



ASSESSMENT OF CURRENT COMPETENCY LEVEL OF AGRICULTURAL EXTENSION ADVISORS IN FEDERAL NEPAL

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Abstract: In the present context of 21st century, modernization in the agriculture sector demands a higher level of competency to fulfill the needs and wants of people around the globe. Competency is amalgamation of skills, knowledge, attitude and behavior that trigger to perform the delegated services in a precise and systematic manner. The objective of this study was to determine the existing competency level of extension advisors of Nepalese extension service. Total 6 districts from province 1, 2 and Bagmati were selected for the study based on a questionnaire. The questionnaire was composed of open and close-ended questions including the nine core competencies. Descriptive statistics was used to analyze the findings. The findings indicated respondent competency in its all nine core competencies *namely* program planning, program implementation, communication skills, extension education and information technology, program evaluation, personal and professional development, diversity, subject matter expertise and emotional intelligence as moderately competent in general. The extension advisors perceived most competent in extension education and information technology and poor in pluralism in agriculture. Subject matter expertise, extension education and information technology skills are getting better with increase in educational level. Current level of core competency of program planning, program implementation skills, communication skills, personal and professional development and pluralism were found to have increased with increased years of experience. The exposure visit and in-service training are effective methods for competencies acquisition.

Keywords: Current competency level, Extension advisors, Extension service, Modern Agriculture.

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INTRODUCTION

Nepalese two third population are actively involved in agriculture that contribute 27% to Gross Domestic Product (GDP) of the nation. Progress in agriculture is not satisfactory even

though the majority of people are involved in farming (MoALD, 2018). Hindrance in use of modern agriculture technology (DoA Nepal, 2019), about 15% of population, as estimated 4.6 million people are food insecure in Nepal (FAO,



2019). With some of the world's worst food crises in recent years impacting tens of millions of people worldwide (FAO, 2021). Milk production, poultry, tea, vegetables, seed and fisheries are progressing well. The mean time data shows increasing rate of foodstuff import to meet the national requirement (MoALD, 2019). Improving farmer's income and healthy nutritious food for the public are upcoming issues for extension advisors, although climate change influences almost everything of a nation (Mandal and Singh, 2020; Jaiswal and Singh, 2021; Verma, 2021; Jha and Singh, 2021).

Historical and organizational setup for agriculture extension advisory

Agriculture extension advisory system started in 1950 A.D. and since then many transformations occurred. A number of various approaches and methods were adopted from individual farmer to group including cooperative model, commodity-based, creating commodity based zones and super zones. In the recent republic era, three layers of government are in their infancy stage. There was a single office District Agriculture Development Office (DADO) and its Agriculture Service Center (ASC) to deliver all advisory and technical services with all faculty members. Its devolution made the agriculture section at municipal level as front line and Agriculture Knowledge Centre (AKC) as second line of the advisory system under provincial government. The Municipal level Agriculture section is a frontline government advisory service provider. Agriculture officer is chief of the municipal agriculture section, which performs all the primary work from planning to implementation (MoALD, 2019). Agriculture Knowledge Centre (AKC) provides advisory and grant support to farmers which are under the Ministry of Land Management, Agriculture and Cooperatives (MoLMAC) at Provincial level. One AKC covers one or more districts according to coverage authority. 753 local governments, 7 provinces are admired by one federal government setting three tiers of government (MoFAGA, 2020). The Federal Ministry of Agriculture and Livestock Development is the leading body for agricultural policy development (MoALD, 2019). Agricultural

growth rate and productivity are increasing at a low rate from years to years. This may be due to weakness in extension delivery services and human resource development (Worldwide Extension Study, 2011).

Extension advisors

Agriculture Technician (AT) or Agriculture Officer (AO) is working as Extension advisor at municipal or provincial or federal level. Technician farmer's ratio is 400 in developed nations whereas it is 1500 in Nepal shows that acute shortage of trained human resources (IRIN, 2013). Structural deployment of field level extension advisors has made it a more challenging job through a single service door.

