AGRI MAGAZINE
(International E-Magazine for Agricultural Articles)
Volume: 03, Issue: 11 (November, 2026)
Available online at http://www.agrimagazine.in
©Agri Magazine, ISSN: 3048-8656

Are Our Extension Workers Ready for the Agri-Startup Revolution?

*M. Radha[1], V. Sailaja[2], P. Ganesh Kumar[1], D. Subramanyam[1], G. Mohan Naidu[1], T. Lakshmi[1], V. Jyothi[1] and G. Asha Latha Sri[1]
[1]S.V. Agricultural College, Tirupati, Andhra Pradesh, India
[2]Agricultural College, Pulivendula, Andhra Pradesh, India
*Corresponding Author's email: radhababy99071@gmail.com

Agri-startups are emerging as important drivers of innovation in agriculture by providing technology-based solutions for production, farm mechanisation, digital advisory services, post-harvest management and marketing. However, the effective adoption of these innovations depends on farmers' awareness, accessibility, affordability and trust. Agricultural extension workers can play a crucial role in bridging the gap between startups and farming communities by facilitating technology assessment, farmer demonstrations, stakeholder networking and informed decision-making. Strengthening extension education through digital competencies, entrepreneurial awareness and practical exposure to startup ecosystems is essential to ensure that innovations translate into meaningful benefits for farmers. A farmer-centric approach to extension–startup collaboration can contribute to a more inclusive, responsive and innovation-oriented agricultural sector.

Introduction

Indian agriculture is entering an era in which innovation is increasingly shaped not only by agricultural research institutions but also by entrepreneurs, technology developers and agri-startups. Artificial intelligence (AI), drone-based crop management, precision agriculture, digital marketplaces and innovative farm-service models are creating new possibilities for addressing long-standing agricultural challenges. Yet, the success of these innovations depends on more than their technical performance. Their value ultimately depends on whether farmers can access, understand, trust and benefit from them. (FAO, 2020; Kayan *et al*., 2023). Agricultural extension has traditionally served as a bridge between agricultural research and farming communities by facilitating knowledge dissemination, technology transfer and capacity development. However, the emergence of agri-startups is expanding the boundaries of this role. Extension professionals are increasingly required to understand emerging technologies, facilitate institutional partnerships, interpret farmers' needs and support informed decisions regarding innovative products and services. This transformation raises a fundamental question: Are our extension workers adequately prepared to facilitate the agri-startup revolution? The question does not imply that extension workers are incapable of adapting. Rather, it draws attention to the need to examine whether existing training systems, institutional arrangements and professional competencies are evolving in response to the changing agricultural innovation landscape.

Agri-Startups: Beyond Technology to Agricultural Transformation

Agri-startups are entrepreneurial ventures that develop innovative products, services or business models to address challenges in agriculture and allied sectors. Their activities extend across the agricultural value chain, including crop production, farm mechanisation, input management, advisory services, post-harvest operations, processing, logistics and marketing. (Raj *et al*., 2024; NITI Aayog, 2023).

Some startups provide digital crop advisory and pest-monitoring solutions, while others offer drone services, machinery rental, precision irrigation, soil-testing facilities and digital market linkages. Entrepreneurial ventures in food processing and supply-chain management also create opportunities to improve product quality, reduce post-harvest losses and connect farmers with organised markets. Recognising this potential, the Government of India introduced the Innovation and Agri-Entrepreneurship Development programme under Rashtriya Krishi Vikas Yojana (RKVY) in 2018–19 to support agricultural innovation and entrepreneurship through financial assistance, technical guidance and incubation. The programme reflects the growing recognition that entrepreneurial initiatives can contribute to addressing agricultural challenges (Government of India, 2024). However, the development of a promising product does not automatically translate into improved farm-level outcomes. A technology may be technically advanced yet remain unsuitable for a particular cropping system, unaffordable for smallholders or difficult to operate under local conditions. The central challenge is therefore to connect innovation with practical agricultural needs. (FAO, 2020; Raj *et al*., 2024).

The Innovation–Adoption Gap: Where Does Extension Fit In?

One of the persistent challenges in agricultural development is the gap between the availability of innovations and their effective use by farmers. The agri-startup ecosystem introduces new possibilities, but it also creates questions concerning accessibility, affordability, credibility and suitability. Consider a startup providing drone-based pesticide spraying services to groundnut farmers in Andhra Pradesh. Although the service may offer operational advantages under appropriate conditions, farmers may have concerns about service charges, spraying effectiveness, safety, availability and the suitability of the technology for their crops. An extension professional can help address these concerns by facilitating demonstrations, explaining the appropriate use of the service, coordinating farmer feedback and helping cultivators compare costs and outcomes. Where necessary, the extension worker can also connect farmers with agricultural scientists or qualified technical specialists to assess specific claims.

