PERCEPTIONS OF EXTENSION AGENTS' EDUCATIONAL NEEDS REGARDING SUSTAINABLE AGRICULTURE IN THE KHORASAN PROVINCE, IRAN

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Abstract

As Iran addresses its goal of self-sufficiency in the production of food and fiber products, sustainable agriculture practices are gaining interest within Extension and the Ministry of Agriculture as a means of achieving this goal. Dependence on pesticide and insecticide imports, compounded by a growing population, limited arable land and high soil erosion, has lead to the call for more appropriate agricultural practices. Little is known, however, about what knowledge and educational needs Extension agents have regarding sustainable agriculture practices. A random sample of Extension agents (N = 90) in the Khorasan Province, Iran was surveyed. Most agents reported they needed more training on sustainable agriculture practices before they coulddisseminate this innovation. To receive this information, agents indicated they wanted more flexible (less compulsory) trainingprograms thatfocused on successful programs in other countries. Agent training should be focused on linkages with local research centers and faculty. Agents perceived a need for more Extension-education programs.

Introduction

The human population is expected to increase by 1 billion people (the equivalent of an additional China) each decade well into the next century. Most of this population growth will occur in the developing nations (FAO, 1993; Swanson 1997), placing further stress on arable land bases. The concept of sustainable agriculture is a relatively recent response to interrelated environmental and economic concerns. In Iran, sustainable agriculture, is gaining popularity among extension agents, farmers, and various organizations and ministries, in particular, within Extension and the Ministry of Agriculture (Chizari, Pezeshki, Lindner, 1998). Crosson (1992) defined sustainable agriculture as " . . . one that can indefinitely meet the demands for food and fiber at socially acceptable economic and environmental costs." York (199 1) stated the goal of sustainable agriculture should be to maintain production levels necessary to meet the increasing aspirations of an expanding world population without degrading the environment. It implies concern for generation of income, promotion of appropriate policies, and conservation of natural resources. Several factors are influencing these organizations to consider sustainable agriculture practices. Iran has limited arable land, compounded by high soil erosion. Iran's population is growing. Iran is dependent on rice, wheat, and meat imports. Iran is also dependent on pesticide and insecticide imports. The goal of self-sufficiency in Iran has been the focus of recent research (Chizari, Karbasioun, & Lindner, 1998; Chizari, Pishbin, & Lindner, 1997; Chizari, Lindner, & Bashardoost, 1997; Pezeshki-Raad, Yoder, & Diamond, 1994). Extension agents have played an important role in helping agriculture systems overcome many problems. However, for agents to help with sustainable agricultural practices they must first understand sustainable agriculture concepts (Agunga, 1995).

Assessing educational needs of extension

agents is recognized as an important element among extension services and seen as a critical factor in the success of the organization. According to Buford, Bedeian and Lindner (1995), as Extension agents face the challenge of learning new skills to maintain their proficiency or become qualified for promotions, the importance of an effective staff training program for Extension agents becomes evident. These authors state further that to ensure Extension agents are well trained, extension management must determine training needs to increase agent capabilities. Similarly Chizari, Karbasioun, and Lindner (1998) noted that Extension will be seriously limited in its ability to plan and execute effective educational programs and other technology transfer activities, without an adequate number of well-trained agents.

According to Alonge and Martin (1995), the first step toward adoption of new ideas by farmers is to provide information on sustainable practices. What has emerged, however, is bipolar evidence from proponents among Extension agents on this subject. Agencies and institutions engaged in information dissemination and educational activities often have personnel specifically charged with informational and educational responsibilities whom themselves have information and education needs (Rollins & Golden, 1994). Shahbazi (1993) warned that to deny the lack of knowledge and the educational needs of extension agents of Iran regarding sustainable agriculture is to deny that technologies related to agriculture are changing. Karami (1995) wrote that the problems facing sustainable agriculture in Iran primarily focuses attention on ecological aspects. However, the author noted, perceptions, attitudes, educational training, and beliefs of extension agents are equally if not more important factors.

Agunga (1995) noted that Extension agents need to be trained in sustainable agriculture in order to develop their understanding, competence, and ability to teach and communicate the concepts to farmers and others. He further stated that the logic is simple: if Extension agents are not convinced of the value of sustainability, how can they be expected to educate farmers? The Extension Service, due to its large network of personnel, is in a position to formulate a cohesive structure for promoting sustainable agriculture education.

Purpose and Objectives

The purpose of the study was to determine the educational needs of extension agents regarding sustainable agriculture in Khorasan Province, Iran.

