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Analysis of Agricultural Information System Members' Environmental Attitudes: The Case of Central District of Boyer-Ahmad County, Iran

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ABSTRACT

The aim of this research was to investigate Agricultural Information System members' environmental attitudes towards organic products in the central District of Boyer-Ahmad County. Survey research method was used in this study. Research population included researchers, extension agents and contact farmers of the study area who were 77, 68 and 72 ones respectively. Research samples were selected among these groups that were 62, 55 and 60 ones. The research tool (questionnaire) was developed based on New Ecological Paradigm Scale. The results of this study showed that all three groups of respondents had a moderate environmental attitude, while the researchers had more favorable environmental attitude. Other findings of this study indicated that researchers' attitudes tend to "limits to growth", extension agents had an attitude more familiar to "balance of nature" attitude and farmers had an "eco-crisis" attitude. The results of the correlation analysis revealed that there was a positive significant relationship between researchers' and extension agents' age and their environmental attitude. However, there was no significant relationship between farmers' age and their environmental attitude. Moreover, no significant relationship was found between researchers' and extension agents' income and their environmental attitude, but there was positive and significant relationship between farmers' income and their environmental attitude. Furthermore, there was no relationship between researchers', extension agents' and farmers' educational level and their environmental attitude which may indicate that their education could not lead to environmental attitude. Therefore, education system should pay more attention to teaching environmental issues.

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INTRODUCTION

In recent decades, the crisis of indiscriminate use of chemical agricultural inputs has led to many problems and hazards. During a 40 years period, consumption of chemicals in agriculture has risen 10 times and crop decreasing rate has been doubled due to pests' damages [28]. Nowadays, environmental problems has become a crucial and controversial issue. Most environmentalists believe that environmental problems can be solved by changing human's attitude towards natural resource and environment [22]. The relationship between human and the environment has had many ups and downs during human life. Nature, has sometimes been considered as a source of spiritual inspiration and sometimes as a source of material needs and has stimulated many wonders, both hope and fear in human existence. With the increasing rate of urbanization, the appearance of industry and use of technology, our nature is altered and use of nature for the material purposes overtook spiritual inspiration. With the advent of the first environmental crisis, it was revealed that indiscriminate use of the environment, disrupt the network of life and endanger survival of animals and humans. Of course, it can be said that this crisis originated in the attitude, the worldview and human behavior towards the environment [7]. In fact, we have not taken reasonable approach to nature and environment which our survival is inevitably depends on it, and we have altered an unsustainable exploitation of environment instead of taking a holistic approach and planning for its sustainable use [12]. Environmental unsustainability is a global issue and important for all nations. Success in the field of environmental conservation requires environmental knowledge and communication with people in a way that learning and adaptation of environmental conservation occurs simultaneously [21]. Thus, most experts

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believe that environmental crisis could be solved by changing behavior and lifestyle of people. To achieve it, people should be convinced that environment is worthwhile not only due to human benefit but also because of its nature, so it should be respected [2]. It requires taking an approach to perceive human action and inner qualities of human such as values, believes, attitudes and biases in order to predict outer behavior [6]. Attitude has three components: cognitive, affective, and behavioral [24]. According to Lytle's definition, attitude is an organized set of believes which reflects people's tendency to an issue or situation. The issue could be favorable or unfavorable. Based on theory of reasoned action, attitude towards the behavior is defined as the individual's positive or negative feelings about performing a behavior [16]. In the other words, attitude affected by cognition, emotions and individual's willing to act [25]. Since growing concerns about environment became a social issue, study on topics such as attitudes, values and environmental behaviors has been considered in the field of social sciences and rural development studies. According to Pohinimi, environmental attitude is a way to recognize how to make appropriate relationships with environment [26].

A lot of studies has been carried out in the field of environmental attitude. The following section highlight some of them.

Rehman and Beedell indicated that factors such as gender, demographic characteristics, social status and race don't have direct effect on behavior. However, they affect attitudes, subjective norms and behavior indirectly.

