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Digital agricultural services and farmers' preferences for e-agriculture in Bagalkot district, Karnataka, India

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Intricacies of the subject

E-Agriculture refers to the application of Information and Communication Technologies (ICTs), mobile applications, digital databases, online markets, and electronic governance platforms for improving agricultural production, marketing, and farmer decision-making. Bagalkot district of Karnataka, located in the Northern Dry Zone, has a strong agricultural economy but faces challenges related to rainfall variability, water scarcity, crop risks, and market fluctuations. This article examines the major e-Agriculture systems relevant to farmers in Bagalkot and identifies important areas for digital agricultural development. Major digital platforms include the Farmer Registration and Unified Beneficiary Information System (FRUITS), Bhoomi digital land records, Digital Crop Survey, Samrakshane crop insurance, e-NAM, Krishi Marata Vahini, Raitamitra, and weather-based advisory services (NICK, 2024; Bhoomi, 2000; e-NAM, 2021; Raithmitra, 2000). According to the NABARD district profile, Bagalkot has a geographical area of approximately 6,552 km², a net sown area of 489,054 ha, and a gross cropped area of 613,727 ha (NABARD, 2026). The analysis indicates that the information, market prices, government schemes, crop advisory, and pest and disease management are important priority areas for farmer-oriented digital services. Strengthening Kannada-based applications, digital literacy, farmer training, and localized advisory systems can improve the adoption and effectiveness of e-Agriculture in Bagalkot.

Introduction

Agriculture is one of the major economic activities in Bagalkot district of Karnataka. The district falls within the Northern Dry Zone and experiences relatively dry climatic conditions, making timely agricultural information important for effective farm management (NABARD, 2026). Farmers require reliable information regarding weather and on other aspects. E-Agriculture provides a digital mechanism for connecting farmers with agricultural information, government services, markets, and agricultural institutions. It includes mobile applications, web portals, digital land records, crop surveys, online marketing platforms, and weather-based advisory services. Karnataka has introduced several digital agricultural initiatives, including FRUITS, Bhoomi, Digital Crop Survey, and Samrakshane, which

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can support efficient delivery of agricultural services (NICK, 2024; 2024;Bhoomi, 2000; e-NAM, 2021). Thus, e-Agriculture represents an integrated digital ecosystem connecting farmers with government departments, markets, financial institutions, and agricultural advisory services.independence. Women reviewers may experience challenges related to workplace harassment, management pressure, unequal treatment, excessive working hours, personal relationships within the organization, and limited flexibility. These issues should be addressed through transparent organizational systems rather than treated as individual problems. Bagalkot has a substantial agricultural area and a large farming population. The major agricultural indicators based on the NABARD district profile are presented in Table 1 (NABARD, 2026). The agricultural statistics demonstrate the importance of digital agricultural services for a large farming community in Bagalkot (NABARD, 2026). Major crops include jowar, maize, bajra, wheat, red gram, Bengal gram, groundnut, sunflower, soybean, sugarcane, cotton, grapes, and pomegranate.

Table 1: Agricultural profile of Bagalkot district

Indicator	Value
Geographical area	6,552 km²
Inhabited villages	613
Gram panchayats	198
Net sown area	489,054 ha
Gross cropped area	613,727 ha
Cropping intensity	125%
Cultivators	196.20 thousand
Small and marginal farmers	163.55 thousand
Agricultural labourers	303.24 thousand

E-agriculture systems followed in Bagalkot

Several digital agricultural and e-governance systems are relevant to farmers in Bagalkot. These platforms facilitate farmer registration, land record access, crop information, crop insurance, market information, and agricultural advisory services.