The specific objectives were:

1. Describe educational needs of Extension agents regarding sustainable agriculture in Khorasan Province, Iran.
2. Describe educational methods most useful to deliver sustainable agriculture information as perceived by Extension agents in Khorasan Province, Iran.
3. Describe characteristics in relation to season and duration of appropriate educational programs to be conducted as perceived by Extension agents in Khorasan Province, Iran.
4. Describe activities for implementing sustainable agriculture programs among farmers as perceived by Extension agents in Khorasan Province, Iran.

Methods

Population

Extension agents (N=125) in Khorasan Province, Iran were the target population for the study. Extension agents (90) were selected by simple random sample to participate in this study (Krejcie & Morgan, 1970). The Ministry of

Agriculture's Extension organization directory was used to locate the agents in each township within the province. The researchers verified the list before distribution of the survey.

Khorasan Province is the largest province of Iran (3 15,000 square kilometers), and produces many agricultural crops: Rice, wheat, rye, barley, cotton, potato, sorghum, corn, fruit, sugar cane, beef, and poultry. Khorasan is located in northeast part of the country and has 150,000 hectares of arable land. The province has a population of 6.1 million, of which 3 million live in rural areas.

Research Design and Data Analysis

The research design used for the study was a descriptive survey method. A questionnaire was developed from the review of literature. The instrument consisted of four separate sections according to the purpose and objectives of the study. A five-point Likert-type scale was used in evaluating the responses. Content and face validity were established by a panel of experts consisting of faculty members and graduate students at Tarbiat Modarres University, Iran. Instrument reliability was estimated by calculating a Cronbach's alpha. Reliability for the overall instrument was .79. A pilot-test was conducted with 20 Extension agents, not included in the sample, in two townships of Tehran Province three weeks before the study. As a result of the pilot test, minor changes in wording were made in the questionnaire. Data were collected through a questionnaire mailed to the 90 Extension agents selected for inclusion in the sample. Those who failed to respond were sent a postcard reminder. If the reminder failed to elicit a response, a follow-up letter and duplicate questionnaire were mailed. Eighty-nine participants responded to the questionnaire for a response rate of 99%. Data collected were analyzed using the Statistical Package for the Social Sciences, Personal Computer Version (SPSS Inc., 1991). Appropriate statistical procedures for description (frequencies, percents, means, and standard deviations) were used.

Results

Selected demographics of survey participants are listed below. All of the participants had a Bachelor of Science degree in an agriculturally related degree area. However, only 8% of the respondents were Agricultural Extension majors. All of the participants were male. Thirty-seven percent of respondents were between the ages of 25-32 years old. Thirty-five percent had one to five years experience working for Extension. Over half of the agents (60%) were married.

Objective One

Respondents were asked to indicate their educational perceptions for sustainable agriculture topics. As shown in Table 1, 79% of the Extension agents agreed or strongly agreed that they needed training regarding the sustainable agriculture practice of integrated pest management. Seventy-six percent of the Extension agents agreed or strongly agreed that they needed training on economical aspects related to sustainable agriculture. Seventy-five percent of participants agreed or strongly agreed that they needed training on natural resource conservation as it related to sustainable agriculture. Sixty percent of the participants agreed or strongly agreed that they needed training on the role of agricultural Extension and education in dissemination of sustainable agriculture practices and development. The only item to receive less than a 50% agree or strongly agree preference by Extension agents was use of legumes to soil crop nitrogen cycle (42%) as it relates to sustainable agriculture.

Objective Two

Table 2 summarizes how Extension agents wanted to receive information regarding sustainable agriculture. A majority (95%) of the

Extension agents preferred visits to other countries with advanced sustainable agriculture programs. Visits to research centers and closer linkage with researchers was the next preferred educational method (86%) among agents. Short term inservice courses, and result and method demonstrations were also highly rated. The three lowest rated items were radio and television programs among Extension agents (6 1 %), Extension publications (58%), and conference and seminar meetings (40%).

Table 1. Extension Agents' Perceptions of Educational Needs Regarding Sustainable Agriculture

Rank	Responses	Frequency"	Percentage	M[b]	SD
1	Integrated pest management	70	79	4.1	0.9
2	Economics of sustainable agriculture	68	76	4.0	1.0
3	Role of Agricultural Extension	60	67	4.0	0.9
4	Natural resource conservation	67	75	3.9	0.8
5	Organic matter management	59	66	3.8	1.0
6	Knowledge of crop varieties for each region	58	65	3.8	1.1
7	Soil conservation	54	60	3.7	1.1
8	Chemical use and application	49	55	3.6	1.1
9	Use of legumes to soil nitrogen cycle	38	42	3.5	1.2

"Number of agree and strongly agree responses; [b]Scale: l=Strongly disagree; 2=disagree; 3=no opinion; 4=agree; 5=strongly agree