Core competency skills

Individual ability to perform certain tasks refers to competency. Knowledge, skills, attitude and behaviors combined forms personal competency (Maddy *et al.*, 2002). Ghimire (2017) referred to eight core competencies necessary for extension advisory in Nepal whereas six were reported in North Carolina Cooperative extension by Lakai *et al.* (2014). Each staff core competency makes a competitive environment in any organizational setup (Vakola *et al.*, 2007). Program planning, communication, program implementation, personal and professional development, extension education and informational technology, diversity, program evaluation, technical subject matter expertise and emotional intelligence are core competencies used for assessment in the study. Proper understanding of competencies required by extension advisors is important for overall agriculture advisory (Owen, 2004). Future extension advisors must be competent and optimist to cover the wide advisory needs of farmers (SeEVERS *et al.*, 2007).

In the Extension Committee on Organization and Policy (ECOP, 2002), vision for the 21st century report, one of the recommendations for extension was to meet those changing needs by building an organization that empowers, encourages, and supports shared leadership and proactive decision making by individuals who have the most relevant information and who operate at a level close to the issues.

Acquisition methods for competency

The rewards are very critical for the competency acquisition among extension advisors. The rewards support much in moving towards personal satisfaction, professional respect and colleague recognition (Shinn and Smith, 1999). The extension advisors are responsible for their own professional development but the government must make an enabling environment for learning to support in job performance (Liles and Mustian, 2004). The promoting factors for the competencies acquisition are personal satisfaction, personal respect from clientele, peer recognition, promotion and salary based on performance, program flexibility based on extension advisor judgment and financial compensations (Shinn and Smith, 1999).

The objective of the study was to explore the current core competencies level and appropriate acquisition methods for extension advisors in the current situation of federal Nepal.

MATERIALS AND METHODS

Research design, Sampling and Data

Collection

The research was designed to analyze the current competency level of extension advisors. The study included all extension offices of local level, province and federal government of selected districts. The authors purposely selected 6 districts for study from 3 provinces (Provinces 1, 2 and Bagmati) out of 7 provinces based on available resources and convenient to conduct the research. The population for the descriptive study was all the class III officers of federal government, level 6, level 7 and Level 8 officers of all 7 provinces, level 6, level 7 and level 8 officers of Local Government of 753 local bodies. This was a descriptive survey research study. A sum of 72 extension advisors voluntarily responded for study during October to December 2019.

Survey instrument

The self-administered questionnaire was crafted with 9 core competencies composed of 56 indicators. The construct program planning and communication skills consists of six competencies in each; program implementation,

education and informational technology and program evaluation had seven competencies; personal and professional development, diversity and subject matter expertise had five competencies each and last emotional intelligence had eight competencies which made a total 56 indicator of competences.

Five-point Likert-type scales were designed to analyze respondent level. For competency level, one equated 'very low', 2 as 'low', 3 as 'moderate', 4 as 'high' and 5 as 'very high'. The data were analyzed by using the descriptive statistics (Frequency, Mean and Standard Deviation).

RESULTS AND DISCUSSION

Demographic characteristics of respondents

Both male (84.72%) and female (15.28 %) were respondents with an average age of 37 years (range from 25 to 57.11 years). The grouping of the age was done in three groups, <35 years (58 %), 36 to 50 years (23 %) and > 51 years (18 %) were responded (table 1).

Extension advisors are having decades of experience (M=11.46) and belong to middle-aged (average age is 37 year) where there seems male majority (84.72%). Female extension advisors (15.28%) is higher than previous i.e. 6.9%, 7.7% (Worldwide Extension study, 2011). Nepalese extension advisors are more experienced than in Malaysia and Ethiopia, where average seven years' experience but it is less than 20 years.

Perception on current level of core competency

Nepalese extension advisor core competencies areas were program planning (6-Statement), program implementation (7-Statement), communication skills (6-Statement), extension education and information technology (7-Statement), program evaluation (7-Statement), personal and professional development (5-Statement), pluralism (5-Statement), subject matter expertise (5-Statement) and emotional intelligence (8-Statement). Thus, a total of 56 competencies for 9 core competencies were aggregated to get the score of each of nine core competencies (table 2).

Table 1: Demographic characteristic of the respondents.

