

The Impact of Social- Economic Level Development on Agricultural Land Use Changes at the Metropolitan Area of Isfahan

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ABSTRACT

This study aimed to discover How effective changes in agricultural land use in the socio - economic development of households. Agricultural land use in Iran is facing problems due to changes in its use, a major problem ranked the second after semi-drought. The intensity in agricultural land use change here due to the simultaneous growth and expansion of technology, communications, city dwelling tendency and close competition in agricultural land use. Sufficient knowledge of the available issues and the impact of agricultural land use change on the socio-economic and cultural aspects of rural society are essential in solving this problem. The statistical population consists of 84,171 rural households in the area under study. The total of the required sample capacity is 382. To assure the accuracy, in practice 456 questionnaires were issued are completed. The adopted study method is of survey type and the hypotheses test and statistical correlation evaluation are made through Structural Equation Modeling (SEM) applied in LISREL software environment. A wide spectrum of methods is applied in SEM.

Results of statistical analysis showed that agricultural land use change in the socio - economic development, quality and quantity of agricultural production, rural income inequality, declining rates of agricultural activities in industry and services has a considerable impact. Also distance from a large city of Isfahan has been effective in reducing land use change. Fitting indexes obtained in the structural equation model (GFI = 0/96) shows the relationship of parameters of the model is confirmed.

KEYWORDS: Land use Changes; Impact; Agricultural; Metropolitan; development.

1. INTRODUCTION

Rapid City dwelling tendency and continuous population growth not only lead to having metropolitan areas but causes changes in the natural spatial mosaic. That is the expansion of residential areas due to changes in various scales engulfs the rural areas and reshapes them into unauthorized cities (Kirk, 2004, 1).

This phenomenon has reduced the influence of the urban area on the surrounding natural environs and the rural areas, in a sense that the development of another city next to the existing one is vividly observed. These newly created commingled structural areas could be termed as urban-rural-natural system or “urban-rural crossing point” (Adell, 1999, 3; Drakakis-Smith, 1997, 103). This shapes up the Para-city dwelling caused by rapid destruction of natural landscapes and non-programmed changes in agricultural land use (Allen, 1993, 6).

In Iran after drought, agricultural land use change has prevalence on agriculture. Many socio-economic issues regarding rural systems should be recognized and identified if a remedy is sought. The compiled data for this purpose would allow the authorities to come up with proper procedures to determine the most effective variables so in case the agricultural land use is changed, the rural community would not be affected in a negative manner, that is, which variable should be given priority and at what level. In due course the authorities will be able to work on the optimization of effective grand-scale management plans.

As defined, a Metropolitan area of Isfahan is a geographic vastness composed of the correlated activities and coexistence of a few cities and communities where there exists a physical bond and a cohesive spatial order. A uniform planning and spatial management is of essence for this vastness. The Metropolitan area of Isfahan with a 50 km radius the center covers 8.346Km² including 36 cities and 352 rural areas. The statistical findings indicate that 31% of this vastness is agricultural lands that provide 46.5% of the provincial agricultural products. The most fertile and rich agricultural lands lie in this area of the province. The agricultural land here has been and is seriously threatened by human influx for residential and recreational use and is being shrunk by tens of hectares annually. The findings here indicate that the 266.233 hectares of agricultural land in the year 2000 has decreased to 230.050 hectares in 2012 that is 15.7% or a total of 36.182 hectares of the agricultural land use that has changed to other usage in the study area.

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No study is conducted on this topic so far; therefore, policies must be adopted that would allow city development by satisfying the residential needs while protecting the agricultural land use in a rational manner instead of destroying it. The attempt is made in this article to determine the effects of Level of socio - economic development on agricultural land use change in the subject area in parallel to the evaluation of the matter.

