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ORIGINAL ARTICLE

The Investigation of correlation between dimensions of sustainability of agricultural system in rural regions of Boroujerd, Iran

Mohammad Reza Bosshaq[1*], Ali Afshari[2], Mohammad Noori[3], Hamzeh Rahimi[4]
[1]Department of Geography & Rural Planning, University of Isfahan
[2]Department of Geography & Rural Planning, University of Isfahan
[3]Department of Geography & Rural Planning, University of Isfahan
[4]Department of Geography & Rural Planning, University of Isfahan
Corresponding author Email:m.r.bosshagh@gmail.com*

ABSTRACT
This research has been investigated of correlation between the dimensions of sustainability of agricultural system and identifying of effective indices in that. The method of the research is descriptive-analytic and survey and the data collection have been reached through field studies. The statistical population of the research is villager householders of the Boroujerd, and the population size has been calculated 218 residents. In order to achieve to the objective of the research, the questionnaire tool has been used. To recognize the validity of the research's tool, Cronbach's alpha coefficient has been used which shows high validity of the tool. The results show that there is a significant positive correlation between dimensions of development of agricultural sustainability. Indeed, the model shows complexity of correlations between variables' sustainable development of agriculture in rural regions of Boroujerd.
Keywords: Sustainable development, agricultural sustainability, rural regions, Boroujer

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INTRODUCTION

Agriculture is one of the most important economic sectors in addition to needs of food and raw materials for industry, plays an important role in the political independence of the country, thus it can be said that the production of sufficient food to feed an ever increasing population is one of the main challenges facing man [1].The developing countries have been faced with the serious challenge because of the imbalance between population growth and agricultural productions and also the pressure of growing population and limited food supplies had attached worldwide attention to research about environment, food and nutrition[2,3]. Specially the immethodical use of pesticides and chemical fertilizers in Iran have been resulted in severe damage to soil and water resources, loss of land, environmental pollution, damage of cycle environmental and health problems for humans, animals and nature[4]. All the above factors especially in recent years, have been high lightened the issues of sustainable development in Iran.

The concept of sustainable development is essentially broad approaches which were discussed social, economic and environmental issues that results from various human activities. The root of this discussion is derived from the Brandt land Commission report entitled "Our Common Future". The best known definition of sustainable development is presented is this report. This commission knows sustainable development as development that will eliminate the present needs without spending the ability of future generations to satisfy their needs [5]. Different definition of sustainability and sustainable agriculture will present after this report published in 1987 and its peak in 1992 in Rio de Janeiro [6]. According to Taylor, the concept of sustainable development is an important stage in environmental theory, because it proves how society should organize itself [7].Pannell and Glenn believe that the concept of sustainability requires more attention to environmental and resources management, but because of its ambiguity it prevents applying right practical decisions [8]. The definition of sustainability in Western Australia is as follows: The sustainability is the result of encounter the current and future generation's needs through

integration of environmental protection, social progress and economics success [9]. Therefore the transformation towards a sustainable level of development often derived from complex dynamic issues [10, 11].As figure 1 indicates sustainability development has three main economic, social and environmental dimensions.

