



# E-Governance Initiatives In Agricultural Sector In Karnataka- Issues And Challenges

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## 1.1 Abstract

The agricultural sector is the backbone of our economy, providing food, clothing, shelter, and employment opportunities to the people, as well as a significant source of income to the state. Karnataka state is a predominantly agriculture-oriented economy where nearly 65% of the population follows agriculture and allied activities as their major occupation. In this context, agricultural sector development always depends on governmental effort to extend supportive policies and programs; simultaneously, farmers' active participation assists in achieving targeted goals for development is an essential precondition required. But while delivering governmental services through electronic means, we face many issues and challenges from different perspectives, which hinder the effective implementation of E-governance in the farming sector. In this context, this paper focuses on the E-governance initiatives of the Karnataka government for agricultural sector development and also issues and challenges faced while delivering E-governance in the agrarian sector. The paper also analyses remedial measures to be undertaken for the successful E-projects to be effectively implemented and sustained for a longer time.

*Key words: E-governance initiatives, Agricultural development, issues and challenges*

## 1.2 Introduction

The agricultural sector is the backbone of our economy, providing food, clothing, shelter, and employment opportunities to the people, as well as significant source of income to the state. Karnataka state is a predominantly agriculture-oriented economy where nearly 65% of the population follows agriculture and allied activities as their major occupation. In this context, agricultural sector development always depends on governmental effort to extend supportive policies and programs; simultaneously,

farmers' active participation assists in achieving targeted goals for development is an essential precondition required. However, in the manual public service delivery, we found the existence of issues such as corruption, delay, red tapism, and benefits of the government policies and programs not reaching the grassroots level at all. To resolve these issues, modern governments have adopted ICT in the administrative mechanism to deliver public services in a faster, efficient, effective, transparent, responsive, and accountable manner, as inclusiveness can be attained. But even in delivering governmental services through electronic means, we face many issues and challenges from different perspectives, which hinder the effective implementation of E-governance in the farming sector. In this context, this paper focuses on the E-governance initiatives of the Karnataka government for agricultural sector development, and also issues and challenges faced while delivering E-governance in the agrarian sector. The paper also analyses remedial measures to be undertaken for the successful E-projects to be effectively implemented and sustained for a longer time.

### 1.3 E-Governance

E-governance is an electronic means of delivering governmental policies, programs, and services to the citizens at their doorsteps in a simple, transparent, accountable, responsive, efficient, and effective manner. The ultimate aim is to deliver public services to different stakeholders at their doorsteps with the intention of maximum benefit and minimum governance interference.

### 1.4 Objectives

- To discuss the role of E-governance initiatives to highlight the issues and challenges in the study area.
- To study issues and challenges in delivering ICT-related governmental services to the farming sector.
- To analyse the reformative measures to overcome these issues and challenges.

### 1.5 Methodology

The research study has been confined to the secondary sources of data collected from various sources such as Newspapers, magazines, research articles, web sources, etc.

### 1.6 Scope of the study

The research study has been limited to E-governance initiatives by the Karnataka government in the context of agricultural development. The state government has taken effective measures for the complete digitalization of all the departments and has successfully implemented many E-projects. In the agricultural sector also initiated projects like BHOOMI, SAMRAKSHANE, FRUITS, ReMSL, KUTUMBA, etc., were initiated for the agricultural development in the state. However, while delivering E-Projects for the different stakeholders, the government has faced many issues and challenges. This paper is restricted to studying issues and challenges faced in the E-governance projects of the agricultural sector, and also focus on the suggested measures for improvement to be taken for further development.

## 1.7 Review of literature

The Literature review provides insights into ideologies, thoughts, conceptions, and views of different thinkers analysed from different perspectives. The theoretical foundation and empirical studies of earlier research studies are the basis for finding the research gap and also rethinking new ideologies about the research subject.

**Chandan Singh (2011):** An analytical study named **E-governance challenges and success factors of Projects Indian perspective** focus as on the CRM-citizenship relationship management where consumers have access to government information and participate in the decision-making and policy-making process through electronic means. The paper specifically depicts on the key environmental, political, technical, and local challenges and SWOT analysis is related to e-governance.

