Core skills and competencies for inclusion in the curriculum for effective performance of extension professionals

Abstract

Changing situations and developments in agriculture in the 21st century demands extension workers to be equipped with a diverse set of competencies. Extension workers' ability to adapt, communicate effectively and combine technical expertise with participatory approaches can significantly influence their job performance and ultimately, contribute to the growth and sustainability of the agriculture industry. Hence, an attempt has been made to know the level of need of core skills and competencies required for extension professionals to perform their job effectively. A scale was developed to measure the level of need of the skills and competencies that an agricultural extension professionals requires to perform their tasks. Considering the importance of contemporary extension roles, responsibilities and based on the scale developed, twelve broad areas of skills and competencies required for agricultural extension professionals were identified and grouped. Professionals presently working in Karnataka State Department of Agriculture, Karnataka State Department of Horticulture and Coffee Board are considered as respondents to analyze the level of need of skills and competencies to be included in curriculum of extension education. Mean index scores were calculated for a particular skills listed under twelve broad areas of skills and competencies selected for the study. The results revealed that soft skills were ranked first, followed by entrepreneurship development skills and communication skills. Planning and designing need based programs, building teamwork skills, agricultural value chain extension, use of modern communication methods and AV aids, use of computer applications, monitoring and evaluation of extension programs, designing training programs, problem solving skills, knowledge on subject matter concepts, motivating farmers, innovativeness and stress management are the individual skills ranked first respectively on the listed twelve broad areas of skills and competencies. Based on the findings of the study, it is recommended that equipping extension workers with the necessary skills during their undergraduate and postgraduate education is crucial to ensure they are well-prepared to meet the evolving demands of the agriculture industry. By reorienting and enhancing the curriculum, agricultural universities and institutions can play a significant role in developing competent extension professionals. This will result in more effective and impactful agricultural extension

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services, leading to improved agricultural productivity, sustainability, and overall rural development.

Key works: Extension workers, job performance, skills and competencies, Education and training.

Introduction

Agriculture in the 21st century has experienced significant changes driven by increasing demands for high-quality and large quantities of farm produce. These changes have had a considerable impact on the roles and job performance of extension workers, who play a crucial role in advising and educating farmers. One of the most prominent shifts observed is gradual replacement of traditional subsistence agriculture with market-oriented or commercial agriculture. This transformation can be attributed to several factors such as rapid economic growth, introduction of new technologies, market expansion and liberalization, increased demand for food, decreasing farming population and urbanization, developed infrastructure facilities and government agricultural policies. Extension workers, as key stakeholders in agricultural development, have adapted their roles to support farmers in adopting modern practices, implementing new technologies, and thriving in the evolving agricultural landscape.

Agricultural extension plays a vital role in welfare of farmers and rural communities by providing essential advisory services and programs that empower farmers to innovate and enhance their knowledge and skills. In the modern context, the role of agricultural extension has evolved beyond simple technology transfer and training, expanding into facilitation and addressing a diverse set of challenges faced by farmers and rural populations (USAID, 2002). Understanding the competencies of extension workers and emphasizing the importance of process skills is essential for optimizing the impact of agricultural extension services. By focusing on both technical knowledge and process skills, extension professionals can foster effective communication, engagement, and learning, leading to better outcomes for farmers and rural communities. Regular evaluation and investment in the professional development of extension personnel are vital for ensuring the continued improvement and relevance of extension services. This has led to an increased focus on development of core competencies that are necessary for extension workers to perform efficiently. Agricultural extension organizations and institutions should ensure that extension workers are equipped with the necessary core

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competencies to perform their jobs effectively. This, in turn, will lead to more impactful and successful extension services that address the needs of farmers and contribute to rural development and sustainable agricultural practices. Hence, an attempt has been made to know the level of need of core skills and competencies for inclusion in the extension course curriculum required for extension professionals to perform their job effectively.

Methodology

By reviewing the research articles published in India and abroad and also through participatory methods like focus group discussion and field workshops by involving different stakeholders in extension education (Farmers, Professionals, PG & Ph.D students and Professors) most important skills and competencies were listed for effective field extension work to accomplish the present day job market. The listed core skills and competencies were further analyzed to eliminate the unimportant ones and by retaining the most important skills for developing an interview schedule by adopting participatory methods.