Demographics	Frequency	Percent
Sex		
Female	11	15.28
Male	61	84.72
Age group		
<35 years	42	58.33
36-50 years	17	23.61
>50 years	13	18.06
Total service duration		
<5 years	25	34.72
6-10 years	21	29.17
11-15 years	6	8.33
16-20 years	6	8.33
21-25 years	1	1.39
26-30 years	8	11.11
31-35 years	2	2.78
>36 years	3	4.17
Total	72	100.00

Table 2: Perception on current level of core competencies.

S. No.	Core competencies	Number of statement used	Current level	
			Mean	SD
1.	Program planning	6	3.51	0.83
2.	Program implementation	7	3.73	0.71
3.	Communication skills	6	3.79	0.82
4.	Extension education and IT skills	7	3.92	0.93
5.	Program evaluation	7	3.59	0.72
6.	Personal and professional development	5	3.68	0.78
7.	Pluralism	5	3.48	0.80
8.	Subject matter expertise	5	3.62	0.74
9.	Emotional Intelligence	8	3.69	0.84

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

The current competency level was recorded on a five-point Likert scale ranging from one for 'very low' to five 'very high'. The overall current competency level shows that the extension advisors have excellent skill in the extension

education and IT Skills ($X=3.92$, $SD=0.93$) and have least skill in pluralism in agriculture ($X=3.48$, $SD=0.80$). Similarly, the communication skill was in second ($X=3.79$, $SD=0.82$), program implementation was third

(X=3.73, SD=0.71). The office working environment was nice as the emotion intelligence ranked fourth (X=3.69, SD=0.84). Personal and professional development as fifth (X=3.68, SD=0.78). The subject matter expertise (X=3.62, SD=0.74), program evaluation (X=3.59, SD=0.72) and program planning (X=3.51,

SD=0.83) have been ranked as sixth, seventh and eighth respectively.

The result showed the mean of each current competency as more than 3, which indicated that Nepalese extension advisors were more competent than moderate and less than high level.

Table 3: Current level of core competency by sex.

S. No.	Core competencies	No. of statement used	Current Level				Mean difference (MD) (male-female)
			Male		Female		
			Mean	SD	Mean	SD	
1.	Program planning	6	3.52	0.79	3.50	SD	0.02
2.	Program implementation	7	3.76	0.69	3.52	1.00	0.24
3.	Communication skills	6	3.84	0.79	3.48	0.79	0.36
4.	Extension education and IT skill	7	3.91	0.92	3.99	0.90	-0.07
5.	Program evaluation	7	3.61	0.73	3.49	0.99	0.12
6.	Personal and professional development	5	3.71	0.79	3.47	0.62	0.24
7.	Pluralism	5	3.50	0.80	3.35	0.74	0.15
8.	Subject matter expertise	5	3.64	0.73	3.53	0.82	0.11
9.	Emotional intelligence	8	3.67	0.86	3.81	0.81	-0.14

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

At current core competency level, both male and female have rated extension education and IT skills as most competent (X=3.91 and X =3.99) respectively. At mean time, both (male and female) perceived low-level competency in pluralism (X=3.50 and X=3.35) respectively.

The highest variation of male and female respondent current level of competency is in communication skills (MD=0.36) and least variation in emotional intelligence (MD=-0.14) (table 3).

Table 4: Current level of core competency by educational level of respondents.

Core competencies	No. of statement used	Current levels of core competency by different educational level							
		TSLC		Diploma/I.Sc. Ag.		B.Sc. Ag.		M.Sc. Ag.	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Program planning	6	3.50	1.08	3.39	0.72	3.51	0.72	3.56	0.84
Program implementation	7	3.87	0.75	3.70	0.74	3.61	0.69	3.77	0.70
Communication skills	6	3.67	0.97	3.91	0.78	3.78	0.77	3.78	0.81
Extension education and IT skill	7	3.43	1.01	3.66	1.06	3.99	0.82	4.12	0.85
Program evaluation	7	3.24	0.69	3.84	0.71	3.63	0.67	3.58	0.72
Personal and professional development	5	3.64	0.71	3.60	0.91	3.79	0.70	3.64	0.80
Pluralism	5	3.49	0.82	3.35	0.93	3.40	0.74	3.56	0.78
Subject matter expertise	5	3.29	0.76	3.62	0.78	3.66	0.68	3.69	0.74
Emotional intelligence	8	4.21	0.60	3.73	0.91	3.74	0.80	3.50	0.84

