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Evaluating Urban Sustainable Development in Arid Region Cities with emphasis Socio- Economic Factors: Ardakan City

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Abstract: All the countries and governments, and so humans are achieving the development; also, the development has a complex, tow dimensions, changeable, searching, and processing concept. In the direction this development, cities are increasingly exposed unpleasant crisis especially in the developing countries. Now the socio- economic changes are accomplished faster than physical changes. The last strategy for growth and develop problems in the world, zonal and local level is Sustainable Development Strategy. Due to the importance of Sustainable Development in the world and arid regions, this research evaluates and study Sustainable Development in social and economic dimensions in Ardakan city. In this dimensions with due attention to the literature of Sustainable Development and key themes suggested by CSD, these indicators are selected and first of all are compared with city's areas of the country by Sign Test. In the second stage, the rank of developing of 17's areas of Ardakan are taken by Standardized Score Index. Research's conclusions explain that although meaningful differences between Ardakan and city's areas of the country aren't seen, but unsustainability in Ardakan areas are seen clearly.
Key Words: Sustainable Development, Socio- Economic Factors, Arid Region, Ardakan City.

1. INTRODUCTION

The urbanizations and urbanism growth is increasing and this trend follows until his stabilization stage to the maximum boundary. While urban life develops and citizen behavior coordinate with this development. The development is a comprehensive trend to human rise, social capacities for answering to human, social basic needs, as needs consistently develop in the shadow of cultural values and world sustainability views (Ziari, 2005). The urban development as a spatial concept could be defined as changes in land use and density area, in order to eliminate needs of urban residents about housing, transportation, leisure, food and etc (Mucomo, 1996). Sustainable Development, is interior and systematic and balanced extension that represent systematic views in all of the sciences. In the other hand, Sustainable Development is complete state of development programs that with general seeing and with emphasizing on systematic views, try to follow a balanced way (Mojtahed Zadeh, 2001). The urban sustainable development required to directed activities about urban design that take place by beneficial using of earth, environment, and energy (Latifi, 2001). The urban sustainable development considers conditions that now citizens and future citizens could live in peace and security and meanwhile the health, enjoy of long and performing life (Salehi fard, 2001). The process of achieving urban sustainable development is uncharted. We only know that plans should address the economic, environmental and social health of the city and this task can only be accomplished by approaching each of these issues at different scales (Marcotullio, 2001). An increasing phenomenon that sees in the population of most cities is ascendant growth till ten million, without adequate resources, there is neither sustainable in them nor guaranty for the subsequent generations. Since most of the needy countries locate in

arid regions, the concern is even greater for attempting to generate a common framework for the development of the development of cities, within their precarious socio- economic and environmental setups (Alshuwaikhat, 2002).

The arid zones are very sensitive natural zones that they have special features. Iran country is also in one of the world arid and semi- arid zones and Yazd province with placing in the heart of desert is considered as one of the arid provinces of Iran.

Ardakan city has settled in Yazd- Ardakan plain, in the heart of central desert of Iran, in the north of Yazd province and in space view, it is one of the largest townships of Yazd province. This city like all of the cities in desert zone, is a water pillar city and has made base on the irrigation and hydraulic systems – that is the foundation of creating a city, like some other cities, isn't based on economic, military, political or religious centers but it's relying on underground waters. We must know that the city primarily core at the end of north Yazd- Ardakan plain, depends on underground water messes in this zone (Sepehri Ardakani, 1985).

This article with the goal of achieving to the relationship between socio- economic factors in urban ecology with sustainable development and necessity of urban sustainability, attempt to survey socio- economic factors of Ardakan city for the planning of urban sustainability development.

1.1. Review of Literature

The sustainability idea goes back to meditations of environment movements in long ways. The trace of sustainability concept also was found in geography literature. Maybe we could say that sustainability and its discussions are resultants of geography fatalism meditations and possibility (Moosa-Kazemi Mohammadi, 2001).

However term of sustainable development is applied in the Koko you statement about environment and development and its origin came back to ecologic development that was offered in the world protection strategy too (Barrow,1995), but its formation depend on organizing of world independent commission about environment and development and offering sustainable development origin report.

This commission, define sustainable development as follow: "elimination the needs of present generation without damaging future generations powers for eliminating needs." Also, this simple definition is based on 21 agenda as a working design of sustainable development for 21 century (Roseland,1997).

Maclaren believes that some keys features of urban sustainability are as follows: equality between nations, protection of the environment and attention to environment patience extent, suitable using of recycling resources, economic variety, community self-confidence, personal health and making satisfaction for human to eliminate basic needs (Maclaren,1996).

The approach based on a social aspect or equality layer has discussed social justice of sustainable development in social ecology branch and urban ecology and believe that the main actors in development are, human and societies. With accepting sustainable development principles that are the elimination of present needs without privation the future generations in urban development and on these lines- it is necessary to decrease present time inequality, that probably it has more anxiety about future generation status. In third world and developing cities, scale and inequalities, sustain an injury and poverty of low-income people, increase the importance of this case more and more (Munasingh,1993).

The studies, in this case, express that for urban and regional sustainable development don't have found any unit formula and each country with attention to its conditions must follow up the special criteria of sustainable development. This problem request to the necessity of deep-seeing clear-sighted, experts and urban responsibilities of the country for assessing, analyzing and making a pattern of sustainable development in urbanization structural of the country.

Marcotullio with reviewing the sustainability in the Asian urban believe that in the era of globalization because of impacts by forces beyond country s borders, sustainable development is an uncharted goal (Marcotollio,2001).

Bo-Sin-Tang has considered the challenges of sustainable development in China and he believed that the majority of challenges and worries, in this case, is because of rapidly globalization growth of economic (Bo-Sin-Tang,2005).

Alshuwaikhat studies about developing sustainable cities in arid regions and attempt to offer a framework that warrants the sustainable development principals in arid regions (Alshuwaikhat, 2002).

In the past, developing and planning of urban has paid more attention to physical sub-structures like water, electricity, sewage, roads and transportation, energy, urban floods and etc – form a master plan or frame- , the urban social sustainability doesn't get with physical designing easily. People of society as human and social capitals play a basic role in sustainable development. Their social and economic characteristics and spatial analyze of socio-economic factors – that they get of population information in urban regions and areas-could assess and experiment the realization of geographical equality principle and support the basic needs in plans and programs of urban development (Sarrafi,2000).

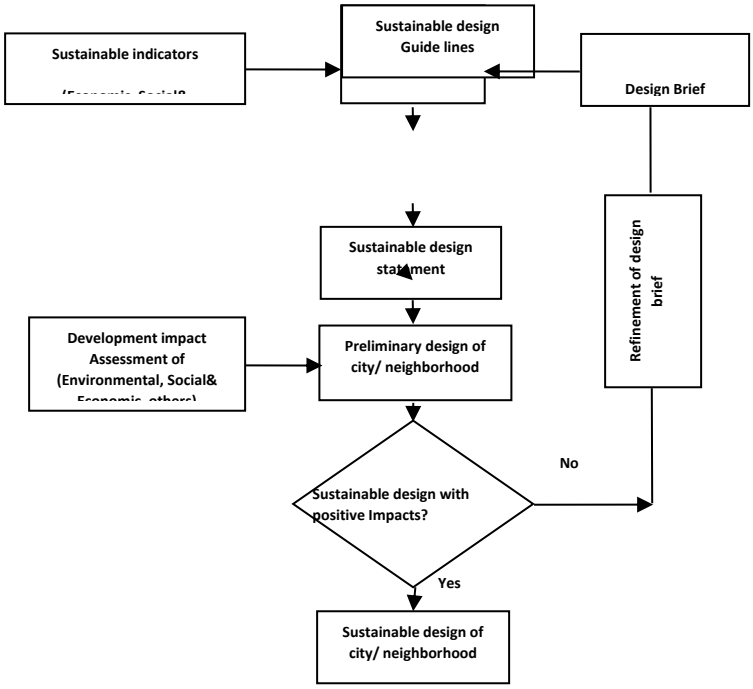


Figure 1- Sustainable design approach in Arid Regions (Alshuwaikhat,2002)

2. Methodology

The measurement and assessment of human environmental, economic, social and cultural functions in geographical places, is possible only through knowing development indicators. For assessing of ecological, social, economic and environmental sustainability effects, is a necessary wide range of indicators. In fact, selection and specification of indicators in developing and lack of it is one of the basic stages in urban

development planning (Rahimi,2004). CSD framework (sustainable development commission) and its indicators complex, is a good start point for national planning.