This example illustrates an important distinction: introducing a technology is not the same as enabling its informed and effective adoption. Extension professionals can contribute to the latter by combining scientific knowledge with local understanding and participatory learning. (FAO, 2020). At the same time, the responsibility should not rest entirely on extension workers. Startups must demonstrate the reliability of their solutions, understand the conditions in which their products are used and respond to farmers' concerns. Effective adoption requires collaboration among entrepreneurs, extension institutions, researchers and farming communities.

From Technology Disseminators to Innovation Facilitators

The agri-startup revolution calls for an expansion of the conventional extension role. The fundamental principles of communication, participation and farmer education remain relevant, but they need to be complemented by new competencies and institutional linkages.

First, extension workers must become innovation facilitators. Rather than merely communicating information about technologies, they should help farmers identify relevant innovations, understand their benefits and limitations, and assess their suitability to local conditions. Second, they must strengthen their capacity for stakeholder networking. Agricultural innovation increasingly involves multiple actors, including startups, agricultural universities, Krishi Vigyan Kendras (KVKs), farmer producer organisations (FPOs), financial institutions, government departments and market intermediaries. Extension professionals can facilitate communication and cooperation among these stakeholders. (Raj *et al*., 2024). Third, extension must become more responsive to market-oriented agriculture. Farmers require support not only in crop production but also in grading, processing, packaging, storage, branding and marketing. Startups working in these areas can create opportunities for farmers to participate more effectively in agricultural value chains.

Finally, extension workers should become facilitators of farmer feedback and learning. Farmers are not merely end-users of technology; they possess valuable practical knowledge about local production systems, resource constraints and everyday agricultural challenges. Their experiences should inform the development and improvement of startup innovations. These changes represent an evolution rather than a rejection of traditional extension. The objective is to strengthen the ability of extension professionals to address increasingly complex agricultural problems.

Are We Preparing Extension Professionals for the New Agricultural Ecosystem?

The readiness of extension workers is closely connected to the quality and relevance of their professional preparation. Agricultural extension education provides a foundation in communication, rural development, participatory approaches and technology dissemination. However, the emerging startup ecosystem also requires knowledge of digital agriculture, entrepreneurship, innovation management, business models and agricultural value chains. (FAO, 2020; Raj *et al*., 2024). This raises important questions for agricultural universities and extension training institutions. Are students given adequate opportunities to interact with agri-startup founders? Do they understand the process through which an agricultural idea becomes a prototype, reaches the market and is evaluated under field conditions? Are they trained to assess the affordability, usability and practical relevance of emerging technologies? These questions warrant systematic examination rather than assumptions that existing curricula are uniformly outdated or that all extension professionals lack digital competencies.

A constructive approach would be to integrate startup-related learning into extension education through field assignments, startup internships, technology demonstrations, agribusiness case studies and interaction with incubators. Students could also undertake projects that identify farmers' problems and explore how collaboration with entrepreneurs might address them.

Institutions such as the National Institute of Agricultural Extension Management (MANAGE), Hyderabad, through its Centre for Innovation and Agripreneurship (MANAGE-CIA), provide examples of institutional efforts to connect agribusiness incubation, entrepreneurship and agricultural innovation. Its stakeholder-connect initiatives also emphasise interaction among entrepreneurs, researchers, educational institutions and other ecosystem participants (MANAGE, 2026). Agricultural universities and extension institutions can build on such approaches by strengthening practical exposure and facilitating partnerships with relevant startup networks. The goal should be to develop professionals who can combine agricultural expertise with critical thinking, digital competence and collaborative problem-solving.

A Farmer-Centric Approach to Startup–Extension Partnerships

Closer collaboration between extension systems and agri-startups can create benefits for both farmers and entrepreneurs. However, such partnerships must be guided by farmers' interests rather than by the commercial promotion of particular products. (Raj *et al*., 2024; FAO, 2020). Consider an illustrative situation in which an FPO in Andhra Pradesh is exploring affordable machinery or primary-processing equipment to improve the handling of its members' produce. A startup may offer a suitable service or technology, but the FPO would need to evaluate investment requirements, operating costs, maintenance, expected utilisation and potential market benefits. An extension professional could help the FPO define its requirements, arrange a demonstration, connect with technical experts and facilitate discussions with the service provider. The farmer organisation could then make an informed decision based on its needs and available resources. Similar partnerships could support the evaluation of digital crop advisory services, precision irrigation systems and post-harvest technologies. In each case, the extension worker acts as a facilitator of informed choice rather than a salesperson.

