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In-service Training: Key to Enhancing Competence and Building Confidence for Job Performance of *Gewog*-level Extension Agents in Bhutan

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Abstract

The study is aimed to measure the confidence levels of the extension agents under the Ministry of Agriculture and Forests based in the gewogs for efficient job performance by identifying their perceptions on the various competencies. A total of nine out of the 20 dzongkhags comprising of 60 gewogs from four regions of the country were selected for the purpose of the study. A structured questionnaire-based survey was administered to 150 samples of extension agents at the gewog-level. The study showed that most of the competencies EAs considered important were also possessed by them and vice versa. However, the competencies considered important that were least possessed by EAs were particularly in vital areas, including technical knowledge and skill oriented competencies. The study indicated that EAs needed some form of training in all the 40 competencies of extension knowledge, skills and qualities measured. The technical knowledge competency stood out as the most important training need. The senior extension agents have lower level of confidence on various competencies as compared to their juniors. These differences in the competency levels could be attributed to the lack of consistent in-service training programme. The approaches and practices of delivering extension services are consistently evolving and curriculum of training institutions being improved based on new developments. The implementation of in-service training should be systematized and regularized or at least the frequency of in-service training should be increased in the future so that technical knowledge and skills of employed/senior extension agents in the field are consistently upgraded and their confidence levels on technical competencies further enhanced. In-service training was rated as one of the primary sources of information and knowledge for extension agents.

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The opportunities to participate in forums like workshops, seminars, conferences and meetings were also found very useful and knowledgeable. Therefore, the Ministry of Agriculture and Forests should accord the highest priority in increasing the frequency of providing in-service training particularly to senior extension agents and also give more opportunities to staff based in the dzongkhags/gewogs for participating in national/regional conferences and seminars.

Introduction

Bhutan is administratively divided into 20 *dzongkhags/*districts. Each *dzongkhag* is governed by a *Dzongdag*/district administrator. The *Dzongkhag* is further broken down into further smaller administrative units called *Gewogs*. In each of the country's 205 *gewogs*, there is an extension centre manned by three extension agents (EAs) representing agriculture (AG), animal husbandry (AH), and forestry (FO) extension working in an integrated approach in the delivery of their services. These EAs have mostly diploma-level trainings and are equipped with basic technical knowledge and communication skills.

The agricultural extension centres are equipped with basic necessary resources to smoothly transfer appropriate technologies, facilitate access to input supplies and promote farm-based enterprizes. The *gewog* extension centres also provide feedbacks to government agencies to improve future services and provide assistance to relevant agencies for prioritizing development activities. The *Dzongkhag* level extension service provides administrative and technical back-stopping to the *gewog* extension centres while the National Extension Coordination (ECC) Unit, at the centre in the Ministry of Agriculture and Forests (MoAF), provides guidelines for implementation of extension programmes at the national level. The *gewog* extension centres are the main service providers to the farmers.

Initially, agricultural extension services in Bhutan were delivered

centrally by the Departments under the Ministry of Agriculture through the various outreach programmes such as the research/production farms. In the mid 1980s, the government decentralized all its development programmes to the districts and appointment of EAs in the blocks was started. It was during the 1992-1997 period that the government adopted an integrated approach to services delivery through the Renewable Natural Resources (RNR) sector placing greater importance on farmers' participation in the decision making process.

Since 1985, the extension strategy in Bhutan was centred on the adoption of the Training and Visit (T&V) extension system. Experiences in applying this system demonstrated the need to modify the management to suit the difficult terrain and scattered farming community of Bhutan. The application of this system, however, improved the overall implementation of the extension services and contributed to farm development especially those in the project-based areas (Tashi, 1993).

