

Analyzing the Economic Effects of Livability on Population Sustainability in Rural Settlements : A Case Study of Villages in Golbahar District of Chenaran County

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Abstract Livability is a notion that is formed from the entanglement of a number of economic, social and environmental concepts. Economic livability is assessed by employment levels, net income and living standards of people in a region. The basic problems of rural life are less in relation to economic issues, such as the lack of job opportunities, income and facilities. This study has been conducted with the aim of investigating the economic effects of livability on population sustainability in rural settlements in Golbahar District of Chenaran County. It is a descriptive-analytical research in which 324 questionnaires were completed. The data obtained from completed questionnaires were analyzed using regression or structural equations and SPSS software. According to the structural models, t-statistic has been calculated to be 2.7766, which is greater than the significance level of 0.05 with the t-value of 1.96. Thus, it can be concluded that this path coefficient is significant at the error level of 0.05. The obtained result indicates the positive economic impact of livability on popula-

tion sustainability in rural settlements. In other words, reinforcement of economic indicators of livability in rural areas will result in population sustainability in rural settlements and the rapid process of migrating villagers to cities, which causes numerous problems in urban areas, is reduced.

Keywords Livability, Economic livability, Population sustainability, Golbahar district, Chenaran county.

Introduction

Today, achievement of favorable living conditions, welfare and peace is among the main goals of achieving the sustainability of rural settlements. That is to say, sustainable rural development seeks to improve the quality of life and reach a healthy and habitable village suitable for today's conditions, which are realized through providing appropriate conditions for human life in different economic, social and physical-environmental dimensions. But among the most important factors for villagers resilience are viability, hope for the future, maintenance of the motivation for the continuity of life and activity, lack of motivation for migration and search for new ways to tackle the crisis of economic, social and environmental-physical livability (Sadeqlou and Sajasi 2014). Vergunst (2003) carried out a study on rural residents in Speing, Sweden, and introduced a viability framework. This framework showed that livability consists of interactions between 5 variables. Local residents,

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social life, service level, local economy and physical location. As to local residents, their number, demographic structure (age and sex) and lifestyle are the important factors. Service level refers to communications, schools, nursing homes and shops. Local economy reflects the ability of a location to generate income and employment and ultimately, physical location describes the landscape and buildings of the area. Vergunst's classification of the study on livability into 5 main variables has the probability of highlighting the meaning of livability, which depends on the interests and views of researchers or participants and may emphasize the interaction framework. He proposed that this framework should be considered as an exploratory model so that different societies are able to discover views in a wider framework (Jasmine and Hariza 2010). The concept of livability has become popular since the 1980s after continuing the growing trend of immigration and evacuation of villages and creating suburban areas along the cities (Bouzarjomehri et al. 2017). Livability is a multi-dimensional concept that sometimes has many overlaps with the concepts of quality of life, welfare and satisfaction with living conditions and its overall meaning consists mainly of both objective and subjective aspects (Dajian and Peter 2010). Livability as a concept can be very broad or limited according to the context in which it is defined. However, the quality of life in every place is the focus of this concept and includes various measurable indicators whose components are usually density, transportation, security and sustainability (Perogordo 2007, Khorasani et al. 2012). Livability is a concept that shows a complete picture of life and living conditions in one place, which provides the optimal quality of life. In a wider sense, livability is directly associated with the quality of life and welfare of residents of a specific place (Rama et al. 2010). The term livability is applied to describe the conditions that make societies better for life. Livability reflects the aspirations to create more enjoyable places in which they live. The concept of livability has been accepted by researchers who are interested in people's experiences of the quality of the home and society environment. A viable environment has been defined as a habitable environment, the degree to which local resources meet the needs of the inhabitants and satisfaction with the relationship between the individual and the environment (Pas et

