

Professionals' Attitudes Towards Organic Farming: The Case of Iran

H. Malek-Saeidi¹, K. Rezaei-Moghaddam^{1*}, and A. Ajili²

ABSTRACT

Organic farming as an approach to sustainable agriculture tries to decrease environmental problems and possible health hazards caused by the residues from pesticides. Since the agricultural professionals are responsible to inform the farmers and the public by education and extension efforts, it is necessary to understand their attitudes. The main purpose of this research was to investigate factors influencing agricultural professionals' attitudes towards organic farming. We used a survey research by questionnaire in Fars province (a southern province in Iran) to collect data from 138 agricultural professionals in autumn 2007. Major independent variables in the study were knowledge of organic farming, general attitude towards the environment, social norm about organic farming, moral norm about organic farming, nutrient attitude, health attitude, perceived transitional difficulty and negative attitude towards conventional agriculture. The findings 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.

Keywords: Agricultural professionals, Attitude towards organic farming, Environment, Knowledge, Moral norm, Social norm.

INTRODUCTION

Nowadays, environmental degradation in Iran has drawn the attention of many agricultural scientists and specialists towards sustainable agricultural systems. Iran's dependence on imports of pesticides and insecticides, limited arable land, terrible soil erosion (Chizari *et al.*, 1999) and increasing consciousness about ill effects of the irregular use of chemical fertilizers (Dahwan *et al.*, 2009) have led to a demand for more suitable policies and agricultural management methods to achieve sustainable agriculture. Despite the presence of a broad consensus to sustainable agriculture, "yet

agreement on how to progress towards it remains elusive" (Rigby and Caceres, 2001; PP. 21).

Many "alternative" approaches have been developed to achieve a more sustainable agriculture. Well known approaches are: integrated pest management, integrated crop management, low input agriculture, permaculture, biodynamic farming, precision agriculture and organic farming (Gold, 1994). From among these approaches, sustainability can be considered in relation to organic farming as a sector growing rapidly in many countries (Rigby and Caceres, 2001).

¹ Department of Agricultural Extension and Education, College of Agriculture, Shiraz University, Shiraz, Islamic Republic of Iran.

* Corresponding author, email: rezaei@shirazu.ac.ir

² Department of Agricultural Extension and Education, Ramin University, Ahvaz, Islamic Republic of Iran.



The purpose of organic farming is to prevent non-equilibrium of natural resources (Sharma, 2005). An important question confronting organic farming is “Can organic farming produce enough food for everybody to assure sufficient food security?” Regarding this question, it should be said that food security is not only the ability to produce food, but also is the ability to store, distribute and to access food (Dar, 2009). According to FAO, “*food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life*” (Panitchpakdi and Steiner, 2008). Therefore, food security includes “global food availability”, “food self-sufficiency” and the “distribution of food”. One of the principal objections to the assumption that organic agriculture can guarantee the global food security is its well-known capacity to produce lower yields and therefore less food in total compared to conventional agriculture (Arponen, 2009). Badgley *et al.* (2006) have proved this statement wrong. They compared 293 global researches on organic yield levels and found out that organic systems could produce enough food on a global per capita basis to sustain the current population. Also, according to the International Federation of Organic Agriculture Movement (2005), in marginalized areas, organic farmers can increase food production by managing local resources without having to rely on external inputs or food distribution systems over which they have little control and/or access. Organic agriculture could thus contribute to the total supply and therefore help improve global food security.

It is to be noted that although organic management of natural resources can substitute external agricultural inputs, land tenure remains a main constraint to the labor investments needed for organic agriculture. Organic farms grow a variety of crops and livestock in order to optimize competition for nutrients and space between species: this results in less chance of low production or

yield failure for the farm as a whole which has an important impact on local food security and resilience. In rain-fed systems, organic agriculture has demonstrated to outperform conventional agricultural systems under environmental stress conditions. Under the right circumstances, the market returns from organic agriculture can contribute to local food security by increasing family incomes (International Federation of Organic Agriculture Movement, 2005).

Organic food systems ought to be evaluated in a wide development context which includes the fact that agriculture has often had a detrimental impact on the environment and on rural societies (e.g. disenfranchised farmers and discredited agriculture and knowledge). Although organic farming is not a “*panacea*” and has its own limits, its health and environmental costs are much lower than those of conventional agriculture. Organic systems have the capacity to increase food availability and access in locations where there are poverty and hunger. Converting to sustainable agricultural systems such as organic farming in developing countries is more than a serious proposition. “*The challenge is neither agronomic nor economic but socio-political*” (El-Hage Scialabba, 2007).

Certified organic agricultural production is limited in developing countries such as Iran (Mahmoudi *et al.*, 2009) where agriculture has a very long history. The country has diverse climatic conditions and a rich biological diversity (Koocheki, 2004). Traditional small scale farming is the main structure of farming communities. Iranian traditional agriculture looks a lot like organic farming in many ways. For example, some products from the mountainous regions are completely organic. There are several reasons to argue that there is a good capacity in Iranian agriculture for conversion to organic agriculture. Although at present, farmers do not pay certification costs, these are borne by the exporter (in limited extent), who has to arrange for

inspections by foreign certification bodies. Now, there is 1,113 ha certified organic agricultural land in the Iran. Furthermore, there are other non-certified organic cases such as 85 ha “olive orchards” and 22,000 ha “fig orchards” whose products are sold in local markets as organic. We should emphasize that “*not all traditional farming systems that do not use artificial pesticides and fertilizers are non-certified organic, because they could be unsustainable due to soil degradation, etc*”. On the other hand, “*non-certified organic food systems may be more in line with the organic values and principles than certified systems, because the latter also face pressures of market competition and globalization*” (Mahmoudi *et al.*, 2009).