The first national extension policy was finalized in 1995 and provided guidelines in pursuing rural development. The main emphasis of this policy was determined by the definition it adopted from Roling (1988) to bring about "communication intervention" and "voluntary changes" on the part of the farmers. To keep pace with the change, this policy was revised, and a simplified definition was adapted where it mentioned that, "extension is providing necessary information to help people form sound opinions and make good decisions" (MoAF 2009, p.9). The policy also recognizes that it is equally important to facilitate providing necessary means and inputs to translate newly acquired information, knowledge or skills into action.

According to the revised extension policy, motivation of extension staff is important to deliver the expected goods and services to the farmers. "The extension system is only as good and effective as the extension agents are. Therefore, how to keep the extension agents highly motivated, dedicated and committed towards their work is a major challenge"

(MoAF, 2009, p. 8).

Given these facts, "extension managers need to know what motivates their staff to be able to manage them more effectively, minimize employees' frustration and boost their working morale," (Mwangi and McCasline, 1994 cited in Fabsoro, Awotunde, Sodiya & Alarima, 2008, p. 141). MoAF (2007) noted that, "job status of extension staff" in Bhutan was reportedly low and that there is an urgent need to "explore other ways and means of motivating the extension staff."

One way of improving the motivation levels of EAs is to pay adequate attention by the MoAF in providing opportunities for enhancing their technical competencies and up-gradation of professional capacities through proper in-service training both within and outside the country. The human resource management division (HRMD) of MoAF should maintain proper staff database on human resource development and make them available to the respective departments for monitoring the staff training position.

Theoretical framework

Fabusoro, Awotunde, Sodiya and Alarima (2008) said that within an agricultural setting, particularly an agricultural extension outfit, motivation of staff is important in achieving the desired agricultural development plan. They said, "Agricultural extension aims at improving the practice of agriculture in the developing world through extension of knowledge to farm families on improved agricultural practices and technologies" (p. 140). Apantaku and Apantaku (2008 cited in Fabusoro, Awotunde, Sodiya & Alarima, 2008) found that motivation factors accounted for 56% of the variance in job satisfaction of agricultural extension workers.

The work motivation and morale of extension staff are very poor in many countries (Vijayaragavan, K. & Singh, Y. P., 1988). The bureaucratic

structure of extension administration, lack of in-service training, rewards and incentives, poor facilities, poor promotional avenues, and the low esteem meted out to extension agents are the major causes of poor motivation and morale. The extension supervisors should have the ability to motivate and lead the field extension workers so that the field agents perform more than routine jobs. Special in-service training for developing motivation among field-workers has to be undertaken by the supervisors. There is the 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 programmes may not be planned efficiently (Khan, Lodhi, Ashraf & Khan, 2007).

The training of extension personnel contributes directly to the development of human resources within extension organizations (Vijayaragavan et al., 1988). "Training programmes are directed towards maintaining and improving current job performance" (Stoner & Freeman, 1992, p. 388). Training has to start with the identification of training needs through job analysis, performance appraisal, and organizational analysis.

Worldwide, there are currently more than 600,000 extension workers comprised of administrative staff, subject-matter specialists (SMS), field-workers, and some multipurpose unidentified people; the Asian and Pacific countries have absorbed more than 70 per cent of them (Bahal, Swanson, & Earner, 1992). Deficiencies in knowledge, skills, and ability among extension personnel, particularly those of Asia, Africa, and Latin America, are remarkable. About 39 per cent of the extension personnel worldwide have a secondary-level and 33 per cent an intermediate-level education (Bahal et al., 1992).

Moreover, within each region, there are lots of variations in basic academic qualifications of the frontline extension workers, SMS, and administrators. Differences in training received are also wide (Halim, A.

& Ali, M. M. 1998). In Africa, most frontline extension workers still have only a secondary school diploma (Bahal et al., 1992). The poor educational background of extension personnel necessitates regular training. 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).

