Environmental Resources Research
Vol. 5, No. 2, 2017

GUASNR

Study of relationship between food security, urban population and development plans in Iran

J. Salem[*1], M. Mojaverian[2]

[1]PhD of Agricultural Economic, Department of Agricultural Economic, Natural Resources and Agricultural Researches Center of Yazd province- Iran

[2]PhD of Agricultural Economic, Department of Agricultural Economic, University of Agricultural and Natural Resources sari

Received:March 2016 ; Accepted: September 2016

Abstract

Urban population growth (non-agricultural population) in developing countries has challenged the food security of urban households. The precise demographic definition of urbanization is the increasing share of a nation's population living in urban areas (and thus a declining share living in rural areas). Mostly, urbanization is the result of net rural to urban migration. We investigated the food security among urban households and the effects and various factors involved for the period of 1983 to 2012. Results showed that during this period the food security of urban households had an increasing trend. Despite the enhancement of food security among urban households, 5.6 percent of the urban populations received less than necessary kilojoules level in 2012, role factors were evaluated as well using time series pattern after estimation of urban household's aggregate food security index (AHFSI). Results showed that effect lag variable of aggregate food security index changes on growth of aggregate food security index in the next year will be significantly negative (at 1% level). These results exhibited that with increase in one-unit growth of food security index in one year, it would decrease by 0.008 units the next year. Every one percent increase of people receiving less than standard energy level will decrease the growth of food security index by 0.009 units. This finding is significant at 10 percent level. Nevertheless, the 1st to 3rd five-year development plans showed more growths on food security indices in comparison with the 4th development plan. Furthermore, the second development plan showed the maximum increase of food security index in comparison with the 4th development plan. Based on the results, the constant and steadily increasing trend of the food security index should be considered as a priority in the future development plans.

***Keywords*:** Food security, Non- agricultural population, Development plans, Iran

Introduction

By definition of food and agriculture organization of the United Nations, the concept of food security is the physical and economic access of all people in any time to enough and rich food and having a healthy life (FAO, 2001). There are several indicators for measuring the level of food security in the literature (Diaz-Bonilla *et al.,* 2000; FAO, 2001). Some of the most important ones include: (1) per capita food production (in cereal equivalent or per food category), (2) per capita caloric availability, (3) per capita protein availability and (4) ratio of food imports in total exports, and (5) non-agricultural population.

The first three indicators measure food security at both national and household (group) levels, and the larger are the values of these indicators the higher is the level of food security. The fourth indicator is exclusively a national food security measure. Diaz-Bonilla *et al.,* (2000) and FAO, (2001), among others, discuss in detail the appropriateness of these indicators as measures of national and/or household food security. A fifth indicator is the share of non-agricultural population (NAGRPOP), which gives an idea of the extent to which countries may be affected by changes in trade and agricultural policies, and the possible distributive impact along the rural/urban dimension.

Several developing countries have indicated their concern that further liberalization of agricultural and trade policies may create problems for their large agricultural populations, where poverty is still concentrated (WTO, 2000a; WTO, 2000b). At the same time, it is also important to notice the shift in the locus of poverty, food insecurity, and malnutrition from rural to urban areas that different developing countries are experiencing, some of them for several decades now, some others as a more recent phenomenon (Rule et al. ,1998; Rule et al. ,1999; Haddad et al. ,1999; Garrett and Rule ,1999). Therefore, while for the other indicators (consumption per capita of calories and proteins, food production per capita, and total exports per unit of food import) a higher value would be associated with greater food security, the ratio of urban population may be somewhat more ambiguous in its implications. Urbanization in developing countries is posing new questions regarding economic and social policies in general, and also in relation to the impact of trade and trade policies on food security. Trade protection for food products is equivalent to a tax on food consumption, with the proceeds of that tax transferred to food producers, while agricultural liberalization (if domestic markets operate adequately) should result in a reduction in the tax burden for food consumers. Therefore, a similar profile of trade protection (or trade liberalization) will have different implications for developing countries with important contingents of urban poor affected by food insecurity (such as several Latin America countries), than for other poor countries (such as many African and Asian countries) where a majority of the population affected by poverty and food insecurity lives in rural areas and works in agricultural production (Diaz-Bonilla *et al.,* 2000)