The results of Abdollahi and Sadeghi's [1] research revealed that students are concerned about their health due to environmental problems, but they do not believe that environment has been used badly. However, they believe that humans have no right to change the environment whatever they like. Banifatemeh et al. [7] investigated the environmental attitude of Tabriz citizens based on the New Environmental Paradigm. The results showed that the mean of citizens' attitude towards protecting the environment is moderate. Also the mean score of citizens' environmental attitudes is different significantly based on their gender and materialistic-supernal value orientation. Furthermore, women and post materialists have more supportive attitude. Moreover, there is a significant relationship between cultural and economic capital and environmental attitudes. Müderrisoğlu and Altanlar [23] studied attitudes and behaviors of undergraduate students towards environmental issues. Their findings showed that students highly support the environmental attitudes. Furthermore, the courses that they take do not affect their environmental attitudes. Moreover, gender has a high effect on environmental attitudes. Ahmadvand and Nooripoor '[3] surveyed a gender analysis to investigate environmental attitudes of agricultural students. The results indicated that agricultural students have moderate and positive environmental attitude. Furthermore, there is no significant difference in environmental attitude of female and male students. Finding of Alavimoghadam et al. [4] showed that environmental information of Amirkabir University of Technology students is less than 50% and environmental problems are the least important issues for them. Kalantari and Asadi investigated environmental attitude and behavior of Tehran residents. The results showed that for Tehran residents, environment is not an important problem in comparison with other social and economic issues. Moreover, the structural model indicated that feeling of stress, environmental information, preparedness to act and environmental legislation have an important impact on environmental attitude and behavior. The research of Ferdosi et al. indicated that the students who pass environmental courses have more environmental conservation behavior than those who do not pass such courses. Also, there is positive significant relationship between human oriented attitude and environmental conservation behavior, but this relationship is not true about disregard to environment. Moreover, there is positive significant relationship between environmental oriented attitude and environmental conservation behavior and negative significant relationship with disregard. Shobeiri et al. [29] compared environmental awareness among secondary school students in India and Iran. Findings showed that there are significant differences between Indian and Iranian students in their level of environmental awareness. Also there are significant differences between them in environmental awareness across and within two groups with regard to their gender. Furthermore, type of school management (government and private) is an effective factor on student's environmental awareness in both countries. Larijani and Yashodhara compared environmental attitude of Iranian and Indian teachers. The finding showed that female teachers have more desirable attitude than male ones .In addition, comparison of agricultural students' environmental attitude in Turkey indicates that female students have more favorable attitude than male ones. In the other words, female students' attitude are more pro-environmental orientation [10]. Barrett et al [8] explored the environmental knowledge, attitudes and behavior of young people in Japan. The findings showed that the majority of respondents exhibited strong ecological consciousness although their knowledge of the causes and form of environmental problem was relatively poor. Chan [13] offered gender as an effective factor on environmental attitude and he suggested TV and school as the most important information resources for Hong Kong students. Salehiomran and Aghamohami [27] also indicated that gender influences environmental attitude. Cain's finding showed that young people have more favorable environmental attitudes than older ones. Thus, age is an effective factor on environmental attitudes. Nooripoor suggested gender, age, contacting with information resources and social welfare as effective factors on environmental attitudes of agricultural students in Yasouj. Jones and Carter rejected the relationship between

income and environmental conservation. Alsoghair [5] noted that age, gender, environmental knowledge determine environmental attitudes. Yang et al. suggested that farmers' attitude and behavior are formed based on their previous experience. Therefore, experience could be as an effective factor on attitude and behavior. Chiou expressed that small producers gain access to less resources so they are risk averse. They are not patient enough to deal with pest infestations and prefer to solve their problem quickly.

Previous studies emphasized that farmers' attitudes and believes towards environmental issues effect farmers' conservative behavior towards environment. Researchers and extension agents as experts could have effective influence on environmental sustainability by informing farmers about environmental issues and influencing their decisions. Therefore, this study aimed to investigate environmental attitudes of Agricultural Information System (AIS) members (researcher, extension agent and farmer) and suggest solution to improve their attitudes. The following specific objectives were also considered.

- To investigate environmental attitude and to compare its dimensions between researchers, extension agents and farmers.
- To identify the relationship between independent variables such as age, income, education and environmental attitudes.
- To compare environmental attitudes of respondents in terms of demographic variables.

The data for this study were collected in 2013 from AIS members in central District of Boyer-Ahmad County.

MATERIALS AND METHODS

Survey research method was used in this study. The study was carried out in central District of Boyer-Ahmad County between three subsystems of AIS members: researchers, extension agents and farmers who were 77, 68 and 72 respectively. The central District of Boyer-Ahmad County has 5 townships namely Kakan, Sepidar, Sarrod Shomali, Sarrod Jonobi and Dashetroom. Sample size was determined 62, 55 and 60 respectively using Krejcie and Morgan sampling table and stratified random sampling with proportional allocation technique. Finally, 76, 45 and 52 questionnaires were collected respectively.

