International Journal of Agricultural Science, Research and Technology *Available online on: www.ijasrt.com*

Role of Agricultural Extension Courses in Adoption of Sustainable Agriculture (Case Study: Wheat Farmers of Shoushtar Township)

Azadeh Noorollah Noorivandi
Department of Agricultural Management, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

Abstract

Identifying role of extension system in adoption of new technologies have important role to developing favorable extension systems. For supporting sustainable agriculture in Iran needs extension systems to be carefully thought and accurately implemented. The purpose of this is analyzing role of extension activities in adoption of sustainable agriculture. Based on the results the attending agricultural extension and education courses was very important because significant differences were observed in adoption of all items of sustainable agriculture between participators and non participators in extension courses. Linear regression was used for predicting changes in farmers' knowledge toward sustainable agriculture. Level of education, technical knowledge regarding sustainable agriculture, income, social participation, social status, job satisfaction may well explain for 66.4% in Knowledge toward sustainable agriculture practices. **[Azadeh Noorollah Noorivandi. Role of Agricultural Extension Courses in Adoption of Sustainable Agriculture. International Journal of Agricultural Science, Research and Technology, 2011; 1(3):117-120].**

Received: 30 August 2011, Reviewed: 10 September2011, Revised: 15 September 2011, Accepted: 22 September 011

Keywords: Extension courses, Sustainable Agriculture

1. Introduction

Direct impacts of agricultural development on the environment arise from farming activities, which contribute to soil erosion, land salinization and loss of nutrients (Abtahi, 2006). In Iran, like other developing countries, soil erosion is one of the most important factor that affect on agricultural productivity. The content of annual soil erosion in Iran is estimated 2.5 billion ton. This amount is equivalent with 8 percent of soil erosion at world scale (Najafi, 2005).

According to various studies, the agri-food sector in Iran has not yet shown any significant development during the last decades (Safaei, 1999). Nevertheless, there is various evidence that agriculture is still far behind the real potential of the country considering its available resource. On the other hand, sustainable land and water use has not yet been reached in Iran (Darvishi, 2003).

Usage of chemical material in agricultural practices has main impacted on water resource pollution. Seepage of pollution waters that produce by agricultural practices. Karshenas (1994) claimed that the difficulties within Iranian agriculture were caused by the mismanagement of human resources and by actors within the agricultural sector, and not because of shortages of natural resources in agriculture. Main method that use for plow of lands in farms of Iran is traditional plowing. Traditional plowing cuts down and overturns up to 8" of soil. The coulter disks on traditional plows are straight disks. This way has vital affected on erosion of soil and water.

Nevertheless, there is a variety of evidence that agriculture in Iran still lags far behind what it could potentially achieve considering the available resource in the country. For instance, research reveals that more than 50% of the total available land, water, and natural resource have not yet been used in agriculture and only 37% of all cultivable land and 58% of all acquirable water, have been utilized (Tahmasebi, 1998). On the other hand, sustainable land use has not yet been achieved in Iran.

Another direct impact of agricultural development on the environment arises from farming activities, which contribute to water pollution (Ommani and Chizari, 2007). More than half of the world's population, and more than 70 percent of the world's poor are to be found in rural areas where hunger, literacy and low school achievement are common. Education for a large number of people in rural areas is crucial for achieving sustainable development. Poverty education strategies are now placing emphasis on rural development that encompasses all those who live in rural areas. Such strategies need to address the provision of education for the many target groups: children, youth, and adults, giving priority to gender imbalances. This complex and urgent challenge should be addressed systematically, through an intricate set of policy measures, at all levels of education systems (UNESCO, 2002).

The great challenge for the coming decades will be to increase food production with less water, particularly in countries with limited water and land resource. The effective and sustainable use of water for agriculture has become a global priority of vital importance, requiring urgent and immediate solutions in view of intensifying competition (Ommani and Chizari, 2007).

Based of multiple researches training and education are a key input, and requirement, of sustainable development (Loucks, 2000; UNESCO, 2002; FAO, 2003).

Extension activities based on the survey information were effective in creating awareness, but did not result in widespread change (Armstrong, 2000). Also, development options that have the potential to increase whole farm profit will invariably consider the potential to increase water use efficiency (WUE). At this regard, extension approaches are very important (Armstrong, 2000).

FAO (2003) also claimed that for successful and sustainable introduction, use and improvement of farm control techniques and technologies, farmers should be encouraged to analyze their problems, search for solutions, monitor and evaluate the selected and implemented techniques and technologies, and adjust them according to their constraints and opportunities. Participatory Training and Extension in Farmers' Water Management (PT&E-FWM) aims to ensure a sustained support to farmers in this process (Kay, 2002).