The precise demographic definition of urbanization is the increasing share of a nation's population living in urban areas (and thus a declining share living in rural areas). Most urbanization is the result of net rural to urban migration (Beauchemin and Bocquier, 2004). The level of urbanization is the share itself, and the rate of urbanization is the rates at which that share is changing. This definition makes the implications of urbanization distinct from those of urban population growth or those of the physical expansion of urban areas, both of which are often treated as synonymous with urbanization (Sattethwaite, 2011). In 1900, worldwide, there were 6.7 rural dwellers to each urban dweller; now there is less than one and projections suggest close to three urban dwellers to two rural dwellers by 2025 and much is made of the fact that in 2008, the world's urban population exceeded its rural population for the first time. United Nations projections suggest that the world's urban population will grow by more than a billion people between 2010 and 2025, while the

rural population will hardly grow at all (United Nations, 2008).

Globally, agricultural production has managed to meet the demands from a rapid growth in the proportion of the workforce not producing food and rapid changes in food demands towards more energy- and greenhouse gas emission-intensive food. However, hundreds of millions of urban dwellers face under-nutrition today, although this is far more related to their lack of income than to a lack of capacity to produce food. That much of the migration over the past 60 years has been from rural to urban areas is hardly surprising in that most of the growth in economic activities over this period has been in urban centers. Today, around 97 per cent of the world's gross domestic product (GDP) is generated by industry and services, and around 65 percent of the world's economically active population works in industry and services—and a very high proportion of all industry and services are in urban areas (Satterthwaite et al., 2010). Iran's population increased dramatically during the past 60 years and from 16.2 million persons in 1951 increased to 75 million persons in 2012 (Iran statistic center, 2013).

Population growth in recent years has been accompanied by migration from rural areas and urban growth. So that the urban population has increased from 32% of the total population in 1956 to 69 percent in 2011 that in comparison with the world is 19 % higher (Iran statistic center, 2013; World Bank, 2013). The number of cities has increased from 199 in 1956 to 1,200 in 2011, and in contrast, a higher number of villages of the country is empty from the population. For example, in Kerman Province, from 14321 villages, 8300 are empty from the population (Housing Foundation of Islamic Revolution of Kerman Province, 2009).

Different Factors are involved in the growth of urbanization in the country, the most important of them are; economic growth and development of industry and services and their concentration in urban areas, inequality of incomes between urban and rural areas, and lack of infrastructure in rural areas (Nagdi, 2002). Urban population from 1956 to 2006 has increased 8 times and urbanization rate has increased 2 times. Increasing urban population with increasing per capita food consumption despite increasing per capita food production in recent years has led to an increase in food imports. Also, investigating agricultural product and food import statistics shows that import of these products increased from 4348 million $ in 1989 to 10242 million$ in 2009 (WTO, 2011). The maximum per capita import of agricultural products belong to cereals so that in 2009 the sum of cereal import was more than 11 million tons and valued at 2.8 billion $ (FAO, 2001). Therefore, with the above description and the increase of urban population with increased dependence on food imports and lack of job opportunities in urban areas, attention to the urban households' food security evaluation and affecting factors is essential.

Lots of researches have been conducted both in Iran and throughout the world about food security but no study has been conducted in Iran about urbanization and its effects on urban households' food security. In some studies, in Iran and all over the world, households' food security level has been evaluated by use of Aggregate Household Food Security Index (e.g. Khodadad and Heydari, 2005; Mehrabi and Mousavi Mohmmadi 2008; Mehrabi and Mousavi Mohmmadi 2010; Safarkhanloo and Mohmmadi Nejad, 2011). Findings of these studies indicate that during the period of the study, the level of food security in both urban and rural households has increased. Results also show that trade liberalization effect on food security in rural households is negative in short-run and positive in long-run (Mehrabi and Mousavi Mohmmadi, 2008). Negative price support of farmers has been formed in most years, but in spite of input supports, protection of agricultural sector has been positive (Mehrabi and Mousavi Mohmmadi, 2010).

In some other studies food security in Iran has been evaluated at the national level (Yavari, and Hossini, 2012). Poverty and food insecurity distribution has been studied in rural and urban areas of Iran. In

this study poverty and food insecurity distribution over space in rural and urban areas are investigated using Foster, Greer, Thorbecke (FGT) index. Results show that, in rural areas poverty is lower than urban areas but, food security (caloric, protein and carbohydrates) in urban areas is better than rural areas. These results reveal that all the poor are not necessarily food insecure (Jafari and Bakhshoodeh, 2008).

