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Analysing the impact of E-Ganna app on Sugarcane Farmers: A study of Muzaffarnagar district

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Abstract
This paper explores the impact of the e-Ganna app on sugarcane farmers in the Muzaffarnagar district. This district, lying in Western Uttar Pradesh and often known as the "sugar bowl" of India, is crucial to the nation's sugar production, processing around 10 million quintals sugar annually. In 2019, the government of Uttar Pradesh launched the e-Ganna app, aims to enhance the livelihoods of sugarcane farmers by promoting transparency, ensuring timely payments, and streamlining supply chain processes. Using the qualitative research method, the study examines the experiences and perceptions of farmers regarding the app. Findings indicate that the app has significantly improved payment transparency, allowing farmers to track their payments in real-time, which reduces uncertainties and delays. Additionally, the app has streamlined administrative processes, such as crop registration and supply ticket generation, making these tasks more efficient and enabling farmers to concentrate more on their farming activities. However, the study also identifies challenges that hinder the full utilization of the app's features. Technical issues and limited internet connectivity are significant barriers that prevent some farmers from fully benefiting from the app. Addressing these issues is crucial to maximizing the app's potential and ensuring that all farmers can take full advantage of its benefits.

Keywords: E-Ganna app, timely payments, transparency, sugarcane farming, supply chain management

Introduction
Digital technology is revolutionizing various sectors by enhancing efficiency, transparency, and inclusivity, and agriculture is no exception. In India, one of the world's largest sugar producers, sugarcane cultivation is vital, especially in states like Uttar Pradesh, Maharashtra, Karnataka, and Tamil Nadu. Western Uttar Pradesh, often called the "sugar bowl," is a major hub, producing over 50 million tonnes of sugarcane annually. This substantial output not only strengthens the local economy but also supports the livelihoods of thousands of farmers. Despite its economic importance, traditional sugarcane farming and supply chain management in Western Uttar Pradesh face numerous challenges. Farmers often encounter bureaucratic delays, payment transparency issues, and difficulties tracking deliveries and payments, leading to financial insecurity and inefficiencies. In response, the Uttar Pradesh government launched the e-Ganna app, a digital platform aimed at modernizing the sugarcane supply chain. The e-Ganna app offers digital tools for crop registration, electronic supply tickets, real-time payment tracking, notifications, and a grievance redressal system. These features are designed to eliminate bureaucratic delays, provide accurate and timely information, and reduce payment-related anxieties, thereby enhancing farmers' productivity and financial security.

This study examines the impact of the app on sugarcane farmers in Muzaffarnagar district, utilizing in-depth interviews with 30 farmers. The goal is to understand their experiences and perceptions of the app, identify challenges, and provide recommendations for improvement. By assessing the app's effectiveness, this research aims to support the development of a more efficient and sustainable agricultural system in the region, demonstrating the transformative potential of digitalization in farming practices.

The E-Ganna App
To promote a digitally empowered society and knowledge-based economy, the Uttar Pradesh government launched the e-Ganna app. This innovative platform aims to improve the livelihoods of sugarcane farmers by enhancing transparency, ensuring timely payments, and

streamlining supply chain processes. The key features of the app include

- **Digital Crop Registration:** Farmers can register their sugarcane crops digitally, reducing the need for physical documentation and minimizing bureaucratic delays.
- **Electronic Supply Tickets:** The app generates electronic supply tickets, providing farmers with accurate and timely information about their crop deliveries.
- **Real-Time Payment Tracking:** Farmers can monitor the status of their payments in real-time, enhancing transparency and reducing anxiety related to delayed payments.
- **Notifications:** The app sends notifications regarding important updates, such as harvest dates, supply schedules, and payment releases.
- **Grievance Redressal:** A feature that allows farmers to lodge complaints and seek resolution for issues they encounter.

Review of the Literature

The e-Ganna app, designed to provide information and services to sugarcane farmers, addresses several key challenges identified in the existing literature. Kumar (2020) [1] emphasizes the necessity of technological support and information dissemination through social media for farmers, which the app can provide. Kumar (2015) [5] conducted a study aimed at identifying issues faced by farmers in the sugar supply chain and developing IT solutions to address these challenges. The study focused on optimizing cane yield and supporting the overall development of farmers involved in sugarcane production. This aligns with the objectives of the e-Ganna app, which seeks to streamline supply chain processes and support farmers' livelihoods. However, R (2019) [3] notes that farmers have limited awareness about sugarcane expert system based mobile application, indicating a need for greater promotion and training. This gap in awareness highlights the need for concerted efforts to educate and train farmers on utilizing digital tools to their full potential.

