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Analysis of the Training Needs of Multi-Functional Extension Agents Associated with Sustainability

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Abstract

The purpose of this study was to identify and prioritize the training needs of multi-functional extension workers related to sustainability in Isfahan Province, Iran. The target population consisted of all multi-functional extension workers in the province (N = 95). The entire population was surveyed. Therefore, sampling procedures were not utilized and the results are limited to the study population. Factor analysis and ranking indicated that the five most important training needs of extension workers were: (1) participatory extension, (2) participatory techniques in rural development, (3) biodiversity protection methods, (4) sustainable fertilization methods, and (5) improved utilization of indigenous knowledge of rural peoples. The years of residence in rural areas, educational level, and active participation in training courses influenced the level of training needed. Training needs were different for native as compared to non-native extension workers and there was a negative correlation between the length of work tenure and need for training regarding sustainability.

Keywords: Training Need, Multi-Function, Extension Agent, Sustainability, Sustainable Agriculture

Introduction

Issues such as environmental degradation, the elimination of small family farms from agriculture, the erosion of rural communities, and the inadequate conservation of fragile lands have made agricultural sustainability a significant concern. Williams (2000) stated that “economically sound, environmentally protective, and social acceptability were the three widely advocated components of sustainable agriculture” (p. 19). According to Al-Subaiee, Yoder, and Thomson (2005), the aim of sustainability in agriculture is a healthy and ample food supply for both the present and future generations through the wise utilization of natural resources.

Given the need for sustainable practices in today’s world, multi-functional extension workers are faced with many changes when working with their clientele. According to Wals and Bawden (2000), dealing with complexity, uncertainty, and conflicting norms, values and interests associated with sustainability requires a fundamental transformation in the competencies required by multi-functional extension workers. These workers are the potential facilitators of sustainable agricultural and rural development. Therefore, if extension workers are to improve their on-the-job effectiveness, they must receive continuous in-service training in-line with their training needs about sustainability. As such, in-service training needs assessments are essential for a productive workforce. Once these needs are determined and prioritized, training resources can be utilized more efficiently.

Agunga (1995) found that multi-functional extension workers have traditionally “played an important role in helping agricultural systems overcome complex problems. However, for extension workers to help with sustainability practices, they must first understand sustainable agriculture concepts” (p. 184). Then they must become familiar with sustainable methods and practices. Onazi (1984) stated

“One of the main factors limiting the development of effective training programs for extension workers in developing countries is the total lack of information on the training needs of extension workers” (p. 137). Onazi (1984) identified seven essential areas of training for extension workers. These included: (1) technical knowledge in agriculture, (2) agricultural extension philosophy, (3) organization and administration, (4) communications in extension, (5) program planning, (6) the use of research methods, and (7) evaluation of extension programs and human development.

Mount (1949), Mathews (1950), Cook (1975), and McCormick (1959), in a systematic analysis of the training needs of extension workers in the United States and Canada, found seven main areas of professional needs. These were the establishment and promotion of cooperatives, extension training methods, human development, communication, technology, research and evaluation. Singh and Mohammed (1982), in a study of the training needs of extension workers in Northern Iraq found that the main areas of training required by extension workers were extension methods, communication, program planning, and technical knowledge in soil fertility, crop production, and irrigation.

Findings from a study by Menon and Annamali (1979) indicated that among the most significant training needs of village level workers in Tamil Nadu, India were subject matter in agriculture, organization and administration of extension programs, program planning and development, farmer training, understanding social systems, the educational process, and human development. Gamon, Mohamed and Trede (1992) found that “orientation for new extension professionals in Iowa should emphasize meeting with county, area, and state staff, time and resource management, motivation of clientele, and teaching methods” (p. 28). In an analysis of extension

agents' educational needs regarding sustainable agriculture in Khorasan Province, Iran, Chizari, Linder, and Zoghie (1999) found that "the highest rated topics were integrated pest management, economics of sustainable agriculture, the role of agricultural extension, and natural resource conservation" (p. 23). Tladi (2004) in an assessment of training needs of extension agents in south-Central Botswana found that the agents needed training in 14 job skill areas including among others, interpersonal communication skills, practical farm skills, conducting needs assessment surveys and mobilizing people to form groups.