Aggregate household food security index (AHFSI) for Pakistan rural households has been calculated and evaluated to be 70.1% that shows a low level of food security (Ahmad *et al.,* 2004). Food security has been studied in rural households of the Tigray region. This study investigated the determinants of food security and identified the major factors that jointly discriminate the rural households of Tigray region into food secure and food insecure households (Tsegay Gebrehiwot, 2009).

The study of factors affecting on growth of urbanization and migration from rural to urban areas in four dimensions of economical, social, cultural and natural - agriculture sectors showed that the economic dimension is more important than the other factors (Ghasemi Ardhany, 2007). The inequality of employment in urban - rural areas and its effect on urbanization growth has been investigated in west Azarbaijan Province during 1966-1996. Findings of this study show that during this period more attention had been paid to creation of job opportunities in urban areas (Morsali, 2006). Results about the causes of migration and urbanization among 534 migrants have indicated that the most important factors are: the subordination of households (45%), searching for a better job (11%), marriage (10%), use of facilities (9%) and job search (6%) (Iran Statistics center, 2003).

Study of developing countries which face urbanization growth, food-security worries, and food-safety challenges showed regionally, the highest urbanization growth is taking place in Asia and Sub-Saharan Africa where urban population is projected to double from 2000 to 2030. The high rate of growth has raised concerns among policymakers and aid donors, some of whom believe that this trend will exacerbate poverty and food insecurity in big cities. Poor and food-insecure people will account for a large share of urban growth because of both rural migration and natural growth, since fertility rates are higher among the poor than the higher income populations. These developments will translate to higher poverty and more food insecurity in urban versus rural areas and present a challenge to create employment opportunities for the urban poor. Growing food-import dependence, in lower income countries in particular, is an urban food-security issue because poor infrastructure precludes imports from being distributed throughout a country. Thus, any increase in import prices or decline in import capacity could lead to a decline in food imports, thereby intensifying food-security vulnerability in urban areas (Shapouri and Rosen, 2009).

Study of urban food insecurity and the new international food security agenda shows that achieving urban food security is the emerging development challenge for the 21st century and that the complexities of urban food systems urgently need to be addressed by researchers, policy makers, and international donors and multilateral agencies (Crush and Frayne, 2011). A high proportion of households have rural and urban components to their incomes and livelihoods—so they are better understood as multilocal, as individual members engage in different activities in different locations while sharing resources and assets. Incomes from non-agricultural activities and remittances have proved important for reducing rural poverty in many places (Deshingkar, 2006).

Remittances from urban household members and earnings from non-farm activities also have a major role in financing innovation and intensification of farming in Africa (Tiffen, 2003) and in Asia (Hoang *et al.,* 2005 ; Hoang et al. 2008).Urbanization is often considered as having negative impacts on agriculture for instance, from the loss of agricultural land to urban expansion and an urban bias in public funding for infrastructure, services

and subsidies. But the scale of urban poverty suggests little evidence of urban bias for much of the urban population—and clearly, urban demand for agricultural products has great importance for rural incomes. Agricultural producers and rural consumers also rely on urban-based enterprises for a wide range of goods and services including access to markets.

Urbanization brings major changes in demand for agricultural products both from increases in urban populations and from changes in their diets and demands. This has brought and continues to bring major changes in how demands are met and in the beneficiaries from farmers, companies, corporations, and local and national economies (and those losing out). It can also bring major challenges for urban and rural food security (Satterthwaite *et al.,* 2010).

There is a very large urban population worldwide with incomes so low that their health and nutritional status are at risk from any staple food price rise as became evident with the rising hunger among urban populations after the food price rises in 2007 and the first half of 2008 (Cohen and Garrett, 2009). Study of urbanization and climate change shows that hundreds of millions of urban dwellers are at risk from the direct and indirect impacts of current and likely future climate change for instance, from more severe or frequent storms, floods and heat waves, constraints on fresh water and food supplies, and higher risks from a range of water-borne, food-borne and vector-borne diseases (Satterthwaite *et al.,* 2010).

