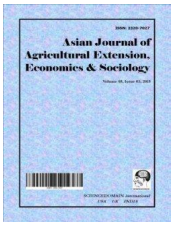

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# A Qualitative Study Examining Core Competency Needs of Agricultural Extension Professionals in Nepal

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***Authors' contributions***

*This work was carried out in collaboration between both authors. Authors RPG and MS designed the study. Author RPG analyzed the data and wrote the first draft of the manuscript. Author MS reviewed and revised the manuscript. Both authors read and approved the final manuscript.*

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## ABSTRACT

**Aims:** To identify core competencies required for extension professionals in Nepal, which is needed to provide right education and training and to prepare a competent extension workforce.
**Study Design:** This was an exploratory qualitative study, which followed an inductive method of data analysis.
**Place and Duration of Study:** The study conducted in Nepal in May 2015 used focus group discussions for data collection. Each focus groups lasted for about two hours.
**Methodology:** Participating in three focus groups were purposively selected 23 Nepalese extension experts from agricultural education, extension, research, non-governmental organization and the private sector. A pre-approved discussion guide was used to streamline group discussions. Review of the secondary literature, specially pertaining to the U.S.-based extension core competency related literature were the bases for the questions used in the discussion guide. Discussions were audiotaped and subsequently transcribed. Transcriptions were read through, themes that emerged were coded using open, axial and selective coding, which resulted in ten core competencies. Opinions that stood out are reported and discussed in the paper.

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**Results and Conclusions:** The study identified ten core competencies that Nepalese agricultural extension professionals require to perform their tasks well. Those core competencies are: program planning, program implementation, resource mobilization, technical knowledge, coordinating skills, professionalism, strengthening extension research linkages, communication, leadership and managerial skills, and information and communication technologies.

*Keywords: Agricultural extension professionals; core competency areas; training needs; Nepal.*

## 1. INTRODUCTION

Agricultural extension services in developing countries are in need of a revival. Top-down, extension agent-led and government dominated extension services have not been of much help to improve agricultural development. Agricultural technologies and input still remain beyond farmers' reach. Specifically, smallholder farmers who comprise more than 90% of the farming population remain un- or under-served by extension. This is contrary to an increasing call that extension services should be demand-driven, participatory, and pluralistic [1]. It means extension services should be beneficiary-led and bottom-up that allow farmers to obtain services from their preferred providers – public or private or non-profit. Please note that farmers are the focus of agricultural development; Their empowerment is crucial to sustainable growth; therefore, extension philosophy should be encouraging farmers to participate in the extension process and "helping farmers to help themselves." With the evolution in and adoption of these new extension approaches, extension professionals (EPs) have additional roles and responsibilities and they should have new knowledge and skills and/or competencies to execute their roles well.

Competencies refer to the set of knowledge, skills, attitudes and behaviors that allow workers to effectively perform their tasks as expected by their clients [2]. Determining training and educational needs, maintaining competitive advantage through increased capacity and finding matching competency for the work are the cores of competency assessment [3,4]. Elaborating the definition of core competency [4] added, "The necessary knowledge will enable individuals to apply the right skills for any work situation that may arise while having the right attitudes will motivate them to put in their best efforts" (Introduction, para. 2). The present study represents a step forward in determining core competencies needed by extension professionals (EPs) in Nepal.

Started in 1952 as a single unit with a few staff members, currently, the agricultural extension services in Nepal currently provide services through a nationwide network of two public departments--the Department of Agriculture (DOA) and the Department of Livestock Services (DLS). Some non-governmental organizations (NGOs) and private agencies such as agro-vets have also started providing extension services but their coverage is limited. Nepal has been facing low agricultural growth for several years now, which is attributable to low adoption of improved technologies resulting in growing food trade deficit, thus the food insecurity [5]. Nepal's recently promulgated twenty-year Agricultural Development Strategy (ADS) categorically mentioned an urgency for a competitive agricultural extension workforce to streamline agricultural development [5]. Working for the public, private and non-profit organizations and acting as the liaison between researchers and farmers, and planning, implementing and evaluating educational and informational programs for their clients, EPs are integral part of agricultural extension services. Therefore, EPs getting right extension education and training and their being competent to provide extension services is paramount for agricultural development.

