

Research Paper: Assessing Social Sustainability and its Determinants: The Case of a Rural District in The West of Iran



Zainab Parvaneh¹, *Jafar Tavakkoli²

1. MSc., Department of Geography, Faculty of Literature & Humanities, Razi University, Kermanshah, Iran.

2. Associate Professor, Department of Geography, Faculty of Literature & Humanities, Razi University, Kermanshah, Iran.



Citation: Parvaneh, Z., & Tavakkoli, J. (2020). Assessing Social Sustainability and its Determinants: The Case of a Rural District in The West of Iran. *Journal of Sustainable Rural Development*, 4(1), 37-48. <https://doi.org/10.32598/JSRD.03.02.03>

doi: <https://doi.org/10.32598/JSRD.03.02.03>

Article info:

Received: 21 Sep. 2019

Accepted: 07 Feb. 2020

Keywords:

Sustainability, Social sustainability, Fuzzy Topsis Model, Path Analysis, Harsam Rural District, Western Iran

ABSTRACT

Purpose: Conceptualization and evaluation of the level of social sustainability have a special status in sustainable development literature. This study was conducted to evaluate the level of social sustainability and the determinants affecting it in the Harasam Rural District in Western Iran.

Methods: Based on the theoretical background and literature, 12 quantitative and 28 qualitative indices were examined in the framework of five components. The population consisted of 1983 households of the mentioned rural district and the sample included 340 people. The research tool was household and village questionnaires. The validity of the tool was confirmed by an expert panel and the reliability by Cronbach's alpha test ($\alpha = 0.84$). Fuzzy Topsis was used to measure the social sustainability of the villages and path analysis to analyze the data.

Results: The results showed that 100% of the villages of the rural district were in unsustainable or semi-sustainable states. Among the internal components, social justice and quality of life, respectively, had the greatest effect on social sustainability. Examining the external factors showed that the centrality of the settlement service and proximity to urban areas had a positive effect on the social sustainability of the investigated villages. Furthermore, out-immigration had the highest negative effect on the social sustainability of the villages.

Conclusion: This research re-emphasizes the importance of intra-generational justice based on social and spatial justice. Merely in the shadow of reducing social and regional inequalities and equitable distribution of development opportunities, the social sustainability of rural communities can be materialized.

* Corresponding Author:

Jafar Tavakkoli, PhD

Address: Department of Geography, Faculty of Literature & Humanities, Razi University, Kermanshah, Iran.

Tel: +98 (912) 7120806

E-mail: J.tavakkoli@gmail.com

1. Introduction

In sustainable development literature, rooted mainly in the environmental movement, social aspects of sustainability are considered less and generally as a tool for reaching sustainable development (Boehn & Hamann, 2011; McKenzie, 2004). Some critics of this approach believe that preserving the environment and providing equal opportunities for future and present generations will be logical and practical when the life of the present generation is not associated with misery, poverty, and inequality (Sen & Anand, 2000). Thus, the view prevails that social sustainability has been overshadowed and dominated by environmental-ecological sustainability and has not been conceptualized and transparent so much (Janker, Mann, & Rist, 2019; Lee & Jung, 2019; Roca-Puig, 2019). The mentioned trend has improved in recent years and social sustainability has been recognized as an essential component of sustainable development. Most of the scientific activities done on social sustainability have focused on definitions, theorizing, and interpretations of this concept. The focus of theoretical views has been on philosophical and political views, human rights, prosperity, equality and social justice, social capital, and empowerment (Woodcraft, 2012).

Recent efforts regarding defining, organizing, and operationalizing social sustainability have led to the identification of three tendencies in this regard. These tendencies are a) development sustainability looking for objectives such as basic needs, creating and maintaining social capital, justice, and equity; b) intermediary sustainability that discusses the changes in social behavior leading to biological-physical goals of sustainable development; and c) the protection sustainability that tries to preserve changing socio-cultural characteristics in societies and identify the coping methods of the people against change (Vallance, Perkins, & Dixon, 2011).

Social sustainability has largely been connected to intra-generational justice. Premature death, illness, malnutrition, illiteracy, and poverty show that today's world has failed to provide equal opportunities for all. However, as a systemic concept, sustainable development addresses the current situation as much as it does the future (Sen & Anand, 2000). Social sustainability can be examined from two aspects: procedural and contextual. In the procedural aspect, social sustainability refers to political participation in decision-making and planning processes, whereas the contextual aspect emphasizes

concepts such as local specifics, lifestyle, equality, and justice and sustainable livelihood (Tiainen, 2016). From this perspective, social sustainability occurs when formal and informal processes, systems, structures, and relationships significantly increase the capacity of current and future generations to create healthy and viable societies. Social sustainability has five key principles: equality, democracy and governance, diversity, social solidarity, and quality of life (Hale et al., 2019; Lee & Jung, 2019; Lin, Zhang, & Geertman, 2015). Colantonio considers the social sustainability discussable in demographic change, empowerment, participation, identity, sense of belonging to life place, health and security, social solidarity, social capital, welfare, happiness in life, and improving life quality (Colantonio, 2007).