In-service training is offered by organizations from time to time for the development of skills and knowledge of the incumbents (Abdul et al., 1998). It is the process of staff development for the purpose of improving the performance of an incumbent holding a position with assigned job responsibilities. It promotes the professional growth of individuals. "It is a program designed to strengthen the competencies of extension workers while they are on the job" (Malone, 1984, p. 209). In-service training is a problem-centred, learner-oriented, and time-bound series of activities which provide the opportunity to develop a sense of purpose, broaden perception of the clientele, and increase capacity to gain knowledge and mastery of techniques (Halim et al., 1998).

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 programme 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 & 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 programmes are implemented, there remains a substantial need for continuing education programmes for extension personnel. This will require an articulated continuing education programme which addresses the specific professional needs of agents.

Training is a circular process that begins with needs identification and after a number of steps, ends with evaluation of the training activity. A change or deficiency in any step of the training process affects the whole system, and therefore it is important for a trainer to have a clear understanding about all phases and steps of the training process (Halim et al., 1998). It is also important to understand that the training phases should end with an evaluation to determine the relevance, effectiveness, and impact of activities in light of their objectives. Raab et al. (1987, p. 5) define training evaluation as "a systematic process of collecting information for and about a training activity which can then be used for guiding decision making and for assessing the relevance and effectiveness of various training components."

Objectives

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

1.   To measure the competency level of EAs for job performance
2.   To identify the in-service training requirements of EAs

3. To find out the differences of perceptions on the competency level by senior and junior EAs and by sector
4. To identify in-service training as the source of information and knowledge for EAs

Methods

Nine *dzongkhags* out of the total 20 *dzongkhags* were selected as study samples based on cluster sampling. The cluster sampling was employed by subdividing the *dzongkhags* distributed in the four regions covered by the RNR Research and Development Centres (RNR R&DC) of the MoAF. The R&DCs 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 R&DCs are horticulture research for east with six *dzongkhags*, cereal crops research for west with five *dzongkhags*, forestry research for west-central with six *dzongkhags*, and livestock research for east-central with three *dzongkhags*. Table 1 illustrates the distribution of the four geographical regions.

Table 1   Four geographical regions along with the Research & Development Centres with their national research mandates and sample districts from each region

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

Total	20	9	150

Having stratified the *dzongkhags* in the four regions, two sample *dzongkhags* 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 nine *dzongkhag* samples. As the total number of *dzongkhags* in Bhutan is 20, the nine sample *dzongkhags* were equivalent to 45% of the total size.

There are three extension agents representing AG, AH, and FO in each extension centre in every *gewog*. As indicated in the introduction, there are a total of 205 *gewogs* in the various *dzongkhags*. Since there are three EAs in each extension centre in every geog, a blanket count of a total of 615 EAs was taken. From this total number of EAs, 29.27% of the EAs totalling to 180 EAs was taken as samples for the study. These many EAs covered 60 *gewogs* in the sample *dzongkhags*. These 60 *gewogs* were apportioned to the nine sample *dzongkhags* based on the sizes of the samples (29.27% EAs) and size of the *dzongkhags* in terms of the number of *gewogs*.

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 *dzongkhags*. Prior to distributing the questionnaires, a training-workshop was conducted with all the respondents in respective *dzongkhag* headquarters. Data format from EAs were collected through postal and personal hand delivery from October-November, 2009.

Out of the nine sampled *dzongkhags* with 180 EAs, 153 EAs responded out of which three data formats were screened and a sample size of 150 retained. The data analysis was carried out using Statistical Package for the Social Sciences (SPSS).

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 capabilities, 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.

A study on the sources of knowledge and information of EAs was also conducted. Table 7 shows the scores of the various sources where in-service training was identified as of the key sources of knowledge and information.

Personal characteristics of EAs

The personal characteristics of the EAs showed that there were 127 male

and 23 female respondents with ages ranging from 21 to 53 years. The average age was 32.9 years out of which 138 of them were married with some of the spouses also working as EAs. The EAs have joined services from 1971 to 2009 with the range of 38 years. There were 53 respondents from AG, 56 from AH and 41 from FO sub-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 centres in the respective blocks while 126 of them said they could reach their centres within a day or less.