Observing non desirable effects of conventional agriculture on soil, environment, natural resources and food has caused the discussion that farmers are producers of agricultural products, so they have a great social responsibility to conserve the environment and human health. Also, They have the responsibility to preserve natural resources for future generations. According to Wheeler (2008), some authors emphasized the positive role that extension professionals play in diffusing agricultural innovations. Indeed, the key role of agricultural professionals in affecting farmers to adoption organic farming as an innovation is emphasized. The main objective of this study was to investigate factors affecting professionals' attitudes towards organic farming. Analysis of professionals' attitudes can be important for designing appropriate plans for organic farming.

Theoretical Background

“Attitudes are frequently described in terms of personal consistency, as a “latent concept” that is individual-dependent” (Vogel, 1994). According to Hyttiä and Kola (2005), “Ajzen defines attitudes as latent and hypothetical characteristics that

can only be inferred from external, observable cues”. Also, Banyte *et al.* (2007) note that attitude is how for or against, positively or negatively, favorably or unfavorably a person regards a particular object. This definition aims to reveal the idea that attitude contains consumer feelings and evaluations related to a particular object.

Attitudes are formed through direct and indirect life experiences and observations. These experiences are “behavioral beliefs”. They have been gathered over time and form the basis of attitudes. Therefore, attitudes are learned and can be changed. They can be viewed as an overall evaluation of behavior and can be measured on a bipolar dimension. “*The more favorable a person's attitude toward a behavior, the more they intend to perform that behavior*” (Sanderson, 2004). Review of different studies (Wheeler, 2008; Sanderson, 2004; Gotschi *et al.*, 2007; Stobbelaar *et al.*, 2006; Vogel, 1994) has shown that attitudes are affected by a set of antecedent variables, including knowledge, socio and structural factors such as community pressures, family concerns, ethical principles and values. They may change over time, as knowledge and other antecedent variables change.

In different studies, some of the recognized models in environmental psychology and behavioral sciences such as “Theory of Reasoned Action” developed by Fishbein and Ajzen, “Theory of Planned Behavior” developed by Ajzen, “Model of Ecological Behavior” developed by Fietkau and Kessel and “Model of Predictors of Environmental Behavior” developed by Hines, Hungerford and Tomera were analyzed to extract factors that could be relevant to the formation of attitudes towards organic farming (Gotsch *et al.*, 2007; Verbeke and Vermeir, 2005; Freyer, 2005).

Although there are many studies related to attitude towards organic farming among farmers, consumers and adolescents (Gotschi *et al.*, 2007; Stobbelaar *et al.*, 2006; Storstad and Bjørkhaug, 2003; Anderson *et al.*, 2003; Saba and Messina, 2003; Midmore



et al., 2001), a few studies have been conducted to identify attitudes of agricultural professionals towards this agricultural system.

Wheeler's study (2008) is one of a few studies to identify professionals' attitudes towards organic farming. Although Wheeler's study (2008) on professionals' attitude showed that increasing organic knowledge played a positive role on whether professionals believed organic farming produced net benefits, other studies have concluded that peoples' attitude towards any subject could be influenced by their knowledge about them (Pieniak et al., 2010; Wheeler, 2007; Fabrigar et al., 2006; Stobbelaar et al., 2006; Allum et al., 2005; McFarlane and Boxall, 2003).

Some studies (Stobbelaar et al., 2006; and Storstad and Bjørkhaug, 2003) have found that general attitudes towards environment, concern for environmental problems and perceived responsibility for environmental protection were emotions that helped people to achieve positive attitudes towards sustainable agricultural activities which help to conserve the environment.

Similarly, several studies (Thøgersen and Ölander, 2006; McFarlane and Boxall, 2003; Hustvedt, 2006; Stern et al., 1995; Pelsmacker and Janssens, 2007) concluded that people's attitudes have high correlations with their social and moral norms. For instance, Stern et al. (1995) constructed a socio-psychological model of environmental concern. The model posits a series of relationships. First, social and institutional structures exert an early and strong influence on the formation of individual psychological variables. From social and institutional structures, values are derived, which then shape more general beliefs and worldviews, such as environmental concerns and altruistic norms. Then, more specific beliefs and attitudes evolve from these general beliefs and worldviews. Thøgersen and Ölander (2006) showed that attitudes towards organic food products were correlated with subjective social norms concerning, and personal norms concerning

organic foods. Likewise, Gotschi et al. (2007) concluded that social norms and values affect what we think of organic products.

On the other hand, Wheeler (2008) used an ordered profit model to evaluate factors influencing overall views towards organic farming. "*Views on conventional agriculture's sustainability*" was one of the factors in this model. Although Wheeler did not find a significant correlation between this variable and professionals' attitude towards organic farming, she emphasized that "*professionals who agreed that conventional agriculture was more profitable than organic agriculture were more likely to be negative towards organics, while those who believed organic farming produced higher quality produce and was more environmentally friendly than conventional agriculture were more likely to be positive towards organics*" (PP. 150).

Stobbelaar et al. (2006), Gotschi et al. (2007), and Cook et al. (2000) found that concerns about community and personal health and the idea that organic foods are healthier and taste better have played a central role in shaping the sustainable agriculture movement.