In sum, one can state that from among the many components and indices mentioned by the researchers of social sustainability, the most important components emphasized by many that are focused on the procedural and contextual aspect of social sustainability are social justice, social solidarity, social participation, life quality, security, and empowerment. The evaluation of social sustainability is significant as the sustainability of human societies can be the cornerstone of economic and environmental sustainability and the close connection of these three aspects of sustainability is undeniable. This connection becomes evident in rural areas.

A glimpse at the situation of rural areas in developing countries shows that most rural settlements, more or less, face major challenges such as poverty, inequality, migration and unorganized rural population structure, low levels of social participation and inappropriate quality of life indicating social unsustainability (Pourtaheri, Zal, & Rokneddin Eftekhari, 2011). This situation can be seen in many villages in Iran, such as the area under study.

Harsam Rural District as the study area of this research located in Eslamabad-e Gharb, Kermanshah, Iran, is one of the deprived areas of the country. The evidence shows that, regarding social sustainability, this rural district faces challenges such as poverty, social inequality, imbalances in the appropriate distribution of services and facilities, the migration of rural households, as well as youth unemployment and, consequently, the migration of young workers to find a job and have a better income. Recognition of social sustainability and its determinants can provide a clear perspective for authorities and rural development planners to provide a proper understanding of existing shortcomings and challenges to achieve sustainable rural development goals. Thus, the present

study tries to answer the following questions. 1) What is the level of social sustainability of the villages in the mentioned rural district? 2) What are the most influential internal components affecting the social sustainability of the villages studied? 3) What are the most influential external components affecting the social sustainability of the villages studied?

2. Literature Review

A review of the previous studies regarding social sustainability in rural areas shows several key results: some studies merely focus on ranking and levelling the social sustainability of villages and ignore the causes and factors of the problem. The significant results of this group of studies indicate the low level of social sustainability in rural settlements (Fattahi et al., 2013; Jamini & Jamshidi, 2014; Pourtaheri, Sojasi Qidari, & Sadeghloo, 2010; Tavakkoli & Rostami, 2013). However, in some cases, the results show that the social sustainability of rural settlements is at a favorable level (Luo, Li, & Fu, 2011). Some of the studies in this regard have examined the relationship or difference between social sustainability and other aspects of sustainability (environmental and economic) in rural settlements (Ameri Siahooi, Rostam Gourani, & Biranvandzadeh, 2011; Faraji Sabokbar et al., 2010).

Some studies have stressed demographic factors, population size, migration of young people from rural areas, and changes in the age structure of the population among the societal factors of sustainability (Manos et al., 2013; Moles et al., 2008; Tavakkoli, 2014). In addition, access to required services needed by villagers is known as one of the factors affecting social sustainability of rural settlements. In this way, the villages deprived of many facilities, including public transportation, educational, health and medical, financial, and credit services, as well as appropriate infrastructure such as safe drinking water, and so on are at lower levels of social sustainability. In this regard, some researchers have concluded that the villages closer to urban centers have better social sustainability due to better access to facilities and services in nearby towns (Pourtaheri et al., 2011; Tavakkoli, 2014).

Moreover, the results of some studies showed that factors such as the level of economic development, social justice, social interaction, quality of life, reduction of employment and the loss of job opportunities, as well as tribal and religious disputes are among factors affecting social sustainability of rural settlements (Jamini &

Jamshidi, 2014; Luo et al., 2011; Manos et al., 2013; Nastaran, Ghasemi, & Hadizadeh Zargar, 2013).

From the methodological point of view, most of the previous studies have used subjective and qualitative indices in measuring the social sustainability of villages, ignoring objective and quantitative indices in this regard. A large part of these works have not used valid models in sustainability measurements, failed in weighing the indices, and considered all indices with the same weight. Besides, in measuring the determinants affecting the social sustainability of the villages, many studies merely focus on external factors affecting social sustainability and some others focus on internal factors affecting it (including its components) and fail to focus on both groups of factors simultaneously. Although the present study does not claim to be perfect, it has tried to eliminate the shortcomings and even evaluate the social sustainability of the villages and the factors affecting it more comprehensively.