Table 1- Key themes suggested by CSD testing country priorities

social	economic	environmental	institutional
Education	Economic dependency/indebtedness/ODA	Freshwater/groundwater	Integrated decision-making
Employment	Energy	Agriculture/ secure food supply	Capacity building
Health/ water supply sanitation	Consumption and production patterns	Urban	Science and technology
Housing	Waste management	Coastal zone	Public awareness and information
Welfare and life quality	Transportation	Marine environment/ protection coral reef	International conventions and cooperation
Cultural heritage	Mining	Fisheries	Governance/role of civic society
Poverty/income distribution	Economic structure and development	Biodiversity/biotechnology	Institutional and legislative frameworks
Crime	Trade	forest Sustainable management	Prepared for Disaster
Population	productivity	Air pollution and ozone depletion	Public participation
Moral and social values		Global climate change/the level of sea rise	
Women role		Sustainable use of natural resources	
Access to resource and land		Sustainable tourism	
Community structure		Restricted carrying capacity	
Equity/ social exclusion		Land use change	

Reference: UN Department of Economic and Social Affairs, 1999.

In this research, selection of indicators depends on information and research view.In this research also on the information of census is emphasized (that offered information about population and housing). This information is available until block and family level that apply for fixing the social area in cities.

The social areas in cities are geographical boundaries that based on natural, social and economic indicators is distinguished from the others.

In this article with attention to the available information in Ardakan city and census areas, social indicators include population: number of people and its growth rate, number of families, immigrant percent and literacy range and scholastic between population, population percent in age groups married status between men and women, with social and population view to economic aspect until locals level and city sectors, with using of census data, could administer active population percent indicators in economic section,

employed population percent, unemployed of women and men, children working and possession status in habitat.

Also dependency rate, a difference of activity and employed between men and women, increasing land, and could obtain the present of commercial use in urban zonal.

With attention to positive and negative nature about some indicators, they have divided to sustainability and unsustainability indicators (table 2&3).

Table 2- Social indicators is used in this research

Row	Sustainability element	nature	summary	Kind of indicator	Description of Indicator
1	Number of literate Population	positive	PLIT	%	Pointer of general literacy
2	Number of literate men	positive	MLIT	%	Pointer of male literacy
3	Number of literate women	positive	FLIT	%	Pointer of female literacy
4	Number of students	positive	STUD	*100000	Pointer of capacity of cultural- science potential powers
5	Number of Graduate Population	positive	GRAD	*100000	Pointer of capacity of cultural- science powers
6	Population studying number	positive	STUD	*100000	Pointer of general literacy
7	Number of married Population	positive	MARI	%	Pointer of family formation level
8	Human house grade	positive	HHG	%growth rate	Pointer of growth rate of families
9	Population 0-5	negative	P0-5	%	Pointer of hi fertility ratio and need to control the population
10	Population 0-14	negative	P0-14	%	Pointer of young population
11	Population +65	negative	P65OV	%	Pointer of old population
12	Immigrant Population	negative	MIG	%	Pointer of bling to make social-economic crudity
13	Number of illiterate Population	negative	PILOT	%	Pointer of low general culture
14	Illiterate Population 6-10	negative	PILIT6-10	%	Pointer of low general culture
15	Different between literate men and women	negative	LITDIF	%	Pointer of social inequity
16	Number of divorced Population	negative	PDIV	%	Pointer of unsustainability of family
17	Number of household with 6	negative	HH6POV	%	Pointer of lack of social partnership

	people and more				
18	Sex ratio	negative	SEXR	%	Pointer of men population to women

Table 3- Economic indicators is used in this research

Row	Sustainability element	nature		Kind of indicator	Description of Indicator
1	Population 15-64	positive	P15-64	%	Pointer of percent of active potential population in age pyramid
2	active Population+10	positive	PACT	%	Pointer of percent of available active population
3	Population employ +10	positive	PEMP	%	Pointer of practitioner% in economic sectors
4	Number of Agricultural employing +10	positive	AGREMP	%	Pointer of economic self- reliance
5	Number of Industrial employing +10	positive	INDEP	%	Pointer of economic self- reliance
6	Number of household with building owner and land of residence	positive	HHLBOW	%	Pointer of eliminating of basic needs
7	Number of household with building owner of residence	positive	HHBOW	*100000	Pointer of removing of basic needs
8	Land price in full texture	positive	BLANDPRI	average	Pointer of economic-socio environmental value
9	Commercial area	positive	COMLU	%	Pointer of importance of regional economic
10	Service area	positive	SERU	%	Pointer of servicing range
11	Ratio of Active Population to inactive	negative	BTAKFL	-	Pointer of dependency ratio
12	Number of Unemployed Population	negative	PUNEMP	%	Pointer of unemployed range
13	Tenant family in residential place	negative	AHRENT	%	Pointer of the percent of population that need to house
14	Number of Resident family in place by free	negative	HHFREE	%	Pointer of the percent of population that need to house

This point is important if economic indicators are improving in the society, the self-reliance discussion of governmental investments will propound.

3. Discussion and result

Ardakan township with 23525 km^2 area has placed in 60 km of the north of Yazd province in Iran central plateau (53˚- 56˚ 20′ E &31˚ 59′- 33˚ 23′N). This township of north and west is limited to Naeen township and of east to Tabas township and salt desert and of the eastern south to Bafgh township and of south to Maybod township (Management and Planning Organization of Yazd province,2005). This urban-based on the last census, have 52102 population that it has 17 domain (area).

The proximity this urban to desert and having of water and land limitations has involved variation in parts of economic, social and environmental that this problem indicates more about population growth and needs to changing in land use and urban densities. Ardakan city with 62.9 mm annual precipitation average and 20.2 c temperature average has placed in the dry climate area.

3.1. Comparison between indicators of Ardakan city in national and regional area

The first step for assessment of development in Ardakan city is a comparison with national and zonal indicators. In this research, first of all generally between Iran and some of countries has compared about some of economic- social indicators of Ardakan city and then with attention to offered indicators, between Ardakan city in zonal level and proximity townships has compared and at last by comparing indicators of Ardakan city and country urban zones indicators for assessing has been used.

One of the available problems in assessment is the comparison between indicators that measurement unit in them isn't equal. For eliminating this problem we use of near method to the nonparametric test of indicators difference sign that is known as Sign Test.

Table 4- Compare some of the socio-economic indicators between Iran and some of Arid zones country

indicator	HDI	GDP	Expectancy to Life	Education indicator	Literacy%	Indicator of Human poverty	Growth of Annual population	Population under 15 years old %	Population over 65 years old%
Arabia	0.777	0.82	72	0.72	79.4	-	4.1	37.8	2.9
Malaysia	0.805	0.77	73.4	0.84	88.7	8.3	2.4	32.8	4.5
Uganda	0.502	0.45	45.7	0.67	67.9	36	3.3	50.4	2.5
Sudan	0.516	0.5	56.5	0.53	60.9	31.3	2.5	39.5	3.6
Iran	0.746	0.72	70.7	0.75	77	16.4	2.5	39.8	4.5

Reference: Human Development Report, 2006, ILO2, p280-300.