Competency level found important by EAs

Table 2 shows 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 seven categories of knowledge, organization & planning, communication, analysis and diagnosis, leadership qualities, initiative and 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). The three competencies EAs found least 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).

With standard deviations of all the levels in almost all categories found ≤1, there are lesser variations in the perceptions of the respondents with regards to the overall competency levels found important.

Table 2 Statements of professional competency rank orders, mean and standard deviation of extension agents of various categories (n=150)

Sl. No.	Competency categories and competency statements	Level of Importance			Level of Possession		
		R	M	SD	R	M	SD
1. Knowledge							
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
2. Personal skills							
2.1 Organization and planning							
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	Set objectives for an extension program	6	4.21	0.745	6	3.71	0.830
8	Conduct situational analysis of extension program	7	4.15	0.693	8	3.48	0.800
9	Coordinate work schedules with other peer staff	8	4.02	0.781	7	3.67	0.757
2.2 Communication							
1	Ability to convey extension messages effectively	1	4.58	0.627	1	4.12	0.732

Sl. No.	Competency categories and competency statements	Level of Importance			Level of Possession		
		R	M	SD	R	M	SD
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
2.3 Analysis and diagnosis							
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
2.4 Leadership qualities							
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
2.5 Initiative							
1	Implement extension	1	4.41	0.744	1	3.97	0.878

Sl. No.	Competency categories and competency statements	Level of Importance			Level of Possession		
		R	M	SD	R	M	SD
	activities without being supervised						
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
3. Personal qualities							
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	5	3.91	0.732
6	Sensitive to the feelings and wishes of farmers	6	4.29	0.780	6	3.87	0.780

Note. R = rank; M = mean; SD = standard deviation

Competency level possessed by EAs

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 least in the seven categories in terms of mean score were, ability to present at seminar (3.26), ability to use power point presentations

(M=3.27); and provide feedback of researchable problems to researchers (3.33).

With standard deviations of all the levels in almost all categories found ≤1, there are fewer variations in the perceptions of the respondents with regard to the competency levels possessed by the EAs.

Overall Competency level found important and possessed by EAs

There were few cases of contrasting variations where the competencies considered important were least 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 & Diamond (1994) but a systematic in-service and continuous professional development programmes have yet to be implemented on a regular basis within MoAF. The in-service trainings for EAs are conducted by the College of Natural Resources (CNR) under the Royal University of Bhutan while the EAs are directly under the mandate of MoAF. The inconsistent and irregular in-service training implemented for EAs maybe the result of lack of coordination and understanding between the training institute and MoAF.

Overall, it showed that most of the competencies EAs considered important were also possessed by them and vice versa. The following competencies observed the highest mean scores for both the importance and possession competencies levels: good understanding about block, people, and culture; design and conduct farmers' training; ability to convey extension messages effectively; possess self motivation, determination and dedication; implement extension activities without

being supervised; and maintain relationship with farmers. These seven statements topped each of the seven categories of competencies for both the importance and possession competencies levels, thereby, clearly establishing the fact that the competencies considered important were possessed by EAs.

Competency level differences and training needs of EAs

Presented in Table 3 are the discrepancy values (DV) calculated on the basis of mean 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. Based on the scores of the DV, each statement is ranked, with 1 accorded as the highest DV rank (R). The highest rank indicated the greatest training needs. Two types of rankings were accorded: (i) individual category/sub-category-wise ranking (R) and (ii) overall ranking (OR).

The results of the overall competency level differences and training needs of EAs identified by presenting the DV values are described below.

Out of the three main categories of competencies with 40 statements, 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).

