Journal of Agriculture and Sustainability
ISSN 2201-4357
Volume 10, Number 2, 2017, 144-156

INFINITY PRESS
www.infinitypress.info

Vegetable Grower'S Knowledge Levels Regarding Some Sustainable Agriculture Practices: A Case Study in Taleeyaa District, Babylon Province, Iraq

Bassim H. Kshash

College of Agriculture, AL-Qasim green University, Babylon, Iraq

Corresponding author: bassimhaleem@yahoo.com

Vegetable Grower'S Knowledge Levels Regarding Some Sustainable Agriculture Practices: A Case Study in Taleeyaa District, Babylon Province, Iraq

Abstract

Sustainable agriculture is an integrated system of plant and animal production practices having a site-specific application that will, over the long-term, satisfy human food and fiber needs; enhance the environmental quality and natural resources base upon which the agriculture economy depends. The final decision of farmers to applying the style of sustainable agriculture based on their knowledge with its experiences and practices. Therefore, the objective of this study was to investigate the level of Vegetable growers' knowledge with some sustainable agriculture experiences and practices.The study was conducted in Babylon Province of Iraq , from district namely Taleeyaa. A sample consisting of 180 respondents was selected through random sampling. A survey method through face-to-face interview by using structured questionnaire was used to collect data. The findings of the study showed that Majority of the respondents (48.9%) were observed in low category of knowledge followed by medium (31.7%) and (20%) high levels of knowledge, respectively. The study recommends that more efforts should be taken by agricultural extension agents to further improve farmers' knowledge regarding sustainable agriculture.

Keywords: Agricultural practices, Farmers knowledge, Iraq, Sustainable agriculture, Vegetable growers.

Introduction

The rapid growth in populations around the world has increased the demand for food, which resulted in a quest to increase agricultural production.

In our effort to increase the food grain production, land, water, energy, soil and biological resources have been subjected to greet pressure and stress (Pandey & Kushwaha 2010, Sadighi & Roosta 2002, Annette, et.al,2011) which affects the ability and the possibility of future generations to satisfy their dietary needs. So scientists and development experts began to think about a new style of development " maintaining a delicate balance between the human need to improve lifestyles and feeling of well-being on one hand, and preserving natural resources and ecosystems, on which we and future generations depend "(meets the needs of the present without compromising the ability of future generations to meet their own needs) which calling sustainable.

Sustainability is the way to provide more healthy foods in the future considering the increasing population and growing demand of agricultural products (Sharghi, et. al., 2010). Sustainable agriculture is effective management of agricultural resources to fulfill human needs, preserve the environment and enhance biological resources (Chikwendu & Arokoyo, 1997).

Sustainable agriculture is often cited to encompass of three main goals namely economic efficiency, environmental quality and social responsibility (D'Silva, et. al., 2011). To ensure environmental, economic, and social sustainability, farmers must adopt different farm-level practices (Sadati, et. al., 2010).

Sustainable agriculture involves a dynamic set of sustainable agricultural practices (SAPs) include conservation tillage, mixed cropping, contour farming, soil testing, crop rotation, reduce rate of herbicides, inter-cropping, mulching, cover cropping, organic fertilizers, integrated pest management (IPM)…..itc.

Despite the great promise of sustainable agriculture in helping to alleviate the problems originated from industrial agriculture, adoption of sustainable practices

remains low in many parts of the world (Baide, 2005). Pretty and Hine (2001) analyzed data from Africa, Asia and Latin America and concluded that from the total agricultural land only a 3% is under some type of sustainable agriculture practice. Titus and Adefisayo (2012) believes that farmers lack the capital to acquire technologies or the human capital to use them effectively. Kamarudin, et. al., (2015) stated that low levels of education and knowledge among the farmers become one of the challenges in agriculture field, while (Joneydi, 2012) believe that using sustainable agricultural practices depends on the farmer's knowledge and understanding of these practices ,so sustainable agriculture demands for knowledgeable human resources knowing the principles and sustainability operations who are capable of its using.

The final decision of farmers to use sustainable agricultural practices is usually the result of their knowledge of these practices, because knowledge is one of the important components of human behavior and plays important roles to supervising farmers in decision making process. It has already been recognized that knowledge is the crucial "fourth factor of production" and sustainable farming practices are more demanding on the skills and knowledge of farmers (Ingram and Morris, 2007).

