

## An Analysis of the Degree of Development of the Rural Districts in the County of Sanandaj, Using Quantitative Methods

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### Abstract

Using the descriptive-analytic method and the evaluation of quantitative data, and by using indexes of infrastructure, education, culture, business, agriculture, and sanitary, which for each of these indexes some criteria are defined, this study attempted to determine and analyze the development of 10 rural districts of the county of Sanandaj, Kurdistan Province. To achieve this aim, models of Analytic Hierarchy Process (AHP), the standard score, Human Development Index (HDI), cluster analysis, and the Index of Dispersion were used, in order to determine the extent and distribution of the facilities and services of the villages of the county of Sanandaj. The results showed that, in terms of facilities and services, there is a great difference among the rural districts of Sanandaj. Based on the research findings in all models used in this study, Hussain Abad rural district and the countryside villages enjoy better conditions in terms of facilities, compared to other rural districts, and the rural districts of Sarab Qamish and Abidar are deprived of development. Moreover, based on the results achieved from the coefficient of variation, the sanitary index (0.06), and the agriculture index (1.69) had the least and the highest difference, respectively among the 10 rural districts of the county.

**KEYWORDS:** development, AHP, cluster analysis, the rural districts of the county of Sanandaj

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### INTRODUCTION

The role of villages in the economic, social and political development in local, regional and national scales, as well as the consequences of underdevelopment in rural districts, such as widespread poverty, growing inequality, rapid population growth, unemployment, migration, and so on have driven the attentions to the rural development (Azkia and Ghaffari, 2004: 19). Therefore, to move towards the development of rural districts, a proper plan should be performed. "In the process of planning for rural development, checking bottlenecks, facilities and available services is the first essential step" (Gilg, 1996: 2). Understanding the current state of village will help the rural development planners determined to achieve their objectives, policies, guidelines and procedures. Determining and analyzing of the level of development of rural areas, and ranking them according to their level of development provides the groundwork for a better allocation of resources and services, with the aim of developing rural areas harmonious. Today in developed countries, it has been tried to move towards the integrated development of rural areas with the proper definition and understanding of

rural development. This approach to the development became widespread in the world in 1980s, which was later on introduced as the *sustainable development*. “The concept of sustainable development necessitates a range of key variables of the economic, social and environmental areas” (Wilson & Other, 2006,:304). This requirement has been felt by the plan makers and rural authorities for several years. The necessity for the development of rural areas is due to the lack of facilities and services, because “the primary objective of rural development is the poverty reduction” (The World Bank, 1992:13) «the concept of sustainable development refers to the maintaining of the development process over time» (Elliot, 1999: 6). Brundtland Commission described the notion of development in 1987: “sustainable development is a development that meets the needs of the present generation without harming the needs of the future generations, and adapts their interests”. Therefore, “the sustainability can be defined as a *new* concept in search of reconciliation between nature and human; Here *new* is a sense of balance and solidarity among the system components” (catizzone, 1999: 59). In addition to the aforementioned relativity “the complex concept of sustainable development has many interpretations” (Suminan, 1998, 16). The confusion and chaos are observed in the definition of sustainable development as well as its concept. “Not far from the truth to say that currently there is no agreeable operational definition of the sustainable development” (Markandina, 2002: 7). However, “sustainable development can be seen as a process” (Baker et. al, 1997, 5), or it can be referred to as “new legitimacy” (Bridger & Luloff, 1999, 378), “Theory of sustainability”, or the “paradigm of sustainability”. Given the above definitions of sustainable development, the measures should also be specified. Indexing is one of the important activities in the evaluation and analysis of development. “The background of indexing has been along with the term of development” (Eftekhari and Yadri, 2004, *Introduction*), and the indicators also helped to define development. “Indicators are a set of specific or altered data, which provides essential information for policy makers and the public” (Miranda, 1999: 74). “If achieving the sustainable development be considered as the goal of planning, the identification and selection of appropriate indicators for development policies would be essential” (Mittelsteadt, 2001, 3). In this study, those indicators are selected, which can possibly encompass all aspects of sustainable development, and can provide a full definition of sustainable development.

The county of Sanandaj, as the capital of Kurdistan Province is located in the west of Iran. According to the latest political divisions at the end of 2011, the county has 2 cities, Sanandaj and Shuyesh, 2 districts, 10 rural districts, 185 inhabited villages, and 11 deserted villages. It seems that according to the boundary position of the county, distribution of facilities in rural areas has not been fair, and has been unbalanced. In addition to the unbalanced distribution of the facilities, the deficiency of facilities can also be noted in the most rural areas of the county. to solve the problem, planning should be established according to the local conditions of the villages, and rural differences should be considered in terms of economic, social and environmental issues, for providing facilities and services. Furthermore, the approach of rural development authorities should be driven to the sustainable development, and should have a thorough and harmonious view towards the rural development. In addition to the above decisions and policies for rural development, organizations such as the *Housing Foundation*, Ministry of Agriculture, and the *Department of Natural Resources* are involved in the unbalanced development of the region, because the institutions are responsible for

implementing of the programs and projects in rural areas. The main consequence of underdevelopment in the villages of the Sanandaj county can be economic problems, the increasing migration of villagers, and the decline of agricultural activities in the noted rural areas. If this trend continues, the number of the deserted villages would be more. Due to the foregoing, now this question is raised that what factors are influential in the unbalanced distribution of facilities and lack of development, and which indicators and methods are suitable for the analysis of development in the area. The purpose of this study was to determine the level of development of the villages of the county of Sanandaj, with emphasis on the rural districts of the county (in the areas of infrastructure and communications, education, sanitary, administration, culture, and agriculture), to be used as a guidance for the planners.