Table 2 : Major E-Agriculture systems

Major Function	System	Function
	FRUITS	Farmer registration and beneficiary services
RTC	Bhoomi	Digital land records and RTC services
	Digital Crop Survey	Digital recording of crop and land information
	Samrakshane	Crop insurance services
	e-NAM	Electronic agricultural marketing
	Krishi Marata Vahini	Market arrivals and price information
	Raitamitra	Agricultural information and farmer services
	PM-KISAN Digital Services	Government financial assistance information
	Weather Services	Weather forecasts and agricultural advisories
	Mobile/WhatsApp Advisory	Crop, pest, and disease information
	GIS and Remote Sensing	Crop, soil, and water monitoring

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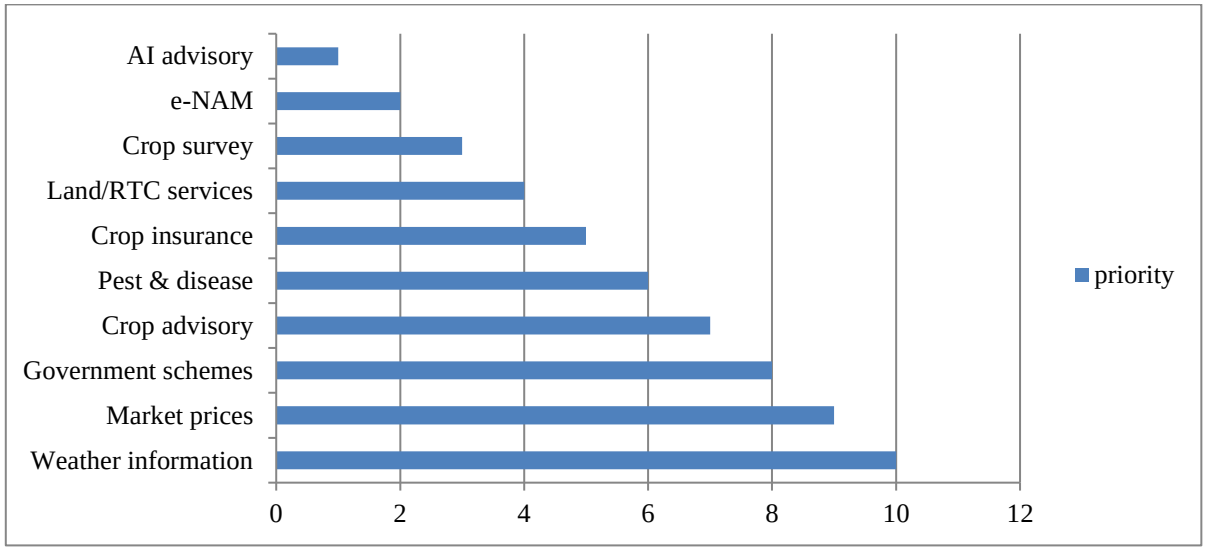
Among these systems, FRUITS, Bhoomi, Digital Crop Survey, and weather-based advisory services have considerable importance because they provide direct support for farmer registration, land information, crop management, and decision-making (NICK ,2024 ; Bhoomi, 2000; e-NAM, 2021;Raithmitra,2000), GIS, remote sensing, artificial intelligence, and mobile-based advisory services represent emerging technologies that can further strengthen precision and smart agriculture in the district.

E-agriculture services preferred by farmers

The available source material does not provide official district-level empirical data regarding the exact preferences of Bagalkot farmers for individual e-Agriculture services (NABARD, 2026). Therefore, the following priorities ranking based on agricultural requirements and available source information. The priority ranking suggests that farmers are likely to value immediate and decision-oriented information, particularly weather forecasts, market prices, government schemes, crop advisories, and pest and disease management (NICK ,2024; e-NAM, 2021).

Fig 1: Priority of e-agriculture services



Conclusion

E-Agriculture has significant potential to improve agricultural information delivery and farmer decision-making in Bagalkot district. The district's large agricultural area, dry agro-climatic conditions, and substantial population of small and marginal farmers highlight the importance of timely access to weather, market, crop insurance, and government information (NABARD, 2026). Digital platforms such as FRUITS, Bhoomi, Digital Crop Survey, Samrakshane, e-NAM, Krishi Marata Vahini, and Raitamitra provide an important foundation for digital agricultural transformation (FRUITS, Krishi Marata Vahini ,2024; Bhoomi, 2000; e-NAM, 2021;Raithmitra,2000). Weather information, market prices, government schemes, and crop advisory services are likely to remain major priority areas for farmers. However, effective adoption requires improved digital literacy, Kannada-based applications, farmer training, and localized advisory systems. Future research should conduct structured field surveys across different taluks of Bagalkot

district to measure farmer awareness, adoption, satisfaction, and actual preferences regarding e-Agriculture services.

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