3. Methodology

The study area

The geographic area of the study is the villages of the Harsam Rural District in Eslamabad-e-Gharb, Kermanshah province, Iran (Figure 1). The population of this village in 2006 was 8177 people, which decreased to 7622 in the census in 2011 with -0.02% population growth in five years (Statistical Center of Iran, 2006, 2011). Examining the literacy status of the rural district shows that out of 7577 people in need of education, 72.36% are literate, which is lower than the average literacy of Kermanshah (81.7%). Men's literacy rate is about 55%, whereas 44% is the rate for women, showing gender inequality and low social justice in education (Statistical Center of Iran, 2016).

The relative density of the Harsam Rural District is 26 people per square kilometer, which is much lower than in the same figure in Eslamabad-e Gharb (67 people per square kilometer). Also, the biological density of the rural district is better than the city and is 57 and 156 square kilometers, respectively (Statistical Center of Iran, 2011).

According to official statistics, 39% of the 6588 active rural population is employed. About 10% of these people are employed in nearby cities, whereas their families live in villages. Furthermore, 73% of rural workers are employed in the agricultural sector (Statistical Center of Iran, 2011). About 80% of the 13477 hectares of ag-

ricultural land in the rural district are rain-fed, cultivating wheat, barley, chickpea, and lentil, and due to low returns, it does not create much income for the villagers (Statistical Center of Iran, 2014). The high percentage of unemployment, lack of diverse job opportunities in villages, and the employment far from the families have led to an escalation of the migration process, population decline, disruption of the balance of the age and sex structure of the population, and somehow the reduction of social security in the district villages.

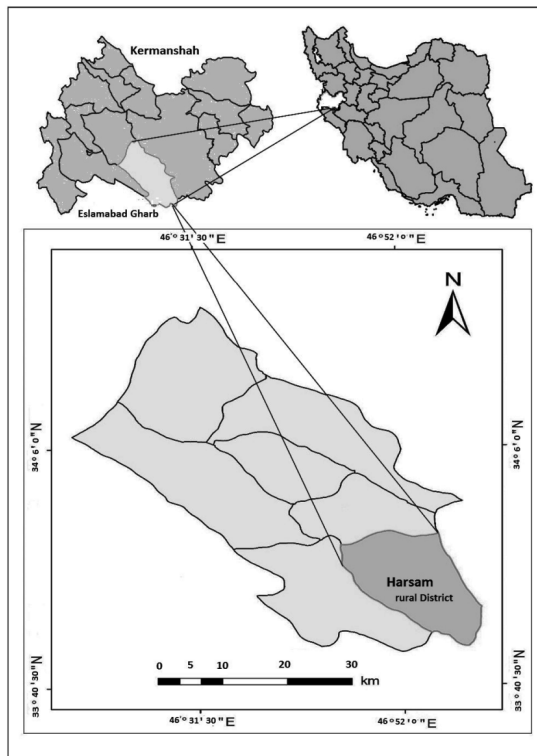


Figure 1. The position of Harsam Rural District in Eslamabad-e Gharb, Kermanshah, Iran



Methodology

The study is applied regarding the nature of the subject, a case study regarding the scope, and descriptive-analytic in terms of methodology, conducted in the form of documentary and field studies. According to the theoretical foundations and the literature, 12 quantitative and 28 qualitative indices were identified in five components to evaluate the social sustainability of the villages surveyed (Table 1). In designing indices, criteria such as credibility and the ease of measurement were considered with respect to time and budget constraints, sensitivity to change, simplicity, and comprehensiveness (Veldhuizen et al., 2015). The statistical population consisted of 1983 rural households living in 23 villages of the rural dis-

tricts. The sample size was calculated using Cochran's formula as 322 people and increased to 340 to minimize potential errors. Then, by the proportional allocation method, the proportion of each village was determined from the sample size. Sample households were selected randomly in each village. The research tool was two questionnaires: one for rural households and the other for village general information. The validity of the tool was confirmed by a panel of thematic experts and the reliability was confirmed by Cronbach's alpha test ($\alpha = 0.84$). For data analysis, in addition to descriptive statistics, Pearson correlation coefficient, regression, and path analysis using SPSS software were utilized.

In this study, rural population, the number of nomadic households, the percentage of employees outside the village, the age of the village, the distance from the nearest town, the rate of emigration, age structure (dependency ratio), and the level of service centrality of the villages as the independent variables were examined along with the dependent variable (social sustainability). Fuzzy Topsis was used to rank the social sustainability in the studied villages (Chen, 2000).

