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The analysis of frontier cooperative function (NGOS) in border and central regions' sustainable development (Case study: frontier regions of Golestan Province in Iran)

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Abstract
This research aims to study the role and function of economic-social nongovernmental organizations' frontier cooperatives in sustainable development with emphasize on developing cooperatives in frontier regions. In this research study the position, function and performance of cooperatives of four frontier cities including Agh Gola city, Gaz port city, Turkman port city and kelaleh were selected, studied and analyzed. The method of study was descriptive-analytical and data documental collection was analyzed in three dimensions of sustainable development including economic, social and environmental by using econometrics (OLS). The results of data analyses have showed that the activities of nongovernmental organizations such as frontier cooperatives of these regions leave the most effects respectively in the field of social, economic and environmental indicators. In the other word, through development in frontier cooperatives and expansion of their activities in borders, at first they had the most positive effect in development of social indicators and at the second degree , they had effect on economic and environmental indicators and dimensions and the relationship between frontier cooperatives' innate duties and their further development with sustainable development of border and central regions is always significant and some strategic programs must be planned in these fields and its relative dimensions.

Key words: *Nongovernmental organizations (NGOS), Frontier cooperatives, Sustainable development, Border regions.*

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Introduction

Sustainable development is an outlook which has been entered on the foundation of economic and management theoretical and practical results of modern era in order to emergence in the field of economic, social, cultural and also political development and because of expanded hopes which have been linked in earth for revival of human life in recent years, sustainable development has been actually a modern ear which has posed some serious doubts towards "ancient discipline" with some assumptions, initiatives and developments of its own. The aim of sustainable development is expanding facilities and improving life condition of present generation without access to God-given resources and threatening the interests of future generations. [1]

Nowadays, sustainable development has become one of the central topics of the world and has affected all the human life areas such as poverty, inequality, training and health, environment, women and children's rights, nations' freedom and also industry, policy and economic and international cooperation and it has proposed as a new range with claim has proposed all the current main issues that has endangered life cycle, nature and mankind.

Basically, economic and social nongovernmental organizations have had and yet have a main role in the process of creating sustainable development that all the cooperatives in general and frontier cooperatives in particular have unmatched role in obtaining development dimensions.. The evidence and experiences have showed that frontier cooperatives are able to have a basic role in sustainable development especially in border, surrounding and central regions of these sectors as one of the main factors of sustainable development regarding capability, functional, rules and regulations. It should be said that that necessity of attention to border regions is not due to the presence of population living in those regions, but also it is because of adverse effects that those regions' underdevelopment leaves on surrounding communities and also central regions and totally internal area of country. [3]

Our country (Iran) with 1648000 square kilometer in the neighborhood of 15 countries enjoys a privilege strategic position. So one of the positive actions which Islamic republic of Iran has done currently have been development and expansion of frontier cooperatives in border regions and frontiers in order to develop border regions and their outskirts significantly through real development of activities and functions of these cooperatives. Because by establishing and developing frontier cooperatives on the one hand, welfare requirement and needed facilities will be provided and expansion of the scope of these cooperative's activities have a positive effect on economic, society and also environment and on the other hand, it will prevent destructive effects of external and central regions of these sectors and country.

This article studies the role of frontier cooperatives function with withdraw from a research work with the same topic as one of the main manifestation of nongovernmental organizations and the method of their influence on border, surrounding and central regions' sustainable development to specify that at first, how much is the extent of frontier cooperatives' functional results? And secondly, in what way do we are able to play a role in access indicators sustainable development of border and also cities and central regions.