As can be seen from the literature review, there is little information available on training needs of extension workers concerning sustainability issues. Hence, this study is considered to be a significant contribution toward filling this gap. However, the authors fully acknowledge that additional steps will also be required. As in all educational programming efforts, training is only one component. Constant feedback will be required from the training participants and in Extension settings such as Isfahan Province, stakeholder input will also be important. Short, intermediate, and long-term outcomes also need to be established in order to measure whether the training achieved the desired results (Boyd, Taylor-Powell, & Shepard, 2001).

Purpose and Objectives

The purpose of this study was to identify and prioritize the training needs of multi-functional extension workers in Isfahan Province, Iran concerning sustainability. Specifically, the objectives of the study were to:

1. Describe the demographic profile of Isfahan Province multi-functional extension workers;
2. Identify the training needs of multi-functional extension workers regarding sustainability; and

3. Determine the relationships among selected variables and training needs of multi-functional extension workers.

Methods

The population for this study included all multi-functional extension workers in Isfahan Province ($N = 95$). The study objectives were accomplished in two phases. The first phase involved an interview study and the second phase utilized a written survey questionnaire. The first phase was designed to obtain more insight into the research purpose and to sharpen the hypotheses for the survey portion.

The researchers developed a questionnaire consisting of two sections: (1) training needs and (2) demographic data. A Likert-type scale was used to assess the respondents' level of agreement on the list of items dealing with sustainability training needs. Respondents rated their levels of agreement using the following scale: 1 = very low agreement; 2 = low agreement; 3 = medium agreement; 4 = high agreement; 5 = very high agreement. To establish content and face validity of the survey instrument, a panel of faculty at Tarbiat Modarres University with professional experience in extension reviewed the instrument. To establish reliability, the instrument was sent to a sample of 17 extension agents from the population of all multi-functional extension workers in Tehran Province who were not included in the study. An internal consistency analysis on the pilot test data produced a Cronbach's alpha coefficient of 0.84. The instrument was administered by the researchers to all multi-functional extension workers from Isfahan Province ($N = 95$) in attendance at a professional meeting.

Statistical data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS 11.5) for windows. Descriptive statistics (frequencies, means, and standard deviations) were used to analyze the data. Factor analysis, by

means of the principal component method was performed on the responses to the items in “part a” of the questionnaire. In this case, five factors were extracted. Items were grouped into the five factors based upon their factor loading using an orthogonal and varimax rotation. Stepwise multiple regression, Spearman correlation coefficient, and U-test were employed to analyze the relationships between and among the variables.

Findings/Results

Objective 1 was to describe the demographic profile of multi-functional extension workers in Isfahan Province. Among the 95 respondents, 30% were over 40 years of age, 41.1% were between 30 and 39 years of age and 28.9% were between 20 and 29. Eighty-two percent had an agricultural background and the remaining 18% did not. Of the 95 respondents, 65% had a high school diploma and 32.5% had some college training and 2.5% of the respondents had educational levels below that of a high school diploma. Thirty-five percent of respondents were from rural villages and 65% were from urban areas. A total of 68.7% of the respondents had more than 10 years of work experience and at least 5 years of residence in rural areas. The remaining 31.3% of the responding extension workers had less than 10 years of work experience and had resided in a rural area for less than five years.

The methods through which multi-functional extension workers preferred to receive training are shown in Table 1.

Table 1

Methods through which Multi-functional Extension Workers Preferred to Receive Training

Methods	<i>f</i>
Cooperative learning techniques	50
Workshops	25
Group discussions	15
Lectures	10

As indicated in Table 1, cooperative learning techniques were the most preferred training method, followed by workshops, group discussions, and lectures. The respondents were also asked to indicate where they would prefer to receive their in-service training. The majority (71%) indicated that they would prefer to receive in-service training at an agricultural college and 59% preferred to be trained by a college faculty member.

Objective 2 of the study was to identify the perceptions of multi-functional extension workers regarding sustainability. As indicated in Table 2, factor analysis grouped the training need items into five factors. The factors were named and ranked as follows: (1) participatory extension, (2) participatory techniques in rural development, (3) biodiversity protection methods, (4) sustainable fertilization methods, and (5) improved utilization of indigenous knowledge of rural peoples.

