Investigating the Evolution of Spatial Structure Patterns of Migration in West-*Azerbaijan* Province

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Abstract

Migration and quality of redistribution of population across country is one of the main factors that planners take into account to control population and guide its movements to economic poles. Scientific recognition of migration phenomenon is important for managing and policy making in the country. These movements change migration pattern, in a way that along with increase in population and the number of cities, urban-urban and rural-urban pattern of migration turned to be the dominant pattern of migration. This pattern was geographically influenced by regional differences and social and economic attractions of cities and villages. Unplanned movements of rural population may bring undesirable consequences to regions and improperly change the region's morphology and spatial structure pattern of the entire region. The main purpose of this research is to investigate and understand the patterns of intra-provincial migrations during last decades and to analyze the underlying factors. The method adopted for this research is quantitative and the approach is descriptive-analytical. Research data includes intra-provincial migration data in scale of the province's rural sub- districts (Dehestan) during 1996- 2011, which is obtained from the Statistical Center of Iran (SCI). To analyze migration data, the methods of calculating the intensity of crude migration and factor analysis were used; then, correlation of spatial structure of West-*Azerbaijan* province with the variables of density, distance, connection and intra-provincial migration rate was examined. The results show that spatial structure of West-*Azerbaijan* was unidirectional in 1996; but, the spatial distribution trend of migration during selected 15 years revealed a kind of decentralization and tended towards clustered spatial pattern. The pattern of spatial connection changed from duality model to continuity model.

Keywords : Migration, Intra-Provincial Migration, Movement Flow Patterns, West-*Azerbaijan* Province

1. Introduction

In different geographical domains, each year, millions of people move for various reasons and change their place of living on their free will or by force. Changing the place of living or migration has become an inevitable part of life for many in the world (Seabrook, 2007: 44). Population movement from one region to another plays significant role in formation or reformation of regional social domains. Although migration forms and changes population and social structure of the neighborhood units, it is contingent upon the existing spatial-social structure of settlements (Knox, 1982: 171). Today's, the issue of settlement mobility in different regional areas has to be taken into account because of indispensable cause and effect relation between intra-regional migrations and its spatial-social structure, especially when analyzing social geography of regions (Chalin, 1993: 66). Migration in any form and with any motivation or result brings about various economic, social and cultural consequences in local, regional, national and international levels. Therefore, governments consider it as complicated issue and largely take it into consideration when managing and policy making (Lahestanizadeh, 1989: 70). During its urbanization, West-*Azerbaijan* province experienced broad social transformations. Generally, major changes in population and migration system, made the province to undergo spatial structure changes during the studied period of time. For this reason, the present research aims to investigate, understand and analyze underlying factors and manner of intra-provincial migrations in recent decades. Key influencing factors on provincial migration flows were examined using the method of calculating crude migration intensity. First, main concepts are surveyed; then, provincial migration trend was examined in reference to national population and housing census done by SCI in 1996, 2006, 2011. Section 2 is devoted to theoretical framework which is presented in two parts: 1) influencing factors on migration; 2) a survey on gravity models, previous studies, introduction of the model and conclusion. Basic concepts and the research hypothesis are as fallows;

- Duality flow connections between rural districts of West-*Azerbaijan* province have taken place according to migration patterns, during 1996-2011.
- It seems that the pattern of migration spatial structure of West-*Azerbaijan* province has changed during 1996-2011.

2. Research Question

On this basis, the main questions to be answered in this article are:

1) What flow connections have been found based on migration patterns in West-*Azerbaijan* province during 1996- 2011?

2) How does spatial distribution of migration in West-*Azerbaijan* province changed during the selected 15 years?

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3. Theoretical framework

Inappropriate spatial structure can lead to increase in distance between individuals and service activity and consequently more separation of labor and consumer market, and decrease in quality of green environment and consequently low level of life quality; in one word, it can lead to emigration (Bertaud and Melpezzi, 2003).

Migration pattern, which is the outcome of historical and physical processes and changing political, social-economic conditions, is made up of elements and factors that explain their manner of establishment and relation between them with certain degree of order and functional capacity (Bertaud and Melpezzi, 2003: 2). Power of place to attract migrants is among the interesting subjects in social-geographic studies and political circles. Nowadays, governments attempt to rearrange urban activities to attract more residents to centers in surroundings of main cities and in this way reduce the pressure in surroundings of these cities (Meijers, 2005). Also, many disputes have been made aiming to control increasing number of families and consequently to control migrations (Chen, 2010); (Basolo, 2003). This emphasizes the necessity of paying attention to migrant-receiving/–sending approach of places; if places use their abilities and potentials to attract individuals, they can enjoy related intellectual and political advantages (Rogers, 1998).

Nijkamp (1976) refers to the variables of population and migration systems and studies the structure of spatial interaction between them. In his idea, movement patterns may issue from outstanding differences in elements of spatial structure. Using multi-criteria analysis, he states in his study that depending on the degree of deviation from local supply of these elements, according to related collective and individual priorities, spatial dispersion will take place from big urban centers to their surrounding areas (Furnkranz, 2009: 55-59).