al. 2015). To measure the livability of a place, we should initially consider a hierarchy of needs at the top of which basic needs are placed. In accordance with Maslow's needs pyramid (1954), local livability is not possible without access to shelter, nutrition and adequate public health. The experience of developing countries shows that viability should first be assessed by the basic needs and services that constitute the basis for humans biological and physiological survival. Individual and public security is also in the next place with little difference in terms of importance (Khorasani 2016). A viable settlement has been briefly defined as a suitable place to work and live (Khorasani et al. 2015). Viability is generally divided into 3 interdependent domains: Economy, society and the environment (Bandarabad and Almadinezhad 2014). If the function of each domain is interrupted, human settlements can quickly collapse, resulting in population decline, poverty, social conflict and increased environmental health problems (Khorasani et al. 2012). Economy is the provider of jobs and income and is essential for public health (people's ability to provide food, clothing and housing) and provision of higher-level needs such as education, health and recreation (Khorasani and Rezvani 2013). The basic problems of rural livelihood in relation to economic issues, such as the lack of job opportunities, selection of limited jobs, facilities and income, are less than urban areas (Grgi et al. 2012). Economic livability is evaluated by employment levels, net income and living standards of people in an area under study, annual number of tourists, retailers performance and value of lands and assets (Khastu and Saeidi 2010). The reality of the livability approach is to promote and develop the concepts related to the quality of life environment of people so that the best biological practices are provided for them and therefore, the ultimate goal of studying the livability of the living environment and its subsequent application is that the lives of people have good quality and be purposeful and enjoyable. In real conditions, rural environments suffer from multiple problems due to various reasons such as low population, distance from the center, geographical isolation, economic structure based on agriculture and so forth and with respect to the living conditions of urban communities, conditions and quality of life in rural environments are far from the realities and standards of contemporary

human life. This has challenged habitation and living conditions in rural environments. Hence, countries have implemented several plants and projects to overcome the mentioned problems and also increase the level of the habitability and livability of rural environments, one of the most important of which is the implementation of rural conductor projects in Iran (Sajasi et al. 2016). The importance of livability is increasingly due to the raised awareness of unsustainable patterns of life and urban consumption that are neither healthy nor sustainable and cause to reduce the power of environmental resources in the long run. New medical studies demonstrate that the increasing prevalence of health problems caused by pollution coincides with the acceptance of this issue that cities are important points of contamination in the water, soil and air, which results from the long history of heavy industrialization and reliance on cars. In addition, large cities are the consumers of a major part of ecosystem resources such as water, forests and resources of aquatic ecosystems (Khorasani and Rezvani 2013). There are still many problems and challenges in rural areas since past strategies for rural development have not been successful and have failed to address issues such as poverty, employment, health, food security and environmental sustainability; these strategies have not been effective in distributing the benefits of growth and development and have led to the creation of multiple problems for rural areas (Roknoddin and Mahdavi 2006). Low living standards in rural areas have led to major problems, one of which was the migration of villagers to major cities, resulting in numerous social, economic and environmental problems in rural areas as well as in cities (Rezvani et al. 2009). Economic factors such as low poverty and having a job, the suitability of living expenses and income and access to appropriate credits reflect the vitality of the village (Cheraghi et al. 2013). Higher income is associated with a lot of positive outcomes, including increased longevity, better health and overall life satisfaction and in contrast, low income is often accompanied by greater crimes and lower health (Biswas and Diener 2001). This research is important in that it is conducted to identify the increase in the rate of livability in rural areas, especially in the area under consideration, because livability conditions are relative and dependent on the location and time conditions. The livabil-

ity approach is generally a complicated and relative concept. It is complicated because certainly, several factors are involved in improving the living conditions of the individual and society and it is relative in that the principles and characteristics considered in one society as favorable conditions may be differently interpreted in another society or place (Isalou et al. 2014). Regarding the research theoretical resources and field studies conducted on population survival in rural areas, practical responses in 2 economic and socio-environmental sectors show that development of job opportunities in order to take advantage of relative regional capabilities and advantages is one of the most important strategies for population survival in rural areas (Akbarpour et al. 2014). In some resources, the term sustainability is meant to be preserving continuing life and existence, not stopping and not losing hope and continuing (Badri and Roknoddin 2003). In this research, by population sustainability, it is meant positive growth of population in rural settlements under investigation. In this regard, rural population of Golbahar District included 21563 people according to the 2006 census, which was reduced to 18576 people in the 2011 census and reached 20951 people in the 2016 census. Further, the number of residential villages in this district was 103 in the 2006 census, which was reduced to 90 villages in the 2016 census. thus, the main research question is as follows: How does the economic dimension of livability affect population sustainability in rural settlements?