**Payal Sharma, Anushumaan Mishra and Prof. Pavan Mishra (2011):** A descriptive study named **E-governance in India is the effectual and challenging approach to governance** it focuses on the challenges in E-governance in India. Major factors are related to technological factors, and other factors and the strategies to make E-governance more effective in India. It recommended that adequate management and governmental experts are required for implementation rather than technical aspects in governance mechanism.

**AdarshSurya KantPatel, Bhrantav Nishendubhai Vora and Pravin KumarRamesh bhai voraPatel (2012)** in their study named **Importance of E-governance in India and challenges in implementation** have been analysed on the importance and benefits of E-governance in an economy. This paper especially focuses on the problems while implementing the E-governance and the comparative of different countries' E-governance status and strategies adopted for effective implementation in their nations. Challenges like low literacy, low per capita income, limited financial resources in a government department, and lack of awareness/training retards the E-governance effective implementation in the state.

**Poonam Malik, Priyanka Dhillon, and Poonam Verma (2014),** in their analytical study named **Challenges and Prospects for E-governance in India** highlight the role and potential of ICT in supporting good governance programs in developing countries. It strongly states that E-governance transforms the economy from an underdeveloped to a developed economy, and also analyzes failures of ICT initiatives in developing countries. It focuses on the E-governance projects and reasons for the success or failures of E-governance initiatives in India. This paper also highlights the issues and challenges of managing E-government projects in India.

**Kiran Yadav and Sanatan Tiwari (2014)** in their descriptive study named **E-governance in India – Opportunities and challenges** have focused on the benefits of E-governance and is classified it as urban governance and rural governance for the detailed analysis. This research paper depicts a clear picture of the projects initiated in India's health and education field. The paper discusses the opportunities in the e-governance areas and analyses challenges while implementing the projects. The technical

challenges such as front-end and back-end challenges are discussed in detail, as how far they affected the E-governance implementation in an economy.

**Kiran Preet Kaur and Dr. Sawtantar Singh Khurmi (2016)** in their study named **Implementation of E-governance in India: Opportunities and Challenges** research paper highlights the sustainable E-governance programs and usage of ICT in rural areas of Panjab and the challenges faced. The paper highlights that a gap between service delivery and reality in the economy is the major issue regarding the E-governance status in the Panjab state. The challenges- including environmental, social, economic, and technical challenges are analysed.

**Nagaraja K(2016):**A descriptive study named **E-Governance in India: Issues and Challenges** article studies the evolution of E-Governance in India, and recent initiatives adopted in the governance sector like G2B, G2C, G2C, and G2E models are analysed. The research paper enlisted the state-wide E-governance projects in India and their implication status and development. The issues in e-governance covered the areas like Technical, economic, and social issues. The paper also highlights the challenges and prospects of e-governance in India.

**Harssimrat Kaur and Hamraj Singh (2016):** An analytical study named **E-governance and its Challenges Inclusion of Women in E-governance in India** is a research paper that analysed the National e-governance plans in India and also e-governance initiatives in India. E –e-governance has been constructed based on four pillars-Cataloguing or information, Transaction, Vertical integration/intra-departmental assimilation, and Horizontal integration. The successful implementation and process depend on how far an economy flows on these pillars. Based on this pillar's analysis, India is now at the third stage in the process of E-governance adoption. The women's role in ICT and the problems and challenges faced by women in India are also discussed in this paper.

**Dr.Sandeep Aggarwal.(2017):**A descriptive study named **Overcoming the Challenges in Implementing E-governance in Rural India** an article highlights how E-governance has transferred to SMART governance in an economy. The government should adopt the policies in the areas of re-engineering the administrative mechanism, capacity building for different stakeholders, training, assessment, and awareness on the E-governance adoption for the success of an economy. This research paper also highlights the challenges of E-governance, such as illiteracy, differences in language, privacy and security, people's hesitation to adopt new technology, etc.

**Guncha Hashmi and Pooja Khanna.(2017):** A study of E-governance: **A journey of challenges, failures, and successes in India.** A research paper states the evolution of E-governance in India and the challenges faced while implementing ICT in the administrative setup. In the present world, most of the developed countries have accepted the computerization of the administration system because of the reduction in operational cost and a citizen-centric, transparent governmental setup. Based on the survey, the challenges in implementing e-governance projects are examined. Finally, the paper states that

for the success of E-governance in a society not only the government, the people's participation also plays a vital role.

