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Research Article

SUSTAINABILITY KNOWLEDGE OF AGRICULTURAL HIGH SCHOOL EDUCATORS IN KHOUZESTAN PROVINCE, IRAN

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ABSTRACT
The purpose of research was analyzing knowledge of agricultural high school educators in Khouzestan province, Iran regarding biodiversity and environmental conservation (sustainability) in agriculture. This study was carried out by survey during April and November 2014. The method of research was correlative descriptive. All agricultural high school educators in Khouzestan province (n=55) were selected for participation in the study. A questionnaire was developed to gather information regarding knowledge of educators regarding biodiversity and environmental conservation in agricultural practices. Questionnaire reliability was estimated by calculating Cronbach's alpha. Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS). Appropriate statistical procedures for description (frequencies, per cent, means, and standard deviations) were used. Based on results there is significant correlation between knowledge of agricultural educators about biodiversity and environmental conservation with communication channel, social participation, social status, individual competency, professional competency and specialized skills. Also the result for regression analysis by stepwise method shows predicator variables that were significantly related to the knowledge of about biodiversity and environmental conservation were entered. Approximately 60.6% of the variances in the knowledge of agricultural educators regarding biodiversity in agriculture could be explained by the attitude and skill to sustainable agriculture, social participation, social status, communication channel and professional competency. Thus recommended apply for the training classes to expand biological control important to be done.

Keywords: *Biodiversity and Environmental Conservation Knowledge, Agricultural Educators, Khouzestan Province*

INTRODUCTION
The well-being of human society is closely related to the well-being of natural ecosystems. The intellectual resources on which the sustainability science is building on need to take into account the knowledge of people as well. We need, therefore, to foster a biodiversity and environmental conservation science that draws on the collective intellectual resources of both formal sciences, and local knowledge systems of knowledge (Pandey, 2001).
There are many reasons—including aesthetic, cultural, and economic—why we may wish to conserve biodiversity. From a strictly functional point of view, species matter so far as their individual traits and interactions contribute to maintain the functioning and stability of ecosystems and biogeochemical cycles. Although species richness is easier to measure, a more predictive science might be achieved if appropriate functional classifications were devised. Specific knowledge of functional types may be critical to predict ecosystem responses under different global change scenarios, or where management priorities seek to manipulate species composition directly, for example, in complex agroecosystems, forestry, or ecosystem restoration with particular functional goals in mind (Loreau *et al.,* 2001).
McElroy (2008) identifies knowledge as the key factor regarding sustainability in agriculture. Farmers can be considered as human information processing systems. Human decision-making involves two components. First, we have the farmer personal characteristics. In this respect, there have been studies regarding the personal characteristics (or traits) that influence farmers in order to adopt (or not) specific farming practices (Lauwere *et al.,* 2004). In the second place, there are person's knowledge processes

regarding farming practices. With knowledge processes, we mean the processes that individual farmers undertake to understand the information they received. These processes are divided in two domains: the static domain (which deals with the way an individual structures knowledge), and the dynamic domain (which deals with the reasoning processes of an individual) (Carreón *et al.*, 2011).

Ommani and Noorivandi (2014) revealed the analysis indicated that the following farmers' personal, economical and social characteristics were positively and significantly related to the adoption of biofertilizers in agriculture practices: educational level, farm size, accessibility, attitude to natural conservation, on farm income, off farm income and social participation. Through the use of bio-fertilizers, healthy plants can be grown, while enhancing the sustainability and the health of the soil and water (Astaraee and Koochaki, 2006).

The purpose of research was analyzing knowledge of agricultural high school educators in Khouzestan province, Iran regarding biodiversity and environmental conservation (sustainability) in agriculture.

MATERIALS AND METHODS

This study was carried out by survey during April and November 2014. The method of research was correlative descriptive. All agricultural high school educators in Khouzestan province (n=55) were selected for participation in the study. A questionnaire was developed to gather information regarding knowledge of educators regarding biodiversity and environmental conservation in agricultural practices. Questionnaire reliability was estimated by calculating Cronbach's alpha. Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS). Appropriate statistical procedures for description (frequencies, per cent, means, and standard deviations) were used.

RESULTS AND DISCUSSION

Results

Demographic Profile

In the first section, has been described agricultural educator' demographic profile in Khouzestan Province of Iran. Approximately, 36.4% of respondents were between 32 to 38 years of age (Table 1). Most respondents (49.1%) reported work experience (education), including 4 to 9 years and the majority of them had experience in agriculture (80%). About 65.5% of agricultural educators had BSc educational level. Based on the results of the study, the income of 60% of them was between ten million to 12 million Rials in month (Table 1).

