

**Perceived Professional Competency Level and Job Performance of  
Block-level Extension Agents in Bhutan**

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**Abstract**

*The primary purpose of this study was to identify the perceptions of extension agents in Bhutan on the professional competencies they considered important and possessed. The results of the study showed that extension agents have lower confidence on the technical knowledge they possessed in the respective subject areas. The other priority training requirements for extension agents identified by the study were on: how to conduct situational analysis, ability to prepare visual aids, finding ways to encourage farmers to adopt innovations, visualizing future extension prospects and problems, introducing new extension methods, building confidence in meeting objectives, creating awareness of the government policy and ability to organize and present a seminar. The junior extension agents have a higher confidence on some competencies compared to their seniors. Therefore, the departments of agriculture, animal husbandry and forestry in the Ministry of Agriculture should regularly conduct training needs analysis and provide in-service training to update the knowledge and skills of extension agents.*

**Key words:** extension agent, professional competency, training, perception, job performance

### Introduction

Bhutan, a tiny Himalayan Kingdom wedged between China and India is administratively divided into 20 districts. Each district is governed by a district administrator. The district is further broken down into 205 smaller administrative units called *Geogs* (blocks). In each block, there is an extension center manned by three extension agents (EAs) representing agriculture, animal husbandry, and forestry sub-sectors of the Ministry of Agriculture (MoA). These EAs work directly under the supervision of the sector heads, representing one each from the above three sub-sectors based at the district headquarters. They provide administrative and technical backstopping to the block-level extension centers.

Extension services delivery system in Bhutan is operated within a challenging setting. The natural topography is one of the most rugged in the world. The young Himalayan land mass is vulnerable to natural disasters, making communication difficult and the variations in climatic factors make the environment fragile. These factors are attributed to creating circumstances for farmers to choose varied livelihoods of scattered human settlement, subsistence farming system, fragmented land holdings, low literacy rate, and problems of rural-urban migration. These problems in turn make delivery of development services more challenging for the extension system which is implemented under a complex situation where the success or failures of programs, one way or the other, always hinges on the job-performance of EAs.

Until the early 1980s, public extension services in Bhutan were delivered directly from the central government agencies through outreach programs. In the mid-1980s, the government decentralized the development programs to the districts and appointment of extension agents in the blocks was started. It was during 1992 - 1997 that the government started placing greater importance on farmers' participation in the decision making process, and addressing farmers' problems through a systematic approach (Tashi, 1993).

Lately, the delivery of extension services to farmers came under critical review from the MoA over questions of efficiency and technical competency possessed by the extension agents. A case study by Tshering, Rai and Rigyal (2007) also observed the critique of MoA where, among many others, lack of technical competency by extension agents resulted in the problems of extension non-performance and ineffective delivery of services. At the same time, the MoA, endorsed by Resolution 19 of the MoA Conference (ECC, 2007), maintained that agricultural, livestock, and forestry extension workforce / personnel are technically incompetent and are not able to deliver the extension programs effectively. Many also alleged that extension workers in Bhutan are underutilized or improperly engaged in the field. These statements have a number of implications on the job performances of extension agents. They raise questions about standard of training provided in training institutions, professional up-gradation opportunities offered once employed and environments conducive for continued learning and knowledge management created for further enhancement of their knowledge and skills. However, all these statements and claims required to be further corroborated and substantiated with proper evidences.

On the other hand, the MoA acknowledges the importance of human capacity development and therefore, the need to provide training opportunities to enhance their professional qualifications and career opportunities. The national extension policy document reflects instituting a proper training needs identification system to ensure EAs with outstanding performance benefit from such opportunities for career enhancements. The Ministry is currently developing the staff database system based on which respective departments and agencies will make transparent and fair nominations of candidates for capacity-building program. Besides the courses offered by academic institutions, all extension agents are also encouraged to undertake self-directed learning to enhance their knowledge and skills base for improved job-performance.

### Theoretical Framework

Boyd (2003) stated that successful extensionists should have strong technical knowledge. Similarly, Belay and Abebaw (2004) contended that higher rates of technology adoption by clients are achieved when extensionists possess adequate technical knowledge.

One of the weaknesses in past approaches in preparing extension personnel in developing countries has been the inability to focus on the development of professional competencies (Easter, 1985). The extension agents in developing countries should possess professional competence in the areas of administration, program planning and execution, evaluation, communications, teaching and extension methods and understanding human behavior (Raad, Yoder & Diamond, 1994). However, a lack of a proper balance between technical and professional competencies in staff has been identified as a common problem in the extension services of developing countries (Bradfield, 1966; Easter, 1985; Khan, Ali & Hussain, 2004; Maunder, 1972). There is a need to identify the job areas in which extension workers are less competent and need trainings. Until and unless these areas are clearly identified, their training programs may not be planned efficiently (Khan, Lodhi, Ashraf & Khan, 2007).

The concept of identifying core competencies is not new to extension (Moore & Rudd, 2004). A competence assessment is designed to evaluate individual knowledge, education, skills, experience, and proficiency to perform those assigned responsibilities (Herringer, 2002). In contrast, performance evaluations are designed to evaluate how well an individual actually performs their responsibilities. An extension agent who has to assume a variety of roles amongst the farmers must fulfill a number of different roles and therefore must prove her / his competence in many diverse areas.

Based on Herringer's (2002) description of a competence assessment, competence can be defined as the ability of an individual to perform a task using his / her knowledge, education, skills and experience. Competencies, especially when used in competence assessments, should relate to the specific tasks required to perform successfully in a given position (Moore & Rudd, 2004). The identification of key competencies provides for individual and organizational growth, and helps the organization meet future demands (Pickett, 1998).

