New Professionalism: Implications for Iranian Extension Agents Toward Environmentally Sound Agriculture

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Abstract: This study was focused on extension professionals' perception of the necessary attributes for extension agents to accomplish environmentally sound agriculture in new professionalism context. A sample of 87 respondents was selected through simple random sampling technique. A survey study was applied as a methodology of research work. Data were collected using a structured questionnaire that addressed to evaluate extension professionals' responses with respect to the necessary attributes for extension agents to accomplish environmentally sound agriculture. For determining the validity of questionnaire, the face and content validity was used. Cronbach's alpha was used to measure reliability of the instrument, which was 0.90 and showed the instrument reliability. Descriptive findings revealed that "Ability to use new information and communication technologies", "Ability to use participatory methods" and "Skills regarding negotiation, dialogue and conflict management" were the first to third attributes for extension agents toward sustainability, respectively. According to Factor Analysis, the implications for extension agents were categorized into two groups consisting: "Multi-functional attributes" and "Collective action attributes" that those factors explained 70.94% of the total variance of the research variables.

Key words: Agricultural extension · Professionalism · Sustainability · Extension agent

INTRODUCTION

Extension could play key role to foster sustainability through its educational programs [1], and to achieve this purpose extension agents as a component of extension system have a vital role in helping farmers for the application of sustainable agriculture practices[2]. However, the question is whether extension agents have been prepared to carry out this task? In response to this question, we can point out to the new paradigm and thoughts that have been emerged in agricultural extension. Within positivist epistemology, as a dominant epistemology in TOT model, extension is looked upon as a necessary delivery mechanism of results of scientific research [3]. In this model, extension agents were considered a knower and farmers the ignorant. Transfer of technology was the assumed role for the extension agents [4]. By shifting paradigm, experiences in agricultural extension and development have indicated that traditional approaches will need to transform in order to move toward sustainability [5]. In new paradigm, constructivism is the fundamental philosophical thought. Within the constructionist epistemology, extension is a means for socially constructing agrarian reality through communication and information sharing activities. Extension can be seen as a societal mechanism for facilitating social learning of appropriate responses to changing conditions [3]. Within this epistemology, in extension programs we must move from a teaching to a learning style because the central principle of environmentally sound agriculture is that it must enshrine new ways of learning about the world. In learning style, the focus is less on what we learn, and more on how we learn and with whom. This implies new roles for development professionals, leading to a whole new professionalism with new concepts, values, methods and behavior. The new professionals, make explicit their underlying values, select methodologies to suit needs, are more multidisciplinary and work closely with other disciplines, and are not intimated by the complexities and uncertainties of dialogue and action with a wide range of non-scientific people [5-10]. In this base, there is a necessity for extension agents, as development agents, to conformity with these changes.

In new paradigm, the role of agricultural extension agents is changing from transferring knowledge and technology to consultants, advisors and facilitators of the farmer learning process [11-14].

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Kroma [15] introduced participation and social learning as a suitable way of learning toward sustainability, too. She wrote that a critical aspect of the social learning process is the opportunity it creates for farmers and change/extension agents to reflect on new ideas and experiences, and on how such new insights can inform and guide subsequent action. Such a process also reflects a view of extension agents, not merely as service providers, but as facilitators, linking farmers to networks of knowledge and resources that support productive activities. An important value of a social learning approach is that extension professionals are themselves enabled to learn their way through on how to work with farmers in a participative, rather than a didactic, top-down way, while creating the social networks for facilitating exchange of knowledge between farmer to farmer, as well as between researchers and farmers. One of the most important requirements for extension professionals to success as a facilitator is encourage them to understand psychological theories through human relation training. Facilitators should be transform attitudes toward greater openness, enthusiasm, respect and humility [16].

In addition, Moyo and Hagmann [13] believe that the role of the extension agent is to facilitate learning process. This involves the facilitation of (a): a process of community development and innovation, (b): a process of collective and individual farmer learning about innovation (technical and social) to enhance the community's capacity to innovate and (c): rural knowledge management. The new role of managing and facilitating learning processes implies special skills and competencies that are far from the present technical focus of extension agents and thus to be developed. Roling and Pretty [10] emphasis on facilitating learning, too. They wrote that instead of "transferring" technology, extension agents must help farming "walk the learning path". Extension agents should seek to understand the learning process, provide expert advice where required, convene and create learning groups, and help farmers overcome major hurdles in adapting their farms.

