

## Role of E-Governance in Agricultural Extension

**Dileep Kumar Gupta<sup>1\*</sup>,  
N Krishna Priya<sup>2</sup>,  
Rita Fredericks<sup>3</sup>,  
Anil Kumar<sup>4</sup>**

<sup>1</sup>Teaching Assistant, Deptt. of  
Agricultural Extension, Institute  
of Agricultural Sciences,  
Bundelkhand University, Jhansi  
(U.P.) – 284128

<sup>2</sup>Coordinator, DAATTC Kadapa  
516 003 ANGRAU, Guntur

<sup>3</sup>CEO, Precision Grow ( A Unit  
of Tech Visit IT Pvt Ltd)

<sup>4</sup>Assistant Professor, School of  
Agriculture, Eklavya University  
Damoh, M.P.-470661



\*Corresponding Author  
**Dileep Kumar Gupta\***

*Available online at*  
[www.sunshineagriculture.vitalbiotech.org](http://www.sunshineagriculture.vitalbiotech.org)

### Article History

Received: 25. 08.2025

Revised: 28. 08.2025

Accepted: 2. 09.2025

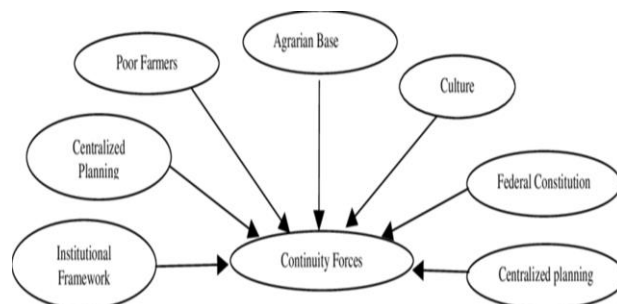
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### INTRODUCTION

Extension services in agriculture have never been unimportant in terms of making farmers aware of technical information, best practices, and market access. These services used to depend on physical outreach strategies like field demonstrations, print materials, and direct face-to-face interactions. This is changing with the evolution of information and communication technologies (ICT), as extension services are being radically changed. E-governance is the application of cyber platforms and software by government departments to provide services, disseminate information, and interact with citizens more efficiently and transparently. In agriculture, e-governance is transforming the provision of extension services through improved communication, better access to information, and empowering farmers with location-based, timely advice. This article discusses the scope of e-governance in agricultural extension, its advantages, difficulties, and prospects in enhancing sustainable and inclusive agricultural growth.

### 1. Understanding E-Governance in Agriculture Definition and Scope

E-governance in agriculture is the application of internet-based digital technologies like websites, mobile apps, cloud platforms, data analysis, and communications networks to extend services, schemes in agriculture, weather, subsidies, insurance, and market facilities.



Source: <https://www.researchgate.net>

It seeks to:

- Taylor service delivery,
- Improve transparency in subsidies and schemes,
- Provide access to inputs and credit,
- Offer scientific counsel on crop care, pest management, and irrigation,
- Improve farmers' involvement in decision-making.

### Elements of E-Governance in Agricultural Extension

1. Digital Platforms: Agricultural information websites, mobile apps, and portals.
2. Mobile-based Advisory: SMS, voice calls, and apps with real-time reminders.
3. Geo-spatial Tools: Remote sensing and GIS usage for land evaluation and crop monitoring.

4. Data Analytics: Big data and artificial intelligence-enabled decision support systems for precision agriculture.

5. Online Marketplaces: Platforms connecting farmers with consumers and suppliers.

### 2. Advantages of E-Governance in Agricultural Extension

#### 1. Enhanced Access to Information

E-governance platforms offer farmers immediate access to information on crop varieties, fertilizers, pest control, soil condition, and weather forecasts. This enables farmers to take well-informed decisions and adopt new farming technologies.

#### 2. Transparency and Accountability

Digital platforms allow farmers to monitor government schemes, subsidies, and payments, making it less prone to corruption and more trustworthy for agricultural programs.



Source: <https://link.springer.com/article>

### 3. Timely Communication

Farmers are alerted early about imminent extreme weather, pest infestations, or disease threats via mobile alerts and notifications. Early interventions minimize the loss of crops and provide resilience.