Several studies were conducted to identify the level of knowledge regarding sustainable agriculture practices, whether among farmers or extension workers or students of agricultural sciences.

Among the studies of farmers, Azman, et. al., (2012) found that (71.2%) of farmers respondents in Malaysia have high level knowledge about sustainable agriculture, (26.2%) have moderate and only (2.5%) have low knowledge. In Iran (Afrous & Abdollahzadeh, 2011) indicate that (41.25%)of respondents had a medium knowledge while (35% , 23.75%) had low and high knowledge regarding sustainable agriculture practices respectively. The result of (Sadighi, 2002) showed that (46%) of farmers have a "high" level of knowledge about sustainable agricultural practice, while (Moghaddam,et.al.,2012) found that that (52.2 %) of respondents used sustainable agricultural practices in low level while

(30.3%) of them in moderate level and (17.5%) in high level. In Nigeria (Ajieh & Uzokwe , 2014) found in their study that (61 %) of the respondents had low knowledge while (10 %) of them had high knowledge, the remaining (29 %) of the respondents had medium knowledge regarding cover crops as a sustainable agricultural practice, (Edeoghon, et. al., 2008) in their study about awareness and use of sustainable agricultural practices by arable crop farmers pointed that all respondents were aware of mixed cropping, (95.6%) cover cropping, (87.8%) organic manure, (80%) mulching, (60%) improved varieties, (58.9%) IPM, (23.3%) minimum tillage, (15.6%) crop rotation, (5.6%) green manure, (4.4%) alley cropping. In Pakistan (Kumbhar, et. al., 2012) found that (52%) of the respondents were observed in medium category of knowledge regarding sustainable agriculture practices followed by high (26.67%) and low (20.56%) levels of knowledge, respectively.

As for the studies conducted out the extension agents, (Pandey & Kushwaha,2010) pointed that (50%) of the respondents were having medium level of knowledge while (40%) and (10%) had high and low knowledge regarding sustainable agricultural practices, respectively. Tiraieyari, et.al., (2013)in Malaysia found that (84.5%) of extension workers reported high knowledge, (15.0%) moderate and (0.5%) reported low knowledge of SAP.

With respect to the studies conducted to determine students' knowledge of sustainable agriculture practices, (Williams,2000) found that mostly of high school agricultural education students in Iowa having limited knowledge. In Iran (Veisi, et. al.,2008) found that students respondents from Tehran university have moderate knowledge level.

Knowledge level of farmers refers to the information they posses in respect of sustainable agricultural practices, agricultural extension is the most important source of information to farmers.

The success of sustainable agriculture, therefore, depends not just on the motivations, skills, and knowledge of individual farmers, but on actions taken by organizations and communities working as a whole, which makes the task that more challenging Extension

workers (Swanson, et. al.,1997). The transfer of knowledge and skills to farmers and their families is an important extension activity, agricultural extension must find out which skills or areas of knowledge are lacking among the farmers, and then arrange suitable learning experiences through which the farmers can acquire them. (Oakley and Garforth**,** 1997**).**

Therefore, this study came to know knowledge level of vegetable growers regarding some sustainable agriculture practices; the findings presented in this paper provide information on farmers' knowledge with respect to sustainable agriculture practices that may be useful to extension agents who are attempting to diffuse sustainable agriculture principles. The study was undertaken to: determine the knowledge level of vegetable growers and determine whether there is a difference in level of vegetable grower' knowledge based on socio-economic characteristics.

Research Methodology

The study was carried out in Al- Taleeyaa district in Babylon Province, Iraq. The population for this study consisted of 310 vegetable growers in the district, 10 of them were chosen for testing the questionnaire reliability. From the 300 remaining ,180 were selected at random. The instrument used was a 2 part questionnaire. The first included the socio-economic characteristics: age, educational level, area cultivated with vegetable crops, years of experience in vegetable cultivation ,annual revenue from vegetable crops . While the second part consist of (18) practices of sustainable agriculture. Content validity of the questionnaire was established by a panel of experts in the field of agricultural extension, crop science, agricultural mechanization, horticulture, and soil and water management. A pilot study was conducted to establish reliability of the instrument, a Cronbach's alpha (a reliability coefficient) of 0.92 was established, hence depicted that the instrument used was reliable and valid

For each of the18 sustainable agricultural practices , respondents were told to use a 4 point Likert-like scale representing level of knowledge where: (3) represent high

knowledge, (2) moderate knowledge, (1) low knowledge and (0) no knowledge. Face to face interviews were used and data collected by researcher visits to respondents during1-25 October 2014. Data were analyzed using frequency, percent, weighted arithmetic mean and Chi-square test. Based on alternatives answers placed of each of the (18) practice a 0-3 numeric value was used. Respondents were classified into 3 categories according to total score including level of knowledge: low (0-18), medium (19-36) and high (37-54). For the 18 practice classification was based on knowledge level as: low (0-1), medium (1.1-2),and high (2.1- 3). Farmer's knowledge of sustainable agricultural practices was analyzed separately, weighted mean score were calculated, the relative importance was ranked in descending order.