Statement of problem

The results of performed studies show that the countries with expanded and wide area such as Iran have some differences and lack of tangible space and regional balances between central, border and surrounding regions which this lack of balance will leave main effects in two directions. One of them is this fact that total developmental movement of these countries will be very slowly and the other is that it increases expansion of insecurities in central, border and surrounding regions and as a re-

sult, total development security and management system of countries and also sub- areas will be influenced. [4]

On the one hand, growth and development of countries' border regions is a function of other economic operations including export that is trading with other countries and they basically benefit from some establishments with public and nongovernmental nature and structure for development surrounding regions including frontier regions. In Iran also frontier cooperatives with their nongovernmental nature were applied and played role as small and early-return economic agencies in the field of income-generation and reducing poverty in border areas. So through planning determined programs in term of making these kind of establishments efficient, we can figure out more appropriate investments in order to guide and consequently new productions, the increase in education level and decrease in cultural effects of surrounding and central regions and those regions' sustainable development will be intensified by their meaningful continuous. [5]

Basically, border regions suffer from potential disabilities especially at agricultural and industry sectors and they have been always considered as deprived and isolated areas of countries. Therefore, development of border market is one of the frontier cooperatives' activities and their main function whose result is help to these regions' economic and developing economic cooperation and commercial exchanges among neighbor countries. Border market development will make possible development of transportation systems and export and import expansion, importing surplus products of surrounding regions, liquidity absorption, restraining inflation and absorbing foreign investments. [6]

From the theoretical viewpoint, sustainable development in border and surrounding regions is considered as an important branch and a phenomenon with expanded and complicated dimensions which actually considers the growth and development of border regions, economic, social, population, environmental and ecological factors. What that is considered important in this field today is awareness of strength and weakness points of social, economic, environmental and ecological dimensions of regions which can be main factor in settlement the difficulties and insufficiencies in order to achieve economic objectives and social health and finally sustainable development. [7]

Through above look at form, content, functional and performance position, frontier cooperatives in Iran's surrounding areas are considered very important in order to through required epistemology in the field of functional role of frontier cooperatives in frontier regions analyze production, commercial, economic and welfare dimensions of border regions and also indicators of these areas' central regions development. By this question that "what does the functional and performance status of frontier cooperatives in Iran?" and "How and to what extend do these frontier cooperatives leave maximum effect in border regions' development and consequently central regions?" A study has been done for answering to these questions in form of a case study in Golestan and regarding functional status of frontier cooperatives of this province in four cities including Agh Gala, Gaz port city, Turkmen port city and kelaleh.

Questions

The questions includes:

1.What is the status of frontier cooperatives and their functional role in sustainable development of border regions?

2.What is the functional role of frontier cooperatives on "economic indicators" of border region?

3.What is the functional role of frontier cooperatives on "social indicators" of border regions?

4.What is the functional role of frontier cooperatives on "environmental indicators" of border regions?

Theories and hypothesis

Respecting to questions and according to this theory including "The effect of frontier cooperatives' development on sustainable development of border and central regions is always significant." However, some hypothesis like following have been defined in order to perform study specifically:

1.The functional role of frontier cooperatives' development on sustainable development of "economic indicators" of regions under study is always significant.

2.The functional role of frontier cooperatives' development on sustainable development of social indicators of regions under study is always significant.

3.The functional role of frontier cooperatives' development on sustainable development of "environmental indicators" of regions under study is always significant.

Theoretical framework and conceptual model

The social and economic reference theories present three dimensions of sustainable development in three categories and one prominent sub-index.

Methodology

The study was selected in type of descriptive-document and statistic population were considered in case of Golestan province which includes all the companies of frontier cooperatives of Golestan in the number of 12 cooperatives with 188267 member who work at four cities including Ag Gala, Gas port city, Turkmen port city and kelaleh.. The obtained data and information were analyzed and studied through four method including A. Analytical-descriptive. B. Econometric (OLS). C. Granger causality advantage determination. D. Digi fuller test.

Findings

The physical condition of Golestan's frontier cooperatives consists of:

A-The number of cooperatives' members

A-The study of process of frontiersman cooperatives' member of Golestan in 10 year time output including (2001-2011) confirms this fact that recruiting in this period has had up to 473.5% growth. Respecting to the nature of these companies, this growth shows social development of population under study which has been done in light of the establishment of these cooperatives. (Table 1)

B- Cooperatives' export value

The study of process of frontiersman cooperatives' member of Golestan shows this fact that this process in studied time output has had 473.5% growth. (Table 2). While in spite of the growth of 99.4% in frontier cooperatives export, the country rating of frontier cooperatives of province has decreased 100% compared with base year (2001) regarding export. (Tables 2 and 3)

As the result, in term of demography, through the increase in the number of cooperatives' members, their export function and share will be increased compared with other economic sectors, so there will be a direct and significant relationship between frontier cooperatives development in term of population and their export functional development which this relation must be always preserved.