As pointed out, there are a few studies to identify attitudes of agricultural professionals towards organic farming. This study seeks to obtain information on the possible factors guiding Iranian agricultural professionals' attitude towards organic farming. We attempted to identify some antecedent variables from different studies in different target groups and analyze their influences on professionals' attitudes towards organic farming.

A diagram has been developed to study the effects of variables on attitudes towards organic farming (Figure 1). In this model, we assume that "general attitude towards environment", "health attitude", "nutrient attitude", "social norm about organic farming", "moral norm about organic farming", "perceived transitional difficulty" and "knowledge of organic farming" are important independent variables factors

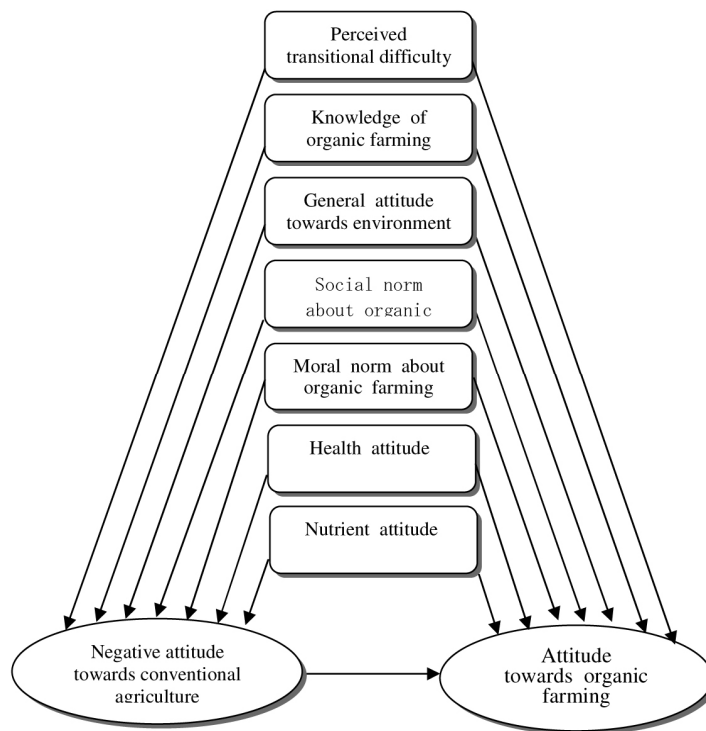


Figure 1. Theoretical framework of variables influencing attitude towards organic Farming (Rectangles indicate independent, ellipses dependent variables).

directly affecting “attitude towards organic farming”. On the other hand, we assume that all the variables have indirect effects on “attitude towards organic farming” via “negative attitude towards conventional agriculture” (Figure 1).

attitude towards conventional agriculture and attitude towards organic farming.

H₃: Negative attitude towards conventional agriculture has a positive and significant impact on attitude towards organic farming.

Hypotheses

MATERIALS AND METHODS

The main hypotheses derived from the conceptual framework are:

H₁: Knowledge of organic farming, general attitude towards the environment, social norm about organic farming, moral norm about organic farming, nutrient attitude and health attitude have a positive and significant impact on negative attitude towards conventional agriculture and attitude towards organic farming .

H₂: Perceived transitional difficulty has a negative and significant impact on negative

Selection of Samples

The statistical population of the study were all agricultural professionals that work in the Jihad-e-Keshavarzi Organization of Fars Province -a southern province in Iran-(N= 411) which were selected using cluster sampling. This technique allows a number of the target population to be sampled while providing statistically valid data that can be extrapolated to the whole population (Lwanga *et al.*, 2005). The province was



divided into 5 clusters (Hayati, 1995) and sample size was determined for every cluster (with attention to the size and proportion of clusters). Then, samples were randomly selected from every cluster. In total, 138 agricultural professionals were selected. Response rate in the present study was 100% and all selected professionals were interviewed during autumn 2007.

Instrument

The survey included face-to-face interviews using a questionnaire for data collection. One section of the questionnaire contained general demographic of the respondents such as age, gender, educational level and work record. The next section was designed to describe professionals' attitudes toward organic farming (24 items), negative attitude towards conventional agriculture (8 items), health attitude (3 items), nutrient attitude (5 items), social norm about organic farming (6 items), moral norm about organic farming (7 items), general attitudes towards the environment (5 items) and perceived transitional difficulty (7 items). Items were rated on a five point Likert-type scale ranging from "strongly disagree" to "strongly agree". Twenty two items were designed to identify professionals' knowledge of organic farming, which were rated on a five-point continuum of "very high", "high", "average", "low" and "very low" options (Appendix A).

Variables Measurement

Attitude towards Organic Farming: This variable was estimated using items related to professionals' attitude towards importance of organic farming for conserving the environment, sustainability, produce quality, improvement of community health and preserving farm for future generations.

Knowledge of Organic Farming: It was estimated using items related to professional knowledge of agro-technical aspects of

organic farming such as nutrient management, weeds, pest and disease control and ecosystem management.

General Attitude towards the Environment: This was measured using items about individual's attitude towards air quality, climate change, emission of agricultural greenhouse gases and their effects on degradation of natural resources and its consequences such as flood and drought, groundwater contamination and reduction in wildlife population.

Social Norm about Organic Farming: Social norm is related to pressure in a person's social environment, e.g. from family or friends (Verbeke and Vermeir, 2005). These norms are formed from beliefs about "*what other people, of importance to the individual, think of the individual performing the behavior*" (Cook et al., 2000). This variable was measured using items about effects of family, consumers, and Jihad-e- Keshavarzi Organization and government's support on individual's belief about this agricultural system.

