

## Sustainability Assessment of the Rural Areas Using Multi Attribute Decision Making Methods (Case Study: Villages of Falavarjan County)

**Zahra Hedayati-Moghadam<sup>5</sup>**

*PhD Candidate of Geography and Rural Planning, University of Isfahan, Isfahan, Iran*

**Sayed Eskandar Seidayi**

*Assistant Professor of Geography and Rural Planning, University of Isfahan, Isfahan, Iran*

**Hedayatollah Nouri**

*Associate Professor of Geography and Rural Planning, University of Isfahan, Isfahan, Iran*

*Received 3 June 2014*

*Accepted 19 January 2015*

### 1. Introduction

Reaching the sustainable development of the country requires much attention to the sustainable development of the rural areas. Therefore, the present study aims to measure and assess the current sustainability level along with the understanding of the differences between the regions with regards to the sustainability indicators in order to make optimal decisions regarding the rural development. Taking this into account, sustainable development is considered as a dominant approach towards development, henceforth, addressing this issue is of great importance in the realm of development studies.

### 2. Theoretical Framework

Sustainability is known as a delicate balance between the economic, social, and environmental dimensions of a community whether at the local, regional, national, or at the international level. In this respect, sustainable development of a country depends on the balanced development of all parts of it. Despite the fact that rural community is one of the most important economic hubs of the country as it can have a leading role in Gross domestic production, food production to meet the needs of population, raw material production, and finally the economic growth and development of the country, less attention has been paid to it in various fields of studies. However, the development of the rural areas of the country has faced many challenges.

Therefore, addressing the issues related to the rural planning and the rural development as well as reviewing and evaluating these issues seems to be essential.

---

1- Corresponding Author: Email: z\_hedayati@yahoo.com

This article studies the stability condition of the rural areas of Falavarjan county in Isfahan city. Also it surveys the dimensions and indicators that would mostly affect the sustainable rural development of this region.

### 3- Methodology

The present study uses a combination of descriptive and analytical methods. First the theoretical bases and the background literature was reviewed based on which and regarding the data from the region under the study, 87 indicators were classified into the five dimensions of Economic, Social, Environmental, Formation, and Access. The data was gathered through a field research and a survey, using interviews and the questionnaire that was prepared for this purpose. The validity of the prepared questionnaire was obtained by using comments from the related experts and the university teachers to make the required changes. The reliability coefficient of the questionnaire 0.79 was obtained through a preliminary test using SPSS software Cronbach alpha coefficient. The statistical population consisted of 56 villages of Falavarjan County each having more than 20 families. The population rate was 93285 people (27024 families) selected from 378 families of 47 villages through a random level-sampling method using Cochran formula.

### 4- Discussion

In order to assess the stability condition in the different villages of Falavarjan County as well as ranking different rural areas of this region TOPSIS and Multi Criteria Decision Model (MCDM) are used through which 87 indicators from different dimensions of Economic, Social, Environmental, Formation, and Access are identified. In the phase of normalizing and weighing the indicators, Fuzzy and Entropy methods are employed while for the ranking of the villages TOPSIS method is applied. The obtained results regarding the values of CL in TOPSIS model indicate that Mosian and Karsangan villages from Abrisham rural area with the sustainability values of 0.890 and 0.732, respectively, have the highest ranks, and VazirAbad and RahimAbad villages from Garkan Shomali rural area with the sustainability values of 0.187, and 0.138, respectively have the lowest sustainability ranks. In order to study the differences between the different rural areas of the region in terms of the sustainable indicators, Multivariate Analysis of Variance (MANOVA) and Dunken test are performed. Results show that there are significant differences across different rural areas of the Falavarjan County in terms of sustainability regarding the four dimensions of Economic, Environmental, Formation, and Access. Therefore, they can be grouped differently in each of these dimensions.

### 5- Conclusion and Suggestions

The results of relative ranking of the rural areas of the region show that sustainability is largely influenced by the environmental factors, especially water resources. Due to the frequent droughts in the country particularly in the province of Isfahan, it is required to manage water resources of the region more efficiently to decrease its negative impact on the sustainable development of the rural areas. According to the field observations, employing high efficient irrigation systems,

and changing the pattern of cropping in the region are among the two possible approaches to reach this end. Empowering local economy and creating various employment opportunities to reduce the reliance on merely agricultural activities can improve sustainability indicators in the region. The increase of the social welfare through the development of health services, education, communication, and supporting services such as agricultural and unemployment insurances can increase the sustainability level. Development is a dynamic process affected by many factors. Achieving sustainable development requires continuous assessment of its indicators to be able to monitor the current state, and consequently to make correct decisions along with taking the necessary steps to preserve the development pace.