The economic functional status of cooperatives

The population growth of Ag Gala showed a growth equal to 296.78% compared with base year (2001). The population of Gas port city also showed 160.82%, Turkmen port city showed 144.47% growth and kelale city showed a growth equal to 327.43% and unemployment rate in Ag Gala city in 2001 has decreased to 7.6% and it has increased to 113.5% in Gas port city. The unemployment rate in Turkmen port city has decreased from 19.81% to 19.8 and unemployment rate in Kelale reached to 10.7%. On the other hand, per capita income of frontier cooperatives members show a growth equal to 12.14% during the years 2001-2011. (Table 4).

The data under study indicates that as the number and consequently development of frontier cooperatives' activities, the border regions have also observed economic development. In

the other words, we can claim that there will be a direct and significant relationship between two variables including "frontier cooperatives' development" and "economic indicators' development" of border regions which this is consistent with social-economic reference theories.

The status of social function of cooperatives

The status of each one of the indicators including literacy rate (adults), health and treatment, level of access to drinking water, access to electricity network, access to natural gas and life expectancy in Golestan's frontier regions were observed according to table 5 as follows:

-The adults' literacy rate during studied time period in Ag Gala, Gas port city, Turkmen port city and Kelale are 342.9%, 944.55%, 130.3 and 364.6% respectively.

Year	1380	1381	1382	1383	1384	1385
The number of member	32827	48109	48109	48109	48109	48109
Year	1386	1388	1388	1389	1390	
The number of member	87321	111256	160290	178929	188267	

Table 1. The number of frontiersman cooperatives' member of Golestan

Year	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390
One thousand dollar	6627	6219	7080	2274	2550	1706	3005	3531	6351	6128	7212

Table 2. The value of exporting the goods of frontier cooperatives of Golestan, Reference: Standard statistical calendar of Golestan province. 2013

Year	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390
Rating	6	7	6	8	5	5	6	6	5	8	12

Table 3. The rate of Golestan regarding the export value in country based on the function of frontier cooperatives and private sector, Reference: Standard statistical calendar of Golestan province. 2013

City	The population growth	Unemployment growth rate		Per capita income
		2010	2011	
Ag Gala	296.78	7.69	7.6	12.4
Gas port city	160.82	12.5	13.5	
Turkmen port city	144.47	19.81	19.8	
Kelale	327.43	10.23	10.7	

Table 4. The effect of frontier cooperatives companies of Golestan province on economic indexes during the years 2001-2011

City	Adults' literacy rate	Health and treatment	Water	electricity	Gas	Telephone	Life expectancy
Agh Gala	342.9	494	43.5	77	250	201	men
Gaz port city	994.55	14.04	73.5	35.56	41.22	---------	Turkman port
city	130.3	10.5	37	39.53	12.63	263	women
Kelale	364.6	282.61	45	33.63	115.38	263	

Table 5. The effect of frontier cooperatives companies of Golestan province on social indexes during the years 2001-2011

-Data analysis also indicates that growth rate of the number of active hospital beds in Agh Gala, Gaz port city, Turkmen port city and Kelale have received to 494%, 14.04%, 10.5 %and 282.61% respectively.
-The growth rate of healthy drinking water access in Agh Gala, Gaz port city, Turkman port city and Kelale have received to 43.5%, 73.4%, 37.9% and 45% respectively.
-According to evidence, the growth of electricity subscribers in Agh Gala, Gaz port city, Turkman port city and Kelale are 77%, 35.56%, 39.53 and 33.63 respectively.
-The level of subscribers' access to natural gas network in Agh Gala, Gaz port city, Turkman port city and Kelale are 250%, 41.22%, 12.63% and 115.38% respectively.
-The level of individuals' access to telephone number has been increased to 201%, in Agh Gala and 263% in Turkman port city and Kelale.
- Average rate of life expectancy among men is……. And among women is ….. Percent in frontier regions including, Turkmen port city and.