For doing Sign Test, assume that n pairs of observations are selected from two nonnormal population defined over a *continuous* sample space. In testing the null hypothesis H_0 that $\mu_1=\mu_2$ or $\mu_d=0$, each differenced di of the paired observation is assigned a *plus* or *minus* sign, depending on whether d_i is positive or negative. If the null hypothesis is true and the populations are symmetric, the sum of the plus signs should be

approximately equal to the sum of the minus signs. When one sign appears more frequently that it should, based on chance alone, we reject the hypothesis that population means are equal (Walpole & Myers,1978).

In this test and this research, ranks of indicators are conceptual that by using of social indicators with $n=17$ and $r^{+}=9$ and $p=0.5$, the null hypothesis is accepted because of:

$R= \min(r^{+} \& r^{-})= 8$

$n = 17$ ، $\alpha = 0.05 \rightarrow r^{*}=5 \rightarrow R>r^{*} \rightarrow$ null hypothesis is accepted

The calculations and diagram made of SPSS, also confirm indicators equality opposite difference between Ardakan city indicators and country urban zones indicators that have been showed in table 6.

Table 5- P(R<r*|H0 is true) in the sign test

N	n															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.500															
2	0.250	0.750														
3	0.125	0.500	0.875													
4	0.062	0.312	0.687	0.937												
5	0.031	0.188	0.500	0.812	0.969	*										
6	0.016	0.109	0.344	0.656	0.891	0.984	*									
7	0.008	0.062	0.227	0.500	0.773	0.938	0.992	*								
8	0.004	0.035	0.145	0.363	0.637	0.855	0.965	0.996	*							
9	0.002	0.020	0.090	0.254	0.500	0.746	0.910	0.980	0.998	*						
10	0.001	0.011	0.055	0.172	0.377	0.623	0.828	0.945	0.989	0.999	*					
11		0.006	0.033	0.113	0.274	0.500	0.726	0.887	0.967	0.994	*	*				
12		0.003	0.019	0.073	0.194	0.387	0.613	0.806	0.927	0.981	0.997	*	*			
13		0.002	0.011	0.046	0.133	0.291	0.500	0.709	0.867	0.954	0.989	0.998	*	*		
14		0.001	0.006	0.029	0.090	0.212	0.395	0.605	0.788	0.910	0.971	0.994	0.999	*	*	
15			0.004	0.018	0.059	0.151	0.304	0.500	0.696	0.849	0.941	0.982	0.996	*	*	*
16			0.002	0.011	0.038	0.105	0.227	0.402	0.598	0.773	0.895	0.962	0.989	0.998	*	*
17			0.001	0.006	0.025	0.072	0.166	0.315	0.500	0.685	0.834	0.928	0.975	0.994	0.999	*
18			0.001	0.004	0.015	0.048	0.119	0.240	0.407	0.593	0.760	0.881	0.952	0.985	0.996	0.999
19				0.002	0.010	0.032	0.084	0.180	0.324	0.500	0.676	0.820	0.916	0.968	0.990	0.998
20				0.001	0.006	0.021	0.058	0.132	0.252	0.412	0.588	0.748	0.868	0.942	0.979	0.994
21				0.001	0.004	0.013	0.039	0.095	0.192	0.332	0.500	0.668	0.808	0.905	0.961	0.987
22					0.002	0.008	0.026	0.067	0.143	0.262	0.416	0.584	0.738	0.857	0.933	0.974
23					0.001	0.005	0.017	0.047	0.105	0.202	0.339	0.500	0.661	0.798	0.895	0.953
24					0.001	0.003	0.011	0.032	0.076	0.154	0.271	0.419	0.581	0.729	0.846	0.924
25						0.002	0.007	0.022	0.054	0.115	0.212	0.345	0.500	0.655	0.788	0.885

Source: Adapted from Table IV, B of H. Walker and J. Lev (1953) *Statistical Inference*, New York: Holt, Rinehart & Winston, by permission of the publishers

Table 6 –Comparison between some of selected social indicators Ardakan city and proximity townships of Yazd province

indicator	Ardakan city	Sadoogh township	Bafgh township	Meybod township	Yazd township	Yazd province
Ratio of men population to women	1.1	1.2	1.08	1.1	1.09	1.1
Literate Population %	82	82.8	87.8	88.2	90.8	88.06
Literate women %	76.6	78.8	84.05	85.09	88.2	84.9
Percent of household without illiterate members	71.6	82.7	87.7	88.2	90.7	88.06
Difference between literate men and women	9.05	7.44	7.07	5.88	4.85	6.04

Population 0-14 years old%	36.3	30.2	35.2	35.7	37.1	24.3
Population +65 years old%	6.1	9.8	7.2	6.7	5.3	6.9
Number of student in 100000	1530	1306	3071	6715	34446	61880
Population of immigrant%	54.1	54.5	57.9	55.9	59.4	58.8
Population of divorced%	0.2	0.3	0.29	0.2	0.38	0.34
Men don't married%	46.3	46.09	42.6	44.4	41.6	41.8
Daughters married%	56.02	59.04	60.4	59.1	62.1	67.9
Women divorced%	0.29	0.45	0.42	0.26	0.52	0.47

Reference: results of the general census of Human and house2006, Iranian statistics organization.

Table 7 –Comparison between socially selected indicators of Ardakan city and country urban zones

indicator	Ardakan city	country urban zones	D_i	indicator	Ardakan city	country urban zones	D_i
growth rate of population in 1375-1385	1.7	1.61	-	Population +65 years old%	6.1	4.77	-
Ratio of men population to women	1.1	1.04	+	Number of student in 100000	1530	2374	-
literate Population %	82	88.93	-	Population of immigrant%	54.1	52.6	+
literate women %	76.6	85.55	-	Population of divorced%	0.2	0.5	+
Percent of household without illiterate members	71.6	73.1	-	Men don't married%	46.3	47.3	+
Difference between literate men and women	9.05	6.64	-	Daughters married%	56.02	52.5	+
Rate of household growth in 1375-1385	3.3	4.5	+	Women divorced%	0.29	0.5	+
Household of 5 persons &more	27.32	32.21	+	Average household	3.7	3.89	+
Population of 0-14	36.3	23.7	-				

years old%							
Pairs number that in these Ardakan city indicators are better or positive= r+							9

Table 8 –Results of Sign Test for selected social indicators

Frequencies

		N
COUNTRY - ARDAKAN	Negative Differences[a]	8
	Positive Differences[b]	9
	Ties[c]	0
	Total	17

a. COUNTRY < ARDAKAN
b. COUNTRY > ARDAKAN
c. ARDAKAN = COUNTRY

Test Statistics[b]

	COUNTRY - ARDAKAN
Exact Sig. (2-tailed)	1.000[a]

a. Binomial distribution used.
b. Sign Test

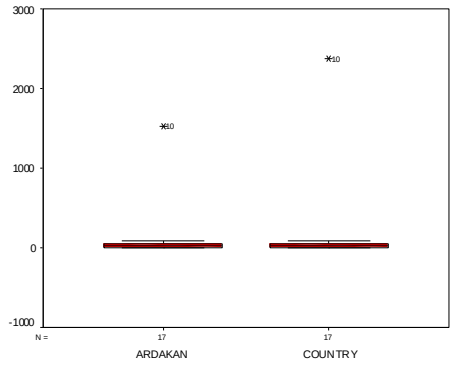


Figure 2- Distribution of social indicators between Ardakan and country urban zones

To do this test by using of economic indicators with *n= 10*, $r^{+}=4$ and *p= 0.5* confirm null hypothesis because of:

