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Influencing Factors on Adoption of Organic Farming from the Perspective of Horticulturists in Sari County, Iran

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Abstract

The economy of Iran is dependent on many variables that play a role in its growth and development. On the other hand, rainfall is one of the important factors of climate change that has affected economic strategic programs including those of the agricultural sector. Rainfall variations impact many economic variables, some of which are explored here. The aim of this study was to evaluate rainfall shocks on some economic variables using a general equilibrium model that included the best scenario representing the highest rainfall, the worst scenario representing the lowest rainfall, and normal scenario considering average rainfall. To check the effect of these changes on the agricultural sector, a set of commodities produced by this section is considered separately, and other sections are considered in general. The results showed that the production of these commodities has been increased by about 14% in the best rainfall scenario. All commodities have been faced with reduced consumption from 0.3% to 10.3% in the worst rainfall scenario; this was the greatest loss of products related to the agricultural commodities. Rainfall increased the price of all commodities by 0.25-28.7%, except for industry. Both private and public investments were influenced by rainfall change.

Keywords:
adoption, organic farming, horticulturist

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INTRODUCTION

It is forecasted that the world's population to about 11 billion and 30 million in 2050 (United States Department of Agriculture, 2009). Achieving this means that more than a billion hectares of natural habitat, mainly in developing countries, the land is agricultural, used of fertilizers increased to two or three times the current level, demand for water intensifies and the use of chemical pesticides to be tripled (Hole et al., 2005). The early twentieth century and with the development of conventional agriculture and the increasing use of fertilizers and pesticides over synthetic chemical inputs, especially intensified efforts to find alternative approaches that eventually led to the emergence of the concept of sustainable agriculture (MacRae et al., 1990). Organic farming is one of the basic branches sustainable agriculture during the past two decades has drawn the interest of many around the world can be high because of public concerns over health and food safety and environmental health. In the meantime, international support and government support, have a significant role in the development of the agricultural system (Biao et al., 2003). In fact, the development of organic agriculture to solve serious environmental problems, health and safety of agricultural products is common systems (Verhoog et al., 2003). In other words, organic agriculture includes all agricultural systems that brave new generation of environmentally, socially and economically to improves produce food and fiber (International Federation of Organic Agriculture Movements, 2004). There is ample evidence that the production of organic food and drinks, both for the domestic market and for export can be effective in increasing farmers' income. This enabled us to reduce poverty and improve food security of households in agriculture (United Nations Environment Programe, 2008). The reasons for the move toward organic farming include: Goods more organic standards, organic foods taste better, organic products are low-risk disease, organic farming respects to water resources, organic farming create healthy soil, organic farming is modeled from nature, organic farming is directing the new research, organic growers are trying to biodiversity, organic farming helps to protect the health of rural communities, diversity organic foods is high (Sharif Moghadam, 2010).

The results provide evidence that there are significant differences in the characteristics between the adopter groups. The findings also reveal that the factors that affect adoption play a different role for early, medium and late adopters, particularly with regard to farming intensity, age, information gathering as well as attitudes of the farmer. More specifically, early adopters were the youngest to adopt organic farming and their decisions were found to be less profit related compared to other groups. Late adoption is constrained by risk considerations, while environmental attitudes and social learning were identified to be important determinants for all adopter groups. Overall, the findings strongly suggest, that for policy measures to be effective, the current state of diffusion has to be taken into account (Lapple & Rensburg, 2011).

Hoseini and Ajoudani (2012) showed that factors of economic and extension-education explained 31 percent of variation of adoption of organic farming, but there is no significant relationship between the technical factors and adoption of organic farming.

Lohr and Park (2002) concluded that the farmers' access to educational resources and information was effective on the adoption of organic farming strategy. Barreiro et al. (2008) in a study as factors influencing the adoption of two environmental projects and agriculture found that adoption of new approaches such as soil conservation and organic production was negatively correlated with age and education had been a positive relationship.

Wheeler (2005) came to the conclusion that social, economic, education factors and attitude to innovation in environmental effect on adoption of environmental technologies. Selfa et al. (2008) showed that age and farm income influence on attitudes towards organic farming. Rezvanfar et al. (2011) showed that motivation and perception

of farmers about organic farming, social attitudes, environmental attitude and participation in extension activities were the main factors of adoption of organic agriculture among small farmers.