Moral Norm about Organic Farming

Moral norms are "*feelings of strong moral obligations that people experienced for themselves to engage in pro-social behavior*" (Bamberg & Möser, 2007). Estimating this variable was carried out by questions such as person's obligation and feeling about other beings, nature, preserving natural resources and conserving the environment.

-Nutrient Attitude

This variable was estimated using questions such as individual's worldview towards taste and quality of foodstuffs with less synthetic materials and their intention to buy these foods.

-Health Attitude

This was estimated using items related to the importance of health for the target group.

Perceived Transitional Difficulty

The perceived transitional difficulty is an index to define the perceived ease or difficulty of performing the conversion and to observe standards related to organic farming (Cock, 2005). It was measured by

questions about possibility of transition towards organic farming with attention to farm conditions and economical and educational situations in the country.

Negative Attitude towards Conventional Agriculture: This variable was estimated using questions related to negative results of conventional agriculture on human health, environment, underground water and agricultural products quality.

Validity and Reliability

To examine the validity and reliability of the questionnaire, a pilot study was conducted on 30 agricultural professionals out of 138 (in Khuzestan Province) and Cronbach's alpha for the items of Likert type scales was calculated. The results showed an appropriate internal consistency among the items of each scale (Table 1).

Data Analysis

Apart from descriptive statistics and several inferential techniques, frequencies, percentage, mean score, standard deviation, coefficient of correlation and multiple regression as a mediation test to path analysis were used to analyze the data. The calculations were carried out using the "Statistical Package for the Social Sciences" (SPSS 11.5). However,, a part of path analysis was carried out without any software (Kalantari, 2006)

Table 1. Reliability analysis (Alpha).

Scale name	Alpha value
Attitude towards organic farming	0.83
Knowledge of organic farming	0.96
General attitude towards the environment	0.67
Social norm about organic farming	0.71
Moral norm about organic farming	0.74
Nutrient attitude	0.63
Health attitude	0.70
Perceived transitional difficulty	0.80
Negative attitude towards conventional agriculture	0.61

RESULTS AND DISCUSSION

Socio and Demographic Characteristics

From 138 participants, 16 professionals (11.6%) were female and 122 professionals (88.4%) were male. The results showed that 27 professionals (19.6%) were younger than 30 years, 47 professionals (34.1%) were 30-40 years old, 59 (42.8%) between 40-50 years and 5 professionals (3.5%) were older than 50 years. The work record profile showed that of 118 professionals who answered this question, 30 (21.7%) had work record less than 5 years, 20 (14.5%) 10-15 years, 35 (25.4%) 15-20 years and 33 (23.9%) had recorded more than 30 years. The education profile showed that of 136 respondents who answered this question, 121 (87.7%) were graduates with a BA or BS degree and 15 were post graduates with an MS.c., MA or MS degree.

According to Table 2, professionals have a high mean score for attitude towards organic farming (74.8). Participants also had a health attitude mean score of 10.4 that is high considering the spectrum of concession 0-12. Spectrum of concession of variable nutrient attitude (0-20) in Table 2 shows that agricultural professionals have a high nutrient attitude mean (16.6). This shows that the general attitude is to consume fruits and vegetables with less chemical materials and better taste. The mean score of professionals' knowledge of organic farming was 58.9, in a spectrum of concession between 0-88 for the variable.

Table 2 shows that the professionals had a mean score of 15.87 in attitude towards social norm about organic farming (spectrum of concession of this variable was between 0-24). This finding shows that positive or negative insight of family, friends and colleagues in Jihad-e-Keshavarzi organization towards organic farming affects professionals' attitude towards this agricultural system. Mean score of attitude towards moral norm about organic farming was 24.76. This indicates that participants

**Table 2.** Descriptive statistics of variables.

Variables	Maximum	Minimum	Mean	Standard deviation
Attitude towards organic farming	94	49	74.81	8.97
Negative attitude towards conventional agriculture	31	12	24.22	3.97
Health attitude	20	6	10.40	1.30
Nutrient attitude	12	10	16.60	2.04
Knowledge of organic farming	88	16	58.93	5.01
Social norm about organic farming	22	10	15.87	2.55
Moral norm about organic farming	28	19	24.76	2.70
General attitude towards environment	20	7	16.70	2.40
Perceived transitional difficulty	24	3	13.89	3.93

Note: spectrum of concession of Attitude towards organic farming (0-96), Negative attitude towards conventional agriculture (0-32), Health attitude (0-12), Nutrient attitude (0-20), Knowledge of organic farming (0-88), Social norm about organic farming (0-24), Moral norm about organic farming (0-28), General attitude towards environment (0-20) and Perceived transitional difficulty (0-28).

felt high obligation about positive effects of organic farming on the environment and other beings. Mean score of perceived transitional difficulty was low (13.89). This indicates that participants believe transition towards organic farming is difficult because of farm conditions and the economic and educational conditions in the country.

Variables Affecting Professionals' Attitude towards Organic Farming

The model for independent variables and attitude towards organic farming (Fig. 1) was used as a cause and effect chain to work out a path analysis. The path analysis can be viewed as an extension of multiple regression. In multiple regression, the researcher is interested to predict the dependent variable. The concern in path analysis is with the predictive ordering of variables. "The model "X" causes "Y" is a regression model, whereas "X" causes "Y" and "Y" causes "Z" is a path analysis model" (Klem, 1995). In sum, the important difference between path analysis and other multivariate methods is much less power of the multivariate methods (such as multiple regression, discriminant analysis, canonical correlation and factor analysis) than path analysis to examine hypotheses about causal

relationships between variables (Borg and Gall, 1989). Path analysis allows a researcher to test a theory of causal order among a set of variables (Klem, 1995). The path coefficients showed that the direct effects of some variables on the others were not significant. Thus, in the final model these paths were discarded for a better understanding of the relations between independent variables and attitude towards organic farming (Figure 2).