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

At current competency level, the subject matter expertise was rated in ascending order from respondents having TSLC to M.Sc. Ag. ($X=3.29 < 3.62 < 3.66 < 3.69$) respectively. The same situation was in extension education and IT skills ($X=3.43 < 3.66 < 3.99 < 4.12$) respectively. There was descending order in emotional intelligence ($X=4.21 > 3.73 > 3.50$)

from TSLC to M.Sc. Ag. qualification group excepting B.Sc. Ag. group ($X=3.74$). Similarly, there was ascending order of program planning skills ($X=3.50 < 3.51 < 3.56$) from TSLC to M.Sc. Ag group, excepting Diploma/I.Sc. Ag. group ($X=3.39$) (table 4).

Table 5: Current level of core competency by working organization of respondents.

Core competencies	No. of statement used	Current level of core competency by organization					
		Local level Ag. section		State Govt./AKC		Federal Govt./Offices	
		Mean	SD	Mean	SD	Mean	SD
Program planning	6	3.28	0.96	3.48	0.88	3.59	0.71
Program implementation	7	3.33	0.73	3.73	0.74	3.77	0.66
Communication skills	6	2.89	0.76	3.76	0.80	3.93	0.79
Extension education and IT skills	7	3.57	0.98	3.77	0.97	4.21	0.78
Program evaluation	7	3.38	0.59	3.55	0.73	3.68	0.71
Personal and professional development	5	3.27	0.80	3.71	0.74	3.68	0.84
Pluralism	5	3.20	0.77	3.51	0.80	3.45	0.80
Subject matter expertise	5	3.87	0.74	3.55	0.76	3.72	0.70
Emotional intelligence	8	3.50	0.72	3.89	0.79	3.38	0.83

Note: 1=Very low; 2=Low; 3=Moderate; 4= High; 5= Very high

The federal government extension advisor rated higher competent in program planning ($X=3.59 > 3.48 > 3.28$), program implementation ($X=3.77 > 3.73 > 3.33$), communication skills ($X=3.93 > 3.76 > 2.89$), extension education and IT skills ($X=4.21 > 3.77 > 3.57$) and program

evaluation ($X=3.68 > 3.55 > 3.38$) than state government /AKC and local level agriculture section extension advisor's current competency level. The local level extension advisors are competent in subject matter expertise then state and federal government (table 5).

Table 6: Current level of core competency by different job level of respondents.

Sl. No.	Core competencies	No. of statement used	Current core competency level by different job levels							
			Level 6		Level 7		Level 8		Class III	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD
1.	Program planning	6	3.33	0.95	3.42	0.85	3.67	0.85	3.61	0.68
2.	Program implementation	7	3.58	0.83	3.65	0.78	3.89	0.57	3.78	0.63
3.	Communication skills	6	3.56	1.00	3.68	0.80	3.92	0.60	3.94	0.77
4.	Extension education and IT skills	7	3.37	1.09	4.01	0.94	3.89	0.72	4.21	0.76
5.	Program evaluation	7	3.43	0.74	3.52	0.73	3.69	0.63	3.69	0.72
6.	Personal and professional development	5	3.41	0.81	3.83	0.69	3.85	0.71	3.63	0.83
7.	Pluralism	5	3.25	0.87	3.51	0.70	3.60	0.86	3.52	0.78
8.	Subject matter expertise	5	3.40	0.82	3.64	0.74	3.68	0.69	3.71	0.69
9.	Emotional intelligence	8	3.93	0.83	3.65	0.96	3.76	0.84	3.54	0.71

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

The study found that higher in current competency level from 6 to 8 in program planning (X=3.33<3.42<3.67), program implementation (X=3.58<3.65<3.89) and communication skills (X=3.56<3.68<3.92) respectively. Class III officer were rated highest for communication skills (X=3.94) and extension teaching and IT

skills (X=4.21). Subject matter expertise (X=3.40 <3.64 <3.68 <3.71) were rated lowest by officer level 6 and increased to level 8 and highest by class III officer respectively. Emotional intelligence (X=3.93) was rated highest by officer level 6 (table 6).