Table 2. Extension Agents' Perceptions of Educational Methods for Receiving Information Regarding Sustainable Agriculture

Rank	Educational Methods	Frequency"	Percentage	M[b]	SD
1	Visits to other countries with advanced sustainable agriculture programs	85	95	4.7	0.6
2	Visits from research centers and closer working relations with researchers	77	86	4.5	0.8
3	Short term inservice courses	80	90	4.4	0.7
4	Result and method demonstration	70	79	4.1	1.0
5	Establishing discussions and lectures meetings at work	63	71	3.8	0.9
6	Individual contact with researchers	58	65	3.8	0.9
7	Extension publications	52	58	3.7	0.8
8	Radio and television programs	54	61	3.7	1.0
9	Seminars and Conferences	36	40	3.4	1.1

"Number of agree and strongly agree responses; [b]Scale: l=Strongly disagree; 2=disagree; 3=no opinion; 4=agree; 5=strongly agree

Objective Three

As shown in Table 3, 47% of Extension agents stated that winter is the most appropriate season for implementing educational programs. Spring and summer were each preferred by 25% of the respondents. Only 3% of extension agents indicated a preference for autumn as an appropriate season for implementing training programs.

Table 3. Extension Agents' Perceptions of Appropriate Seasons for Implementing Educational Programs Regarding Sustainable Agriculture

Season	Frequency[a]	Percentage
Spring	22	25
Summer	22	25
Autumn	3	3
Winter	42	47

[a]N=89

Table 4 shows duration of effective educational programs as perceived by Extension agents. A majority (52%) of the Extension agents stated that one to two weeks is an appropriate duration for conducting educational programs about sustainable agriculture. Six percent of the Extension agents stated that more than three weeks is an appropriate duration for conducting educational programs about sustainable agriculture.

Table 4. Extension Agents' Perceptions of Duration for Educational Programs Regarding Sustainable Agriculture

Duration	Frequency[a]	Percentage
One Week	23	26
One to Two Weeks	46	52
Two to Three Weeks	15	17
More Than Three Weeks	5	6

[a]N=89

Objective Four

Table 5 summarizes perceptions of Extension agents for implementing effective activities regarding sustainable agriculture among farmers. Most Extension agents (86%) reported a need for more Extension education activities as an effective tool in disseminating sustainable agriculture among farmers. The second most effective activity was introducing appropriate technology (74%). The two lowest rated activities were increasing the price of inputs which are harmful to natural resources (43%) and distribution of Extension publications (36%).

Conclusions

Based on the findings of this study, the following conclusions were drawn.

1. Most Extension agents in the Province indicated they had utilfilled educational needs regarding sustainable agriculture. The highest rated educational needs were integrated pest management, economics of sustainable agriculture, role of agricultural Extension, and natural resource conservation. These topics are central to Iran's goal of self-sufficiency in food and fiber production. For example, the loss of crops to pests in Iran is extremely high. Control of pests still depends heavily on pesticides. Unless the introduction of pests into new regions is prevented by quarantine measures or eradication, the control of imported and indigenous pests must depend on pesticides until effective sustainable agricultural pest management strategies can be developed.

Table 5. Extension Agents' Percentions of Activities for Implementing Sustainable Agriculture Programs Among Farmers

Rank	Activity	Frequency"	Percentage	M[b]	SD
1	More Extension-education	77	86	4.3	0.7
2	Introducing new technology	66	74	4.0	0.8
3	Workshops and class	70	79	3.9	0.7
4	Using key and local leaders	59	66	3.9	0.9
5	Establishing associations	65	73	3.8	0.9
6	Formal education colleges of agriculture	43	48	3.8	1.0
7	Taking sustainable agriculture practices into consideration as an ideal farming practice	55	62	3.8	1.0
8	Price increase of inputs which are harmful to environment and natural resources	38	43	3.2	1.1
9	Distribution of Extension publications	32	36	3.0	0.9

"Number of agree and strongly agree responses; [b]Scale: l=Strongly disagree; 2=disagree; 3=no opinion; 4=agree; 5=strongly agree

2. Extension agents in the Khorasan Province, Iran preferred to receive information on sustainable agriculture through visits to other countries with advanced sustainable agricultural programs and visits from research centers and closer working relations with researchers. The first of which would require substantial capital outlay and commitment from the Extension organization and Ministry of Agriculture. The second option presents a more fiscally palatable opportunity.

3. Agents in the Khorasan Province, Iran preferred to attend sustainable agriculture educational programs during the winter months, lasting from one to two weeks.

4. Extension agents in the Khorasan Province, Iran perceived the need for more Extension education programs and introduction of new technologies as key to implementing effective activities regarding sustainable agriculture among farmers.

