

Farmer's Attitude on Sustainable Agriculture and its Determinants: A Case Study in Behbahan County of Iran

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Abstract: The purpose of this study was to conduct a descriptive survey to study the attitudes and perceptions of Iranian farmers on the concepts and thoughts of sustainable agriculture and identifying effective factors on their attitude. The target population of this study consisted of 7314 Behbahan farmers of Khuzestan province of Iran. A sample consisting of 208 respondents was selected through Stratified Sampling. The instrument used for assessing the attitude of respondents on the concepts of sustainable agriculture was a questionnaire by reliability 0.78. Responses were grouped based on the differences in standard deviation of mean, which revealed that 73.4% of respondents had moderate attitude towards concepts of sustainable agriculture. The results of study showed that there is positive correlation between literacy, participation in extension courses, off-farm income, farmer's knowledge about sustainable agriculture, level of use of sustainable agriculture methods, extension contacts and job satisfaction and negative correlation between age, experience in agricultural activities, family size and agrarian land with attitude toward sustainable agriculture. According to result of regression the 'extension contacts', 'Farmers knowledge about sustainable agriculture', 'Job satisfaction' and 'literacy' are effective factors on farmers attitude toward sustainable agriculture and explained 52.6% of this scale.

Key words: Attitude, Behbahan County, sustainable agriculture

INTRODUCTION

Currently, the world shows extensive worries on the destructive effects of advanced agricultural technologies on the environment, natural resources and long-term sustainability of agronomy systems. Soil degradation, erosion, water pollution, excessive use of chemicals, waste of water, decreasing ground water tables, destruction of natural habitats for wildlife and insects and pests resistance against insecticide and pesticide are only a few of the concerns expressed by environmentalists, ecologists, agricultural professionals, policy makers, farmers and public (Leeuwis, 2004; Al-Subaiee *et al.*, 2005). Despite these environmental effects at many places, the modern agriculture has been involved in many economic and social changes both in the industrial and developing countries. Among this involvement one may name: loss of job, transfer of economic opportunities from men to women, increasing specialization in livelihood, the rural institutions becoming governmental and many other cases (Pretty, 1995). Sustainable agriculture, as a managerial philosophy and a system that provides agricultural needs of both present and future generations has raised as a major challenge of the 21st century to meet these complications and natural and human difficulties;

that is, agriculture should be consume less and be sustainable more (Pretty, 1995; Williams, 2000; Qamar, 2002; Rasul and Thapa, 2003; Leeuwis, 2004). The farmers, environmentalists, protectors of natural resources and rural settlers have various interests and concerns on this issue and thus, each give a separate definition on sustainable agriculture; thus, there is no unique definition for sustainable agriculture (Beus and Dunlap, 1990; Leeuwis, 2000).

The perceived importance of sustainability among farmers differs from farmer to farmer and is influenced by socio economic characteristics as well as information-seeking behavior of the farmers. Since this study explored the degree of importance that farmers attach to different sustainable agricultural practices and factors that influence it, it is useful to define sustainability (Tatlidil *et al.*, 2008).

In many developing countries, agriculture plays a vital role in the economy, and sustainability in the agricultural sector must address the issues of poverty alleviation, food security, and stable income generation for a rapidly growing population (Lee 2005; Bhutto and Bazmi, 2007).

To ensure environmental, economic, and social sustainability, farmers must adopt different farm-level

practices such as judicious use of chemicals, integrated pest management, adequate irrigation, and proper care of plant and animal health. Especially, the relationship between pest sellers and farmers behavior about the proper use of pesticides is very important. In a research conducted by Aktas (2001), the place of pest sellers in the agricultural extension system was investigated and it was found that at the macro level there is a lack of law and regulations, which will direct the optimal use of chemicals and pesticides. Soil pollution in the locality is basically caused by improper use of farm machinery, improper use of chemical fertilizers and pesticides, improper irrigation and lack of modern irrigation systems such as trickle and drip irrigation, deforestation, early and excessive grazing of range lands, and farm land being used for housing and industrialization purposes.

Attitudes are defined as a disposition to respond favorably or unfavorably to an object, person, institution or event. An attitude is (a) directed towards an object, person, institution, or event; (b) has evaluative, positive or negative, elements; (c) is based on cognitive beliefs towards the attitude-object (i.e., the balancing between positive and negative attributes of an object leads to an attitude); and (d) has consequences for behavior when confronted with the attitude object (Bergevoet *et al.*, 2004).