In almost all competency studies of extension personnel in developing countries, findings indicated the need for further strengthening of professional competencies in almost all areas of competencies identified (Androulidakis & Siados, 2003; Hussain, 2004; Khan et al., 2004; Muhammad et al., 1995; Raad, Yoder & Diamond, 1994; Randavay & Vaughn, 1991). The extension personnel once in the field are also expected to perform an assorted number of tasks but Androulidakis and Siados (2003) pointed out that extension agents' competence should be in accordance with the task areas in which they will be assigned to operate in order to perform successfully. This advocates the fact that to the extent possible, the assigning of non-extension related or ad-hoc tasks to agents should be reduced as it is a common practice in most developing countries, particularly in the context of Bhutan.

Extension staff development (through training) is a crucial element in making the extension system more efficient and effective (MoA, 2009). However, once graduating as extension agents, continuous professional development through in-service training program for extension agents in Bhutan still remains a challenge. The lack of properly coordinated up-gradation and specialization plan of extension staff, stand as a major shortcoming besides the existence of unhealthy practice of ad-hoc and biased nomination of candidates for overseas capacity building trips (ECC, 2007).

Raad, Yoder, and Diamond (1994) suggested that professional competencies should be developed at the in-service level rather than at the pre-service level. They further suggested that even after pre-service programs are implemented there remains a substantial need for continuing education programs for extension personnel. This will require an articulated continuing education program which addresses the specific professional needs of agents.

### Purpose and Objectives

This study was part of a larger research concerned with examining the monitoring and evaluation system for improving the job performance of block-level extension agents in Bhutan. Opinions were sought both from extension agents and their managers. This particular study focused on the professional competency levels of extension agents and compared the perception of extension agents on the competency levels possessed by them. The primary objectives of this study were:

- (a) to identify the areas where competency level is considered important in the perception of extension agents
- (b) to identify the gap between the competency level considered important and the level possessed by the extension agents
- (c) to find out the differences on the competency level possessed by periods of joining services and sector of extension agents.

### Methods

Using the background of extension setup in Bhutan, nine districts out of the total 20 districts were selected as study samples based on stratified random sampling. The first order stratification was based on the number of districts distributed in the four regions covered by a premier research centre (RC) each. The RCs in Bhutan are distributed to cover the whole of the country through the four regions of East, East-Central, West and West-Central. The national mandates of RCs are horticulture research for east with six districts, cereal crops research for west with five districts, forestry research for west-central with six districts, and livestock research for east-central with three districts. Table 1 illustrates the distribution of the four geographical regions.

Table 1

*Four Geographical Regions along with the Research Centers with their National Research Mandates and Sample Districts from Each Region, Bhutan 2009*

Region	Research Centers (RC) & mandates	Total No. of districts	Names of Sample Districts	No. of respondents
West	Yusipang: <i>Cereal crops research</i>	5	2 districts: <i>Haa and Paro</i>	31
West-central	RC, Bajo: ( <i>Forestry research</i> )	6	3 districts: <i>W/Phodrang, Tsirang and Punakha</i>	69
East	RC, Wengkhar: ( <i>Horticulture Research</i> )	6	2 districts: <i>Mongar and Trashigang</i>	30
East-Central	RC, Jakar: ( <i>Livestock research</i> )	3	2 districts: <i>Bumthang and Trongsa</i>	20
Total		20	9	150

Having stratified the districts in the four regions, two sample districts each were selected from all the regions through simple random sampling. One additional sample was selected from the west-central region, as its mandate extended to one of the largest research areas, thereby making a total of 9 district samples. As the total number of districts in Bhutan is 20, the nine sample districts were equivalent to 45% of the total size.

There are three extension agents representing agriculture, animal husbandry and forestry in each extension center in every block. As indicated in the introduction, there are a total of 205 blocks in the various districts. Since there are three extension agents in each extension center in every block, a blanket count of a total of 615 agents was taken. From this total number of agents, 29.27% (180 agents) was the sample. They covered 60 blocks in the sample districts. These 60 blocks were apportioned to the nine sample districts based on the sizes of the samples (29.27% EAs) and size of the districts in terms of the number of blocks.

A structured questionnaire was designed and mostly self-administered questionnaire survey was executed. The survey was preceded by the pretesting of questionnaires with 45 respondents in two districts. Prior to distributing the questionnaires, a training-workshop was conducted with all the respondents in respective district headquarters. Data format from EAs were collected through postal and personal hand delivery from October - November 2009.

Out of the nine sampled districts with 180 EAs, 153 EAs responded out of which three data formats were screened and a sample size of 150 retained. The database was designed and entered in the Census and Survey Processing System (CSPRO) package and later converted to Statistical Package for the Social Sciences (SPSS) for analysis.

To obtain a quantitative measure of respondents' perceptions towards the competency level EAs considered important and level possessed, the rating scales used in the questionnaire included: very low = 1; low = 2; average = 3; high = 4 and; very high = 5. These rating scales were used as the basis for calculating the mean scores (M) and standard deviation (SD) of the competency level of each competency statement.

The categories of competencies used to measure was based on the recommendations made by Oakley and Garforth (1985) on the types of knowledge and personal skills EAs should have to make them carry out their jobs effectively. Knowledge focused mainly on the technical, rural life, adult education and policy while skills focused on the various sub-categories of organization and planning, communication, analysis and diagnosis, leadership skills, and initiatives. The study also measured the personal qualities of EAs including their self-confidence, sensitivity to farmers' feelings, reliability to work, and commitments.

The first analysis (Table 2) presented the mean score ranking to show the levels of competencies they considered important against the level they possessed. Table 3 shows the discrepancy values on the basis of differences between the importance levels of competencies for the job performance of EAs and the possessed levels as training needs in the identified competencies. Two F-tests (Table 4 & Table 5) followed by Scheffe post hoc comparisons were executed to find the differences of groups of EAs by periods of joining services and by sector.