Table 7: Current competency level by different age group of respondents.

Core competencies	No. of statement used	Current core competency level by age groups					
		<35 years		36-50 years		>50 years	
		Mean	SD	Mean	SD	Mean	SD
Program planning	6	3.57	0.76	3.46	0.96	3.40	0.83
Program implementation	7	3.69	0.69	3.80	0.75	3.75	0.74
Communication skills	6	3.73	0.80	3.85	0.87	3.88	0.81
Extension education and IT skills	7	4.11	0.88	3.82	0.72	3.47	1.15
Program evaluation	7	3.57	0.69	3.60	0.67	3.64	0.86
Personal and professional development	5	3.63	0.77	3.85	0.66	3.62	0.95
Pluralism	5	3.46	0.73	3.59	0.81	3.38	1.00
Subject matter expertise	5	3.64	0.70	3.67	0.78	3.51	0.81
Emotional intelligence	8	3.48	0.79	4.01	0.79	3.93	0.87

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

The study found that communication skills (X=3.73<3.85<3.88) and program evaluation skills (X=3.57<3.60<3.64) were increased with increased age of extension advisors. At mean time, the extension education and IT skills (X=4.11>3.82>3.47) decreased over time in the

age group. The program planning, program implementation, personal and professional skills, subject matter expertise and emotional intelligence were found to increase up to age group <35 years and in between 36 to 50 years but decreased over >50 years age group (table 7).

Table 8: Current competency level by different years of total job experience group of respondents.

Sl. No.	Core competencies	No. of statement used	Current core competency level by total job experience					
			<15		15-30		>30	
			Mean	SD	Mean	SD	Mean	SD
1.	Program planning	6	3.49	0.83	3.58	0.81	3.67	0.85
2.	Program implementation	7	3.65	0.69	3.89	0.78	3.89	0.57
3.	Communication skills	6	3.73	0.80	3.86	0.93	3.92	0.60
4.	Extension education and IT skills	7	4.00	0.86	3.74	1.04	3.89	0.72
5.	Program evaluation	7	3.56	0.69	3.73	0.75	3.69	0.63
6.	Personal and professional development	5	3.64	0.74	3.85	0.85	3.85	0.71
7.	Pluralism	5	3.44	0.74	3.60	0.89	3.60	0.86
8.	Subject matter expertise	5	3.60	0.72	3.77	0.81	3.68	0.69
9.	Emotional intelligence	8	3.54	0.80	4.10	0.83	3.76	0.84

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

The study found that the current level of core competency of program planning ($X=3.49<3.58<3.67$), program implementation skills ($X=3.65<3.89=3.89$), communication skills ($X=3.73<3.86<3.92$), personal and professional development ($X=3.64<3.85=3.85$) and pluralism ($X=3.44<3.60=3.60$) increased over the increased in number of total year of experience. Similarly, extension education and IT skills, program evaluation and emotional

intelligence increased up to a total 30 years of experience (table 8).

Methods for competencies acquisitions

Having various methods of achieving the competencies, 4 major methods of competency acquisition were provided to respondents, to rate them on a four-point Likert scale from 1 being 'not appropriate', 2 for 'somewhat appropriate', 3 for 'appropriate' and 4 as 'very appropriate'.

Table 9: Respondents preferred competency acquisition methods.

Competency acquisition methods	Sum of rated points	Mean	SD
College or university education and learning	229	3.18	0.74
Induction training	244	3.39	0.57
In service training	249	3.4	60.65
Exposure visit (field/inter/national) and seminar	259	3.60	0.66

Note: 1=Not Appropriate; 2= Somewhat Appropriate; 3=Appropriate; 4= Very Appropriate.