Table 3 Rank orders of professional competencies on the basis of differences between level of importance and level of possession by EAs (n-150)

Sl. No.	Competency categories and competency statements	IL Mean	PL Mean	DV	Rank	OR
1. Knowledge						
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
2. Personal skills						
2.1 Organization and planning						
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
2.2 Communication						
1	Ability to prepare visual aids	4.33	3.42	0.91	1	2

Sl. No.	Competency categories and competency statements	IL Mean	PL Mean	DV	Rank	OR
	to help deliver information					
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
2.3 Analysis and diagnosis						
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
2.4 Leadership qualities						
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
2.5 Initiative						

Sl. No.	Competency categories and competency statements	IL Mean	PL Mean	DV	Rank	OR
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
3. Personal qualities						
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

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

In executing the overall ranking of all the seven categories combined with 40 statements, the ten most important training needs identified, in order of importance, were: (1) adequate technical knowledge in the subject area (DV=1.00); (2) ability to prepare visual aids to help deliver information (DV=0.91); (3) awareness of the current government policy (DV=0.90); (4) ability to present a seminar (DV=0.77); (5) ability to use power-point presentation (DV=0.76); (6) introduce new methods in extension work (DV=0.75); (7) provide feedback of researchable problems to researchers (DV=0.73); (8) find ways to encourage farmers to adopt innovations (DV=0.72); (9) ability to persuade farmers to adopt technologies (DV=0.71); and, (10) conduct situational analysis of extension programmes (DV=0.67).

The five competencies that required the least training requirements were: (1) apply persuasive style to inform clientele (0.05); (2) lead farmers (0.31); (3) design and conduct farmers' training (DV=0.32); (4) maintain relationship with farmers (DV=0.33); and (5) coordinate work schedules with other peer staff (DV=0.35).

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 three main categories of extension knowledge, skills and qualities. This supports the findings of Androulidakis & Siados (2003); Hussain, (2004); Khan et al. (2004); Muhammad et al. (1995); Raad, Yoder & Diamond (1994); Randavay & 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 MoAF have in Bhutan on the technical competency level of extension agents. The MoAF 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 ten most important training needs identified above should be considered as important training needs areas for designing future in-service training programmes.

The study, thus, found out that from the 40 statements identified that required some form of training for the EAs, the statement on technical knowledge competency stood out as the most important training requirement for the EAs.

Comparison on perceived competency by periods of joining service/senior and junior EAs

Table 4 shows the comparison made among the three groups of EAs who have joined service, from 1999 and earlier (n=59), 2000 to 2004 (n=42), and 2005 to 2009 (n=49) on the 40 statements/competencies. These three

groups who have joined services at different periods were likely to vary in terms of work experience, ages, family patterns, and training opportunities due to the evolving curriculum or contents of training programmes in institutions like the CNR at Lobesa. These variations of personal effects were likely to impact on the perceptions of the EAs and this comparison was aimed to record these varied perceptions.

Table 4 Comparison of competency level possessed by extension agents by periods of joining service

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	
1. Knowledge							
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
2. Personal skills							
2.1 Organization and planning							
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[b]	0.59	4.05[ab]	0.70	4.14[a]	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*

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	
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
2.2 Communication							
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
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

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	
2.3 Analysis and diagnosis							
1 Find ways to encourage farmers to adopt innovations	3.46[b]	0.80	3.86[a]	0.68	3.69[ab]	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[b]	0.74	3.81[a]	0.71	3.57[ab]	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[b]	0.71	4.02[a]	0.56	3.82[ab]	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

	Competency categories and competency statements	1999 and earlier (n=59)		2000 - 2004 (n=42)		2005 - 2009 (n=49)		F-value
		M	SD	M	SD	M	SD	
5	Visualize future extension prospects and problems	3.36[b]	0.80	3.76[a]	0.76	3.67[ab]	0.66	4.283*
6	Apply persuasive style to inform clientele	3.03[b]	0.85	3.45[a]	0.67	3.71[a]	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	3.98	0.88	4.14	0.61	3.96	0.94	0.645

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	
being done everyday							

Note. M = mean; SD = standard deviation; * significant at 0.05 confidence level; *** significant at 0.001 confidence level; Scheffe' post hoc comparison represented with superscript [ab]: means followed by same letters are not significantly different from each other

The comparison showed statistically significant differences of perceptions among the three stratified groups of senior and junior EAs 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 ≤1, indicating there were no significant deviations of opinions from the mean.