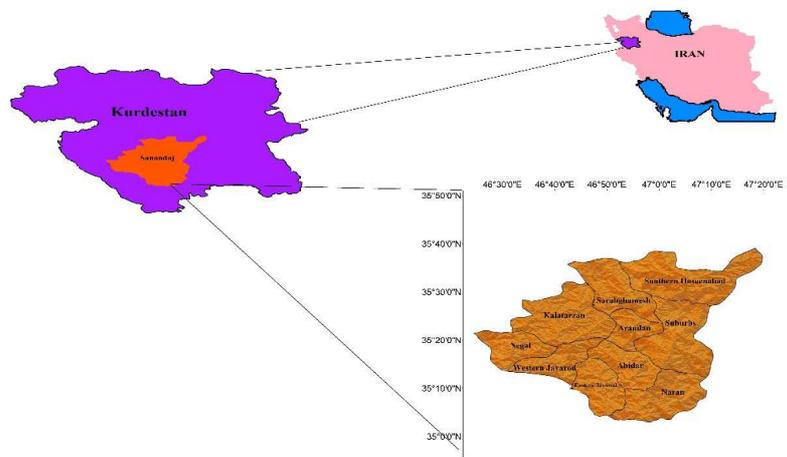


Fig 1. The location of the studied area

## Methods

With respect to the studied components, the study used a descriptive-analytical method. The population of the study were 10 rural districts in the county of Sanandaj. The examined indicators were 27 in six areas of infrastructure and communications, sanitary, education, administration, culture, and agriculture. The data were collected from the census of the Encyclopedia of Villages in 2011, and also the field study of the villages. Then, models of Analytic Hierarchy Process (AHP), the standard score, Human Development Index (HDI), cluster analysis, and the Index of Dispersion were used to rank the rural districts of the county, and then the rate of inequalities were investigated. For data analysis SPSS, Excel, Expert choice, and for mapping Arc GIS10.2 software were used.

Analytic Hierarchy Process (AHP):The multi criteria evaluation method was proposed by Thomas L. Saaty for the first time in 1980, and has found numerous applications in various fields, particularly in the regional planning (Aldian and Taylor, 2005: 4).

The Standardized Score: This model is one of the methods for determining the regional inequalities, and for ranking of the regions in a vast land. This approach reveals the amount of differences of areas. The overall structure of this model is as follows (Ghanbari, 2013: 129):

Human Development Index (HDI):This index is an attempt to leave the production-oriented perspective, and replace it with human-oriented approach (Griffin and McKinley, 1994: 125). In order to rank countries in terms of human development model, the United Nations Development Program was used for the first time in 1990, which works with the same importance for the indexes in rankings. (UNDP, 1998: 107)

Index of Dispersion: Index of dispersion is the relative scale of dispersion, which the variability of two or more data can be compared to. The coefficient is statistically a significant expression of dispersion among a number of the indexes (Danial and Terrel, 1995; Zheng and et al, 2000:245).

Table 1. Indicators and variables in the research

Row	Index	Variables
1	Education	Elementary School, Secondary School Boys and Girls , Boys and Girls High School.
2	Sanitary	Social workers , Physician assistant , Physician , Waste disposal system , Home of Health , The health center .
3	Cultural	Radio and television network coverage , Access to newspapers and magazines, public library.
4	Agriculture	Veterinarian , Number of households farmers , Repair shop agricultural machines.
5	Infrastructure	Asphalt road , Access to a vehicle , Telecom , Agricultural production Cooperative Company , Rural Cooperative Company , Mailbox , Representing rural post office or post.
6	Administrative	Village Islamic Councils , Dehyari

## Findings

Table 2. The final value of the criteria and sub-criteria in AHP model

Criteria	Weight of the Criteria	Sub-criteria	Weight of the Sub-criteria
Infrastructure	0.207	Asphalt road	0.283
		Telecom	0.358
		Mailbox	0.124
		Representing rural post office or post	0.124
		Company , Rural Cooperative Company	0.112
Education	0.150	Elementary School ,	0.232
		, Secondary School Boys	0.175
		, Secondary School Girls	0.198