Materials and Methods

This study is an applied research design in terms of purpose and a descriptive-analytical research in terms of method. To collect the data required for answering the research question and testing the hypothesis, documentary and field methods have been employed. With reliance on the questionnaire designed based on previous studies and available findings, the necessary information has been gathered. In this study, the economic impact of livability, including index of public transport, housing, infrastructure facilities and services and employment and income, on sustainability of rural population in Golbahar District of Chenaran County has been evaluated. The questionnaire reliability was determined by the pretest and

Table 1. Estimation of the sample size in studied villages. (+) Villages with increased population, (-) Villages with decreased population, Source: Iran's Statistics Center in 2016 and the author's calculations.

| No. | Village name | Household | Number of samples |
|-----|--------------------|-----------|-------------------|
| 1 | Asjil + | 492 | 126 |
| 2 | Kheirabad + | 84 | 22 |
| 3 | Dulkhan + | 44 | 12 |
| 4 | Kalateh Sheikhha + | 98 | 25 |
| 5 | Mohsenabad + | 85 | 22 |
| 6 | Abqad - | 132 | 34 |
| 7 | Shirin - | 45 | 12 |
| 8 | Ferizi - | 149 | 38 |
| 9 | Karangan - | 72 | 19 |
| 10 | Kamalabad - | 54 | 14 |
| | Total | 1255 | 324 |

Cronbach's alpha method. For the pretest, a total of 50 questionnaires were completed in the studied villages and then, its reliability (equal to 0.803) was approved through Cronbach's alpha test. The spatial scope of this research is Golbahar District of Chenaran County. This district is located at a geographic longitude of 58°24' to 58°50' E and a latitude of 36°17' to 36°43' N. It leads to Mashhad City from northeast, to Chenaran County from north, northwest and west and to Neyshabour County from southwest, south and southeast. The approximate area of this district is 1054 square kilometers (State Divisions, Khorasan Razavi Governorate). According to the 2016 census, there were 56 villages with over 20 households in

Golbahar District, of which 28 villages had a positive population growth and 28 villages had a negative population growth. The positive or negative growth of population in villages has been calculated based on increasing or decreasing population number in 2 censuses of 2006 and 2016 and the sample villages are 15% of 56 villages, amounting to 8.5 villages which increased to 10 villages in order for the 2 groups to be proportionate in terms of villages with positive or negative population growth. This number has been selected proportionally from each population class. Finally, simple random sampling method has been applied to determine the sample villages. In determining the sample size based on the Cochran formula, 292 questionnaires were obtained. But given that the main purpose of the work is fulfilled through regression or structural equations, 320 questionnaires need to be completed in order to estimate the model in AMOS and LISREL software in structural equations. Since in each village, the number of questionnaires is rounded up, 324 questionnaires should be completed, as shown in the Table 1 below :

To administer the questionnaire in the studied villages, systematic random sampling method has been used. The research data were analyzed through regression or structural equations and using appropriate statistical techniques and SPSS-23 and smart PLS-2 software. Besides, the research data have been expressed with the help of structural models.

Table 2. Valid percentage distribution of items in the questions. Source : Completed questionnaires.

| Component | Questions | Very high | High | Medium | Low | Very low |
|--|---|-----------|------|--------|------|----------|
| Public transport | How convenient are the access roads to the villages around you? | 11.5 | 27.2 | 49.5 | 9.9 | 1.9 |
| | How much do you have access to public transport? | 0.0 | 6.3 | 19.7 | 36.7 | 37.3 |
| Housing | How strong is the foundation of your house? | 9.0 | 18.9 | 49.5 | 17.3 | 5.3 |
| | How much do you enjoy enough area and rooms? | 5.3 | 33.9 | 42.9 | 14.3 | 3.7 |
| Infrastructure facilities and services | How much of the goods needed by households is provided in the village stores? | 0.9 | 19.5 | 36.5 | 30.3 | 12.7 |
| | How much do you enjoy cooperative services of the village? | 0.3 | 0.9 | 4.0 | 30.1 | 64.6 |
| | How much do you enjoy electricity, gas, telephone, internet? | 3.1 | 41.4 | 35.5 | 16.2 | 3.7 |
| Employment and income | How many different job opportunities are there in this village? | 0.9 | 4.6 | 20.7 | 51.1 | 22.6 |
| | How much is the access to jobs in the city or surrounding villages? | 0.0 | 5.6 | 38.8 | 39.4 | 16.1 |
| | How suitable is your job? | 3.7 | 10.2 | 52.8 | 22.2 | 11.1 |
| | How sufficient is your income? | 0.6 | 10.5 | 42.4 | 35.3 | 11.1 |
| | How much do you want to remain in the village? | 28.1 | 27.8 | 27.8 | 12.3 | 4.0 |