## 1.8 Research Gap

The review of literature glimpse of the earlier research studies, depicting the issues and challenges faced by the country while implementing the E-projects. At the international level, research studies have been conducted by many countries, and the study suggested recommendations regarding strengthening the existing organizational structure and how to reach real-time information to different stakeholders in the farming areas. It proves empirically that E-governance has a positive impact on raising farmers' income; enabling real-time information both in pre-harvest and post-harvest management of resources efficiently and effectively. At the national level, research studies about the pre-harvest and post-harvest management of farming activity concerning E-governance initiatives are limited.

Research studies in Karnataka state on e-governance initiatives concerning agricultural development, its impact, and outcome-based issues and challenges are very few, not covering all aspects of the agriculture sector, and the time gap is another dimension. We found a research gap in the earlier studies.

The present research study focuses on the current status, trends on the issues and challenges, and recommendations on the E-governance initiatives on agricultural development confined to the Karnataka state. Every day, the government initiates new projects to digitalize the entire departments and structure of the organization to achieve the SMART governance concept. For this purpose, E-governance projects, portals, and accessibility of digital infrastructure are developed and implemented, ultimately to gain the fruitfulness of growth and welfare of the farming community. In the present dynamic world, digital technology is changing every day, so the emerging new technology has created new issues and challenges in the changing scenario. The present study concentrates on the issues and challenges of the agrarian sector in changing times, and technology, organizations, and different stakeholders are discussed.

## 1.9 Karnataka's agricultural scenario overview

Karnataka state is a major producer of food crops and commercial crops, contributing 15% to the state GDP, and nearly 65% of the population depends upon agriculture and allied activities as their main occupation. The total geographical area of Karnataka state is 1.91.791 lakh hectares; out of these, 1.28.460 lakh hectares of land is available for cultivation purposes, constituting 67.43% of the geographical area. The majority of the landholders are marginal landholders (less than 1 hectare), constituting 49.1%, and the average landholding size is 1.36 hectares. Our state is divided into ten agro-climatic zones based on geographical factors like amount of rainfall, soil type condition, temperature, etc, influencing cropping patterns and variations in the agricultural practices. The government has made an effort with the appropriate policies and programs for agricultural development from time to time.

## Features of E-governance initiatives

- E- E-Governance is an electronic means of public service delivery efficiently and effectively at the doorsteps of the different stakeholders involved in the process.
- Transparency and accountability will enhance the government processes and information available, accessible in a faster manner, and encourage people's participation in policy making and decision making process.
- The big data information assists the government in making appropriate policies for the targeted groups of people and assists in the decision-making process.
- E-governance will promote inclusive and sustainable growth through public services accessible to all people, and no one left behind in the development process.
- The G2C, G2G, G2E, G2B, and G2F services will streamline the entire public mechanism and reasoning in the overall development of a nation.
- The ICT-based public services will reduce the cost to the government, and the economy will move towards a paperless, cashless, corruption-free economy.

## Strengths of E-governance Initiatives

- The public services are provided in a transparent, faster, simple, convenient, responsive, and accountable manner.
- The inclusiveness and sustainability principle will be responsible for no one is left behind in the development process can be attained.
- Big Data Analytics assists in formulating macroeconomic policies, identifying non-beneficiaries, and concentrating on neglected areas for the overall development of a nation.
- The efficiency and effectiveness in the public management system through ICT will enhance government-citizen relationships, and trust in government functioning will encourage more participation of the citizens.
- The service-oriented approach, authenticity in service delivery, and a corruption-free system a symbols of model governance in an economy.
- The citizen participation in public policy making and decision making process will lead to real citizen empowerment that can be attained in the society.
- Big data analytics helps the academicians, researchers to analyze, find the solutions for any issues in the economic and social perspectives.

## Opportunities in E-governance Initiatives

- The government will implement more citizen-centric E-projects for the welfare of the people because of more accessibility, availability, and higher level usage in society.
- The financial Digital Services will assist the government in implementing financial benefit schemes that will reach the targeted groups of people and remove loopholes like delay, corruption, etc, and will improve more social welfare programs in an economy
- The online service will reduce the cost to the government and even different stakeholders in an economy and will move toward a cashless, paperless society.