2. Methodology

The method of this research is descriptive-correlative and analytically based on casual-correlative. Population of this study is all wheat farmers of Shoushtar Township. 221 farmers were selected as the sample based on using Cochran formula. The random cluster sampling method was used in this study.

Questionnaire was randomly given to these wheat farmers to be filled .Questionnaire and interview was the main study tools. To write this questionnaire, first, the theoretical basics were evaluated based on the related resources and references; then, considering the studies and theoretical framework, the primary questionnaire was arranged and, after being convinced of its face and content validity and reliability in addition to the necessary modifications, the final one was completed. Face and content validity of the study were confirmed by the panel experts. To determine the questionnaire reliability, 30 ones were filled by farmers (out of the statistical population) and the alpha cornbach`s coefficient was calculated (0.83) indicating a proper reliability coefficient.

3. Results

Based on the results 64% of farmers were participated in agricultural extension courses (Table 1). To analyzing role of extension activities in adoption of sustainable agriculture, 12 question was raised and perception of farmers regarding role of extension activities in adoption of sustainable agriculture was measured by using a Likert-scale: (5) = Very high; (4) = high; (3) = moderate; (2) = low; (1) = Very low (Table 2).

To comparative two groups of farmers (participated and not participated in extension courses) regarding adoption of different items of sustainable agriculture was used mann whitney U test.

Based on the results the attending agricultural extension and education was important because significant differences were observed in some items of sustainable agriculture between participated and not participated in extension courses (Table 3).

Table 1. Frequency of farmers regarding participation in agricultural extension courses

Participation	Frequency	Percent
Yes	141	64
No	80	36
Total	221	100

Table 2. Role of extension activities in adoption items of sustainable agriculture

Items	Mean*	SD	CV	Priorities
Soil conservation	3.54	1.09	0.308	3
Farming rotation	3.09	0.98	0.317	5
Water management	2.65	1.78	0.672	12
Farming control	2.67	1.55	0.581	11
Biological control	2.59	1.42	0.548	10
IPM	3.06	0.87	0.284	2
Productivity	2.98	0.99	0.332	6
Efficiency	2.50	1.02	0.408	9
Leguminous	2.78	0.78	0.281	1
Organic practices	3.09	0.97	0.314	4
Integrate animal and farming activities	2.69	1.07	0.398	8
Minimum tillage	3.05	1.04	0.341	7

* (5) = Very high; (4) = high; (3) = moderate; (2) = low; (1) = Very low

Table 3. Comparative two groups of farmers regarding adoption of different items of sustainable agriculture

Items	Participated	Not participated	MW U-test	Sig
Soil conservation	35.76	17.76	891.123	0.000
Farming rotation	29.87	25.98	1762.123	0.457
Water management	24.54	23.98	1982.128	0.897
Farming control	24.67	24.45	2154.129	0.912
Biological control	27.67	25.78	1769.139	0.461
IPM	32.561	19.781	945.123	0.000
Productivity	29.671	26.871	1098.89	0.041
Efficiency	28.671	27.761	1673.33	0.312
Leguminous	35.324	17.563	711.324	0.000
Organic practices	30.540	19.671	912.501	0.000
Integrate animal and farming activities	28.391	27.120	1609.381	0.317
Minimum tillage	31.987	21.598	1125.345	0.049

The wheat farmers' knowledge toward sustainable agriculture was determined. Based on response's level for this section were categorized using a five-point Likert type scale: 1=very low, 2= low, 3=medium, 4= high and 5=very high.

The range in responses to 10 appropriate questions for this section was 10-50. For the purpose of characterization the score was transformed into four levels as "weak", "medium", "good" and "excellent".

After computing the mean and standard deviation of the knowledge score, the four categories were determined by scores fallen within the two standard deviation on the left of the mean on a normal cave and also on two standard deviation on the right of the mean (Table 5).

The relationship between some selected respondents' characteristics with farmers' knowledge toward sustainable agriculture is shown in Table 5. There was a significant relationship between the levels of education, income, social participation, job satisfaction, awareness to sustainable agriculture with farmers' knowledge toward sustainable agriculture. Linear regression was used for predicting changes in farmers' knowledge toward sustainable agriculture (Table 6).

Level of education, technical knowledge regarding sustainable agriculture, income, social participation, social status, job satisfaction may well explain for 61.2% changes ($R^2 = 0.612$) in knowledge in sustainable agriculture Practices.