Attitude is determined by the beliefs that are salient or important to a person. Attitudes are formed by what an individual perceives to be true about the attitude-object. This perception may or may not be based upon information and knowledge and/or an emotional reaction towards the object. Many beliefs and values may underpin an attitude (Willock *et al.*, 1999). Attitude simply refers to 'a person's evaluation of any psychological object'. These evaluation judgments are represented as items of knowledge, which are based on three general classes of information: cognitive information, emotional information, and information about past behaviors (Allen *et al.*, 2003).

In fact attitude reflects personal factors. Attitude is a predisposition to act in a certain way. It is the state of readiness that influences a person to act in a given manner (Rahman *et al.*, 1999). Therefore, attitude surveys in agriculture could lead to a more adequate explanation and prediction of farmers' economic behavior and have been used on conservation and environmentally related issues focusing on the influence of attitude variables as predictors of conservation behavior (Dimara and Skuras, 1999). Dimara and Skuras (1999) concluded from their research that a significant relationship was found between behavior and the goals and intentions of farmers. This relationship is even stronger when statements on attitudes, social norms and perceived behavioral control are included (Bergevoet *et al.*, 2004). Investigators have taken four different positions concerning causal

relationships between attitudes and behaviors: attitudes cause behaviors; behaviors cause attitudes; attitudes and behavior have mutual causal impact; and attitudes and behaviors are slightly, if at all related (Bentler and Speckart, 1981).

The objectives of the study were as follows:

- To describe the socio-economic characteristics;
- To measure the farmers attitude toward sustainable agriculture, and
- To determine the extent to which selected socio-economic characteristics influence the importance the farmers' attitude to sustainable agriculture.

MATERIALS AND METHODS

This research was done from March of 2009 to November of 2009 in Behbahan County from Khuzestan Province in Iran. The population of this study consisted of 7314 farmers of Behbahan county of Khuzestan province in Iran. 208 farmers were selected by Stratified Sampling. The instrument for data collection was questionnaire that consists of two sections. Section one had 24 statements of the sustainable agriculture. Five point Likert scale ranged from 1 = strongly disagree to 5 = strongly agree. Meanwhile, some of the statements were designed negative. The highest possible value for the general perception in this scale was 120 and the lowest 24. Higher values indicated positive attitude toward sustainable agriculture concepts. Section two contained demographic information, asking farmers' age, years of experience, level of education, literacy, agrarian land and etc., Questionnaire reliability was estimated by calculating Cronbach's alpha, which was 0.78. Group of respondents for their attitude regarding sustainable agriculture concepts was used by the interval standard deviation from mean:

- A = very low: $\text{Min} \leq A < \text{Mean} - \text{St.d.}$
- B = low: $\text{Mean} - \text{St.d.} \leq B < \text{Mean}$,
- C = moderate: $\text{Mean} \leq C < \text{Mean} + \text{St.d.}$,
- D = high: $\text{Mean} + \text{St.d.} \leq D \leq \text{Max}$

Data were analyzed using the Statistical Package for the Social Sciences (SPSS-11.5). Appropriate descriptive statistics such as frequencies, Percentage scores, mean scores, standard deviations and correlation and multiple regression were used to analyze the data.

Study area: Behbahan County with extent of 3516 Km² has located in between longitude of 50°13' and 50°16' at East and in latitude of between 34°30' and 30°37' in North. This county is placed in semiarid region in east southern of Khuzestan province of Iran and height of it from sea surface is 300 m. Annual rainfall average of

Table 1: Classification of farmers according to their attitude toward sustainable agriculture

Attitude	Frequency	%	Cumulative %
Very low(A)	30	14.4	14.4
low(B)	95	45.7	60.1
moderate(C)	39	18.8	78.9
high(D)	44	21.2	100
Total	208	100	

A = very low: $Min \leq A < Mean - St.d$. B = low: $Mean - St.d \leq B < Mean$. C = moderate: $Mean \leq C < Mean + St.d$. D = high: $Mean + St.d \leq D \leq Max$

