



Forecasting the competencies for extensionists in changing agricultural scenario in India

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ABSTRACT

Agriculture sector is witnessing a change both at the local and global level, requiring competent human resources in the extension services to fulfill the needs of the farmers. In view of this, the present study was undertaken to forecast the competencies required by the Extensionists in changing agricultural scenario. The study also sought to identify the ways in which these competencies can be acquired. Delphi technique was used to forecast the competencies. Delphi was carried out during December, 2015 to March 2016 at Indian Council of Agricultural Research-Indian Research Institute, New Delhi. Online google forms were used for sending questionnaire and collecting data from the experts identified from the field of agricultural extension. Total 26 competencies were identified by a panel of 23 experts and categorized into the following four constructs: Knowledge, Skill, Professionalism, and Communication. The study also identified the 15 ways for acquiring these competencies. The findings will assist the policy makers, academicians and extension organizations to formulate suitable strategies to make the Extensionists future ready.

Key words: Agriculture, Competencies, Delphi, Extensionists, Forecasting

Agricultural extension is considered as an integral part of human resource development and is indispensable for the change process. Agricultural extension is said to be a public service for human resource development of people engaged in agriculture including farmers (Van den Ban and Hawkins 1996). According to the FAO (2006), extension workers are faced with high and very complex demand because of new trends in agriculture, health, industry and cooperatives that are directly related to other socio-demographic factors, such as age, population, gender and environmental issues. The effectiveness of the extension programmes greatly depends upon their competence and deliverance (Rasmussen 1989).

As the new knowledge and technologies are developed continuously, a challenge is posed to extension professionals to transfer these updates to the end user. Agricultural extension instructors have to continuously develop and enhance their capabilities along with the ongoing changes and challenges (Trede and Whitaker 2000). In the future, the Extension professionals have to be more skillful and futuristic so as to serve the need of the varied clientele (Seevers *et al.* 2007). The competency approach to human resource management enables organizations to develop their capacity through the identification of knowledge, skills, and abilities essential to success (Vakola *et al.* 2007). Bengé *et*

al. (2011) reported that identifying competencies needed by extension agents is a determining factor for adequate education curricula, training, and retention. Understanding and developing the competencies of the organization and its employees are essential for having and maintaining a competitive advantage.

In the view of changing agricultural scenario, the present study was conducted to identify the important competencies required by the extension professionals to be effective and efficient in meeting the future needs.

MATERIALS AND METHODS

Forecasting in the study referred to predicting the competencies required in future by the extensionists in the context of changes occurring in the agriculture and extension scenario. For this study, a panel of 40 experts in the field of agricultural extension were selected for forecasting through Delphi technique but, out of 40 experts, as many as 25 (62.5%) participated in first round and 23 (57.5%) participated in the second round and third round. Data was collected from December 2015 to March 2016 and the study was conducted from ICAR-Indian Research Institute, New Delhi. Online google forms were used for sending the questionnaire. It was decided with the experts and scientists to conduct three rounds of Delphi in the present study.

The questionnaire was developed by the researcher after reviewing the existing literature and discussions with the scientists. Round one contained unstructured, open ended instrument that had additional space for any suggestions, as

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recommended by Finch and Crunkilton (1999). Before the expert panelists were able to access round one instrument, review panel checked it for jargon, consistency and clarity of content. Constant comparative method was used to analyse the response received from the experts after the round one and adopted to develop the questionnaire for round 2. Accordingly, Delphi panelists may be required to rate or rank-order items to establish preliminary priorities among items. As a result of round two, areas of disagreement and agreement are identified. Responses for round 2 were recorded on a 5-point Likert type scale ranging from 1 being not important to 5 being very important. Responses from the round 2 were analyzed using median, Inter-Quartile Range, Quartile Deviation, and Percentage and questionnaire for the Round 3 was developed. The only difference, between the second and third round procedures, was that the mean and standard deviation of the first round ratings were placed with each of the third round items. This round gives Delphi panelists an opportunity to make further clarifications of both the information and their judgments of the relative importance of the item.