Patterson [17] described the characteristics of tomorrow's extension agent. Who believes that extension agent of future will be prepared to manage change with a combination of knowledge, attitudes and skills that come together under three themes: (a): an autonomous learner, (b): an effective communicator and (c): a systemicist. In rethinking extension communicators, Donnellan and Montgomery [18] posed new role for extension agents as a consulting communicator. They define the consulting communicator as someone who applies knowledge of social science research to help plan communication strategies, analysis audiences and select best communication tools to achieve desired goal.

Based on the above-mentioned paragraphs, new professionalism need to trained extension agents with new competencies, knowledge, attitudes and behavior with respect to environmentally sound agriculture. According to Karbasioun *et al*. [12] and Chizari *et al.* [19], low level of Iranian extension agents' knowledge with respect to sustainable agriculture is one of the major barriers hampering adoption of sustainable agriculture practices. Totally, they do not have enough competencies to deliver extension programs regarding environmentally sound agriculture. The purpose of the present study was to identify the best attributes for Iranian extension agents to support environmentally sound agriculture.

MATERIALS AND METHODS

This study is part of a larger research project, entitled "extension mechanisms to support dimensions and policies of sustainable agriculture." The study was carried out in Iran. This investigation is quantitative and descriptive in its nature; applied in type and survey in design. The target population included a total of 170 faculty members of agricultural extension education, extension head in provinces and extension specialists of deputy of agricultural extension and farming system in the Ministry of Agriculture (*Jihad-e-Keshavarzi*) in Iran. The 87 of them were selected by random sample using the table for determining the sample from given population developed by Bartlett *et al*. [20]. The researcher verified the list before distribution of the survey to control for frame and selection threats to external validity. To collect information, a self-made questionnaire was designed. Questions were generated from the literature review. The instrument consisted of two separate sections according to the purpose and objectives of the study. The first section was designed to gather data on personal characteristics of extension specialists. The second section was designed to gather data regarding the necessary attributes for extension agents to accomplish environmentally sound agriculture in Iran. Extension professionals were asked to rate their viewpoints concerning these attributes on a five point Likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree and 5 = strongly agree. To ensure its content and face validity, the research instrument was reviewed several times by the research group and then implemented in a pilot test to measure its reliability. Questionnaire reliability was estimated by calculating Cronbach's alpha. Reliability of the overall instrument was estimated at 0.90.

It meant that instrument had high reliability. The data were collected between October 2006 and March 2007. After gathering and encoding information from the questionnaires, data was obtained for analysis. Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS, 14). Beside descriptive statistics (mean, standard deviation and variation ratio), Factor Analysis and Kruskal-Wallis test were employed for detailed analysis. A prior alpha level of 0.05 was used to determined statistical significance.

RESULTS AND DISCUSSION

The demographic characteristics of the respondents showed that the ages of the respondents ranged from 25 to 63. The mean age was 38 (SD=8.87, N =79). About 39.2% (n= 31) of the respondents belonged to the age group ranging from 31 to 40 years old. Most of the respondents in the study were male (93.7%) and only 5 persons (6.3%) were female. The respondents' years of experience ranged from two to 30. The mean years served in extension were 12.4 (SD = 8.75). Nearly one - third of agricultural extension professionals (29.1%) had served in extension for 1 to 5 years. 29.1% of extension specialists had a doctoral degree in agricultural extension and education discipline, and sixty- tow percent (n= 49) of respondents were a masters degree holders. only 8.9 % of extension specialists had a bachelor's degree (n=7). 35.4% of respondents (n = 28) were faculty members and 15.25% (n = 12) had a managerial position. Remain were extension experts (49.35 %). 35.4% of respondents worked at universities, 27.8% (n = 22) worked at Agriculture Ministry. 29.1% (n = 23) of extension specialists worked in agricultural extension services at province level and remain worked at county level (6.3%).

