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Kisan Sarathi portal: Unraveling the benefits and unveiling the limitations of digital farmer assistance

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Abstract

The agriculture sector in India plays a significant role in the country's Gross Domestic Product (GDP), contributing approximately 18 percent. Additionally, a substantial portion of India's population, about 60 percent, depends on this sector for their livelihoods. Despite the advancements in Information Technology (IT) and communication, which have facilitated the dissemination of crucial information about crops, a considerable number of farmers remain unaware of proper farming practices. Furthermore, a substantial group of farmers continues to have unresolved doubts and queries, which hinders their ability to adopt modern and efficient agricultural techniques. Addressing these knowledge gaps and providing tailored support to the farming community is of utmost importance to enhance productivity and sustainable growth in the agricultural sector. The government has introduced a digital platform called 'Kisan Sarathi' to assist farmers in obtaining the correct information at the right time, delivered in their preferred language. This platform aims to bridge the gap between agricultural experts and farmers, ensuring that farmers have access to timely guidance, which can enhance their productivity and efficiency in agriculture. The platform's key features and benefits have been designed to revolutionize how farmers access essential agricultural knowledge across different regions.

Keywords: Kisan Sarathi, GDP, agriculture, portal, digital India

1. Introduction

This newly launched digital platform 'Kisan Sarathi,' jointly launched by Shri Narendra Singh Tomar, Minister for Agriculture and Farmers Welfare, and Shri Ashwini Vaishnaw, Minister for Electronics and Information Technology, on July 16th, 2021, during the 93rd ICAR Foundation Day. The paper explores the purpose, features, and significance of 'Kisan Sarathi' in delivering timely and accurate information to farmers in their preferred language. One of the main features of this portal is to provide information in native language as most of the farmers prefer local dialect also in case of tribal areas (Lahiri *et al.*, 2017) ^[5]. With effective use of ICT rural areas could prosper because it makes it possible to disseminate relevant information in timely, cost-effective, and user-friendly form (Sweety Mukherjee *et al.*, 2023) ^[1] Through an in-depth analysis of the platform's functionalities and potential impacts, the study highlights its role in empowering farmers and promoting agricultural development. It is an advanced agricultural information and communication system developed in collaboration with the Indian Council of Agricultural Research (ICAR). It operates under the umbrella of the Interactive Information Dissemination System (IIDS), a project powered by the Digital India Corporation (DIC) and the Ministry of Electronics and Information Technology (MeitY), Government of India. This cutting-edge technology solution aims to be an intelligent online platform that facilitates agricultural support at the local level with a broader national perspective. Its primary objective is to provide farmers with seamless and multimedia connectivity, enabling them to access the latest agricultural technologies, knowledge base, and a diverse pool of subject matter experts. The system empowers farmers by offering them crucial information and resources, enhancing their agricultural practices and productivity. However there are some barriers like erratic power supply, poor internet connectivity, lack of knowledge in using and handling various ICT tools (Anand *et al.*, 2020) ^[13], but till now it has proven an effective tool of information dissemination. Although we have highly educated, trained, and well-organized Agricultural extension experts, but approximately 60% of farmers remain underserved, lacking access to any extension agency or representative (Singh *et al.*, 2015) ^[2]. However this portal could be effective with new advanced features to overcome the drawbacks of previous models.

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2. Related works

2.1 Agmarknet

Agmarknet (Source: www.agmarknet.gov.in), short for Agricultural Marketing Information Network, is an important initiative in India aimed at providing reliable and real-time agricultural market information to farmers, traders, policymakers, and other stakeholders. Established by the Directorate of Marketing & Inspection (DMI), under the Ministry of Agriculture & Farmers' Welfare, Agmarknet plays a pivotal role in promoting transparency and efficiency in the agricultural marketing system. AGMARKNET – is truly such an Internet based information system that aims at providing "single window" service, catering to diversified demands of information (P. Venkatesh *et al.*, 2021) ^[11]. Farmers and traders can access this information through the Agmarknet portal (www.agmarknet.gov.in) or mobile apps, enabling them to make informed decisions about crop planning, selling strategies, and finding the most favorable markets for their produce. Agricultural Marketing Information Network is an important initiative in India aimed at providing reliable and real-time agricultural market information to farmers, traders, policymakers, and other stakeholders. Established by the Directorate of Marketing & Inspection (DMI), under the Ministry of Agriculture & Farmers' Welfare, Agmarknet plays a pivotal role in promoting transparency and efficiency in the agricultural marketing system. Farmers and traders can access this information through the Agmarknet portal (www.agmarknet.gov.in) or mobile apps, enabling them to make informed decisions about crop planning, selling strategies, and finding the most favorable markets for their produce.

