Competency Assessment as a Way of Determining Training and Educational Needs of Extension Professionals in Nepal

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Abstract

This study examines the level of and gaps in core competencies among agricultural extension professionals in Nepal. The study population was composed of agricultural extension professionals in governmental extension offices and agriculture-based, non-governmental organizations. During August-September 2015, 349 extension professionals completed self-administered surveys. The design for the data collection instrument was based on a literature review and on focus group recommendations. Data were analyzed using descriptive and inferential statistics. The findings revealed that respondents perceived themselves to be moderately competent in extension core competencies -- program planning, program implementation, communication skills, educational and informational technology, program evaluation, personal and professional development, diversity, and technical subject matter expertise. Respondents' perceived levels of competency differed by their current position, undergraduate college attended, and level of education, although not much by their age and experience in extension. Office chiefs and foreign-educated respondents perceived themselves as having higher levels of competency than their counterparts -- subject matter specialists and technical officers, and in-country-educated professionals. The perceived levels of the importance of all core competencies were significantly higher than the professionals' perceived levels of their own competency, indicating gaps in extension core competencies among Nepalese extension professionals. The findings imply that that there is a need for in-service training of extension professionals in all core competency areas. Preservice extension education curricula need to be reviewed and updated, incorporating the core competencies highlighted in this study.

Introduction

The success of agricultural extension services is contingent on extension professionals' knowledge, skills, and abilities to perform their extension work effectively. Extension professionals (EPs) educate farming communities about new and improved agricultural technologies and practices and their adoption. As Christoplos (2010) explained it, extension is a system of facilitating access for farmers or their organizations to new knowledge, information, and technologies. Extension enables farmers to engage in interactions with research, education, and other stakeholders and assist them in developing their technical, organizational, and management skills and practices. As alluded to in this definition, extension is a complex process involving several actors with varied interests, a process in which EPs are expected to play catalytic roles. EPs serve as information brokers, community organizers, facilitators, and change agents (Suvedi & Kaplowitz, 2016). Maddy, Niemann, Lindquist, and Bateman (2002) asserted that extension employees "should possess the necessary competencies to anticipate and deliver quality educational programs of relevance and importance to our publics" (p. 1). Only EPs who are trained, motivated, and competent—technically and in process skills—can succeed in effectively delivering agriculture-related knowledge and skills to their clients.

Core Competency Definitions

"Competencies" and "core competencies" are buzzwords in extension and in education and training. "Competencies" refer to human abilities to provide efficient and effective services, and to help attain individual and organizational goals. Burke (1989) defined "competence" as the ability to perform at the standards expected of employees. Seevers, Graham, and Conklin (2007) used the term "core competency" to describe the basic knowledge, skills, attitudes, and behaviors that contribute to workers' excellence in their respective professions. Core competencies are, according to Athey and Orth (1999) and Lucia and Lepsinger (1999), observable human dimensions necessary for program success, both individually and organizationally; and they are the qualities required at all levels in the workforce. The terms "competencies" and "core competencies" are used interchangeably in the literature. In this paper, "core competencies" are defined as the broader constructs to which "competencies" are attributed.

The competency of individuals is directly related to their performance. As Shim (2008) pointed out, a high level of competency leads to higher efficiency in services, better performance, and higher satisfaction among staff members and their clients. Highlighting the importance of a competent workforce in an organization, Dubois, Rothwell, Stern, and Kemp (2004) stressed "no competencies, no outputs, no organization" (p. 21). These points underline the increasing need for a competency assessment of human resources.

Extension Core Competencies

The types of jobs that extension professionals (EPs) do define the extension core competencies that EPs need to possess. The literature suggests that EPs should be able to communicate effectively with clients; demonstrate program development abilities; lead and/or facilitate collaboration and coordination with stakeholders; and evaluate extension programs (Suvedi & Ghimire, 2015; Suvedi & Kaplowitz, 2016). This literature further underscores that EPs should be able to foster diversity in their work; pursue personal and professional development throughout their careers; be