4. Findings

Sustainability level of the studied villages

As stated, Fuzzy Topsis was used to determine the sustainability of the villages. In this regard, the various stages of forming the decision matrix, descaling the matrix, weighing the matrix according to the expert panel, calculating the ideal and anti-ideal solutions, determining the distance between each village and the ideal and anti-ideal solutions, as well as calculating the similarity index were performed. However, presenting the calculations and their tables is beyond the scope of this paper. Finally, the villages were ranked and rated according to the similarity index. The similarity index in Fuzzy TOPSIS is in a range between zero and 1. If the amount of this index is closer to 1, the village will be more sustainable and vice versa. According to the Neumayer method, if the social sustainability score is less than 0.5, the village will be unsustainable. If it is between 0.5 and 0.8, the village will be semi-sustainable. Under the condition that the value is between 0.8 and 1, the village is sustainable (Neumayer, 2001). Given that the mentioned values in the studied villages range from 0.41 to 0.61, none of the villages were socially sustainable, about 30% of the villages were unsustainable, and nearly 70% of them were semi-sustainable (Table 2).

Table 1. Components and indices of social sustainability

Component	Qualitative indices	Quantitative indices
Participation	1) The level of accountability in the public activities of the village, 2) the level of interaction of the people of the village 3) The assistance in the agricultural work, 4) Participation in cultural activities, 5) The level of satisfaction of people with the village authorities and council	1) Percentage of contributors to rural council elections 2) Percentage of participants in parliamentary elections
Life quality	1) The quality of access to appropriate agricultural services, 2) the quality of access to appropriate health services, 3) the quality of access to appropriate educational services, 4) satisfaction with the quality of housing, 5) feeling happiness, 6) belonging to the village, 7) the quality of sanitation, 8) the quality of waste collection and disposal	1) Employment rate of rural residents 2) Diversity of educational levels in the village 3) Women's literacy rate
Security	1) The sense of security of habitants 2) fear of the prevalence of social abnormalities, 3) level of trust to state institutions functions 4) level of trust between community members 5) security level for night Commuting	1) The percentage of crimes in the village 2) The ethnic and tribal conflicts over the past decade
Social justice	1) Equitable access to services in the village, 2) equal opportunities for participation in society, 3) adequate income for working 4) fair access to rural general resources (pasture and water ...), 5) equitable distribution of services between villages of rural sub-district.	1) Percentage of landless households 2) Percentage of poor households
Empowerment	1) Self-confidence level 2) individuals ability to use existing opportunities and facilities, 3) efforts to address social inequalities in the village, 4) increase in productivity and production efficiency 5) Relationships with rural affairs institutions	1) Hours of unemployment during the week 2) Number of close and intimate friends 3) Number of professional skills



Table 2. Levelling the villages of Harsam Rural District in terms of social sustainability

Similarity index	Social sustainability	Frequency	Percent
0.8-1	Sustainable	0	0
0.5-0.8	Semi-sustainable	16	69.57
Less than 0.5	unsustainable	7	30.43



The interview with local informants implies that this condition originated from lack of health services in most villages of the rural district, urbanism, the reluctance of educated young people to live in the countryside, lack of job opportunities in villages, as well as insecurity in some villages, especially regarding livestock robbery.

Factors affecting social sustainability

Conducting a more accurate investigation on the determinants and factors affecting social sustainability in the Harsam Rural District, based on the theoretical frame-

work and literature review, two components or factors were identified and distinguished. They were 1) internal factors affecting social sustainability including participation, quality of life, security, social justice and empowerment and 2) external factors such as village age, village population, number of nomadic households, age structure (dependency ratio), percentage of employees outside the village, out-migration, distance from the nearest town, and the level of service centrality of the villages.

Regression and path analysis techniques were used to determine the effect of the internal components on social

sustainability and determine the most important component in this regard. First, utilizing linear regression, the relationships between components of participation, life quality, security, social justice, and empowerment with social sustainability were examined. The coefficient of determination obtained from the linear regression of the above components is 0.847. This means that the mentioned components explain 84.7% of the changes in the dependent variable (social sustainability), and the path analysis model is valid.

The analysis of the standard beta coefficients in Table 3 shows that amongst the factors affecting social sustainability of the studied villages, life quality and empowerment with a significance level of 99% are the first and second priorities and social justice and security with a 95% significance level are the third and fourth priorities.

As regression only measures the direct effects of variables on the dependent variable and their indirect effects remain unknown, path analysis was used to cover this weakness. In path analysis, the incremental effects

of variables are considered by adding each variable; so these relationships are expressed through a set of equations, showing the degree of dependence of each variable on the previous variable. The basic principle in path analysis is that any correlation coefficient between two variables can be broken down into a set of paths. Separate paths show the effects of variables and their relationships through the order of precedence and late mediation variables (Kalantari, 2006).