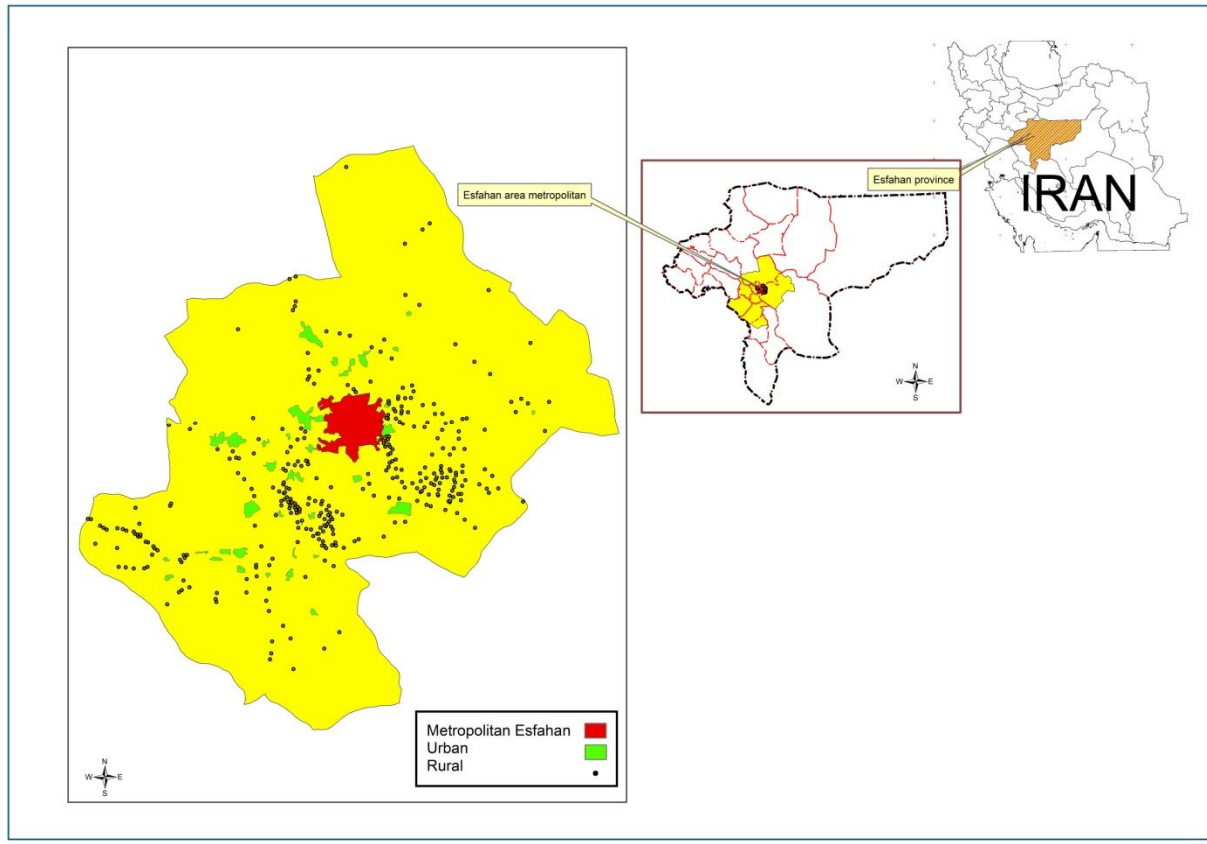


Fig1: location of the study area

Comparing maps derived from satellite data and geographic information systems environment represents a drastic change in land use types in the study area has occurred. According to Table (1) Comparison of the maps have been prepared. Area of land use types, the percentage of increase or decrease in each of the years 2000 and 2012 were evaluated.

Table 1: Area of land between 2000 and 2012, the rate of increase or decrease each

Type of land use	Area (ha) 2000 Year	Area percent 2000 Year	Area (ha) 2012 Year	Area percent 2012 Year	Percentage increase or decrease
Agriculture	266232	31.9	230050	27.6	-36182
Hotbed	468086	56.1	484120	58.0	+16034
Baer lands	61275	7.3	68723	8.2	+7448
Residential areas	39007	4.7	51707	6.2	+12700
Total	834600	100	834600	100	-

Reference: this research

LITERATURE REVIEW

Ioffe and Nefedova, 2001 conducted a study on agricultural land use change with an emphasis on agriculture and recreation. They found a drop in external agricultural land use quality.

Irwin and Geographers have developed advanced spatial models with respect to agricultural land use change in association with economic process (Irwin and Geoghegan, 2001).

In their article, Bell and Irwin, 2002 focus on factors that lead to the rural-urban interface in the United States of America. They introduce micro-level applicable modeling procedures (Bell and Irwin, 2002).

The rural housing land transition is the subject of a study conducted by Longa and Heiligh and Zhang, 2007 where based on a hypothetical basic structure a research method is introduced (Longa and Heiligh and Zhang, 2007).

Land requirements for rural and urban use are a futuristic concern. Verburg et al, 2010 have provided a typology for the subject for a period of 30 years beginning year 2000, ending 2030, based on some scenarios regarding agricultural land use change, which is a predictive approach (Verburg et al., 2010).

Different levels of research are involved in the field of agricultural land use change. Studies conducted on the absorption of agricultural land use by urbanization explain the socio-spatial and economic features in differentiating the central urban and rural zones (Bouraoui, 2005).

In their article, Nugraha and Prayitno, 2011 focus on, it can be concluded that the development of Agro-tourism-Based Area for Belimbing (Starfruit) Dewa is innovation for government in aching the advantage of various potentials existing in Depok City, exactly in Sawangan District. Land area, institution, human resource, technology, and information system have simultaneously brought significant influence on their income. With reference to path analysis model, there were two clusters of high-class entrepreneur group and low-class entrepreneur group (Nugraha and Prayitno, 2011).

MATERIALS AND METHODS

The survey method is adopted in this study and the hypothesis tests scoring the statistical correlations are obtained through Structural Equation Modeling in LISREL software environment.

The corresponding dependent variables' in this study consist of the effects of agricultural land use change on rural communities.

With respect to the similar studies the theory, regarding the evaluation in specific, there exist variables known as independent ones that constitute the analytical format of this study as follows:

Awareness level, cultural level, participation level, employment and unemployment level, social problems, household income-expenses, infrastructure and welfare, distance to the closest city, distance to the Metropolitan city of Isfahan, agricultural quantitative level, agriculture quality, land and housing cost, effect on lifestyle, agricultural land sales, prevailing carrier, tendency towards agriculture practice.