technically competent in their subject areas; and efficiently use newly emerging educational and informational technology (EIT) such as the Internet, email, social media, and computers. More importantly, EPs should not only be knowledgeable about these competency areas but also able to transform that knowledge and those skills into actions. The extent to which EPs in developing countries have attained these competencies is not well-documented. Most EPs in developing countries are educated under traditional curricula that focus more on technical aspects of crops and livestock and less on process skills such as communication, leadership, adult learning, and social mobilization (Davis, 2015; Swanson, 2008). They may not have the required core competencies to serve in extension. According to Ghimire, Koundinya, and Holz-Clause (2014), EPs in Nepal lack professional competencies. Only study Nepal conducted on competency assessment was in the 1980s and that was about agricultural graduates 'preparation for job (Robson, Suvedi, Shivakoti, Pokharel, & Maughan, 1986). Graduates as well as their supervisors perceived graduates to be well-prepared with technical skills but not so with communication skills. We are entering a new era, backed by advancing science and technology. Farmers expect new innovations to boost their farm productivity while addressing burgeoning challenges such as diseases, pests, and climate change. There is a need for EPs who can work with and help people in this challenging yet opportunity-filled age. It is, therefore, imperative to periodically assess workers' competencies and identify where they are in those competencies, where the gaps are, and what should be done to address those gaps.

The goal of this study was to examine the gaps in perceived competencies among EPs in Nepal. The study objectives were to: (1) assess the perceived level of competency in core competencies among extension professionals; (2) determine whether the perceived level of core competency varies with respondents' demographics; and (3) ascertain the gaps between perceived level of competency and the perceived importance of the core competencies among extension professionals. Identification of perceived competency levels will allow extension management to know which EPs fit where, and who needs what types of orientation and training. The findings also identify areas that agricultural education and training need to address.

Conceptual Framework

This study was grounded in the competency-based approach to human resource management, which helps improve employee and organizational outputs. The goods and services that staff members offer are the result of their tasks, and tasks are the function of staff members' thoughts, feelings, and actions (Dubois et al., 2004). Mulder (2010) offered a similar argument: EPs need integrated sets of knowledge, skills, abilities, and attitudes to be able to effectively deliver services to their clients. Knowledge is not the only thing that matters in providing services. To improve efficiency and impart sustainable outcomes, workers must have both process skills and technical competencies. Furthermore, as O'Neil, Allred, and Baker (1997) pointed out, a shift from traditional to high performance work, which workers such as EPs are asked to do, involves a new type of behavior and orientation toward a job. As agricultural systems and farmers' demands are changing, EPs may need new knowledge and skills to serve their clients well. This warrants assessing the competency of staff members periodically.

The major thrust of a competency assessment is to identify gaps in competency

and help to design training and education to address those gaps. As Shim (2008) pointed out, the assessment of core competencies is a learning process that helps organizations to determine a standard for training, development, and learning activities for EPs to prepare for the future, adapt to changes, and make services more efficient. Similarly, Swanson (2008) pointed out that EPs need new knowledge and skills, which they can acquire through additional training and education, to undertake new tasks and responsibilities. Therefore, this study was designed to elicit extension workers' opinions of their levels of competency on process skills and to identify the knowledge areas and skills in which they think they have gaps.

Because EPs are adults who have worked in extension services for years and, as seen in evidence presented in the literature (Dziechciarz, & Dziechciarz-