. **Results and Discussion**

The distribution of respondents based on their level of knowledge in some sustainable agriculture experiences and practices is shown in Table 1. Majority of the respondents (48.9 %) belonged to 'low' category followed by (31.1%) and (20 %) in 'medium' and 'high categories of knowledge in some sustainable agriculture experiences and practices respectively. The average knowledge level for all respondents were (22.06) which is within medium level of range of values between (0 - 54).

As for the respondents knowledge regarding some sustainable agriculture experiences and practices, table 2 indicates that the study identified high level of knowledge for the respondents in the following practice: covering gropes (2.61), use of animal manure (2,47). And moderate level in: mixed cropping (1.93), rotational grazing (1.77), reduce rate of herbicides (1.5), narrow strip intercropping (1.48), use of low input livestock facilities (1.38), recycling agricultural wastes (1.25), conservation tillage (1.21), reduce nitrogen fertilizer rates (1.14). While the following practice shoed a low level: use of green manure (1.08), herbicides resistant crop (1.06), mulching (mulch weeding) (1.04), insect resistant crop (0.79) , crop rotation (0.52) , soil testing (0.51) , integrated pest management(IPM)

(0.49), no till (0.16) . The weighted mean for total (18) sustainable agriculture experiences and practices is (1.23), it is in a median category of knowledge level.

Chi square analysis was used to see whether there is a difference between the level of the training needs of respondents, depending on their characteristics, the results in table (3) showed there is no significant difference between the level of the training needs of respondents depending on age, cultivated area, years of experiences in vegetables growers work and annual revenue, while there is a significant difference depending on educational attainment. The results show (Table 3) that the highest proportion of respondents with the high need for training were among the second category of cultivated area (7.8%). While the highest percentage of respondents at least need for training within the first category of educational attainment and the fifth category of age and cultivated area (1.7%).

Conclusion

There is a relatively low level of knowledge regarding sustainable agriculture experiences and practices among vegetable growers in Babylon province, with an average knowledge level for all respondents within medium level .The more knowledge of sustainable agriculture practices are covering gropes and use of animal manure while the least knowledge are crop rotation, soil testing and integrated pest management (IPM). It is necessary to expand the study to determine farmer's knowledge regarding sustainable agriculture experiences and practices in other provinces or cities , and fulfillment an extension activities to increase farmers knowledge regarding sustainable agriculture experiences and practices.

References

Afrous A. & Abdollahzadeh G.(2011). assessing factors affecting on sustainability of agriculture a case of Dezful county, southwest Iran. Australian Journal of Basic and Applied Sciences, 5(11): 1444-1449.

Ajieh, P.C., and Uzokwe, U.N. (2014). Farmers' knowledge and perception regarding the importance of cover crops in the Northern Agricultural Zone of Delta State,Nigeria , *Journal of Agriculture and Veterinary Science*, 7(2) Ver. I, 14 - 18.

Annette F, Erik M , Gianluca B (2011): Sustainable food consumption and production in a resource-constrained world , European Commission , Brussels.

Azman A, D'Silva J, Abu Samah B and Shaffril H(2012): Comparative Study on Sustainable Agriculture Knowledge among Malaysian Contract Farmers , *Am. J. Applied Sci.*, 9 (5) : 673 - 677. **DOI :** 10.3844/ajassp.2012.673.677.

Baide J.(2005): Barriers To Adoption Of Sustainable Agriculture Practices In The South: Change Agents Perpectives , MSCthesis , Auburn University .

Chikwendu, D.O. and Arokoyo,J. O.(1997): Women and sustainable agricultural development in Nigeria.*J.Sustain.Agric.*,1(1):53 – 69. **OI:**10.1300/J064v11n01_06.