For the present study, consensus was said to be high when quartile deviation (QD) was less than or equal to 0.5 and Inter Quartile Range (IQR) less than or equal to 1, medium when quartile deviation was in between 0.5 and 1 and IQR greater than 1 but less than 2 and no consensus if quartile deviation is more than 1 and IQR more than 2; and the importance level which are: very high in which the median value is 4 and above and had been rated as either four or five by at least 80% of respondent (Duncan *et al.* 2014) while low (in which the median value is less than 3.5) and less than 80% of the respondent had rated the item below 4. Only items having high consensus and medium with high importance were retained for the study.

RESULTS AND DISCUSSION

Forecasting of required Competencies for Extensionists in changing agricultural-extension scenario

In round I, using constant comparative method the responses of the expert panel was used to develop 32 statements related to competencies required by the Extensionists, and 18 statements relating to the ways to acquire the required competencies. By the end of round 3, only 26 competencies statement and 15 ways to acquire them reached consensus by the judges. The result of the forecasting of the required competencies in changing agricultural-extension scenario is depicted in the Table 1. A total of 26 competency statements in four different categories, viz. knowledge (5competencies), skills (14 competencies), professionalism (4 competencies) and communication (3 competencies) were forecasted for the Extensionists. The expert panel gained high consensus and high importance on all the five competencies statements i.e. sound understanding of the social-economic aspect of the farmers as well as the farming system, update about the recent opportunities of profit making for farmers in agriculture e.g. market related information, practical knowledge and skills about the crop production practices, update about recent advances in extension around the world and global dynamics of trade around the world (international know how skills) and knowledge about the Information and Communication Technology beside various instruction technologies. Diab and Abdel-Ghany (2014) also pointed out in their study that extension professionals should not only be competent in their specialized field of agriculture but also have enough knowledge in other agriculture fields. Based on the statements listed in the skill category of competencies, the finding shows that emphasis is towards competencies

Table 1 Competencies for Extensionists in changing agricultural-extension scenario in round 3 (n=23)

Indicators	Median value	Q1	Q3	IQR	QD	% agreement	Remark
I Category A Knowledge							
The Extensionists should develop sound understanding of the social-economic aspect of the farmers as well as the farming system. AVERAGE(EXPERTS)=4.21	5	5	5	0	0	100	HH
The Extensionists should have the update about the recent opportunities of profit making for farmers in agriculture e.g market related information. AVERAGE(EXPERTS)=4.26	4	3	4	1	.5	96	HH
Practical knowledge and skills about the crop production practices. AVERAGE(EXPERTS)=4.17	4	3	4	1	.5	84	HH
Update about recent advances in extension around the world and global dynamics of trade around the world (international know how skills) AVERAGE(EXPERTS)=4.04	5	4	5	1	.5	92	HH
Knowledge about the information and Communication Technology beside various instruction technologies. AVERAGE(EXPERTS)= 3.74	4	4	4	0	0	100	HH

Contd.

Table 1. (Concluded)

Indicators	Median value	Q1	Q3	IQR	QD	% agreement	Remark
II Category B: Skill							
Sub Category i) Technical skill							
Expertise in computer and various new modes of information and communication technologies (mobile, expert system, decision support system, drones, etc.) AVERAGE(EXPERTS)=4.21	5	5	5	0	0	100	HH
Expertise in "how to do skill". AVERAGE(EXPERTS)=4.52	4	4	5	1	.5	94	HH
Expertise in mobilizing farmers and capacity building AVERAGE(EXPERTS)=4.21	5	4.5	5	.5	.25	96	HH
Developing entrepreneurial skill. AVERAGE(EXPERTS)=4.30	4	4.5	5	.5	.25	90.4	HH
The ability to demonstrate the technological skill relevant to the subject matter. AVERAGE(EXPERTS)=4.30	5	4.5	5	.5	.25	98	HH
Co-ordination, Networking, and Negotiation skill with interdisciplinary team and different stakeholders. AVERAGE(EXPERTS)=4.34	4	4	5	1	.5	96.9	HH
Sub category ii) Leadership Skill							
Ability to assess the needs of different stakeholders like farmers, input agencies, organization etc. AVERAGE(EXPERTS)=4.13	5	4	5	1	.5	89.6	HH
Apply critical thinking and innovativeness. AVERAGE(EXPERTS)=4.26	5	4.5	5	0.5	0.25	94.3	HH
Understanding and utilizing group dynamics, work dynamics, personality type, and team-building strategies. AVERAGE(EXPERTS)=4.21	5	5	5	0	0	100	HH
Positive thinking and energy; working toward success and motivating it in others. AVERAGE(EXPERTS)=4.13	4	3	4	1	.5	84.6	HH
Sub Category iii : Personal skills							
Conflict Resolution skill AVERAGE(EXPERTS)=4.17	4	3	4	1	.5	89.4	HH
Developing risk taking ability. AVERAGE(EXPERTS)=4.17	4	3	4	1	.5	92	HH
Understanding diversity in Extension AVERAGE(EXPERTS)=4.21	4	4	5	1	.5	90.4	HH
Gender Sensitization. AVERAGE(EXPERTS)=4.17	5	5	5	0	0	100	HH
III Category C. Professionalism							
Stress management AVERAGE(EXPERTS)=4.21	5	5	5	0	0	100	HH
Problem solving and Decision Making Skill AVERAGE(EXPERTS)=4.34	4	3	4	1	.5	86	HH
Able to manage multiple tasking. AVERAGE(EXPERTS)=4.17	5	4	5	1	.5	90.6	HH
Flexibility/ adaptability with the situation. AVERAGE(EXPERTS)=4.13	4	4	4	0	0	100	HH
IV Category D: Communication							
The ability to make the environment conducive for open communication. AVERAGE(EXPERTS)=4.48	4	3	4	1	.5	86.8	HH
Credibility build up with farmers. AVERAGE(EXPERTS)=4.13	4	4	5	1	5	88.6	HH
Increased need for active interaction with farmers that necessitate changing traditional styles of instruction to new interactive and practical approaches. AVERAGE (EXPERTS)=4	4	4	4	0	0	100	HH