### 4. Empowerment and Participation

E-governance portals invite farmers to provide feedback, respond to surveys, and co-participate in farm planning. This has a positive impact on community-based strategies and localized problem-solving.

### 5. Financial Inclusion

Online services enable farmers to access credit, insurance, and subsidy programs easily through simplified online procedures, less paperwork, and enhanced enrollment rates.

### 6. Effective Extension Services

By linking farmers to experts and extension officers via video conferencing and messaging services, e-governance overcomes geographical

distances and ensures that even far-flung areas get guidance.

### 3. Top E-Governance Initiatives for Agricultural Extension

#### 1. Agricultural Advisory Services through Mobile

Schemes such as the m-Kisan portal in India provide region-specific advisories to farmers through mobile messages in local languages, which include weather reports, crop care, and government schemes.

#### 2. Digital Soil Health Cards

Soil health platforms give farmers customized advice based on soil analysis, enabling them to use suitable fertilizers and enhance crop yields.

#### 3. e-NAM (National Agriculture Market)

An integrated online market platform connecting farmers with buyers from different states, allowing transparent price discovery and minimizing reliance on intermediaries.

#### **4. Remote Sensing and GIS Tools**

Satellite-enabled services reveal information about crop health, water levels, and pest infestations, enabling governments to plan interventions and farmers to utilize resources more optimally.

#### **5. Farmer Call Centers**

These call centers provide direct advisory services in which farmers can pose questions on cultivation, animal husbandry, and government schemes and get instant expert advice.

#### **4. Issues in E-Governance Implementation for Agriculture**

##### **1. Digital Divide**

Smartphone, internet connectivity, and digital literacy are not evenly distributed, and especially rural and backward communities lag behind, constraining the extendability of e-governance services.

##### **2. Language Barriers**

Most platforms are not provided in local languages or dialects, which makes it challenging for smallholder farmers to access available resources.

##### **3. Lack of Trust**

Farmers are reluctant to use digital services because they fear misuse of data, fraud, or poor support systems.

##### **4. Infrastructure Gaps**

Frequent power outages, poor network connectivity, and a shortage of skilled personnel make it difficult to implement e-governance programs effectively.

##### **5. Cybersecurity Risks**

With growing adoption of digital tools, farmers' data security and platform integrity are under threat from hacking, fraud, and disinformation campaigns.

#### **5. Measures to Enhance E-Governance in Agricultural Extension**

**1. Access for All:** Government programs need to provide affordable smartphones, internet connectivity, and targeted training programs for women, youth, and small farmers.

**2. Localized Content:** Information must be provided in local languages and custom-made to accommodate local conditions, ensuring cultural acceptability and improved uptake.

**3. Capacity Building:** Extension personnel and farmers must be educated about the effective utilization of digital platforms, including the advantages and disadvantages.

**4. Cybersecurity Strengthening:** Strong encryption, user verification, and awareness

campaigns must be incorporated in e-governance platforms to protect confidential information.

**5. Public-Private Partnerships:** Government, technology companies, NGOs, and farmer associations can collaborate to scale digital services, exchange best practices, and promote innovation.

#### **6. The Future of E-Governance in Agriculture**

The contribution of e-governance to agriculture extension will grow even larger with the progress in artificial intelligence, blockchain, and IoT. Predictive analytics can improve disease prediction, smart irrigation devices can conserve water, and online marketplaces can give direct access to global customers. With the changing climate, e-governance platforms will become instrumental in building resilience by offering early warnings, adaptive measures, and collaborative platforms for knowledge exchange. Additionally, combining agriculture with finance technology (FinTech) and supply chain management systems will establish an efficient ecosystem in which farmers can plan, produce, and sell with enhanced efficiency and security.

#### **CONCLUSION**

E-governance is revolutionizing agricultural extension from conventional means to dynamic, information-based, and farmer-focused services. Through enhanced access to information, increased transparency, and facilitated inclusion, digital platforms enable farmers to make better-informed choices and achieve sustainable development. Obstacles like digital divides, linguistic divides, infrastructural voids, and cybersecurity risks need to be overcome through inclusive policies, community-level training, and technological advancements. With agriculture progressively adopting digital technologies, e-governance will remain a foundation for fostering resilience, productivity, and rural development that guarantees each farmer, irrespective of location and socio-economic background, access to the information and resources required to succeed in an ever-evolving world.

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