Presenting the concept of integrated professionalism, [6,7] argued that a combination of knowledge, skills, and attitudes can lead to competency, and that they are the important traits that extension workers should possess. However, the need for competencies among extension workers is context-specific [7], and extension education is a lifelong learning process [8]. Hence, these core competencies are subject to change as new situations unfold. It indicates that there should always be effort to determine new competencies required for EPs.

Most core-competency-related studies in agricultural extension and education are from the West, particularly the United States. The U.S. colleges and universities have institutionalized core competencies in their cooperative extension

services systems. We searched the Michigan State University (MSU) Library webpage, together with the Google Scholar and ProQuest for publications related to core competencies for agricultural EPs. We were able to trace and review the core competencies for EPs used by eleven land-grant universities, namely University of Nebraska-Lincoln, The Ohio State University, Michigan State University, North Carolina State University, Washington State University, Kansas State University, Iowa State University, Oklahoma State University and the University of Missouri, Texas A & M, and University of Florida. We also reviewed the Ph.D. dissertation by [9].

There were 98 competencies and core competencies listed in eleven U.S. studies or sources. After discounting redundant ones, there remained 34 competencies. Fig. 1 shows the 11 most mentioned core competencies and the number of sources reporting them. Communication skills are the most sought after core competency, as reported by nine out of eleven sources. Professionalism is mentioned in seven sources; technical subject matter expertise and knowledge of organization/organizational management in six sources each; and program planning, education and informational technology, facilitative leadership and international relationship in five; and, diversity and pluralism, facilitative leadership, program implementation and evaluation and applied research are reported in four sources each. Four additional competencies were reported in three sources each. Not shown in the figure are five competencies in two sources and 14 competencies in one source.

The results show that communication skills are one of the most important traits for EPs in the U.S., and possibly in many other developed and developing countries as well. This supports the fact that communication is the crux of extension. Effective communicators do not only deliver information in an understandable and convincing way, but using their communication skills, persuade beneficiaries to share their perceptions and/or and experiences of their farming related problems. On a similar note, professionalism is about following and practicing professional norms and standards set forth by their respective professional organizations to serve clientele to the best possible way and help attain professional goodwill. Professionalism is one of the traits private providers give due importance. Closely following communication skills and professionalism are technical subject matter expertise and organizational management skills, which six of the eleven sources mentioned. Developed countries such as U.S. have advanced technologically thus higher production and productivity. Farmers there are relatively more educated, have access to and are informed of the current research and technologies. Therefore, one would assume that technical subject should not be a priority agenda and competency among extension educators there. On the contrary, the review show that most universities see technical subject matter expertise as an important competency extension educators should possess. Therefore, technical subject matter expertise remains to be important and critical to extension services success irrespective of the degree of the country's development.