Duda, 2016; Okwoche, Ejembi, & Obinne, 2011; Rigyal & Wangsamun, 2011), it is assumed that EPs are able to articulate both which competencies are critical or important to their services (and which are not), and how confident and able they are in those competencies. Determining the perceived importance of competenncies is indicative of what value workers give and how willing the workers are to acquire and/or possess those competencies. Level of competency, on the other hand, indicates their current caliber. The difference between the expected and the current level of competency defines the training and educational needs. However, as Mulder (2010) and Liles and Mustian (2004) pointed out, competency needs are context-specific, and individuals' personal characteristics and organizational background will influence their perceptions of levels, needs, and importance of a competency.
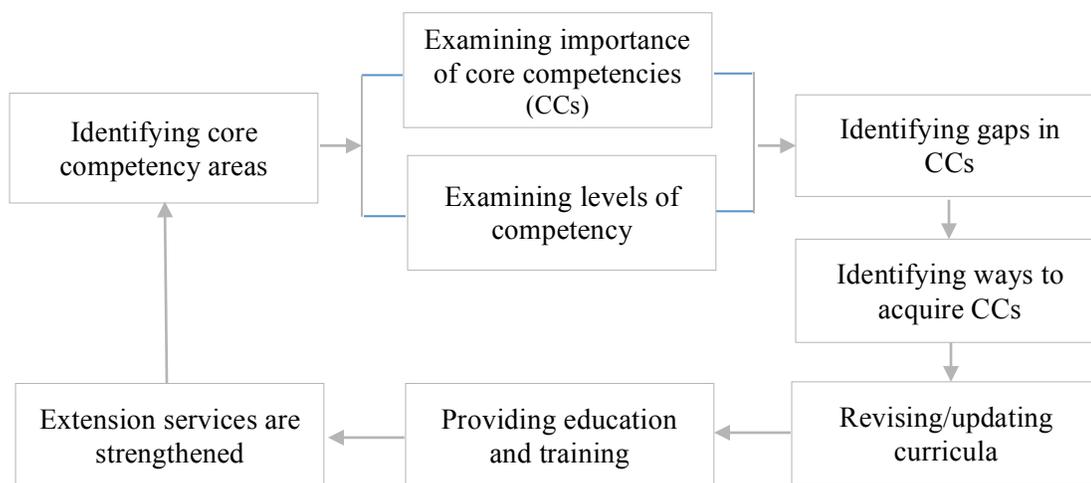

Figure 1. Conceptual framework for competency assessment.

This study was a part of a larger study. As illustrated in Figure 1, broad core competency areas were first identified by soliciting the viewpoints of extension experts. This paper is based on three stages: examining the importance of core competencies, examining the levels of core

competencies, and identifying gaps in core competencies. This would lead to identifying ways to acquire core competencies by revising and updating pre- and in-service extension education and training curricula, offering training and education to targeted EPs, and, ultimately,

providing more effective extension services. A periodic review of the extension programs would help identify new core competency areas that need to be addressed, which completes the cycle.

Explanation of Variables

For objective 1, the variables of interest were the ratings of the level of core competencies. For objective 2, ratings of the level of core competencies are the dependent variables. Independent variables are demographic traits: gender; primary organization (government extension offices and agricultural-based non-governmental organizations [A-NGOs]), undergraduate college (Tribhuvan University and affiliated colleges, hereafter referred to as TU; Purbanchal University and other non-TU colleges in Nepal, hereafter referred to as PU; and colleges outside Nepal); experience in extension in years; district extension office chief, subject matter specialist and technical officer defining current position; age in years; and education (intermediate [I. Sc.], bachelor's degree [B.Sc.], and postgraduate). For objective 3, the perceived level of importance and self-rated level of competency for core competencies are the dependent variables. The existing literature (Brodeur, Higgins, Galindo-Gonzalez, Craig, & Haile, 2011; Eicher, 2006; Ghimire & Martin, 2011; Lahai, Goldey, & Jones, 1999; Lopokoiyit, Onyango, & Kibett, 2013; Okwoche et al., 2011; McClure, Fuhrman, & Morgan, 2012) was used as the basis for selecting the explanatory variables. Though the literature suggests that the core competencies of EPs differ by those demographic traits listed above, there is no agreement on how they differ.

Study Methods

This cross-sectional research employed surveys to collect data. The study sought to assess the perceptions of extension professionals (EPs) in public extension organizations—the Department of Agriculture (DOA) and the Department of Livestock Services (DLS)—and of those in A-NGOs. The study population comprised extension professionals—office chiefs, subject matter specialists (SMSs), and technical officers (TOs)—in district agricultural (DADO) and district livestock services offices (DLSO), and agricultural program officers in A-NGOs. We used web-based and in-person surveys to collect data. The researcher visited 17 districts. EPs there self-administered the surveys. Surveys were also administered among EPs attending training programs at central training centers, as well as those visiting regional directorates and departments. Technical officers in field offices accessible to the researcher also filled out the survey. The final data (n = 305), excluding the web-based data, came from 45 districts and all three eco-zones.

In September 2015, a web-based survey was conducted among 302 professionals using SurveyMonkey.com. This survey sample excluded hard-copy survey respondents. Respondents were sent an email explaining the objective of the study, methods to fill out the survey, and a link to access the survey. Three follow-up emails were sent to non-respondents over a 3 to 5 day interval. The survey received a 16.79% response rate after discounting the bounced-back emails and unusable responses. Because no differences were found between data from the web-based and in-person surveys, the two data sets were combined, resulting in 349 responses.