		Boys High School	0.198
		Girls High School	0.198
Sanitary	0.114	Social workers	0.063
		Physician assistance	0.091
		·Home of Health	0.198
		·The health center	0.350
		Physician	0.199
		Waste disposal system	0.107
		public library.	0.667
Cultural	0.70	Access to newspapers and magazines	0.333
		Village Islamic Councils	.0.333
Administrative	0.142	Dehyari	0.667
		Veterinarian	0.333
Agriculture	0.316	Repair shop agricultural machines	0.667

Table 3. (a) levels of development of the rural districts of the county of Sanandaj, based on the Human Development Index (HDI), (b) the cluster analysis model (K-mean), (c) the standard score model (d) the degree of CV in the indexes

Rural district	HD(1-I <sub>j</sub> )	Ranking	Levels of developed
Abidar	-0.45211	8	Deprived
Arndan	-0.80529	10	Deprived
Suburbs	1.061038	1	Semi-developed
Nran	0.03424	5	Deprived
southern Hossein Abad	0.690015	2	Semi-developed
Sarab Qamish	-0.52656	9	Deprived
Javrud western	0.112626	5	Deprived
Javrud eastern	0.289482	6	Deprived
Klatrzan	0.394588	3	Deprived
Negel	0.253183	7	Deprived

(a)

Rural district	Levels of developed
Abidar	Deprived
Arndan	Semi-developed
Suburbs	Semi-developed
Nran	Deprived
southern Hossein Abad	developed
Sarab Qamish	Deprived
Javrud western	Deprived
Javrud eastern	Semi-developed
Klatrzan	Deprived
Negel	Semi-developed

(b)

Rural district	The mean	Ranking	Levels of developed
Abidar	-0.45211	8	Deprived
Arndan	-0.80529	10	Deprived
Suburbs	1.061038	1	developed
Nran	0.03424	5	Semi-developed
southern Hossein Abad	0.690015	2	Semi-developed
Sarab Qamish	-0.52656	9	Deprived
Javrvd western	0.112626	4	Semi-developed
Javrvd eastern	-0.07707	6	Semi-developed
Klatrzan	0.215685	3	Semi-developed
Negal	-0.25259	7	Deprived

CV	index
0.06	Sanitary
0.74	Infrastructure
0.43	Administration
1.29	Education
1.71	Agriculture
0.84	Culture

(c)



(a)

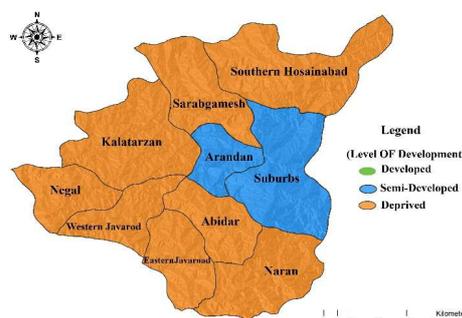
(d)



(b)



(c)



(d)

Fig 2. (a) the level of development of rural districts of the county of Sanandaj based on the Human Development Index (HDI), (b) the cluster analysis model, (c) the standard score model, (d) the Analytical Hierarchy Process

Given the level of development, rural districts of the county of Sanandaj are sorted in three levels, i.e. developed, semi-developed, deprived. The results showed that the levels of development are quite different among the rural districts of the region, in a way that in the Analytic Hierarchy Process (AHP) model, the suburbs and Arndan are semi-developed and other rural districts are deprived. In the standard score model, suburbs are developed, Klatrzan, Zhavrud eastern and western, Hossein Abad and Nran are semi-developed, and Abidar, Arndan, Negel, and Sarab Qamish are deprived of development. In the Human Development Index (HDI), Hossein Abad and suburbs are semi-developed and other rural districts are deprived. In the cluster analysis (k = means) model, Hossein Abad is developed, Negel, Zhavrud western, Arndan and suburbs are semi-developed, and Klatrzan, Zhavrud eastern, Sarab Qamish, Nran and Abidar are deprived. Finally, in the coefficient of variation (CV) model, sanitary index has the lowest level of inequalities in the distribution of resources and services with 0.06 of the coefficient of variation, and agriculture index has the highest level of inequalities in the distribution of resources and services with 1.79 of the coefficient of variation among the rural districts of the county of Sanandaj.

### Discussion and Conclusion

In rural development planning process, identifying and analyzing the constraints, and ranking the rural areas in terms of development and deprivation have a great importance, which should always be considered. On this basis, the study used 27 variables in the form of 6 indicators, and utilized models of Analytic Hierarchy Process (AHP), the standard score, Human Development Index (HDI), cluster analysis, and the Index of Dispersion, and in terms of the level of development, it categorized the rural districts of the county of Sanandaj into three levels, i.e. developed, semi-developed and deprived. Based on the findings of the study, in all models, Hossein Abad rural district and suburbs enjoyed better facilities than the other rural districts, and Sarab Qamish and Abidar rural districts are deprived of development. According to the results of the coefficient of variation, sanitary index with 0.06, and the agriculture index with 1.79 had the minimum and the maximum variations, respectively.

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