Post-hoc comparison on groups with differences of perceptions

Scheffe' post hoc comparison indicated that group 1999 & earlier and group 2005-2009 significantly differed on, manage time effectively (p=0.024) and observed highly 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 statistically 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 Comparison of competency level possessed by extension agents by sub-sector

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								
2.1 Organization and planning								
1	Deal	3.96	0.62	3.82	0.66	3.88	0.68	0.640

S/N	Competency categories and competency statements	Sector AG (n=53)		AH (n=56)		FO (n=41)		F-value
		M	SD	M	SD	M	SD	
	effectively with field / extension problems							
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[a]	0.78	3.50[b]	0.85	3.73[ab]	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[a]	0.70	3.95[b]	0.88	4.22[ab]	0.65	3.496*
9	Evaluate extension program	3.72	0.79	3.66	0.77	3.76	0.83	0.177
2.2 Communication								
1	Ability to convey	4.06	0.80	4.18	0.72	4.12	0.68	0.375

S/N	Competency categories and competency statements	Sector AG (n=53)		AH (n=56)		FO (n=41)		F-value
		M	SD	M	SD	M	SD	
	extension messages effectively							
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	3.58	0.66	3.52	0.89	3.59	0.92	0.116

S/N	Competency categories and competency statements	Sector AG (n=53)		AH (n=56)		FO (n=41)		F-value
		M	SD	M	SD	M	SD	
	traditional culture and its effect on change							
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[b]	0.78	4.00[ab]	0.66	4.24[a]	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[ab]	0.65	3.38[b]	0.75	3.85[a]	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	3.26[b]	0.79	3.25[b]	0.84	3.68[a]	0.72	4.340*

S/N	Competency categories and competency statements	Sector AG (n=53)		AH (n=56)		FO (n=41)		F-value
		M	SD	M	SD	M	SD	
	style to inform clientele							
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	4.04	0.81	4.00	0.89	4.02	0.79	0.028

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	
	everyday							

Note. AG = agriculture; AH = animal husbandry; FO = forestry; M = mean; SD = standard deviation; * significant at 0.05 confidence level; Scheffe' post hoc comparison represented with superscript [ab]: means followed by same letters are not significantly different from each other.

Comparison on perceived competency by sub-sector

Table 5 shows the comparison of perceptions among the three sub-sectors of AG (n=53), AH (n=56) and FO (n=41) on the 40 statements/competencies. Given the different disciplines, the nature of their work also differed from one another in terms of work load, service, approach to farmers, extension methods, etc. The comparison was made to assess the differences of perceptions, if any, given the different nature of work in the three sectors.

The group comparison showed statistically significant differences among the three groups of AG, AH, and FO sub-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, $p=0.015$.

Again the standard deviations ≤1 indicated there were no significant deviations of opinions from the mean.

Post-hoc comparison on groups with differences of perception

Scheffe' post hoc comparison indicated that groups AG and AH 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 AG and FO significantly differed on: lead farmers (p=0.033) and on, apply persuasive style to inform clientele (p=0.042). The AH and FO groups significantly differed on: see both sides of an argument in question (p=0.006) and on, apply persuasive style to inform clientele (p=0.031).

Based on the means of the items, these statistical significance differences indicated that AG group is better than AH in setting objectives for an extension programme and to design and conduct farmer's training. The FO group was found to be in a better position to lead farmers as compared to the AG group; at the same time, the FO group was found better than AH to see both sides of arguments in question. The significance test found that it is mainly the FO group who is more inclined towards applying persuasive styles as compared to AG and AH groups.