A competency list drawn from a literature review and from suggestions made by experts during focus groups was used for designing the survey instrument. The survey contained eight core competencies, each of which had five to seven competencies within it for a total of 48 competencies. Program planning and communication skills had six

statements each; program implementation, educational and informational technology, and program evaluation had seven statements each; and the rest -- personal and professional development, diversity, and technical subject matter expertise -- had five statements each. Each statement had two parts, level of importance and competency, measured on a five-point Likert-type scale (1 = not important or very low, 3 = average or moderate, 5 = very important or very high), which were designed to examine respondent perceptions. The survey was field tested among 22 EPs, with eight respondents filling out surveys with the researcher present. The survey was then modified to integrate their feedback. One side of the in-person survey was in English, and the other side, in Nepali. Respondents were free to choose either version. An expert at Michigan State University and the extension experts in Nepal reviewed the survey instrument and validated the contents. Reliability coefficients calculated post-hoc for the eight core competencies ranged from .86 to .94. Index scores were calculated to examine the overall perceptions of importance, levels of competency, and perceptions by respondents' demographics. Data were analyzed using descriptive statistics (frequency, mean, standard deviation) and inferential statistics (independent sample t-test, one-way analysis of variance [ANOVA], post-hoc LSD, paired t-test).

Study Findings
Study Participants

Table 1 shows respondents' demographics. Among 349 extension professionals (EPs) participating in the survey, the majority of the respondents were male (93.1%). The mean age of respondents was 46 years, with an average experience of 20.32 years. There were 160, 152, and 36 respondents from the DOA, DLS, and NGOs, respectively. More than one-third of the respondents (37.2%) had I. Sc. (high school), 23.8% had B. Sc. (undergraduate), and 39% had postgraduate degrees. A majority of the participants (73%) were graduates of TU, Nepal; 14.9% were graduates of PU, Nepal; and 12.2% had attended colleges outside Nepal. Approximately one-fifth (19.1%) were DOA and DLSO chiefs; one-third (32.2%) were SMSs; and 34 (9.9%) were NGO-POs. Technical officers (TOs) made up of 38.8% of the respondents.

Table 1.
Respondents' Demographics

Demographic characteristics		*n*	%
Gender (*N* = 349)	Female	24	6.9
	Male	325	93.1
Organization (*N* = 348)	DOA	160	46.0
	DLS	152	43.7
	NGO	36	10.3
Current position (*N* = 345)	DADO/DLSO Chief	66	19.1
	SMS	111	32.2
	NGO-PO	34	9.9
	TO	134	38.8
Age group (*N* = 341)	≤ 35 years	71	43.9
	36-50 years	119	35.1
	≥ 51 years	149	20.9
Highest education (*N* = 344)	I. Sc.	128	37.2
	B. Sc.	82	23.8
	Postgraduate	134	39.0
Undergraduate college/university (*N* = 337)	TU	246	73.0
	PU	50	14.9
	University outside Nepal	41	12.2
Experience in extension (*N* = 325)	≤ 5 years	55	16.9
	6-10 years	27	8.3
	11-15 years	15	4.6
	16-20 years	41	12.6
	≥ 21 years	187	57.5

Perceptions of Level of Core Competencies

Descriptive statistics revealed that respondents perceived themselves as having moderate to high levels of competency in all of the core competencies. As shown in Table 2, respondents indicated that they had the highest levels of competency in personal and professional development, followed by communication skills, diversity, program implementation, program planning, and technical subject matter expertise. Program evaluation received the lowest rating, though still moderate, followed closely by educational and informational technology.

Table 2.
Descriptive Statistics Showing Perceived Level of Competencies

Core competency	Number of competencies used to compute index score	*Mean (SD) (N = 349)*
Program planning	6	3.66 (0.61)
Program implementation	7	3.77 (0.65)
Communication skills	6	3.89 (0.64)
Educational and informational technology	7	3.57 (0.85)
Program evaluation	7	3.56 (0.73)
Personal and professional development	5	3.92 (0.69)
Diversity	5	3.84 (0.71)
Technical subject matter expertise	5	3.64 (0.69)

Note. Scale: 1 = Very low, 2 = Low, 3 = Moderate, 4 = High, 5 = Very high.