The multiple rural–urban linkages noted above mean that climate change impacts on agriculture will affect urban areas (for instance, influencing food availability and price), and climate change impacts on urban areas will affect agriculture (for instance, disruptions in urban demand for agricultural produce and disruptions to the goods and services provided by urban enterprises to agriculture and to rural households). Many rural households would also suffer if remittances from family members working in urban areas were disrupted by climate change-related impacts (Satterthwaite *et al.,* 2010). The aim of this study is assessment of the relationship between urban household's food security with non-agricultural population and development plans in Iran. This study will investigate the food security among urban households and the effects and various factors involved for the period 1983 to 2012. In addition, to investigate the urbanization effects on urban households' food security; a regression model will also be used.

Materials and Method

In this study, AHFSI has been used to calculate urban households' food security based on FAO's formula; proposed by Sen (1976) and Bigman (1993):

$$AHFSI = 100 - \left\{ H\left(G + (1-G)I^P\right) + \frac{1}{2}CV\left(1 - H\left(G + (1-G)I^P\right)\right)\right\} * 100 \quad (1)$$

$$G = \frac{C_S - C_{AU}}{C_S \times H} \qquad G = \frac{P_U}{P_T} \qquad G = \frac{S}{\overline{X}}$$

In these formulas H and P_U are percentage and the number of people who receive less energy than the standard amount respectively, P_T is the total number of studied population, G is the intensity of nutritive poverty, C_S is the standard energy, C_{AU} is the average of energy less than standard and I^P is Gini index of energy distribution between poor people; CV shows changes of energy distribution over the time and it is calculated by the deviation and average of energy distribution over time. This index has been introduced by (FAO, 2001) and originated from three elements: nutritive poverty level, distribution of food between poor people & intensity of nutritive poverty. The domain of this index is between 0 to 100 percent (Thomson and Metz, 1998).

Due to unavailability of the received energy statistics of each poor household, Gini coefficient of expenses distribution of poor households has been used in this study instead of Gini coefficient of energy distribution among poor people. As food requirement is the most important need for households, there is a high correlation between costs of consumption and the received energy of low income groups of society. Finally, to investigate the

urbanization effects on urban households' food security, below regression model was used:

$$LAHFSI = \alpha\ NAGRPOP + \beta\ H + \theta\ I^P + D_K$$

In this model:

LAHFCI= Food security of urban households,

NAGRPOP = Non Agricultural Population index,

H = level of poverty in households,

I^P = Ginni index of distributing energy in households, and

D_K = Dummy variables of effect of development programs on food security growth.

Data was collected from library. In order to calculate aggregate food security index of urban households, statistical studies of urban & rural households' income and cost have been used which is annually collected by the Statistical Center of Iran.

For evaluating food security in urban households' level, the aggregate household food security index was used. After gathering statistic of urban households' food cost according to 10 income deciles, costs were converted to energy using nutrition operation matrix. Then, the energy values obtained was compared with the standard energy recommended by the International Food Policy Research Institute. In order to analyze the results, the software packages Shazam10 and Eviews10 were used.

Results and Discussion

The aggregate food security index of urban household was estimated from 1983 to 2012 (Table 1). In this table, H is percentage of people who received less energy than the standard amount (2750 calorie) and it is defined by proportion of people who received energy less than standard amount to the total number of people; I^P is Gini index of distribution energy between poor people. Urban households' food security had an almost increasing trend from 1983 to 2012**.** Although food security is improved in urban households, 5.6 percent of urban population in 2012 has received less energy than the standard amount.

Table 1. Total Index of Urban Households Food security and food import capacity index in Iran

Year	H	NAGRP*	I^P	AHFSI	Year	H	NAGRP*	I^P	AHFSI
1983	36.9	51	0.383	84.65	1998	24.7	62	0.246	94.46
1984	38.8	52	0.381	84.96	1999	24.4	63	0.233	94.7
1985	39	53	0.375	85.48	2000	24.2	64	0.221	94.96
1986	33	54	0.397	86.65	2001	28.1	65	0.204	94.65
1987	32.5	54.5	0.367	85.24	2002	25.1	65.5	0.198	95.22
1988	31.7	55	0.359	87.68	2003	24.2	66	0.181	95.69
1989	37.3	56	0.346	88.77	2004	22.1	66.5	0.178	96.09
1990	36.3	56.5	0.317	90.11	2005	20.7	67	0.185	96.17
1991	34.1	57	0.335	90.08	2006	21.6	68	0.178	96.14
1992	38.3	58	0.305	89.79	2007	20.3	69	0.201	96.05
1993	39.5	58.5	0.298	89.58	2008	19.9	70	0.226	96.4
1994	36.1	59	0.288	90.72	2009	21.2	71	0.247	96.1
1995	31.2	60	0.253	92.81	2010	21.6	71.5	0.269	95.8
1996	29.1	61	0.252	93.34	2011	21.8	71	0.297	95.6
1997	28.4	61.5	0.241	93.78	2012	1.7	70	0.268	94.4

*NAGRP= Non Agricultural Population

Source: Study results

Regarding the nature of data time series, it is necessary to design an appropriate pattern besides stationary data.