2.2 e-NAM

The eNAM (Source: www.enam.gov.in), short for Electronic National Agriculture Market, is a transformative digital platform launched by the Government of India in 2016. It aims to revolutionize agricultural trade and marketing in the country by providing a unified online marketplace for buying and selling agricultural commodities. It can be accessed through Web-Based Portal or Mobile Applications. Farmers, traders, commission agents, and other stakeholders can access eNAM through the official web portal. They need to visit the eNAM website (<https://www.enam.gov.in>) using a web browser on their computers or mobile devices. Once on the website, users can register and log in to access the various features and functionalities of the platform. eNAM also offers dedicated mobile applications for Android and iOS devices. Users can download the eNAM app from their respective app stores (Google Play Store for Android and Apple App Store for iOS) and install it on their smartphones or tablets. The mobile app provides a user-friendly interface for farmers and traders to conduct online trading, check market prices, receive alerts, and access other eNAM services on the go. According to a study carried out in Sriganganagar district, Rajasthan, it was revealed that over 71% of farmers hold a positive attitude towards e-NAM (M. Shanmukh Raju *et al.*, 2022) ^[7].

2.3 Soil health card (SHC) portal

The Soil Health Card (SHC) Portal (Source: www.soilhealth.dac.gov.in) is an important digital platform initiated by the Government of India to provide comprehensive information about the soil health to farmers. Launched in 2015 under the National Mission for Sustainable Agriculture (NMSA), the SHC Portal aims to promote

sustainable agricultural practices and improve soil fertility and productivity across the country. To get started, farmers need to register on the portal by providing their basic details, including name, mobile number, email address, and Aadhaar card number. Once registered, farmers can request a soil health test by submitting a soil sample from their fields to designated soil testing laboratories. Proper sampling techniques are essential to ensure accurate results. After laboratory testing, the soil analysis data is uploaded to the portal, and farmers can access their personalized Soil Health Cards. By adopting the recommended fertilizers and nutrients at the prescribed dosages and timings, farmers can optimize their yields and improve soil health.

3. Framework and design of portal

The framework of the Kisan Sarthi portal (Source: www.kisansarathi.in) is designed to provide a comprehensive and user-friendly platform for farmers, agricultural stakeholders, technical staff, KVK experts etc. Below is an outline of the key components and functionalities that form the framework of the portal. The main administrator of portal is termed as 'KVK Coordinator' which can monitor the KVK expert and KVK office Executive and farmers on portal. Farmer can call using toll free number 18001232175 or 14426.

A. Dashboard

Dashboard contains details of Project i.e. Today's calls, total calls, location covered, today's registration, messages, text messages, total advisory, voice calls on the screen.

B. Registration

Using this KVK coordinator can manage the farmer registration or create a user i.e expert and KVK office executive for farmer registration.

- **Farmer Registration:** Details like name, date of birth, mobile number, address, land mark, state, district, block, pin, police station etc. along with farm information, live stock & poultry information, fisheries information can be inserted in the portal. Farmer can show their interest through the Kisan Sarathi home page with show interest and can fill all their details of state, district and respective KVK then submit it.
- **User:** There are two types of users (1) KVK Expert- To attend call and provide advisory to farmers (2) KVK Expert- Provide advisory to farmers when primary expert is unavailable.
- **User Import from Excel File:** Allows bulk import of users' data from an Excel file, which includes information like Block/Mandal, primary language, and other relevant details.
- **Valid Farmer List:** Displays the list of successfully registered and validated farmers.
- **Invalid Farmer List:** Displays the list of farmers whose registration information needs verification or correction.

C. Unregistered Farmer

- **Pending:** Lists farmers who have initiated the registration process but are yet to be validated.
- **Closed:** Shows the list of unregistered farmers whose registration was unsuccessful or closed.

D. Block & Village Management

- **Block:** Allows administrators to manage and organize

different administrative blocks.

- **Village:** Enables the management of villages within each block.

E. Users Management

- **KVK Expert:** Provides administrators the ability to manage agricultural experts associated with Krishi Vigyan Kendra (KVK).
- **KVK Executives:** Allows the management of executives working within Krishi Vigyan Kendra.