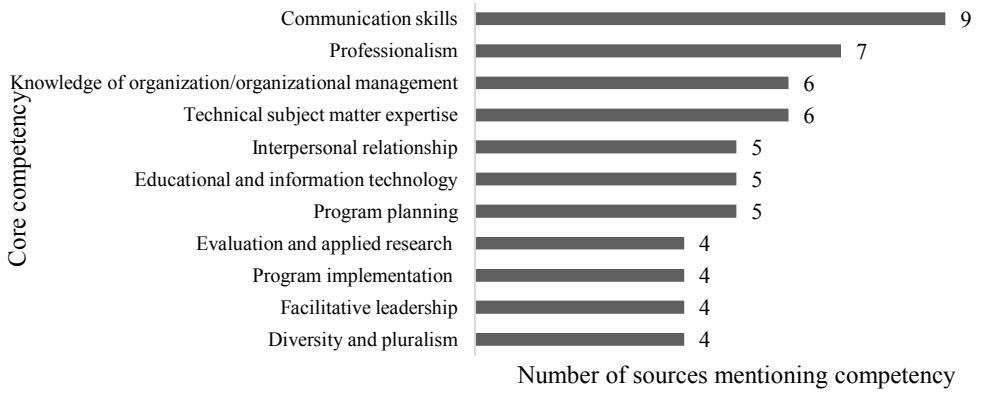


**Fig. 1. Top eleven competencies used in the U.S.**

Included in six sources organizational management is another critically important competency for extension educators followed by program planning and educational information reported in five each. It shows that the extension services seek its extension workers to be competent in using social media, email, the Internet, and computer use. Given that 21st century is era of information and communication technologies (ICTs) and ICTs importance is ever increasing, the extension services are striving to keep its extension workers competent in ICTs and make compatible to work in changing contexts. Critical thinking, successful teaching, and knowledge of marketing and knowledge of extension are other competencies that the review revealed. Among these four, "knowledge of extension" is particularly critical for extension workers because, unless and until extension workers know principles and usages of extension, they may not be able to articulate the needs of their clients and effectively implement programs to meet their needs. EPs should understand what extension is, how it has evolved, and what its missions and programs are; therefore, the competency "knowledge of extension" is very relevant for EPs. Even though the above-mentioned core competency list is not exhaustive, the findings are important to understanding the competencies that today's EPs should possess and be ready for, and the areas that extension education services and extension human resources should focus on.

Further review of the literature revealed that there have been only a few studies to identify core competencies for EPs in the East and none existed in Nepal. Moreover, none of the studies in the East sought experts and/or key informants' opinion about extension competencies. The goal of this study is to strengthen extension human resources by offering them the right training and education. Its objective is to determine the core competencies required for EPs in Nepal.

## 2. METHODOLOGY

This exploratory study employed focus group discussions (FGDs) for data collection. FGDs foster in-depth and focused discussion on research issues among group members; Generate more and rich data than individual interviews [10] and are effective in capturing the critical interactional dynamics of social practices [11]. Twenty-three purposively selected experts representing the Department of Agriculture (DOA), the Department of Livestock Services (DLS), Agricultural and Forestry University, Tribhuvan University and Purbanchal University, the Nepal Agricultural Research Council, the Council for Technical Education and Vocational Training, and the private sector attended the FGDs. A discussion guide was used to facilitate the discussion. Each focus group lasted about two hours. Confidentiality of the data and anonymity of the participants' identity were maintained throughout. Participants were given unique codes. The first digit of the code represented focus group number and second digit represented participants themselves. For example, participant 2.1 refers to first participant of second FG. Focus group interviews were audio-taped, transcribed and subsequently coded using open, axial and selective coding techniques, as suggested by [12]. The researcher read the texts, identified the themes, and allocated codes or labels to the themes. The frequency of mention of themes were recorded and are reported. The findings of the three focus groups were combined to generate a core competency list.

## 3. RESULTS

Participants reported 69 competencies representing knowledge, skills, abilities and behaviors they would like to see in EPs to do their jobs well. Integration and grouping of the related competencies generated ten core competencies (Table 1).

### 3.1 Program Planning

All focus group participants told that program planning is an integral part of extension. They reiterated that in order to effectively contribute to program planning, EPs have to be cognizant of national policies, strategies, programs, rules and regulations to allow extension programs to complement national goals. Nepal has decentralized its agricultural services program and has devolved power to the local institutions for several years now, but his has not been that effective. This has necessitated district extension offices and their staff to do their own program planning, budgeting, and monitoring. Participant 1.3 urged that:

> *Some monitoring part goes directly to the district as a part of the devolution. They [district offices] are free do their own planning and budgeting. They also get central budget. …they are also responsible for the long-term planning in the district.*