Effect of the negative attitude towards conventional agriculture on attitude towards organic farming in table 3, indicates that professionals' views on the current sustainability of conventional agriculture has the strongest direct influence on their attitude towards organic farming (0.3). This effect was significant at a 0.01 level based on a regression test (Figure 2). Table 4 shows that the correlation between negative attitude towards conventional agriculture with attitude towards organic farming is significant ($r= 0.39$, $P< 0.01$). Therefore, professionals who believe conventional agriculture is currently unsustainable and produces low quality products have higher positive attitude towards organic farming.

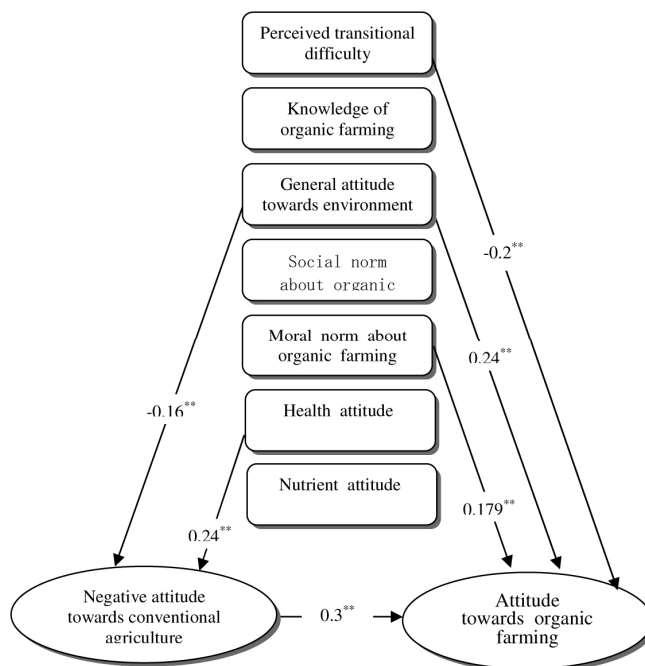


Figure 2. Path diagram of the variables influencing attitude towards organic farming. The path coefficients are linear and standardized (β). The significance of test is: $*0.05 \geq p > 0.01$ and $**0.01 \geq p > 0.001$.

Table 3. Direct and indirect effects of the independent variables and negative attitude towards conventional agriculture on attitude towards organic farming.

Variable	Direct effect	Indirect effect	Total effects
Negative attitude towards conventional agriculture	0.3**	0	0.3
Health attitude	0.02	0.07	0.09
Nutrient attitude	0.13	0.02	0.15
Knowledge of organic farming	0.09	0.027	0.1
Social norm about organic farming	0.055	0.04	0.09
Moral norm about organic farming	0.179**	0.05	0.23
General attitude towards environment	0.24**	0.05	0.29
Perceived transitional difficulty	-0.2**	0.02	-0.18

The significance of test is: $*0.05 \geq p > 0.01$ and $**0.01 \geq p > 0.001$.

Figure 2 indicates that after the variable negative attitude towards conventional agriculture, general attitude towards the environment had the highest effect (0.24) on professionals' attitude towards organic farming which was significant at the 0.01 level. This indicates that respondents with a more environmentally friendly conscious have more positive attitude towards organic

farming. Table 4 shows that the correlation between general attitude towards the environment and attitude towards organic farming is significant ($r= 0.48, P< 0.01$). This result confirms the results of studies by Stobbelaar *et al.*, (2006) and Storstad and Bjørkhaug (2003). General attitude towards the environment also has an indirect effect on attitude towards organic farming via



Table 4. Correlation matrix between different variables.

Variables	Attitude towards rganic farming	Negative attitude towards conventional agriculture	Health attitude	Nutrient attitude	Knowledge of organic farming	Social norm about organic farming	Moral norm about organic farming	General attitude towards environment
Negative attitude towards conventional agriculture	0.39**							
Health attitude	0.34**	0.29**						
Nutrient attitude	0.36**	-0.17*	0.26**					
Knowledge of organic farming	0.24*	0.06	0.22**	0.3**				
Social norm about organic farming	0.19*	-0.01	0.17	0.09	0.15			
Moral norm about organic farming	0.46**	0.18*	0.37**	0.33**	0.32**	0.4**		
General attitude towards environment	0.48**	-0.25**	0.3*	0.3**	0.15	0.15	0.42**	
Perceived transitional difficulty	-0.33**	-0.002	-0.14	-0.15	-0.09	-0.01	-0.13	-0.1

The significance of Pearson's correlation test is: *0.05 ≥ p > 0.01 and **0.01 ≥ p > 0.001.

negative attitude towards conventional agriculture (Figure 2). Negative effect of general attitude towards the environment on negative attitude towards conventional agriculture (-0.16) confirms the negative and significant correlation between these two variables in Table 4 (r= -0.25, P< 0.01). This result indicates that professionals with more environmentally conscious attitudes have negative attitudes towards sustainability of conventional agriculture and on the contrary have a more positive attitude towards organic farming.

