Plant Archives Vol. 26, No. 2, 2026 pp. 1610-1616 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org

DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2026.v26.no.2.218

ASSESSMENT OF PROFESSIONAL COMPETENCY GAPS AMONG AGRICULTURAL EXTENSION PERSONNEL: A BORICH NEEDS ASSESSMENT IN KARNATAKA, INDIA

Chedulla Venkata Sai Anusha[1*], Geeta S. Tamgale[2] and Maloth Girija Sri[3]

[1]Department of Agricultural Extension Education, College of Agriculture, University of Agricultural Sciences, Dharwad, Karnataka - 580 005, India

[2]Department of Extension and Communication Management, College of Community Science, University of Agricultural Sciences, Dharwad, Karnataka - 580 005, India

[3]Department of Agricultural Extension Education, College of Agriculture, Professor Jayashankar Telangana Agricultural University, Rajendranagar, Hyderabad, Telangana – 500 030, India

*Corresponding author E-mail: anusha7102000@gmail.com

(Date of Receiving-22-07-2026; Date of Revision-12-09-2026; Date of Acceptance-23-09-2026)

ABSTRACT

Agricultural extension personnel play a vital role in promoting technology adoption and improving farmers' livelihoods. The effectiveness of extension services largely depends on the professional competencies of extension personnel. The present study was conducted during 2023-24 in seven districts of Northern Karnataka to assess the perceived importance, possession, and gaps in professional competencies among 120 Agricultural Officers (AOs) and Assistant Agricultural Officers (AAOs) working in Raitha Samparka Kendras (RSKs). Data were collected using a pre-tested structured questionnaire through personal interviews and Google Forms. Professional competencies were assessed under three dimensions: knowledge, skills, and personal qualities covering 33 competency statements. The Borich Need Assessment Model (1980) was used to identify competency gaps through Mean Weighted Discrepancy Scores (MWDS). The findings revealed that awareness of current government policies, setting objectives for extension programmes, report writing, and maintaining relationships with farmers recorded the highest perceived importance and possession. The highest competency gaps were observed in trying out innovative extension practices (MWDS = 3.27), coordinating work with peer staff (3.08), conducting frontline demonstrations (3.05), use of multimedia and MS Office (3.04), and leadership in programme planning and execution (3.04). Overall, 44.17 per cent of the respondents exhibited a medium level of competency gap, followed by high (30.00%) and low (25.83%) levels. The study highlights the need for regular competency assessment and needs based capacity building programmes focusing on innovation, leadership, digital skills, and practical extension approaches to enhance the effectiveness of extension personnel and strengthen agricultural extension service delivery.

***Key words*:** Professional competencies, Extension personnel, perceived gaps, Borich Need Assessment Model

Introduction

Agricultural extension personnel play a pivotal role in facilitating technology transfer, strengthening farmers' knowledge, and promoting sustainable agricultural development. The effectiveness of extension services largely depends on the professional competencies of extension personnel, including their technical knowledge, communication abilities, leadership qualities, planning skills, and problem-solving capacity (Swanson *et al.*, 2010). As agriculture becomes increasingly knowledge-driven and technology-oriented, extension professionals are expected to continuously update their competencies to address the evolving needs of farmers and the agricultural sector (FAO, 2014).

For an extension professional to be successful, they must not only be competent in technical matters but also in management, programming, communication, human relation and leadership (Graham, 2009; Stone and Coppernoll, 2004). This underlines the need to equip professional competency to carry out both specified and unspecified tasks leading to the satisfaction of all stakeholders' current and future desired standards (Khadayata *et al.*, 2019). Professional competence is a combination of knowledge, skills, and personal attributes that enables extension personnel to perform their responsibilities effectively and efficiently (Khadyata, 2018). Identified competencies in extension require program planning, execution, implementation, and evaluation; faculty and public relations; professional and personal development; communication and management skills (Cooper and Graham, 2001). Identifying competency gaps is essential for designing need-based capacity-building programmes and improving the quality of extension services. Assessing these gaps helps organizations prioritize training interventions and enhance the overall performance of extension personnel (Borich, 1980). In this context, the present study was undertaken to assess the perceived importance, possession, and gaps in professional competencies among extension personnel of the Karnataka State Department of Agriculture.