Parvin (2011) came to the conclusion that features such as education, pest management, access to regular information and extension services, credits, prerequisites for understanding the farmers about the risks of ecological (ecological) are the result of widespread use of pesticides. Training in the field under the supervision of promoters, along with the successful application of pesticides is effective in reducing credit facilities. Increased training of farmers in IPM, agricultural inputs, local communities and using traditional farming operation, the sense of danger resulting from the use of pesticides, quality and security and improve the lives of farmers increase rice production. Shahbazi and Norozi (2011), in a study entitled "The role of extension on the development of organic farming" came to the conclusion that eenvironmental attitude and organic agricultural production in a sustainable manner requires benefit from a holistic extension system which was based on three pillars extension of the system of continuing education, motivation, self-help and development of rural participation in the sustainable development of human resources. Kuhestani et al. (2014) research was carried out to analyze and evaluate factors influencing on development of organic farming in the viewpoint of agricultural Jihad organization' experts in Sistan and Baluchestan province. Results of factor analysis showed that financial-supportive, infrastructure, environmental and cultural components factors were among the factors influencing on development of organic farming totally explaining 62.97% of the variance. The findings of Malek Saeidi et al., (2012) showed that negative attitude towards conventional agriculture, general attitude towards the environment, perceived transitional difficulty and moral norm had significant and direct effects on attitude towards organic farming. Negative attitude towards conventional agriculture had the most direct effect. As it was expected, the perceived transitional difficulty had a negative effect on attitude towards organic farming.

Horticulture was very importance in Iran. Because it has the following benefits: per unit area yield is high, high returns per unit area, a free grower/labour remains engaged for the whole, best utilization of waste land, raw material for industries, use of undulating lands. There are 136052 hectares of fertile gardens in the Mazandaran Province and they include fourth in the Iran. Also the Mazandaran Province ranked second in terms of production of garden. Citrus gained certain economic and trade significance since 80 years ago through planting modified seedlings and now. Mazandaran province is the pioneer of citrus production in Iran. This province having 45% of under cultivation surface and 47% of production share of citrus. Investigation on agricultural crops marketing, particularly horticultural crops and fruits were of great importance.

Many pesticides used to destroy pests are harmful to human health. Their entry into lakes and rivers causes pollution of water resources. One of the causes of the increasing trend of allergies and other diseases is the accumulation of pesticide residues in human food. At present, these kinds of problems are very much considered. Organic farming was proposed for human health and the achievement of sustainable food security. Organic farming is an alternative agricultural system which originated early in the 20th century in reaction to rapidly changing farming practices. Organic farming as an approach to sustainable agriculture tries to decrease environmental problems and possible health hazards caused by the residues from pesticides. The use of chemical pesticides were higher than the limit by Gardeners in Mazandaran Province (Organization of Jihad-e-Agriculture of Mazandaran, 2016). The main problem is that adoption of organic farming among horticultures help produce healthier.

This study was aimed at investigation of effective factors on adoption of organic farming in Iran viewpoint of horticulturists. In order to achieve this objective, specific objectives are presented as below:

• Study of adoption of organic farming

• Relation of horticulture's personal, farming, social, economical, communicational- educational and innovation characteristics with adoption of organic farming

• Effect of horticulture's personal, farming, social, economical, communicational- educational and innovation characteristics on adoption of organic farming

METHODOLOGY

Research method

In relation to objective, this applied research, since the results can be employed by programmer and policy makers. In order to reach precise and reliable data we used quantitative method. Because this research simply investigates existed conditions and defines them and there is no possibility to control or manipulate the variables, it is descriptive. Because the gathering of information about the views, beliefs, thoughts and behaviors or group characteristics of a society is statistical and also it is under recognition, so it is measuring. Furthermore, because it investigates and analyzes the relations between independent and dependent variables, it is correctional.

Statistical population

The research population consisted of 18830 horticulturists in Sari county, Iran, which was selected using stratified randomizing sampling method and Cochran formula (n=330). Finally, 317 questionnaires were analyzed.

Variables

The independent variables included personal characteristics of the respondent horticulturists (age, work experience), farming characteristics (garden acreage, number of pieces garden, drip irrigation acreage, age of garden and agro ecological situation), economic characteristics (yield, cost-benefit ratios), communicational- educational characteristics (contact with experts, effect of extension- education activities, use of information sources), social characteristics (social participation, social status), characteristics of innovation (relative advantage, compatibility, testable, visibility and complexity). The dependent variable was adoption of organic farming. All scale of variables was interval. Status of adoption of organic farming was measured by nine statements with a range of Likerts 5 items. The scoring of the mentioned range was 0=never, 1=rarely, 2=occasionally, 3= often, 4=always. Thus, the maximum score of adoption of organic farming was 36 and the minimum score is 0. All data were analyzed using the Statistical Package for the Social Sciences, Personal Computer Version (SPSS/PC+). Appropriate statistical procedures for description and inference were used. The alpha level was set apriority at 0.05.