(HH, High Importance High Consensus; MH, Medium Importance High Consensus). Forecasting the methods to acquire the required competencies

related to three sub categories such as technical skill (6 statements), leadership skills (4 statements) and personal skills (4 statements).

The expert panel were of the opinion that the extension professionals should develop expertise in ICT, how to do skills, mobilization, entrepreneurial abilities and negotiation skills. These skills will be important in the coming years to be effective and relevant in their field. As farmers are from diverse background and social dynamics in the village, it will have an effect on their working, the extensionists have to possess mobilization and negotiation skills. Extension professionals need to develop partnerships with their stakeholders and build up trust to support their work (Cochran 2009). Moore and Rudd (2003) emphasized the importance of internet and computer skills under technical skill category for the extension educator in present and future. The leadership competencies which gained high consensus and importance were ability to assess the needs of different stakeholders like farmers, input agencies, organization etc. Applying critical thinking and innovativeness, understanding and utilizing group dynamics, work dynamics, personality type, and team-building strategies, positive thinking and energy; working toward success and motivating it in others. As a leader, the extensionists should work toward effective team building. Cooper and Graham (2001) in their study "Competencies needed to be Successful County Agents and County Supervisors" also reported similar finding that critical thinking and innovativeness were important competencies needed by the County Agents and County Supervisors to be effective in future. In the category of personal skills, conflict resolution skill, developing risk taking ability, understanding diversity in extension, and gender sensitization achieved high consensus and high importance. India is home to many races, cultures, religions and ethnicities and gender-related issues, such as gender disparities are frequently observed in the villages. Hence, extension professionals should develop the competencies to demonstrate sensitivity to the diverse needs of various cultural groups in the community. These observations were supported by the findings of Lakai *et al.* (2014) and Suvedi and Ghimire (2015).

Managing stress, problem solving and decision making skill, ability to manage multiple tasking, and flexibility/adaptability with the situation were the competencies required by the extensionists in the category of professionalism. As part of their job profile, extension professional will face with more difficult situations which lead to stressful environment. This requires them to manage the stress and able to take thoughtful decisions by articulating all the available resources. In the communication category, stressed was given to open communication. In future, farmers will play a dominant role in planning and execution of the extension programme, hence open communication will help in free flow of information from both the ends. An effective extension professional in the changing agricultural scenario will be the one who are able to make farmer comfortable with the system.