F. Messages

- **Compose – (1) Bulk:** Blockwise/Village Wise: Lets users send bulk messages to all or specific farmers within a block or village. (2) Individual: Using Mobile Number: Allows users to send individual messages to farmers using their mobile numbers. (3) Internal Messages: Facilitates communication between key roles like Director, KVK Nodal, KVK Expert, and KVK Coordinator.
- **Inbox:** Displays received messages and calls from farmers and other users.
- **Outbox:** Shows messages and calls sent by the portal's users.

G. Calls

- **Inbound:** Logs details of incoming calls, including caller name, mobile number, receiver role, call status, and action taken (enquiry, demo, etc.).
- **Outbound:** Records details of outgoing calls made by portal users to farmers.
- **Closed:** Lists calls that have been successfully resolved or closed.

H. Assign Calls

- **Assign Call to Expert:** Allows administrators to assign specific calls from farmers to designated agricultural experts.
- **Assign Call List:** Displays a list of calls that have been assigned to experts.

I. Feedback

Thumbs Up/Down: Enables farmers to provide feedback on the assistance they received, expressing satisfaction or dissatisfaction.

J. Reports

- **Call Reports:** Generates reports on call-related data, including call duration, resolution status, etc.
- **Message Reports:** Provides insights into message-related activities and effectiveness.
- **Export Farmer List:** Allows the export of farmer data for further analysis.

K. Discussion Forum

Facilitates a platform for farmers and experts to engage in discussions, exchange ideas, and seek advice or support from the community.

4. Advantages

4.1 Databank of Farmers: The portal serves as a comprehensive repository of essential information and data related to agricultural stakeholders. This digital database collects, stores, and organizes information about individual

farmers, including their personal details, farming practices, landholdings, crop choices, and other pertinent information. The databank aims to create a comprehensive profile of each farmer, facilitating better understanding and analysis of their needs and requirements.

4.2 Agricultural Information: Farmers can access a vast repository of agricultural information, including best practices, crop management techniques, weather forecasts, and market trends, helping them make informed decisions.

4.3 Expert Assistance: The portal connects farmers with agricultural experts, Krishi Vigyan Kendra (KVK) professionals, and extension officers, enabling them to seek expert advice and guidance for specific farming challenges.

4.4 Digital Platform for Communication: Kisan Sarthi provides a digital platform to communicate not only to farmers but also between departments and experts and to share experiences, and participate in discussion forums, fostering a sense of community and knowledge exchange.

4.5 Easy Registration and Data Management: The portal allows farmers to register easily, maintain their profiles, and update information, ensuring accurate and up-to-date records for efficient administration and support.

4.6 Call and Message Management: Farmers can use the portal to receive and make calls, send and receive messages, and manage communication effectively, improving coordination with experts and officials.

4.7 Feedback and Evaluation: The portal's feedback mechanism enables farmers to provide input on the assistance received, allowing for continuous improvement and better service delivery.

4.8 Multilingual Interface: By offering information in regional languages, the portal ensures that farmers from diverse linguistic backgrounds can access content and understand instructions easily.

4.9 Empowering Rural Communities: Kisan Sarthi empowers farmers with knowledge and technology, bridging the digital divide in rural areas and fostering agricultural growth and prosperity.

4.10 Enhancing Agricultural Productivity: The portal's comprehensive information, expert guidance, and modern agricultural techniques contribute to improved productivity, crop yields, and sustainable farming practices.

5. Limitations

5.1 Absence of Video or Photo Upload: The lack of video or photo upload functionalities on the Kisan Sarthi portal restricts farmers from providing visual evidence of their agricultural challenges or achievements. Incorporating such features would enable farmers to share real-time data, such as crop diseases, pest infestations, or successful farming practices, facilitating better assessment and targeted support by experts and extension officers.

5.2 Dominance of Calls Related to Government Subsidy Schemes: The overwhelming number of calls regarding

government subsidy schemes may result in an imbalanced focus on specific agricultural initiatives, overshadowing other critical issues faced by farmers. Implementing a call classification system or interactive voice response (IVR) technology can efficiently route and prioritize calls based on predefined categories, ensuring comprehensive and equitable assistance to farmers.

5.3 Lack of awareness about the Portal: Farmers are experiencing increasing distress due to a knowledge gap between scientists and themselves, stemming from a shortage of extension personnel (Singh and Jahanara, 2019). Similarly limited awareness among farmers about the existence and functionalities of the Kisan Sarthi portal hampers its widespread adoption and utilization. Effective outreach strategies, including community workshops, promotional campaigns, and collaboration with agricultural extension services, are essential to enhance awareness and encourage farmer participation.