- The citizen can avail and access the public services 24/7, and even web portals, mobile-based apps assist in getting better service delivery at their fingertips.
- The digital divide, rural-urban divide issues will be resolved with a higher level of usage of ICT in the administration process.
- Physical visits to the departments will be avoided, and a transparent way of public service delivery will be provided to all stakeholders.

### **Status of E-governance initiatives in the farming sector in Karnataka state**

The Karnataka economy is a pioneer in the area of E-governance initiatives in our country, securing the 6<sup>th</sup> position in the e-governance initiatives of EGDI2024. The favourable digital physical infrastructure facilities and government efforts are appreciable in implementing ICT in all the wings of administrative mechanisms. Economic transformation is the key component of SMART governance, The Karnataka government is at the forefront of implementing and initiating e-governance projects in the state. Apart from the National Informatics Centre operated at the central level, the government of Karnataka established the Centre of e-Governance in association with the Department of Personnel and Administration reforms at the state level to develop and implement E-governance projects in all the departments. The E-governance initiatives of the Karnataka government can be broadly classified based on sectoral perspectives as follows

#### **BHOOMI Project (2002)**

The BHOOMI project was launched in Karnataka in 2002 to digitalize the land record management system in the state. The earlier land records management system was manually maintained by the village accountants who are going to maintain 3 to 4 villages' land records. But in this system, major loopholes existed delays in service RC/RTC, land documents, transfer of property, sale of property, etc. Sometimes, manipulation of land records, favouritism, and inability to recognize the land area and real owners lead to confusion among the farmers.

Initially, Kioniks centers were entrusted with the responsibility of issuing land records in rural areas. At present, records of tenancy and crops (RTC), and Records of rights(ROR) are available to the farmers by paying rupees 15 at a nearby Kioniks center, also downloaded from the websites, and the BHOOMI app enables the farmers to get soft land record copies. Presently, digital mapping of land area measurement has been done through the application of drone technology; land authentication has made it still more efficient and effective.

#### **NEMMADI Kendras(2003)**

The BHOOMI project successfully consolidated the land record database but the next step is to reach the services to the beneficiaries at their doorsteps needs a proper channel. The Nemmadi kendras provided services such as issuing birth certificates, death certificates, caste certificates, land records-related certificates, old age pensions, etc.

### **Common Service Centers (2009)**

The CSC will send services in the fields of agriculture, health, education, banking, utility service, and commercial service. (Internet providing village land BPO) Training in open (vocational) audio and video shooting is provided in a single platform. The people can avail the services like payment of electricity, water bills, tax payment, enrolment to government programs, etc. The government intends to provide minimum common services to the people at their doorsteps and create awareness among the people on governmental programs. Under the common service centres, more than 350 services are provided through Kioniks Center, where micro-small entrepreneurs are appointed at the local level.

### **ReNMs(2013):**

The Karnataka government, in collaboration with the private agency NCDEX Market Limited in 2014, established an online agricultural marketing system known as Rashtriya e-market Services Limited (ReMSL). This online marketing merged 13 markets(APMC)with the slogan of “Any time Anywhere” concept and started functioning as a single platform for farmers, traders, commission agents, and agricultural committees to be registered successfully and a model project in India and also inspired the central government to initiate an all India level digital market known as e-NAM in the country. Presently, 162 markets (APMC) are merged in a unified market platform where traders from different parts of the country can participate, the highest bidder bidding will purchase and immediate payment assists the farmers to get the profit transparently. As per statistical data for 2022-23 the ReMSL has transacted 9.12 Crore MTs of agricultural commodities worth Rs. 2, 63,715.82 Cr.

### **SAMRAKSHANE (2016)**

The Karnataka state government, with the assistance of the Centre for E-governance and the National Informatics Centre, developed a portal for the farmers to assist in the enrolment of crop insurance, registering claims, calculation, payment, and updating information transparently. The portal is opened for schemes such as Pradhan Mantri fasalBhima Yojana, crop insurance schemes, and modified weather-based crop insurance schemes brought into the single portal where the farmers benefit and are responsible for increasing the enrolment of farmers in this scheme.