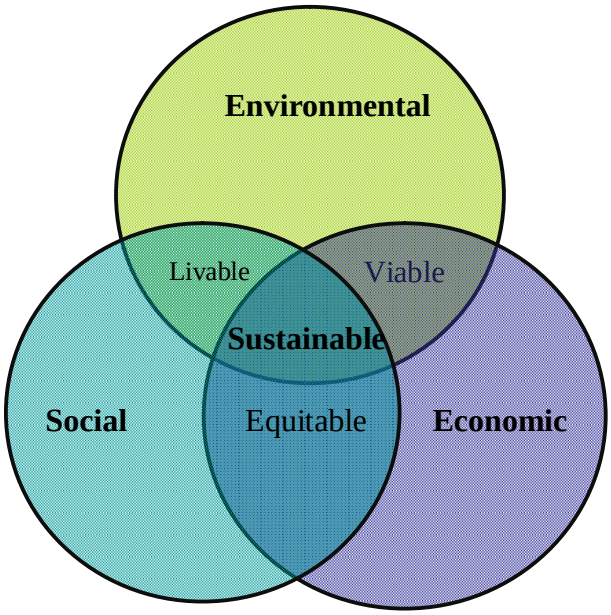

Fig 1: Dimensions of sustainable development

Sustainable agriculture is one of the important aspects in sustainable development. Basically agricultural sustainability does not have a single meaning [12, 13]. Some are considered sustainable agriculture in a particular time and space [14, 15]. D'silva and his partners believe that sustainable agriculture ensures economic, social and ecological stability which is called based on an equal model [16].Thus without losing the social aspects (like: family, welfare society, quality of life, human health, labor, and management requires and Etc.) sustainable farm should be achieved to economic goals and environmental objectives, too [17].Therefore economic efficiency, environmental quality and social responsibility are the three main objectives of sustainable agriculture [18]. Thus the most important issue in agricultural development is emphasis on sustainable agriculture. Agricultural sustainability depends on achieving a fundamental change in the overall agricultural structure, management and optimum utilization of resources, also organizing and conduction activities in rural areas. Because of the development and sustainability of agriculture, the village and rural development should take into consideration so it will be found true identity and real mean. According to these interpretations the aim of this study is assessing correlation between dimensions of development of agricultural sustainability and identifying of effective indices on sustainability of agricultural system in rural regions Boroujerd of Iran.this study investigated the relationship between dimensions of sustainable agriculture and to identify factors affecting the sustainability of agriculture in rural areas is Borojerd.

RESEARCH METHOD

The paper involves collecting primary data by the use of the questionnaire which was processed through the descriptive-analytical framework of the Amos and Spss softwares. The statistical sample is drawn from the household's heads of rural areas households (7493 people). Hence 30 questionnaires were distributed and administered as part of a pilot study in two villages within the study sample (agricultural beneficiary) to ensure representation of sample and testing the reliability of the questionnaire. Then the Cochran's formula was used to achieve a reasonable volume of the sample. 200 out of 7493 rural households from the rural area of Borujerd were selected to answer the questions on random basis to ensure the reliability and validity of the results.

Finally Cronbach's alpha method was used to assess the reliability of questionnaires which via the obtained data, the validity coefficient of questionnaires were obtained for the three questionnaires (economic, and social environmental), which (0.85, 0.78, 0.81) respectively. This method indicates the suitability of the research tools.

The indices of each dimension and Cronbach's alpha value have been shown (Table 1) . Finally, for analyzing the data factory were used factorial analysis and modeling of structural equations.

Table1.The observing Alpha value

Dimensions	Indicator	Code	The observing Alpha value
Economic	Access to the types of seeds and fertilizers Access to market for agricultural product Access to farm machinery Access to bank loans and credits	A1 A2 A3 A4	0.85
Social	Rate of tend to insurance of lands Use of communication channels Satisfaction of farming job	B1 B2 B3 B4	0.78
Environmental	Better protection of water quality and quantity Use of animal manure to reinforced soil Use of fallow Performance of crop rotation	C1 C2 C3 C4	0.81

RESULTS AND DISCUSSION

The results of descriptive findings show that the average age of subjects is 48.13 years. The average of per capita of respondent's agricultural land is 7.84 hectares. Table 2 shows other descriptive characteristics of the research.

Table 2. The findings of descriptive research

Variables	Mean	Std. Deviation	Minimum	Maximum
Age(year)	48.13	10.24	24	71
Education(year)	6.18	2.35	0	13
Number of household	4.96	1.22	2	9
Agricultural history(year)	31.79	10.19	3	36
Total amount of lands(hectare)	7.84	1.48	1	23
Lands under irrigated farming(hectare)	6.21	1.66	0.5	20
Income(10,000Rls)	285.60	29.95	200	650
Number of disposal lands(piece)	2.84	0.95	1	8
Average of land's size(hectare)	5.52	1.44	0.5	8

In tables 3, 4 and 5 dimensions of development of agricultural sustainability came into factorial analysis that variance percent is shown.