Materials and Methods

The study was carried out during the year 2023-24 across the seven districts of Northern Karnataka under the jurisdiction of the University of Agricultural Sciences (UAS), Dharwad. The target population comprised Agricultural Officers (AOs) and Assistant Agricultural Officers (AAOs) working in the Raitha Samparka Kendras (RSKs) under the Karnataka State Department of Agriculture. A simple random sampling technique was adopted to select the respondents. The sample included 15 AOs and 5 AAOs each from Bagalkot, Dharwad, Gadag, Haveri, and Vijayapura districts; 8 AOs and 2 AAOs from Belagavi; and 9 AOs and 1 AAO from Uttara Kannada, resulting in a total sample of 120 extension personnel. A structured questionnaire was designed and pre-tested in a non-sample area to ensure its validity and reliability. The professional competence of the respondents was assessed based on three key dimensions: knowledge required for performing assigned responsibilities, skills needed to execute departmental tasks effectively, and personal qualities essential for carrying out their professional duties. Data were collected through both personal interviews and online Google Forms. Mean, Standard Deviation, Frequency and Percentage were used to calculate perceived level of importance and possession of professional competencies.

Gaps in professional competencies were assessed as the difference between the importance of a competency and the level of competency possessed by extension personnel. Based on the procedure suggested by Rohit (2016), with suitable modifications, a total of 33 competency statements were developed and grouped into eight dimensions: knowledge, analysis and diagnosis, planning and organization, communication, leadership, initiativeness, documentation skills, and personal qualities.

The competency gap was measured using the Borich Need Assessment Model (Borich, 1980). Respondents rated both the importance and their level of possession of each competency on a five-point Likert scale ranging from 1 to 5. The Mean Weighted Discrepancy Score (MWDS) was computed using the formula:

Discrepancy Score = I-C

Weight Discrepancy Score = I (I-C)

Mean Weight Discrepancy Score = ΣI (I-C)/n

In the above equations,

I = Importance level,

C = Competency level/ Possession level and

n = Number of extension personnel.

Results and Discussion

Perceived importance and possession of professional competencies in the extension personnel

The data regarding perceived importance and possession of professional competencies in the extension personnel as furnished in Table 1 discussed below.

Knowledge to carry out tasks

The results regarding knowledge to carry out tasks revealed that Awareness of the current government policies shown higher perceived level of importance (4.53) and perceived level of possession (4.04).

The need to know about the current government policies and technologies to solve the problems and requirements of the farmers found to support the present findings.

The results of past research study of Rohit *et al.*, (2020) found to support the present findings.

Skills to carry out tasks of KSDA

Analysis and diagnosis skills:

It was noticed that 'Analysing traditional culture and its effect on change' shown highest mean for perceived level of importance (4.48) and perceived level of possession (4.03).

Table 1: Distribution of extension personnel based on perceived importance and possession of professional competencies (n=120).