Migrant-sending/-receiving rate of the regions can be examined according to the existing differences in places' characteristics and in regard to indexes such as employment opportunity, payment rate, services quality, crime rate and environmental conditions (Capello, 2007). However, what is important in examining migration patterns is to discover the reasons that make one place attractive or unattractive in the eyes of residents. For this, it is required to notice social, political, population, economic, spatial and environmental characteristics and their influence on power of destination place to attract migrants (Tirtosudarmo, 2009).

Related information on intra-regional migrations in different countries is collected using different tools (census, survey, official documents) (Stillwell et al, 2010). With no doubt, to calculate broad range of migration, indexes of density (such as rate and efficiency), connection (such as connectivity and/or inequity) and distance (as mean travelled distance) must be factored in (Norwegian Refugee Council, 2007). Migration index is a valuable tool by means of which analysts can understand migrants' behavior and population, and consequently, economic changes (Bell et al, 2014).

There are various environmental, social, economic, cultural and political-administrative factors playing in urban-rural relations; this produces variety of relations that are difficult to examine within pre-determined subjective and theoretical frameworks; however, since these connection patterns can contribute to better understanding of them, we can use them in certain conditions. The main patterns in this regard are duality model and continuity model (Mirzayi et al, 2012). Connection patterns are as follows:

A) Duality model: this model basically stresses inconsistencies between city and village, and substantial duality in urban and rural growth. According to this method, the manner of compliance and integration of village connections to city depends on basic economic differences, difference in application of technology, level of enjoyment from technological knowledge and inequity in terms of power distribution and legal status; these factors lead to regional migration.

B) Continuity model: proponents of this model believe that there are not basic differences between city and village; they consider them as two poles and advocate urban-rural and rural-urban migration and more inter-regional relations. According to this model, existing inequities between city and village are projected not as inconsistencies between two settlement units, but as different and gradual stages and levels of an evolutionary trend. Continuity model roots in the ideas of Louis Wirth and is important in two respects: first, in respect of categorization and segregation of settlements; second, in respect of analyzing the trend of social course and transformation (Mirzayi et al, 2012).
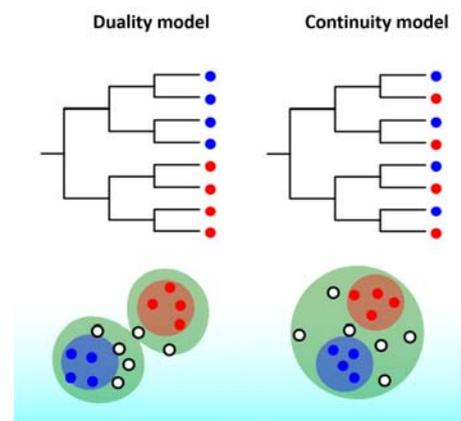

Fig .1.Types of immigration connections
(Source www.ebi.ac.uk)

3.1 Review of literature

Lomax et al. (2000) in an article named "Internal Migration in the United Kingdom: Analysis of an Estimated Inter-District Time Series, 2001–2011" studied manner of internal migrations between intra-provincial regions in Britain during first decade of 21th century. Research method employed for this study was to use quantitative methods such as calculating net migration density, unemployment rate, gross domestic production, distance and relation between regions. Based on resulted estimations, moving from urban to rural areas decreased during 2001-2011, while, the opposite was the case in northern and southern regions; in these regions, movement to north and south in urban areas increased (Lomax et al, 2013).

Blake et al. (2000) in their article "Creating a Temporally Consistent Spatial Framework for the Analysis of Interregional Migration in Australia" examined four key methods for developing compatible spatial systems to analyze inter-regional migrations during 1976-1996; for this aim, they used census and geographic data. Migration data was formed based on migration from one settlement to another and then returning to the origin place. Results revealed that these movements have caused spatial discontinuity in the region (Blake et al, 2000).

Shen in 2013 in "Explaining Interregional Migration Changes in China, 1985–2000, Using a Decomposition Approach", applying Poisson multi-level model, examined population, social and economic characteristics of the origin and destination and changes in migration parameters during 1985-1990 and 1995-2000. Results showed that inter-provincial migration in China had an increase of 22 million during these periods, 62.28 percent of which can be explained through changes in values of variables and 37.72 percent through changes in value of parameters of the model (Shen, 2013).

Nogle (1997) in his article "Internal Migration Patterns for US Foreign-Born, 1985–1990" studied inter-provincial in-migrations using logistic method. Nogle came to two outcomes: first, New York, California and Florida were the biggest migrant-receiving states in America and New York had the highest rate in receiving migrants. Second, highest rate of migration to California was from Mexico and the highest rate of migration to Florida was form Cuba (Nogle, 1997).

Vidyattama (2013) in an article called "Inter-provincial migration and 1975–2005 regional growth in Indonesia" investigated the influence of internal migration on development of province in Indonesia. This article used census related to 1975-1980, 1985-1990, 1995-2000 and measured correlation between income and unemployment. Results revealed that migration insignificantly played in regional convergence during 1975-2000; however, different policies influenced the rate of migration during the given periods and inter-provincial migrations especially in poor provinces positively influenced economy of Indonesia (Vidyattama, 2013).