Table 2 shows stationary test results using augmented Dickey- Fuller unit root method. All variables were non-stationary. Regarding data insufficiency, Schwartz Statistics was used to determine the optimal lag.

Table 2. Dickey-Fuller test results for pattern variables

Variable	Level			First difference			Degree of Co integration
	Number of optimal Lag (SIC)	Dickey-Fuller Statistic	Unit radical Probability	Number of optimal Lag (SIC)	Dickey-Fuller Statistic	Unit radical Probability	
AHFSI	1	-2.21	0.46	1	-4.87	0.004	I(1)
NAGRPOP	1	-3.88	0.03	-	-	2	I(1)
H	5	-5.46	0.00	-	-	-	I(1)
I^P	0	-4.91	0.00	-	-	-	I(1)

Source: Study results

Table 3. Unit root tests

In many researchers' viewpoints, usual tests of unit root suffer some flaws; therefore, tests of Dickey-Fuller or augmented Dickey- Fuller and Phillips & Peron is less effective than alternative hypothesis. Specially, when the sample size is small (n=50), there is no tendency to reject null hypothesis (Konia, 2001). In order to prevent these problems, several methods have been suggested. One is to use other unit root tests such as very large adjustments of Dickey-Fuller and Phillips and Peron tests that has been developed by Elliott et al. (1996), Perron and Ng (1996), and others. On the other hand, regarding the issue that the power of any test depends on the information available, theoretically operation unit root test may be improved along with an increase in sample size.

Furthermore, as an increase in the range of time series may be associated with structural changes problems, cross-sectional and time series observations can be used for better understanding of the issue. Eviews 5 provides us with calculating some unit root tests of integrated data. These tests include those of Levin, Lin and Chaw, Breitung, Pesran and Shin, Fisher's tests and at last Hadri test. Using more reliable tests, the results of unit root test have been shown in Table 3 for time series in the first differenced. Optimized lag was accomplished using Schwarz statistics (SIC) which is suitable for small sample size. Results reveal that all variables are collective in the first phase (I [1]).

Regarding instability of AHFSI variable, effect of other variables on AHFSI changes were evaluated. As is indicated in Table 4 the overall index variable effects on growth of AHFSI is negative and significant at the one percent level. The results show that with one-unit growth of food security index in a year, growth of this index in the next year reduced by 0.008 unit. Also, with one percent of people that received energy less than standard, food security growth index decreased by 0.0009 units.

Table 3. Estimated results of food security pattern

Type of test	Hypothesis (H_0)	Statistic value	probability	Hypothesis result with probability 95%
Levin, Lin & Chu	Entity of unit root	-2.47	0.00	Rejection of the null hypothesis
Breitung	Entity of unit root	-1.4	0.08	Rejection of the null hypothesis
Pesaran and Shin	Entity of unit root	-2.8	0.00	Rejection of the null hypothesis
ADF - Fisher Chi-square	Entity of unit root	22.47	0.00	Rejection of the null hypothesis
Hadri Z-stat	Series are stable	0.81	0.00	Acceptance of the null hypothesis

Source: Study results

Table 4. The overall index variable effects on growth of AHFSI

Variable	Parameter Estimates	Standard Deviation	T Statistic	Probability Level
AHFSI(-1)	-0.008	0.002	-3.3	0.00
H	-0.0009	0.0005	-1.72	0.10
I^P	8.2 88.200 $\times 10^{-6}$	2.64×10^{-5}	0.31	0.76
NAGRPOP	-0.0046	0.006	-0.79	0.44
D_1	0.011	0.0055	2.00	0.06
D_2	0.018	0.005	3.32	0.00
D_3	0.011	0.00497	2.25	0.04
D_4	0.006	0.0046	1.37	0.19
Intercept	-7.67	5.865	1.31	0.21

Durbin-Watson = 1.8935
r-square between observed and predicted = 0.7465
Jarque-Bera normality test- chi-square (2 df) = 1.9469
p-value= 0.378