One of our assumptions was that the variable perceived transitional difficulty would affect negative attitude towards conventional agriculture as well as attitude towards organic farming. Figure 2 indicates that perceived transitional difficulty has a direct but negative influence on professionals' attitude towards organic farming (-0.2) which was significant at 0.01 level. Indeed, it was explicitly postulated that the professionals who believe transition towards organic farming is difficult or impossible considering farm conditions and economic and educational situation in Iran, have a negative attitude towards organic farming.

Table4 shows that the correlation between perceived transitional difficulty and attitude towards organic farming is negative and significant (r= -0.33 , P< 0.01).

Moral norm about organic farming plays a positive role on belief to produce net benefits. Professionals who were engaged in the environment, human and other beings, were also more likely to be positive towards organic agriculture (r= 0.179, P< 0.01). As found in other studies (Thøgersen and Ölander, 2006, Hustvedt, 2006), Table 4 shows a positive and significant correlation between moral norm about organic farming and attitude towards organic farming (r=0.46, P< 0.01).

Although some studies (Cook et al., 2000; Stobbelaar et al., 2006; Gotschi et al., 2007; Traversi and Nijkam, 2005) found a direct influence of health attitude on attitudes towards organic farming, the present study did not confirm this. However, as shown in

Figure 2, health attitude was found to have an indirect effect on attitude towards organic farming via negative attitude towards conventional agriculture. Based on Table 5, the direct effect of health attitude on negative attitude towards conventional agriculture ($r=0.24, P<0.01$) emphasizes that more attention to health has a positive effect on negative attitude of professionals towards conventional agriculture thereby having an indirect and positive effect on their attitude towards organic farming. Table 4 shows a positive correlation between health attitude and negative attitude towards conventional agriculture ($r=-0.29, P<0.01$) and a positive correlation between health attitude and attitude towards organic farming ($r=0.34, P<0.01$).

CONCLUSIONS

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. Understanding their attitudes towards organic farming is necessary and this research was conducted to investigate important factors affecting agricultural professionals' attitude toward organic farming.

The effects of independent variables on the dependent variable of attitude towards organic farming indicate that professionals with more positive general attitudes towards the environment, had a positive moral norm about organic farming, and were more critical of

conventional agriculture. In addition, they believed in the benefits of organic farming. This emphasizes the importance of feeling moral obligation about the environment, human and other beings, as well as professionals' views on the current sustainability of conventional agriculture to improve attitude towards sustainable agricultural systems, especially organic farming. The effect of the independent variable perceived transitional difficulty indicates that professionals who believed that transition towards organic farming is very difficult, had a negative attitude towards organic farming. The effects of knowledge of organic farming, attitude towards social norm about organic farming, health attitude and nutrient attitude on attitude towards organic farming were not confirmed by the study. But, variable health attitude influences attitude towards organic farming indirectly via negative attitude towards conventional agriculture. This finding indicates that attention to health for the individual, family and society can stimulate the individual's attention towards environmental problems and negative results in case of conventional agriculture and can increase their positive attitude towards organic farming.

The influence of negative attitude towards conventional agriculture, moral norm about organic farming and general attitude towards the environment on attitude towards organic farming emphasizes the role of extension programs for organic farming and communicative media to increase public information and especially agricultural professionals' information on environmental

Table 5. Direct and indirect effects of the independent on negative attitude towards conventional agriculture.

Variable	Direct effect	Indirect effect	Total effects
Health attitude	0.24**	0	0.24
Nutrient attitude	0.07	0	0.07
Knowledge of organic farming	-0.01	0	-0.01
Social norm about organic farming	0.14	0	0.14
Moral norm about organic farming	0.155	0	0.155
General attitude towards environment	-0.16**	0	-0.16
Perceived transitional difficulty	0.07	0	0.07

The significance of test is: * $0.05 \geq p > 0.01$ and ** $0.01 \geq p > 0.001$.



problems and negative consequences of conventional agriculture. These programs should focus on the negative impacts of consuming fruits and vegetables with harmful amounts of pesticide residues on health. Moreover, the promotion of the practices of organic farming successfully, depends on specialized knowledge. Therefore, encouraging agricultural professionals to acquire correct knowledge of this agricultural system should be a priority with the organizations of education and extension institutes.

There are different factors (such as socio-economic variables, information seeking behavior, personal and business objectives and food patterns at home) that influence attitude towards organic farming directly or indirectly through reciprocal actions. Further studies are recommended among agricultural professionals at the national level, as it is expected to provide considerable evidence regarding the role of other variables such as perceived behavioral control and risk management.