Okonny-Myers studied "The Interprovincial Mobility of Immigrants in Canada". He used the main outcomes of the study to analyze intra-provincial movements of migrants and population maintenance based on obtained information from Linear Migration Database IMDB during 2000-2006. According to the results, tendency of move in Canada was higher from east to west; and Ontario, Quebec and British Columbia received large number of migrants. This result was based on net migration rate produced by Demographic Division of Statistics Canada. Various flows of intra-province migration caused inequity in the province; however, regions with similar rate of population followed the same trend (Okonny-Myers, 2010).

Kousheshi (2004) studied the role of the youth in migration flows and its influence on labor supply in Tehran province. The study revealed that migration flows of the province especially migrant-sending and migrant-receiving flows were completely age- and gender-oriented. Migration rate of both genders in working ages was remarkably high and migration rate of 15-29 years old individuals was as such that absolutely influenced labor supply of the province (Kousheshi, 2004).

Mahmoudian & Moshfegh (2008) in a research entitled "Changes in the spatial structure of inter-regional migration in Iran during the period 1976 - 2006" studied change trend of selected important indexes of inter-regional (inter-provincial) migration system using conceptual model of spatial structure of internal migrations and Zelinsky's mobility transition theory during a period of 30 years. Having introduced five principal dimensions of internal migrations system (intensity, impact, continuity, centralization, migration distance), they calculated their some of key measures and described and analyzed their general trend over three decades. The results of their study revealed that during this period the rate of gross remigration and index of migrations' effectiveness in redistribution of population had radical fall (Mahmoudian & Moshfegh, 2008: 89-117).

4. Research method

This research is an analytical-descriptive type of study and is based on quantitative data collected through documentary studies. To conduct this research, official statistics of SCI was used and different methods and techniques were adopted for their analysis. Statistics belongs to census periods covering 1996 to 2011; the main emphasis was on statistics related to migration, individual's place of birth and crude total population, for cities and rural districts of West-*Azerbaijan* province in segregate form.
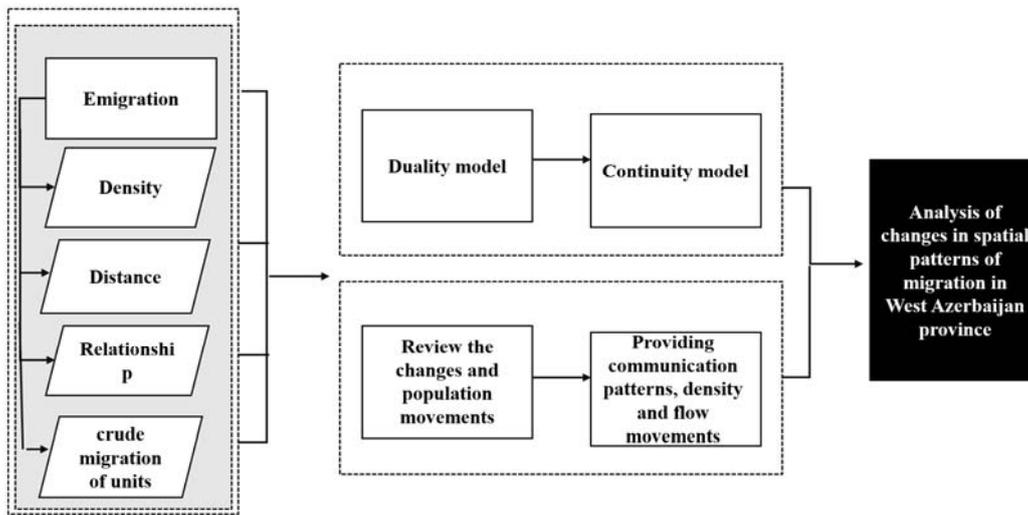
Fig. 2.Conceptual Model Research (source: authors)

4.1 Method of calculating crude migration intensity

Bell et al proposed this method to compute the intensity of migration. It calculates indexes of intensity, connection, gross production and the rate of crude migration. Intensity index in this method is calculated as follows:

$$CMI = \left(\frac{\sum_i \sum_{j \neq i} M_{ij}}{\sum_i P_i}\right) * 100$$

In this equation, M_{ij} stands for the number of internal migrants moving between i and j; p_i stands for the region's population. Using CMI method, spatial dimension of internal migration and changes and movements of migrants are mapped. In this method, variables of distance and median (instead of mean) are used (Bell et al., 2002: 449).