Development of interview schedule

Taking into consideration the scope and objectives of the study, an interview schedule was prepared by including the items from scale developed to measure the level of need of the skills and competencies that an agricultural extension professionals require to perform their tasks and suitable changes were incorporated in the formation of items, questions and their sequences. Adequate caution was exercised to make the schedule unambiguous, clear, complete, comprehensive and understandable. Based on the findings of scale developed in the study, twelve broad areas of skills and competencies were identified by considering the importance of contemporary extension role and responsibilities. Under each broad area individual skills or competencies were grouped. Skills and core competencies considered for present study were operationalized as the basic sets of knowledge, skills, abilities, and behaviours that agricultural extension professionals require for effective performance on the following twelve broad areas.

1. **Programme Planning Skills:** operationalized as direction and intensity of efforts to bring about desirable change among farmers in view of national agricultural development strategies, programs, and policies. Nine items were included and assessed this area of competency.

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2. **Programme Implementation Skills:** operationalized as ability of professional to coordinate extension programs, demonstrate teamwork and negotiation skills, engage diverse local stakeholders, delegate responsibilities, and follow participatory decision making in extension work. Eight items were considered and assessed under this competency.
3. **Efficiency and Effectiveness of Extension Skills:** Are required by agricultural extension professional to perform certain activities effectively to enhance the efficiency like linkages with other areas, coordinating with other firms, integrating with private firms and facilitating entrepreneurship etc., Nine items were considered and assessed under this competency.
4. **Communication Skills:** Are operationalized as ability of agricultural extension professionals to respect local culture, prepare reports of their work, share success stories and lessons learned, use various communication channels to disseminate information about important extension activities and programs, and possess good listening and public speaking skills. Four statements were administered to assess this competency.
5. **Information & Communication Technologies (ICTs) skills**: Are operationalized as ability of extension professionals to use computers, audio visual aids, mass media, mobile phones, and social media for communication, teaching, and learning. Six items were used to assess this competency.
6. **Programme Evaluation Skills:** Are operationalized as ability of agricultural extension professionals to understand monitoring and evaluation concepts, conduct monitoring and evaluation of extension programs, develop data collection instruments, apply qualitative and quantitative tools to collect and evaluation of data, write evaluation reports, and share results with stakeholders. Four items were administered to assess this competency.
7. **Professional Development skills:** Are required for learning to maintain professional credentials such as practice of principles of good governance, commitment to career advancement, apply professional ethics in work, follow organizational policies & directives, and demonstrate positive attitude toward extension work. Seven items were administered to assess this competency.
8. **Personal skills:** Personal skills are the qualities that can be considered as strengths, be it in professional life or personal life. Any individual with excellent personal skills is

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reliable and contributes to a work culture positively. Four items were administered to assess this competency.

9. **Technical Expertise and Marketing Skills:** Operationalized as ability of agricultural extension professionals to demonstrate basic disciplinary knowledge, understand the innovative technologies, educate community members about risks and uncertainties, use of publications, demonstrate agribusiness management, and facilitate entrepreneurship development. Eight statements were included and assessed under this competency.
10. **Leadership and Management Skills:** Operationalized as the capacity of an agricultural extension professionals behavior which emphasizes the quality of work, clarifies everyone's responsibilities, offers new approaches to problem solving and encourages decision making through groups. Five statements were administered to assess this competency.
11. **Entrepreneurship development skills:** Operationalized as the ability and readiness to develop, organize and run a business enterprise, along with any of its uncertainties in order to make a profit. Entrepreneur should be able to plan business, ready to take risk, innovative, manage finance etc., Developing these entrepreneurial skills is one of the most important competencies considered in extension education. Seven statements were administered to assess this competency.
12. **Soft Skills:** Are personal attributes that supports situational awareness and enhances an individual's ability to perform the job effectively. Four statements were considered and assessed under this competency.

