruption of the past system, fading of traditional customs owing to the arrival of people from other villages and integration of the residents of different villages in one location can be stated. In field visits to villages, the mismatch between the width of accessing paths and the volume of traffic, residents' need, the lack of green spaces and visual beauty suitable for the rural environment is visible. Moreover, according to the interviewee's view in each of the studied villages, building incomplete houses due to the lack of loans and owners' financial affordance in completing the buildings after their displacement can be mentioned. Therefore, offering plan and technical and specifications in the type form to the rural residents was not welcomed seriously by the mind the people themselves designed and changed the plan and infrastructure. This led to the fact that the government supported that part of the infrastructure, which has been considered in housing consumption pattern in case of applicant's weak financial strength in the forms of incomplete, abandoned or in the case where part of the infrastructure is used.

Although thus far, the socioeconomic, physical and bioenvironmental effects of resettlement are considered, this framework cannot be perfect. According to the results of this study and the impact of resettlement on the different areas of quality of life, it is proposed to regard the framework of quality of life in the evaluation prior to the implementation of the plan of resettlement and the assessment of the potential impacts of these projects, since quality of life regards all aspects of human life and includes the subjective and objective aspects.

## REFERENCES

- [1] Afrakhteh, H. (1996). Evaluating the results of the implementation of the plan of rural organization in Iran (Case Study of Sistan and Baluchistan Province), Proceedings of organization of dispersed villages, Hamadan.
- [2] Rahmati, M. M. (2006). Socioeconomic transformations of integration of villages in the earthquake-stricken region of Roodbar and Manjil, Journal of Iranian Social Studies, Vol. I, No. 2.
- [3] Ballesteros, M. (2002), Rethinking institutional reforms in the Philippine housing sector, no. 16, Philippine Institute for Development Studies.
- [4] Biderman, A. D. (1974), Social indicators. In R. L. Clewett & J. C. Olson (Eds.), whence and whither in social Indicators and marketing, Chicago: American Marketing Association, pp 27-44.
- [5] Birch, J. (2012). "Coalescent communities: Settlement aggregation and social integration in Iroquoian Ontario." *American Antiquity* 77(4): 646-670.
- [6] Canada Inc., and Androdev Canada Inc., Experience with Dams in Water and Energy Resource Development in The People's Republic of China.
- [7] Chung, H. (2010). "Building an image of Villages-in-the-City: A Clarification of China's Distinct Urban Spaces." *International journal of urban and regional research* 34(2): 421-437.
- [8] Connell, J. (2012). "Population Resettlement in the Pacific: lessons from a hazardous history?" *Australian geographer* 43(2): 127-142.
- [9] Costanza, R. (2007), Quality of life: An Approach Integration Opportunities, Human Needs, and Subjective Well-Being, *Ecological Economics*, No. 61, pp 267-276.
- [10] Dunford, M. and L. Li (2011). "Earthquake reconstruction in Wenchuan: assessing the state overall plan and addressing the 'forgotten phase'." *Applied Geography* 31(3): 998-1009.
- [11] Fan, M., et al. (2015). "Solving one problem by creating a bigger one: the consequences of ecological resettlement for grassland restoration and poverty alleviation in Northwestern China." *Land Use Policy* 42: 124-130.
- [12] Hagerty, Michael R. et al. (2001), Quality of life indexes for national policy: review and agenda for research, *Social Indicators Research*, Vol. 55(1), p1.
- [13] Hardoy, J.; Satterthwaite, D. (1993). Housing policies: A review of changing government attitudes and responses to city housing problems in the third world. In S. G. Cheema (Ed.), *Urban management: Policies and innovations in developing countries*, pp. 111–161.
- [14] Henderson, Hazel; Lickerman Jon; Flynn Patrice. (2000), *Calvert-Henderson Quality of Life Indicators*, Calvert Group Publisher.
- [15] Kolodinsky, J. M., et al. (2013). "It is not how far you go, it is whether you can get there:

**Neghabi, Mahbubeh et al. "A Study of Effects of Resettlement Models on Changes of Quality of Life in Earthquake-Stricken Villages of Iran, Case Study: Earthquake-Stricken Villages of East Azerbaijan Province"**