Final analysis of data under study explains that as the level of frontier cooperatives' activity in border regions in Golestan increases, the indicators related to social development have also significantly increased. So, it will be acknowledged that there is a direct and significant relationship between two variables including frontier cooperatives' development and social development of frontier and surrounding regions.

The effect of frontier cooperatives' function on environmental indicators

In the border regions under study, the green space level has had a growth of 74.26% during studied time output and this growth has been reaches from the 6257 hectare in 2003 to 14812 hectare in 2010. (Table 6).

In addition, each hectare of tree besides producing 12800 tone healthy Oxygen annually, it almost absorbs double it CO2 (Carbon dioxide), 4.1 kg daily aerosols, 7.2 kg nitrogen oxides, 7.2 kg Sulfur oxide, 9.0 kg Carbon monoxide and some dangerous materials such as Chromium (140 mg) and Lead (5200 mg).

Therefore, analyzing existing data in this section also indicates this issue that through increase in activities level and the number of frontier cooperatives in province and city subsidiaries under study, we always be witness of environmental development and preventing human and technological.

destructive. In other words, we can claim that there has always been a direct, significant and positive relationship between two variables including development of frontier cooperatives and development of environmental indicators.

Functions econometric analysis (Digi fuller test)

The relation of effect and affect between the indicators of three variables including economic, social and environmental with sustainable development variable were analyzed annually and for time period of 2001-2011 by using OLS econometric method, Digi fuller test and determination of Granger causality relation coefficient. As in this method, sustainable development has considered as a function of three indicators including economic, social and environmental.

On the other hand, because of high number of branches of three variables under study, three main branches if each variable on development were tested in solidarity test in such a way that solidarity relationship among export (economic), level of education (social) and green space level (environmental) of frontier cooperatives have been considered and the results of solidarity test of above three indicators totally showed that: development level has the most solidarity with indicator "literacy level" that means with "social variable" and the variables of three income indicators (economic), life expectancy

(social) and green space (environmental) have the most relation between sustainable development and economic variable (cooperative's

	TOSE	EXTAVONI	SAVAD	BAGH
TOSE	1	0.40	0.83	-0.14
EXTAVONI	0.40	1	-0.05	-0.39
SAVAD	0.83	-0.05	1	-0.19
BAGH	-0.14	-0.39	-0.19	1

Table 7. Solidarity test between variables (export, primary education level, green space level)

	BAGH	DARAMAD TAVONI	OMID	TOSE
BAGH	1	0.004	0.02	-0.147
DARAMAD TAVONI	0.004	1	0.88	0.842
OMID	0.02	0.88	1	0.73
TOSE	-0.14	0.84	0.73	

Table 8. Solidarity test among variables (income, hope expectancy and green space)

Null Hypothesis: Unit root (individual unit root process) Series: AB, BAGH, BARGH, BEHDASHT, BIKARI, DARAMAD O STAN,DARAMAD TAVONI, EXTAVONI, GAZ, JAMIAT, OMID, SAVAD1, SAVAD2, TAKHT, TEDAD, TEL, TOSE				
METHOD			statistic	Probably **
ADF- Fisher Chi-square			40.1526	0.0377
ADF – Choi Z-stat			1.23172	0.8910
Intermediate ADF test results UNTITLED				
series	Probably	lag	Max lag	obs
AB	0.9219	0	1	10
BAGH	0.0487	0	1	10
BARGH	0.9897	1	1	9
BEHDASHT	0.2014	0		10
BIKARI				Dropped from Test
DARAMAD OSTAN				Dropped from Test
DARAMAD TAVONI				Dropped from Test
EXTAVONI				Dropped from Test
GAZ	0.8331	1	1	9
JAMIAT	0.6582	0	1	10
OMID	0.0000	1	1	9
SAVAD1	0.8728	0	1	10
SAVAD2	0.9302	0	1	10
TAKHT	0.6560	1	1	9
TEDAD	0.9844	0	1	10
TEL	0.1362	0	1	10
TOSE	0.9844	0	1	10

Table 9. The study of variables through Digi Fuller test

income) (Table7).