Table 1 depicts the respondents' perceptions towards the necessary attributes for extension agents to accomplish environmentally sound agriculture. The replies prioritized according to means and variation ratios (VR). Because VR depicts the variation of perceptions, lower VR, i.e. lower variation of the respondents' perceptions (more homogeneous), for same mean, placed on higher rank. Table 1 indicates that having professionals with "Ability to use new information and communication technologies" has first priority because of having the lowest extent of variation ratio (M = 4.65, VR = 0.30). "Ability to use participatory methods" (M = 4.60, VR = 0.32),"Having skills regarding negotiation, dialogue and conflict management" (M = 4.51, VR = 0.38) and "Ability to work as a facilitator" (M = 4.51, VR = 0.40) have allocated priorities from second to forth, respectively. Furthermore, having professionals with "Ability to mobilize local people" with the highest extent of variation ratio (M = 4.33, VR = 0.50) has allocated last priority to itself.

To categorize necessary attributes for extension agents to accomplish environmentally sound agriculture, an exploratory Factor Analysis was conducted for the data presented in Table 2. The Factor Analysis used was a principal components analysis with factor extraction and VARIMAX rotation. The four commonly used decision rules were applied to identify the factors [21]: 1) minimum eigenvalue of 1; 2) minimum factor loading of 0.4 for each indicator item; 3) simplicity of factor structure; and 4) exclusion of single item factors. By using Bartlett's test and KMO test determined whether research variable are appropriate for factor analysis (KMO = 0.803, Bartlett = 356.055, Sig =0.000). It revealed that the internal coherence of the data is appropriate. The necessary attributes for extension agents to support sustainable agriculture are

Table 1: Respondents' perceptions towards necessary attributes for extension agents to accomplish environmentally sound agriculture

Rank	Necessary attributes for extension agents to accomplish environmentally sound agriculture			
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	professionals with:	M	S.D	V.R
1	Ability to use new information and communication technologies	4.65	0.62	0.30
2	Ability to use participatory methods	4.60	0.67	0.32
3	Skills regarding negotiation, dialogue and conflict management	4.51	0.72	0.38
4	Ability to work as a facilitator	4.51	0.68	0.40
5	Ability to understand farmers' practices in terms of systems thought	4.50	0.70	0.40
6	Particular Knowledge and competencies regarding sustainable agriculture technologies	4.49	0.70	0.41
7	More multidisciplinary and work closely with other disciplines	4.33	0.86	0.47
8	Ability to mobilize local people	4.33	0.82	0.50

Scale: 1 = strongly disagree,   2 = disagree,   3 = undecided,   4 = agree and   5 = strongly agree

Table 2: Results of Factor Analysis for necessary attributes for extension agents to accomplish environmentally sound agriculture and the variables of each factor

Row	Necessary attributes for extension agents to accomplish environmentally sound agriculture	Factor 1	Factor 2
	Multi-functional attributes:		
1	Ability to understand farmers' practices in terms of systems thought	0.860	
2	Ability to work as a facilitator	0.779	
3	Skills regarding negotiation, dialogue and conflict management	0.778	
4	Ability to use participatory methods	0.769	
5	Ability to use new information and communication technologies	0.758	
6	Particular Knowledge and competencies regarding sustainable agriculture technologies	0.683	
	Collective action attributes:		
7	More multidisciplinary and work closely with other disciplines		0.873
8	Ability to mobilize local people		0.812
	Eigen value	3.71	1.970
	Percent variance	46.35	24.590
	Cumulative percentage	46.35	70.940
	Cronbach's alpha	0.90	0.720

Table 3: Kruskal-Wallis test for comparison of means for necessary attributes for extension agents by their Age, Years of experience, Organizational position and Level of Education

Attributes for extension agents	Age X^2	p	Years of experience X^2	p	Organizational position X^2	p	Level of education X^2	p
More multidisciplinary and work closely with other disciplines	9.72	0.04*	8.86	0.11	3.30	0.19	11.20	0.004**
Particular Knowledge and competencies regarding sustainable agriculture technologies	3.40	0.50	4.91	0.43	1.97	0.37	4.33	0.11
Ability to understand farmers' practices in terms of systems thought	1.90	0.76	2.23	0.82	2.75	0.25	3.7	0.15
Ability to work as a facilitator	3.94	0.41	3.75	0.60	2.02	0.36	4.96	0.08
Ability to use participatory methods	0.92	0.92	2.31	0.80	0.87	0.64	0.09	0.96
Ability to use new information and communication technologies	1.40	0.85	0.37	0.97	1.34	0.51	6.82	0.03*
Skills regarding negotiation, dialogue and conflict management	1.70	0.80	3.51	0.62	0.63	0.73	0.89	0.64
Ability to mobilize local people	2.36	0.67	2.68	0.74	5.50	0.06	2.93	0.23