Table 4. Distribution of Respondents' knowledge in sustainable agriculture Practices (n=360)

Knowledge	Frequency	Percent	Cumulative percent
Week	79	35.747	35.747
Medium	86	38.914	74.661
Good	31	14.027	88.688
Excellent	25	11.312	100.000
Total	221	100	

Table 5. Correlation between selected independent variables with Knowledge in sustainable agriculture Practices

Variable	r	p
Level of education	0.684	0.000***
Social participation	0.578	0.000***
Income	0.467	0.000***
Age	-0.086	0.56
Awareness	0.364	0.000***
Job satisfaction	0.834	0.000***

*: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$.

4. Conclusion

Focus on efficient use of extension courses and improvements in sustainable agriculture will be the major challenges in the coming years. Sustainable agriculture has a vital role for conservation of natural resources.

The Results indicated that extension activities dos pay moderate attention to necessity characteristics of extension organization to accomplish sustainable agriculture and these attributes are almost favorable situation. Also necessitate reorganizing of extension institutions to accomplish sustainability. For increasing extension activities productivity, extension courses must be designing based on farmers needs and conditions of them.

Allahyari et al (2009) was confirmed these findings and claimed Iran's sustainable agricultural extension–education methods are not favorable and the extension system does not pay enough attention to them. Iran's extension system only gives attention to On–farm experimentations, Group extension methods and networking to exchange and sharing information and new communication and information methods thereabout at medium level. The study shows that to accomplish sustainability in agriculture, we must give attention to diversify extension–education methods. Based on the findings, in most of the above mention methods, farmers' participation is key element for the success of extension activities and they are favor for the achievement of sustainability.

Table 6. Linear regression used for predicting changes in farmers' knowledge toward sustainable agriculture.

Variable	B	SE B	Beta	T	Tsig
Level of education (x_1)	0.534	0.463	0.356	2.244	0.000
Technical knowledge regarding sustainable agriculture (x_2)	0.538	0.674	0.757	4.743	0.000
Income (x_3)	0.856	0.465	0.254	4.213	0.000
Social participation (x_4)	0.854	0.245	0.357	2.275	0.000
Social status (x_5)	0.456	0.235	0.354	4.325	0.000
Social status (x_6)	0.135	0.356	0.414	4.754	0.000
Job satisfaction(x_7)	0.643	0.365	0.495	4.577	0.000
Constant	3.354	0.385	-	4.256	0.000

F = 14.02, Signif F = 0.000, R^2 = 0.612

References:

1. Abtahi, M.(2006). Soil degradation by human agents. Dehati, Monthly on Agriculture 34:38-44.

2. Allahyari, M. S., Chozari, M and Mirdamadi, M. (2009). Extension-Education Methods to Facilitate Learning in Sustainable Agriculture. J. Agri. Soc. Sci., 5(1–2):27-30.

3. Armstrong, D. (2000). A farm management economics approach to extension: water use efficiency on irrigated dairy farms in northern Victoria and southern NSW. Department of Natural Resources and Environment Kyabram Dairy Centre. Available on the: http://www.regional.org.au/au/apen/2001/r/ArmstrongD.htm

4. Darvishi, A. K. (2003). Capacity and ability of sustainable development in Iran. Agricultural Economic and Development Journal (Persian), 5, 2, 30-53.

5. FAO. (2003). Sustainable Water Resources Management for Food Security in the Near East Region. High-Level Technical Workshop “Regional Programs for Food Security in the Near East: Towards Sustainable Food Security and Poverty Alleviation”, Jeddah, 8-9 October 2003, FAO.

6. Karshenas, M. (1994). Concepts and measurements of agricultural surplus: a new accounting framework with application to Iran, Journal of Peasant Studies, 21, 2, 235-261.

7. Kay. M. (2002). Training for irrigation water management transfer a case study review. Irrigation Advisory Services and Participatory Extension in Irrigation Management Workshop organised by FAO – ICID 24 July 2002 Montreal, Canada.

8. Loucks, D. (2000). Sustainable Water Resources Management. International Water Resources Association, Water International, 25(1):3-10.

9. Ommani, A . R and Chizari, M. (2007). The effects of extension education and communication channels on technical knowledge of wheat farmers regarding sustainable agriculture. The Proceedings of 4th World Environmental Education Congress, Durban, South Africa.

10. Tahmasebi, Z. (1998). Necessity of paying attention to role and position of agricultural sector in employment generation during third economic, social and cultural development plan of Iran. Zeitoon persian magazin, 140, 4-11.

11. UNESCO.(2002). Education for rural development in Asia: experiences and policy lessons. FAO/UNESCO Seminar Bangkok, Tailand, 5-7 November.