Table 3. The average of economic dimension and its research components in the studied villages.

| Components Village | Public transport | Housing | Infrastructure facilities and services | Employment and income | Economic dimension | Population sustainability |
|--------------------|------------------|---------|--|-----------------------|--------------------|---------------------------|
| Abqad | 2.333 | 3.069 | 1.947 | 2.260 | 2.327 | 1.581 |
| Asjil | 2.523 | 3.369 | 2.781 | 2.653 | 2.814 | 3.865 |
| Kheirabad | 3.626 | 3.191 | 2.381 | 2.500 | 2.712 | 3.371 |
| Dulkhan | 2.725 | 2.349 | 1.501 | 2.068 | 2.036 | 3.050 |
| Shirin | 2.007 | 2.667 | 1.954 | 2.193 | 2.184 | 1.795 |
| Ferizi | 2.453 | 2.914 | 2.037 | 2.224 | 2.325 | 0.619 |
| Karangan | 2.097 | 3.019 | 2.316 | 2.382 | 2.470 | 1.731 |
| Kalatch Sheikha | 3.687 | 3.196 | 2.401 | 2.529 | 2.743 | 3.504 |
| Kamalabad | 1.986 | 3.124 | 2.159 | 2.060 | 2.296 | 1.913 |
| Mohsenabad | 2.576 | 3.382 | 2.929 | 2.645 | 2.864 | 2.926 |
| Total | 2.604 | 3.165 | 2.428 | 2.461 | 2.602 | 2.803 |

Results and Discussion

Descriptive statistics of questionnaire items

Based on the survey conducted, the percentage of each option selected by respondents has been provided in the following Table 2 and the highest amount of agreement in each question has been colored.

By examining the villages in terms of components in the economic dimension, it is observed that Asjil, Kheirabad, Kalateh Sheikhha and Mohsenabad villages which have a positive population growth are higher than the average economic dimension of viability which is equal to 2.602 and enjoy better economic conditions (Table 3). Abqad, Shirin, Ferizi, Karangan and Kamalabad villages which are faced

with population decline are lower than the average economic dimension of viability, which indicates the unfavorable conditions of economic viability in these villages. This issue confirms the research hypothesis. Considering the study of the research components, infrastructure facilities and services sector of the villages with a value of 2.428 is lower than other sectors. In evaluating rural cooperative services in that sector, there is great weakness and rehabilitation of cooperatives is needed. In the employment sector with value of 2.461, the access to jobs in rural areas should be strengthened by having the priority of job diversification. In this regard, it is recommended to reinforce the livestock sector alongside agriculture and horticulture to increase rural incomes. The 2 above mentioned sectors have been evaluated to be weaker than the average economic dimension. In the

Table 4. First order confirmatory factor analysis of hidden variables.

| Component | Items | Factor loading | SD | t-statistic | AVE | CR |
|--|-----------|----------------|--------|-------------|--------|--------|
| Public transport | q01 | 0.819 | 0.0617 | 13.2805 | 0.6787 | 0.8086 |
| | q02 | 0.8287 | 0.068 | 12.1777 | | |
| Housing | q03 | 0.6607 | 0.1182 | 5.5902 | 0.6911 | 0.8119 |
| | q04 | 0.9724 | 0.0198 | 49.1858 | | |
| Infrastructure facilities and services | q05 | 0.8053 | 0.0289 | 27.8275 | 0.4894 | 0.7347 |
| | q06 | 0.4977 | 0.0688 | 7.2303 | | |
| | q07 | 0.7564 | 0.0491 | 15.4152 | | |
| Employment and income | q08 | 0.5708 | 0.0761 | 7.5043 | 0.469 | 0.7772 |
| | q09 | 0.6463 | 0.078 | 8.2827 | | |
| | q10 | 0.767 | 0.0641 | 11.9698 | | |
| | q11 | 0.7377 | 0.0655 | 11.2682 | | |
| Population sustainability | Mandegari | 0.8265 | 0.0273 | 30.3302 | 0.6997 | 0.8233 |