Table 2

Means, Standard Deviations, and Ranks of Training Need Items for each Factor

Factor/Item	<i>M</i>	<i>SD</i>	Factor Loading
Participatory extension	4.32	0.47	
Participatory extension planning	4.21	0.50	0.85
Participatory monitoring & evaluation	4.31	0.54	0.82
Participatory needs analysis	4.34	0.49	0.84
Farmer's organization establishment	4.42	0.51	0.81
Participatory techniques in rural development	4.11	0.54	
PRA tools	4.22	0.61	0.75
Participatory technology development	3.99	0.94	0.72
Beneficiary participation	4.01	0.87	0.74
Gender role and involvement	4.22	0.99	0.76
Biodiversity protection methods	4.00	0.54	
Integrated pest management	3.99	0.91	0.65
Integrated weed management	4.03	0.56	0.68
Agro forestry	3.98	0.99	0.62
Natural resource management	4.00	0.78	0.59
Sustainable fertilization methods	3.67	0.87	
Methods of minimizing chemical application	3.97	0.87	0.63
Organic agriculture	3.49	1.02	0.65
Integrated farm management	3.66	0.79	0.66
Low-input sustainable agriculture	3.70	0.67	0.65
Integrated crop/livestock systems	3.53	0.98	0.65
Improved utilization of indigenous knowledge of rural peoples	3.56	0.81	
Indigenous irrigation methods	3.60	0.83	0.71
Integrating indigenous knowledge with technical knowledge	3.55	0.77	0.69
Women's roles in processing of animal products	3.56	0.81	0.70
Process of exchanging indigenous knowledge	3.53	0.79	0.72

Objective 3 was to determine the relationships between and among selected variables and the training needs of extension workers. Stepwise multiple regression revealed that three extension workers' characteristics (years of residence in rural

areas, educational level, and active participation in on-the-job training courses) explained a statistically significant portion of the variance (R Square = .80) associated with the extent of training needs (Table 3).

Table 3

Stepwise Regression of Extension Workers' Characteristics on Extent of Training Needs Regarding Sustainability

Variable	<i>B</i>	Std. Error	Beta	<i>t</i>	Sig.
Years of settlement in rural areas	-4.9	.04	-.15	-6.7	.001
Educational level	19.2	3.3	.88	43.45	.02
Active participation in training courses	-3.22	.04	-.21	-3.46	.01
(Constant)	-102.6		295	-5.48	.001

The number of years of residence in rural areas explained the greatest amount of variance for the extent of training needs (61%). Education level (10%) and active participation in training courses (8.9%) explained nearly 19% of the variance. Spearman rho (r_s) was used to determine the relationship between the length of work tenure of multi-functional extension workers and training needs. The results indicated that there was a negative correlation ($p = 0.041$, $r = 0.22$) between length of work tenure and training needs. This implies that as the length of job tenure increases, training needs of multi-functional extension workers decrease. A U -test indicated that training needs were different for native as compared to non-native agents ($U = 1.99$, $p = 0.03$).

Conclusions

The following conclusions were drawn from the results of the study:

1. The most important training needs of multi-functional extension workers were in the areas of participatory extension, participatory techniques in rural development, biodiversity protection methods, sustainable fertilization methods, and improved utilization of indigenous knowledge of rural peoples.
2. Agents who had lived longer in rural settlements and who were active participants in training courses were less likely to indicate a need for additional training. On the other hand, it should be noted that agents with higher levels of education indicated a desire for further training.
3. Native extension workers had different training needs than did non-native workers.
4. Agents who had been employed longer felt less need for training than their counterparts.

Implications

Achieving sustainability in agricultural operations requires in-service training programs and encouraging multi-functional extension workers to collaborate for planning and implementing these programs. Based upon the results of this study, the implication clearly exists that a high priority should be given to planning, developing, and implementing in-service training programs for multi-functional extension workers regarding sustainability issues. The planning and development for this in-service training should take in to consideration the agents' level of education and their life and work experience with rural people. Since the urgency to address sustainability issues in agriculture is not only a regional challenge, the implications of this study for sustainable extension agriculture programs among agricultural communities extends beyond Isfahan Province. Higher agricultural education institutes can cooperate with The Organization of Agricultural Research and Education in developing these in-service training programs.