For conducting a path analysis and calculating the direct and indirect effects of independent variables on the dependent variable, at first, path diagram was plotted to show the direct and indirect relationships and effects of each variable on the others. In plotting the path analysis diagram, we tried to establish the causal order between the components by relying on theoretical foundations and the rational relationships between the components of social sustainability. Accordingly, the components with a more logical priority were shown on the left side of the model, and the components in the causal relation to the first group were placed on the right (Figure 2).

Table 3. The effect of internal components on the social sustainability of investigated villages (utilizing regression)

Component	Beta standard coefficients	T value	Sig.
Participation	0.023	0.180	0.859
Quality of Life	0.506	4.201	0.001
Security	0.240	2.052	0.056
social justice	0.287	2.429	0.027
Empowerment	0.391	3.798	0.001

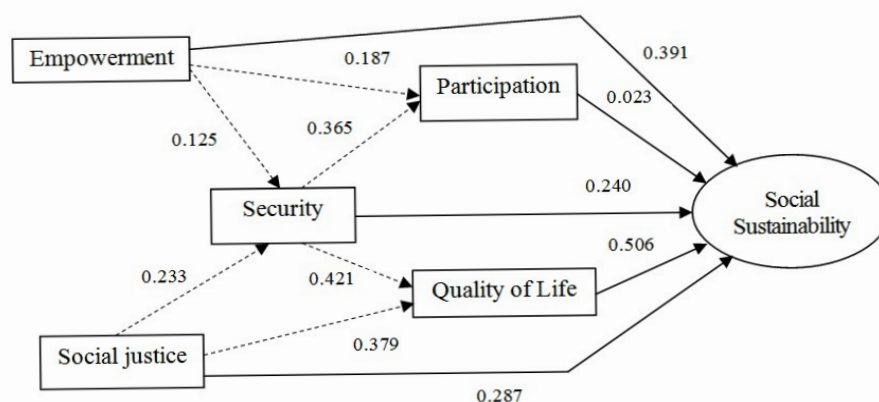


Figure 2. The path analysis diagram of the components affecting social sustainability



Afterward, by conducting the path analysis steps, the direct and indirect effects of the mentioned components on social sustainability were obtained. As the beta coefficients derived from the regression are standardized allowing comparison of the effects of all components, these coefficients are considered the base of the study and are presented in the path analysis diagram.

After determining the direct and indirect effects of all the components on social sustainability, it was found that social justice with an overall effect of 0.583 was the first priority and the quality of life with a total effect of 0.506 was the second. Whilst, participation with a total effect of 0.023 had the least impact and was at the bottom of priority ranking (Table 4). As is seen, unlike the results of regression, where the quality of life had the greatest effect on explaining the social sustainability of mentioned villages, path analysis determined the highest general effects (direct and indirect) on social sustainability of villages related to social justice, and other components were at the next levels of significance.

As stated above, the components mentioned explain 84.7% of the changes in the dependent variable (social sustainability). Thus, 15.3% of the changes in social sustainability are explained by variables outside the model; some of which were identified and studied.

For this purpose, variables such as village population¹, number of nomadic households², the percentage of employees outside the village³, village age⁴, distance

1. The minimum and maximum population of the studied villages is 29 and 1262 people, respectively.
2. 7 of the studied villages have nomadic households.
3. On average, 24.7% of the workers in the villages studied are outside the village. The minimum value is zero and the maximum value is 70%.
4. The studied villages were between 70 and 3000 years old.

from the nearest town⁵, out-migration rate⁶, age structure (dependency ratio)⁷, service centrality of the villages⁸ were examined using Pearson correlation coefficient. Amongst the studied variables, the first four variables did not have a significant relationship with the social sustainability of the studied villages, and so were excluded from the study.

The results of the tests imply that a negative and significant relationship can be seen between variables of distance from the nearest town and social sustainability at a confidence level of 99%. In other words, with an increase in the distance from town, the social sustainability of the villages reduces. Similarly, the same relationship is observed in the case of age structure (dependency ratio) and social sustainability, showing that in rural areas with an unbalanced age structure and high population

5. The minimum and maximum distance between villages from the nearest town is 26.5 and 60 km, respectively.
6. The rate of out-migration was calculated according to the number of households that had migrated from the village during the last 5 years. The average for all villages was 15.30. The minimum and maximum rates are 3 and 50 households in the studied villages, respectively.
7. To study the age structure, the general dependency ratio was used, the quotient of the inactive population (under 15 years + above 65 years of age) on active population (15-64 years). The closer it is to 1, the lower the active population; the closer it is to zero, the greater the active population (Kazemipour, 2008). The minimum and maximum ratios in these villages are 0.28 and 0.54, respectively.
8. To calculate the centrality of the services provided by the villages, a set of services in the villages - 1) Rural municipality, 2) Kindergarten 3) Primary school 4) Secondary school 4) High school 5) Health center 6) Health home 7) Agricultural machinery repair 8) Mosque 9) Kerosene and gas cylinders agents 10) Grocery store 11) Bakery 12) Butchers 13) Post office 14) Rural cooperative 15) Agricultural promoters 16) Sports ground 17) Public library 18) Firefighting station - was examined. Then, the villages were classified according to the number of available services. Accordingly, 30.5% of investigated villages had 3 to 6 services.