Environmental attitudes of AIS members were measured by Dunlap and Van Liere's New Ecological Paradigm (NEP) scale. The respondents were given 15 questions on a 5 point Likert rating scale, ranging from 1 (strongly disagree) to 5 (strongly agree) which each 3 questions measured one of 5 dimensions of environmental attitude. The first dimension was balance of nature in which balance between human and nature is known as a guarantee of human and earth survival. The second dimension measured limits to growth. This dimension noted limiting human activities as a solution to environmental problems. The third dimension referred to anthropocentrism which indicated human dominated his surround environment and other creatures have been created to serve human. The fourth dimension was environmental orientation. This aspect unlike anthropocentrism gave priority to environment and suggested human as part of nature and therefore dominant of part to total would be impossible. The fifth dimension was eco-crisis. From this point of view, nature is too unsustainable and eco-crisis would threaten the earth. The total possible score in this test would be 75 which indicated eco-crisis orientation and the least score would be 15 which referred to anthropocentric orientation.

RESULTS AND DISCUSSION

The results of demographic analysis are shown in table1. The mean score of the age of researchers, extension agents and farmers were 40.5, 41.53 and 42.38 respectively. All researchers had bachelor and above certificates, 60% of extension agents had associate degree and 40% of them had bachelor certificate. 26.9% of farmers were illiterate, 15.4% of them had primary education, 19.3% had diploma, 26.9% had associate degree and 11.5% had bachelor and above certificates.

Table 1: Respondents in terms of individual characteristic.

Variable	Variable level	researcher		extension agent		farmer	
		No.	%	No.	%	No.	%
Gender	Male	30 a	39.5	7	15.6	6	11.5
	female	44	57.9	38	84.4	46	88.5
Marital state	Single	20	26.3	4	8.9	10	19.2
	married	54	71.1	41	91.1	42	80.8
education	illiterate	-	-	-	-	14	26.9
	Primary school	-	-	-	-	8	15.4
	Diploma	-	-	-	-	10	19.3
	Associate degree	-	-	27	60	14	26.9
	Bachelor and above	76	100	18	40	6	11.5

Environmental attitudes of respondents are shown in table 2. According to the mean score, researchers, extension agents and farmers had a moderate environmental attitude with the mean 3.52, 3.35, 3.30 of 5

respectively .The statement , "The earth has plenty of natural resources if we just learn how to develop them" elicits strong agreement from both researchers' and farmers' view point. Even though researchers and farmers both believe the latter statement, but they look at it from different view point. Researchers believe that new resources could be discovered while farmers use natural resources (e.g. water, soil, fossil fuels, etc.) and think that they are endless. Extension agents had a strong agreement on the term: "The balance of nature is very delicate and easily upset".

Table 2: environmental attitudes of AIS members.

Statements	Researcher				extension agent				farmer			
M=Mean, SD=Standard Deviation, CV= Coefficient variation, R=Rank	M	SD	CV	R	M	SD	CV	R	M	SD	CV	R
1) We are approaching the limit of the number of people the earth can support	2.65	1.1	0.41	11	2.78	1.1	0.39	12	3.12	1.13	0.36	9
2) Human have the right to modify the natural environment to suit their needs	2.71	1.15	0.42	12	2.96	1.34	0.45	14	2.23	1.23	0.38	10
3) When humans interfere with nature it often produces disastrous consequences	3.92	0.81	0.2	4	3.93	1.07	0.27	7	4.20	0.85	0. 2	4
4) Human ingenuity will insure that we do NOT make the earth unlivable	4.13	0.69	0.16	3	4.33	0.73	0.16	2	4.25	0.66	0.15	2
5) Human are severely abusing the environment	4.11	0.6	0.14	2	4.13	0.81	0.19	3	4.23	0.64	0.15	3
6) The earth has plenty of natural resources if we just learn how to develop them	4.24	0.48	0.11	1	3.96	0.92	0.23	6	4.33	0.55	0.12	1
7) Plants and animals have as much right as humans to exist	4.16	1.04	0.25	7	4.40	0.88	0.2	4	4.20	0.99	0.23	5
8) The balance of nature is strong enough to cope with the impacts of modern industrial nations	2.21	0.95	0.42	14	1.73	0.81	0.46	15	2.44	1.34	0.54	14
9) Despite our special abilities humans are still subject to the laws of nature	2.97	0.99	0.33	9	2.79	1.05	0.37	11	3.08	1.31	0.42	12
10) The so-called ecological crisis facing humankind has been greatly exaggerated	2.21	0.99	0.44	15	2.25	1.03	0.31	10	2.60	1.3	0.5	13
11) The earth is like a spaceship with very limited room and resources	3.11	1.07	0.34	10	3.60	1.07	0.29	8	3.65	1.21	0.33	8
12) Human were meant to rule over the rest of nature	2.43	1.03	0.42	13	2.49	1	0.4	13	2.65	1.62	0.61	15
13) The balance of nature is very delicate and easily upset	3.81	0.9	0.23	6	4.16	0.53	0.12	1	4.23	1.05	0.24	6
14) Human will eventually learn enough about how nature works to be able to control it	3.66	0.74	0.2	5	3.36	1.02	0.3	9	3.08	1.27	0.41	11
15) If things continue on their present course, we will soon experience a major ecological catastrophe	3.84	1.18	0.3	8	3.96	0.85	0.21	5	4	1.28	0.32	7
Sum	3.52	0.41		-	3.35	0.47		-	3.30	0.38		-