$R= \min(r^{+} \& r^{-})= 4$

$n = 10$ و $\alpha = 0.05 \rightarrow r^{*}=2 \rightarrow R>r^{*}$ → null hypothesis is accepted

Table 9 – Comparison between some of the economic selected indicators of Ardakan city and proximity townships of Yazd province

indicator	Ardakan city	Sadoogh township	Bafgh township	Meybod township	Yazd township	Yazd province
Economic active Population %	32.3	43.3	44.3	45.4	40.1	43.4

Economic inactive Population %	67.7	55.6	54.9	53.2	58.8	55.6
Difference between the activity of men and women %	49.4	64.7	44.7	47.9	53.2	37.41
Population employ 10-14years old	2.37	3.07	2.3	1.9	2.8	3.3
Dependency ratio	0.7	0.56	0.54	0.53	0.58	0.55
Human house of building owner and land of residence	75.1	78.3	74.3	79.1	72.2	71.7
household of tenant	8.3	5.8	9.1	6.3	13.8	18.14
active Population %in Agricultural part	6	21.2	22.2	6.3	3.86	11.8
active Population %in Industrial part	64	21.8	11.3	35.4	28.1	28.04

Reference: results of the general census of Human and house2006, Iranian statistics organization.

Table 10 –Comparison between economically selected indicators of Ardakan city and country urban zones

indicator	Ardakan city	country urban zones	D_i
Economic active Population %	32.3	38.77	-
Economic inactive Population %	67.7	60.4	-
Difference between the activity of men and women %	49.4	38.95	-
Unemployment rate	4.36	11.82	+
employ 10-14years old%	2.37	0.8	-
Dependency ratio	0.7	0.43	-
Household of building owner and land of residence%	75.1	62.2	+
Household of tenant%	8.3	9.2	+
active Population %in Agricultural part	6	22.27	-
active Population %in industrial part	64	26.51	+
Pairs number that in these Ardakan city indicators are better or positive= r+			4

Table 11 –Results of Sign Test for selecting economic indicators

Frequencies

		N
COUNTRY - ARDAKAN	Negative Differences[a]	4
	Positive Differences[b]	6
	Ties[c]	0
	Total	10

a. COUNTRY < ARDAKAN
b. COUNTRY > ARDAKAN
c. ARDAKAN = COUNTRY

Test Statistics[b]

	COUNTRY - ARDAKAN
Exact Sig. (2-tailed)	.754[a]

a. Binomial distribution used.
b. Sign Test

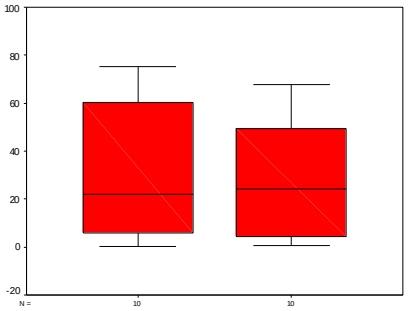
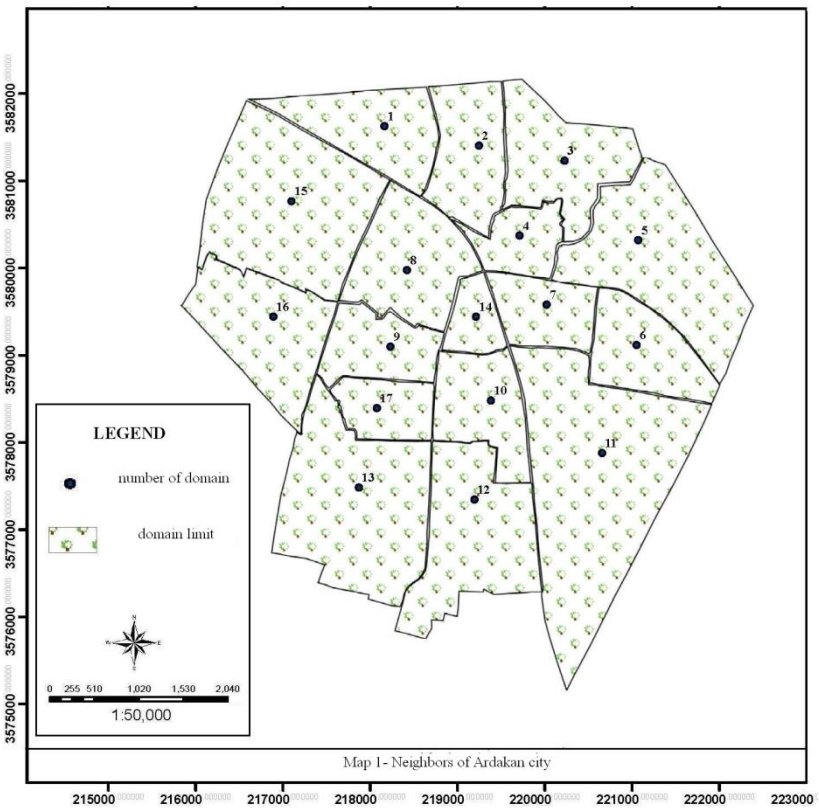


Figure 3-Distribution of economic indicators between Ardakan and country urban zones

4. Assessment and sustainability test in the zones of Ardakan city

Based on studies of the master plan of Ardakan city, the whole area of the city was divided into 17 domains or neighbors that in these domains observe the worn texture until urban new textures.



In this level of assessing the development of Ardakan city, offered indicators for Ardakan city were compared to distinguish whether not rejected equality in the first level, was confirmed between interior domains of the Ardakan city. So first of all available information for interior domains of Ardakan is offered and then by using of standardized score method, the rank of domains in social and economic aspects is determined.

Table 12 -Social indicators of interior domains in Ardakan city

domain	PLIT	MLIT	FLIT	PMARI	HHG	P0-5	P0-14	P65OV	MIG	PILIT	PILT6-10	LITDIF	PDIV	HHGPOV	SEXR
1	93.6	95.4	91.7	59.7	2.9	2.65	32.9	5.1	112	6.4	0.5	3.7	0.1	17.3	110
2	86.5	90.4	82.2	54.2	11.7	2.3	38.3	6.1	384	13.5	0.9	8.2	0.37	15.2	109.2
3	80.3	85.6	74.5	61.2	7.09	1.75	38	7.4	98	19.7	0.8	11.1	0.25	11.5	110
4	70.2	87.5	61.6	47.7	13.9	1.35	43.8	7	511	29.8	7.4	25.9	0.05	6.7	111.5
5	86.5	90.8	81.9	52.2	5.7	2.24	33.3	6.8	148	13.5	1.4	8.9	0.25	12.8	110.3
6	51.7	62.9	39.8	66.3	10.06	0.28	38.1	7.9	149	48.3	50.6	23.1	0.3	12.9	111
7	86.9	91.7	81	52.7	8.05	1.47	42.3	7.4	447	13.1	0.5	10.7	0.35	12.9	109.8
8	89.6	93.1	85.9	49.7	11.13	1.93	34.4	5.1	169	10.4	3.7	7.2	0.07	13.9	107
9	84.2	89.2	79.1	52.7	5.19	1.43	33.5	7.4	132	15.8	1.3	10.1	0.03	10.2	110
10	83.9	88.1	79.3	51.7	7.84	1.52	33.8	6.5	172	16.1	2.6	8.8	0.27	11.8	111
11	78.3	84.8	72.5	46.2	2.6	1.17	37.7	7.8	240	21.7	1	12.3	0.29	5.2	110.8
12	91.7	94.6	87.9	45.9	6.29	2.41	44.1	5.5	551	8.3	1	6.7	0.1	15	109.9
13	94.6	96.7	92.3	46.4	7.34	2.5	34.1	5.2	435	5.4	1.8	4.4	0.1	11.6	111
14	87.7	88.4	87.1	53.7	6.16	1.47	33.1	5.4	108	12.3	0	1.3	0.09	19.4	108.9
15	89.5	93.5	85.5	61.7	1.55	2.15	30.8	3.2	146	10.5	0.7	8	0.32	12.7	110.6
16	92	93.8	90.3	60.7	0.64	2.28	31.2	3.5	42	8	0	3.5	0.35	24.5	109
17	85.3	88.2	82.4	55.9	4.04	1.43	39.1	5.6	91	14.7	3.4	5.8	0.11	14	110

Reference: Arsah consultant engineers, 2001.