In the next group, life expectancy (social variable) has the most solidarity with frontier cooperatives' development variable. However we can be satisfied with this result that each one of representatives of these three social, economic and environmental indicators may have a different solidarity with sustainable development (Table 8).

Stationary and integration analysis

At the first stage and before estimating and assessment of model's effects, the applied time series stability was ensured. Principally a series is called stable when its variance and average are fixed during time and the amount of covariance between two time periods should depend only on distance or interval between two periods, otherwise the series have had a unit branch and it is commonly called unstable. There are basically different tests to study series stability which its simplest way is drawing series diagram. But in economic studies, a more applicable and famous test such as Digi Fuller which is known as Augmented Dickey-Fuller test (ADF2) usually is used. The null hypothesis in this test is series' instability whose critical values will be calculated by simulation method of Mont Carlo which obtained by Digi fuller and it was extended by Mackinnon. Through above description in this study, Digi Fuller test was also used in order to determine the method if variables' stability for the purpose of study, evaluation and simultaneously test the variables one by one separately. According to table 3, prob=0.03 < 0.05 and the hypothesis of series inconstantly totally was rejected. So, the series of economic, social and environmental variables are totally stable or static simultaneously and with together. In the other word, according to ADF test, all the variables have been at the error level of 5% from zero order and they have been shown that the data are at the static or stable level.

As it was explained, the validation method (OLS) or at least the squares have been used to study the effect of each one of variables on sustainable development that a representative of each variable that means social indicators (life expectancy), economic (cooperatives' income) and environmental (green space level) were entered in the model and the results of test of three indicators showed that life expectancy (social indicator) and then cooperative's income (economic variable) have the most positive and significant effect on frontier cooperatives' development, surrounding and central regions and it seems that the effect of all the variables except green space level variable , have been significant. Of course respecting obtained possibilities and comparing it with test statistic (with probability level of 5%), the obtained result indicates that coefficients of social and economic variables have and had more significant effect on region's sustainable development. Because their probability have been observed less than 55.

On the other hand, the amount of (f) of computed function has been observed more than 2. So, the model's regression has also been meaningful and this means that all the coefficients have not had equal to zero and at least one of them was opposite to zero. Since in econometric method usually the amount of independent variables explanatory of pattern is measured by R2, so in this estimation R2 has been obtained equal to 73% which indicates this issue that 73% of changes of frontier region's sustainable development of province under study (Golestan) are explainable and justifiable by independent variables.

The results of test of social indictor (adults' literacy level), economic indicator (cooperative export) and environmental indicator (green space level) also showed that they have had positive and significant effect on frontier cooperatives' development of Golestan province among which the most effect and role belongs and has belonged to environmental variable and however the green space level of frontier, central and surrounding regions increase, at the same level its frontier cooperative' development will be increased. On the other hand,

the results of tests of life expectancy, population and green space level all showed that life expectancy variable (social indicator) has the most functional role and effect on cooperatives' development and region's economic variables rating (Table 10).

In the study of three indicators including urban gas, unemployment and green space level specified that the most negative effect has belonged to unemployment factor (economic variable) and the access to urban gas (economic variable) has had more positive and significant effect on cooperatives' development and the results of adults' literacy level test (social indicator) and two economic indicators (unemployment and cooperative's export) and green space level showed that the effect of green space level on cooperatives' development is positive and the effect of unemployment is negative and inhibitory and literacy effect is positive and leading. However, it was specified according to regressions' analysis and obtained results that based on econometric equations among three indicators, social indicator has and has had the most effect on frontier cooperatives' development and consequently border, surrounding and central regions' sustainable development (Table 11).