The statistics for individual competencies show eight competencies with ratings of 3.48 or lower. The lowest ratings were given to familiarity with government administrative and financial rules and regulations ($M = 3.41$) and computers (Internet, email, webpages) for communication ($M = 3.42$). Many competencies receiving low scores mostly concerned information, communication, and technology (ICTs) and program evaluation. Demonstrating a positive attitude toward extension work ($M = 4.24$) received the highest rating, followed by good listening skills and preparing reports on extension work, both with an average score of 4.10.

Level of Competency by Demographics

Table 3 shows perceived levels of core competencies by primary work organization, undergraduate college, age, experience in extension, current position, education, and gender.

Primary organization and undergraduate college. The NGO-POs rated themselves significantly higher for educational and informational technology (EIT) than GO respondents. Ratings differed significantly by undergraduate college for all but two of the core competencies: educational and informational technology, and personal and professional development. The PU group rated significantly lower than the other two groups for five core competencies: program planning, program implementation, communication skills, diversity, and technical subject matter expertise. The TU group rated program evaluation competency higher than the PU group.

Table 3.
One-way ANOVA and t-Test Results (F and t values) Showing Differences in Perceptions of Levels of Core Competencies by Demographics

Core competency	Primary organization	College	Age	Extension experience	Position	Education	Gender
Program planning	0.662	5.702**	0.200	0.321	15.447***	12.351***	0.488
Program implementation	0.043	4.274*	0.731	0.439	11.192***	4.581*	0.128
Communication skills	0.197	8.361***	0.470	1.287	4.584*	2.486	0.135
Educational and informational technology	5.547**	1.695	18.622***	15.090***	18.441***	29.994***	2.341*
Program evaluation	1.396	4.434*	2.577	2.692*	4.299*	5.701**	1.118
Personal and professional development	0.125	1.411	2.084	0.852	2.212	3.415*	0.188
Diversity	0.802	5.113**	0.401	0.483	2.288	2.446	0.120
Technical subject matter expertise	1.037	3.980*	0.562	1.332	5.748**	4.676*	0.493

Note. * $p \le .05$, ** $p \le .01$, *** $p \le .001$.

Age and experience in extension. The only age-related difference found in perception was in educational and informational technology (EIT), which the youngest group (≤35 years) rated the highest. The least experienced group (≤ 9 years) rated themselves higher for EIT than those with more experience. The 10-19 years' experience group rated themselves higher for this core competency than the other two groups with higher levels of experience. The ≤ 9 years' experience group rated program evaluation higher than the 20-29 years' experience group.

Current position. The DADO and DLSO chiefs perceived themselves as having significantly higher levels of competency than SMSs and TOs for all core competencies except personal and professional development, and diversity. The chiefs rated themselves significantly higher for program planning, program implementation, and EIT than the NGO-POs. The NGO-POs rated their competency for EIT to be significantly higher than that of SMSs and TOs. An additional analysis showed that the TOs rated themselves significantly lower than others for six of the core competencies, with diversity, and personal and professional development as the exceptions.

Education. Postgraduate degree holders perceived themselves as having a higher level of competency in program planning, educational and informational technology, and program evaluation than those with less education. Ratings of high school or equivalent degree holders for program implementation, personal and professional development, and technical subject matter expertise were significantly lower than those of EPs with postgraduate degrees; they were also lower for program implementation and technical expertise than ratings of undergraduate degree holders.

Gender. Males and females differed in their ratings on EIT, with a higher rating by females. An analysis of individual competencies revealed that females rated themselves higher for competency in using

Microsoft Excel, Word, PowerPoint, a computer for Internet and email, and a mobile phone for texts and short message service.

Discrepancy between Desired and Current Levels of Competency

The mean ratings of the importance of core competencies are significantly higher than the mean ratings for the levels of competency for all of the core competencies (Table 4).