Results of the perceptions based on the comparison by periods of joining service and by sector

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 programme 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. It is also possible that the proportion of training and up-gradation opportunities availed by the RNR *Dzongkhag*

extension personnel may not be adequate. Table 6 shows that the percent share of training opportunities in terms of short terms, study tours, meetings, conferences, etc. are very low for the *Dzonkhags* as compared to other agencies within the RNR sector.

Table 6 Percent share of training acquired by staff working in the various agencies under MoAF during the period 2008-2009

S/N	Dept./ Agency	No. of Staff	Type of Training			% share of Training		
			Short Term	Study Tours	Confere nce/ Meeting s, etc.	Short Term	Study Tours	Conference / Meetings etc.
1.	DAMC							
	HQ Central	24	3	5	12	12.5	20.8	50.0
	Program	12	0	0	5	0.0	0.0	41.7
	Total	36	3	5	17	8.3	13.9	47.2
2.	DoA							
	HQ Central	51	8	13	22	15.7	25.5	43.1
	Program	206	51	28	22	24.8	13.6	10.7
	Dzongkhag	281	64	47	15	22.8	16.7	5.3
	Total	538	123	88	59	22.9	16.4	11.0
3.	DoL							

	HQ Central	28	3	4	15	10.7	14.3	53.6
	Program	261	56	38	24	21.5	14.6	9.2
	Dzongkhag	280	27	10	2	9.6	3.6	0.7
	Total	569	86	52	41	15.1	9.1	7.2
4	DoF &PS							
	HQ Central	87	16	11	23	18.4	12.6	26.4
	Program	999	16	135	18	1.6	13.5	1.8
	Dzongkhag	234	0	5	2	0.0	2.1	0.9
	Total	1320	32	151	43	2.4	11.4	3.3
5.	CoRRB							
	HQ Central	17	4	8	6	23.5	47.1	35.3
	Program	188	30	22	25	16.0	11.7	13.3
	Total	205	34	30	31	16.6	14.6	15.1
6.	BAFRA							
	HQ Central	13	6	8	9	46.2	61.5	69.2
	Program	137	13	28	4	9.5	20.4	2.9
	Total	150	19	36	13	12.7	24.0	8.7
7.	Sectt.	222	70	19	77	31.5	8.6	34.7

Note. DAMC=Department of Agricultural Marketing and Co-operatives; DoA=Department of Agriculture; DoL=Department of Livestock; DoF&PS=Department of Forests and Park Services; CoRRB=Council for RNR Research for Bhutan; BAFRA=Bhutan Agricultural and Forestry Regulatory Authority: Sectt=Secretariat

Source: MoAF. (2012). Retrieved 31 January 2012 from http://www.moaf.gov.bt/moaf/?p=33&wpfbcat=5.

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 AG and AH with FO. The emphasis of training of EAs in Bhutan is on using participatory approaches in delivering services to farmers. While it is simpler for AG and AH 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 FO extension, and thus higher mean difference, while AG and AH extension are exposed only to participatory extension approaches to bring about changes.

The statistical significance test also showed that it is the junior groups of EAs who are more inclined towards applying persuasive style of delivering services.

In-service training: Key source of knowledge and information for EAs

Table 7 shows the scores of knowledge and information sources for the EAs. As many as 14 sources were ranked from 1 to 14 with 1 being the most important. Respondents ranked the same number in more than one source given the appropriateness and relevance. For the purpose of analysis, the score of the first three most important ranks (R) orders (R1 Imp, R2 Imp & R3 Imp) were chosen for each item, multiplied by 3, 2 and 1 respectively and summing up the sub-scores to get the total score as shown in the Table.

The result showed that the most important sources of knowledge and information for EAs were: the College of Natural Resources; RNR Sector Heads; and, in-service training, that ranked R1. The statements: attending workshops; seminars; and conferences ranked as R2 important sources of information. The third most important source was: regular sector-specific meeting in the *dzongkhag* (R3) followed by extension materials (R4) and

RNR R&DC at R5.