Analyzing Knowledge of Agricultural Educators Regarding Biodiversity and Environmental Conservation in Agricultural Practices:

The dependent variable of research was knowledge of agricultural educators regarding biodiversity and environmental conservation in agricultural practices in Khouzestan province, Iran. The dependent variable was assessment with a Likert scale (1=Very low, 2=low, 3=Moderate, 4=High, 5= Very high). Based on the table 2, educators basically need to educate regarding biodiversity and environmental conservation. Also educators were stratified to five strata. The results indicated 40% of educators had high knowledge regarding biodiversity and environmental conservation in agriculture (Table3). Based on results, educators need to educate regarding all items of biodiversity that noted in research. In extensive reviews of adoption studies in developing countries (Feder *et al.*, 1985; Feder and Umali, 1993), no study was found to have analyzed the direct effects of participants' subjective assessments of agricultural technology characteristics on adoption decisions.

In the multiple studies such as, Adesina and Zinnah (1993) found that farmers' perceptions of the characteristics of modern rice varieties significantly affected adoption decisions in Sierra Leone. Most studies on this topic consider the socio-economic characteristics of farmers to be key determinants affecting adoption of the new technology. Although some of these factors are important, the vast majorities of these studies ignores or fail to take account of the educators' knowledge of the technology and its ultimate results. These studies can therefore be biased when it comes to the factors affecting stakeholders' decisions concerning the adoption of this technology.

Table 1: Personal, Social and Economical Characteristics of Agricultural Educators

Characteristics	Frequency	Percent	Cumulative Percent
Age			
26-32	18	32.7	32.7
32-38	20	36.4	69.1
38-44	11	20	89.1
44-50	6	10.9	100
Total	55	100	
Work experience (year)			
4-9	27	49.1	49.1
9-14	16	29.1	78.2
14-19	3	5.5	83.6
19-24	3	5.5	89.1
24-29	6	10.9	100
Total	55	100	
Income in month (Million Rials)			
10-12	33	60	60
12-14	12	21.8	81.8
14-16	4	3.7	89.1
16-18	2	3.6	92.7
18-20	4	7.3	100
Total	55	100	
Level of education			
Associate degree	1	1.8	1.8
BSc	36	65.5	67.3
MSc	18	32.7	100
Total	55	100	

Table 2: Frequency of Agricultural Educators Regarding Knowledge about Items of Biodiversity and Environmental Conservation in Agriculture (n=55)

Biodiversity and Environmental Conservation (Sustainability) Knowledge in Agricultural Practices	**1**		**2**		**3**		**4**		**5**		**Mean**	**sd**	**CV**
	f	%	*f*	%	*f*	%	*f*	%	*f*	%			
How use of organic fertilizers and biological fertilizers in agriculture	1	1.8	1	1.8	13	23.6	22	40	18	32.7	4	0.902	0.225
How use of green manure	1	1.8	2	3.6	19	34.5	19	34.5	14	25.5	3.781	0.936	0.247
Sustainable agriculture's role in protecting plant and animal species	5	9.1	8	14.5	11	20	19	34.5	12	21.8	4.445	1.244	0.279
Biological control of pests	3	5.5	6	10.9	16	29.1	21	38.2	9	16.4	3.490	1.069	0.306
How to protect water resource													
Mechanical weed control	0	0	1	1.8	13	23.6	31	56.4	10	18.2	3.909	0.701	0.179
Biological control of weeds	0	0	4	7.	1	25.	1	34.	1	32.	3.92	0.9	0.2

				37.3	4	5	9	5	8	7	7	39	39
How to use of legumes in crop rotation	0	0	4	7.3	18	32.7	20	36.4	13	23.6	3.763	0.901	0.239
Ability to teach, how balance nutrients in the soil	0	0	1	1.8	20	36.4	21	38.2	13	23.6	3.836	0.811	0.211
Ability to teach, method of crop rotation	0	0	2	3.6	17	30.9	22	40	14	25.5	3.872	0.840	0.216
Ability to training of farming methods to manage pests	1	1.8	2	3.6	16	29.1	20	36.4	16	29.1	3.872	0.943	0.243
Ability to training of biological control of pests by natural enemies	0	0	9	16.4	15	27.3	23	41.8	8	14.5	3.545	0.939	0.264
How to maintain and use of crop residues	0	0	2	3.6	9	16.4	27	49.1	17	30.9	4.072	0.790	0.194
Analysis of the role of sustainable agriculture in the economic and social situation of farmers	0	0	1	1.8	15	27.3	24	43.6	15	27.3	3.963	0.792	0.199
Analysis the role of sustainable agricultural in stability of production in the long-term	0	0	2	3.6	22	40	21	38.2	10	18.2	3.790	0.809	0.218
Analysis of minimum tillage to reduce erosion	0	0	4	7.3	10	18.2	27	49.1	14	25.5	3.927	0.857	0.218
Ability to planning for increase production and income	1	1.8	3	5.5	17	30.9	19	34.5	15	27.3	3.8	0.969	0.255
Ability to planning for the environmental conservation	1	1.8	3	5.5	16	29.1	18	32.7	17	30.9	3.854	0.989	0.256
Ability to designing to enhance self-reliance and interest in sustainable agriculture activities	1	1.8	4	7.3	19	34.5	19	34.5	12	21.8	3.672	0.963	0.262
Ability to organize the agricultural organizations regarding conservation	2	3.6	5	9.1	22	40	14	25.5	12	21.8	3.527	1.051	0.297
Ability to evaluate the role of sustainable agriculture in alleviating poverty and improving living standards	1	1.8	3	5.5	22	40	20	36.4	9	16.4	3.6	0.894	0.248
Ability to compare the use of heat to destroy weeds with other methods	2	3.6	8	14.5	22	40	17	30.9	6	10.9	3.309	0.978	0.295
Ability to interpret a cause of using local cultivars	1	1.8	10	18.2	24	43.6	13	23.6	7	12.7	3.272	0.970	0.296
Ability to the use of disease-resistant varieties with other varieties	4	7.3	9	16.4	20	36.4	15	27.3	7	12.7	3.218	1.1	0.341