Source: Study results

This result was significant at the ten percent level. Although the effect of energy distribution coefficient between the poor on AHFSI is positive but this effect was not significant at the appropriate level (76%). Also the effect of percentage of non agricultural population on AHFSI has been negative but not significantly at the appropriate level (44%). Evaluation of the effect of development programs on growth of AHFSI represents significant behavior of this index during development programs. According to the estimate results all of development programs of first to third have more growth in AHFSI in comparison with the fourth development program. The results of this estimation and Durbin-Watson statistic revealed that estimation patterns have no autocorrelation between disturbing components. Also results of Jarque-Bera normality test and estimation level probability show that the disturbing components are normal and T statistics estimate are valid (Table 4).

Determination coefficient statistics show that about 75 percent of the dependent variable (Growth of AHFSI) is explained by the independent variables in the model which is a plausible explanation.

Conclusion

The effect of percent of urban non-agricultural on urban food security index was negative, although not significant at the appropriate level. But the country's urban population trend of increase mainly due to migration from rural to urban areas, is a source of concern for food security of urban households. The creation of jobs in urban areas in recent years has faced with many problems and the growing dependence on food imports, particularly cereals has increased and any increase or decrease in import prices or import capacity could lead to a reduction in food imports and vulnerability to food insecurity in urban areas. Regarding the results estimated in Table 4, growth of the overall index of food security in each year was associated with reduction in growth in future years. So it is necessary to be prepared in this context until growth of food security index reaches good stability and growth of this index continues in feature years or maintain the desired growth. As results show (Table 4), reduction of energy distribution coefficient between poor will lead to a reduction in the country's food security index. Therefore, improving of this distribution coefficient in the country would be more necessary. Also evaluation of different development programs shows that in the fourth program, growth of this index has reduced compared with previous programs. Although the absolute level of the index has also increased in the fourth, but its growth has declined relative to other programs. Therefore, it seems the stability index and maintenance of its upward trend must be considered as one of the priorities of future development programs.

Reference

Ahmad, Sh., Siddique Javed, M., and Ghafoor, A. 2004. Estimation of food security situation at household level in rural areas of Panjab. International Journal of Agricultural and Biology 18(1), 279-286.

Andersen. and Rajul, P.L. 1995. Prospects for future world food security. International Rural Development Centre (IRDC).

Beauchemin, C., and Bocquier, P. 2004. Migration and urbanization in Francophone West Africa: an overview of the recent empirical evidence. Urban Stud. 41, 2245–2272.

Bigman, D. 1993. The measurement of food security. In: Berck, P. / Bigman, D (eds.1993): Food security And Food Inventories. In Developing Countries. Wallingford: CAB International. 238-251.

Cohen, M., and Garrett, J. 2009 The food price crisis and urban food insecurity. London, UK: IIED.

Deshingkar, P. 2006. Internal migration, poverty and development in Asia. ODI Briefing Paper 11. London, UK: Overseas Development Institute.

Diaz-Bonilla, E., Thomas, M., Robinson, S., and Cattaneo, A. 2000. Food Security and Trade Negotiations in the World Trade Organization: A Cluster Analysis of Country Groups, Trade and Macroeconomics Discussion Paper 59, Washington D.C: International Food Policy Research Institute.

Food and Agriculture Organization of the United Nations, 2001. Some Issues Relating to Food Security in the Context of WTO Negotiations on Agriculture",Geneva Round Table on Food Insecurity in the Context of WTO Negotiations on Agriculture 2001. Discussion Paper No. 1, Rome, Italy: FAO.

Ghasemi Ardhany, A. 2007. Causes of Rural migration to urban in Iran with meta-analysis of academic dissertations (1980- 2004). Rural and development Scientific and research quarterly journal of Agricultural Planning and Economic Research Institute Vol. 9, No.1.

Haddad, L., Ruel, M., and Garrett, J.L. 1999. Are urban poverty and under nutrition growing? Some newly assembled evidence. Food Consumption and Nutrition discussion paper 63. Washington, D.C.: International Food Policy Research Institute.

Hoang, X.T., Dinh, T.T.P., and Nguyen, T.H. 2008. Urbanization, fruit production and rural livelihood transformations in the Mekong Delta. London, UK: IIED.

Housing foundation of Islamic Revolution of Kerman province. 2009. Report of State of residence in villages and rurals of Kerman province.