Table 13 – Economic indicators of interior domains in Ardakan city

domain	SERLU	HHFREE	HHRENT	BTAKFL	PUNEMP	COMLU	LANPRI	HHBOW	HHLBOW	INDEP	PEMP	PACTPRO	P15-64
1	0.4	6.6	12.8	0.6	1.1	1	2567	0	77.8	51	98.9	25.1	62
2	0.2	6.7	8.2	0.8	5.9	0.8	5160	11.4	80.3	52	94.1	29.2	55.6
3	0.02	4.8	5.5	0.83	3.6	0.3	4818	4.7	76.4	47	96.4	43.6	54.6
4	1	8.5	15.1	1.03	7.5	3.5	8520	6.7	68.9	46	92.5	44.5	49.2

5	0.4	3.7	6.1	0.67	4.3	0.2	5049	57.9	81.6	49	95.7	45.5	59.9
6	0.1	1.7	3.2	1	1.6	0.4	3457	11.4	36.3	56	98.4	70.3	46
7	0.5	3.6	11.1	1	6	1.7	6358	17.5	70.2	36	93.9	33.6	49.7
8	0.5	3.9	7.2	0.66	6.1	1.4	5960	13.9	67.2	41	93.9	17.7	59.8
9	0.05	1.2	7.6	0.69	5.6	0.2	5960	4.2	74	46	94.4	24.8	59.1
10	0.5	3.9	6.8	0.67	4.5	1	6129	5.7	83.7	41	95.5	25.4	59.7
11	0.1	1.9	10.4	0.83	2.2	0.1	5301	0.4	79.6	41	97.8	31.5	54.5
12	0.4	5.8	12.5	0.98	3.9	0.3	4974	2.4	78.1	39	96.2	22.4	50.4
13	0.01	1.8	5.4	0.78	2.8	0.2	4115	9.2	88.9	44	97.3	22.2	60.7
14	0.9	5.6	7.6	0.63	3.7	2	8143	5.6	75.8	54	96.3	18	61.5
15	0.4	3.2	6.3	0.51	3	0.8	2569	5.7	84.1	32	97.3	24.1	66
16	0.02		7.5	0.53	2.7	0.01	2569	17.7	83	60	97.3	21.1	65.3
17	0.02	3.4	7.4	0.8	3.6	0.2	4338	0	70.9	44	96.9	21.1	55.3

Reference: Arsah consultant engineers, 2001.

4.1. Standardized score method

This method was used for comparing indicators one unit indicator from the result of compound indicators (Moosa-Kazemi Mohammadi,2001). This method reveals the measure of the difference between domains and neighbors.

The standardized score is as follows:

$$SS_{ij} = \frac{X_{ij} - \overline{X}}{\sigma_i} \qquad \text{equation 1}$$

In this equation:

Ss_{ij}= standardized score of *I* indicator in domain *j*

X_{ij}= *I* indicator in *j* domain

X= mean of *I* indicator

σi= variance of *I* indicator

In the next stage, any of standardized score of indicators in any domains collected and its result was divided upon whole indicators. This score is means of standardized score or development indicator of domains that offered unit indicator for comparing about development status.

$$SS_J = \frac{\mathbf{1}}{n}\sum SS_{ij} \qquad \text{equation 2}$$

In this equation:

Ss_j= development indicator for *j* domain

n= number of indicators

The tables, this scores of socio-economic indicators for Ardakan city by using this method show.

Table 14 – Standardized score for social indicators in Ardakan city s domains

domain	SEXR	HH6POV	PDIV	LITDIF	PILT6-10	PILIT	MIG	P65OV	P0-14	P0-5	HHG	PMARI	FLIT	MLIT	PLIT
1	0.00	0.88	-0.83	-0.89	-0.34	-0.90	-0.73	-0.68	-0.83	1.43	-1.01	0.93	0.94	0.83	0.90
2	-0.75	0.41	1.40	-0.19	-0.31	-0.22	0.93	0.03	0.46	0.85	1.39	0.03	0.19	0.17	0.22
3	0.00	-0.43	0.41	0.27	-0.31	0.38	-0.81	0.96	0.38	-0.06	0.13	1.17	-0.41	-0.46	-0.38
4	1.40	-1.51	-1.24	2.57	0.24	1.36	1.70	0.67	1.77	-0.72	1.98	-1.04	-1.41	-0.21	-1.36
5	0.28	-0.13	0.41	-0.08	-0.26	-0.22	-0.51	0.53	-0.73	0.75	-0.24	-0.30	0.17	0.22	0.22
6	0.94	-0.11	0.83	2.13	3.84	3.16	-0.50	1.31	0.41	-2.48	0.94	2.01	-3.11	-3.46	-3.16
7	-0.19	-0.11	1.24	0.20	-0.34	-0.26	1.31	0.96	1.41	-0.52	0.39	-0.22	0.10	0.34	0.26
8	-2.81	0.12	-1.07	-0.34	-0.07	-0.52	-0.38	-0.68	-0.47	0.24	1.23	-0.71	0.48	0.53	0.52
9	0.00	-0.72	-1.40	0.11	-0.27	0.01	-0.60	0.96	-0.69	-0.58	-0.38	-0.22	-0.05	0.01	-0.01
10	0.94	-0.36	0.58	-0.09	-0.16	0.04	-0.36	0.32	-0.61	-0.44	0.34	-0.38	-0.03	-0.13	-0.04
11	0.75	-1.85	0.74	0.45	-0.30	0.58	0.05	1.24	0.31	-1.01	-1.09	-1.28	-0.56	-0.57	-0.58
12	-0.09	0.36	-0.83	-0.42	-0.30	-0.72	1.94	-0.39	1.84	1.03	-0.08	-1.33	0.64	0.73	0.72
13	0.94	-0.40	-0.83	-0.78	-0.23	-1.00	1.24	-0.61	-0.54	1.18	0.20	-1.25	0.98	1.00	1.00
14	-1.03	1.36	-0.91	-1.26	-0.38	-0.33	-0.75	-0.46	-0.78	-0.52	-0.12	-0.05	0.58	-0.09	0.33
15	0.56	-0.16	0.99	-0.22	-0.32	-0.51	-0.52	-2.03	-1.33	0.60	-1.37	1.25	0.45	0.58	0.51
16	-0.94	2.51	1.24	-0.92	-0.38	-0.75	-1.15	-1.81	-1.23	0.82	-1.62	1.09	0.83	0.62	0.75
17	0.00	0.14	-0.74	-0.56	-0.10	-0.10	-0.85	-0.32	0.65	-0.58	-0.70	0.31	0.21	-0.12	0.10

Reference: calculations of Writer.