**Table 1. Core competencies suggested by focus group participants**

| Core competency | Examples |
|---|---|
| Program planning | Familiar with national agricultural policies, programs and strategies; involve clients and stakeholders in needs assessment; effectively mobilize resources including local resources (e.g., resource persons) |
| Program implementation | Familiar with government and/or local administrative rules and regulations; understand and follow working procedures |
| Resource mobilization | Tap resources; allocate resources to the needy ones; collaborate with line agencies such as NGOs to avoid duplication in programs and make efficient use of available resources |
| Technical knowledge | Basic knowledge of technical subjects of their discipline; safe use of pesticides; knowledge of their subject matter; remain current with the new innovation and research; able to conduct integrated pest management (IPM) |
| Coordinating skills | Capacity to coordinate various stakeholders including local political bodies and line agencies; NGO people should coordinate with DADO and DLSO |
| Professionalism | Respect time; follow work ethics; maintain transparency in work; be motivated and positive about extension work; diligent; proactive to understand and solve problems |
| Extension research linkages | Eager and skillful to work with farmers; possess research skills; engage in applied research; document the work and share the results with stakeholders; find outcomes of research and inform research with the findings |
| Communication skills | Understand and take into account social, cultural, economic, educational contexts of the clients; effective trainer; effectively listen to clients; good speaking skills |
| Leadership, managerial skills | Facilitator; demonstrate administrative skills; effectively manages office and staff members |
| Information and communication technologies (ICTs) | Computer and e-extension friendly; use Internet for learning; communicate through emails with clients and stakeholders when needed |

Highlighting EPs contribution to attaining national goals, Participant 1.1 urged that,

> *District chiefs are graduates in technical fields, but they are responsible for overall agricultural development in the districts. Their main responsibilities currently are to translate national policies and priorities into actions… they do annual as well as periodic planning.*

## 3.2 Program Implementation

Participants mentioned being able to successfully implement extension programs as an important competency EPs should have.

> *They [EPs] in the district serve as focal points for program directorates and help in planning and implementing these [directorate] programs.*

Participants described that there are several working procedures in extension services that extension workers have to be familiar with and importantly be able to follow those procedures.

## 3.3 Resource Mobilization

Participants strongly and repeatedly voiced that EPs should be competent in resource mobilization. Given that resources for extension services are limited and shrinking, extension workers have to be skillful to tap human, physical, social, financial resources from public, private sectors and appropriately allocate those resources to achieve the most impact on those with the greatest need. Reflecting upon his experience of working in extension with a limited budget, Participant 1.3 said:

> *We have a limited resource and we have to cover a large population…it [there] is not more than 20 to 25% [of the] coverage in services by DADO and DLSO offices*.

The DLSO and DADO chiefs oversee the mobilization of resources in the districts; therefore,

> *They must have managerial skills and capabilities to manage resources"* [Participant 1.1].

Contrary to a broader understanding of extension services facing resource crunches, it was surprisingly pleasant to hear from a participant that, in Nepal, resources for public agricultural programs in recent years have increased significantly. He added that Nepal now needs competent workers who can best utilize those resources. Participant 2.1 stated:

> *There is an extremely huge resource [for agricultural programs] now… They [EPs] are overloaded with the programs. [However] [k]nowledge update is rare; it is not happening at all…They [EPs] are so busy in programs like training...they themselves need training…When they provide training, they teach basic [same old] things that they have learned [long ago] during their study period.*

The above perspectives suggest that in EPs have to be competent to resource mobilization in both cases – when there are ample resources or there is resource limitation.

### 3.4 Technical Knowledge

Participants categorically mentioned updated technical knowledge; Knowledge of new seeds, breeds, pesticides; and ability to conduct Integrated Pest Management (IPM), among other essential technical skills for EPs. Given that Nepal has low agricultural productivity, mobilization of technically competent EPs who can disseminate improved agricultural technologies among farmers cannot be overemphasized. Highlighting importance of technical competency among EPs Participant 1.1 said:

> *And of course technical knowledge is very important [for EPs]. Even though a subject matter specialist cannot be expert in all the technical areas… he should have at least basic knowledge of [his discipline]*.

Participant 2.1 mentioned that farmers attend trainings hoping that they will learn something new and useful to their farming, but they often get frustrated because trainers use the same old class notes and do not offer any new information. He added that trainers neither read any new literature nor have any interest in learning new things. Participant 1.1 shared an interesting perspective about extension workers who are not as competent technically as they should be. He added that when extension workers are not competent and are not able to help farmers with advice, they try not to see and visit farmers. This hurts both parties -- demotivates EPs to work and prevents farmers from obtaining services.