(1=Very low, 2=Low, 3=Moderate, 4=High, 5= Very high)

Table 3: Knowledge Level of Biodiversity and Environmental Conservation in Agriculture

Knowledge levels	Frequency	Percent	Cumulative Percent
Very low	0	0	0
Low	1	1.8	1.8
Moderate	18	32.7	34.5
High	22	40	74.5
Very high	14	25.5	100
Total	55	100	

Correlation Study

Table 4 displays the results which show that there is a relationship between knowledge of agricultural educators regarding biodiversity in agriculture and independent variables. Spearman coefficient was employed for measurement of relationships between independent variables and dependent variable.

Based on the results there is significant correlation between knowledge of agricultural educators regarding biodiversity in agriculture with communication channel, social participation, social status, individual competency, professional competency, specialized skills.

Regression Analysis

Table 5 shows the result for regression analysis by stepwise method. Predicator variables that were significantly related to the knowledge of agricultural educators regarding biodiversity in agriculture were entered. The result indicates that 60.6% of the variances in the knowledge of agricultural educators regarding biodiversity in agriculture could be explained by the attitude and skill to sustainable agriculture, social participation, social status, communication channel and professional competency.

Table 4: Correlation measures between knowledge of educators about biodiversity and environmental conservation and independent variables.

Variable 1	Variable 1	r	p
Communication channel	knowledge of agricultural	0.362**	0.007
Age	educators about	-0.069	0.617
Work experience	biodiversity and	0.012	0.929
Income	environmental	0.043	0.758
Level of education	conservation in agriculture	0.020	0.884
Social Participation		0.545**	0.000
Social status		0.538**	0.000
Job satisfaction		0.236	0.083
Individual competency		0.130	0.345
Professional competency		0.435**	0.001
Specialized Skills		0.419	0.001

**p < 0.05; **p < 0.01*

Table 5: Multivariate regression analysis

Multivariate regression analysis	B	SE B	Beta	T	Sig
Constant	-24.936		0.876	4.489	0.000
Attitude to sustainable agriculture	0.694	0.219	0.378	3.166	0.003
Skill of sustainable agriculture	0.209	0.133	0.206	1.570	0.123
Communication channel	0.261	0.211	0.145	1.236	0.222
Social participation	0.121	0.632	0.029	0.191	0.850
Social status	0.909	0.599	0.241	1.518	0.135
Professional competency	0.006	0.116	0.007	0.055	0.957

$R=0.779$, $R^2=0.6068$, $F=12.335$, $Sig=0.000$

$R^2=0.6068$

$Y= -24.936+0.694x_1+0.209x_2+0.261x_3+0.121x_4+0.909x_5+0.006x6$

Discussion and Recommendation

Wossink and Boonsaeng (2003) observed that farmers' knowledge is crucial for successful research and development strategies.

They further stated that many promising agriculture policies have failed because they were inappropriate to farmer's needs and perception. Knowledge generally refers to how people select, organize and interpret information gained through the senses or experience (Encyclopaedia, 2004). Based on results there is significant correlation between knowledge of agricultural educators about biodiversity and environmental conservation with communication channel, social participation, social status, individual competency, professional competency, specialized skills.

Also the result for regression analysis by stepwise method shows predicator variables that were significantly related to the knowledge of about biodiversity and environmental conservation were entered. Approximately 60.6% of the variances in the knowledge of agricultural educators regarding biodiversity in agriculture could be explained by the attitude and skill to sustainable agriculture, social participation, social status, communication channel and professional competency. Thus recommended apply for the training classes to expand biological control important to be done.

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