Table 15 – Standardized score for economic indicators in Ardakan city s domains

domain	SERLU	HHFREE	HHRENT	BTAKFL	PUNEMP	COMLU	LANPRI	HHBOW	HHLBOW	INDEMP	PEMP	PACTPRO	P15-64
1	0.25	1.19	1.46	-1.00	-1.66	0.19	-1.43	-0.84	0.23	0.71	1.60	-0.40	0.86
2	-0.41	1.24	-0.02	0.21	1.08	-0.03	0.06	-0.02	0.45	0.84	-1.09	-0.10	-0.25
3	-1.00	0.32	-0.90	0.39	-0.23	-0.58	-0.14	-0.50	0.11	0.16	0.20	0.96	-0.42

4	2.23	2.11	2.20	1.60	1.99	2.94	1.99	-0.36	-0.53	0.02	-1.98	1.02	-1.36
5	0.25	-0.21	-0.70	-0.58	0.17	-0.69	-0.01	3.35	0.56	0.43	-0.19	1.10	0.50
6	-0.74	-1.18	-1.64	1.42	-1.37	-0.47	-0.92	-0.02	-3.34	1.39	1.32	2.92	-1.91
7	0.58	-0.26	0.91	1.42	1.14	0.96	0.75	0.43	-0.42	-1.34	-1.20	0.22	-1.27
8	0.58	-0.12	-0.35	-0.64	1.20	0.63	0.52	0.16	-0.68	-0.66	-1.20	-0.95	0.48
9	-0.91	-1.42	-0.22	-0.45	0.91	-0.69	0.52	-0.54	-0.10	0.02	-0.92	-0.43	0.36
10	0.58	-0.12	-0.48	-0.58	0.28	0.19	0.61	-0.43	0.74	-0.66	-0.31	-0.38	0.47
11	-0.74	-1.09	0.69	0.39	-1.03	-0.80	0.14	-0.81	0.39	-0.66	0.98	0.07	-0.44
12	0.25	0.80	1.36	1.30	-0.06	-0.58	-0.05	-0.67	0.26	-0.93	0.09	-0.60	-1.15
13	-1.04	-1.13	-0.93	0.09	-0.69	-0.69	-0.54	-0.18	1.19	-0.25	0.70	-0.62	0.64
14	1.90	0.70	-0.22	-0.82	-0.17	1.29	1.77	-0.44	0.06	1.12	0.14	-0.93	0.78
15	0.25	-0.46	-0.64	-1.54	-0.57	-0.03	-1.43	-0.43	0.77	-1.89	0.70	-0.48	1.56
16	-1.00	-2.01	-0.25	-1.42	-0.75	-0.90	-1.43	0.44	0.68	1.94	0.70	-0.70	1.44
17	-1.00	-0.36	-0.28	0.21	-0.23	-0.69	-0.41	-0.84	-0.36	-0.25	0.48	-0.70	-0.30

Reference: calculations of Writer.

In the next stage, the average of standardized scores has calculated for positive and negative indicators.

Table 16 – Mean of standardized scores for positive and negative Socio- economic indicators in Ardakan city s domains

Domain	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Mean of pos social indicator	0.72	-0.03	-0.02	-0.52	0.12	-1.36	0.06	-0.4	-0.05	0.07	-0.45	0.13	0.53	-0.05	0.47	0.47	0.1
Mean of pos economic indicator	0.13	-0.06	-0.14	0.44	0.59	-0.2	-0.14	-0.12	-0.3	0.09	-0.21	-0.38	-0.09	0.63	0.13	0.13	-0.45
Mean of neg social indicator	-0.39	0.48	0.09	0.68	-0.05	0.95	0.43	-0.19	-0.36	-0.08	-0.09	0.24	-0.18	-0.42	-0.49	-0.33	-0.32

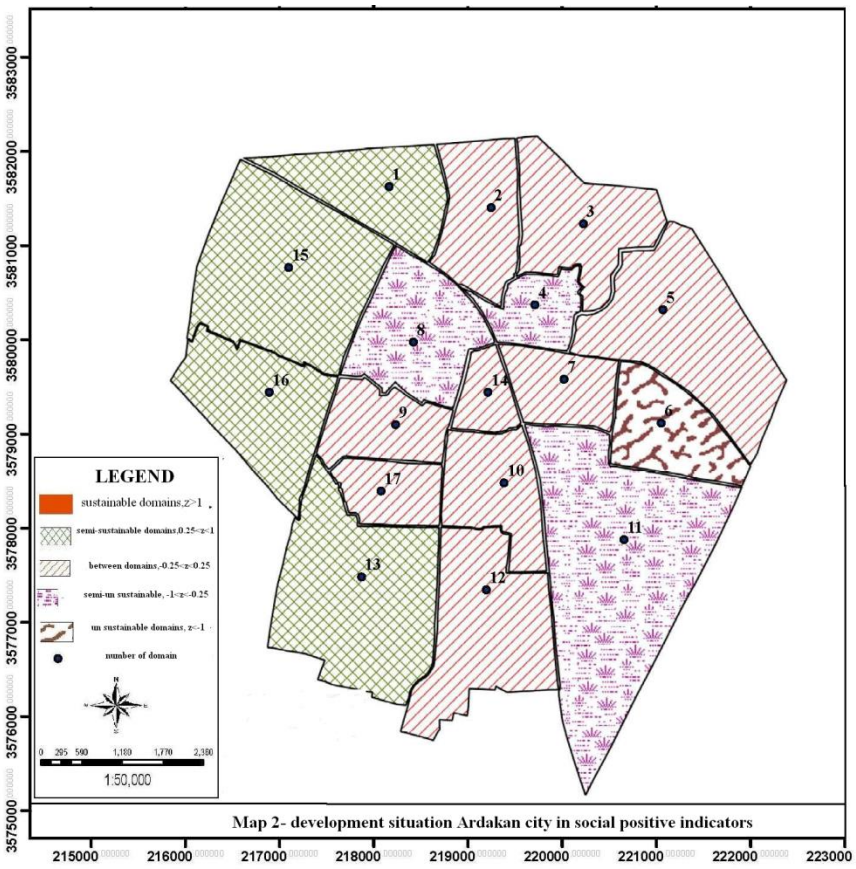
Mean of neg economic indicator	0	0.62	-0.1	1.98	-0.33	-0.69	0.8	0.02	-0.03	-0.22	-0.26	0.85	-0.67	-0.13	-0.8	-1.11	-0.17
Mean of pos socio-economic indicator	0.42	-0.045	-0.08	-0.04	0.35	-0.78	-0.04	-0.26	-0.17	0.08	-0.32	-0.12	0.22	0.29	0.28	0.2	-0.17
Mean of neg socio-economic indicator	0.19	0.55	-0.005	1.33	-0.19	0.13	0.61	-0.08	-0.19	-0.15	-0.17	0.54	-0.42	-0.27	-0.64	-0.72	-0.24

Reference: calculations of Writer.

Table 17 –Rank of Ardakan city s domains based on mean of standardized scores

domain	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Mean of pos socio-economic indicator	1	10	11	8	2	17	9	15	13	7	16	12	6	4	5	3	13
Mean of neg socio-economic indicator	15	14	11	17	6	12	16	10	7	9	8	13	3	4	2	1	5

Reference: calculations of Writer.