The study found that the best method to acquire competency for extension advisors was during exposure visit (field/inter/national) and in-service training (table 9). According to Harder *et al.* (2010), exposure visit or travelling seminar was considered the most important for professional competency acquisition. Extension systems need to invest comprehensively in in-service training to produce the needed outcome (Ferrer *et al.*, 2004).

Relationship of current level competency and demographic characteristics

Both male and female extension advisors have rated extension education and information technology skills as most competent and perceived low-level competency in pluralism. This is an almost similar finding as of Lakai *et al.* (2014). Male perceived themselves more competent in communication skills than their female counterparts. As per perspective of emotional intelligence, female extension advisors get more support from their supervisors than males. Subject matter expertise, extension education and information technology skills are getting better with increase in educational level. Emotional intelligence rated high by TSLC and minimum by M.Sc. Ag. group, indicating that higher educational levels made officers

independent in work. Except, Diploma/ I.Sc. Ag. group, the program planning skills are getting more from TSLC to M.Sc. Ag. group.

Program planning, program implementation, communication skills, extension education and information technology skill, program evaluation skills are the domains where federal officers perceive better than state government/AKC and local level agriculture section extension advisor's current competency level. The local level extension advisors are competent in subject matter expertise then state Government or AKC officers and federal officers. Level 8 extension advisors are comparatively more competent in program planning, program implementation and communication skills than level 6 and 7; it is due to more experience of extension work. Class III officer was rated highest for communication skills and extension teaching and information technology skills. Subject matter expertise was lowest rated by officer level 6 and increased to level 8 and highest by Class III officer respectively. Emotional intelligence was highest rated by officer level 6. The finding supported Ghimire (2017) and countered Lakai *et al.* (2014) who reported that overall proficiency level does not vary with extension advisors job position.

Communication skills and program evaluation skills were increased with an increase in the age group of extension advisors. At mean time the extension education and IT skills decreased over increased in age group. The finding supports Ghimire (2017) and counters the finding of Lakai *et al.* (2014), who found that competency for professional competencies including ITs increased with age. The program planning, program implementation, personal and professional skills, subject matter expertise and emotional intelligence were found to have increased up to age 50 years but decreased over that. Current level of core competency of program planning, program implementation skills, communication skills, personal and professional development and pluralism increased over the increased number of total years of experiences. Similarly, extension teaching and information technology skills, program evaluation and emotional intelligence increased up to a total of 30 years of experience. This is similar to the finding of Burke (2002) reported that 4-H agents' knowledge importance and use of competency vary with age and year of experiences.

CONCLUSIONS

Nepalese extension advisors are in middle age having more than decade of professional experience with majority having master's degree. They perceived themselves at a moderate level of competency for core competency. Extension advisors felt most competent in extension education and information technology while least in pluralism in agriculture. Communication and program evaluation skills increased with age. The extension of education and information technology skills decreased over time. Current level of core competency of program planning, program implementation skills, communication skills, personal and professional development and pluralism increased over the increased number of total years of experiences. The extension advisors felt exposure visit and in-service training as appropriate methods of competency development. The findings of the study could be internalized for human resource development.

REFERENCES

1. **Burke T.** (2002). Defining competency and reviewing factors that may impact

knowledge, perceived importance and use of competencies in the 4-H professional's job. Department of Adult and Community Education, North Carolina State University. <http://repository.lib.ncsu.edu/ir/bitstream/1840.16/3630/1/etd.pdf>