Maintaining professional independence is particularly important. Claims concerning yield increases, cost reductions, environmental benefits or profitability should not be accepted merely because a product is technologically advanced or promoted by a startup. Where appropriate, such claims should be examined through credible evidence, field evaluation and consultation with relevant experts. A farmer-centric approach also requires attention to digital exclusion, affordability, language barriers and unequal access to services. Technologies that work well for larger farms may not necessarily be practical for smallholders. Extension professionals can communicate these constraints to entrepreneurs and encourage the development of solutions suited to diverse farming communities.

Preparing for the Future: A Shared Responsibility

Preparing extension workers for the agri-startup revolution requires coordinated action by educational institutions, government agencies, researchers, incubators, entrepreneurs and farmer organisations. Agricultural universities should periodically review extension curricula and training programmes to identify emerging competency requirements. Digital agriculture, agripreneurship, technology assessment, market linkages and innovation facilitation deserve greater practical attention where gaps are identified. (FAO, 2020; MANAGE, 2026). Extension institutions and KVKs can facilitate structured interactions between startups and farmers through demonstrations, field-level evaluations and feedback sessions. Such activities can help determine whether innovations are appropriate for local conditions and can provide entrepreneurs with valuable information for improving their products and services.

Agri-startups, in turn, should engage with farmers and extension professionals during product development and implementation. Early consultation can help them understand actual agricultural problems, identify barriers to adoption and design more accessible solutions. (Raj *et al*., 2024). Agricultural graduates should also be encouraged to view entrepreneurship as a possible career pathway alongside research, teaching, extension services and other agricultural occupations. Appropriate mentoring, incubation, technical guidance and institutional support can help young professionals explore opportunities in agribusiness and rural enterprise development. Ultimately, readiness should be assessed not simply by the number of training programmes conducted or digital tools introduced, but by whether extension professionals can effectively facilitate collaboration, support informed decisions and contribute to meaningful farmer outcomes.

Conclusion

The agri-startup revolution presents both an opportunity and a challenge for agricultural extension. Emerging enterprises can introduce innovative solutions to problems in production, resource management, post-harvest handling and marketing. Nevertheless, their potential will remain limited if innovations fail to address farmers' actual needs or cannot be adopted under practical field conditions. Agricultural extension has an important role in bridging this gap. By combining traditional strengths in farmer engagement and participatory learning with digital competence, entrepreneurial awareness and institutional networking, extension professionals can help ensure that innovation translates into meaningful agricultural benefits.

The question posed in this article should therefore be viewed as an invitation to reflection and action, not as a criticism of extension workers. The priority is to strengthen their preparation, create opportunities for continuous learning and establish effective partnerships between extension institutions and the agri-startup ecosystem. The future of agricultural extension will depend not merely on how effectively new technologies are communicated, but on how successfully farmers are connected with innovations that are relevant, reliable, accessible and beneficial. Preparing extension workers for this responsibility is an essential step towards a more responsive, inclusive and innovation-oriented agricultural sector.

References

1. Food and Agriculture Organization of the United Nations (FAO). (2020). Transforming agricultural research and extension systems: Unlocking the potential of agricultural innovation to achieve the Sustainable Development Goals. FAO.
2. Government of India, Ministry of Agriculture and Farmers Welfare. (2024, February 9). Promotion of startups in agriculture sector. Press Information Bureau. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2004516
3. Kayan, A., Kumar, A. and Kohli, R. 2023. Impact of agriculture startups in rural India. Startup India, Government of India.
4. MANAGE. 2026. MANAGE Centre for Innovation and Agripreneurship (MANAGE-CIA). National Institute of Agricultural Extension Management, Hyderabad.
5. MANAGE. 2026. PM-RKVY programme. National Institute of Agricultural Extension Management, Hyderabad.
6. MANAGE. 2026. Agri-startup stakeholders connect programme. National Institute of Agricultural Extension Management, Hyderabad.
7. NITI Aayog. 2023. Compendium of 75 agri entrepreneurs and innovators. Government of India. https://digitallibrary.niti.gov.in/handle/123456789/6524
8. Raj, S., Raahalya, S. and Anand, A. 2024. Fostering innovations in agriculture: An analysis of agri-startups and stakeholders' engagement. *International Journal of Agriculture Innovation, Technology and Globalisation*, 4(4): 301–333.