REFERENCES

1. Allum, N., Sturgis, P., Tabourazi, D. and Brunton-Smith, I. 2005. Scientific Knowledge and Attitudes across Cultures: A Meta-analysis. University of Surrey, UK.
2. Anderson, C., Deaver, K., Ewbank, K., Fauser, C., Fleming, K., King, R. S., Oxenhandler, S., Prunte, K., Ricketts, R., Roth, E. M., Stringer, B., Willett, Ch., Wilson, L. and Young, M. 2003. Attitudes toward Agriculture and Food Safety among Missourians. Missouri Department of Agriculture, University of Missouri, Columbia.
3. Arponen, A. 2009. *Could Organic Food Feed the Planet?* Short Essay for Bright Conference in Milano, University of Helsinki, Finland."
4. Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Jahi Chappeli, M., Avilés-Vázquez, K., Samulon, A. and Perfecto, I. 2006. Organic Agriculture and the Global Food Supply. *Renewable Agri. Food System*, **22(2)**: 86-108.
5. Bamberg, S. and Moser, G. 2007. Twenty Years after Hines, Hungerford and Tomera: A New Meta-analysis of Psychosocial Determinants of Pro-environmental Behavior. *J. Environ. Psycho.*, **27**: 14-25.
6. Banyte, J., Joksaite, E. and Virvilaite, R. 2007. Relationship of Consumer Attitude and Brand: Emotional Aspect. *Engin. Econo.*, **2(52)**: 65-77.
7. Borg, W. R. and Gall, M. D. 1989. *Educational Research: An Introduction*. Fifth Edition, Longman, New York and London, P.839.
8. Chizari, M., Linder, J. R. and Zoghie, M. 1999. Perceptions of Extension Agent's Educational Needs Regarding Sustainable Agriculture in the Khorasan Province, Iran. *J. Intl. Agri. Ext. Edu.*, **40(4)**: 13-21.
9. Cock, L. de. 2005. Determinates of Organic Farming Conversion. *International Congress of the EAAE (European Association of Agricultural Economists)*, "The Future of Rural Europe in the Global Agro-food System", 24-27 August, Copenhagen, Denmark.
10. Cook, J. A., Fairweather, R. J. and Campbell, R. H. 2000. New Zealand Farmer and Grower Intentions to Use Genetic Engineering Technology and Organic Production Methods. Agribusiness and Economics Research Unit, Lincoln University, New Zealand.
11. Dahwan, A. K., Singh, S. and Kunar, S. 2009. Integrated Pest Management (IPM) Helps Reduce Pesticide Load in Cotton. *J. Agri. Sci. Tech.*, **11**: 599-611.
12. Dar, B. 2009. Background Info: Organic Agriculture. http://ecoseram.com/pdf/backgr_oundorganic.
13. El-Hage Scialabba, N. 2007. Organic Agriculture and Food Security. *International Conference on Organic Agriculture and Food Security*, FAO, Italy, 3-5 May.
14. Fabrigar, R. L., Petty, E. R., Smith, M. S. and Crites, L. S. 2006. Understanding Knowledge Effects on Attitude-behavior Consistency: The Role of Relevance, Complexity, and Amount of Knowledge. *J. Person. Socio. Psycho.*, **90(4)**: 556-577.
15. Freyer, B., Leitner, H., and Lindenthal, T. 2005. What will the Next Generation Do When They Succeed Their Parents?. *Proceedings of the Conference "Researching Sustainable Systems"*, Adelaide 2005, P. 414-418.

16. Gold, M. V. 1994. *Sustainable Agriculture: Definitions and Terms*. National Agricultural Library, U.S. Department of Agriculture. <http://www.nal.usda.gov/afsic/pubs/terms/srb9902.shtml>.
17. Gotschi, E., Vogel, S. and Lindenthal, T. 2007. *High School Students Attitudes and Behavior towards Organic Products: Survey Results from Vienna*. University of Natural Resources and Applied Life Sciences, Vienna.
18. Hayati, D. 1995. Factors Influencing Technical Knowledge Sustainable Agriculture Knowledge and Sustainability of Farming System among Wheat Producers in Fars Province. Master's Thesis, College of Agricultural Extension and Education, Shiraz University.
19. Hustvedt, G. 2006. Consumer Preferences for Blended Organic Cotton Apparel. An Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy, Kansas State University.
20. Hyytiä, N. and Kola, J. 2005. *Citizens' Attitudes towards Multifunctional Agriculture*. Department of Economics and Management, University of Helsinki.
21. International Federation of Organic Agriculture Movement (IFOAM). 2005. *The Policy Framework of Organic Food and Farming*. IFOAM Training Manual on Organic Farming.
22. Kalantari, Kh. 2006. Data Processing and Analysis in Socio-economic Research. Sharif, Tehran, P.386.
23. Klem, L. 1995. *Reading and Understanding Multivariate Statistics*. (Eds.): Grimm, L. G. and Yarnold, P. R., American Psychological Association, Washington, DC., PP. 65-97.
24. Koocheki, A. 2004. Organic Farming in Iran. 6th IFOAM-Asia Scientific Conference "Benign Environment and Safe Food", 7th – 11th September 2004, Yangpyung, Korea.
25. Lwanga, S., Sapirie, S., Steinglass, R., Stroh, G. and Wylie, A. 2005. *Immunization Coverage Cluster Survey-reference Manual*. World Health Organization.
26. Mahmoudi, H., Sharghi, A., Vossoughi, Sh. and Salama, Sh. 2009. *Organic Agriculture as a Strategy for Improving Small Farmers' Livelihood in Iran*. Environmental Sciences Research Institute, Shahid Beheshti University, Tehran.
27. McFarlane, L. B. and Boxall, C. P. 2003. The Role of Social Psychological and Social Structural Variables in Environmental Activism: An Example of the Forest Sector. *J. Environ. Psycho.*, **23**: 79–87.
28. Midmore, P., Padel, S., McCalman, H., Isherwood, J., Fowler, S. and Lampkin, N. 2001. *Attitude towards Conversion to Organic Production Systems: A Study of Farmers in England.*, Aberystwyth: Institute of Rural Studies, University of Wales. http://orprints.org/8441/1/midmore_padel_Attitudes_conversion.pdf
29. Panitchpakdi, S., and Steiner, A. 2008. Organic Agriculture and Food Security in Africa. *United Nations Conference on Trade and Development, United Nations Environment Programme*, United Nations, New York and Geneva. http://www.unctad.org/en/docs/ditcted200715_en.pdf
30. Pelsmacker, D. P. and Janssens, W. 2007. The Effect of Norms, Attitudes and Habits on Speeding Behavior: Scale Development and Model Building and Estimation. *Accid. Anal. Prev.*, **39**: 6–15.
31. Pieniak, Z., Aertsens, J., and Verbeke, W. 2010. Subjective and Objective Knowledge as Determinants of Organic Vegetables Consumption. *Food Qual. Prefer.*, **21**: 581–588.
32. Rigby, D. and Caceres, D. 2001. Organic Farming and Sustainability of Agri-cultural Systems. *Agri. System.*, **68(1)**: 21-40.
33. Saba, A. and Messina, F. 2003. Attitudes towards Organic Foods and Risk-benefit Perception Associated with Pesticides. *Food Qual. Prefer.*, **14**: 637-645.
34. Sanderson, K. 2004. Extension Support for Organic Farmers in the South: A Function of Attitude, Knowledge, or Confidence?. A thesis presents to the graduate school of the University of Florida in partial fulfillment of the requirements for the degree of Master of Science, University of Florida”
35. Sharma, A. K. 2005. *A Handbook of Organic Farming*. Agro Bios (India), P.289.
36. Stern, P. C., Dietz, T. and Guagnano, G. A. 1995. The New Ecological Paradigm in Social-psychological Context. *Environ. Behav.*, **27(6)**: 723–743.
37. Stobbelaar, D, J., Casimir, G., Borghuis J., Marks, I., Meije, L. and Zebeda, S. 2006. Adolescent's Attitudes toward Organic Food: A Survey of 15 to 16 Years Old School Children. *Intl. J. Consumer Stud.*, **31(4)**:349-356.