Iran statistic center. 2013. Population census results of different years. Tehran. Press and Information Office of Statistics.

Iran statistic center. 2003. Migration and Urbanization in Iran. Tehran. Press and Information Office of Statistics

Jafary, M., and Baghshndae, M. 2008. Study of poverty local distribution and food insecurity in rural and urban households in Iran, Scientific& research quarterly journal of agricultural economics and development. 16, 61.

Khodadad Kashi, F., and Heydari, KH. 2005. Estimating of food security level in Iranian households based on the AHFSI index, Agricultural Economics and Development Scientific and research quarterly journal of Agricultural Planning &Economic Research Institute. 12, 4.

Mehrabi Boshrabadi, H. and Mousavi Mohmmadi, H. 2008. Analysis of Trade Liberalization Effects on Food Security of Rural Households in Iran. Rural and development Scientific and research quarterly journal of Agricultural Planning and Economic Research Institute. 10, 2.

Mehrabi Boshrabadi, H., and Mousavi Mohmmadi, H. 2010. Analysis of Agricultural Protection Policies Effects on Food Security of Rural Households in Iran. Agricultural Economics and Development Scientific and research quarterly journal of Agricultural Planning and Economic Research Institute. 16, 3.

Morsali, A. 2006.The inequality of employment of urban - rural in West Azarbaijan Province during 1966-1996. Rural and development Scientific and research quarterly journal of Agricultural Planning and Economic Research Institute, 9, 2.

Nagdi, A. 2002. Study of urban development and its social consequences. M.S thesis, University of Isfahan.

Ruel, M., J.L. Garrett, S.S. Morris, D. Maxwell, A. Oshaug, P. Engle, P. Menon, A. Slack, and L. Haddad. 1998. Urban challenges to food and nutrition security: a review of food security, health, and care giving in the cities. Food Consumption and Nutrition Division discussion paper 51. Washington, D.C.: International Food Policy Research Institute.

Ruel, M., Haddad, L., and Garrett, J.L. 1999. Some urban facts of life. Food Consumption and Nutrition Division discussion paper 64. Washington, D.C.: International Food Policy Research Institute.

Satterthwaite D., Gordon Mc, G., and Cecilia, T. 2010. Urbanization and its implications for food and farming

Satterthwaite, D. 2004. The under-estimation of urban poverty in low and middle-income nations. London, UK: IIED.

Sen, A.K. 1976. Poverty: An ordinal approach to measurement. Econometrical. 44, 219-231.

Shapouri, Sh. and Rosen, R. 2010. Developing Countries Face Urbanization Growth, Food-Security Worries, and Food-Safety Challenges, Food Security Assessment, 2008-09/ GFA-20 Economic Research Service/USDA

Thomson, A., and Metz, M. 1998. "Implication of economic policy for food security". A Training Manual. FAO, Rome

Tiffen, M. 2003. Transitions in sub-Saharan Africa: agriculture, Urbanization and income growth. World Dev. 31, 1343–1366.

Tsegay Gebrehiwot, 2009. Determinants of food security in rural households of the Tigray region. A thesis submitted to Addis Ababa University in partial fulfillment of the requirements for the degree of master of science in applied statistics.

United Nations 2010. World population prospects. New York

Wiebe, K., and Tegne. 2000. Resource Quality. Agricultural Productivity. and Food Security in Developing Countries. Food Security Assessment. 2008-09/ GFA-12 Economic Research Service/USDA

World bank. http://web. world bank .org/website/external/ world development indicators

World Trade Organization, 2000a. Agreement on agriculture: Special and differential treatment and a development box. Proposal to the June 2000 special session of the committee on agriculture by Cuba, The Dominican Republic, Honduras, Pakistan, Haiti, Nicaragua, Kenya, Uganda, Zimbabwe, Srilanka, and Elsalvador. G/AG/NG/W/13.

World Trade Organization, 2000b. Agreement on agriculture: Green Box/Annex 2 subsidies. Proposal to the June 2000 special session of the committee on agriculture by Cuba, The Dominican Republic, Honduras, Pakistan, Haiti, Nicaragua, Kenya, Uganda, Zimbabwe, Sri Lanka, and El Salvador.

Yavari, R., and Hossini, A. 2012. Evaluation Iran food security in during development different plans and study of oil revenues effects on food security. Shiraz University. The 8th Biennial Conference of Iranian Agricultural Economics Society