At last the standardized scores of domains divide to 5 groups that include sustainable (z> +1), semi-sustainable (0.25< z < +1), between (-0.25< z < +0.25), semi non-sustainable (-1< z < -0.25), non-sustainable (z < -1) that results offered in table 18:

Table 18 – Distribution of the number of domains of Ardakan city based on standardized scores means of positive and negative indicators

z	Social positive indicators		Economic positive indicators		Social negative indicators		Economic negative indicators	
	Number of domain	%	Number of domain	%	Number of domain	%	Number of domain	%
z> +1	0	0	0	0	0	0	1	5.8
0.25< z < +1	4	23.5	3	17.6	4	23.5	3	17.6
-0.25< z < +0.25	9	53	11	64.7	7	41.1	6	35.3
-1< z < -0.25	3	17.6	3	17.6	6	35.3	5	39.4

z < -1	1	5.8	0	0	0	0	1	5.8
sum	17	100	17	100	17	100	17	100

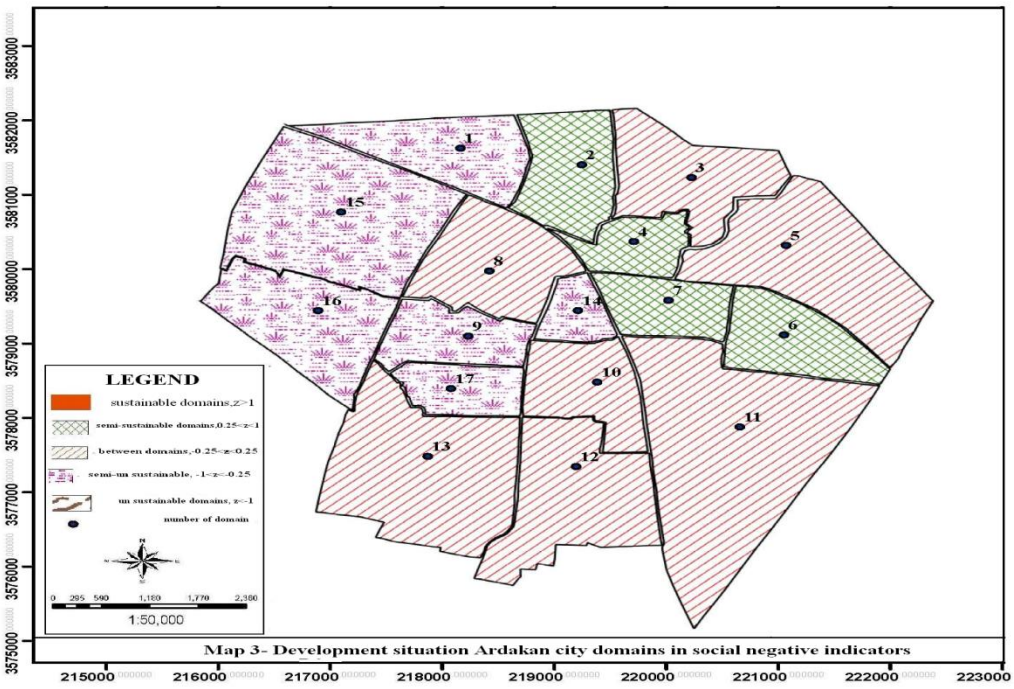
Reference: calculations of Writer.

4.2. Evaluate of relationship between socio-economic variables and sustainable development trend

In this section of research in order to study the relation between socio-economic variables with general development indicator and its aspects, consider the meaningful correlation between them by using of Pearson correlate method.

Attention to table 19, between positive social and economic indicators of is a straight relation with selected sustainability indicators; but isn't in meaningful level. Between positive social and negative economic indicators is an inverse relation and between negative social and negative economic indicators is a direct relation in meaningful level; it means that in neighbors with lower social indicators are lower economic indicators so. In result generality of sustainable development is right to extend, of course, this point is important that between social and economic indicators in development trend, economic indicators show more relation.

For studying the relationship between socio-economic variables and sustainability indicators in the term to table 20, can say to be a direct relation in meaningful level between some variables like land and house owners and literate population numbers; it means that these variables are concordant with development trend.



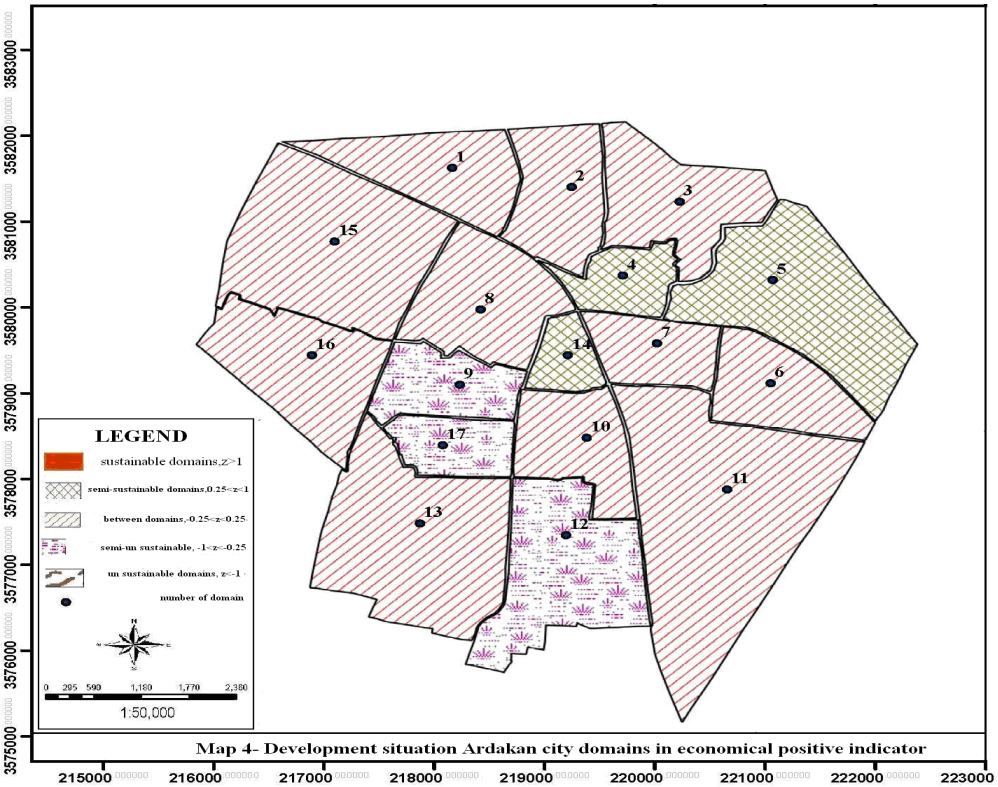
Map 3- Development situation Ardakan city domains in social negative indicators

The variables like the number of married population, active and employee population, difference between literate men and women and dependency ratio have an inverse relation with positive sustainability indicators: it means that this still hasn't reached to sustainability stage that this problem is important in straight and meaningful relation of variables like unemployment population and active population with unsustainability indicators of development.

Table 19 – Meaningful test of correlation of socio- economic indicators with sustainability indicators in Ardakan city

Correlation	Z POS.SD	Z NEG.SD	Z POS.SOC	Z NEG.SOC	Z POS.ECO	Z NEG.ECO
Pearson Corr zpos.soc	0.577	-0.640	1	-0.697	0.072	-0.319
Sig. (1-tailed)	0.008	0.003	0	0.001	0.392	0.199
N	17	17	17	17	17	17
Pearson Corr zpos.eco	0.645	0.059	0.072	-0.054	1	0.126
Sig. (1-tailed)	0.003	0.411	0.392	0.418	0	0.315
N	17	17	17	17	17	17
Pearson Corr zneg.soc	-0.172	0.892	-0.697	1	-0.054	0.535
Sig. (1-tailed)	0.255	0	0.001	0	0.418	0.013
N	17	17	17	17	17	17
Pearson Corr zneg.eco	0.231	0.806	-0.219	0.535	0.126	1
Sig. (1-tailed)	0.187	0	0.199	0.013	0.315	0
N	17	17	17	17	17	17
Correlation is meaningful at the0 /05 level (1-tailed).						

Reference: calculations of Writer.