### **e-SAP (2019)**

The e-SAP project was launched by the University of Agricultural Science Raichur in 2011-12 under RKVY grants. After the successful implementation in the Kalyana Karnataka districts, it later spread to all the agricultural universities in Karnataka, and the government of Karnataka adopted it in 2019-20 as a major E-project to spread to all the districts in Karnataka.

The pest surveillance advisory measures available in this project concentrated mainly on an ICT-based solution to the pest diseases, microbial diseases, weeds, and nutritional disorders that are solved through this app-based technology by the farmers. The e-SAP is now operating in the agriculture and horticulture crops of more than 53 and is capable of resolving more than 1000 problems.

**AGRIS NET** (Agricultural information system network)

Under the national E-Governance plan of A-MMP, priority has been given for the facilitation of digital infrastructure in the rural areas. The development of digital infrastructure needs software databases, network connections, accessibility, and cloud network accessibility. In this context, in 2007 a scheme known as AGRIS NET was in coherence with central, NIC, and state government functions towards the maintenance of common dashboards and portals for accessing and availing agricultural-related information by the farmers.

**E- Panchayat (2018)**

The national e-governance plan under the mission mode project gave priority to digitalizing the Panchayats to eliminate the digital divide and inclusive growth in rural areas. At present, NIC connected 2.50.000 village panchayats to deliver services in rural areas for disseminating information at a faster level and extending governmental service to their doorstep. The services extended by the E-panchayats such as issuing birth and death certificates, payment of taxes, e-health, subsidy benefits, e-agricultural extension services, pension benefits, unemployment eradication programs of the government, farmers' welfare schemes, and disseminating information on agricultural and selected activities to the rural population.

**KUTUMBA (2019)**

The Karnataka government, with the assistance of the Centre for e-governance, Department of Personnel, and administrative reforms, introduced the KUTUMBA platform in the agricultural sector. The success of this portal instigated the government of Karnataka to launch the portal for an integrated social information system under which all the resident family's information is gathered under a single platform. This database has assisted the government in identifying beneficiaries and non-beneficiaries of the government schemes, and socio-economic status, and taking appropriate policy measures to include those left out in the program.

**FRUITS (2022)**

The Government of Karnataka has launched a new web portal to collect the databases of farmers' information in a single portal, which helps in the formulation of appropriate policies and programs by the government for the well-being of the farmers. For the smooth functioning of the agricultural and allied sectors, development schemes are implemented by various departments. It is difficult for the farmers to produce documents for each department, like agriculture, horticulture, livestock, etc, and the same farmers applying and availing the benefits from all of these sectors make it very difficult for the government to consolidate the information for further steps to be undertaken. To resolve all these issues, the Karnataka government, in association with NIC, developed a software database to register the farmer's information in a single portal known as "Farmer Registration and Unified Beneficiary Information System" (FRUITS).

**FAPS (2002)**

Farmer agriculture produces support system those farmers registered in the FRUITS database shifted to FAPS where the farmers availed the facility of procurement of agricultural produce and get the money within fifteen days of the sale of their produce. The Farmers can register through an online portal and take part in the procurement process where the agencies take part and receive the money in a very short period; earlier, the farmers had to wait for four to five months. Under this scheme, many farmers benefit every year due to its transparency, efficiency, and accountability, and payment is directly transferred to the farmer's account in a very short period in the procurement of agricultural produce.

**K-KISAN(Karnataka-Krishi information system and networking)**

The Karnataka government launched a project known as K-KISAN will extend the services in the areas of farm mechanization, agro-processing, micro-irrigation, Krishi bhagya yojane, Agriculture input supply system, license for seed, fertilizers, pesticides, and insecticides for the farmers. The portal will assist the farmers in accessing and availing these services to enhance production and sustainability in agricultural production.

**1.10 Issues in E-governance implementation in the agricultural sector**

The major issues in the E-governance implementation in the agricultural sector in the Karnataka state have been broadly classified based on the reasons as follows

**Organizational issues**

1. Under the organizational issues, funding of the project for the e-governance project formulation, implementation, extension, continuation, and maintenance requires adequate financial resources for the government. But the government has many responsibilities, especially, targeting developmental activities. So, allocating more funds to start new E- projects, continuation, and maintenance is a big issue with respect financial aspects of the government.
2. E-governance projects are always long-term projects, and maintaining, sustaining, continuing, and upgrading software and services needs more cost from the side of the government. So, it is very difficult for the government to allocate funds for sustenance and continuation of the existing projects.