The above findings indicate that technical subject matter expertise is getting increased attention and importance in Nepal. It is indicative of the fact that as mentioned by several participants, there is dearth of technically competent workers and thus a knowledge gap and low agricultural productivity. Please note that there could be some level of respondent biases as all the participants were trained in traditional schools concentrating on technology-focused courses.

### 3.5 Coordinating Skills

Participants highlighted coordinating skills as another competency required for EPs, in particular for NGO EPs. The pluralistic approach of extension envisages NGOs as partners in extension service delivery. Agriculture-based NGOs are relatively few and new to extension services in Nepal. [13] underscored that most NGOs are donor-driven and are not bound by government rules; therefore, their programs may not be in line with national policies. Therefore, suggestions for EPs to have coordinating skills is very pertinent. This should however apply to government organization (GO) professionals as well as they play even bigger role coordinating with line agencies on program planning and implementation, including resource mobilization.

Coordination is not only about GOs and NGOs working together. Coordination could be for resource tapping and resource mapping. NGOs and GOs professionals can serve as resource persons for one another, which has several merits: enhanced coordination, increased knowledge sharing, better program implementation, better results and sustainable programs. On the same line Participant 2.6 noted:

> *NGO [professionals] could be the resource persons for DLSO and DADO. Those who follow… coordination, [their] program…would sustain. Sustainability is the key [for agricultural development]….Ultimately program has to be sustained. Tomorrow when NGOs leave [it is GOs] who should take care or carry over [the programs].*

Unlike most participants, who presented negative sides of the NGOs, one participant said that there are very good agricultural-based NGOs in Nepal which are accountable towards their clients. Presenting an example of public and nonprofit sector collaboration, Participant 2.1 said that the *Tuki Sangh*, a local NGO, has been effectively working to deliver services in rural Dolakha district. NGO employees visit GO offices for advice when needed.

### 3.6 Professionalism

Participants suggested EPs should be efficient in their personal management: demonstrate high motivation, promote transparency and be respectful to others. Practicing good governance, integrity and inclusiveness are other competencies mentioned by participants that leads to professionalism. Given an increase in criticism that EPs in many developing countries, Nepal included, are less accountable to their clients, but more to their bosses, lack transparency and their overall quality of work is poor [14], these suggestions seem helpful to counter those criticisms. Participants reiterated, EPs are required to visit farmers and work with farmers demonstrating new technologies and learn from these experiences. Participant 2.2 emphasized that if EPs get their hands dirty and offer farmers the field-tested technologies and practices, extension would succeed. Providing logic for the necessity for EPs to visit farmers and their fields, participants explained that this can help them to learn the real field situations, which are often different from what are taught or faced in colleges and offices. Delineating further participants argued that there is not a single factor that they can name to explain how EPs work and serve their clients. They listed factors—political, economic, educational and cultural—affecting EPs work. Therefore, EPs must be versatile and they must learn to accustom and work in diverse conditions. Collectively, discussions indicated "learning by doing" as an important and critical skills EPs should hold.

Asking other participants to be cautious and vigilant of the ways EPs in public offices (GO-EPs) work and stressing the need for EPs to be more accountable towards farmers, a participant representing private industry categorically mentioned that the GO-EPs project themselves as being superior than their service seekers. He continued that GO-EPs are reluctant to engage themselves in continued education and training; therefore, their knowledge and skills are obsolete. He added that about 95% of the GO-EPs fall in this category whom farmers and entrepreneurs do not feel like approaching for services. He said that there are only about five percent of EPs who continuously engage in learning, are up to date with the latest information; who highly value their clients' needs and these professionals are highly valued by farmers as well. These perspectives of an entrepreneur provide several insights about Nepal's extension services. EPs have to act professionally: They should engage in continuous learning, they should be ethical, they have to maintain integrity in their services, among other things. EPs have the role to help farmers learn new knowledge, therefore EPs themselves should be clear whether the information they provide is valid and current. EPs should ask themselves: Am I helping farmers to solve their problems? Am I using the right method for extension? Are farmers comfortable with my facilitation? Am I visiting farmers and their fields and doing my best to understand farmers and their problems? Is not there something I can learn from farmers? This entails both learning and research.