## **Results and Discussion**

### **Personal Characteristics of Respondents**

The personal characteristics of the 127 male and 23 female respondents included EAs with ages ranging from 21 to 53 years, with an average age of 32.9 years out of which 138 of them were married with some of the spouses who also worked as EAs. EAs have joined services from 1971 to 2009 with the range of 38 years. There were 53 respondents from agriculture, 56 from animal husbandry and 41 from forestry sectors. About 92% of the EAs have diploma-level education and training skills with the rest possessing post-graduate diploma or mere certificates. As many as 24 EAs reported having to stay overnight to reach their extension centers in the respective blocks while 126 of them said they could reach their centers within a day or less.

### **Importance of Competency Levels and Rank Orders for Competency Possessed**

The explanation of Table 2 showed the importance of competency levels and Table 3 identified the gap between competencies considered important and possessed by EAs. Table 2

showed that EAs rated almost all competencies having a high level of importance (mean score (M) = 3.87 to 4.80). Out of the total of 40 competencies, the most important competencies they found in the various seven categories of knowledge, organization & planning, communication, analysis and diagnosis, leadership qualities, initiative & personal qualities, included: good understanding about block, people, and culture (M=4.53); design and conduct farmers’ training (M=4.47); ability to convey extension messages effectively (M=4.58); find ways to encourage farmers to adopt innovations (M=4.37); possess self-motivation, determination and dedication (M=4.44); implement extension activities without being supervised (4.41); and maintain relationship with farmers (M=4.80).

Table 2  
*Statements of Professional Competency Rank Orders, Mean and Standard Deviation of Extension Agents of Various Categories, Bhutan 2009*

Sl. No.	Competency categories and competency statements	Level of importance			Level of Possession		
		R	M	SD	R	M	SD
<b>1. KNOWLEDGE</b>							
1	Good understanding about block, people & culture	1	4.53	0.621	1	4.13	0.730
2	Adequate technical knowledge in the subject area	2	4.46	0.692	4	3.46	0.631
3	Awareness of the current government policy	3	4.39	0.741	3	3.49	0.809
4	Awareness of the approaches to adult education	4	4.21	0.805	2	3.52	0.817
<b>2. PERSONAL SKILLS</b>							
<i>2.1 Organization and planning</i>							
1	Design and conduct farmers’ training	1	4.47	0.621	1	4.15	0.775
2	Deal effectively with field / extension problems	2	4.44	0.690	4	3.89	0.651
3	Design a work plan for extension activity	2	4.44	0.690	2	4.03	0.750
4	Involve farmers in program planning	3	4.37	0.781	5	3.73	0.948
5	Manage time effectively	4	4.34	0.654	3	3.97	0.695
6	Evaluate extension program	5	4.29	0.710	6	3.71	0.790
7	Conduct situational analysis of extension program	6	4.15	0.693	8	3.48	0.800
8	Set objectives for an extension program	7	4.21	0.745	6	3.71	0.830
9	Coordinate work schedules with other peer staff	8	4.02	0.781	7	3.67	0.757
<i>2.2 Communication</i>							
1	Ability to convey extension messages effectively	1	4.58	0.627	1	4.12	0.732
2	Ability to persuade farmers to adopt technologies	2	4.36	0.707	2	3.65	0.624
3	Ability to prepare visual aids to help deliver information	3	4.33	0.783	3	3.42	0.929
4	Provide feedback of researchable problems to researchers	4	4.06	0.899	4	3.33	0.923
5	Ability to present a seminar	5	4.03	0.827	6	3.26	0.935
6	Ability to use power point presentations	5	4.03	0.958	5	3.27	1.267

Table 2 Continued

*Statements of Professional Competency Rank Orders, Mean and Standard Deviation of Extension Agents of Various Categories, Bhutan 2009*

Sl. No.	Competency categories and competency statements		Level of importance			Level of Possession		
			R	M	SD	R	M	SD
<i>2.3 Analysis and diagnosis</i>								
1	Find ways to encourage farmers to adopt innovations	1	4.37	0.709	3	3.65	0.743	
2	Use local leaders to influence farmers to change	2	4.27	0.849	1	3.84	0.905	
3	Identify problems of farmers and why they arise	3	4.24	0.721	2	3.81	0.721	
4	Analyze how change in social status affect farmers	4	4.11	0.770	5	3.55	0.832	
5	Analyze traditional culture and its effect on change	5	4.03	0.867	4	3.56	0.823	
6	Recognize learning differences in age groups	6	3.89	0.804	6	3.45	0.887	
<i>2.4 Leadership qualities</i>								
1	Possess self-motivation, determination & dedication	1	4.44	0.680	1	4.03	0.741	
2	Lead farmers	2	4.32	0.726	2	4.01	0.764	
3	Provide leadership in program planning and execution	3	4.27	0.810	3	3.78	0.842	
4	Visualize future extension prospects and problems	4	4.18	0.812	5	3.57	0.763	
5	See both sides of arguments in question	5	4.03	0.827	4	3.61	0.741	
6	Apply persuasive style to inform clientele	6	3.87	0.838	6	3.37	0.807	
<i>2.5 Initiative</i>								
1	Implement extension activities without being supervised	1	4.41	0.744	1	3.97	0.878	
2	Confidence to work without guidance and support	2	4.37	0.671	2	3.81	0.814	
3	Introduce new methods in extension work	2	4.37	0.691	3	3.62	0.849	
<b>3. PERSONAL QUALITIES</b>								
1	Maintain relationship with farmers	1	4.80	0.418	1	4.47	0.673	
2	Commitment to extension work	2	4.58	0.658	2	4.20	0.777	
3	Reliability in implementing extension work	3	4.41	0.647	3	4.05	0.663	
4	Sure of what is being done everyday	4	4.39	0.723	4	4.02	0.831	
5	Confidence in own abilities to meet set objectives	5	4.37	0.727	6	3.91	0.732	
6	Sensitive to the feelings and wishes of farmers	6	4.29	0.780	5	3.87	0.780	

*Source: field data 2009*

*Note.* R = rank

The three competencies EAs found less important in the seven categories in terms of mean score were, apply persuasive style to inform clientele (M=3.87); recognize learning differences in age groups (M=3.89); and coordinate work schedules with other peer staff (M=4.02).