Table 4. Prioritizing the effect of components on social sustainability

Component	Direct effect	Indirect effect	Overall effect	Prioritization
Participation	0.023	-	0.023	5
Quality of Life	0.506	-	0.506	2
Security	0.240	0.221	0.461	3
social justice	0.287	0.296	0.583	1
Empowerment	0.391	0.061	0.452	4

dependency ratio, social sustainability is less. Moreover, a negative and significant relationship is observed between the out-migration of the villages and social sustainability at 95% confidence level. In other words, social sustainability is lower in villages with more out-migration. In addition, there is a positive and significant relationship between the level of service centrality of the village and social sustainability at 95% confidence level. This means that if more services are concentrated in one village, its social sustainability will be higher as well (Table 5).

Regression analysis was utilized to determine which of the variables were more significant in explaining the social sustainability of the villages. The results of the test showed that the level of significance was 0.002 and the regression was confirmed at a confidence level of 99%. Thus, it can be said that the regression has the necessary validity and there is a linear relationship between the examined variables (Table 6).

Examining Beta standard coefficients shows that out-migration at 99% confidence level has the most negative effect on the social sustainability of the villages under study. In other words, out-migration is one of the most important determinants of social sustainability. In turn, this factor has a significant effect on the population structure or dependency ratio of villages. Besides, the level of service centrality and possessing more facilities and services as the second factor has a positive effect on the social sustainability of the surveyed villages.

5. Discussion

Nowadays, social sustainability has a special place in the sustainable development literature and gets rid of environmental approaches domination. While accepting the concept of inter-generational justice within the framework of sustainable development, social sustainability puts special emphasis on the concept of intra-generational justice and the components of social solidarity, social participation, life quality, security, empowerment, and social justice.

Table 5. The relationship between external variables and social sustainability of the studied villages

Variable	Pearson correlation	
	Correlation	Significance
Distance from the nearest town	** -0.536	0.008
Out-migration level	* -0.422	0.045
Dependency ratio	** -0.535	0.009
Service centrality level	* 0.415	0.049

** Significant significance at 99% level * significant at 95% level



Table 6. The effect of external variables on the social sustainability of investigated villages

Variable	Beta standard coefficients	t value	Significance
Distance from the nearest town	-0.360	-2.004	0.060
Out-migration level	-0.520	-3.125	0.006
Dependency ratio	-0.049	-.234	0.818
Service centrality level	0.391	1.997	0.061



Reviewing the status of above-mentioned components in rural settlements of the most developing countries implies that social sustainability condition is unsatisfactory, which in turn, in a systematic interaction with other dimensions of sustainability (environmental-economic), causes unsustainability or at least a fragile sustainability of the villages of these countries. Such conditions are visible in many rural areas of Iran and in the scope of this review. So, the levelling of social sustainability with the Fuzzy Topsis technique showed that 100% of villages in the Harsam Rural District are in an unsustainable or semi-sustainable situation. These results confirm the results of Pourtaheri et al., 2010; Tavakkoli & Rostami, 2013; Fattahi et al., 2013; Jamini & Jamshidi, 2014 and are contrary to the review of Luo, Li, & Fu, 2011.

Evaluating the internal factors affecting social sustainability of the villages using the path analysis technique indicates that social justice and life quality had the highest effect on social sustainability. Nastaran et al., 2013; Jamini & Jamshidi, 2014; Luo, Li, & Fu, 2011; Manos et al., 2013 emphasized the importance of these two components.

Investigating the external variables affecting the social sustainability of the villages showed that the service centrality of the settlement and having welfare facilities would increase the social sustainability. Also, better and more access to the needed facilities and services through proximity to urban centers had a positive impact on the social sustainability of the studied villages. This is in line with the results of Pourtaheri et al., 2011 and Tavakkoli, 2014. Moreover, it was found that the higher the out-migration and dependency ratios are in the studied villages, the lower the social sustainability will be. This is consistent with the results of studies by Moles et al., 2008; Manos et al., 2013; Tavakkoli, 2014.