Table 7 Scores of knowledge and information sources in order of importance (n=150)

S/N	Sources of knowledge and information	No. 1 Imp (No. of scores x 3)	No. 2 Imp (No. of scores x 2)	No. 3 Imp (No. of scores x 1)	Total scores (1+2+3)	R
1.	RNR R&DC	72	32	20	124	5
2.	College of Natural Resources	136	42	10	188	1
3.	Dzongkhag RNR sector heads	108	66	14	188	1
4.	Regular sector-specific meetings in the Dzongkhag	84	64	15	163	3
5.	Attending workshops, seminars & conferences	90	52	23	165	2
6.	Policy directives from technical Departments	39	34	17	90	7
7.	External visitors (both RNR & non-RNR)	24	24	13	61	11
8.	Extension materials	87	44	21	152	4
9.	Peer group (other EAs in the geog)	51	34	11	96	6
10.	In-service training	108	60	20	188	1
11.	Village leaders and farmers	45	30	11	86	8
12.	Media: television	27	22	12	61	11
13.	Media: radio	36	24	9	69	10
14.	Media: newspapers	39	28	9	76	9

Note: Imp = Importance; R = rank

Therefore, it is vital for the MoAF to be aware that in-service training of EAs play key role as source of information and knowledge in addition to up-dating their technical competency and skills (during the training). It is

also very clear that opportunities to participate in formal and informal forums like the workshops, seminars, conferences and regular sector-specific meetings are found very useful and knowledgeable although statistic in Table 6 showed very low participation in such forums by the *dzongkhag* level extension personnel within the RNR Sector.

Summary and recommendations

The discrepancy values of 40 competencies calculated on the basis of mean differences between the levels of competencies considered important and the competency levels possessed by the EAs showed that 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. The differences were considered as the training needs in the identified competencies and since they are all positive values, it indicated that EAs needed training in all the competencies. The technical knowledge competency, which is the most vital competency, required the highest level of training by EAs.

The ten most important training needs identified were: technical knowledge in the subject area; ability to prepare visual aids to help deliver information; awareness of the current government policy; ability to present a seminar; ability to use power-point presentation; new methods in extension work; provide feedback of researchable problems to researchers; find ways to encourage farmers to adopt innovations; ability to persuade farmers to adopt technologies; and, conduct situational analysis of extension programmes. Therefore, it is recommended to bestow the highest priority in these training areas in designing in-service training programmes in the future.

The approaches and practices of delivering extension services are consistently evolving and curriculum of training institutions being improved based on new developments. The implementation of in-service training should be systematized and regularized or at least the frequency

of in-service training should be increased in the future so that technical knowledge and skills of employed/senior EAs in the field are consistently upgraded and their confidence levels on technical competencies further enhanced.

The result of the study showed evidences that merit in-service training programme to be accorded the highest priority. In measuring the competencies, the senior EAs particularly those who have joined service before 1999 were found to have lower level of confidence in several competencies. By up-dating and up-grading their knowledge and skills through in-service training, they could enhance their confidence and opportunities for personal growth.

In measuring the sources of knowledge and information for EAs, in-service training was also found to be one of the main sources of knowledge and information. The ranking of 14 sources of knowledge and information showed that in-service training along with the RNR SHs and the College of Natural Resources were rated as the most important sources of information and knowledge for the EAs. Thus, the significance of in-service training to EAs as highlighted above. The ranking also showed that the participation in workshops, seminars and conferences was rated as the second most important sources of knowledge by EAs. However, with the perceived weak institutional linkages and formal networks with external organizations, the opportunities for EAs to participate in such formal and informal forums could be greatly reduced. Therefore, the strengthening of institutional linkage building and enabling of as many EAs as possible to participate in national/regional seminars, meetings, workshops and conferences is recommended so that they can gain exposure and their prospects for learning can be enhanced.

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