S. No.	Statements under areas of professionalcompetencies	Perceived level			
		Importance		Possession	
		Mean	SD	Mean	SD
I	**KNOWLEDGE TO CARRY OUT TASKS**				
1	Understand mandates and objectives of Department	4.35	0.60	3.80	0.68
2	Awareness of the current government policies	4.53	0.62	4.04	0.92
3	Good understanding of district, people and culture	4.11	0.84	3.57	0.85
4	Adequate technical knowledge in the subject area	4.37	0.75	3.83	0.90
5	Awareness to approaches towards adult education	4.22	0.75	3.70	0.79
II	**SKILLS TO CARRY OUT TASKS OF KSDA**				
	A: Analysis and diagnosis skills				
1	Identifying problems of farmers and why they arise	4.18	0.69	3.60	0.84
2	Analysing traditional culture and its effect on change	4.48	0.65	4.03	0.94
3	Analysing how change in social status affect farmers	4.13	0.68	3.63	0.81
4	Using local leaders to influence villagers to change	4.41	0.79	3.91	0.87
	B: Planning and Organization skills				
1	Assessing training needs of the farmers	4.29	0.61	3.65	0.75
2	Setting objectives for an extension program	4.56	0.68	4.02	0.86
3	Designing and conducting farmers training	4.16	0.77	3.63	0.87
4	Coordinating work schedules with other peer staff	4.29	0.77	3.66	0.85
5	Curriculum development and time management	4.29	0.78	3.78	0.87
6	Conducting situational analysis and use of PRA tools	4.24	0.85	3.74	0.88
7	Laying out front line demonstrations and on farm testing	4.28	0.75	3.68	0.85
8	Evaluating extension program	4.25	0.81	3.71	0.91
	C: Communication skills				
1	Delivering radio talks and TV talks	4.16	0.61	3.53	0.69
2	Establishing rapport with the farmers & persuade them to adopt technologies	4.58	0.58	3.99	0.99
3	Ability to prepare and use multimedia sources	4.26	0.67	3.61	0.77
	D: Leadership qualities				
1	Leading farmers by using persuasive style	4.06	0.73	3.55	0.81
2	Providing leadership in program planning and execution	4.58	0.60	3.94	0.92
3	Seeing both sides of arguments during conflicts	4.19	0.73	3.58	0.88
	E: Initiativeness				
1	Confidence to work without guidance and support	4.19	0.57	3.52	0.85
2	Try out something innovative/ new in extension work	4.67	0.51	3.97	1.00
	F: Documentation skills				
1	Use of MS office and data interpretation	4.13	0.66	3.47	0.74
2	Report writing and submission	4.64	0.55	4.09	0.96
III	**PERSONAL QUALITIES TO CARRY OUT TASKS**				
1	Sensitive to the feelings and wishes of farmers	4.22	0.64	3.65	0.73
2	Maintaining relationship & keeping contact with farmers	4.55	0.63	3.98	0.89
3	Confidence in own abilities to meet set objectives	4.16	0.78	3.55	0.81
4	Commitment to extension work	4.20	0.73	3.66	0.82
5	Reliability in implementing extension work	4.14	0.86	3.69	0.93
6	Sure of what is being done everyday	4.24	0.79	3.65	0.88

The necessity to build a strong relationship with the local people and for understanding their requirements, the in-depth knowledge of indigenous culture, their beliefs and how it effects their nature of living is mandatory, hence the above results.

Planning and Organization skills:

It was observed that the necessity of 'Setting objectives for an extension program' pointed out higher perceived level of importance (4.56) and perceived level

Table 2: Gaps in professional competencies as perceived by extension personnel (n=120).