The regression test and examination of Beta coefficients showed that amongst the mentioned factors, out-migration had the most negative effect on the social sustainability of the surveyed villages. Thus, the villages with more out-migration have an unbalanced demographic structure, and due to their small population, do not have the demographic threshold required for absorbing many governmental and nongovernmental services. These villages experience more unsustainability. It should be noted that the villages of the rural district are experiencing two out-migration trends. The first one is immigration from the countryside to distant or nearer cities, and the second one is at the rural sub-district level that is from remote and under-populated villages to more

populated villages with more facilities, and both trends lead to social unsustainability.

According to the results, the following recommendations are put forward to improve the social sustainability of investigated villages: 1) as social justice had the greatest effect on the social sustainability of villages, measures such as creating equal economic and social opportunities, fair access to the general resources of the villages (rangeland and water, and so on), poverty elimination programs, and justice in the distribution of services among villages of rural sub-district can be effective and promising. 2) Given the importance of life quality as the second most important component affecting the social sustainability of the surveyed villages, planning and action to improve the physical structure and quality of housing, better provision of health services, education-like the guidance of students to courses that can provide employment in the village- and gender equality are suggested. 3) Considering out-migration as the most important external factor of the unsustainability of surveyed villages, the adoption of strategies for reducing rural-urban migration (such as the distribution of public and private services among the villages) is recommended. In addition, developing non-agricultural job opportunities, agricultural supplementary industries, irrigation, and watering projects in rural areas that are mostly rain-fed must be taken into account.

Acknowledgements

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declared no conflicts of interest.

References

- Ameri Siahooi, H. R., Rostam Gourani, E., & Biranvandzadeh, M. (2011). Assessment of Rural Sustainability and Rural Development in Shahab District of Qeshm county. *New Attitudes in Human Geography*, 3(4), 159-177.
- Boehn, D., & Hamann, B. (2011). Approaches to Sustainability Examples from Geography Textbook Analysis in Germany *European Journal of Geograph*, 2(1), 1-10. Retrieved from http://www.eurogeography-journal.eu/download.php?articleid=135&file=2_1_Approaches+To+Sustainability_boehn_hamann.pdf.