Connect index is another index which shows emigrational connection between regions. Stillwell employed this index for the first time to calculate rate of ethnic migrations in 2001 census. To compute connection between regions following equation is used:

$$Ic = \frac{internal\ migration > 10 * migrations\ between\ regions}{total\ number\ of\ migratons}$$

Finally, to measure relation between internal migration and dependent variable of settlement patterns, it is necessary to study movement flows using net migration index. There are two methods to do this; the first method is to use MEI index and the second one is to use ANMR index. MEI index measures balance or imbalance in a network of intra-regional internal migrations; and ANMR index shows redistribution of population caused by net migration balance (Bell et al., 2002: 450).

$$MEI = 100\left(\frac{\sum_i |D_i - O_i|}{\sum_i D_i + O_i}\right)$$

$$ANMR = 100\left(\frac{0.5 \sum_i |D_i - O_i|}{\sum_i P_i}\right)$$

D_i shows total migrations in region i; Q_i shows total migrations from other regions to region i; p_i shows population of region i. In order to calibrate the model, it is required to define matrix of movement flows between regions. For this, an accurate measuring tool which is based on movement flows between small units was used. For instance, in this model, we can segregate 451 regions into 1100 counties. Both distance between regions and distance between segregated sections are measured; and eventually, exact distance between regions is obtained.

$$d_{ij} = \frac{\sum_r \sum_s (m_{rs} + m_{sr}) d_{rs}}{\sum_r \sum_s (m_{rs} + m_{sr})}$$

Here, d_{ij} stands for distance between regions; d_{rs} stands for distance between sections and m_{rs} shows the rate of migration between sections r and s (Fotheringham, 1991).

4.2 Dependent variable of factor analysis

Factor analysis aims to reduce the large number of variables to a few interpretable variables called factors (Kim, 2003: 114). Factors are assumed elements or variables that reflect shared variance of tests, measures and resulted answers of the questions. Usually the most effective variables are determined when the number of variables to study is large and the relation between them is unknown. In this method, variables are made up of a set of factors, in such a way that the percentage of variance dwindles from the first factor to others. Therefore, variables of the first factors are the most effective ones.

4.3 Correlation analysis using geographically weighted regression (GWR) in West-Azerbaijan province

Geographically weighted regression devotes especial attention to determined variable coefficients for local difference, through allocating more weighted connection to geographic observations. This method easily maps spatial patterns and is useful in calculating and examining spatial hypothesis (Wu, 2003: 5). It can also show impact extent of each variable on another variable. Equation of regression line can be calculated as below:

$$Y = aX + b$$

Positive coefficient of X indicates that there is direct correlation between dependent variable and independent variable; negative coefficient means that no correlation between these two variables was seen.

5. The area of study

West-Azerbaijan province is an extended region in north-west of Iran and shares boarders with Turkey, Iraq and Nakhichevan Republic. This province covers an area about 37412 km^2 and includes 3 million people and 17 counties. Making up 31.28 percent of total population, the county of Urmia was the most populous one in 2011. Around 365408 people entered the province or moved across it during 1996 to 2011. Previous living place of 25.96 percent of migrants was in other provinces; 21.49 percent lived in other counties of this province and 49.57 percent lived in the county where the census was taken place. Residing place of the rest was reported abroad or undeclared. Comparison of previous living place of migrants with the place in which they were censuses indicates that during the studied period 30.76 percent moved from village to city, 35.18 percent from city to city, 13.56 percent from village to village, and finally 17.52 percent moved from city to village.
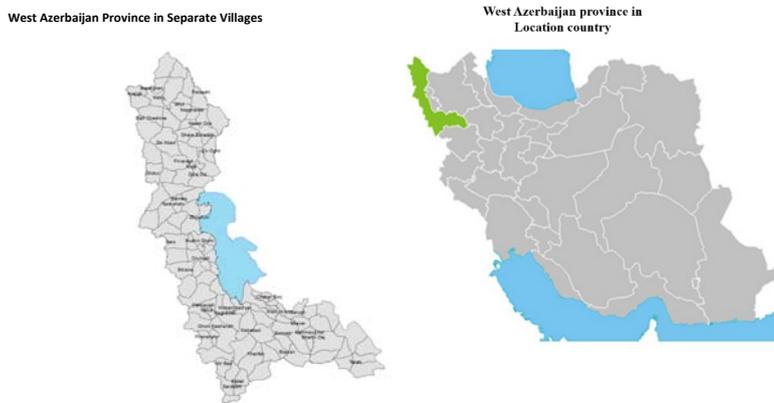

Fig. 3. geographic position of West-Azerbaijan province in Iran and its segregation to rural districts
(Source: planning of West-Azerbaijan, 2009)

6. Discussion and analysis

6.1 Discussing and analyzing density using the method of calculating the intensity of crude migration between rural districts of West- Azerbaijan province