Granger causality test

The granger test will be used in the case that the indicators and sun-indicators are involved and effective very much in a phenomenon that in this study, because of high +volume of indicators in sub-indicators of three main variables including social, economic and environmental, it seems that determine which one of variables are cause and effect of each other. In order to use Granger test to specify that which one of two variables under study is cause and which one is effect, at first two variable including "literacy level" and "the number of cooperative's member" were considered in order to specify that is the causality of the number of cooperative' members from the area of literacy factor or not, it means that literacy is the factor of increasing the number of frontier cooperatives' members, for example, however the literacy level of the population of frontier regions is more, the number of cooperatives' members will be increased? It was specified in the study of the causes that is the relationship between variables:

1.Causality is moved toward literacy element variable from frontier cooperatives' income variable. It means that literacy is the cause of frontier cooperatives' income, and this means however the literacy level of frontiersman regions' individuals are increased, frontier cooperatives' income will be also increased. (Table 12)

2.Causality is moved toward the variable of application of cooperatives' members from the number of telephone subscribers. It means that telephone subscribers is the factor of the number of cooperatives' members, so however the frontier cooperatives' members are increased, the number of telephone subscribers will be also increased.

3.Causality is moved toward the variable of the number of cooperatives' members from the cooperatives' income variable. It means that cooperatives' income is the factor of the number of the number of cooperatives' members, so however the cooperatives' income is increased, the number of frontier cooperatives' members will be also increased.

4.Causality is moved toward the population variable from the development variable. It means that sustainable development is the factor of the population growth, so however the level of sustainable development of border, surrounding and central regions is increased, the number of population will be also increased. (Table 14)

5.Causality is moved toward the frontier cooperatives' export variable from the life expectancy variable. It means that life expectancy is the factor of the cooperatives export, so however the level of life expectancy is increase, the export will be also increased.

6.Causality is moved toward life expectancy variable from health variable. It means that

the health is the factor of life expectancy, so however the level of frontier cooperatives' health is increased, the life expectancy will be increased.

7.Causality is moved toward population variable from green space level variable. It means that the green space level is the factor of population growth, so however the green space level is increased, the population of border, surrounding and central regions will be increased.

8.Causality is moved toward population and cooperatives variables from access level to healthy drinking water, natural gas, electricity and healthy drinking water access level network.

Discussion and conclusion of findings

Data analysis totally showed that the life expectancy variable (social indicator) and then cooperatives' income variable (economic indicator) have the most positive and significant effect on frontier regions' sustainable development. Also with respect to obtained probability with less that 5% and its comparison with test statistic (with possibility level of 5%), this result has been obtained that variables coefficient related to social and economic indicators have more significant effect on frontier cooperatives' development and estimation of R2 which is equal to 73% indicates this the 73% of development changes are justifiable and explainable through independent variables.

In fact, we can conclude that frontier cooperatives' activities in Golestan province have the most functional role and effect on social, economic and environmental indicators of border, surrounding and central regions' sustainable development. In the other word, these cooperatives' activities have and have had the most positive effect on social indicators and the effect of frontier cooperatives' activities on economic and environmental components are more sensible, positive and significant.

Diagram 1. The effectiveness of variables under study on frontier regions' sustainable under study by using OLS model.

Dependent Variable: TOSE Method: least squares				
variable	coefficient	Std. error	t-Statistic	Prob
c	-1.21 E+08	1.14 E+08	-2.064031	0.03226
BAGH	-14.25872	47.03320	-1.303163	0.07706
JAMIAT	23.44819	42.78428	1.548056	0.06007
OMID	17.74398	16.40801	2.081422	0.03154

Table 10. The study of the variables including life expectancy, population and green space level through Digi Fuller test

Independent Variable: TOSE Method: least squares Sample: 2001-2011				
Variable	coefficient	Std. error	t- Statistic	prob
C	87.53444	42.15947	-3.351317	0.0154
SAGH	43.32784	15.72436	2.755460	0.0331
BIKARI	-86780.36	142599.1	-0.608562	0.5651
EXTAVONI	1199.569	205.1409	5.847536	0.0011
SAVAD1	12207.20	1151.264	10.60331	0.000

Table 11.The study of the variables including literacy level, unemployment and export and green space level through Digi Fuller test