A population of 325.740 that constitutes 84.171 households is extracted from 2006 provincial housing and population census records.

The sampling method here is of multi-step/stage sampling that according to the appropriate circumstances the categorical, systematic and random sampling is applied.

For sample volume estimation Cochran formula is applied that yields to 382 samples. For better accuracy 456 questionnaires are completed. The compiled data went through statistical analysis through LISREL, SPSS soft wares. The maps and spatial data are analyzed in ARC GIS10 environment.

RESULTS

Determined and factors influencing variables for agricultural land use changes on the level of economic development - social, rural households, indicators have been classified. In regression models, variables used as independent variables or predictor variables and changes in agricultural land use as independent variables were entered into the model. The outputs of the model shows, the level of socio - economic development component of households with agricultural land use change is significant. The coefficient of determination shows that 11 percent of agricultural land use change in variance component by component level socio - economic development of households can be explained. The Beta coefficient is an inverse relationship between these two components. f the thousandths, is significant at $1\% \geq p$

Tables of regression and structural equation modeling, this assumption are confirmed. The amount of agricultural land use change on the socio - economic development of households has negative effects.

Table 2: Multivariate linear regression coefficient of determination of the level of socio - economic development of agricultural land use change component

Sig	F	AD R2	R2	R
0.000	58.568	.0112	.0114	.0338

Reference: this research

Table 3: Multivariate linear regression of socio - economic development of households with agricultural land use change component

Sig	t	Standardized Coefficients	Unstandardized Coefficients		
		Beta	Std. Error	B	
0.000	-7.653	-0.338	0.117	-0.896	Level of socio - economic development
0.000	11.264		5.943	66.937	Constant coefficient

Reference: this research

Structural Equation Modeling

Model and its components using the software end, model has been constructed (Fig. 2) and the operations on the model results show that the test statistic DW to 98/1 is and between 5/1 and 5/2 is located. Furthermore, it should have a normal distribution with mean zero errors. The test results show nearly normal distribution of errors is presented as the mean value close to zero and the standard deviation is close to one. Thus, the assumption of normality of errors was established and there is no problem in using structural equations.

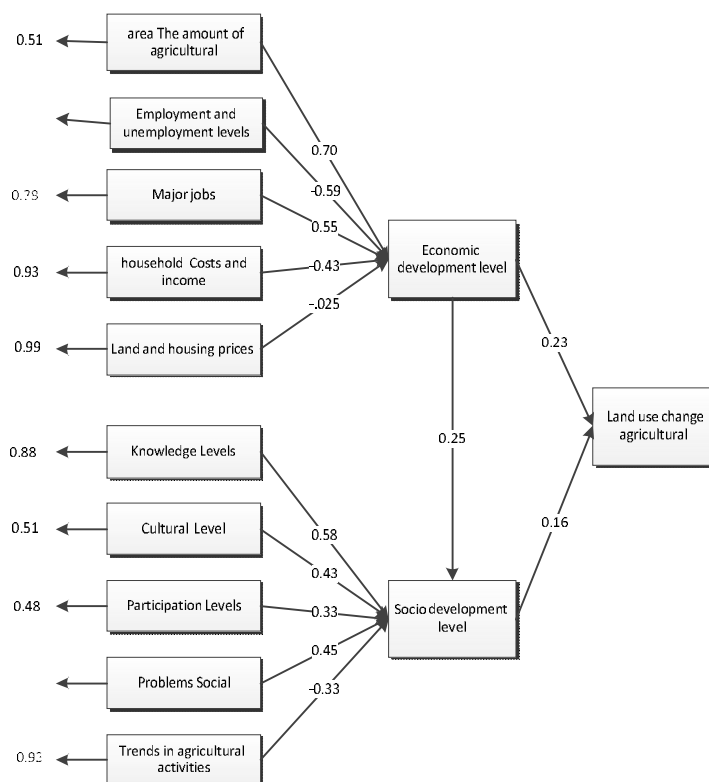
To investigate the non-linear relationship between the independent variables must be calculated index value of the index. The eigenvalues of close to zero indicates that the internal correlation between them is high. The value of the index greater than 30 indicates a serious problem in the use of structural equation. The value of the index greater than 30 indicates a serious problem in the use of structural equation. Since the eigenvalues of this study was close to zero and none of the parameters is not more than 30 there is a serious problem in the use of structural equation.

The main question raised is whether the model, the model is appropriate? To answer this question, one must confirming Ho theory / df model must be examined and appropriate measures. The output end, the value / df calculated with 98/1 (less than 2) there is / df below shows the goodness of fit of the model. Whatever the value / df is less model model is more suitable for - the following results are obtained from the output end, software.

0.098 = RMSEA, 0.000 = value - p 1.98 = χ^2 / df

GFI fitness index is equal to .096 and AGFI equal to .090

Based on the results, changes in agricultural land use in the socio - economic development of households has a considerable impact.

**Fig 2: Path analysis of relationships**

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