5.4 Limited Internet Service in Remote Areas: In regions with inadequate internet connectivity, farmers encounter difficulties in accessing the portal's online resources and features. Implementing offline functionalities, such as SMS-based information dissemination, offline data storage, and periodic synchronization, can provide critical support to farmers in remote areas with limited internet access. In a study was conducted in the Samastipur and Katihar districts of Bihar during the year 2018-2019 it was found that the major issued were connection of internet was poor or slow, lack of knowledge, lack of confidence in using ICT tools etc. (Anand *et al.*, 2020)^[13].

5.5 Technical Literacy Barriers: The portal's technical nature may present challenges for farmers with lower levels of educational literacy, hindering their ability to navigate and benefit fully from its features. To overcome this limitation, incorporating user-friendly interfaces, audio instructions, and interactive tutorials can enhance accessibility and usability for all farmers. Lack of education resulting in a lack of awareness is one of major constraint in success of ICT based knowledge portals (Mishra *et al.*, 2020)^[14].

5.6 Multiple Dialects in Language: The diversity of regional dialects used on the portal may lead to miscommunication and comprehension issues, affecting the effectiveness of communication between farmers and experts. Integrating language translation services or providing dialect-specific support can foster seamless communication and understanding for all users. The study conducted by Balu *et al.*, 2018^[17] gives first and foremost suggestion that the information should be in local language. Likely personnel of

Kisan call centre are sometimes unable to understand the farmers' problem (Shashikant Goyal *et al.*, 2021)^[15].

5.7 Absence of Call Classification: The lack of a call classification system results in inefficient handling of farmer inquiries, potentially leading to delays in addressing urgent issues. By implementing call categorization and routing algorithms, calls can be directed to the appropriate experts or departments, streamlining responses and ensuring timely resolution of farmer queries.

5.8 Office Hour Availability: The portal's limited availability during office hours may constrain farmers from seeking timely assistance outside these periods, particularly during emergencies or critical farming situations. Introducing 24/7 support mechanisms, such as chat bots or automated help lines, can enhance accessibility and responsiveness, catering to farmers' needs round the clock.

6. Case Study with respect to Jalore District

Jalore district is located in the southwestern part of the state of Rajasthan. It is situated between the Aravalli Range and the Thar Desert. It is a part of the Jodhpur division in Rajasthan. According to the Census 2011, Jalore district has a total population of 1,828,730, out of which urban population in Jalore accounts for 8.3 percent. The overall literacy rate is 55.97 percent, with male literacy at 69.50 percent and female literacy at 42.35 percent. The primary language spoken in Jalore is Rajasthani, with several dialects used by the local population. The primary sector accounted for the highest share of 41 percent in the Gross District Domestic Product (GDDP). Out of total work force of the district 'Cultivators' form about 63.67 percent of all workers, while agricultural labourers form 20.12 percent. Lies in the agro climatic zone II-B Pearl Millet, Cluster Bean, Moth, Cumin, Isabgol, Mustard etc. are major crops cultivated here. The District comprising nine blocks, namely Ahore, Jalore, Sayla, Bhinmal, Jaswantpura, Raniwada, Sanchore, Chitalwana and Bagoda, hosts a Krishi Vigyan Kendra (KVK) located in the Sayla block's Keshwana village. Within the KVK, six Subject Matter Specialists (SMS) actively engage in activities aimed at enhancing farmer welfare.

As of July 2023, the Kisan Sarthi portal has successfully registered approximately 200,000 farmers, providing them with essential advisory services related to crop management and weather forecasts at regular intervals. Furthermore, the KVK conducts training programs both at its campus and directly in farmers' fields. On an average working day, the KVK receives around 20 calls.

A sample survey of 25 farmers has been done with following questionnaire to examine the efficiency of portal.