To discuss and analyze crude migration intensity in West-Azerbaijan province, M$_{ij}$, which is the number of internal migrants having moved between counties i and j over a period of 15 years, was calculated; regional p$_i$ relates to i which stands for population prone to migration in each given period. Intensity, proportion of the number of migrations to population prone to migration which is shown in percent, can be shown as an index in form of time series to activate compatible comparison during the given decade. CMI changed from 4.3 percent to 4.8 percent of total population during this period. Table No. 2 shows an increase in index of CMI which rose from 78 in 1996 to 93 in 2011. Index of CMI also illustrates the summary of traveled distance by migrants in system, which presents spatial changes in internal migration. Both mean and median migration distance became shorter

during time series. In this research, as Bell et al. suggested in 2002, median migration distance has been used. As he puts, median value is definitely more reliable than mean value since distribution of these distances is in diagonal form; this reflects powerful influence of distance, which always happens. Median distance of 50 km in 1996 decreased to 47 km in 2011. Migration distance indexes are achieved through sum total of inter-regional migrations (and, in this way, intra-regional migration distances are not taken into account). As mentioned, seeking better life, education and employment opportunity and getting access to services and facilities caused an increase of migration and settlement in central areas of the province, which led to formation of residential nodes in northern and southern parts during short period of time (table. 2).
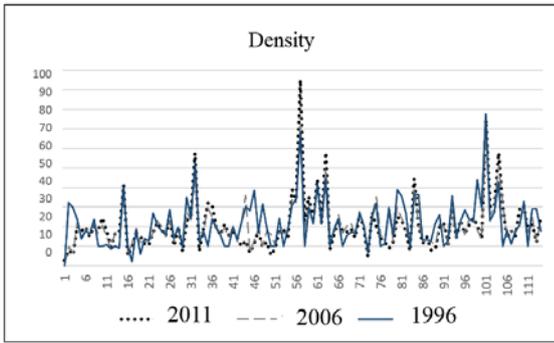
Fig.4. Changes in density using the intensity of crude migration during the years 1996-2011 (Source: Authors)

6.2 Examining relations among West-Azerbaijan counties using the method of calculating crude migration intensity

Another measure illustrated in table No.3 is connectivity index, which measures emigrational changes in inter-regional relations during time series. Index of connectivity (IC) is simple measurement of spatial connectivity, since it calculates a number of non-zero values between each main area and all destination regions. Stillwell and Williams employed this index to measure ethnic migrations, in 2010 census. They understood that 65 percent of regions in local scale strongly connected to big urban regions.

To analyze connection, the rate of migrants was used to achieve the level of inter-regional relation. Degree of connectivity during 1996 to 2011 increased from 30 percent to over 31.5 percent, which indicates that connections had an increase at the end of the studied period (Figure.4).
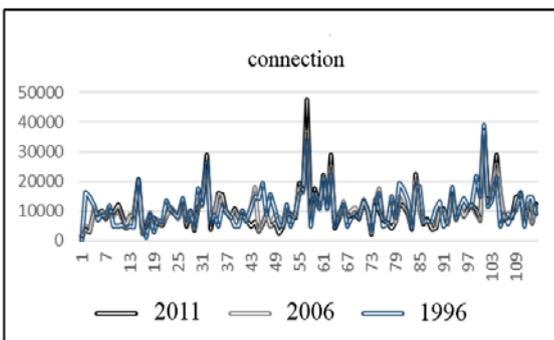

Fig.5. level of inter-regional relation (Source: Authors)

6.3 Examining movement flows between rural districts of West- Azerbaijan province

It is important to understand influence of internal migration on population settlement pattern. In this section, spatial patterns of internal network migration which is subdivided into two types of flows in regional scale are taken into consideration. These two scales that form the pattern of movement flow are migration effectiveness index (MEI) and annual net migration rate (ANMRR). MEI in fact points to the degree of (a) symmetry or (im) balance in a network of migration between regional flows; while, ANMR shows redistribution of population caused by balance in migration index. Network migration rate is used to show change pattern of migration exchange in the system for both scales. According to median distance, MEI rose from 0.63 to 0.81. Such increasing pattern in MEI during 1996 to 2011 represents combinational effect of demographic, economic and etc. factors in causing this phenomenon. Also, ANMR index in each cell – which is indicative of intra-regional migration that takes place in one region – rose from 0.35 to 0. 41. These results show that migration has led to population growth; it also revealed gradual change of population density and distribution toward northern, southern and central part of West-*Azerbaijan* province. In 1996, highest population concentration was in rural districts locating around the city of Uremia, and West-*Azerbaijan* province had presented a mono-central pattern. During the following 15 years, population density tended toward northern and southern nodes with cohesion concentrated in central parts (table. 2).

According to trend of population changes during 1996 to 2011, migrations were mostly toward the rural districts of Bakeshlouchai, Nazlouchai, northern Nazlouchai, Rouzehchai, Barandouzchai, southern Barandouzchai, Bashghaleh and Torkaman in surroundings of Urmia; mentioned rural districts acted as central focuses in the studies period of time and due to increased activity in northern and southern parts of the province (Bakeshlouchai, Nazlouchai, northern Nazlouchai, Rouzehchai, Barandouzchai, southern Barandouzchai, Bashghaleh and Torkaman) and increase of density in the rural districts of eastern Makrian, western Makrian, Karasani, eastern Ajourlo, Barough, Zarrinehroud, Firouragh, Gharazia-al-din, Akhtachi and eastern Akhtachi, migrant sending rate for mentioned rural districts decreased; this created continuity model between northern, southern and central nodes.