38. Storstad, O. and Bjørkhaug, H. 2003. Foundation of Production and Consumption of Organic Food in Norway: Common Attitudes among Farmers and Consumers? *Agri. Human Values*, **20**: 151-163.
39. Thøgersen, J. and Ölander, F. 2006. The Dynamic Interaction of Personal Norms and Environment-friendly Buying Behavior: A Panel Study. *J. Appl. Socio. Psycho.*, **36 (7)**: 1758-1780.
40. Traversi, C. M. and Nijkamp, P. 2005. Willingness to pay for Agricultural Environmental Safety: Evidence from a Survey of Milan, Italy, Residents. FEEM Working Paper, No.100.04. <http://ssrn.com/abstract=562722>.
41. Verbeke, W. and Vermeir, I. 2005. Determinants of the Consumer Attitude-behaviour Gap in Sustainable Consumption Decision. Working paper, Department of Agricultural Economics, Ghent University, Belgium.
42. Vogel, S. 1994. Environmental Attitudes and Behaviour in the Agricultural Sector as Empirically Determined by Use of an Attitude Model. Institut für Wirtschaft, Politik und Recht, Universität für Bodenkultur Wien.
43. Wheeler, S. 2007. The Barriers to Further Adoption of Organic Farming and Genetic Engineering in Australia: Views of Agricultural Professionals and Their Information Sources. *Renewable Agri. Food System.*, **23(2)**: 161-170.
44. Wheeler, A. S. 2008. What Influences Agricultural Professionals' Views towards Organic Agriculture?. *Ecolo. Econ.*, **65**: 145-154.

نگرش کارشناسان نسبت به کشاورزی ارگانیک: مورد ایران

ح. ملک سعیدی، ک. رضایی مقدم و ا. آجیلی

چکیده

کشاورزی ارگانیک به عنوان یکی از رهیافت‌های کشاورزی پایدار به دنبال کاهش مشکلات محیطی ناشی از بقایای آفت‌کش‌ها و خطرات تهدید کننده آنها برای سلامت انسان می‌باشد. از آنجا که کارشناسان کشاورزی مسئول اطلاع‌رسانی به کشاورزان از طریق فعالیت‌های آموزشی و ترویجی می‌باشند، درک نگرش آنها ضروری است. پژوهش حاضر با هدف مطالعه عوامل تأثیرگذار بر نگرش کارشناسان کشاورزی به سوی کشاورزی ارگانیک انجام شده است. برای این منظور، از روش تحقیق پیمایشی و ابزار پرسشنامه برای جمع‌آوری اطلاعات از ۱۳۸ کارشناس کشاورزی در استان فارس (یکی از استان‌های جنوبی ایران) بهره گرفته شد. متغیرهای مستقل پژوهش شامل دانش نسبت به کشاورزی ارگانیک، نگرش کلی زیست‌محیطی، هنجار اجتماعی، هنجار اخلاقی، نگرش نسبت به تغذیه، نگرش نسبت به سلامتی، درک سختی انتقال به سوی کشاورزی ارگانیک و نگرش منفی نسبت به کشاورزی متداول بودند. یافته‌های این مطالعه حاکی از تأثیر مستقیم و معنی‌دار متغیرهای نگرش منفی نسبت به کشاورزی متداول، نگرش کلی زیست‌محیطی، درک سختی انتقال به سوی کشاورزی ارگانیک و هنجار اخلاقی نسبت به کشاورزی ارگانیک بر نگرش به سوی این سیستم کشاورزی است. در این راستا، نگرش منفی نسبت به کشاورزی متداول بیشترین اثر مستقیم را دارا می‌باشد. همان‌طور که انتظار می‌رفت، درک سختی انتقال به سوی کشاورزی ارگانیک دارای اثری منفی بر نگرش به سوی این سیستم کشاورزی می‌باشد.