**Technical issues**

1. In the case of technical issues in our economy due to the federal set-up form of government, the vertical and horizontal integration of the different departments of the center and state governments for better coherence with the merging of all the information to provide services for the different stakeholders in a single portal. So, the interoperability of effective governance projects depends upon the centre-state relationship in implementing E-projects. In government departments always there is a miscommunication between the centre and state projects when different political parties at the state and centre, among various departments, lead to difficulty in functioning for the effective beneficiary for the different stakeholders.

2. The maintenance of privacy in data capture and surveillance is the major issue while collecting data from the farmers. In the present scenario, due to the cybercrimes, virus attacks, and hacking problems in the software field very difficult for the government to maintain privacy.

3. Security issues are also prime problems when we encourage private participation in the e-governance projects collaboration. In the case of collecting data about the farmers, agricultural status, and personal information, we should be very careful with public-private participation because the private sector's motive is always intended toward profit-oriented and commercial intentions, sometimes the possibility of misuse of the data, and cybercrime at the national and international level due to the leakage in the information. The public sector motives of service-oriented, inclusiveness, moral ethics, and value-based approach are not found in the working of private participation in the E-projects.

### **Social issues**

1. Under the social issues, lack of awareness among the farmers due to illiteracy, negligence, superstitious beliefs, following age-old methodology denied accepting the new way of technical revolution in their occupation leads to non-usage of E-services.

2. The digital divide and digital illiteracy among rural farmers are responsible for the unawareness about the E-governance projects of the government implemented and denied the benefits of the projects.

3. Presently, due to cybercrime issues, the possibility of cheating is responsible for hesitation among the farmers in using ICT-based governmental schemes and programs in the rural areas.

4. In the Karnataka state, enrolment to the KUTUMBA and farmers database information collection schemes like FRUITS is not more than 50%; this indicates unawareness, superstitious beliefs, and the negligent attitude of the farmers are the reasons for not enrolling in the governmental data collection process.

5. Most of the farmers in Karnataka belong to the small and marginal farmer category more than 80% and are unable to have smart phone facilities due to the low income and poverty level denied by the ICT-based programs of the government.

6. The simple, easier way of accessibility of web portals, software, availability in local language, and network availability is very important in the inclusiveness of farmers in all perspectives.

### **Political issues**

1. The government always plays a pivotal role in the development and implementation of the E-projects concerning agricultural development in an economy. If the government does not make the effort to formulate and implement E-projects automatically farmers will be unable to get the new technology accessibility.

2. If the centre and state government have a different political ruling party and regional disparities reasoning in quarrels, fund allocation bias, in E-projects implementation. The real sufferers are obviously, the citizens of the state only.

3. The integration of different departments is very important for the collective working of any project. But still, due to many issues, the vertical and horizontal integration of the different departments is not achieved in our state.

## **Economic issues**

1. The cost of development of ICT-based project formation, maintenance and gradation of software, data capture, and implementation are very expensive for the government.
2. The long-term Service Delivery to the public is very costly. The maintenance and upgrading of services to the farmers in the changing scenario need governance support from all perspectives.

### **1.11 Challenges in delivering E-governance services**

#### **Technological challenges**

1. The digital physical infrastructure provided in the rural remote areas is the biggest challenge to the government as it has to cover each village, hobli, and extend services at their doorsteps.
2. The integration of different departments horizontally and vertically as the big storage of data management has to be carried out for better functioning of the system.
3. The delivery of services becomes more complicated if more than one departments are interlinked with its big data source, very difficult for the data analytics in the system.
4. The poor rural connectivity, lack of sufficient physical digital infrastructure, such as internet connectivity, make it very poor for downloading, accessing, and log in to the web portal at least 25 MBPS is required but in most rural remote areas the net connection is very poor, it is less than 5mbps.