The perceptions of the EAs regarding the competencies they possessed ranged from a mean score of  $M=3.26$  to  $M=4.47$ . The competencies which were possessed by EAs at the highest level in the seven category-wise competencies were: good understanding about block, people & culture ( $M=4.13$ ); design and conduct farmers' training ( $M=4.15$ ); ability to convey extension messages effectively ( $M=4.12$ ); use local leaders to influence farmers to change ( $M=3.84$ ); possess self-motivation, determination and dedication ( $M=4.03$ ); implement extension activities without being supervised ( $M=3.97$ ); and maintain relationship with farmers ( $M=4.47$ ). The three competencies EAs indicated they possessed less in the seven categories in terms of mean score were, ability to use power point presentations ( $M=3.27$ ); apply persuasive style to inform clientele ( $M=3.37$ ); and recognize learning differences in age groups ( $M=3.45$ ). With standard deviations of both the levels in almost all categories  $\leq 1$ , there is less variations in the perceptions of the respondents.

Overall, it showed that most of the competencies EAs considered important were also possessed by them and vice versa. There were few cases of contrasting variations where the competencies considered important were not necessarily possessed by EAs particularly in the case of technical knowledge, ability to deal effectively with field problems, and finding ways to encourage farmers to adopt changes. The comparisons also found that skill oriented competencies like use of power-point presentations, applying styles to inform clientele, and identifying learning differences in age groups were found to be at the lower level of competencies possessed. These are usually skills and knowledge that were to be developed at the in-service level as recommended by Raad, Yoder and Diamond (1994) but a systematic in-service and continuous professional development programs have yet to be implemented on a regular basis in Bhutan. The in-service training for EAs is conducted by the College of Natural Resources under the Royal University of Bhutan while the EAs are directly under the mandate of Ministry of Agriculture. The inconsistent and irregular in-service training implemented for EAs maybe the result of lack of coordination and understanding between the training institute and Ministry of Agriculture.

Presented in Table 3 are the discrepancy values (DV) calculated on the basis of differences between the levels of competencies considered important and the competency levels possessed by the EAs. These differences were considered as the training needs in the identified competencies. Out of the seven categories of competencies, the most important training needs areas of EAs, category-wise, were: adequate technical knowledge in the subject areas ( $DV=1.00$ ); conduct situational analysis of extension programs ( $DV=0.067$ ); ability to prepare visual aids to help deliver information ( $DV=0.91$ ); find ways to encourage farmers to adopt innovations ( $DV=0.72$ ); visualize future extension prospects and problems ( $DV=0.61$ ); introduce new methods in extension work ( $DV=0.75$ ); and confidence in own abilities to meet set objectives ( $DV=0.46$ ).

In executing the overall ranking of all the seven categories combined with 40 statements, the four most important training needs identified were: (i) adequate technical knowledge in the subject area ( $DV=1.00$ ); (ii) ability to prepare visual aids to help deliver information ( $DV=0.91$ ); (iii) awareness of the current government policy ( $DV=0.90$ ); and (iv) ability to present a seminar ( $DV=0.77$ ). The four competencies that required the least training requirements were: (i) apply persuasive style to inform clientele ( $DV=0.05$ ); (ii) lead farmers ( $DV=0.31$ ); (iii) design and conduct farmers' training ( $DV=0.32$ ); and (iv) maintain relationship with farmers ( $DV=0.33$ ).

Table 3

*Rank Orders of Professional Competencies on the Basis of Differences between Level of Importance and Level of Possession by Extension Agents, Bhutan 2009*

Sl. No.	Competency categories and competency statements	IL Mean	PL Mean	DV	Rank	OR
<b>1. KNOWLEDGE</b>						
1	Adequate technical knowledge in the subject area	4.46	3.46	1.00	1	1
2	Awareness of the current government policy	4.39	3.49	0.90	2	3
3	Awareness of the approaches to adult education	4.21	3.52	0.60	3	13
4	Good understanding about block, people & culture	4.53	4.13	0.40	4	31
<b>2. PERSONAL SKILLS</b>						
<i>2.1 Organization and planning</i>						
1	Conduct situational analysis of extension program	4.15	3.48	0.67	1	10
2	Involve farmers in program planning	4.37	3.73	0.64	2	11
3	Evaluate extension program	4.29	3.71	0.58	3	14
4	Deal effectively with field / extension problems	4.44	3.89	0.55	4	17
5	Set objectives for an extension program	4.21	3.71	0.50	5	18
6	Design a work plan for extension activity	4.44	4.03	0.41	6	30
7	Manage time effectively	4.34	3.97	0.37	7	34
8	Coordinate work schedules with other peer staff	4.02	3.67	0.35	8	36
9	Design and conduct farmers' training	4.47	4.15	0.32	9	38
<i>2.2 Communication</i>						
1	Ability to prepare visual aids to help deliver information	4.33	3.42	0.91	1	2
2	Ability to present a seminar	4.03	3.26	0.77	2	4
3	Ability to use power point presentations	4.03	3.27	0.76	3	5
4	Provide feedback of researchable problems to researchers	4.06	3.33	0.73	4	7
5	Ability to persuade farmers to adopt technologies	4.36	3.65	0.71	5	9
6	Ability to convey extension messages effectively	4.58	4.12	0.46	6	22
<i>2.3 Analysis and diagnosis</i>						
1	Find ways to encourage farmers to adopt innovations	4.37	3.65	0.72	1	8
2	Analyze how change in social status affect farmers	4.11	3.55	0.56	2	16
3	Analyze traditional culture and its effect on change	4.03	3.56	0.47	3	20
4	Recognize learning differences in age groups	3.89	3.45	0.44	4	23
5	Use local leaders to influence farmers to change	4.27	3.84	0.43	5	25
6	Identify problems of farmers and why they arise	4.24	3.81	0.43	5	26
<i>2.4 Leadership qualities</i>						
1	Visualize future extension prospects and problems	4.18	3.57	0.61	1	12
2	Provide leadership in program planning and execution	4.27	3.78	0.49	2	19
3	See both sides of arguments in question	4.03	3.61	0.42	3	27
4	Possess self-motivation, determination & dedication	4.44	4.03	0.41	4	30
5	Lead farmers	4.32	4.01	0.31	5	39
6	Apply persuasive style to inform clientele	3.87	3.37	0.05	6	40