Sl.No.	Statements relevant to professional competencies ofextension personnel	MWDS	Rank
I	**KNOWLEDGE TO CARRY OUT TASKS**		
1	Understand mandates and objectives of Department	2.57	16
2	Awareness of the current government policies	2.28	21
3	Good understanding of district, people and culture	2.66	13
4	Adequate technical knowledge in the subject area	2.68	12
5	Awareness to approaches towards adult education	2.59	15
II	**SKILLS TO CARRY OUT TASKS OF KSDA**		
	A: Analysis and diagnosis skills		
1	Identifying problems of farmers and why they arise	2.68	12
2	Analysing traditional culture and its effect on change	2.22	23
3	Analysing how change in social status affect farmers	2.31	20
4	Using local leaders to influence villagers to change	2.57	16
	B: Planning and Organization skills		
1	Assessing training needs of the farmers	2.95	5
2	Setting objectives for an extension program	2.76	10
3	Designing and conducting farmers training	2.52	18
4	Coordinating work schedules with other peer staff	3.08	2
5	Curriculum development and time management	2.74	11
6	Conducting situational analysis and use of PRA tools	2.57	16
7	Laying out front line demonstrations and on farm testing	3.05	3
8	Evaluating extension program	2.65	14
	C: Communication skills		
1	Delivering radio talks and TV talks	2.83	8
2	Establishing rapport with the farmers & persuade them to adopt technologies	2.83	8
3	Ability to prepare and use multimedia sources	3.04	4
	D: Leadership qualities		
1	Leading farmers by using persuasive style	2.27	22
2	Providing leadership in program planning and execution	3.04	4
3	Seeing both sides of arguments during conflicts	2.78	9
	E: Initiativeness		
1	Confidence to work without guidance and support	2.88	7
2	Try out something innovative/ new in extension work	3.27	1
	F: Documentation skills		
1	Use of MS office and data interpretation	3.04	4
2	Report writing and submission	2.59	15
III	**PERSONAL QUALITIES TO CARRY OUT TASKS**		
1	Sensitive to the feelings and wishes of farmers	2.66	13
2	Maintaining relationship & keeping contact with farmers	2.78	9
3	Confidence in own abilities to meet set objectives	2.94	6
4	Commitment to extension work	2.54	17
5	Reliability in implementing extension work	2.34	19
6	Sure of what is being done everyday	2.88	7
MWDS: Mean Weight Discrepancy Score)			

of possession (4.02).

For any project or program to be successful, setting the objectives plays a major role in achieving the development and continuation of programs, thus setting objectives is the important skill to carry out the further tasks.

Communication skills:

It was noticed that the 'Establishing rapport with the farmers and persuade them to adopt technologies' had the highest perceived level of importance (4.58) and perceived level of possession (3.99).

Good communication skill is the first and foremost thing to leave an impression with the farmers and make

Table 3: Distribution of extension personnel based on perceived gaps in professional competencies (n=120).

Sl. No.	Professional competencies	Categories		
		Lowf (%)	Mediumf (%)	Highf (%)
1	**Knowledge to carry out tasks**	43 (35.83)	47 (39.17)	30 (25.00)
2	**Skills to carry out tasks of KSDA**	39 (32.50)	45 (37.50)	36 (30.00)
	2.1 Analysis and diagnosis	52 (43.33)	24 (20.00)	44 (36.67)
	2.2 Planning and Organization	39 (32.50)	53 (44.17)	28 (23.33)
	2.3 Communication	44 (36.67)	49 (40.83)	27 (22.50)
	2.4 Leadership qualities	40 (33.33)	26 (21.67)	54 (45.00)
	2.5 Initiativeness	38 (31.67)	55 (45.83)	27 (22.50)
	2.6 Documentation skills	43 (35.83)	44 (36.67)	33 (27.50)
3	**Personal qualities to carry out tasks**	37 (30.83)	30 (25.00)	53 (44.17)

them to adopt the recent trends and technologies hence the results.

Leadership qualities:

The observation of leadership qualities revealed that the highest mean value of the extension personnel was noticed for 'Providing leadership in program planning and execution' for perceived level of importance (4.58) and perceived level of possession (3.94).

Before the start of any program, planning is required, without any leadership the program leads to the failure, hence regarding the program planning and also executing that program leadership qualities should be possessed.

Initiativeness:

It was observed from the results that 'Confidence to work without guidance and support' had the highest mean value of the extension personnel for perceived level of importance (4.67) and perceived level of possession (3.97).

To persuade farmers to accept challenges in the competitive market it is the initiativeness among the extension workers count the lot, hence the results (Anusha and Tamgale, 2025).

Documentation skills:

It was noticed from the results that 'Report writing and submission' shown the highest mean values for perceived level of importance (4.64) and perceived level of possession (4.09).

How much work extension workers do depend on recorded work as a good reference material for impressing the farmers, hence the extension personnel felt report writing and submission as an important skill.

Personal qualities to carry out tasks:

The results regarding skills to carry out tasks revealed that 'Maintaining relationship and keeping contact with farmers' recorded the highest mean value of perceived level of importance (4.55) and perceived level of possession (3.98).