#### **Organizational challenges**

1. The e-governance effectiveness and efficiency always depend upon the digital-physical infrastructure facilities availed to the rural farmers free of cost to access and download the information/content.
2. The efforts of the government in creating awareness of digital education, accessibility, and usage are limited as most of the farmers in India are illiterate, and even digital illiteracy is the biggest challenge.
3. The e-governance services available in the regional language are very important to reach at the ground level because the literacy rate is very low in rural areas even if government services available in the English language are unable to reach the rural population.
5. The key officials in e-governance projects, we found that in government jobs most of the staff getting transfers frequently so difficult to continue the existing project and maintain efficiency and effectiveness in the project and another issue is the lack of trained staff sufficiently available.
6. The connecting linkage with G2B, G2G, G2F, and G2C for the effective implementation of the Agribusiness corridor in the state needs governmental efforts to integrate the various departments.

#### **Financial challenges**

1. The funding of the project for the e-governance project formulation, implementation, extension, continuation, and maintenance requires adequate financial resources from the government. But the government has many responsibilities, especially, targeting developmental activities. So, allocating more funds to start new E- projects, continuation, and maintenance is a big challenge with respect financial aspects of the government.

2. E-governance projects are always long-term projects, and maintaining, sustaining, continuing, and upgrading software and services needs more cost from the side of the government. So, it is very difficult for the government to allocate funds for sustenance and continuation of the existing projects.

### **Governance challenges**

1. The policies and regulatory framework on data governance management, citizen-centric service delivery approach and cyber-attacks are effective implementation is the biggest challenge in the state.
2. In the Karnataka government, more than 3000 departments are operated in rural and urban areas. In this context, the interlinking and coordination among all the departments for coherence functioning is the greater challenge for the government.
3. Cyber security issues are the major threat in the operational and functional process of the digital means of delivering public services in an economy. Cybercrime, cyber-attacks, and virus reasoning in the losing trust, and morality among the citizens about the usage of E-services.

### **Social challenges**

1. The use of mobile apps and login to specific web portals and websites are hesitant to be adopted and unused by rural farmers due to digital illiteracy, unawareness negligence, and a traditional bounded mind-set that prefers to stick to the traditional methods.
2. In the rural agricultural market, we found that still dominated by middlemen, local buyers, and farmers are not able to come to the E-market or APMC and forcibly sell to the locally available middlemen because of transportation costs, waiting patience for better prices, unnecessary risk in the selling of the product, unawareness about the benefits of e-market.
3. Lack of practical exposure to farmers on the usage of apps, web portals, and websites, only the educated especially digitally literate can access the e-governance services. The illiterate and digitally illiterate farmers lag in the benefits, and sometimes they depend on other people, misguiding, cheating, and wrong information are happened in the rural areas.
4. The e-governance effectiveness and efficiency always depend upon the digital-physical infrastructure facilities available in rural areas but the availability, and accessibility are denied by the rural poor because of the high cost of smart phones, mobile devices, laptops, and high net connection charges are main reasons for digital non-inclusion in the society.
5. The technological revolution in the information and communication sector enhances the adoption of new innovative techniques in web portals, apps, website access, login, and extended Service delivery. It is very difficult for the farmers to access the updated new technology and special skills needed to access the new technical services delivered by the government for the farmers.
6. The rural women mainstreaming digital accessibility play a key role because women play a major role in the agrarian sector. The lack of accessibility due to digital illiteracy, women entrepreneurs are unable to access online modes of information. Women-centric efforts must be taken to improve the e-governance effective implementation.

7. The small and medium landholders need new technology-based information that is available in cloud Technology. The minimum data required for downloading, accessing, and sharing involves 25 Mbps, but the cost to use this information is very high, denying the farmers access to the information, and especially in remote areas, the net connection is the biggest challenge.

### **Political challenges**

1. The successful implementation of E-governance always depends on the ruling party's priority on the continuation and discontinuation of the existing project. The vision to achieve a set of targets, good motives, and intention for implementation of digital projects always depends on efficient and good leadership in an economy.

2. India is a federal setup of government; at the Central level National Informatics Centre will initiate many E-projects, and at the state level, every state government initiates governance projects of their own. The coherence between Central and state government projects is necessary for the successful implementation of any project. Sometimes, different political parties ruling at the centre and States cause rivalry in implementing projects.