Likert rating scale ranging from 1 (strongly disagree) to 5 (strongly agree).

To explore whether the observed difference between respondents is significant or not, the analysis of variances (ANOVA) was used. As it is shown in table3, researchers', extension agents' and farmers' environmental attitudes were significantly different at 95 percent confidence. The results of post hoc LSD test showed that environmental attitudes of researchers and farmers are different (according to the mean) and researchers have more desirable attitudes. However, there is no significant difference between environmental attitudes of researchers and extension agents.

Table 3: comparison of environmental attitudes in AIS by using analysis variances.

Subsystem	Frequency	Mean	Standard Deviation	F	Sig.
researcher	76	3.52^{a}	2	3.842	0.023*
extension agent	45	3.35^{ab}	170		
farmer	52	3.30^{b}	172		

* There is significant difference at the 0.05 level
Mean with the same letter has no significant difference

As previously stated, environmental attitude is measured in 5 dimensions. Therefore, comparing these dimensions between AIS members is carried out in the following step. The results showed that extension agents have the highest mean score in "balance of nature" which means that they are more balance-oriented and believe that balance between human and nature would guarantee earth survival (Table4). Other findings indicated that researchers have the highest mean score in "limits to growth" which means that they tend to limit human desire. In addition, the results revealed that farmers have the highest mean score in "anthropocentrism" and they believe human have the right to rule over the nature. Moreover, in terms of environmental orientation, researchers are more environment-orientated which means that they have more tendency to conserve environment. Furthermore,

farmers have the highest mean score in eco-crisis. In the other words, they believe that environment is very unsustainable and ecological crises threaten the earth.

The ANOVA test also carried out to compare dimensions of respondents' environmental attitudes. The results indicated that respondents are different concerning balance of nature and limit to growth (Table4). The findings of post hoc LSD test revealed that researchers and extension agents are different from farmers in terms of balance of nature as researchers and extension agents are more pro-environmental orientation. This could be because of their occupation that they tend to conserve the environment and believe that agricultural activities must not cause environmental degradation. However, farmers tend to use pesticides and fertilizers to protect their crops against pests.

The results of post hoc LSD illustrated that there is significant difference between researchers' and farmers' attitude about "limit to growth" while there is no significant difference between researchers and extension agents about this aspect (Table4). This indicates that researchers believe to limit human demands more than farmers. Furthermore, extension agents and farmers are not significantly different in this aspect.

In previous analysis, 5 dimensions are analyzed among 3 subsystems to indicate which subsystem has the highest score in each dimension. In the following, 5 dimensions are analyzed within each subsystem to indicate which dimension has the highest score in each subsystem. According to table4, researchers have the highest mean score in "limits to growth" aspect and they have tendency to limit human desire. Extension agents have the highest mean score in "balance of nature" aspect which means that they much believe in sustaining balance between human and nature while farmers much believe in "eco-crisis". According to total environmental attitude, researchers have more desirable environmental attitude than extension agents and farmers (Table4).

Table 4: comparing dimensions of environmental attitudes in AIS by using analysis variance.