Table 2: Ranking of statements

statements	Mean	SD	CV	Rank
Soil and water are the sources of all life and should therefore be strictly conserved.	4.32	0.809	0.187	1
The indiscriminate uses of agricultural chemicals are harmful for humans.	4.29	0.961	0.224	2
Clover and alfalfa cultivation improves the soil fertile.	3.89	0.891	0.229	3
Application of animal fertilizers can increase soil fertile.	4.15	0.974	0.235	4
The key to agriculture's future success lies in learning to imitate natural ecosystems and farm in harmony with nature.	4.10	0.970	0.237	5
Farmers should farm only as much land as they can personally care for.	4.17	1.030	0.247	6
The primary goal of farmers should be to maximize the productivity, efficiency, and profitability of their farms. *	4.08	1.071	0.263	7
Consumption of animal fertilizers can increase income.	3.76	1.020	0.271	8
Most of farms should integrate agronomy and animal husbandry.	3.88	1.146	0.295	9
Crop rotation and diversity can reduce farms pests.	3.62	1.709	0.298	10
Minimum tillage can reduce erosion and soil degradation.	3.48	1.047	0.301	11
My farm productivity will be reducing If I use not chemical fertilizers and pesticides in my farm. *	3.92	1.185	0.302	12
One of the principles of agriculture is reduces the environmental damages.	3.88	1.181	0.304	13
Pest attack will be increasing due to Consecutive planting a plant in the farm.	3.71	1.161	0.313	14
Agricultural chemicals materials pollute the environment.	3.98	1.266	0.318	15
For increased agricultural production should be used machinery and new technologies. *	3.85	1.275	0.331	16
The best way to reduce pest and weed damage is Weed farm.	3.24	1.149	0.354	17
The best way to control and reduce damage of farm pests and weeds is biological control.	3.20	1.137	0.355	18
Application of green manure is not necessary due to exist chemical fertilizers. *	3.07	1.106	0.360	19
Farmer's income will be reducing due to crop rotation. *	3.32	1.249	0.376	20
Appropriate method for control of pest and weed is use of pest pesticide and poisons. *	3.62	1.388	0.383	21
Farm productivity increase only due to increase in consumption of fertilizers. *	3.22	1.385	0.422	22
Residues of before planting reduce fertile soil. *	2.47	1.513	0.613	23
Crop rotation can cause to soil erosion. *	2.16	1.366	0.632	24

* = negative statements

county is 354 mm, the minimum temperature is -2.8°C and maximum temperature is 50.2°C (Anonyms, 2009). Number of exploitable units of county is 7314 units that 82% of them have a space under 10 ha (Anonyms, 2006).

RESULTS AND DISCUSSION

The ages of the respondents ranged from 22 to 81 and the mean age was 44 (SD = 13.56, N = 208). Majority (56.7%, n = 118) of respondent were 30-54 years old. All of the respondents in the study were male. The years of experience of respondents ranged from 3 to 50 and the mean of their experience was 22 years. The educational level of majorities (30%) of farmers was primary, average number of family size of farmers was five people. The average size of farm to each farmer was equal to 5.5 ha, average of irrigated land was 4.1, and 1.5 ha of their lands were dry lands. Average number of pieces for the farmers under this study was 3.3 pieces. Majority of farmers were landowner and dominant farming system was agronomy and animal husbandry in this region (45.2%) and mostly have alternative cropping and they used of labor for their agricultural activities. 43.3% of farmers in this study have

off-farm activities and 45% of farmers access to agriculture credits for their activities. Only 30% of respondents participated in extension courses.

The result of study showed that majority of farmers have low and very low knowledge about sustainable agriculture (52.4%) and 53.8 of farmers have low and very low level use of methods of sustainable agriculture. According to result of assessment of farmers' job satisfaction, 50.5% of farmers have low and very low level of this factor.

To group the respondents on their attitude towards concepts of sustainable agriculture, the interval of standard deviation from mean was used. According to Table 1 attitudes of 45.7% (n = 95) of respondents on sustainable agriculture was at the low level. In addition, 21.2% (n = 44) of respondents had high attitude and 18.7% of them (n = 39) had moderate attitude and 14.4% of them (n = 30) had very low attitude on the concepts of sustainable agriculture (Table 1).

Table 2 shows the mean and standard deviations of statements used to evaluate the attitude of farmers on sustainable agriculture.

Table 3: correlation between attitude toward sustainable agriculture and other variables

Variables	Farmers attitude to organic farming	
	Correlation	p-value
Farmers age	- 0.502**	0.000
Literacy	0.529**	0.000
Family size	- 0.434**	0.000
Experience in agriculture activities	- 0.477**	0.000
participation in extension courses	0.506**	0.000
agrarian land	- 0.245**	0.000
Off -farm income	0.265**	0.000
Farmers knowledge about sustainable agriculture	0.587**	0.000
Level of use of sustainable agriculture methods	0.448**	0.000
Extension contacts	0.611**	0.000
Job satisfaction	0.181**	0.009

Table 4: Results of multiple regression analysis

Source of variation	SS	df	MS	F-ratio	p-value
Regression	18355.508	4	4588.877	53.483	0.000
Residual	16559.487	193	85.800		
Total	34914.995	197			