2. **DoA** (2019). Retrieved from the Department of Agriculture, Government of Nepal. <http://www.doanepal.gov.np/ne/content>
3. **ECOP** (2002). Extension Committee on Organization and Policy. The Extension system: A vision for the 21st century. <http://www.aplu.org/NetCommunity/Document.Doc?id=152>
4. **FAO** (2019). GIEWS Country Brief Nepal June 2010. http://www.fao.org/giews/countrybrief/country/NPL/pdf_archive/NPL_Archive.pdf
5. **FAO** (2021). <https://www.fao.org/news/archive/news-by-date/2021/en>.
6. **Ferrer M., Fugate A.M., Perkins D.F. and Easton J.** (2004). Rediscovering the Potential of In-Depth Training for Extension Educators. *Journal of Extension*. 42(1): 1IAW3.
7. **Ghimire R.P.** (2017). Competency Assessment as a way of determining training and educational needs of extension professionals in Nepal. *Journal of International Agricultural and Extension Education*. 24(2): 137-142. 10.5191/jiaee.2017.24210.
8. **Harder A., Lamm A. and Vergot P.** (2010). Explore your world: Professional development in an international context. *Journal of Extension*. 48(2):2FEA3.
9. **IRIN** (2013). Analysis: The trouble with Nepal's agriculture. Published on Jan 23rd, 2013. <http://www.irinnews.org/report/97321/analysis-the-trouble-with-nepal-s-agriculture>.
10. **Jaiswal S. and Singh O.P.** (2021). Riverbed vegetable farming's contribution in livelihood recovery of Nepalese farmers. *International Journal of Biological Innovations*. 3 (1): 83-91. <https://doi.org/10.46505/IJBI.2021.3108>.
11. **Jha A.K. and Singh O.P.** (2021). Farmers' awareness and perception about Livestock insurance in Dhanusha District, Nepal.

- International Journal of Biological Innovations*. 3 (1): 228-239. <https://doi.org/10.46505/IJBI.2021.3125>.
12. **Lakai D., Jayaratne K.S.U., Moore G.E. and Kistler M.J.** (2014). Identification of current proficiency level of extension competencies and the competencies needed for extension agents to be successful in the 21st century. *Journal of Human Science and Extension*. 2 (1):71-89.
 13. **Liles R.T. and Mustain R.D.** (2004). Core Competencies: A system approach for training and organizational development in extension. Proceedings of the 20th Annual Conference, Association for International Agricultural and Extension Education, Dublin, Ireland. <https://www.aiaee.org/attachments/article/1079/031.pdf>.
 14. **Maddy D.J., Niemann K., Lindquist J. and Bateman K.** (2002). Core competencies for the Cooperative Extension System [Report]. Retrieved from: Personnel and Organizational Development Committee (PODC) of ECOP. <http://podc.unl.edu/finalPODC.pdf>.
 15. **Mandal A.C. and Singh O.P.** (2020). Climate Change and Practices of Farmers' to maintain rice yield: A case study. *International Journal of Biological Innovations*. 2(1): 42-51. <https://doi.org/10.46505/IJBI.2020.2107>.
 16. **MoALD** (2018). Ministry of Agriculture and Livestock Development. Civil Society Collaboration in measuring impact of adaptation investments: the case of agriculture in Nepal. <https://moald.gov.np/>.
 17. **MoALD** (2019). Retrieved from Ministry of Agriculture and Livestock Development, Government of Nepal. <https://www.moald.gov.np/ministry-info>.
 18. **MoFAGA** (2020). Retrieved from Ministry of Federal Affairs and General Administration, Government of Nepal. <https://www.mofaga.gov.np/ministry-introduction>.
 19. **Owen M.B.** (2004). Defining key sub competencies for administrative country leaders. *Journal of Extension*. 42(2): 2RIB3.
 20. **Seevers B., Graham D. and Conklin N.** (2007). Education through Cooperative Extension (2nd ed.). Columbus, OH: The Ohio State University Curriculum Materials Service.
 21. **Shinn G. and Smith K.** (1999). Anticipating roles of the Cooperative Extension Service in 2010: A Delphi technique involving agricultural and natural resource agents and family and consumer science agents in Texas. Paper presented at the Proceedings of the 26th Annual National Agricultural Education Research Conference, Florida.
 22. **Vakola M., Soderquist K.E. and Prastacos G.P.** (2007). Competency Management in support of organizational change. *International Journal of Manpower*. 28(3-4): 260-275.
 23. **Verma A.K.** (2021). Influence of climate change on balanced ecosystem, biodiversity and sustainable development: An overview. *International Journal of Biological Innovations*. 3(2):331-337. <https://doi.org/10.46505/IJBI.2021.3213>.
 24. **Worldwide Extension Study** (2011). Extension and advisory services in Nepal: A brief history of public extension policies, resources and advisory activities in Nepal. Website: <http://www.worldwide-extension.org/asia/nepal/s-nepal>.