Table 1

Index of movement flows between West-*Azerbaijan* rural districts

Characterized	1996	2006	2011
MEI Index	0.63	0.79	0.81
ANMR Index	0.35	0.39	0.41

Table 2
Map of density, connection and movement flows in West-*Azerbaijan* province for each rural district during 1996-2011

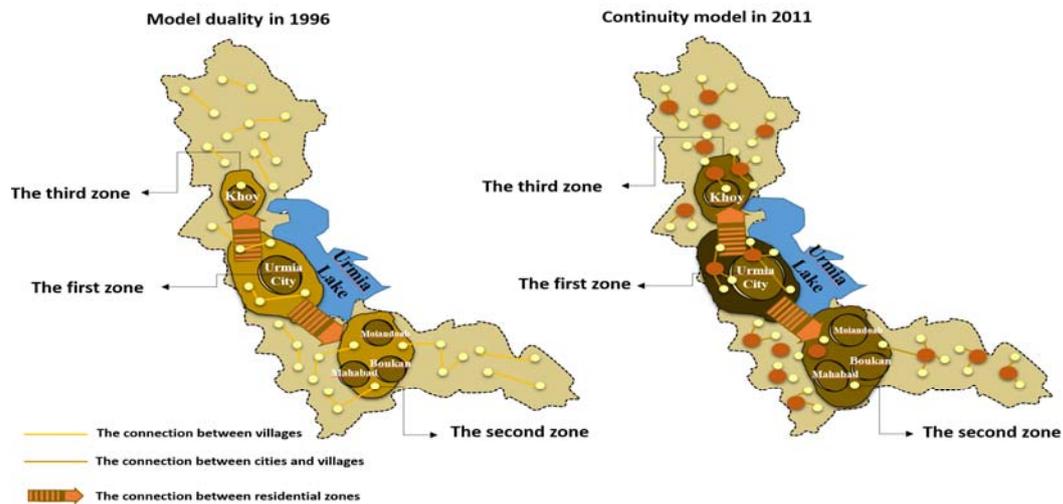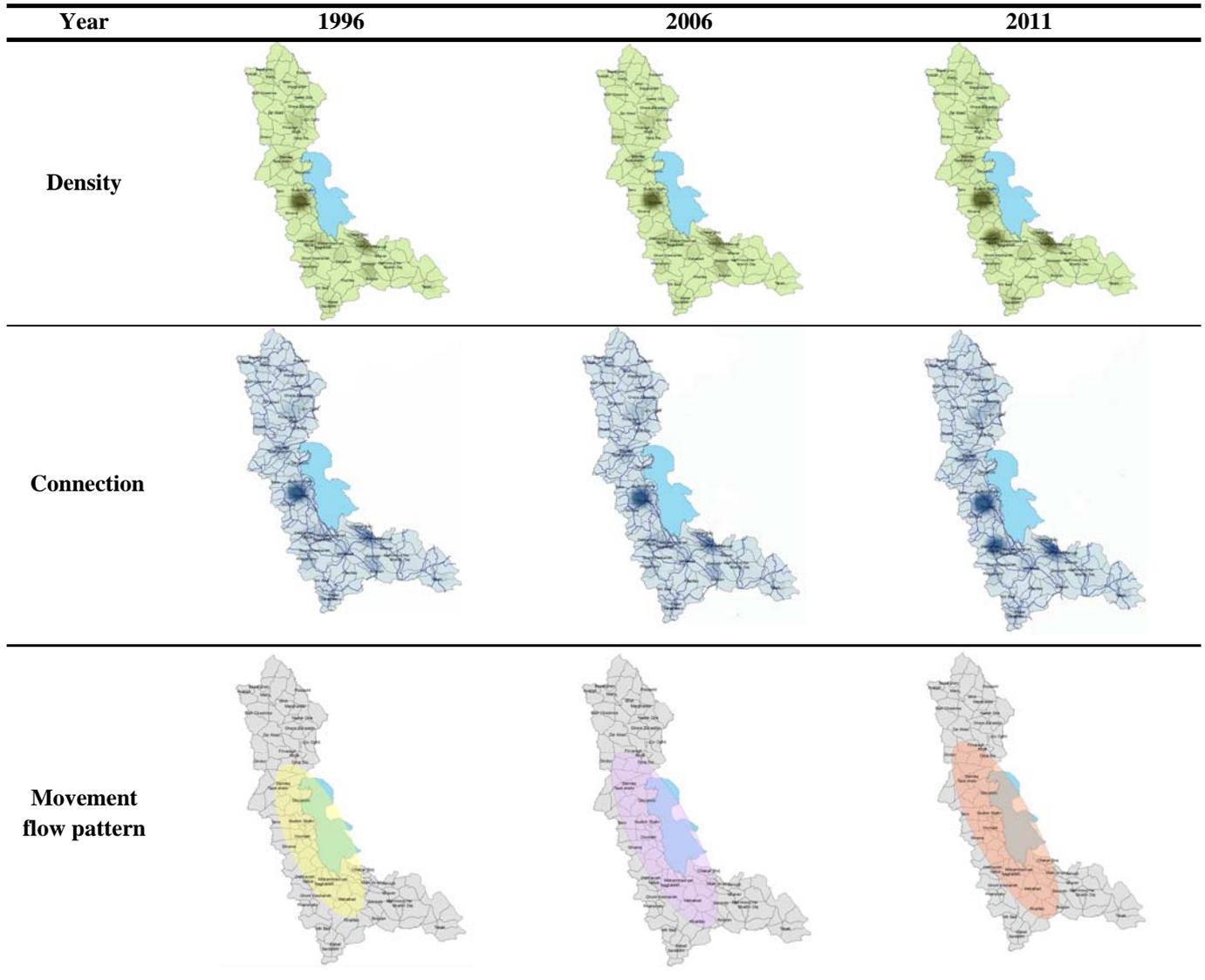| Year	1996	2006	2011
Density			
Connection			
Movement flow pattern			