Selection of respondents

The extension professionals working in Government line departments, State Agriculture Universities, ICAR institutions, NGOs and private firms working in the state of Karnataka were considered as respondents in order to check and analyze the level of importance of skills and competencies required by extension professionals to be incorporated in the curriculum of extension education for effective performance of agricultural extension work at the field level.

The developed instrument was sent by post as well as by survey through 'Google Forms' and via email to all the Agriculture and Horticulture departments of Karnataka state (30 Districts) out of which 261 extension workers responded with complete information as mentioned in the Table

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below. With regard to Coffee Board Junior and Senior Liaison Officers working in different areas of Karnataka were considered as respondents to collect the data.

Chart 1 : Extension Professionals selected for the study

Institutions addressing nations of the respondents	Number responded
Karnataka State Department of Agriculture (Agriculture Officer, Assistant Agriculture Officer, Assistant Director of Agriculture and Joint Director of Agriculture)	107
Karnataka State Department of Horticulture -(Assistant Horticulture Officer, Assistant Director of Horticulture and Senior Assistant Director of Horticulture)	120
Coffee board Liaison officers	34
Total	**261**

Keeping in mind their experience in agricultural extension work, respondents were requested to rate the level of importance of the twelve skills and competencies on the following criteria:

Level of Need for inclusion in the curriculum: The listed skills & competencies were rated by the respondents to analyze the need of skills and competencies required by extension professionals to improve their job performance at the field level. Five-point continuum scale and weightage given for each response as suggested by Likert (1932) was used to measure the level of importance as 1-No need for inclusion in the syllabus, 2-Slight need for inclusion, 3-Moderate need for inclusion, 4- High need for inclusion and 5-Very high need for inclusion.

Results and Discussion

The selected skills and competencies were ranked for its level of need for inclusion in the curriculum by calculating mean index scores for each of the selected skills and competences (The first three ranked skills and competencies as most need are mentioned). The results presented in the Table 1 clearly indicates that, Soft skills are more needed to be included in the curriculum followed by entrepreneurship development skills and communication skills

Table 1: Ranking based on level of need for inclusion in the curriculum for skill & competencies

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Sl. No.	Skills & competencies	Mean	SD	Mean Index Scores	Rank
1	Soft skills	17.61	3.29	0.88	I
2	Entrepreneurship Development skills	29.58	5.18	0.85	II
3	Communication Skills	16.83	3.30	0.84	III
4	Information & Communication Technologies (ICT) Skills	24.78	4.50	0.83	IV
5	Technical expertise and Marketing skills	33.04	5.80	0.83	IV
6	Personal skills	16.47	3.23	0.82	V
7	Program planning skills	36.54	6.50	0.81	VI
8	Professional Development Skills	28.43	5.48	0.81	VII
9	Programme Evaluation skills	15.93	3.42	0.80	VIII
10	Leadership and Management Skills	19.54	4.22	0.78	IX
11	Programme Implementation Skills	30.71	6.63	0.77	X
12	Enhancing Efficiency and Effectiveness of Extension	34.81	7.06	0.77	X

The level of need for inclusion in the extension education curriculum for selected twelve broad areas of skills and competencies in the study were ranked individually. Out of all the twelve broad skills selected there is a high level of need for soft skills, communication skills, entrepreneurship development skills, personal skills and information and communication technologies (ICT) skills. This clearly indicates that the highly ranked skills are needed for effective performance. Extension professionals with proficiency of these skills will be able to make informed decisions about agricultural systems and facilitation can make significant contributions to extension services and agricultural development.

Agricultural universities and vocational/technical training institutions are responsible for producing agricultural development professionals who can shoulder the responsibilities of enhancing sustainable agricultural systems (Dubois et al., 2004; Baker, 2015). Hence, Facilitation and training of needed skills are essential at the stage of learning as well as at professional level. These competencies can be contextualized through basic induction training

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and further refined through staff development or in-service training and continuing education opportunities.