Table 4.
Paired t-tests Results of Level of Importance and Level of Competency

Core competency	Mean (SD) ($N = 346$)		Paired difference		t value
	Importance	Competence	Mean diff.	SD	
Program planning	4.44 (0.46)	3.66 (0.61)	0.78	0.61	24.025***
Program implementation	4.44 (0.45)	3.77 (0.65)	0.67	0.63	19.777***
Communication skills	4.49 (0.44)	3.89 (0.64)	0.61	0.59	19.014***
Educational and informational technology	4.40 (0.51)	3.57 (0.85)	0.83	0.88	17.649***
Program evaluation	4.37 (0.49)	3.56 (0.73)	0.81	0.73	20.690***
Personal and professional development	4.58 (0.46)	3.92 (0.69)	0.66	0.64	19.092***
Diversity	4.45 (0.48)	3.84 (0.71)	0.61	0.62	18.519***
Technical subject matter expertise	4.47 (0.50)	3.64 (0.69)	0.83	0.68	22.726***

Note. *** $p < .001$

Discussion

Extension professionals (EPs) in Nepal perceived themselves to be moderately to highly competent in their ability to perform their jobs. The highest ratings for personal and professional development for both importance and level of competency indicate that EPs are committed to fostering integrity and good governance in extension services. They would like to pursue learning and further their knowledge on extension. Importantly, they seemed to have a positive attitude toward their extension work, a key factor in being a successful worker. The findings are consistent with studies among Cooperative Extension professionals in North Carolina by Lakai, Jayaratne, Moore, and Kistler (2014), and with EPs in Ethiopia by Wasihun, Kwarteng, and Okorley (2013).

The 21st century has brought an era of accountability and of ICTs. ICTs such as smart phones, the Internet, and social media facilitate effective dissemination of agricultural information among a large group of consumers. EPs have to be cognizant of and able to use these tools in their work. The study results indicate that the opposite is true.

Public extension services in Nepal and throughout the developing world have long been criticized as being top-down and less effective than their counterparts in the developed world at serving their clients. The current demand-driven extension envisions bigger roles for NGOs and the private sector. It is, therefore, encouraging to find that NGO-POs perceived themselves as having higher levels of competency in educational and informational technology (EIT), and as being on par with their government counterparts in the other seven competencies. These findings are in contrast to those of Lopokoiyit et al. (2013) in

Africa, where all of the NGO workers' competency levels were higher than those of government workers in all of the areas measured.

The higher the education level of the respondents, the more competent they perceived themselves to be in core competencies. Respondents with a postgraduate degree perceived themselves as having a higher level of competency in all areas except communication skills and diversity. These findings are in line with a study by Lakai et al. (2012), who found that a higher level of preservice training helps EPs to acquire core competencies. Consistent with findings by Duo and Bruening (2007), chiefs rated themselves higher for most competencies, including program planning and implementation. Technical officers, most of whom do not hold undergraduate degrees but who do more fieldwork serving farmers than their better educated counterparts, have lower levels of competency. Given the increasing stake of TOs in extension services, this is a serious issue in need of immediate attention.

Respondents' levels of competency varied by the undergraduate college they attended, with the alumni of non-Nepali colleges indicating higher ratings. This implies that foreign colleges, attended by one respondent group, offered a better education in the core competencies than agricultural colleges in Nepal. This could be because of their using better curricula, better teaching methods, and/or better educational materials focusing on extension core competencies, as well as learning environments more conducive for students to learn.

Except for EIT, respondents perceived themselves as having equal levels of competency regardless of their age. This finding goes against that of Lakai et al. (2014), who found that proficiency in professional competencies, including use of

ICTs, increased with age. Higher levels of competency in EIT among the youngest group could reflect greater exposure and more opportunities to use ICTs. The emergence of the Internet in Nepal is fairly recent, and older people have likely had fewer opportunities to learn about ICTs than younger ones. It is very likely that younger EPs might have attended courses on computer technology in school, and may have learned about ICTs and other e-tools there.

Experience counts, in both learning and providing services. Adult and/or informal learning, which is an integral part of extension education, emphasizes experiential learning among extension stakeholders, which include extension professionals. Reasonably, staff members with longer work experience are expected to be more skillful and competent in serving their clients. Yet, aside from educational and informational technology (EIT) and program evaluation, which were rated the highest by the least experienced group, this study does not show any such differences in other competencies by experience.

Office chiefs rated themselves higher in six of the eight core competencies, perhaps because of their having more education than others. A large percentage (91%) of the chiefs reported holding postgraduate degrees, as compared with 2.3 % of TOs, 43% of SMSs, and 65% of NGO-POs. This counters the findings of Lakai et al. (2014), who found that overall proficiency levels of EPs did not vary with their job position. The findings of this study reinforce the notion that a higher level of preservice education is critical to acquiring competencies.