Table 3 Continued

*Rank Orders of Professional Competencies on the Basis of Differences between Level of Importance and Level of Possession by Extension Agents, Bhutan 2009*

Sl. No.	Competency categories and competency statements	IL Mean	PL Mean	DV	Rank	OR
<i>2.5 Initiative</i>						
1	Introduce new methods in extension work	4.37	3.62	0.75	1	6
2	Confidence to work without guidance and support	4.37	3.81	0.56	2	15
3	Implement extension activities without being supervised	4.41	3.97	0.44	3	24
<b>3. PERSONAL QUALITIES</b>						
1	Confidence in own abilities to meet set objectives	4.37	3.91	0.46	1	21
2	Sensitive to the feelings and wishes of farmers	4.29	3.87	0.42	2	28
3	Commitment to extension work	4.58	4.20	0.38	3	32
4	Sure of what is being done everyday	4.39	4.02	0.37	4	33
5	Reliability in implementing extension work	4.41	4.05	0.36	5	35
6	Maintain relationship with farmers	4.80	4.47	0.33	6	37

*Source: field data 2009*

*Note.* IL=level of importance; PL=level of possession; DV= discrepancy value; OR=overall ranking

The discrepancy values based on the mean perceptions of EAs were positive values for all the competencies ranging from the lowest value of 0.05 to the highest value of 1.00. This indicated that EAs needed training in all competencies shown in the seven categories under extension knowledge, skills and qualities. This supports the findings of Androulidakis and Siados (2003), Hussain (2004), Khan et al., (2004), Muhammad et al., (1995), Raad, Yoder and Diamond (1994), and Randavay and Vaughn (1991) that in developing countries, there is the need to strengthen competencies in all areas. This result also supports the low estimation that the Ministry of Agriculture have in Bhutan on the technical competency level of extension agents. The Ministry of Agriculture always contended that although EAs in Bhutan have fairly good communication skills, they lacked technical competency to undertake their jobs proficiently (ECC, 2007). Therefore, the training needs identified above should be considered as important areas for designing future in-service training program.

### **Differences of Groups on the Competencies Possessed**

Table 4 and 5 fulfill objective three by showing the differences of groups on the competencies possessed by EAs. Both the Tables 4 and 5 showed the results of F-tests conducted by groups of periods of joining service and by sector. Table 4 showed that statistically significant differences were found among the three levels of periods of joining service on: manage time effectively,  $F=(2, 147) 4.162, p=0.017$ ; coordinate work schedules with other peer staff,  $F=(2, 147) 3.057, p=0.050$ ; ability to use power point presentations,  $F=(2, 147) 3.259, p=0.041$ ; find ways to encourage farmers to adopt innovations,  $F=(2, 147) 3.833, p=0.024$ ; analyze traditional culture and its effect on change,  $F=(2, 147) 3.578, p=0.030$ ; identify problems of farmers and why they arise,  $F=(2, 147) 3.528, p=0.032$ ; visualize future extension prospects and problems,  $F=(2, 147) 4.283, p=0.016$ ; and apply persuasive style to inform clientele,  $F=(2, 147) 11.117, p=0.000$ . The standard deviations for all categories were mostly  $\leq 1$ , indicating there were no significant deviations of opinions from the mean.

Table 4

*Comparison of Competency Level Possessed by Extension Agents by Periods of Joining Service, Bhutan 2009*

Competency categories and competency statements	Periods of joining service						F-value
	1999 and earlier (n=59)		2000 - 2004 (n=42)		2005 - 2009 (n=49)		
	M	SD	M	SD	M	SD	
<b>1. KNOWLEDGE</b>							
1 Adequate technical knowledge in the subject area	3.37	0.64	3.50	0.63	3.53	0.62	0.954
2 Good understanding about block, people & culture	4.03	0.81	4.14	0.68	4.24	0.66	1.126
3 Awareness of the current government policy	3.49	0.82	3.55	0.83	3.43	0.79	0.244
4 Awareness of the approaches to adult education	3.44	0.79	3.62	0.70	3.53	0.94	0.588
<b>2. PERSONAL SKILLS</b>							
<i>2.1 Organization and planning</i>							
1 Deal effectively with field / extension problems	3.80	0.64	3.98	0.68	3.92	0.64	1.021
2 Manage time effectively	3.78 <sup>b</sup>	0.59	4.05 <sup>ab</sup>	0.70	4.14 <sup>a</sup>	0.76	4.162*
3 Coordinate work schedules with other peer staff	3.51	0.77	3.88	0.67	3.67	0.77	3.057*
4 Conduct situational analysis of extension program	3.51	0.84	3.52	0.74	3.41	0.81	0.295
5 Involve farmers in program planning	3.69	0.93	3.71	1.07	3.78	0.87	0.101
6 Set objectives for an extension program	3.54	0.84	3.93	0.78	3.73	0.84	2.742
7 Design a work plan for extension activity	3.86	0.78	4.21	0.72	4.06	0.72	2.811
8 Design and conduct farmers' training	4.15	0.67	4.10	0.91	4.20	0.79	0.221
9 Evaluate extension program	3.69	0.82	3.79	0.78	3.65	0.78	0.326
<i>2.2 Communication</i>							
1 Ability to convey extension messages effectively	4.07	0.81	4.24	0.62	4.08	0.73	0.761
2 Ability to persuade farmers to adopt technologies	3.64	0.64	3.67	0.57	3.65	0.66	0.016
3 Ability to prepare visual aids to help deliver information	3.25	0.96	3.62	0.76	3.45	1.00	1.953
4 Ability to present a seminar	3.07	0.94	3.45	0.83	3.22	0.99	2.106
5 Ability to use power point presentations	2.95	1.33	3.40	1.17	3.53	1.21	3.259*
6 Provide feedback of researchable problems to researchers	3.19	0.86	3.40	0.77	3.43	1.10	1.131