It is the commitment of the extension personnel of what to be done with greater reliability and confidence plays the major role in achieving success of the task, hence the results (Kamilu and Bolarinwa, 2017).

Gaps in professional competencies as perceived by extension personnel

The perceived gaps of extension personnel in professional competencies assessed over Mean weighted discrepancy scores (MWDS) (Table 2) revealed that the highest gap (MWDS=3.27) was noticed for 'Try out something innovative/new in extension work', followed by 'Coordinating work schedules with other peer staff' (MWDS=3.08), 'Laying out front line demonstrations and on farm testing' (MWDS=3.05), 'Ability to prepare and use multimedia sources' (MWDS=3.04), 'Providing leadership in program planning and execution' (MWDS=3.04) and 'Use of MS office and data interpretation' (MWDS=3.04). These results were due to the fact that, non-existence of the opportunities to excel in meeting the demands of the farmers and lack of opportunities to try innovative type of extension work and less allocation of funds to conduct the demonstrations (Raji *et al.*, 2016).

But, the results of past research studies conducted by Rohit *et al.*, (2019) and Bishnoi *et al.*, (2020) reported that highest perceived gap was noticed in designing and conducting farmers training and confidence to work

Table 4: Distribution of extension personnel according to overall perceived gaps in professional competencies (n=120).

Sl. No.	Categories	DEP	
		f	%
1	Low perceived gaps (<22.92)	31	25.83
2	Medium perceived gaps (22.92-31.74)	53	44.17
3	High perceived gaps (>31.74)	36	30.00
Mean= 27.33SD=10.38; DEP: Distribution of extension personnel			

without support and guidance respectively.

Whereas, low mean weighted discrepancy scores was noticed in case of 'Analysing traditional culture and its effect on change' (MWDS=2.22) and 'Leading farmers by using persuasive style' (MWDS=2.27). This may be due to the reason that the respondents had strong connections with the local people and good knowledge regarding the traditional culture of their areas might have encouraged them to persuade the farmers in adopting the recent technologies.

Further, the least gap (MWDS=2.52) was observed for 'Designing and conducting farmers training', followed by 'Reliability in implementing extension work' (MWDS=2.34), 'Analysing how change in social status affect farmers' (MWDS=2.31), 'Awareness of the current government policies' (MWDS=2.28). The many years of experience in conducting trainings and filed extension work besides the routine touch with social systems of farmers might have resulted for this situation (Goswami *et al.*, 2023).

The past research findings of Rohit *et al.*, (2019) and Bishnoi *et al.* (2020) reported that lowest perceived gap was noticed in coordinating work with their peer and conducting survey in operational area respectively.

It could be observed from the Table 3 that comparatively highest per cent of the extension personnel (39.17%) were noticed under medium category of knowledge to carry out tasks. Similarly, for skills to carry out tasks of KSDA, most of the extension personnel (37.50%) belonged to medium category. Further, for personal qualities to carry out tasks, the highest per cent of the extension personnel (44.17%) comes under high category. As we discussed earlier, that personal qualities to carry out tasks had highest gaps, hence highest per cent of the extension personnel falls in high perceived gaps category.

The overall distribution of extension personnel based on the perceived gaps in professional competencies displayed in the Table 4 revealed that moderate per cent of the extension personnel (44.17%) belonged to medium perceived gaps, followed by distribution in high perceived gaps and low perceived gaps with 30.00 and 25.83 per cent respectively. The probable reason for this maybe because of the above said result that less than 20 per cent gaps were noticed in all the three types of professional competencies. This result indicated the requirement of training in updating the professional competencies of extension personnel.