Variables in the equation					
Variables	R ² Cumulative	R ² Change	F Change	P Change	β
constant	-	-	-	< .01	52.422
Extension contacts	0.373	0.373	116.440	< .01	0.551
Farmers knowledge about sustainable agriculture	0.435	0.062	75.143	< .01	0.482
Job satisfaction	0.511	0.076	67.562	< .01	-0.502
literacy	0.526	0.015	53.483	< .01	1.496

Variables not in the equation				
Variables	β	t	Sig-t	
Farmers age	0.023	0.263	0.793	
Family size	0.127	1.561	0.120	
Experience in agriculture activities	0.080	0.944	0.347	
participation in extension courses	0.115	1.748	0.082	
agrarian land	0.076	1.391	0.166	
Off-farm income	0.027	0.505	0.614	
Level of use of sustainable agriculture methods	-0.040	-0.521	0.603	

SV = Source of variation, SS = Sum of squares, MS = Mean Square

Correlation analysis of attitude toward sustainable agriculture with some variables: Pearson correlation was used to test the relationship between farmer’s attitude and other variables. According to Table 3 there are negative correlation between age, experience in agricultural activities, family size and agrarian land with attitude toward sustainable agriculture. In addition, there are positive significant relationships between attitudes toward sustainable agriculture with variables such as: literacy, participation in extension courses, off-farm income, and farmers’ knowledge about sustainable agriculture, level of use of sustainable agriculture methods, extension contacts and job satisfaction. Other variables did not show any significant correlation with the main scale of this research.

Identifying the effective factors on attitude toward sustainable agriculture: Table 4 presents the selected variables influence on the attitude toward sustainable agriculture. This objective was accomplished using multiple regression analysis. Among 11 variables that entered into model, only 4 variables had significant

influence on farmers’ attitude. These variables together explained 52.6% of the variance of effective factors on farmers attitude toward sustainable agriculture in the region selected for the study.

The variable that entered the regression model first was ‘extension contacts’ considered alone; this variable explained 37.3% of the variance for farmers’ attitude. The second variable that entered into model was ‘Farmers knowledge about sustainable agriculture’ and explained 6.2% of the variance. The third was ‘Job satisfaction’ and explained 7.6% of the variable alone and finally the forth variable was ‘literacy’ that explained 1.5% of the scale.

CONCLUSION AND RECOMMENDATION

The subject of sustainable agriculture and necessity of changes in the activities of agriculture sector in a direction that would fit sustainable development is an issue recently raised in our country and many scientific groups have shown interest to it. Sustainable agriculture, as a system for producing foods and fibers, is more

knowledge - intensive than input intensive and needs knowledge, management and skills (Cho and Boland, 2004). To transfer this knowledge, skills and management to farmers, it is necessary to generate desirable changes in the attitudes of farmers as first step; therefore, assessing attitudes in connection with the principles and concepts of sustainable agriculture gives a standard of existing status on which basis, planning could be made to achieve desirable status. Therefore propose of this study was assessment of farmers attitude toward sustainable agriculture and identifying determinants of it.

Based on the research findings, age of farmers under study and their level of experience in agriculture activities were appropriate for these activities, but they have low literacy level. The majority of farmers were not participated in extension courses and they do not access to agriculture credits. The findings of this study indicated that the attitude of farmers is not in a favorable situation. Results of correlation test showed that older farmers with more age, experience in agriculture activities, family size and more agrarian land have low attitude toward sustainable agriculture than younger farmers. In addition farmers with high level of literacy and participation in extension courses have better attitude toward this type of agriculture. In other hand off-farm income, farmers' knowledge about sustainable agriculture, level use of sustainable agriculture methods, extension contacts and job satisfaction have positive correlation with farmers' attitude toward sustainable agriculture.

In study area according to research findings, the factors that have positive correlation with farmers attitude as literacy, off-farm income, farmers knowledge, use of sustainable methods don't have good status therefore can result that all of this factors caused that farmers don't have good level of attitude toward sustainable agriculture.

Survey the affective factors on attitude toward organic farming showed that extension contacts related sustainable agriculture was the most effective factor in improving attitude towards sustainable agriculture and using the extension contacts are in the next order. Other effective factors that recognized in this study were Farmers knowledge about sustainable agriculture, Job satisfaction and farmers literacy. According to the findings of this research, the educational level of majorities of farmers was primary were low. In other hand these factors have had negative correlation with attitude toward sustainable agriculture. That is why majority of farmers have low-level attitude towards sustainable. Therefore recommended that:

- Can increased farmers attitude, knowledge and skills about sustainable agriculture with holding extensional workshop for farmers in area
- Create rural industries and industrial related to processing the agriculture production can decrease

pressure on natural recourse and increase farmers income in other hand;

- Access to more rural infrastructural and credits can increased job satisfaction between farmers.

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