D'Silva, J.L. ,Abu Samah, B.,Uli, J. and Shaffril, H.A. (2011): Towards developing a framework on acceptance of sustainable agriculture among contract farming entrepreneurs. *Afr. J. Bus.Manage.*, 5(20):8110 – 8116. DOI: 10.5897/AJBM11.034

Edeoghon, C.O. ,Ajayi, M. T. and Ugboya, T.O. (2008): Awareness and Use of Sustainable Agricultural Practices by Arable Crop Farmers in Ikpoba Okha Local Government Area of Edo State , *J. of Sustainable Development in Agriculture & Environment* ,. 3(2):55 – 63.

Ingram, J. and Morris, C. (2007): The knowledge challenge within the transition towards sustainable soil management: an analysis of agricultural advisors in England. *Land Use Policy*, 24(1),100 – 117.

Joneydi, M.S.(2012): Factors affecting in sustainability of agricultural production systems in Iran, *Annals of Biological Research*, 3 (9),4578 – 4583.

Kamarudin, H.D., Aziz, N.E., Zaini, M.K. and Ariff, N.Z.(2015) : Exploring Knowledge Sharing Practices among Paddy Farmers towards Building a Foundation for Knowledge Creation , *International Journal of Social Science and Humanity*, 5(1): 112 - 115. DOI: 10.7763/IJSSH.2015.V5.434

Kumbhar, M.I., Sheikh, S.A., Soomro, A.H. and Khooharo, A.A.(2012): Sustainable Agricultural Practices as Perceived by Farmers in Sindh Province of Pakistan , *Journal of Basic & Applied Sciences*, 8:325 – 327.

Moghaddam, K., Fatemi, M. and Monfared, N.(2012): Factors affecting agricultural sustainable activities among wheat producers , *Journal of Research in Agriculture*,1(2).93 – 98.

Oakley, P.and Garforth, C.(1997): Guide to extension training ,F.A.O. , Rome.144 PP.

Pandey, N.K. and Kushwaha, R.K. (2010): Knowledge Level of Agricultural Officers regarding Sustainable Agricultural Practices in Uttar Pradesh , *Indian Res. J. Ext.*

Pretty, J. and Hine, R.(2001):Reducing food poverty with sustainable agriculture: A summary of new evidence. Centre for Environment and Society, University of Essex, Colchester, UK.

Sadati, S.A., Fami, H.S., Asadi, A. and Sadati, A.(2010) : Farmer's Attitude on Sustainable Agriculture and its Determinants: a case Study in Behbahan County of Iran, *Res. J. Appl. Sci. Eng. Technol.*, 2(5) : 422 – 427.

Sadighi, H. and Roosta, K.(2002): Assessing Farmers' Sustainable Agricultural Practice needs: The Case of Corn Growers in Fars, Iran, *J. Agric. Sci. Technol*. 4, 103 - 110.

Sadighi, H.(2002): Assessing Farmers' Sustainable Agricultural Practice Needs: Implication

for a Sustainable Farming System, AIAEE , Proceedings of the 18th Annual Conference of Association of International Agricultural and Extension Education. Durban,South Africa..PP.390 – 396.

Sharghi,T.,Sedighi, H. and Eftekhari, A.R. (2010): Effective factors in achieving sustainable agriculture. *Am. J. Agri. & Biol. Sci*., 5 (2): 235-241

Swanson, B.E., Robert, P.B. and Sofranko, A.(1997): Improving agricultural extension. A reference manual , F.A.O. ,Rome.

Tiraieyari, N., Hamzah, A., Abu Samah, B. and Uli, J.(2013): Knowledge And Perceptions Of Extension Workers On Sustainable Agricultural Practices , *American Journal of Environmental Science* 9 (1), 45 - 50. doi:10.3844/ajessp.2013.45.50

Titus, B. and Adefisayo, B. (2012): Institutional and Technical Factors Influencing Sustainable Agricultural Practices in Nigeria, *International Journal of Science and Technology (IJST)*,1(11) : 609 – 621.

Veisi, H., Hematyar, H., Kerdar, H.A,(2008): Exploring the Relationship Between Students' Knowledge and Perception Towards Sustainable Agriculture, *Environmental Sciences*, 5(2),39 – 50.

Williams, D.(2000): Students' Knowledge Of And Expected Impact From Sustainable Agriculture , *Journal of Agricultural Education*, 41(2), 19 – 24.