Table 2: Level of need for inclusion in the curriculum as expressed by extension workers with respect to Programme planning skills

(n=261)

Sl. No.	Programme planning skills	Mean	SD	Rank
1	Planning and designing need based programmes	4.33	0.87	I
2	Agricultural development strategies, programs, and policies	4.21	0.89	II
3	Goals of extension service and extension work	4.15	0.93	III
4	Need assessment and prioritizing local needs	4.11	1.07	IV
5	Organizing/implementing agricultural development programme	4.03	1.07	V
6	Resource planning for proper implementation	4.02	1.04	VI
7	Visualizing strategic planning for effective implementation	3.99	0.98	VII
8	Critical analysis of the steps involved in programme implementation	3.88	1.06	VIII
9	Administrative and financial management and regulations	3.82	1.02	IX

The results in table 2 indicate the level of need for inclusion in the curriculum as expressed by extension workers with respect to Program planning skills. The first three ranked skills and competencies are mentioned as they are considered and prioritized as needed. Majority of the extension workers expressed planning and designing need based programs ranked first with mean score 4.33 as needed followed by Agricultural development strategies, programs, and policies (4.21) as second. Goals of extension service and extension work ranked third (4.15) by extension workers as needed to be included in the extension curriculum.

Table 3: Level of need for inclusion in the curriculum as expressed by extension workers with respect to Program Implementation Skills

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Sl. No.	Programme Implementation Skills	Mean	SD	Rank
1	Building teamwork skills	4.22	0.97	I
2	Negotiation skills and its application	3.90	1.08	II
3	Motivating and engaging local stakeholders in implementing extension programs	3.89	1.09	III
4	Risk Mitigation and Adaptation in Extension	3.89	1.05	IV
5	Execution of Government programs	3.87	1.09	V
6	Participatory decision making in extension work	3.79	1.16	VI
7	Main streaming gender and supporting minority groups in extension works	3.63	1.23	VII
8	NGOs integration with extension	3.56	1.21	VIII

Level of need for inclusion in the curriculum as expressed by extension workers with respect to Program Implementation Skills is presented in table 3 where majority of the extension workers considered building teamwork skills (4.22) as needed by ranking first followed by negotiation skills and its application (3.90) as second rank. Motivating and engaging local stakeholders in implementing extension programs (3.89) are ranked third as needed to be included in the extension curriculum as expressed by extension workers.

'Enhancing efficiency and effectiveness of extension skills' were ranked by calculating mean scores for each individual skills for its level of need for inclusion in curriculum in Table 4 revealed that 'agricultural value chain' extension ranked first (4.28) followed by 'farmer organization development' and 'facilitation skills' (4.22) as second and 'total quality management in extension' ranked third (4.03) as needed for inclusion in the extension education curriculum respectively.

Table 4: Level of need for inclusion in the curriculum as expressed by extension workers with respect to Enhancing Efficiency and Effectiveness of Extension Skills

(n=261)

Sl.	Enhancing Efficiency and Effectiveness of	Mean	SD	Rank

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No.	Extension Skills			
1	Agricultural value chain extension	4.28	0.91	I
2	Farmer organization development and Facilitation skills	4.22	1.00	II
3	Total Quality Management in extension	4.03	1.04	III
4	Convergence of different stakeholders	3.85	1.13	IV
5	Community mobilization	3.82	1.14	V
6	Integrated and inclusive extension	3.79	1.09	VI
7	Conduct rapid rural appraisal (RRA) and participatory rural appraisal (PRA)À	3.76	1.09	VII
8	Collaboration with other extension services	3.67	1.13	VIII
9	Integration of private extension service providers	3.40	1.23	IX

The communication skills were ranked for its level of need for inclusion in curriculum is shown in Table 5 where 'use of modern communication methods and AV aids' ranked first (4.38) followed by 'public speaking and rapport building' as second (4.17) and 'understanding local culture', while 'sharing success stories and lessons' ranked third (4.14) for its level of need.

The level of need for inclusion in curriculum with respect to information and communication technologies (ICT) skills were ranked based on the mean scores for each individual skills in Table 6 shows 'use of computer applications' ranked first as needed with mean score of 4.40. Skills in conducting Webinar/ video conferencing (4.25) ranked second followed by Documentation of information using ICT tools ranked third with mean score of 4.15.

