

Investigating Factors Affecting Knowledge of Agricultural Science Students of Bu-Ali Sina University of Iran toward Organic Farming

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Abstract: The purpose of this research was to investigate viewpoints of students about organic farming. The undesirable negative consequence of conventional farming has led to the need and emphasis for new sustainable agricultural production techniques. Agricultural students play an important role in extension and spread of the system. This research was carried out applying a survey method. The respondents were 150 agricultural students from Bu-ali Sina University of Hamedan. Instrument of data gathering was questionnaire. Likert-type scales were used to measure knowledge and attitude toward organic farming. Cronbach's alpha coefficient was higher than 0.7 which was favorable. Validity of the questionnaire was confirmed by an experts' panel. Data analysis was accomplished using SPSS. The results indicated that access to environmental information as well as the attitude toward environmental issues has positive and direct effect on knowledge toward organic farming. Based on the results, variables of attitude towards health within the framework of environmental attitude exert indirect effects of knowledge toward organic farming.

Key words: Attitude, knowledge, norm, organic farming, students

INTRODUCTION

In the first period agricultural production was mainly in traditional form and involved use of non-purchased inputs. It mainly entailed soil-building practices, nonuse of synthetic inputs and use of non-chemical material like ash, cow dung etc. to control pest and diseases. On the arrival of the green revolution especially in the larger farms developed with an emphasis on high external input agriculture, as the cost of the external inputs continued to be unsustainable for the smallholders and the natural fertility declined rapidly probably due to toxicity problems of chemical fertilizers. Coupled with declining food security was poverty that resulted from low agricultural productivity, consequently calling for alternative sustainable production systems.

In response to growing environmental and social concerns, steps are being taken by the agricultural industry to develop and use more responsible practices. Many farmers share concerns about the future of the food and fiber industry and some are taking action to improve their operations. "Without abandoning the quest for efficiency, they are trying to farm within more responsible boundaries. They want a farm that is not only profitable, but durable. The kind of agriculture they aspire to be usually termed 'sustainable agriculture'" (Northwest Area Foundation, 1994).

Organic agriculture includes all agricultural systems that promote the environmentally, socially and economically production of food and fibres with a greater emphasis on soil fertility (UNCTAD, 2006).

The increased demand for organically grown food has reflected consumers' concern with food safety, genetically modified foods, pesticide residues, and the environmental impact of conventional agriculture (Fresh, 1996; LaTrobe, 2001; Misra *et al.*, 1991; Zepeda *et al.*, 2006).

Previous studies have revealed possible economic, health, and technical barriers that influenced non-organic farmers' attitudes about adopting organic farming practices (Hattam, 2006; Schneeberger *et al.*, 2002). Such studies explained why non-organic farmers did not consider organic production as economically feasible (Darnhofer *et al.*, 2005; Fairweather, 1999; Niemeyer and Lombard, 2003). Austrian farmers, for example, did not adopt organic practices for the following reasons: no compensation payments for organics and no willingness to forego net income for benefits of environmentally friendly farming (Darnhofer *et al.*, 2005).

Given the supply and demand for organic foods, it would be valuable to communicators, educators, and Extension professionals to understand non-organic farmers' attitudes toward organic and non-organic agriculture and their barriers to adoption. Studying attitudes is a central field of social psychology, but it yet

Table 1: Summary of trichotomized attitudinal scores of students toward organic farming

Knowledge score	Trichotomy	Frequency	Percent	Cumulative (%)
Unfavorable	<30	78	52	48.4
Neutral	31-60	54	36	83
Favorable	>61	18	12	100
Total		150	100	

Field survey (2011)

remains unclear how attitudes guide behaviour. Studies have analyzed various demographic characteristics to determine how they relate to attitudes toward organic farming methods. The most frequently studied characteristics were years of farming experience, family farming tradition, age, education level, and gender (Duram, 1999; Egri, 1999; Fairweather *et al.*, 2001; Midmore *et al.*, 2001; McCann *et al.*, 1997; Niemeyer and Lombard, 2003).

Austrian farmers, for example, did not adopt organic practices for the following reasons: no compensation payments for organics and no willingness to forego net income for benefits of environmentally friendly farming (Darnhofer *et al.*, 2005). The loss of return on organic products would have affected British farmers ability to pay their mortgages (Fairweather, 1999). Large-scale, non-organic farmers in South Africa considered fewer marketing opportunities, no premium prices, and the lack of subsidies as economic factors keeping them from adopting organic practices (Niemeyer and Lombard, 2003).

Davidson and Freudenburg (1996) and Filson (1993) found that female farmers had higher levels of concern for the environment, especially in respect to specific environmental issues. According to Beus and Dunlap (1994), women farmers in Washington State were more likely to use alternative or organic farming practices.

The main objective of this study was to investigate factors affecting knowledge of Bou-ali sina University's students towards or. Onanic farming the basis of this main goal, the following specific objectives were investigated:

- To find out some individual and social factors affecting knowledge of organic farming.
- To identify relationships among personal factors, attitudes and knowledge of organic farming.