Table 1: Questionnaire for Survey

| Question | Option 1 | Option 2 |
|---|--------------|--------------|
| Are you a smartphone user? | Yes | No |
| How many members are there in your family? | Less than 10 | More than 10 |
| Are you aware of the Kisan Sarthi portal? | Yes | No |
| Are you familiar with any other agricultural portal? | Yes | No |
| Have you personally registered on the Kisan Sarthi portal? | Yes | No |
| Have all the members in your family registered on the Kisan Sarthi portal? | Yes | No |
| Is the information provided on the Kisan Sarthi portal available in your native language? | Yes | No |
| Have you encountered any language-related issues while using the portal? | Yes | No |
| Is the Kisan Sarthi portal able to deliver information in a timely manner? | Yes | No |

| | | |
|---|-------------------------------|--------------|
| Do you find the portal user-friendly and easy to navigate? | Yes | No |
| Does the portal provide all the necessary agricultural information you require? | Yes | No |
| On average, how many calls do you make to the Kisan Sarthi portal in a week? | Less than 10 (including zero) | More than 10 |
| Have you received advisory messages on time through the Kisan Sarthi portal? | Yes | No |
| Have you attended any training sessions conducted by nearby Krishi Vigyan Kendra (KVK)? | Yes | No |

Table 2: Survey Results Analysis

| Question | Percentage |
|--|------------|
| Smartphone User | 80% |
| Aware of Kisan Sarthi | 40% |
| Familiar with other Agricultural Portals | 70% |
| Personal Registration | 10% |
| Family Registration | 2% |
| Information in Native Language | 80% |
| Language-related Issues | 32% |
| Timely Information Delivery | 80% |
| User-friendly Portal | 80% |
| Necessary Agricultural Information | 80% |
| Received Advisory Messages on Time | 90% |
| Family Size | 6 |
| Average Calls per Week | 2 calls |

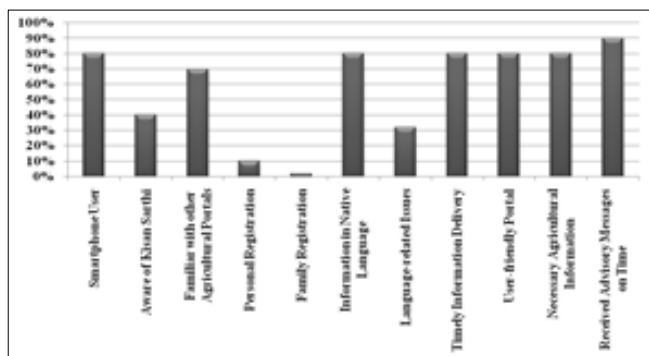


Fig 1: Survey Analysis

7. Conclusion and Further Discussion

An overwhelming majority (80%) of farmers in Jalore District are smartphone users, indicating a significant potential for leveraging digital platforms for agricultural information and support. Approximately 70% of farmers are familiar with other agricultural portals while only 40% of the farmers surveyed are aware of Kisan Sarthi are familiar with it. This indicates the need for increased efforts in promoting the portal's existence and benefits to a larger farming community. Relatively low respondents encountered language-related issues while using the portal, indicating the importance of multilingual support to cater to diverse linguistic backgrounds. A large majority of farmers reported that the Kisan Sarthi portal effectively delivers information in a timely manner, which is crucial for informed decision-making and farming practices. Most of farmers acknowledge receiving advisory messages on time through the Kisan Sarthi portal, demonstrating its effectiveness in disseminating critical agricultural updates. Based on the survey conducted in Jalore District, it is evident that the awareness and utilization of the Kisan Sarthi portal among farmers are relatively limited. This finding highlights the need for enhanced efforts to promote the Kisan Sarthi portal and increase its accessibility to the farming community in the region.

It is noteworthy that the district's overall literacy rate is 54% (Source: Indian Census 2011). This aspect may have contributed to the lower awareness of the portal, as illiteracy can pose a barrier to accessing and utilizing digital platforms. Bridging this literacy gap and providing support to farmers

with limited digital literacy could be instrumental in increasing the adoption of the Kisan Sarthi portal. To improve the outreach and effectiveness of the portal, targeted awareness campaigns and training programs should be conducted. These initiatives can empower farmers with the necessary knowledge and skills to navigate the portal and benefit from its agricultural information and advisory services. Interest in ICT can be seen not only in male farmers but also in female farmers (Jha *et al.*, 2021) ^[4]. However some challenges also faced by Scientists at KVKs. (Poorva Dashora *et al.*, 2022) ^[9]. In conclusion, while the Kisan Sarthi portal holds great potential to support farmers' welfare and productivity, there is a clear need to address the current low awareness and utilization rates. By tailoring interventions to accommodate the specific needs of the farming community, the Kisan Sarthi portal can become a valuable tool in facilitating agricultural development and empowering farmers in Jalore District.

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