Table 4 Continued

2.3 Analysis and diagnosis

1 Find ways to encourage farmers to adopt innovations	3.46 <sup>b</sup>	0.80	3.86 <sup>a</sup>	0.68	3.69 <sup>ab</sup>	0.68	3.833*
2 Use local leaders to influence farmers to change	3.68	0.86	4.07	0.89	3.84	0.94	2.359
3 Analyze traditional culture and its effect on change	3.37 <sup>b</sup>	0.74	3.81 <sup>a</sup>	0.71	3.57 <sup>ab</sup>	0.96	3.578*
4 Recognize learning differences in age groups	3.25	0.82	3.55	0.92	3.61	0.91	2.564
5 Identify problems of farmers and why they arise	3.64 <sup>b</sup>	0.71	4.02 <sup>a</sup>	0.56	3.82 <sup>ab</sup>	0.81	3.528*
6 Analyze how change in social status affect farmers	3.44	0.88	3.57	0.80	3.67	0.80	1.063

2.4 Leadership qualities

1 Lead farmers	4.00	0.70	4.07	0.71	3.96	0.89	0.245
2 Possess self-motivation, determination & dedication	3.88	0.70	4.19	0.67	4.06	0.83	2.249
3 Provide leadership in program planning and execution	3.63	0.81	3.90	0.79	3.86	0.91	1.652
4 See both sides of arguments in question	3.49	0.82	3.76	0.66	3.61	0.70	1.650
5 Visualize future extension prospects and problems	3.36 <sup>b</sup>	0.80	3.76 <sup>a</sup>	0.76	3.67 <sup>ab</sup>	0.66	4.283*
6 Apply persuasive style to inform clientele	3.03 <sup>b</sup>	0.85	3.45 <sup>a</sup>	0.67	3.71 <sup>a</sup>	0.71	11.11** *

2.5 Initiative

1 Implement extension activities without being supervised	3.81	0.99	4.14	0.68	4.00	0.87	1.798
2 Confidence to work without guidance and support	3.73	0.87	3.98	0.60	3.78	0.90	1.214
3 Introduce new methods in extension work	3.53	0.80	3.74	0.83	3.63	0.93	0.776

3. PERSONAL QUALITIES

1 Commitment to extension work	4.08	0.79	4.31	0.68	4.24	0.83	1.150
2 Reliability in implementing extension work	3.98	0.66	4.14	0.57	4.06	0.75	0.714
3 Maintain relationship with farmers	4.47	0.68	4.52	0.55	4.43	0.76	0.225
4 Sensitive to the feelings and wishes of farmers	3.83	0.70	3.86	0.75	3.94	0.90	0.268
5 Confidence in own abilities to meet set objectives	3.85	0.74	3.95	0.62	3.96	0.82	0.391
6 Sure of what is being done everyday	3.98	0.88	4.14	0.61	3.96	0.94	0.645

Source: field data 2009

Note. \* significant at 0.05 confidence level; \*\*\* significant at 0.001 confidence level

Scheffe' post hoc comparison represented with superscript<sup>ab</sup>: means followed by same letters are not significantly different from each other.

Scheffe' post hoc comparison indicated that group 1999 & earlier and group 2005-2009 significantly differed on, manage time effectively (p=0.024) and observed very high significant difference on, apply persuasive style to inform clientele (p=000); group 1999 & earlier and group 2000 - 2004 significantly differed on, find ways to encourage farmers to adopt innovations (p=0.028), analyze traditional culture and its effect on change (p=0.031), identify problems of farmers and why they arise (p=0.032), visualize future extension prospects and problems (p=0.029); and observed very high significant difference on, apply persuasive style to inform clientele (p=000). No significant differences were observed between groups 2000-2004 and 2005-2009 on any of the statements.

Table 5 showed that statistically significant differences were found among the three levels of agriculture, animal husbandry, and forestry sectors on: set objectives for an extension program, F=(2, 147) 3.704, p=0.027; design and conduct farmers' training, F=(2, 147) 3.46, p=0.033; lead farmers, F=(2, 147) 3.506, p=0.033; see both sides of an arguments in question, F=(2, 147) 5.464, p=0.005; and apply persuasive style to inform clientele, F=(2, 147) 4.340, p=0.015.