The only difference by gender was in educational and informational technology (EIT), where females scored higher than males. Consistent with the study by Lakai et al. (2014), females rated themselves higher

in computer use, including using Microsoft programs, the Internet and email, and mobile phones and texting. The findings show that female EPs are perceived as being more computer-friendly and competent in ICT use than their male counterparts. The finding that the perceived levels of competency for all but one of the core competencies are similar for both genders reveals that females are as competent as males in extension services.

This study found a clear difference in the perceived level of importance and the perceived level of competency, with competency being significantly lower than importance. This suggests that EPs in Nepal have much to learn related to extension competencies to effectively perform their roles. The largest difference was found in educational and informational technology, and in technical subject matter expertise, followed by program evaluation. These are the areas in which EPs need more training. The greater need for technical subject matter training is consistent with the study by Rigyal and Wangsamun (2011) in Bhutan but contrasts that of Conklin, Hook, Kelbaugh, and Nieto (2003) at Ohio State University. It is worth noting that EPs perceived all of the core competencies to be important and very important to their work,we can therefore assume that they value these extension skills and are eager to hone their competencies.

The areas least known to respondents were ICT use; government administrative and financial rules and regulations; and the vision, mission, and goals of extension services. How can we expect effective services from EPs who do not know what the extension's vision, missions, and goals are? How can we expect efficient and accountable extension services from EPs who do not know their governmental rules and regulations?

Conclusions and Recommendations

This study sought to assess the level of core competencies of agricultural extension professionals (EPs), to determine differences in levels of core competencies by demographics, and to identify any existing gaps in competency in Nepal. The study found that EPs perceived themselves as having a high level of competency in all of the extension core competencies. Receiving lower yet still positive ratings were ICTs, which include computer use, e-learning, and social media. These were found to be the weakest areas for EPs. Interestingly, the longer the extension worker's experience, the lower the perceived level of ICT competency. Foreign-educated EPs appear to be more competent in extension skills than those who are educated in-country, in spite of the proximity of and familiarity with local stakeholders and local contexts, as well as opportunities for in-country colleges to train students in local contexts that articulate local needs and demands. Curricula and teaching methods may have a significant bearing on students' competencies. The findings indicate gaps in the national agricultural extension education system.

The chiefs' perception of themselves as competent was higher than other groups' self-perceptions. The chiefs had more education than the others, thereby emphasizing the importance of preservice education among extension workers. There is a clear discrepancy among EPs between the desired and actual levels of competency for core competencies, indicating that EPs in Nepal do not feel they are as competent as they should be to serve their clients. Core competencies with the highest competency gaps—educational and informational technology, technical subject matter expertise, and program evaluation—are the areas in which EPs in Nepal are most in need of training. One important conclusion from this study is that EPs in Nepal

perceived extension core competencies as important and thus essential to their work.

The government of Nepal should adopt appropriate policies and programs to provide training to its extension professionals, including its technical officers, on computer use, program evaluation, and technical subject matter. It should also review and adapt the extension education curricula of international universities as needed. Soliciting beneficiaries' perceptions of the levels of competency of their extension workers and examining the differences between self- and beneficiary-rated levels of competency would be worth researching to determine how and whether ratings are consistent across the two populations. Also useful would be undertaking qualitative research using in-depth interviews among extension stakeholders about extension professionals' delivery of services and gaps, if any, in their competency.

This study had some limitations. Originally, we planned to use proportionate stratified sampling and to use a web-based survey. But, while we were pretesting the survey, only six of 39 professionals participated. This response was less than one would ordinarily find in web-based surveys. Realizing that not all of the EPs had email and that employing a web-based survey only would not be effective, we used both in-person and web-based surveys. When data collection was about to start, Nepal was badly hit by an earthquake. This was followed soon after by incessant rainfall and political strikes in various regions of Nepal. Stratified sampling could not be employed, so convenience sampling was used to select the sample.

The study findings have relevance to international extension. For example, as in Nepal, extension professionals in other developing countries may have lower competency levels in education and

information technologies, technical subject matter, and program evaluation. These could be the key areas for EPs to receive additional training and education.

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