Fig. 6. Spatial connection pattern change for West-*Azerbaijan* province during 1996 to
2011 (Source: Authors)

6.4 Factor analysis

In order to see whether variable set of this research in correlation matrix is suitable for factor analysis or not, we use Kaiser-MeierOlkin (KMO) statistic. Achieved KMO statistic in this study is 0.903 which indicates that the existing correlations are suitable for factor analysis. Also, the assumed equality between unit matrix and correlation coefficient matrix is rejected according to Bartlett test.

According to table No.3, since the KMO statistic is 0.903, data is suitable to carry out factor analysis.

The result of Bartlett test is meaningful; this means that null assumption is rejected, in another words, there is correlation between variables.

Table 3

The amount of KMO (The dependent variable tendency to migrate)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	9
Bartlett's Test of Sphericity	0.03
Approx. Chi-Square	2731.405
df	528
Sig.	0.000

In factor analysis, the method was to analyze using key variables; the employed rotation method was orthogonal rotation. This table shows eigenvalue variance before and after rotation:

Table 4

Eigenvalue and variance corresponding to factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	0.770	14.340	14.340	0.770	14.340	14.340	0.685	12.767	12.767
2	0.673	12.543	26.883	0.673	12.543	26.883	0.653	12.171	24.937
3	0.625	11.652	38.534	0.625	11.652	38.534	0.696	12.946	37.901
4	0.609	11.338	49.872	0.609	11.338	49.872	0.643	11.971	49.872

(Source: Aauthors)

Table No.4 illustrates eigenvalue and variance corresponding to factors. Eigenvalue of each factor is a proportion of variance of all variables which is explained by that factor. Eigenvalue can be calculated through the sum of squared factor loadings of all variables. Lower eigenvalue for a factor means that the given factor played little in explaining variables variance. As it is seen, four factors can explain variances. If we rotate achieved factors using Varimax method, the first factor (density) will have 12.76 percent, the second factor (distance) 12.17 percent, third factor (connection) 12.9 percent and the fourth factor (internal net migration) 11.97 percent of variance.
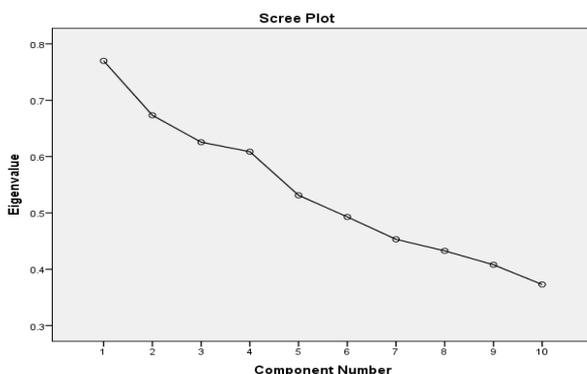

Fig .7. Changes of Eigen values in relation to factors
(Source: Authors)

The figure above shows the changes of Eigenvalues in relation to factors. It is used to determine the optimum number of variables. According to this figure, it is clear that from the fourth factor onward small changes happen in eigenvalue; so, four factors can be determine as key factors that play the most influential role in explaining data variance.

6.5 Regression between dependent variable of migration spatial structure and independent variables of density, connection, distance and internal migration intensity

Among variables introduced to the model, the variables of density, connection, distance and internal crude migration intensity were entered to regression model as independent variables in order to predict changes of dependent variables of migration, using simultaneous (step by step) method.

In step by step method, the most effective variable is entered to the model, the variable of density in first step, the variable of distance in the second step; the variable of connection in the third step and the variable of internal migration intensity in the fourth step are entered in regression model.

Table No. 5 illustrates summary of statistics related to model fitting and includes the number of fitted models, multiple correlation coefficient, determination coefficient, adjusted determination coefficient and standard error of regression model estimation.