RESEARCH METHODOLOGY

This research was carried out applying a survey method. The respondents were 150 agricultural students from Bu-ali Sina University of Hamedan. Instrument of data gathering was questionnaire. Likert-type scales were used to measure knowledge and impact Cronbach's alpha coefficient was higher than 0.7 which was favorable. Validity of the questionnaire was confirmed by an experts' panel. Data analysis was accomplished using

SPSS. A researcher-developed questionnaire consisting of items was adapted from previous studies (Egri, 1999; Fairweather *et al.*, 2001; Midmore *et al.*, 2001; Niemeyer and Lombard, 2003; Schneeberger *et al.*, 2002). This study explains students knowledge and attitude toward organic farming with their demographic characteristics: gender (Beus and Dunlap, 1994; Egri, 1999), family farming history, age (Fairweather *et al.*, 2001; Mc Cann *et al.*, 1997; Niemeyer and Lombard, 2003), education (Duram, 1999; Fairweather *et al.*, 2001; McCann *et al.*, 1997). After a panel of experts reviewed the questionnaire items to establish validity, the questionnaire was pilot tested by each association's board members. For the data analysis, apart from several descriptive methods such as stepwise multiple regression technique and path Analysis was also used.

RESULTS AND DISCUSSION

Demographic characteristics: Of the 150 students surveyed, 37.7% was male and 62.3% female. They ranged between 18 and 35 years of age, with a mean age of 23 years. 44.7% of students were studying crop production and breeding, 30.6% were studying Animal Science and 24.7% were horticulture. 66.7% of them were student of Bachelor of Science; 26.6% were students of Master of Sciences; and 6.7% were Ph.D. students.

Knowledge about organic farming: To determine the knowledge of the respondents with regard to organic farming, knowledge was categorized with a score of <30 graded as low knowledge or unfavorable, 31-60 moderately knowledge or neutral and >61 high knowledge or favorable. The results in Table 1 indicated that a majority of the respondents, 52% had an unfavorable knowledge about organic farming, with 36% having a moderately knowledge and only 12% having a high knowledge. Table 2 shows the mean and standard deviations of statements used to evaluate the attitude of students toward organic farming.

To analyze the relationship between the variables, correlation analysis was applied. Table 3 clearly demonstrates that there was a significant correlation between Knowledge of organic farming with average, education, income, attitude toward environmental issue, attitude toward person, family and social health, attitude toward social norm, access to environmental information and educational services.

Stepwise multiple linear regressions: This section provides an empirical analysis between dependent variables (knowledge of organic farming) and some of the explanatory variables that were established in the previous sections. This procedure was used to determine the variable accounting for the majority of total knowledge of organic farming indicators. Multiple linear regressions in a stepwise manner were used and one variable was added

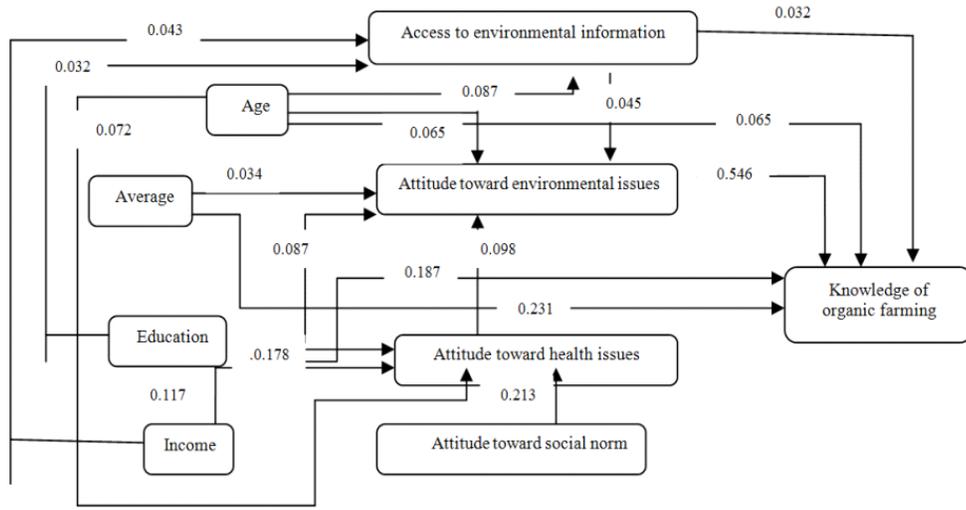


Fig. 1: Path diagram of the final model. The path coefficients are linear and standardized. The significance is; *: $0.05 \geq p > 0.01$ and **: $0.01 \geq p > 0.001$. The non-significant paths were discarded. Data source: Responses from 150 students.

Table 2: Shows the mean and standard deviations of statements used to evaluate the attitude of students toward organic farming.