### 3.7 Extension Research Linkages

Participants seemed worried that EPs services are not to the levels expected by farmers. They attributed this weakness on extension to limited coordination and communication between research and extension. Participants seemed convinced that extension professionals are not aware of the new research findings as a result. Participant 1.3 urged:

> *EPs working in the districts must have sound knowledge of research findings. Being informed of the current research findings is essential for EPs.*

On the same line Participant 2.2 stressed that district and field EPs should always have research support so that they will know and will be able to tell farmers factors affecting their farming and offer appropriate solutions to address those problems. Articulating linkages between research and extension he elaborated that:

> *Extension and research are actors of a cycle. Extension brings [or conveys] [farmers'] problems to research and goes to back [to farmers] with the solutions.*

Participants indicated not involving EPs in research, particularly applied research as the

reason for extension services being less effective. Participant 2.2 argued that even research-recommended technologies need field testing, that EPs can do. He provided an example of how a corn variety performed well in an altitude and region other than that recommended by the research. Participant 2.2 argued:

> *What we should be doing is, problems facing farmers have to be researched. Our extension is suffering because of the poor linkages between these three sectors [research, extension, education]. There are some people who work with farmers and acquire knowledge and they are working fine, but there is no system to address [promote] this.*

## 3.8 Communication Skills

Participants raised communication skills as another essential skill for EPs. They believed that EPs coordinate with farmers and other stakeholders, do research/demonstrations/field days, provide training, conduct meetings, and work with local community leaders. Doing these tasks require EPs to be efficient communicators. Having only technical knowledge is not sufficient to be a competent extension worker, she/he has to have good communication skills, which she/he can use to transfer her/his knowledge to farmers (Participant 3.5). Sharing an importance and outcome of being an effective communicator in extension, Participant 3.6 stated that we [EPs] should have political support to prepare and pursue agricultural development plan; therefore:

> *Our extension workers need to have skills [and ability to effectively communicate] and motivate local leaders. This [communication] skills is very important [for EPs). If they [local leaders] are motivated, they [each] can motivate another 50 people.*

Providing additional communication skills areas participants mentioned writing skills, public speaking skills, and ability to document extension work and disseminate extension results. Referring to communication process and articulating the effect of senders' attitude and knowledge of local sociocultural contexts to communication results, Participant 3.5 told that EPs must be familiar with local contexts in order to be trusted by local people. He continued:

> *It could be political, social, religious and cultural plus language things…[F]aith and attitudes are affected by knowledge. If you respect them [local leaders or farmers] it will pay you dividend…If you sound like them, they [local leaders or farmers] will start behaving like you.*

The discussion points to the fact that communication is not only an art, but also a social phenomenon where people reciprocate based on how their partners behave. Patiently listening to others, valuing others' voices and cultures, and respecting partners as they are very much counts in building trust and boosting communication.

## 3.9 Leadership Skills

Given that scope of agricultural extension services is ever widening and many different stakeholders are involved in or associated with extension services, EPs have the challenge to work with them and make extension and collaboration contribute to agricultural development. Within these backdrops, participants mentioned that DADO chiefs participate in most committees (e.g., disaster mitigation or providing relief materials or food security, etc.) that operate in the districts. Community members expect EPs to contribute more towards societal development. Extension chiefs and other EPs should be competent to lead the programs and lead other stakeholders when needed. Participants also discussed that there are about fifty employees in each DLSO or DADO, therefore, the performance of extension chiefs as leaders greatly impact employees' perspectives and performance. Further, it also came up in the discussion that an increasing complexity and changes in agricultural systems warrant an extension workforce to be extremely dynamic, innovative and able to garner clients' support as needed. Participants added, identifying stakeholders and reaching out to them, identifying their strengths and weaknesses, seeking out stakeholders' input to identify and solve problems, effectively communicating to inform others, and supervising extension work he/she is assigned, and evaluating progresses as programs are executed, making decisions to improve programs, and being innovative to solve farming problems are some of the salient leadership qualities EPs should possess.