Null Hypothesis	Obs	F-Statistic	Prob
DARAMAD TAVONI does not Granger Cause SAVAD	9	10.7109	0.0248
SAVAD1 does not Granger Cause DARAMAD TAVONI		0.57937	0.6012

Table 12- The study of relationship between variables of elementary literacy and the number of cooperative through Granger causality test

Null Hypothesis	Obs	F-Statistic	Prob
DARAMAD TAVONI does not Granger Cause SAVAD	9	2.23164	0.2234
SAVAD1 does not Granger Cause DARAMAD TAVONI		10.5465	0.0254

Table 13. The study of the variables of cooperative' income and the number of cooperatives' members through Granger causality test

Null Hypothesis	Obs	F-Statistic	Prob
JAMIAT does not Granger Cause TOSE	9	8.32504	0.0375
TOSE does not Granger Cause JAMIAT		0.03659	0.9644

Table 14. The study of variables of the number of population and development level through Granger causality test

Null Hypothesis	Obs	F-Statistic	Prob
DARAMAD TAVONI does not Granger Cause TOSE	9	2.23164	0.2234
TOSE does not Granger Cause DARAMAD TAVONI		10.5465	0.0254

Table 15. The study of variables of the development and cooperative's income through Granger causality test

Null Hypothesis	Obs	F-Statistic	Prob
BEHDASHT does not Granger Cause OMID	9	8.28899	0.0378
OMID does not Granger Cause BEHDASHT		0.70042	0.5485

Table 16. The study of variables of health and life expectancy through Granger causality test

Null Hypothesis	Obs	F-Statistic	Prob
BAGH does not Granger Cause JAMIAT	9	68.3150	0.0008
JAMIAT does not Granger Cause BAGH		0.98435	0.4491

Table 17. The study of variables of population and green space level through Granger causality test

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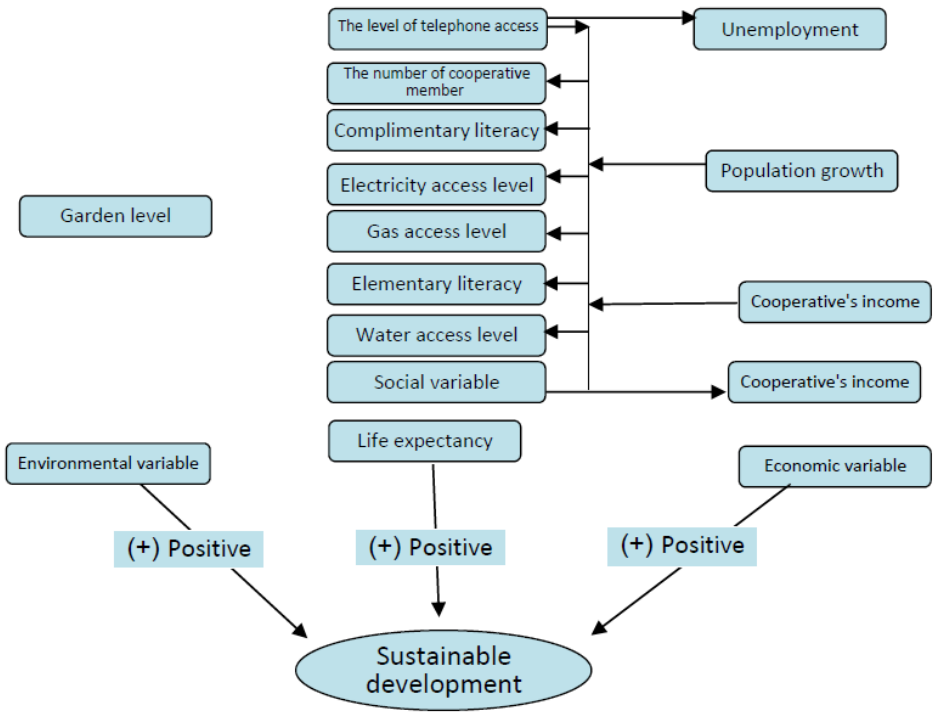

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