Conclusion

The study revealed that extension personnel of the Karnataka State Department of Agriculture possessed moderate to high levels of professional competencies across knowledge, skills, and personal qualities. However, notable competency gaps were identified in innovation, coordination with peer staff, leadership in programme planning and execution, use of multimedia and digital tools, frontline demonstrations, and data interpretation. Overall, nearly half of the respondents (44.17%) exhibited a medium level of competency gap, indicating considerable scope for professional development. The findings emphasize the importance of implementing regular competency assessments and need-based training programmes focusing on emerging extension approaches, digital technologies, leadership development, communication, and practical field-oriented skills. Strengthening these competencies will enhance the effectiveness of extension personnel in delivering quality advisory services, promoting technology adoption, and addressing the evolving needs of farmers, thereby contributing to improved agricultural development and extension service delivery.

References

Anusha, C.V.S. and Tamgale G. (2026). Professional competencies among extension personnel of Karnataka State Department of Agriculture. *International Journal of Agriculture Extension and Social Development,* **9**, 201-203.

Bishnoi, S., Singh K.N., Ray M., Dahiya S., Dubey S.K., Singh A., Mishra P., Singh S., Pattanaik B., Yadav M. and Shankar R. (2020). Competencies and gap analysis of the Krishi Vigyan Kendra extensionists and barriers in acquiring ICT-based competencies. *Indian Journal of Extension Education,* **56(2)**, 65-71.

Borich, G.D. (1980). A needs assessment model for conducting follow-up studies. *Journal of Teacher Education,* **31(3)**, 39-42.

Cooper, A.W. and Graham D.L. (2001). Competencies needed to be successful county agents and county supervisors. *Journal of Extension,* **39(1)**, 1-11.

Food and Agriculture Organization of the United Nations. (2014). *Capacity development for agricultural innovation systems*. FAO.

Goswami, A., Phand S.S., Biswas S. and Das S. (2023). *Innovative extension approaches in sustainable development of extension organization*. W.B. University of Animal & Fishery Sciences & National Institute of Agricultural Extension Management (MANAGE).

Graham, R.C. (2009). *Ohio State University extension competency study: Developing a competency model for a 21st-century extension organization* (Doctoral dissertation, The Ohio State University).

Kamilu, B. and Bolarinwa O.A. (2017). Agricultural extension personnel perception of performance appraisal and its implication on commitment to the job in Ogun State Agricultural Development Programme, Nigeria. *South African Journal of Agricultural Extension,* **45(2)**, 64-72.

Khadayata, K.G. (2018). *Professional competence of Agricultural Technology Management Agency personnel in Middle Gujarat* (Ph.D. Thesis, Anand, Agricultural University, Gujarat, India).

Khadayata, K.G., Patel S.R. and Patel A.R. (2019). Professional competence of Agricultural Technology Management Agency (ATMA) personnel. *International Journal of Current Microbiology and Applied Sciences,* **8(12)**, 2964-2969.

Raji, E., Ijomah T. and Eyieyien O. (2024). Improving agricultural practices and productivity through extension services and innovative training programs. *International Journal of Applied Research in Social Sciences,* **6**, 1297-1309.

Rohit, J. (2016). *Mapping and forecasting of competencies for extensionists in changing agricultural scenario* (Doctoral dissertation, Indian Agricultural Research Institute, New Delhi, India).

Rohit, J., Satyapriya S., Sangeetha V., Singh P.K. and Singh K.N. (2020). Forecasting the competencies for extensionists in changing agricultural scenario in India. *Indian Journal of Agricultural Sciences,* **90(3)**, 489-494.

Rohit, J., Singh P., Chahal V.P., Satyapriya S. and Sangeetha V. (2019). Skill gap analysis of extensionists working in Krishi Vigyan Kendras in India. *Indian Journal of Agricultural Sciences,* **90(2)**, 268-272.

Stone, B. and Coppernoll S. (2004). You, extension and success: A competency-based professional development system. *Journal of Extension,* **42(2)**.

Swanson, B.E. and Rajalahti R. (2010). *Strengthening agricultural extension and advisory systems: Procedures for assessing, transforming, and evaluating extension systems* (Agriculture and Rural Development Discussion Paper No. 45). World Bank.