*$p \leq 0.05$, **$p \leq 0.01$

categorized into two main groups. Together, these components explain 70.94% of variance. The first group, which is labeled Multi-functional attributes, consists of six items and Cronbach's alpha for this group is 0.90, which is more than sufficient. This factor had the most Eigen value (3.71). In addition, this factor explained 46.35% of the total variances of the variables. The second group, Collective action attributes, is comprised of two items. This component has a Cronbach's alpha of 0.72, which can be regarded as sufficient. In addition, this component that its eigenvalue was 1.97 explained 24.59% of the total variances of the variables (Table 2).

Based on the Kruskal-Wallis test respondents' perception with respect to the necessary attributes for extension agents to accomplish environmentally sound agriculture differed significantly by respondents' age for the attribute "More multidisciplinary and work closely with other disciplines" ($X^2 = 9.72$, p= 0.04). The findings show that the means of respondents' perceptions toward the necessary attributes for extension agents to accomplish environmentally sound agriculture significantly differed when examined by their level of education for the attributes "More multidisciplinary and work closely with other disciplines" and "Ability to use

new information and communication technologies". Respondents whose level of education was bachelor's degree was significantly less likely to agree with attribute "More multidisciplinary and work closely with other disciplines." Extension experts who had Ph.D or master's degrees were significantly more likely to agree with this attribute. In addition, who had bachelor's degree was significantly more likely to agree with attribute "Ability to use new information and communication technologies."

CONCLUSION

Human resource in extension system is considered as a key factor in agriculture and rural development process. Adequate number of well-trained agent plays a vital role for a progressive extension service. Not only, working context, financial setting, structure and management would also directly contribute in success of an efficient system, but also human resources deserves as a foundation for extension activities [22]. By shifting in philosophical foundations of rural and agricultural development's thoughts, and emerging new professionalism with new concepts, values, methods and behavior, extension agents should be adapted themselves with these changes. Currently Iranian extension agents do not have sufficient competencies, skills and knowledge toward environmentally sound agriculture. According to findings of this study, the first attribute for extension agents for the achievement of sustainability, was "Ability to use new information and communication technologies." The ability to use ICT is now assumed by most policy makers, experts, and commentators to be prerequisite to living the "information age". There is no doubt that ICTs, when effectively, constructively, and critically deployed, can serve as "the bedrock for national survival and development" and as "the engine for sustainable development" [23]. "Ability to use participatory methods" and" Skills regarding negotiation, dialogue and conflict management" were the second and third characteristics for extension agents toward sustainability, respectively. These findings underpin Leeuwis [24], Ahmadvand, and Karami [4] studies. Based on the Factor Analysis findings "Multi-functional attributes" was the most important role for extension agents toward sustainability. Considering to multidimensional concepts of sustainability [25], and dominant of systemic and holism viewpoints in new paradigm of extension, therefore, it would be necessary to train extension workers that they can be able to adapt whit these challenges. "Collective action attributes" was the next factor in Factor Analysis. This finding underpins Pretty's study [9].