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Table 5: Level of need for inclusion in the curriculum as expressed by extension workers with respect to Communication Skills and Competencies

(n=261)

Sl. No.	Communication Skills and Competencies	Mean	SD	Rank

1	Use of modern communication methods and AV aids	4.38	0.90	I
2	Public speaking and rapport building	4.17	1.04	II
3	Understanding local culture while sharing success stories and lessons	4.14	1.04	III
4	Effective communication skills with different -kinds of clients and stakeholders	4.14	1.04	IV

Table 6: Level of need for inclusion in the curriculum as expressed by extension workers with respect to Information & Communication Technologies (ICTs) skills

(n=261)

Sl. No.	Information & Communication Technologies (ICTs) skills	Mean	SD	Rank
1	Use of computer applications	4.40	0.82	I
2	Skills in conducting Webinar/ videoconferencing	4.25	0.97	II
3	Documentation of information using ICT tools	4.15	0.92	III
4	Use of social media & Mobile phone services (SMS service, WhatsApp, Facebook, Instagram, Research Gate etc.,)	4.10	1.14	IV
5	Development and Use of publications—journals, research reports, etc	4.05	1.05	V
6	Application of cyber extension	3.84	1.09	VI

The results in Table 7 revealed that, the Monitoring and evaluation of extension programs ranked first as needed (4.03) for inclusion in curriculum with respect to program evaluation skills. Impact assessment ranked second as needed (4.14) followed by digital data collection techniques and analyzing, interpretation and writing reports (3.98) ranked as third for inclusion in curriculum with respect to program evaluation skills.

Table 7: Level of need for inclusion in the curriculum as expressed by extension workers with respect to Program Evaluation Skills

(n=261)

Sl. No.	Program Evaluation Skills	Mean	SD	Rank
1	Monitoring and evaluation of extension programs	4.03	1.01	I

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2	Impact assessment	4.14	1.01	II
3	Digital data collection techniques and analyzing, interpretation and writing reports	3.98	1.03	III
4	Preparation of digital Schedule/ questionnaire	3.78	1.07	IV

Professional development skills were ranked for its level of need for inclusion in curriculum is shown in Table 8 resulted that Designing training program was ranked first (4.24) as needed for inclusion in curriculum. Knowledge on agricultural insurance policies and procedures ranked second (4.23) as need to include in the curriculum followed by application of professional ethics in works, honesty and integrity' ranked third (4.16) as need to include in curriculum of extension education.

Table 8: Level of need for inclusion in the curriculum expressed by extension workers with respect to Professional Development skills

(n=261)

Sl. No.	Professional Development skills	Mean	SD	Rank
1	Designing training programmes	4.24	0.96	I
2	Knowledge on agricultural insurance policies and procedures	4.23	0.90	II
3	Application of professional ethics in works, honesty and integrity	4.16	1.04	III
4	Understanding good governance (i.e., participation of clients, accountability to clients, transparency)	4.05	0.98	IV
5	Commitment to career advancement (In-service training programs, professional meetings and conferences)	3.97	1.09	V
6	Engaging various social and marginalized groups including women and youth in extension programs	3.93	1.06	VI
7	Understanding diversity within and among clients and stakeholders	3.85	1.06	VII

Table 9: Level of need for inclusion in the curriculum expressed by extension workers with respect to Personal skills

(n=261)

Sl. No.	Personal skills	Mean	SD	Rank
1	Problem Solving skills	4.28	0.86	I

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2	Adaptability skill	4.18	0.96	II
3	Guiding and Supervising Skills	4.05	1.01	III
4	Group formation and support	3.96	1.03	IV

The results in Table 9 explained the level of need for inclusion in curriculum for personal skills where 'problem solving' skills were ranked first (4.28) as needed followed by 'adaptability skill' as second (4.18) and 'guiding and supervising skills' as third rank with the mean scores of 4.30 and 4.05, respectively.