## **1.12 Recommendations**

### **Organisational perspectives**

1. The re-engineering of the entire governmental organization system is a necessary pre-condition to introduce new ways of revolution and change in the workflow of functioning and services available to the public. The technological transformation should be accepted and implemented in the entire organizational system.

2. Before launching any e-project throughout the economy, pilot projects are to be undertaken to test the initial level of the functioning of the projects, efficiency level, effectiveness level, responsiveness, and workflow of the project. This study also ensures to identification of the beneficiaries' level and loopholes when operated and implemented in the study area.

3. The evaluation and monitoring agency must be established to assess and evaluate every e-project launched by the government to know the status of impact, level of implementation, and effectiveness of the financial resources allocated. This evaluation and monitoring process also assists the government in knowing the loopholes in the projects, continuous monitoring of the existing projects and further improvements to be taken for the corrections in the project should be part of government responsibility.

4. Creating awareness among the different stakeholders through social media such as Radio, Newspaper, Television, Twitter, internet, Instagram, etc., and in the rural areas through village Panchayats, KVK centers, FPOs, Raitha samparka kendras, SHGs about the E-Projects benefits. In this context, the government will take appropriate measures for the popularization of the projects among the public for the better utilization of the projects.

5. The success of any E-project depends upon the level of readiness that exists in an economy. Here, before creation and implementation, the government must build up readiness for digital infrastructure, capacity building among staff, awareness, internet connectivity, evaluation, and an outcome-based approach to be built up in an economy.

6. The vision and mission of E-projects must be in the right direction to deliver public services. E-projects must be competent and have an international-level approach.

7. The priority must be given to cyber security and cyber laws to control hacking of software, attacking of virus issues and misuse of big data will lose trust among the different stakeholders concerning E-delivery of services.

8. In the long run, E-projects should be created to maintain sustenance and continuously deliver public services. So that people will have trust in the E-Projects and inclusiveness can be attained.

9. E-participation must be encouraged among the rural farmers to make them involved in government policy and decision-making processes, resulting in inclusiveness in the society.

10. Research and development must be prioritized in the creation and implementation of e-projects about the agrarian sector because they dominate our economy.

11. Our economy operates in a federal structure; central and state governments both formulate E-projects in the agrarian sector, which leads to confusion among the users. So, the synergy between central and state government initiatives and also a model for agriculture digitalization must be formulated in the national level plan.

### **Economic perspectives**

1. From the financial perspective, E-projects expenditure is always very high, sometimes it is very difficult for the government to launch new projects as financial constraints restrict them. So, public-private partnership programs such as Build-own-operate(BOB), Build, own, manage, operate(BOMO), and also private participation must be encouraged to introduce new projects.

2. Capacity building among the staff is an essential requirement at three levels in the structure of the organizational mechanism. Here, three levels of capacity building are required, such as in the formulation of E-projects level, implementation (Departments) level, and maintenance level.

3. Capacity building among the targeted groups is also very important for the effectiveness and inclusiveness of E-projects to remove the digital divide in society. E-literacy, training, advisories, technological advice, awareness camps, and hands-on training should be undertaken for no one is left behind in the development process. The demonstration of technological usage must be given to the farmers, focusing on the easier methods of availing public services.

## Farmers Perspectives

1. The farmer's active participation is a necessary precondition for the success of any E-projects. So, farmers' involvement in availing and accessing E-services through getting digital education and visiting nearby service centres such as Raitha Samparka Kendra, KVK, Agricultural departments, and Village resource centres is helping the farmers.

2. Farmers should sell their agricultural produce in the digital market instead of through middlemen. Local traders will get transparent, accountable, better prices and immediate payment through digital means to assist in getting better income.

## Way forward/ Conclusion

The E-governance initiatives are the new way of delivering governmental services in the agrarian sector extending a transparent, accountable, responsive, efficient, and effective manner. Even though these E-services have a better outcome-oriented vision still faces certain issues and challenges in various aspects. But with governmental efforts in resolving issues and challenges especially in cyber security attacks, digital divide, rural-urban divide, content available in local language, network facility, simple mode of communication, creating awareness on digital literacy and active participation from the side of the farmers can successfully get the benefits of E- Projects in the state. The evaluation of E-projects, monitoring, controlling, and continued for a longer period needs effective governmental policies in sustaining E-projects.

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