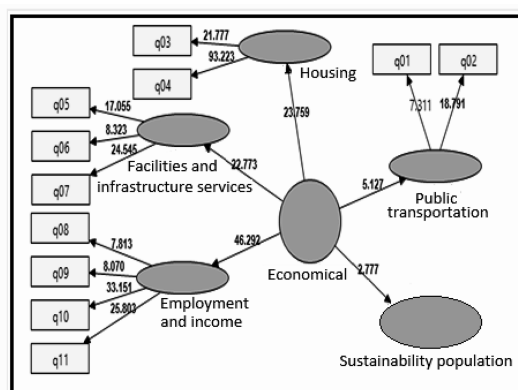


Fig. 1. Structural equation model along with t-statistics.

transport sector, access to public transport has been reported to be very poor, which requires special planning. Kheirabad and Kalateh Sheikhha have reported their transport status to be favorable because both villages are located in the path of the link road. In connection with the impact of economic viability on population sustainability, the residents reports also indicate a tendency to stay more in Asjil, Kheirabad, Dulkhan, Kalateh Sheikhha and Mohsenabad villages which enjoy higher viability. As shown in the Table 4 above, population sustainability in these villages is greater than the average of 2.408 and on the contrary, Abqad, Shirin, Ferizi, Karangan and Kamalabad villages which have population decline are faced with unsustainable population based on the above assessment.

The data obtained from the questionnaires were analyzed using regression or structural equations. Based on the structural model, t-statistic is equal to 2.7766, which is greater than the significance level of 0.05 with the t-statistic of 1.96 (Table 5). The general rule of decision-making in structural models based on

Table 5. The path coefficient and significance associated with the first hypothesis.

| Direct path | Path coefficient | SD | t-statistic | Result |
|------------------------------------|------------------|--------|-------------|-----------|
| Economic population sustainability | 0.1612 | 0.0581 | 2.7766 | Confirmed |

t-values is such that if the absolute value of t-values for a coefficient is higher than 1.96, that coefficient is significant at a 95% confidence level (Fig. 1). Hence, it can be concluded that this path coefficient is significant at the error level of 0.05 and the obtained positive coefficient suggests the positive impact of the economic dimension on population sustainability in rural settlements. Therefore, the hypothesis is confirmed at a 95% confidence level. Thus, the research hypothesis indicating the effectiveness of the economic dimension of livability in population sustainability in rural settlements is approved.

Conclusion

Livability involves multiple factors that depend on local economic, social and cultural conditions (Momtaz and Elsemary 2015). The concept of livability is a composite variable that is affected by several variables. Changes in peoples income levels, living conditions, health status, environment, psychological pressure, leisure, family happiness, social relationship and several other variables determine the living conditions and their changes in a composite manner (Sadeqlou and Sajasi 2014). With respect to the research results which demonstrate that the economic dimension of livability has been effective in population sustainability in rural settlements of Golbahar District and villages with lower economic livability are facing population decline, for population survival, it is suggested that rural roads be expanded and renovated, public transportation be considered and job creation and employment diversification that cause to increase rural incomes be strengthened. Moreover, expansion of infrastructure facilities and services, such as the revival of rural cooperatives, can be effective in providing villagers with necessities and supplying agricultural inputs. At the same time, reinforcement of rural housing should be taken into account. Since access to jobs has been less mentioned in the items of villagers, this shows the weakness of employment and unemployment in villages. Therefore, job creation and employment diversification in villages through the construction of livestock units and creation of small workshops on agriculture, horticulture and livestock supplies and also the strengthen-

ing and development of tourism should be taken into consideration so that rural incomes increase in this way. Given the research results and direct observation of the problems of villages, the following suggestions are offered to improve rural affairs: Due to the proximity of this district to Mashhad City and the need for a natural and calm environment and also the presence of natural phenomena such as rivers, mountains and countryside, it seems desirable to create the necessary infrastructure for tourism industry and organize it favorably to create employment. Considering the abundant gardens in this rural district, creation of small conversion industries in the field of garden products such as packaging and juice extracting can be effective in creating jobs and raising the income of villagers in the region. To expand the lands under cultivation, new irrigation methods such as drip irrigation and greenhouse cultivation for crops are recommended. With regard to agricultural products and the establishment of livestock units, creation of dairy production workshops and production of livestock feed and vermicompost fertilizer in livestock farms will increase income and create employment. Facilities and services such as the expansion of rural roads and the revival of rural cooperatives to serve the villagers needs and engage in activities in the field of providing agricultural inputs should be addressed. Given the research findings, it seems essential to help the reconstruction and reinforcement of rural housing which contribute to population sustainability in rural settlements in addition to employment creation.

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