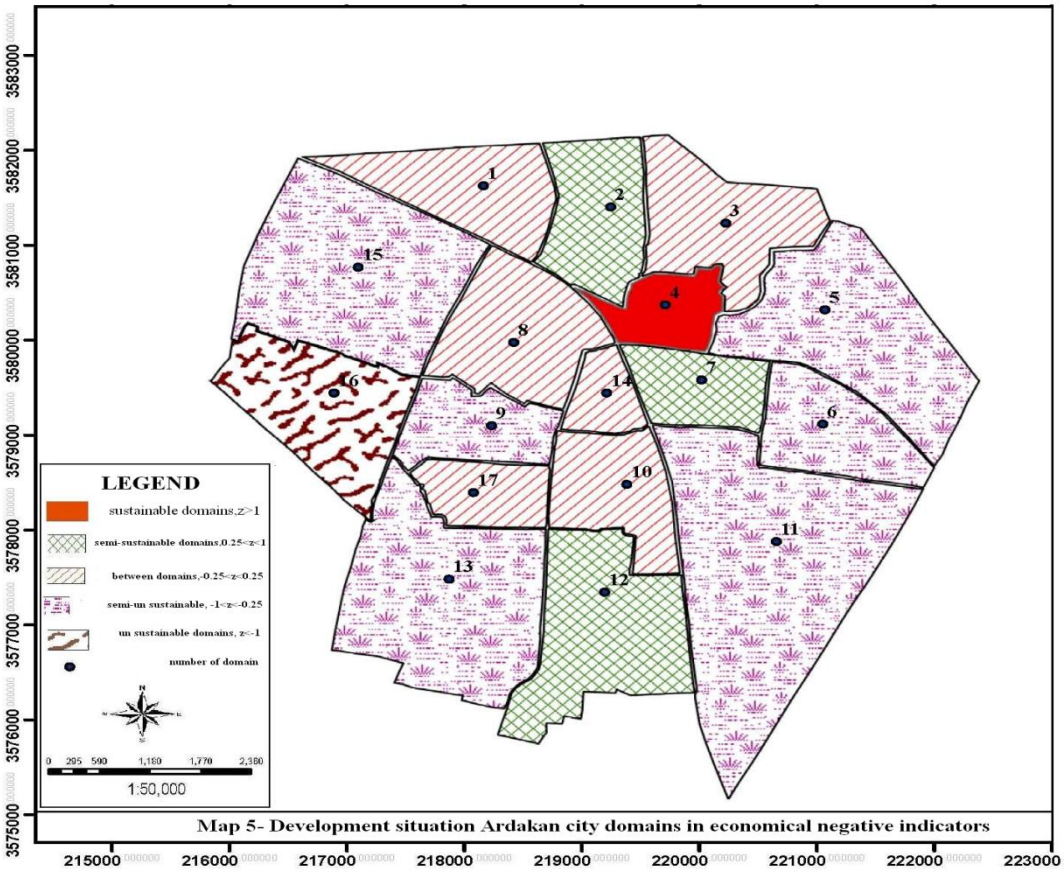


Map 4- Development situation Ardakan city domains in economical positive indicator

Table 20 – Meaningful test between some of the socio- economic variables with sustainability indicators in domains of Ardakan city

Correlation	PLIT	MARI	LITDIV	HH6POV	PACT	PEMP	HHLBOW	HHBOW	BLANDPRI	PUNEMP	BTAKFL
Pearson Corr zpos.sd	0.492	-0.163	-0.289	0.302	-0.26	-0.173	0.473	0.337	0.138	0.162	-0.240
Sig. (1-tailed)	0.022	0.265	0.130	0.120	0.157	0.254	0.027	0.180	0.298	0.267	0.177
N	17	17	17	17	17	17	17	17	17	17	17
Pearson Corr zneg.sd	-0.599	-0.136	0.726	-0.321	0.548	-0.496	-0.574	-0.064	0.511	0.481	0.823
Sig. (1-tailed)	0.006	0.302	0	0.104	0.011	0.021	0.008	0.403	0.018	0.025	0
N	17	17	17	17	17	17	17	17	17	17	17
Correlation is significant at the0 /05 level (1-tailed).											

Reference: calculations of Writer.



Map 5- Development situation Ardakan city domains in economical negative indicators

With attention to past information could say that in whole city level opposite of country urban zones, the totality of sustainable development is confirmed about socio-economic indicators but in neighbors level, variations become manifest little by little and meaningful relation isn't observed between socio-economic variables with sustainable development trend.

5. Conclusion

The last strategy for problems resulting from growth and development in world, regional and local level (urban and rural) in past decades is sustainable development strategy that in this method any development must eliminate present needs, so must eliminate future needs.

In the past, attention to ecologic limitation like water, using local material and structural, making of suitable methods for the following a life like Qanat, ventilation- shafts and so on, were examples of sustainability. So low population, the absence of environmental and industrial contaminants have been one of the factors that have helped to this sustainability, but now urban design had used the kind of patterns about urban development that it not only hasn't made sustainability in urban but also has followed unsustainability in around zones. Therefore developing of any urban in arid zones needs to an accurate study of sustainable indicator that it would affect on urban management or do of offering development plans.

In term of above information and by using of Sign Test, are observed that in socio-economic aspects in the whole city for comparing with country urban zones could see sustainability circumstances; but evaluating in zones and urban parts has affected by urban dynamic and population movements and structural affairs so. Also as figures of tables and maps show, dispersion of socio-economic indicators in Ardakan city is relatively more and general indicator obtained from scores ranks in positive indicators in 17 domains is between 0.42 & -0.78, and in negative indicators between 1.33 & -0.72. With attention to table 15 are seen in positive indicators of socio-economic aspect, no one of domains aren't in high sustainability status and about 53% of domains in positive social indicators and about 64.7% of domains in positive economic indicators have placed in the middle limit. Only 1, 5, 14, 15 and 16 domains have placed in semi-sustainable status that domain 1 is one of the new domains that population is increasing in it. Domains 5,14,15,16 with having new-built houses is passing development stage; it means social processes is completing of center toward urban margins and recent and new-built domains are shaping with homogenous social groups. Also, 2,4,6,7 and 12 domains are the lowest sustainable about socio-economic aspect. The 4 and 7 domains are interior domains envelope old urban textures. Indeed, domain 4 turn out old texture to worn texture; the feature is seen in turning traditional urban to modern urban in the whole of major, intermediate and even minor cities that result in disappearing urban original identity. The 6 and 7 domains in the south of 4 domain, is one of the oldest domains that changing of social groups in this is completing.

The 12 and 13 domains (that most of the migrants have placed in there) have located in the south margin of urban. These domains are first dwellings of migrant that in the process of arriving in urban has placed as a temporary base and has been observed decrease racial and cultural utility.

Also with studying between socio-economic variables and sustainable development trend, are seen unsustainability in domains level; this problem especially is seen more about unplanned parts made of resulting in expanding of urban and joining near rural to urban.

This point is important to say that the evaluation of sustainable development strongly depends on selected indicators. So the kind of view about research and selecting indicators affect on evaluating s results. Also, positive and negative nature of indicators effects on ranking about studying of places.

It is necessary to pay attention to growth population, joining margin rural to urban and suburbanite that relate with unsustainability zonal development and urban parts and these factors cause not to execute master plans and heterogeneous development of urban and development indicators status.

It sounds that measures like:

- Attention to improving work and life conditions of whole citizens and residential of urban

- need to sustainable socio-economic development and attention to sustainable full culture in urban

-Deployment and development of urban green spaces, water views and using online technology in this grounds

-Building design and anticipating the possibilities of serving according to traditional and historical textures in urban for protecting of available spaces.

-Offer plans and projects confirming to urban climatic, cultural and social conditions, also using more natural materials in improvement projects

- Start improvement projects about making parkways and greenways

-A mixture of modern technology and traditional methods to revival urban environment and decrease destructive effects of using instruments and equipment of environmental contaminants; for example using of renewed energy sources like sun, wind, water and so on.

That could effect on the sustainability of arid zones.

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