**Key words:** Assessment, Sustainability, MADM, TOPSIS model, Falavarjan county.

# References

1. Akbari, N. A., & Zahedi Keyvan, M. (2007). *Application of multi-criteria decision making and ranking methods*. Tehran. Organization of Municipalities and Village Administrations. [in Persian]
2. Asgharizadeh, E., & Jamkhaneh Zabihi, M. (2012). The evaluation and ranking of rural development level using multiple attributes decision making methods (Case study: Rural districts in Sari county). *Journal of Research and Rural Planning*, 2(3), 26-48. [in Persian]
3. Bahramzadeh, H. (2004). Sustainable development. *Tadbir Monthly Magazine*, 134, 1-5. [in Persian]
4. Bell, S., & Morse, S. (2007). *Measuring sustainability* (N. Shahnvshy, S. Dehghanian, & Y. Azinfar, Trans.). Mashhad: Ferdowsi University of Mashhad Publication. [in Persian]
5. Chatzinikolaou, P., Bournaris, T., & Monos, B. (2013). Multi- criteria analysis for grouping and ranking European Union rural areas based on social sustainability indicators. *International Journal of Sustainable Development*, 16(3), 335–351.
6. Etuk, L. (2012). *2000 baseline assessment of rural community vitality*. Rural studies program, Oregon State University (Working paper). Retrieved from <http://ruralstudies.oregonstate.edu>.

7. European Commission. (2001). *A framework for indicator for the economic and social dimensions of sustainable agriculture and rural development*. Retrieved from [ec.europa.eu/agriculture/public/reports/sustain/index\\_en.pdf](http://ec.europa.eu/agriculture/public/reports/sustain/index_en.pdf).
8. Farahani, H., & Asdaghi Saraskanrod, Z. (2011). Methodologies for measuring sustainability. In A. Yaghoubi Farani (Ed), *Proceedings of the the Second National Conference on Sustainable Rural Development* (pp. 1-24). Bu Ail Sina University, Hamadan. [In Persian].
9. Guijt, I., Moiseev, A., & Prescott-Allen, R. (2001). *IUCN resource kit for sustainability assessment*. Retrieved from <http://www.iucn.org/themes/eval/index.html>.
10. Hamzehe'e, M. R., & Fazelbeygi, M. M. (2011). *From under development to sustainable development: International theories of sustainable development*. Kermanshah: Razi University Press. [In Persian].
11. Khosrobeigi, R., Shayan, H., Sojasi Ghidari, H., & Sadeghlo, T. (2011). Assessment and evaluation of sustainability in rural areas using TOPSIS- FUZZY multi-criteria decision making technique. *Journal of Rural Research*, , 1(2), 151-158. [In Persian].
12. Limtan, T. (2012). *Well measured developing indicators for sustainable and livable transport planning*. Canada: Victoria Transport Policy Institute.
13. Manos, B., Bournaris, T., & Chatzinikolaou, P. (2010). Impact assessment of CAP policies on social sustainability in rural areas: An application in Northern Greece. *Operational Research*, 11(1), 77-92 .
14. Momeni, M. (2008). *New topics in operations research* (2<sup>nd</sup> ed.). Tehran: Tehran University Press. [In Persian].
15. Portahehi, M., Zal, A., & Eftekhari, A. B. (2011). Assessment and measurement social sustainability in rural area case study rural area of Khoram bid. *Journal of Village and Development*, 3, 19-49 . [In Persian].
16. Pourtaheri, M., Sojasi Ghidari, H., & Sadeghloo, T. (2010). Measurement and packing of social sustainability in rural Areas by using FUZZY Technique. *Journal of Rural Research*, 1, 1-31. [In Persian].
17. Provincial Government of Isfahan. (2012). *Statistical yearbook of 2012 of Falavarjan county*. Isfahan: Bureau of Statistics, Information, and GIS. [In Persian].
18. Singh, K. R., Murty, H. R., & Gupta, S. K. (2009). An overview of sustainability assessment mythologies. *Ecological Indicators*, 9, 189-212.
19. Steer, A. (1992). The environment for the development. *Finance and development*, 29(2), 18-31.
20. UN. (2000,). *Indicators of sustainable development: Guidelines and methodologies* (Report No. 21). Retrieved from [www.un.org/esa/sustdev/natlinfo/indicators/guideline](http://www.un.org/esa/sustdev/natlinfo/indicators/guideline).
21. Wiren, V. (2000). Sustainability in agriculture- An evaluation of principal goal oriented concepts to close the gap between theory and practice. *Agriculture, Ecosystems and Environment*, 84(2), 115-129.
22. Zahedi, S., (2007). *Sustainable development*. Tehran: Samt Publications. [In Persian].

#### How to cite this article:

Hedayati-Moghadam, Z., Seidayi, S. E., & Nouri, H. (2015). Sustainability assessment of the rural areas using multi attribute decision making methods (Case study: Villages of Falavarjan County). *Journal of Geography and Regional Development*, 13(24), 91-112.  
URL <http://jgrd.um.ac.ir/index.php/geography/article/view/35861>