Validity and reliability

The data was gathered through questionnaires. Validity of the instrument was established by a panel of experts consisting of senior faculty members in agricultural extension and education

Table 1
Reliability of Research Variables

Variables	Number of items	Cronbach alpha
Agro ecological situation	4	0.78
Social status	4	0.89
Social participation	4	0.87
Effect of extension-education activities	8	0.83
Use of information resources	9	0.85
The relative advantage of organic farming innovations	4	0.91
Compatibility of organic farming innovations	3	0.89
Testability of organic farming innovations	2	0.94
Visibility of organic farming innovations	4	0.92
Complexity of organic farming innovations	4	0.81
Adoption of organic farming	9	0.89

department. Also a pilot test was conducted to determine the reliability of the survey instrument. In this test, the mentioned questionnaires were given to 30 horticultures which were similar to statistical society in regional, economic, cultural and social conditions (Ghaemshahr County). After gaining the data concluded the Cronbach alpha coefficient for all the variables with degree scale of 89% (Table 1).

Findings

Status of adoption of organic farming

Table 1 shows mean and standard deviation, associated with the status of each questions related to the situation of adoption of organic farming among the respondents. Based on the mentioned Table 2, the first until the third priorities were using a combination of methods to combat pests, biological control of pests and drained soil to improve soil texture and the fight against weed. Priorities of other items can be seen in Table 2.

The status of adoption of organic farming viewpoint of the respondents showed in Table 3. According to the results, 54.6, 34 and 11.4 percent of horticulturists expressed situation of adoption of organic farming were very low and low, moderate and high and very high respectively.

Relation of horticulture's personal, farming, social, economical, communicational- educational and innovation characteristics with adoption of organic farming

Table 4 showes intensity, relation orientation and a meaningful level of horticulture's personal, farming, social, economical, communicational-educational and innovation characteristics with adoption of organic farming. As the Table 4 shows variable of experience with adoption of organic farming had been relationship of negative and significant. Also variables of yield, cost-benefit, drip irrigation acreage, connect to experts, social status, social participation, effect of extension- education activities, use of information resources, compatibility of organic

Table 2
Prioritizing the Items Related With Adoption of Organic Farming

item	Mean	SD	Rank
Using a combination of methods to combat pests	1.88	1.58	1
Biological control of pests	1.62	1.50	2
Drained soil to improve soil texture and the fight against weed	1.55	1.48	3
Removal of the remains of plants to garden	1.25	1.38	4
Efficient use of land and water resources	1.21	1.33	5
The use of green manure and livestock manure	1.17	1.42	6
Water and soil testing and control	1.12	1.38	7
Select a location suitable for planting in terms of having proper air flow, full sun, low humidity and drip irrigation	1.08	1.32	8
Preventing the transmission and spread of diseases	0.84	1.43	9

The range of Likert's 5 items: Never= 0, always=4

Table 3
Status of Adoption of Organic Farming Viewpoint of the Respondents

Status	Frequency	Percent of frequency	Cumulative percentage
Very low	92	29	29
low	81	25.6	54.6
Moderate	108	34	88.6
High	24	7.6	96.2
Very high	12	3.8	100
Total	317	100	-

Median = Low Mode= Moderate

Table 4
The Relation of Horticulture's Personal, Farming, Social, Economic, Communicational- Educational and Innovation Characteristics with Adoption of Organic Farming

Variables	Pearson correlation coefficient	P-value
Age	-0.061	0.276
Experience	-0.113*	0.045
Garden acreage	0.105	0.061
Yield	0.136*	0.015
Age of garden	0.101	0.072
Number of pieces of garden	0.078	0.169
Drip irrigation acreage	0.286**	0.000
Connect to experts	0.149**	0.008
Cost-benefit ratio	0.136*	0.015
Agro ecological situation	0.064	0.255
Social status	0.361**	0.000
Social participation	0.342**	0.000
Effect of extension-education activities	0.381**	0.000
Use of information resources	0.259**	0.000
The relative advantage of organic farming innovations	0.080	0.157
Compatibility of organic farming innovations	0.224**	0.000
Testability of organic farming innovations	0.234**	0.000
Visibility of organic farming innovations	0.078	0.167
Complexity of organic farming innovations	0.109	0.065

*p<0.05 **p< 0.01

farming innovations and testability of organic farming innovations with adoption of organic farming had been relationship of positive and significant.