Table 5  
*Comparison of Competency Level Possessed by Extension Agents by Sector, Bhutan 2009*

S/ N	Competency categories and competency statements	Sector						F-value
		AG (n=53)		AH (n=56)		FO (n=41)		
		M	SD	M	SD	M	SD	
1. KNOWLEDGE								
1	Adequate technical knowledge in the subject area	3.45	0.64	3.43	0.63	3.51	0.64	0.211
2	Good understanding about geog, people & culture	4.15	0.77	4.11	0.68	4.15	0.76	0.057
3	Awareness of the current government policy	3.53	0.72	3.46	0.89	3.46	0.81	0.107
4	Awareness of the approaches to adult education	3.55	0.80	3.57	0.83	3.41	0.84	0.478
2. PERSONAL SKILLS								
<i>2.1 Organization and planning</i>								
1	Deal effectively with field / extension problems	3.96	0.62	3.82	0.66	3.88	0.68	0.640
2	Manage time effectively	3.96	0.62	3.98	0.65	3.98	0.85	0.011
3	Coordinate work schedules with other peer staff	3.75	0.76	3.55	0.81	3.71	0.68	1.044
4	Conduct situational analysis of extension program	3.47	0.85	3.46	0.79	3.51	0.78	0.046
5	Involve farmers in program planning	3.72	0.99	3.71	1.02	3.76	0.80	0.027
6	Set objectives for an extension program	3.92 <sup>a</sup>	0.78	3.50 <sup>b</sup>	0.85	3.73 <sup>ab</sup>	0.81	3.704*
7	Design a work plan for extension activity	4.09	0.77	3.96	0.76	4.02	0.72	0.406
8	Design and conduct farmers' training	4.32 <sup>a</sup>	0.70	3.95 <sup>b</sup>	0.88	4.22 <sup>ab</sup>	0.65	3.496*
9	Evaluate extension program	3.72	0.79	3.66	0.77	3.76	0.83	0.177

Table 5 Continued

2.2 Communication

1	Ability to convey extension messages effectively	4.06	0.80	4.18	0.72	4.12	0.68	0.375
2	Ability to persuade farmers to adopt technologies	3.64	0.59	3.71	0.59	3.59	0.71	0.517
3	Ability to prepare visual aids to help deliver information	3.49	0.82	3.41	1.04	3.34	0.91	0.299
4	Ability to present a seminar	3.30	0.99	3.09	0.92	3.32	0.88	0.967
5	Ability to use power point presentations	3.21	1.35	3.20	1.30	3.44	1.12	0.519
6	Provide feedback of researchable problems to researchers	3.43	0.84	3.20	0.96	3.37	0.97	0.951

2.3 Analysis and diagnosis

1	Find ways to encourage farmers to adopt innovations	3.62	0.77	3.61	0.76	3.73	0.71	0.372
2	Use local leaders to influence farmers to change	3.79	0.95	3.75	0.92	4.02	0.82	1.203
3	Analyze traditional culture and its effect on change	3.58	0.66	3.52	0.89	3.59	0.92	0.116
4	Recognize learning differences in age groups	3.51	0.85	3.34	0.90	3.54	0.93	0.747
5	Identify problems of farmers and why they arise	3.81	0.59	3.68	0.77	3.98	0.79	2.040
6	Analyze how change in social status affect farmers	3.55	0.85	3.59	0.83	3.51	0.84	0.103

2.4 Leadership qualities

1	Lead farmers	3.83 <sup>b</sup>	0.78	4.00 <sup>ab</sup>	0.66	4.24 <sup>a</sup>	0.83	3.506*
2	Possess self-motivation, determination & dedication	3.92	0.70	4.02	0.73	4.17	0.80	1.286
3	Provide leadership in program planning and execution	3.75	0.85	3.66	0.82	3.98	0.85	1.707
4	See both sides of arguments in question	3.66 <sup>ab</sup>	0.65	3.38 <sup>b</sup>	0.75	3.85 <sup>a</sup>	0.76	5.464*
5	Visualize future extension prospects and problems	3.58	0.72	3.45	0.81	3.73	0.74	1.680
6	Apply persuasive style to inform clientele	3.26 <sup>b</sup>	0.79	3.25 <sup>b</sup>	0.84	3.68 <sup>a</sup>	0.72	4.340*

2.5 Initiative

1	Implement extension activities without being supervised	4.08	0.70	3.84	0.99	4.00	0.92	1.026
2	Confidence to work without guidance and support	3.85	0.86	3.71	0.83	3.90	0.74	0.708
3	Introduce new methods in extension work	3.68	0.83	3.57	0.95	3.61	0.74	0.221

3. PERSONAL QUALITIES

1	Commitment to extension work	4.23	0.72	4.16	0.85	4.22	0.76	0.114
2	Reliability in implementing extension work	4.09	0.66	3.96	0.71	4.12	0.60	0.823
3	Maintain relationship with farmers	4.42	0.66	4.48	0.76	4.54	0.55	0.382
4	Sensitive to the feelings and wishes of farmers	3.91	0.74	3.84	0.76	3.88	0.87	0.098
5	Confidence in own abilities to meet set objectives	3.87	0.79	3.96	0.69	3.90	0.74	0.240
6	Sure of what is being done everyday	4.04	0.81	4.00	0.89	4.02	0.79	0.028

Source: field data 2009. Note. AG = agriculture; AH = animal husbandry; FO = forestry; \* significant at 0.05 confidence level; Scheffe' post hoc comparison represented with superscript <sup>ab</sup>. means followed by same letters are not significantly different from each other.

Scheffe' post hoc comparison indicated that groups agriculture and animal husbandry significantly differed on, set objectives for an extension program ( $p=0.027$ ) and on, design and conduct farmers' training ( $p=0.040$ ). The two groups agriculture and forestry significantly differed on, lead farmers ( $p=0.033$ ) and on, apply persuasive style to inform clientele ( $p=0.042$ ). Animal husbandry and forestry groups significantly differed on, see both sides of an arguments in question ( $p=0.006$ ) and on, apply persuasive style to inform clientele ( $p=0.031$ ).

In the comparison for groups with periods of joining services, the significant differences identified were mostly that of the senior EAs having joined services before 1999 with the other two groups of junior EAs. It is to be noted that in the identified significant differences, the means for the junior groups are higher than the senior group indicating that the EAs who have joined services after 2000 have higher confidence in the various competencies. This may be possible because of the irregular in-service training program in Bhutan where the employed EAs are not able to enhance their competencies in accordance with the task areas assigned to operate (Androulidakis & Siados, 2003). Moreover, the continuously improved curriculum in the extension training institute is better suited to build the capacity of the new EAs to face relevant challenges in the farmers' fields.