Variables	Mean	SD	Min.	Max.
Knowledge of organic farming	97.45	11233	65	117
Attitude toward environmental issue	25.56	6.324	9	32
Attitude toward person, family and social health	19.33	5.782	8	25
Attitude toward social norm	17.86	7.825	6	22
Access To environmental information and educational services	13.21	5.243	5	20

Field survey (2011)

Table 3: Correlation among different variables

Variables	Correlation type	Knowledge of organic farming
Average	Pearson	0.576**
Education	Pearson	0.732**
Income	Spearman	0.422**
Attitude toward environmental issue	Spearman	0.554**
Attitude toward person, family and social health	Spearman	0.476**
Attitude toward social norm	Spearman	0.598**
Access to environmental information and educational services	Spearman	0.768**

** : Correlation is significant at 0.01 levels Field survey (2011)

Table 4: Linear regression for prediction of Knowledge of organic farming

Variables	Coefficient of regression (B)	Beta	t-value	Sig.
Constant	43.32	-	12.467	0.000
Age	0.345	0.065	2.878	0.002
Average	0.643	0.231	3.872	0.004
Education	0.322	0.187	5.265	0.000
Income	1.235	0.067	1.657	0.400
Attitude toward environmental issue	2.154	0.546	10.36	0.00
Attitude toward person, family and social health	0.456	0.123	2.761	0.065
Attitude toward social norm	0.145	0.016	0.541	0.561
Access to environmental information and educational services	0.341	0.032	6.450	0.000

Field survey (2011)

to the regression equation at each step. The added variable was the one which induced the greatest reduction in the error sum of squares. It was also the variable which had the highest partial correlation with the dependent variable for fixed values of those variables already added. Moreover, it was the variable which had the highest F

value. According to the results, 67.2% of the total variation in knowledge of organic farming could be attributed to these aforementioned variables. F-value is high enough to reject the null hypotheses that the variables cannot explain the variations in knowledge of organic farming between the students in the sample. The

Table 5: Direct and indirect impacts of the independent variables on knowledge of organic farming

Variables	Direct impacts	Indirect impacts	Total
Age	0.065**	0.213	0.278
Average	0.231**	0.278	0.509
Education	0.187**	0.189	0.376
Income	0	0.123	0.123
Attitude toward environmental issue	0.546**	0	0.546
Attitude toward person, family and social health	0	0.367	0.367
Attitude toward social norm	0	0.005	0.005
Access to environmental information And educational services	0.032**	0.265	0.297

other variables were not included in the analysis due to their low relative contributions. Regression coefficients for the accepted variables are shown in Table 4.

Path analysis: A model for knowledge of organic farming, (Fig. 1), was used as a cause/effect chain to work out path analysis. As the qualitative variables of this model were measured through various items in the form of Likert type scale; thus by adding up these items, a quantitative set of data for each of the variables was obtained and the path analysis was calculated. The cause/effect coefficients of the variables derived from the various steps of the regression calculation. Figure 1 depicts all the path coefficients obtained from multiple regressions. The path coefficients show that the direct effects of some variables on the others were not significant at the 0.05 level. Thus, in the final model these paths were discarded. Figure 1 shows the most acceptable model derived from the data obtained i.e. the most efficient representation of the cause/effect structure. All the significant path coefficients at 0.05 levels were indicated in the model. This model was finalized in a two-stage process. In the first stage the model was appropriately adjusted, in the second stage all statistically non-significant and non-relevant paths were eliminated. The direct effect of one variable on another can be seen from the weighting given by the path coefficient; its value lies in the range between -1 to +1 and indicates the relative change in the dependent variable for any change in the independent variable. Any additional, indirect influences were determined by multiplying the path coefficients of indirect paths. The direct and indirect effects of each independent variable on the dependent variable of knowledge of organic farming were calculated as indicated in Table 5 access to environmental information influenced knowledge of organic farming indirectly through the attitude toward environmental issues. Furthermore, Attitude toward social norm also did not have a direct influence on knowledge of organic farming, but it also acts through attitude toward health issues and attitude toward environmental issues.

CONCLUSION

Deriving from the data set, the model presented in Fig. 1 demonstrates the direct and indirect cause relationships knowledge of organic farming with some basic variables such as age, average, education, income, attitude toward environmental issue, attitude toward person, family and social health, attitude toward social norm, access to environmental information and educational services. The strongest direct paths to knowledge of organic farming stem from age (0.065), average (0.231), education (0.187), attitude toward environmental issue (0.546), access to environmental information and educational services (0.032). Income, attitude toward person, family and social health, and attitude toward social norm had indirect impact on knowledge of organic farming. However the direct influence of education on environmental attitude was also confirmed. There were several studies suggesting that education plays an important role in enhancing the knowledge of organic farming by providing individuals with the ability to better formulate alternate views and present arguments to support their knowledge. It is emerged from the present study that education high level can change attitude and knowledge of organic farming. This conclusion is presented in Fig. 1. Results indicate that attitude toward health issues is influenced by four variables of attitude toward social norm (0.213), income (0.117), age (0.072) and education (0.178). Also results shows that attitude toward environmental issues is under the influence of five attitude toward health issues (0.098), education (0.087), average (0.034), age (0.065) and access to environmental information (0.045),

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