The role of horticulture's personal, farming, social, economic, communicational- educational and innovation characteristics on adoption of organic farming

In order to predict the role of research variables on adoption of organic farming, we used step by step regression. Analyzing the regression enables the researcher to predict the variance of dependent variable through independent variables and determine the role of every independent variable in explanation of dependent variable. In step by step method, the strongest variables enter the equation one after another. This process goes on until the errors of meaning exam reaches to 0.05 errors. Results showed social participation, effect of extension-education activities and drip irrigation acreage enter the equation in three of steps, respectively. This means that social participation have the highest influence on adoption of organic farming. This variable alone explained 18.7 percent of variance in dependent variable. Social participation and effect of extension-education activities communally explained 22.7 percent of variance in dependent variables, in step two. In final, social participation, effect of extension-education activities and drip irrigation acreage in three steps explained a variation of 24% of adoption of organic farming (Table 5). According to the amount of beta in Table 6, we can write the regression equation as follows:

Table 5
Analyzing the Regression of Adoption of Organic Farming

Step	R	R Square	Adjusted R Square
1	0.432	0.187	0.184
2	0.476	0.227	0.222
3	0.490	0.240	0.233

Median = Low Mode= Moderate

Table 6
The Standardized and Non-Standardized Coefficients of Adoption of Organic Farming

Variables	B	Beta	t	P-value
Social participation	0.737	0.31	5.36	0.000
Effect of extension- education activities	0.206	0.19	3.29	0.001
Drip irrigation acreage	0.112	0.13	2.37	0.019
Constant	1.72	-	4.14	0.047

$Y = 0.31X1 + 0.19X2 + 0.13X3$
X_1 = Social participation
X_2 = Effect of extension- education activities
X_3 = Drip irrigation acreage

CONCLUSION AND RECOMMENDATIONS

Organic farming is an alternative agricultural system with a range of environmental and social benefits in comparison to conventional agriculture. The agricultural professionals are responsible for informing farmers and the public by education and extension efforts. This study aimed at studying the adoption of organic farming, indicated that more of the respondents (54.6 percent) believed that adoption of organic farming was low and very low. According of results using a combination of methods to combat pests, biological control of pests and drained soil to improve soil texture and the fight against weed had been important related to adoption of organic farming. Results from analyzing the Pearson correlation showed that experience have 0.05 percent of meaningful and negative relation with adoption of organic farming. This means that the less experienced gardeners, better adoption of organic farming. Also variables of yield, cost-benefit, drip irrigation acreage, connect to experts, social status, social participation, effect of extension-education activities, use of information resources, adaptability and testable of innovations of organic farming with adoption of organic farming had been relationship of positive and significant. This means that the increase in social status, social participation, effect of educational activities, resource utilization information and contact with experts, as well as improved adoption of organic farming. Also the gardens acreage and higher yield, better adoption of organic farming. Of course intensity correlation in relate social participation, social status, effect of education and extension activities were moderate and in others variables the intensity correlation is low and very low. These results conform to the researches of (Azeez & Jimoh, 2007; Fabrigar et al., 2006; Gotschi et al., 2007; Hoseini & Ajoudani, 2012; Lohr &Park, 2002; Mahantesh & Singh, 2009; Rezvanfar et al., 2011; Selfa et al., 2008; Shahbazi & Norozi, 2011; Wheeler, 2008; Willer & Yussefi, 2007). Furthermore, the results of step-by-step regression illustrated that variables of social participation, effect of extension-education activities and drip Irrigation acreage in three steps explained a variation of 24% of adoption of organic farming. Variable of social participation have the highest influence on adoption of organic farming. This variable alone explained 18.7 percent of variance in adoption of organic farming. These results conform to the researches of (Azeez & Jimoh, 2007; Fabrigar et al., 2006; Gotschi et al., 2007; Hoseini & Ajoudani, 2012; Lohr &Park, 2002; Mahantesh & Singh, 2009; Rezvanfar et al., 2011; Selfa et al., 2008; Shahbazi & Norozi, 2011; Wheeler, 2008; Willer & Yussefi, 2007). This research showed that for improve the adoption of organic farming must be increased social participation and social influence of horticultures. Also promote effect of education and extension activities. This means that we will increase the participation of gardeners with gardener cooperatives and associations and play a more active role in executive activities. Also promote the management of pests and diseases, and packaging and grading of products among gardeners. For improve the adoption of organic farming must be innovations of organic farming tested and

the results are visible for horticultures. Also this innovations offer with fewer complications. For improve the adoption of organic farming was suggested gardens were consolidate and drip irrigation to be institutionalized. Also to increase knowledge and skills in organic farming, horticulturists use more information sources such as radio, TV, books and the internet. In final for improve the adoption of organic farming was suggested yield and benefit-cost ratio increased.

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