On the comparisons drawn by sector, particular mention has to be made on the highly significant differences noted on the statement, apply persuasive style to inform clientele, between the agriculture and animal husbandry with forestry. The emphasis of training of EAs in Bhutan is on using participatory approaches in delivering services to farmers. While it is simpler for agriculture and animal husbandry EAs to adopt this practice, the nature of services for forestry is such that they are influenced in adopting more regulatory and policing job undertaken by the territorial forestry officials responsible for protecting the forests. Given the fact that Bhutan with 72.5% of the total area covered with forests, maintained strong forest conservation and protection regulation, the forestry officials are highly trained to undertake policing and protection jobs. Although the block-level forestry EAs are trained to adopt participatory approaches, the effect of the manner in which territorial forestry protection is implemented is simply irresistible for them to emulate. Therefore, applying persuasive style to inform clientele could be a more familiar job for the forestry extension, and thus higher mean difference, while agriculture and animal husbandry extension are exposed only to participatory extension approaches to bring about changes.

### **Conclusions and Recommendations**

It is evident from the results that EAs rated almost all competencies having high level of importance. It also showed that overall, most of the competencies they considered important were also possessed by them. What EAs considered important, they learned to acquire them. The few exceptions with contrasting variations that need mention are particularly on technical knowledge; deal effectively with field problems, and finding ways to encourage farmers to adopt innovations.

The results of the discrepancy values ascertained that EAs lacked technical knowledge in their subject areas thereby corroborating the repeated assertions of the Ministry of Agriculture that the EAs lacked technical competency for effective job performance. Therefore, the Ministry of Agriculture should pay particular attention to enhance this competency of employed EAs through regular in-service training programs. The other most important training requirements based on this study are on building the capacity to conduct situational analysis, ability to prepare visual aids, finding ways to encourage farmers to adopt innovations, visualize future extension prospects and problems, introduce new methods, build abilities to meet objectives, create awareness of the government policy, and efficiently present a seminar.

The confidence on the various competencies of junior EAs were found higher than the senior EAs. This may be possible because there are no regular in-service training programs in Bhutan to update and refresh the skills and knowledge of employed EAs to enhance their competencies. The approaches and practices of delivering services are consistently evolving and

curriculum of training institutions being improved based on new developments. The departments of agriculture, animal husbandry and forestry in the Ministry of Agriculture should regularly conduct training needs analysis and in-service training to update the knowledge and skills of senior EAs.

Forestry EAs possessed fairly higher skills in applying persuasive styles which is an added advantage if the services could be delivered effectively. However, cautionary measures should be taken not to impose excessive persuasive territorial forestry discipline in a system where the strength is using participatory approaches in extension services delivery.

### References

- Androulidakis, S. I., & Siardos, G. C. (2003). Agricultural extension agents' perception regarding their relevance and competence in certain professional task areas. *European Journal of Agricultural Education and Extension*, 1(3), 1-14.
- Bradfield, A. (1966). *Guide to extension training*. Rome: Food and Agricultural Organization.
- Boyd, B. L. (2003). Competencies for leaders of volunteers during the next decade: a national Delphi study. *Journal of Agricultural Education*, 44(4), 47-57.
- Belay, K. & Abebaw, D. (2004). Challenge facing agricultural extension agents: a case study from South Western Ethiopia. *African Development Review*, 16(1), 139.
- Easter, G. W. (1985). *Assessment of professional competencies need by extension agents in developing countries: Case study in Swaziland*. Unpublished Doctoral Dissertation, University Park: The Pennsylvania State University.
- Extension Coordination Committee. (2007). *Recommendations for revitalizing RNR extension services*. Unpublished Report, Thimphu: Ministry of Agriculture.
- Herringer, J. M. (2002). Once isn't enough when measuring staff competence. *Nursing Management*, 33(2), 22.
- Hussain, N., Ali, T., Khan, M. A. J., & Ahmad, M. (2004). Training of agricultural extension administrators in planning extension activities in the Punjab, Pakistan. *International Journal of Agriculture and Biology*, 6(5), 941-942.
- Khan, M.A.J., Ali, T., & Hussain, N. (2004). Competencies regarding extension methodology possessed by agricultural officers in Punjab. *Indus Journal of Plant Sciences*, 3(1), 31-33.
- Khan, M.A.J., Lodhi, T. E., & Ashraf, I., & Khan, A. K. (2007). An assessment of technical competences (agronomic practices) needed by agricultural officers in the Punjab, Pakistan. *Pakistan Journal of Agricultural Sciences*, 44(2), 381-384.
- Maunder, A. H. (1972). *Agricultural extension: A reference manual*. (ERIC Document Reproduction Service No. ED 075 628).
- Ministry of Agriculture (MoA). 2009. National Extension Policy of RNR Sector of Bhutan. Thimphu: MoA. Retrieved from <http://www.moa.gov.bt/moa/downloads/downloadFiles/MoADownload3ye3533bg.pdf>
- Moore, L. L., & Rudd, R. D. (2004). Leadership skills and competencies for extension directors and administrators. *Journal of Agriculture Education*, 45(3), 22-33.
- Muhammad, S., Garforth, C., & Malik, N. H. (1995). Competence of extension field staff in various communication channels for effective extension work. *Pakistan Journal of Agriculture Sciences*, 32(4), 266-269.
- Oakley, P. & Garforth, C. (1985). *Guide to extension training*. Rome: FAO.
- Pickett, L. (1998). Competencies and managerial effectiveness: Putting competencies to work. *Public Personal Management*, 27(1), 103-115.
- Raad, G. P., Yoder, E. P., & Diamond, J. E. (1994). Professional competencies needed by extension specialists and agents in Iran. *Journal of International Agricultural and Extension Education*, 1(1), 45-53.