Table 5

Summary of statistics

Model	Multiple correlation coefficient	The coefficient of determination,	Adjusted R Square	Std. Error of the Estimate
1	0.542	0.293	0.292	2.50735
2	0.719	0.517	0.515	2.07531
3	0.835	0.696	0.694	1.64788
4	1.000	1.000	1.000	0.00000

(Source: Authors)

1.Density

2. Density and distance

3. Density, distance and connection

4.Density, distance, connection crude migration intensity

Interpretation of the above table shows the degree of correlation coefficient between dependent and independent variables. In model 1, only density variable was entered in and the amount of multiple correlation coefficients was reported as 0.542; therefore, there was almost strong correlation between the variable of density and migration spatial structure. The amount of adjusted determination coefficient was reported as 0.293 which means that independent variable of density by itself can explain almost 29 percent of total variance of dependent variable (migration spatial structure pattern). Entering the variable of distance to model 2 added 17 percent to determination coefficient and raised it to 0.517. In model 3, adding the variable of connection added about 11 percent to determination coefficient and raised it to 0.696. Finally, in the last model, entering the variable of internal crude migration intensity, added 6 percent to determination coefficient and raised the final determination coefficient to 100 percent. Eventually, all data was explained by regression model. Final model is as follows:

Migration spatial structure= (0.517) Internal crude migration + (0.696) connection + (1.000) distance + (0.542) density + (- 0.344)
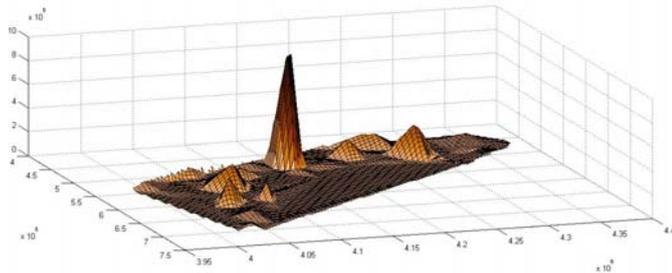

Fig.8. Migration structure pattern of West-*Azerbaijan* province in 2011 (Source: Authors)

7. Conclusion

Migration and redistribution of population in the country is among the factors that social and economic policy makers pay attention in order to regulate and orient population movements and direct it to selected poles. Hypothesis test in this study revealed the meaningful relation among the variable of density, distance, connection, internal crude migration and also spatial structure of migration in West-*Azerbaijan* province.

Indexes of density, distance, connection and internal migration intensity were used to assess change trend of West-*Azerbaijan* migration pattern during 1996 to 2011. The results showed time series of network migration rate and balance in migration system throughput the period under study. Spatial connection was increasing since migration flow between regions became more non-homogenous and unequal; profitability of migration as a drive for redistribution of population across the country was increasing. In regional level, analysis of data's time series highlighted the importance of surrounding rural districts of Urmia as a key factor in migration system of West-*Azerbaijan*. During 1996 to 2011, general trend in regional level experienced an increase in the volume of

internal and intra-province migration, and led to formation of new patterns of network migration, and created continuity model among northern, southern and central nodes.

In sum, the first hypothesis was rejected since continuity was created during studied period, which led to pattern change of migration structure. Second hypothesis was proved since migration structure pattern in 1996 had central structure, and migration mostly had been toward surrounding rural districts of Urmia; however, this changed during 15 years and some nods were created in northern and southern parts of the province, and tended toward clustered pattern.

In this regard, a set of comprehensive, integrated and coordinated administrative policies must be adopted; for example, more economic assets must be provided in villages and small towns. In relation to migration curbing policies that are completely focused on migrant-sending regions, naturally we need to deal with the causes of migration. Usually, poverty, lack of production assets, employment and finding income or lack of economic-social infrastructures are among the main reasons that motivate migration.

However, such change in spatial pattern brings about some consequences. In majority of developed countries, cities are production centers and motivate development and progression which is due to agricultural growth and high agricultural production and export of its surplus; but, in West-*Azerbaijan* because of retrogression of agriculture and its reduced production, majority of farmers tend to rush to middle towns. In regard to population movement from agriculture section to other sections of production and from rural to urban regions, we must acknowledge that agricultural activities is only small part of what human being needs for its evolution. So, the more her/his assets grow, more s/he requires manpower to spend in non-agricultural activities; this in itself causes rural-urban and agricultural-nonagricultural migration.

According to definition, reasons and consequences mentioned above, it is necessary to propose suggestions to deal with this problem, among which are:

- Theoretically, in circumstance of population increase and necessity of phenomenon function, vital balance is created when rural population is attracted to industrial- urban centers based on appropriate planning in line with economic development of country; and the remaining labor stay and work on their farming lands.

- Variable of general literacy rate acts as suitable factor for out-migration trend; so, there is positive relation between the rate of general literacy and the rate of migration from village. With growth and expansion of mechanization in a province, because of reduced job opportunities, the rate of migration to that province is decreased.

- Promoting rural tourism is an important source of income and employment; it is seen as determining means for economic and social development of rural collectivities.

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- Government can guarantee the volume of surplus population according to economic, social, spatial and temporal conditions and with regard to population growth of each region and its assets, and guide them to pre-determined paths in line with development policies, in order to prevent rural agriculture weakening and rural labor evacuating, in the one hand; and population concentration in cities and their cancer-like growth, on the other hand. In this way, it can guarantee industrial development through logical development throughout the country along with development in agriculture section.

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