Dimension	Researcher		extension agent		farmer		F	Sig.
	M	SD	M	SD	M	SD		
balance of nature	10.07[a]	1.38	10.83 [a]	1.75	10.02 [b]	0.28	5.52	0.005**
limits to growth	11.83 [a]	1.47	10.33 [ab]	2.17	10.00 [b]	1.53	4.51	0.012**
anthropocentrism	8.0	2.01	8.7	2.06	8.81	2.99	1.3	0.27
environmental orientation	10.76	2.30	10.45	1.7	10.37	2.13	1.03	0.35
eco-crisis	10.15	2.31	10.38	1.59	10.80	2.63	1.81	0.166
Total environmental attitude	52.26	5.53	50.07	5.4	50.47	6.01	1.88	0.165

Mean ranging from 3 to15 for dimensions and from 15 to 75 for Total environmental attitude
** There is significant difference at the 0.01 level
Mean with the same letter has no significant difference

Independent t test was used to compare male and female environmental attitude. The findings reveal that according to the mean score, both men ($\overline{X}$=50.02) and women ($\overline{X}$=50.92) have a moderate attitude towards environment. Furthermore, the findings indicate that they are different in terms of "limit to growth" as men believe more than women that limiting human desires is a solution to environmental problems. Except for eco-crisis, men have higher mean score than women in other dimensions of environmental attitude, however, the difference was not significant (table5).

Table 5: comparison of environmental attitude according to gender.

	female		male			
Dimension	Mean	SD	Mean	SD	t	Significant level
balance of nature	9.93	1.68	10.23	1.59	-1.28	0.2
limits to growth	9.79	1.9	10.59	1.65	-2.28	0.02**
anthropocentrism	9.19	2.25	9.39	2.41	-0.50	0.61
environmental orientation	10.51	1.5	10.57	2.25	-0.25	0.8
eco-crisis	10.58	2.18	10.34	2.33	0.66	0.5
Total environmental attitude	48.57	5.47	50.9	5.71	-	-

** There is significant difference at the 0.01 level.

Using independent samples t test, the findings revealed that single and married respondents were not significantly different in terms of environmental attitude (table6).

Table 6: comparison of environmental attitude according to marital status.

marital state	frequency	mean	Standard deviation	t	Significant level
single	34	3.33	1.65	0.66	0.5
married	135	3.39	2.41		

Mean ranging from 1 to 5.

To investigate the relationship between independent variables such as age, income, education and environmental attitude Pearson coefficient analysis was used. The results showed that there is a positive and significant relationship between researchers' and extension agents' age and their environmental attitude as the

older they are, the better attitude they have. However, there is no significant relationship between farmers' age and their environmental attitude. Moreover, no significant relationship was found between researchers' and extension agents' income and their environmental attitude, but there is positive and significant relationship between farmers' income and their environmental attitude. Finally, there were no relationship between researchers', extension agents' and farmers' educational level and environmental attitude (table7).

Table 7: Correlation between independent variables and AIS members' environmental attitude.

independent variables	Subsystem	Pearson correlation	Significant level
Age	researcher	0.23	0.049*
	extension agent	0.6	0.000**
	farmer	0.04	0.76
Income	researcher	0.131	0.158
	extension agent	0.095	0.317
	farmer	0.36	0.043*
Education	researcher	0.002	0.97
	extension agent	0.25	0.09
	farmer	0.000	1

* There is significant difference at the 0.05 level
** There is significant difference at the 0.01 level

Conclusions:

As the results suggest, researchers, extension agents and farmers have a moderate attitude towards environment. However, researchers have more desirable environmental attitude than extension agents and farmers. Therefore, it is suggested that training workshops be held for extension agents and farmers to inform them about the harmful effects of conventional farming on environment which could result in improving their environmental attitudes and behaviors.

Other findings indicated that researchers have the highest mean score in "limit to growth" aspect which means that they believe in limiting human desire as a solution to environmental problems. However, extension agents have the highest mean score in "balance of nature" and believe that human and nature should be in balance which would guarantee the earth survival. Furthermore, farmers have the highest mean score in "eco-crisis" and believe that environmental crisis threaten the nature.

The results of Pearson correlation coefficient reveal that there is a positive significant relationship between researchers' and extension agents' age and their environmental attitude as the older they are, the better attitude they have. However, there is no significant relationship between farmers' age and their environmental attitude. Moreover, no significant relationship is found between researchers' and extension agents' income and their environmental attitude, but there is positive and significant relationship between farmers' income and their environmental attitude. Thus, it could be concluded that farmers' income positively impacted their environmental attitude. It is recommended to provide more opportunities for farmers to increase their income by diversifying their income such as emphasizing ecotourism in the region

There is not any relationship between researchers', extension agents' and farmers' education and environmental attitude which may indicate that their education could not lead to environmental attitude. Therefore, education system should pay more attention to teaching environmental issues.

Thus, they pay less attention to harmful effects of their activities to environment. Therefore, informing farmers about conserving environment could be useful for improving their environmental attitudes.

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