Recommendations

Based on the conclusions of this study, the following recommendations were made.

1. Inset-vice programs are needed to help agents understand new practices and their applications in various farming systems. Sustainable agriculture education with agents should begin with topics of high interest before moving on to other topics of equally important, but of less interest to agents.

2. Because of the costs associated with international travel Extension agent training should be focused on linkages with local research centers and faculty.

3. Inservice and training programs are typically dictated from policy makers in Tehran, Iran and attendance is mandatory. Extension agents' preferences for inservice and training programs during winter months lasting from one to two weeks should be incorporated into Iran's Extension Service and Ministry of Agriculture's policies and procedures regarding timing and length of its programs.

4. To implement sustainable agriculture programs, Iran's Extension Service and Ministry of Agriculture should promote and implement more Extension education

programs and introduce and demonstrate new technologies.

5. More research needs to be conducted in different Provinces to determine the educational needs of Extension agents regarding sustainable agriculture.

6. As Iran works on its goal of becoming self-sufficient in food and fiber production, results from this study may serve as a basis for further research regarding sustainable agriculture, and educational needs of extension agents. Education has a role in helping Extension agents, policy makers, and others in developing methods to solve problems associated with natural resource management and profitable farming systems. For sustainable agriculture to succeed, policy formulation must be developed in a new way. Policy processes must be enabling and participatory, creating the conditions for sustainable development based more on locally available resources and local skills and knowledge. Effective policy processes will have to bring together a range of actors and institutions for creative interaction and address multiple realities and unpredictability. The extent to which these problems and issues will be solved systematically remains uncertain.

7. Finally, more research is needed to determine the relationship between the goal of self-sufficiency and sustainable agriculture practices. The success of sustainable agriculture depends not just on the motivations, skills, and knowledge of individual agents and farmers but, on action taken by groups or communities as a whole. This makes the task more challenging. Simple extension of the message that sustainable agriculture can match conventional agriculture for profits, as well as produce extra benefits for society as a whole, will not suffice (Swanson, 1997).

References

Agunga, R. A. (1995). What Ohio Extension agents say about sustainable agriculture. Journal of Sustainable Agriculture, 5(3), 169-l 78.

Alonge, A. J. & Martin, R. A. (1995). Assessment of the adoption of sustainable agriculture practices: Implications for agricultural education. Journal of Agricultural Education, 36(3), 34-42.

Buford, J. A., Jr., Bedeian, A. G., & Lindner, J. R. (1995). Management in Extension (3rd ed.). Columbus, OH: Ohio State University Extension.

Chizari, M., Karbasioun, M., & Lindner, J. R. (1998). Obstacles facing extension agents in the development and delivery of extension educational programs for adult farmers in the province of Esfahan, Iran. Journal of Agricultural Education, 39(1), 48-55.

Chizari, M., Pezeshki, G., & Lindner, J. R. (1998). Perceptions of extension agents regarding sustainable agriculture in the Khorasan Province of Iran. Conference papers of the Annual Conference of the Association for International Agricultural and Extension Education. Tucson, Arizona.

Chizari, M., Pishbin, A. R., & Lindner, J. R. (1997). Self-perceived professional competencies needed and possessed by agricultural extension agents in the Fars Province of Iran. Journal of Extension Systems. 13 (1), 146-154.

Chizari, M., Lindner, J. R., &Bashardoost, R. (1997). Participation of rural women in rice production activities and extension education programs in the Gilan Province, Iran. Journal of International Agricultural and Extension Education. 4 (3), 19-26.

Crosson, P. (1992). Sustainable food and fiber production. Paper presented at the Annual

Meeting of the American Association for the Advancement of Science. Chicago.

FAO (1993). The challenges of sustainable forest management: What future for the world's forest. Rome: FAO.

Karami, E. (1995). Agriculture extension: The question of sustainable development in Iran. Journal of Sustainable Agriculture, 5(2), 47-54.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psvcholonical Measurement, 30, 607-710.

Pezeshki-Raad, G., Yoder, E. P., & Diamond, J. E. (1994). Professional competencies needed by extension specialists and agents in Iran. Journal of International Agricultural and Extension Education. l(l), 45-53.

Rollins, J. T., & Golden, K. (1994). A proprietary information dissemination and education system. Journal of Agricultural Education, 35(2), 37-43.

Shahbazi, E. (1993). Development and rural extension. Tehran, Iran: Center for Tehran University publication.

Swanson, B.E. (ed.). (1997). Improving agricultural extension: A reference manual. Rome: FAO.

York, E. T. (1991). Agricultural sustainability and its implications to the horticulture profession and the ability to meet global food needs. HortScience, 26, 1252-1256.