REFERENCES

1. Broussard, S.R. and J.C. Bliss, 2007. Institutional commitment to sustainability: An evaluation of natural resource extension programs in universities in Alabama and Oregon. International Journal of Sustainability and Higher Education, 8(3): 272-284.
2. Agunga, R.A., 1995. What Ohio Extension agents say about sustainable agriculture? Journal of Sustainable Agriculture, 5(3): 169-187.
3. Roling, N.G. and M.A.E. Wagemakers, 1998. Facilitating sustainable agriculture, Participatory learning and adaptive management in times of environmental uncertainty, Cambridge University Press.
4. Ahmadvand, M. and E. Karami, 2007. Sustainable agriculture: Toward a conflict, management based agricultural extension. Journal of Applied Sciences, 7: 3880-3890.
5. Toness, A.S., 2001. The potential of participatory rural appraisal (PRA) approaches and methods for agricultural extension and development in 21st century. Journal of International Agricultural and Extension Education, 8(1): 25-37.
6. Chambers, R., 1993. Challenging the professions: Frontiers for rural development. London, Intermediate Technology Publications.
7. Cho, K.M. and H. Boland, 2004. Education and Extension for Multi - Functional Agriculture: Extension Concepts for Sustainable Agricultural Development in Myanmar. In the proceedings of the 20th annual conference of AIAEE, Dublin, Ireland, pp: 531-537.
8. Pretty, J.N., 1995. Regenerating agriculture. Policies and practice for sustainability and self - reliance. London, Earthscan.
9. Pretty, J.N., 1995. Participatory learning for sustainable agriculture. World Development, 23(8): 1247-1263.
10. Roling, N.G. and J.N. Pretty, 1997. Extension's role in sustainable agricultural development, in improving agricultural extension: a reference manual, Eds., B.E. Swanson and *et al.* Rome, FAO.

11. Elsey, B. and K. Sirichoti, 2002. The learning facilitation role of agricultural extension workers in the adoption of integrated pest management by tropical fruit growers in Thailand. Studies in Continuing Education, 24(2): 167-180.

12. Karbasioun, M., H. Beimans and M. Mulder, 2007. Supporting role of the agricultural extension services and implications for agricultural extension instructors as perceived by farmers in Esfahan, Iran. Journal of International Agricultural and Extension Education, 14(1): 31-44.

13. Moyo, E. and J. Hagmann, 2000. Facilitating competence development to put learning process approaches into practice in rural extension. In: Human resources in agriculture and rural development, Rome.

14. Probst, K. and J. Hagmann, 2005. Protypical approaches to innovation development. In participatory research and development for sustainable agriculture and natural resource management: Source book. Eds., J. Gonsalves and *et al.* intentional potato center - user's perspectives with agriculture research and development, Philippines, 2005.

15. Kroma, M., 2003. Participation and Social Learning: Supporting Farmer Innovation in Central Ghana. Journal of International Agricultural and Extension Education, 10(1): 43-51.

16. Grudens-Schuck, N., 2000. Extension and Grassroots Educators' Approaches to Participatory Education: Interrelationships among Training, Worldview and Institutional support. Proceedings of the Adult Education Research Conference, Vancouver, British Columbia, June 1-4.

17. Patterson, T.F., 1991. Tomorrow's extension educators - learner, communicator, systemicist. Journal of Extension,[on-line], 29 (1). Available at: http://www.joe.org/joe/1991spring/fut1.html.

18. Donnellan, L.M. and F.S., Montgomery, 2005. Rethinking extension communications: is an issue programming the key. Journal of Extension, [on-line], 29 (1). Available at: http://www.joe.org/joe/2005april/a2.shtml.

19. Chizari, M., J.R. Lindner and F. Lashkarara, 2001. Perception of Lurestan Province, Iran wheat farmers with respect to sustainable agricultural practices. Journal of International Agricultural and Extension Education, 8(3): 65-71.

20. Bartlett, J.E., J.W. Kotrlik and C.C. Higgins, 2001. Organizational Research: Determining Appropriate Sample Size in Survey Research. Information Technology, Learning and Performance Journal, 19(1): 43-50.

21. Hair, J.F., B. Black, B. Babin, R.E. Anderson and R.L. Tatham, 2005. Multivariate Data Analysis (6th Edition). Florida: Englewood Cliffs, NJ., Prentice Hall.

22. Heidary, A., S.M. Hosseini and E. Shahbazi, 2006. Comparison of Various Characteristics of Extension Workers in Former Ministries of Jihad-e Sazandegi and Agriculture to Identify and Prioritize the Desirable Status for Extension System in Ministry of Jihad-e-Agriculture. Iranian Agricultural Extension Education Journal, 2(2): 18-28.

23. Akca, H., M. Sayili and K. Esengun, 2007. Challenge of rural people to reduce digital divide in the globalized world: Theory and practice. Government Information Quarterly, 24: 404-413.

24. Leeuwis, C., 2000. Reconceptualizing participation for sustainable rural development: towards a negotiation approach. Development and Change, 31: 931-959.

25. Rao, N.H. and P.P. Rogers, 2006. Assessment of agricultural sustainability. Current Science, 91(4): 439-448.