Table 1. Distribution of respondents according to knowledge of sustainable agriculture experiences and practices. (N = 180)

Level of knowledge	Score rang	n	%	Average Level of knowledge
Low	1 - 18	88	48.9	
Medium	19 - 36	56	31.1	22.06
High	37 - 54	36	20.0	
Total		180	100	

Source: Field Survey Data, 2014

Table 2. Average knowledge level of Sustainable agriculture experiences and practices

NO	practices	Respondents knowledge level				Weighted mean	Knowledge category
		Non	low	medium	high		
		n	n	n	n		
1	Covering gropes	115	60	5	0	2.61	High
2	Use of animal manure	93	78	9	0	2.47	High
3	Mixed cropping	55	67	48	10	1.93	Medium
4	Rotational grazing	45	58	67	10	1.77	Medium
5	Reduce rate of herbicides	40	47	60	33	1.5	Medium
6	Narrow strip intercropping	37	44	68	31	1.48	Medium
7	Use of low input livestock facilities	33	48	53	46	1.38	Medium
8	Recycling agricultural wastes	25	44	63	48	1.25	Medium
9	Conservation tillage	15	42	73	50	1.21	Medium
10	Reduce nitrogen fertilizer rates	29	37	45	69	1.14	Medium
11	Use of green manure	25	31	57	67	1.08	Low
12	Herbicides resistant crop	25	40	35	80	1.06	Low
13	Mulching (mulch weeding)	22	33	56	69	1.04	Low
14	Insect resistant crop	10	28	46	96	0.79	Low
15	Crop rotation	4	25	40	111	0.52	Low
16	Soil testing	8	17	35	120	0.51	Low
17	Integrated pest management(IPM)	8	13	39	120	0.49	Low
18	No till	0	7	15	158	0.16	Low
	All practices					1.23	

Source: Field Survey Data, 2014

Table 3. Distribution of respondents according to characteristics and knowledge level.

Categories of characteristics		Categories of knowledge level								Chi square
		low		medium		high		total		
		n	%	n	%	n	%	n	%	
Age (years)	18 – 28	16	8.9	6	3.3	3	1.7	25	13.9	
	29 – 39	15	8.3	11	6.1	10	5.6	36	20.0	15.3ns
	40 – 50	27	15	18	10	8	4.4	53	29.4	
	51 – 61	27	15	14	7.8	7	3.9	48	26.7	
	62 - 72	3	1.7	7	3.9	8	4.4	18	10.0	
	Total	88	48.9	56	31.1	36	20	180	100	
educational	Primary	3	1.7	7	3.9	—	—	10	5.6	
attainment	Middle	27	15	9	5	3	1.7	39	21.7	29.1*
	Secondary	18	10	28	15.6	11	6.1	57	31.6	
	Technical	15	8.3	6	3.3	11	6.1	32	17.8	
	University	25	13.9	6	3.3	11	6.1	42	23.3	
	Total	88	48.9	56	31.1	36	20	180	100	
cultivated area	<1.5	10	5.6	12	6.7	6	3.3	28	15.6	
(ha)	1.5-2.5	37	20.5	18	10	14	7.8	69	38.3	4.93ns
	>2.5-3.5	25	13.9	15	8.3	12	6.7	52	28.9	
	>3.5-4.5	13	7.2	7	3.9	2	1.1	22	12.2	
	>4.5	3	1.7	4	2.2	2	1.1	9	5	
	Total	88	48.9	56	31.1	36	20	180	100	
Years of	4 – 10	4	2.2	6	3.3	5	2.8	15	8.3	
experience	11 – 17	21	11.7	10	5.6	8	4.4	39	21.7	7.13ns
	18 – 24	27	15	17	9.4	7	3.9	51	28.3	
	25 – 31	29	16.1	16	8.9	9	5	54	30.0	
	32 - 38	7	3.9	7	3.9	7	3.9	21	11.7	
	Total	88	48.9	56	31.1	36	20	180	100	
annual	2000-3000	5	2.8	5	2.8	—	—	10	5.6	
revenue ($)	3001-4001	14	5.8	11	6.1	8	4.4	33	18.3	14.21ns
	4002-5002	25	13.9	14	7.8	11	6.1	50	27.8	
	5003-6003	40	22.2	20	11.1	10	5.6	70	38.9	
	6004-7004	4	2.2	6	3.3	7	3.9	17	9.4	
	Total	88	48.9	56	31.1	36	20	180	100	

Source: Field Survey Data, 2014

ns: not significant. * : significant at 0.05 level of chi-square.