Table 2 shows the result of the forecasting of the ways to acquire the required competencies by the Extensionists in the third round. It was found that the methods/ways were proposed in 4 main categories, viz. training, policy reforms, field capabilities and personal skills. The expert panel of this study agreed that training for various ICT's, online courses, practical topics and foundation training at entry level will equip the Extensionists to take up their future roles. Foundation course at the entry level will help in laying a concrete framework for their future role. These training will expose the Extension professionals to recent developments in their subjects and also provide hand-on experience on different topics. In the category of policy reform, the expert panel acknowledged that the Extensionists should be provided performance linked incentives, attention should be given on infrastructure development for ICT and funds should be given to their organization for carrying out various extension activities. Evidence from different countries confirms the potential importance of such incentives in enhancing the performance of agricultural extension systems (Vijayaragavan and Singh 1998, Swanson and Rajalahti 2010). The expert panel affirmed that professionals should be provided with exposure to different field situation and models. One of the basic principles of extension is "seeing is believing". So, the Extensionists should be provided with the opportunity to learn from successful situations worldwide. They will develop different competencies if they work at both the levels, i.e. at the technology generation and technology implementation. In case of personal category, developing conducive organization climate and soft skills to work as leader and change agent were accorded high importance and high consensus while developing moral and ethical value was given medium importance and high consensus. This may be due to the reason that the expert panel was of the opinion that the Extensionists had required moral and ethical values for their work. Organizational climate is very important for effective functioning of any organization. Boyd (2003) in his study showed that an organization that doesn't foster a positive environment for the development of the individual will act as a barrier in acquiring the required competencies.

In changing agricultural scenario, extension professionals need to be competent in their respective fields. Preparing the extension professionals for the future situation is the need of the hour. The present study was undertaken to ascertain the competencies required by the Extensionists in days to come. The result of the study confirmed that the Extensionists need to acquire competencies in related disciplines of agriculture, work in multi-disciplinary approach, gain international know-how, technical know-how and digital know-how. The study also highlighted different methods like professionals training course, providing performance linked incentives etc which can facilitate in acquiring the competencies. Organizations should redirect resources to assist extension professionals in acquiring the competencies, including provision of educational materials, professional

Table 2 Ways to acquire the required competencies by the Extensionists (n=23)

Indicator	Median value	Q1	Q3	IQR	QD	% agreement	Remark
I Category A: Training							
Frequent, relevant and practical capacity development and training on diverse topics. AVERAGE(EXPERTS)=4.65	5	5	5	0	0	100	HH
Use of online and e- learning module to enhance knowledge and skill. AVERAGE(EXPERTS)=4.31	4	3	4	1	.5	83	HH
Professional training courses for the Extensionists at the entry level. AVERAGE(EXPERTS)=4.21	5	4	5	1	.5	93.6	HH
Training to use various modes of information and communication technology. AVERAGE(EXPERTS)=4.27	5	4	5	1	.5	89.4	HH
II Category B: Policy Reforms							
Providing performance linked incentives. AVERAGE(EXPERTS)=4.61	5	4	5	1	.5	86	HH
Providing infrastructure for development of ICT. AVERAGE(EXPERTS)=4.17	5	4	5	1	.5	95.2	HH
Competitive salary, tenure and hiring more professionals. AVERAGE(EXPERTS)=4.69	4	3	5	2	1	85.3	LH
Providing financial resources and fund to the institution. AVERAGE(EXPERTS)=4.13	4	4	4	0	0	100	HH
III Category C: Field capabilities							
Exposure to the Extensionists to the different field situation and successful model. AVERAGE(EXPERTS)=3.65	5	4	5	1	.5	92	HH
Field work under the guidance of multidisciplinary team. AVERAGE(EXPERTS)=4.00	4	4	4	0	0	100	HH
Working with integration of both back end(field) and front end (market). AVERAGE(EXPERTS)=4.13	4	4	5	1	.5	85.3	HH
IV Category D: Personal skills							
Developing soft skills to function as leaders and change agent. AVERAGE(EXPERTS)=4.13	5	4	5	1	.5	86.3	HH
Developing moral and ethical values AVERAGE (EXPERTS)=4.5	4	3	4.5	1.5	.75	80	MH
Conducive organizational climate and work culture. AVERAGE(EXPERTS)=4.17	4	3	4	1	.5	82.9	HH

HH, High Importance High Consensus; MH, Medium Importance High Consensus; LH, Low Importance High Consensus

development time, and reimbursement for professional development expenses related to acquiring the competencies. The result of the study will be helpful in designing various training programmes and modules for the newly recruited extension professionals and also in-service candidates. The findings of the study provide important resources in the field of agricultural extension for developing the strategy for the changes in offering.

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