Recommendations

Based upon the conclusions and implications several recommendations need to be considered. First of all, while the input from the participating extension workers is important, it is recommended that other stakeholders now be contacted to assess their view of the findings. A participatory approach to extension work has been advanced through this study and therefore would benefit from additional input and/or confirmation by others of the results. It is further recommended that benchmarks be established to measure progress from the suggested training in meeting the goal of increasing extension worker effectiveness related to sustainability.

Although native and non-native extension workers indicated different training needs, this study did not delve into exactly what the differences were.

Therefore, it is recommended that additional inquiry take place to determine what the differences are. It is also recommended that since sustainability issues cross regional boundaries, it is appropriate to replicate this study in other provinces as well. Finally, it is recommended that a study of multi-functional farmers' attitude toward sustainable agriculture practices should also be conducted. Planning sustainable agricultural programs based on the findings of this study can positively affect the diffusion rate of sustainable agricultural practices by farmers as the principal actors in promoting sustainability in agriculture.

References

- Agunga, R. A. (1995). What Ohio extension agents say about sustainable agriculture. *Journal of Sustainable Agriculture*, 5(3), 169-187.
- Al-Subaiee, S., Yoder, S. F., & Thomson, J. (2005). Extension agents' perceptions of sustainable agriculture in the Riyadh Region of Saudi Arabia. *Journal of International Agriculture and Extension Education*, 12(1), 5-13.
- Boyd, H., Fitzsimmons, E., Taylor-Powell, E., & Shepard, R. (2001, May). *The LOGIC model*. A seminar presented at the Western Region Train the Trainer meeting, May 1-3, 2001, Boise, Idaho.
- Chizari, M., Lindner, J. R., & Zoghie, M. (1999). Perceptions of extension agents' educational needs regarding sustainable agriculture in the Khorasan Province, Iran. *Journal of Agricultural Education*, 40(4), 20-27.
- Cook, B. D. (1957). *Comparative analysis of the training needs for county agricultural agents in Tennessee*. Unpublished doctoral dissertation, University of Wisconsin, Madison.
- Gamon, J. A., Mohamed, I., & Trede, L. D. (1992). Self-perceived orientation training needs of extension professionals in Iowa. *Journal of Agricultural Education*, 34(4), 24-29.
- Mathews, J. L. (1951). *A method for determining training needs and planning training programs*. Unpublished doctoral dissertation, University of Chicago.
- McCormick, R. W. (1959). *Analysis of training needs of county extension agents in Ohio*. Unpublished doctoral dissertation, The Ohio State University, Columbus.
- Menon, K. P., & Annamali, R. (1979). An analysis of the training needs of village level workers. *Madras Agricultural Journal*, 62(10-12), 812-819.
- Mount, J. T. (1949). *Training for extension work in agriculture*. Unpublished master's thesis, University of Wisconsin, Madison.
- Onazi, O. C. (1984). An analysis of the training needs of potential agricultural extension workers in northern Nigeria. *Journal of Rural Economic Development*, 9(2), 133-139.
- Singh, R., & Mohammed, Z. H. (1982). A study of the training needs of extension workers belonging to northern Iraq. *Mesopotamia Journal of Agriculture*, 14(1), 5-17.
- Tladi, F. M. (2004). Job content and training needs of agricultural extension agents in south-central Botswana. *Journal of International Agriculture and Extension Education*, 11(3), 33-39.

Wals, A., & Bawden, R. (2000). *Integrating sustainability into agricultural education: Dealing with complexity, uncertainty and diverging worldviews*. SOCRATES Thematic Network for Agriculture, Forestry, Aquaculture and the Environment (AFANET), University of Aberdeen, Scotland.

Williams, D. L. (2000). Students' knowledge of and expected impact of sustainable agriculture. *Journal of Agricultural Education*, 41(2), 19-24.