## 3.10 Information and Communication Technologies (ICTs)

ICTs are increasingly being used in extension services. Disseminating information using ICTs is

quick, less costly, but more effective to reach out to a large number of people. Highlighting the need for increasing importance of ICTs in extension, Participant 3.4 underscored that EPs should be computer- and e-friendly. Please note that ICTs (e.g., smart phone, mobile service, text messaging, etc.) are increasingly used worldwide, including in developing countries. However, farmers demand need-based, credible (trustworthy), relevant (have immediate application, locally adapted), reliable, timely and cost-effective information that they can rely on to make informed decisions about farming. Research shows that disadvantaged farmers can benefit more from the use of ICTs (e.g., mobile phones) than those who are better off [15]. Furthermore, public agricultural extension services in Nepal covers only about 25% of the farmers; the rest either do not get any services at all or use private providers for services. Radio and television agricultural programs (RTAP) are popular information sources in Nepal among those who could not be reached in-person [16]. Supporting this point, participants shared that there are several private service providers who do not have any formal education, but listen to RTAPs, learn new agricultural technologies, and advise farmers, accordingly. The above views of participants suggest that EPs in Nepal should learn and use ICTs in extension services.

Issues of EPs lagging not only in knowledge, but also in using information and communication technologies (ICTs) also came up. Participant 1.4 said that some office chiefs have never used computer and they do not even know how to turn the computers on. Oppositely, referring to private poultry entrepreneurs, Participant 3.1, who was a university professor, acknowledged that private sector people access the Internet more frequently, they always search for the latest research articles and even attend international agri-fairs. They are more updated with the latest information than college professors and extension professionals. In the same vein Participant 1.1 said:

> *They [commercial farmers] are educated. They use the Internet facilities. They can access [latest] information from everywhere [and anytime they want]. What I have found rather is that these commercial farmers are more advanced than subject matter specialists…they collect information from all possible sources while district EPs are sort of bureaucrats, not even technocrats…Their technical knowledge is not updated.*

One can argue that serving rural small farmers, not the commercial farmers, is the priority in countries like Nepal. Since EPs cannot reach out to a large swath of smallholders in-person and many smallholder farmers too do use cellular phones and social media, it is urgent that EPs learn and use ICTs in extension.

## 4. DISCUSSION AND CONCLUSION

The 21st century is the era of "knowledge economy" and "knowledge management" [17] and they will dominate in education, training and extension for several years to come. This is also the era of partnership, collaboration, participation, so bottom-up approach should be followed, not top-down; and demand-driven services should be adopted, not supply-driven services. EPs should give priority to farmer's needs and demands. The approach to agricultural extension services should be farmers first, not technicians first. Modernization of agricultural extension services stresses the need for a dialogue and interactions among agricultural stakeholders; Asserts that research, education and extension should work together with farmers; and underscores to engage extension staff members in learning and co-learning. Saying so, technology transfer is the prerequisite to improve agricultural productivity. Having technical competency will make EPs comparatively advantageous and effective, but the combination of both technical and process skills and competencies will make them even more competent. Developing agrarian countries such as Nepal need EPs who can bring stakeholders together, foster exchange of ideas and information, and make innovations happen. The consolidated list of ten core competencies is not exhaustive, but it covers many of the key competency domains.

A few competencies that experts suggested are unique to Nepal, other may suit to other developing countries with similar socioeconomic contexts, but a few of those competencies contrast with those in the developed countries. The Nepalese experts emphasized technical subject matter expertise; program planning, including knowledge of national agricultural program, policies and strategies; and program implemention, while diversity and pluralism and organizational management seemed to the priorities in the West. Second, is the need for strengthening research extension linkages through increasing collaboration and communication which Nepalese experts

highlighted. Sharing strategy to strengthen the linkages, experts suggested an increasing importance and urgency for engaging EPs in applied research and working in close collaboration with research. Their indication was towards employing "learning-by-doing" modules. That would not only provide extension workers opportunities to get first-hand information about the local farming systems, but would also allow them to interact with and learn from farmers and researchers. Literature in the west included program evaluation and research, but did not categorically mention applied research, however. Third, Nepalese experts wanted EPs to be mindful of cultural sensitivity of their clients, work continually to win farmers' confidence and trust and contribute to sustainability of extension services. Fourth, experts strongly felt that EPs should remain current and versed with the government administrative and financial regulations. Literatures in the West are silent on these later two issues.