- Chen, C.-T. (2000). Extensions of the TOPSIS for group decision-making under fuzzy environment. *Fuzzy Sets and Systems*, 114(1), 1-9. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0165011497003771>. doi:[https://doi.org/10.1016/S0165-0114\(97\)00377-1](https://doi.org/10.1016/S0165-0114(97)00377-1)
- Colantonio, A. (2007). Social Sustainability: An Exploratory Analysis of its Definition, Assessment Methods, Metrics and Tools. Paper presented at the Measuring Social Sustainability: Best Practice from Urban Renewal in the EU.
- Faraji Sabokbar, H. A., Badri, S. A., Motiee Langroodi, S. H., & Sharafi, H. (2010). Measuring the sustainability of rural areas using analytical network process (ANP), Case-study: Rural areas of Fasa County. *Human Geography Research*, 42(72), 135-156.
- Fattahi, A., Bayat, N., Amiri, A., & Nemati, R. (2013). Measurement and prioritization of social sustainability in the Rural Areas of Delfan County using VIKOR Multiple Criteria Model- Case Study: Northern Khavir rural subdistrict. *Regional Planning*, 3(11), 65-78.
- Hale, J., Legun, K., Campbell, H., & Carolan, M. (2019). Social sustainability indicators as performance. *Geoforum*, 103, 47-55. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0016718519300855>. doi:<https://doi.org/10.1016/j.geoforum.2019.03.008>
- Jamini, D., & Jamshidi, A. (2014). Investigating the determinants of social sustainability in rural areas (Case study: Chardavol county). *Geographical planning of Space*, 4(13), 147-165.
- Janker, J., Mann, S., & Rist, S. (2019). Social sustainability in agriculture - A system-based framework. *Journal of Rural Studies*, 65, 32-42. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0743016718306740>. doi:<https://doi.org/10.1016/j.jrurstud.2018.12.010>
- Kalantari, K. (2006). Data processing and analysis in socioeconomic research using SPSS software (Second ed.). Tehran: Sharif Publishing House.
- Kazemipour, S. (2008). Preliminary Methods of Population Analysis (Fourth ed.). Tehran: Payame Noor University Press.
- Lee, K., & Jung, H. (2019). Dynamic semantic network analysis for identifying the concept and scope of social sustainability. *Journal of Cleaner Production*, 233, 1510-1524. Retrieved from <http://www.sciencedirect.com/science/article/pii/S095965261931933X>. doi:<https://doi.org/10.1016/j.jclepro.2019.05.390>
- Lin, Y., Zhang, X., & Geertman, S. (2015). Toward smart governance and social sustainability for Chinese migrant communities. *Journal of Cleaner Production*, 107, 389-399. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0959652614013717>. doi:<https://doi.org/10.1016/j.jclepro.2014.12.074>
- Luo, X., Li, P., & Fu, X. (2011). Factors that Affect Social Stability of Rural Areas in Ganzi District. *Asian Agricultural Research*, USA-China Science and Culture Media Corporation, 3(6), 1-4.
- Manos, B., Bournaris, T., Chatziniolaou, P., Berbel, J., & Nikolov, D. (2013). Effects of CAP policy on farm household behaviour and social sustainability. *Land Use Policy*, 31, 166-181. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0264837712000324>. doi:<https://doi.org/10.1016/j.landusepol.2011.12.012>
- McKenzie, S. (2004). Social Sustainability: Towards Some Definitions. <https://books.google.com/books?id=EzhWvgAACAAJ>
- Moles, R., Foley, W., Morrissey, J., & O'Regan, B. (2008). Practical appraisal of sustainable development—Methodologies for sustainability measurement at settlement level. *Environmental Impact Assessment Review*, 28(2), 144-165. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0195925507000819>. doi:<https://doi.org/10.1016/j.eiar.2007.06.003>
- Nastaran, M., Ghasemi, V., & Hadizadeh Zargar, S. (2013). Assessment of Indices of Social Sustainability by Using Analytic Network Process (ANP). *Applied Sociology*, 24(3), 155-173.
- Neumayer, E. (2001). Analysis of the Human Development Index and Sustainability, A constructive, proposal. *Ecological Economics*, 39(1), 101-114.
- Pourtaheri, M., Sojasi Qidari, H., & Sadeghloo, T. (2010). Measurement and priority social sustainability in rural regions using TOPSIS-Fuzzy technique based on order preference by similarity to a fuzzy ideal solution (Case study: Khodabandeh county Rurals in Central Part. *Rural Research*, 1(1), 1-32.
- Pourtaheri, M., Zal, A., & Rokneddin Eftekhari, A. (2011). An evaluation and prioritization of social sustainability in rural Areas: A case study of villages in Khorrambid county of Fars Province. *Village and Development*, 14(3), 19-49.
- Roca-Puig, V. (2019). The circular path of social sustainability: An empirical analysis. *Journal of Cleaner Production*, 212, 916-924. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0959652618337867>. doi:<https://doi.org/10.1016/j.jclepro.2018.12.078>
- Sen, A., & Anand, S. (2000). Human Development and Economic Sustainability. *World Development*, 28, 2029-2049. doi:[10.1016/S0305-750X\(00\)00071-1](https://doi.org/10.1016/S0305-750X(00)00071-1)
- Statistical Center of Iran. (2006). Population and Housing Census- Identification of villages. Iranian Statistic Center, Retrieved from <http://www.amar.org.ir/Default.aspx? Tabid = 1042>
- Statistical Center of Iran. (2011). Population and Housing Census- Identification of villages. Retrieved from <http://www.amar.org.ir/Default.aspx? Tabid = 1042>
- Statistical Center of Iran. (2014). Agricultural Census - Village Profiles. Retrieved from <https://www.amar.org.ir>
- Statistical Center of Iran. (2016). Population and Housing Census- Identification of villages. Retrieved from <http://www.amar.org.ir/Default.aspx? Tabid = 1042>
- Tavakkoli, J. (2014). Measurement of Socio-Economic sustainability of Rural Settlements in North and South Khavir rural Districts of Lorestan Province. *Applied researches in Geographical Sciences*, 14(32), 71-92.
- Tavakkoli, J., & Rostami, B. (2013). Sustainability of rural settlements in Takab County. *Village and Development*, 16(2), 63-83.
- Tiainen, H. (2016). Contemplating governance for social sustainability in mining in Greenland. *Resources Policy*, 49, 282-289. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0301420716300551>. doi:<https://doi.org/10.1016/j.resourpol.2016.06.009>

Vallance, S., Perkins, H. C., & Dixon, J. E. (2011). What is social sustainability? A clarification of concepts. *Geoforum*, 42(3), 342-348. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0016718511000042>. doi:<https://doi.org/10.1016/j.geoforum.2011.01.002>

Veldhuizen, L. J. L., Berentsen, P. B. M., Bokkers, E. A. M., & de Boer, I. J. M. (2015). A method to assess social sustainability of capture fisheries: An application to a Norwegian trawler. *Environmental Impact Assessment Review*, 53, 31-39. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0195925515000335>. doi:<https://doi.org/10.1016/j.eiar.2015.04.002>

Woodcraft, S. (2012). Social Sustainability and New Communities: Moving from Concept to Practice in the UK. *Procedia - Social and Behavioral Sciences*, 68, 29-42. Retrieved from <http://www.sciencedirect.com/science/article/pii/S187704281205687X>. doi:<https://doi.org/10.1016/j.sbspro.2012.12.204>