- modeling the effects of mobility on quality of life in rural New England." *Journal of Transport Geography* 31: 113-122.
- [16] La Rovere, E.L.; Mendes, F.E. (2000), Tucurí Hydropower Complex Brazil, Cape Town, South Africa: Case study prepared for the World Commission on Dams (<http://www.dams.org/kbase/studies/br>).
- [17] Liu, N., et al. (2013). "Health-related quality of life and long-term care needs among elderly individuals living alone: a cross-sectional study in rural areas of Shaanxi Province, China." *BMC public health* 13(1): 313.
- [18] Obusu-Mensah, K. (1996), Ghana's Volta Resettlement Scheme: The long-term consequences of post-colonial state planning. London: International Scholars Publications.
- [19] Ortolano, L.; Kao Cushing, K. et al. (2000), Grand Coulee Dam and the Columbia Basin Project, USA. Cape Town, South Africa: Case study report prepared as an input to the World Commission on Dams.
- [20] Pacione, Michael. (2003), Urban environmental quality and human wellbeing: a social geographical perspective, *Landscape and Urban Planning*, 65(1-2), pp19-30.
- [21] Petrosillo, I., et al. (2013). "The use of subjective indicators to assess how natural and social capital support residents' quality of life in a small volcanic island." *Ecological Indicators* 24: 609-620
- [22] Poomalar, G. and B. Arounassalame (2013). "The quality of life during and after menopause among rural women." *J Clin Diagn Res* 7(1): 135-139.
- [23] Rezvani M.R.; Badri, S.A.; Sepahvand F.; Akbarian Roonizi S. R. (2012), The effects of second home tourism on improving life quality of rural residents, Case: Roudbar-e Qasran District-Shemiranat County, *Urban regional studies and research*, Volume 4(13).
- [24] Robinson, S. (2000), The Experience with Dams and Resettlement in Mexico. Contributing paper prepared for Thematic Review I.3: Displacement, Resettlement, Rehabilitation, Reparation and Development. Cape Town, South Africa: World Commission on Dams.
- [25] Scudder, T. (1998), Resettlement, in Biswas, A.K. (Ed.), *Water Resources Environmental Planning, Management, and Development*, Tata McGraw Hill Publishing Company Ltd., New Delhi.
- [26] Sengupta U.; Sharma S. (2009), No longer Sukumbasis: Challenges in grassroots-led squatter resettlement program in Kathmandu with special reference to Kirtipur Housing Project, *Habitat International*, vol.33, pp34-44
- [27] Sundaram, P. S. A.; Bongirwar, A. L. (1985), An approach to shelter for squatters in Pune, *Habitat International*, vol. 9, pp 266–288.
- [28] Taneja, Bansuri; Thakkar, Himanshu. (2000), Large Dams and Displacement in India. Cape Town, South Africa: Submission no. SOC166 to the World Commission on Dams,
- [29] Tashi, G. and M. Foggin (2012). "Resettlement as Development and Progress? Eight Years On: Review of emerging social and development impacts of an 'ecological resettlement' project in Tibet Autonomous Region, China." *Nomadic Peoples* 16(1): 134-151.
- [30] Tersoo, P. (2014). "Agribusiness as a veritable tool for rural development in Nigeria." *International Letters of Social and Humanistic Sciences (ILSHS)* 3: 26-36.
- [31] Townsend, R., et al. (2014). "South East Asian migrant experiences in regional Victoria: Exploring well-being." *Journal of Sociology* 50(4): 601-615.

**Neghabi. Mahbubeh et al. "A Study of Effects of Resettlement Models on Changes of Quality of Life in Earthquake-Stricken Villages of Iran, Case Study: Earthquake-Stricken Villages of East Azerbaijan Province"**

- [32] UN-Habitat. (2003), The challenge of slums. Nairobi: UN-Habitat, p 131.
- [33] Wang, Y. (2015). "How Do We Rebuild a Disaster damaged Heritage Settlement: A study of the Post-Earthquake Reconstruction of the Village of Taoping. A Traditional Qiang Settlement in Sichuan China."
- [34] Wilmsen, B., et al. (2011). "Development for whom? Rural to urban resettlement at the Three Gorges Dam, China." *Asian Studies Review* 35(1): 21-42.
- [35] Witness for Peace (WFP). (1996), *People Dammed: The impact of the World Bank Chixoy Hydroelectric Project in Guatemala*, WFP.
- [36] World Bank Operations Evaluation Department (WBOED). (1993), *Early Experience with Involuntary Resettlement: Overview*, World Bank, Report No. 12142.
- [37] Xu Y.; Tang B.; Chan E.H.W. (2011), State-led land requisition and transformation of rural villages in transitional China. *Habitat International* (35), pp 57-65
- [38] Xu, Y., et al. (2011). "State-led land requisition and transformation of rural villages in transitional China." *Habitat International* 35(1): 57-65.
- [39] Yusufeli Dam and hepp resettlement action plan. (2006), Ministry of Energy and Natural Resources, environmental consultancy co., Ankara, Turkey.
- [40] Bathrellos, G. D., et al. (2012). "Potential suitability for urban planning and industry development using natural hazard maps and geological–geomorphological parameters." *Environmental earth sciences* 66(2): 537-548.
- [41] Blaikie, P., et al. (2014). *At risk: natural hazards, people's vulnerability and disasters*, Routledge.

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