Table 10: level of need for inclusion in the curriculum as expressed by extension workers with respect to Technical Expertise and Marketing Skills

(n=261)

Sl. No.	Technical Expertise and Marketing Skills	Mean	SD	Rank
1	Knowledge on subject matter concepts	4.37	0.89	I
2	Knowledge of agribusiness management	4.28	0.85	II
3	Market-oriented agricultural extension education	4.27	0.96	III
4	FPOs linkage with extension	4.16	0.99	IV
5	Public Private Partnership opportunities	4.07	1.01	V
6	Linkages and coordination with development departments	4.05	0.97	VI
7	Linkage with Co-operative societies	3.94	0.98	VII
8	Agribusiness companies	3.93	1.00	VIII

The level of need for inclusion with respect to technical expertise and marketing skills were ranked by respondents. Table 10 revealed that the 'knowledge on subject matter concepts' ranked first as need to include in the curriculum with mean score of 4.37. Knowledge of agribusiness management ranked second as need (4.28) to include in curriculum followed by Market-oriented agricultural extension education are ranked third (4.27) as need to be included in curriculum.

Table 11: Level of need for inclusion in the curriculum expressed by extension workers with respect to Leadership and Management Skills

(n=261)

Sl. No.	Leadership and Management Skills	Mean	SD	Rank
1	Motivating farmers	4.26	0.94	I

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2	Conflict management	3.93	1.11	II
3	Social and cultural upliftment	3.90	1.02	III
4	Delegating responsibilities to subordinates	3.85	1.13	IV
5	Cultural intelligence	3.61	1.11	V

Leadership and management skills were ranked for its level of need for inclusion in the curriculum is shown in Table 11 where 'skills to motivate farmers' ranked first as need to include in curriculum with mean score of 4.26. 'Conflict management skills' ranked as second (3.93) followed by 'social and cultural upliftment' ranked third (3.90) as need to be included in the extension education curriculum.

Table 12: Level of need for inclusion in the curriculum expressed by extension workers with respect to Entrepreneurship development skills

(n=261)

Sl. No.	Entrepreneurship development skills	Mean	SD	Rank
1	Innovativeness	4.45	0.81	I
2	Risk bearing ability	4.31	0.82	II
3	Finance management	4.21	0.98	III
4	Strategic management	4.21	0.90	IV
5	Resilience	4.15	0.99	V
6	Business planning	4.15	0.97	VI
7	Promoting group entrepreneurship	4.13	0.99	VII

The results in Table 12 revealed that the 'innovativeness' (4.45) was ranked first as need to be included in the curriculum for entrepreneurship development skills followed by 'risk bearing ability' as second (4.31) and 'finance management' as third rank (4.21).

With respect to soft skills the level of need for inclusion in the curriculum of extension education is shown in Table 13 where 'stress management' was ranked first with mean score of 4.46. 'Self-motivation' was ranked second (4.40) as need to be included in the curriculum followed by 'time management' (4.39).

Table 13: level of need for inclusion in the curriculum expressed by extension workers with respect to Soft Skills

(n=261)

Sl. No.	Soft Skills	Mean	SD	Rank

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1	Stress Management	4.46	0.87	I
2	Self-motivation	4.40	0.91	II
3	Time Management	4.39	0.95	III
4	Positive thinking	4.36	0.98	IV

Conclusion

The recommendations outlined in the study are vital for enhancing the competence and performance of agricultural extension workers in response to the changing agricultural situation. Designing and organizing training programs for extension workers that focus on core skills and competencies. These programs should address technical knowledge, communication, problem-solving, participatory approaches, and other essential skills required for effective extension work. Revise and update the extension curriculum at the graduate and post-graduate levels to include the necessary competencies and provision of continuous education and in-service training for extension agents to keep their knowledge and skills up to date. This will ensure that future extension workers are well-prepared to meet the evolving demands of the agriculture sector. Extension and advisory services need to clearly articulate their role in the rapidly changing rural and agricultural context. By redefining and clarifying their purpose, extension services can align their efforts with current challenges and opportunities. This ongoing development will equip them to address emerging challenges and incorporate innovative practices. Competent and well-trained extension workers will be equipped to adapt to changing agricultural situations and provide valuable guidance to farmers, leading to improved agricultural productivity, sustainability, and overall rural development.

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