There is and will be a need for technical knowledge on agricultural development irrespective of the extent of agricultural development in the country or area. However, the priority one gives to this domain varies. It appeared from the findings that technical knowledge should be a priority competency among EPs in Nepal. It could be because, unlike farmers in the West most of whom are technically sound, farmers in Nepal have less technical know-how and there is high demand for technical advice among them. The high gap in technical knowledge among farmers could be due to high gap in technical knowledge among EPs whom farmers rely on for advice. This in turn may be because of the weak linkages between research and extension. This indicates that either extension services are not receiving research support therefore are not able to disseminate research recommendations or research is not focusing on farmers felt issues of immediate needs. The suggestion to increase research extension collaboration and engage EPs in applied research is related to the preceding argument of making EPs technically competent and strengthening research extension linkages. If researchers and extension workers work together they will exchange information and ideas and one would learn and benefit from another.

EPs have to play multiple roles — technicians, social mobilizers, trainers, advisors and evaluators – while they serve farmers, it is extremely important for them to have knowledge of technical subjects of their field as well as be able to apply soft skills. As a focus group participant observed, farmers' expectations of EPs are very high. If EPs are not able to advise farmers with technical knowledge, they start avoiding farmers vis-à-vis farmers become reluctant to seek extension professional's services. On the other hand, technical knowledge boosts EPs' confidence and augments service delivery.

Extension workers in developing countries are trained on technical subjects and they may have little knowledge of soft or process skills or how they should be behaving with their clients. Additionally, like in many developing countries EPs in Nepal are government employees and are accountable more to the government and their bosses than to their clients. This could be the reasons for EPs assuming themselves to be more powerful and/or having more authority than their clients and oppositely being less sensitive to their clients and their cultural values. This could be the logic for experts' suggestion of EPs being sensitive to clients' cultural values.

The goal of extension services is to improve agricultural productivity thus the farmers' livelihoods, which are directly tied to national goal of alleviating poverty and improving food security. In order to effectively transform vision into action and action to result, actors like EPs have to understand the phenomenon of extension, for example, what it is, how it works, how it has evolved, its approaches, etc. There is seemingly a gap among EPs in these areas. This justifies experts' suggestions of EPs requiring to be familiar with extension policies, strategies, national plans, and financial and administrative procedures.

Further to the above discussion, the findings of the study are largely consistent with the competency domains proposed by [18] and [19], but less so with the competencies—youth development, organizational planning, time management, risk management and liability for extension volunteers—proposed by [20]. Competencies consistent with the Ohio State University model [21] are communication skills and problem solving. Consistent to the information on competency literature, program planning, including needs assessment, was raised by a majority of the focus group participants. This advice on planning is consistent to [14], who articulating Nepal's

context, said there is always mismatch between farmers' real needs and interests and projects and programs focus. EPs with expertise on planning have to intervene in those cases.

In summary, this exploratory study sought to identify core competencies for agricultural EPs in Nepal. Experts in Nepal suggested ten core competencies—program planning, program implementation, resource mobilization, technical knowledge, coordinating skills, professionalism, extension research linkage, communication, leadership and managerial skills, and information and communication technologies. Contrary to core competencies suggested elsewhere in the world, including those by the U.S. Cooperative extension service, Nepalese experts strongly urged EPs in Nepal to have competency on applied research and strengthening extension-research-farmer linkages. These ten core competencies and their associated competencies could be the bases for updating extension core competency related education and training curricula and designing data collection instrument for future competency assessment studies in Nepal and elsewhere having similar contexts to that of Nepal.

We urge the Nepal's extension management to design separate packages on extension core competencies for pre-training for college students and in-service trainings for the current EPs and train these two extension human resource groups. The trainings should focus on technical subject matters; Agricultural extension approaches, policies, strategies, tools; and national agricultural plans, policies and program implementing procedures; among others.

## DISCLAIMER

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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