Table 3.Factorial analysis of economic indices of agricultural sustainability

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.270	56.757	56.757	2.270	56.757	56.757
2	0.888	22.196	78.953			
3	0.511	12.773	91.726			
4	0.331	8.274	100.000			
KMO= 0.702	Bartlett's Test of Sphericity= 211.869				Sig. 0.000	

Table 4.Factorial analysis of social indices of agricultural sustainability

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.046	51.157	51.157	2.046	51.157	51.157
2	0.943	23.578	74.735			
3	0.713	17.824	92.559			
4	0.298	7.441	100.000			
KMO= 0.633	Bartlett's Test of Sphericity= 175.725				Sig. 0.000	

Table 5.Factorial analysis of environmental indices of agricultural sustainability						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.584	64.598	64.598	2.584	64.598	64.598
2	.977	24.433	89.032			
3	.367	9.181	98.213			
4	.071	1.787	100.000			
KMO= 0.637	Bartlett's Test of Sphericity= 534.142			Sig. 0.000		

Then the research model was designed using modeling of structural equations. The results (Table 6) show that the model indices are in good conditions and the model has an acceptable fit. The model (Fig2) is shown with standard coefficients.

Table6.Indices of the research model

CMIN	DF	GFI	AGFI	NFI	RFI	IFI	TLI	CFI	PNFI	PCFI	RMSEA
84.22	49	0.934	0.895	0.894	0.857	0.953	0.935	0.952	0.664	0.707	0.050

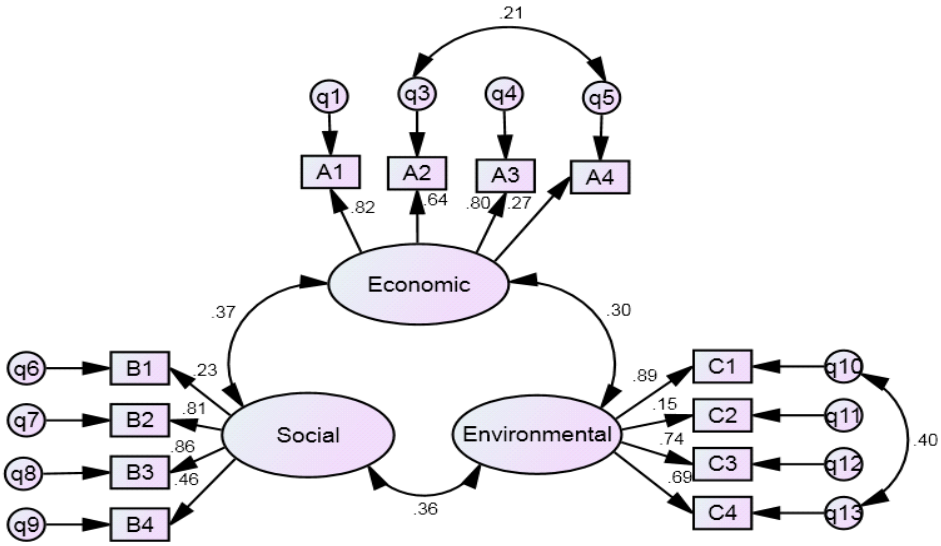

Fig2: The research model with standard coefficients

CONCLUSION

The findings show that according to one or two dimensions cannot be enough in sustainability of agricultural system but a collection of dimensions have affect in it. The model shows complexity of correlations between variables' sustainable development of agriculture in rural regions of Boroujerd .In fact in this study the research model indicate a direct and significant positive correlation between dimensions of agricultural sustainability. Decades of experience the planning in Iran shows that more attention has been on productivity growth regardless of social and environmental dimensions and this issue is most parts of unsustainable of agricultural system and finally rural migration has been in most of the regions. Nowadays rural communities need to look at all aspects of agriculture and having sustainable employment.

The results of this research indicate that access to seeds and fertilizers and access to farm machinery have most portions in economic dimension. Indices of communication channels and the rate of participation in promotional and training course have more important than other indices in social dimension. Also indicator of better protection of water quality and quantity has more important role in environmental dimension.

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