Singh (2008) [5] provides an overview of the farming system in western Uttar Pradesh, where sugarcane is the primary income source and employment provider. Despite its significance, the income of family workers in this region is much lower than in Punjab. Singh's study suggests that a combination of technology, policy, and institutional innovations is needed to improve productivity and profitability. The e-Ganna app represents a technological innovation that could contribute to this goal by enhancing supply chain efficiency and providing timely information to farmers. Aggarwal (2022) [6] proposes a decision support tool for sustainable agricultural management by identifying suitable crop rotation practices in the Muzaffarnagar district of India. This tool aims to promote sustainable farming practices, which can be complemented by the e-Ganna app's focus on optimizing sugarcane cultivation and supply chain management.

This research seeks to answer the following questions: How does the electronic generation of sugarcane slips impact the efficiency and reliability of sugarcane delivery? To what extent has the app improved the transparency of payment processes? What are the farmers' perceptions and experiences regarding the app's usability and effectiveness? The objectives of this study are to assess the app's impact on enhancing productivity, efficiency, and financial security of sugarcane farmers, to identify challenges faced by farmers in using the app, and to provide recommendations for improving the app's functionality and accessibility to better support sustainable agricultural practices.

Methodology

This study employs a qualitative research approach to explore the impact of the e-Ganna app on sugarcane farmers in Muzaffarnagar district. Qualitative methods are chosen for their ability to understand the experiences and perceptions of farmers regarding the app's influence on their livelihoods. Purposive sampling is used to select 30 farmers from three villages such as Kinoni, Pinna, and Lalukheri with 10 farmers were chosen from each village. This sampling method ensures that participants have relevant experience and can provide valuable insights into the app's impact.

Data are collected through in-depth, semi-structured interviews with the selected farmers. The interviews are designed to obtain detailed responses regarding the farmers' experiences with the app, focusing on its impact on transparency of payment processes, efficiency of administrative tasks, and overall farming practices. Thematic analysis is used to analyse the data, involving the identification, analysis, and reporting of patterns within the data to uncover key themes related to the research questions. Ethical considerations are also given importance in this study, with informed consent obtained from all participants and their confidentiality ensured throughout the research process.

Findings

Improved Transparency and Timely Payments

Most farmers felt that the digital application has brought greater transparency to the sugarcane payment process. Earlier, they often had to wait for weeks without clear information about when payments would be credited. With the app, farmers can now check payment status in real time, which has reduced uncertainty and anxiety. Mr. Rajesh Kumar and Anuj Kumar from Kinoni shared that “the app has saved a lot of time and effort by providing real-time updates on payments.” Farmers explained that timely information has helped them plan household expenses, purchase agricultural inputs, and manage loan repayments more confidently.

Reduced Administrative Burden

Farmers also reported that the app has made administrative work much simpler. Earlier, tasks such as crop registration and verification required multiple visits to offices and sugar mills, often leading to delays and frustration. The digital registration process has reduced these visits and saved time. As Suresh Singh and others noted, “Earlier, I had to visit the office multiple times to complete the registration. Now, I can do it with a few clicks on my phone.” Many farmers felt that this change has allowed them to spend more time in their fields rather than dealing with paperwork and officials.

Impact of Electronic Sugarcane Slips

The introduction of electronic sugarcane slips was seen as one of the most useful features of the app. Farmers explained that earlier there was often confusion regarding

delivery dates, quantity of cane supplied, and payment calculations. Electronic slips now provide clear and accurate information, reducing misunderstandings between farmers and sugar mills. Vikram Malik mentioned, "The electronic slips have made a big difference. There's no more confusion about delivery schedules or payment amounts. Everything is clear and easy to track." This has improved trust and coordination in the cane supply process.

Better Financial Planning

Access to timely notifications regarding payments and harvesting schedules has helped farmers manage their finances more effectively. Knowing in advance when payments will arrive has reduced their dependence on informal borrowing. Sompal Singh from Lalukheri explained, "The app helps me plan better by providing timely notifications about payments and harvest dates." Farmers felt that even small updates made a difference in planning labour, inputs, and household needs.

Challenges and Areas for Improvement

Technical and Connectivity Issues

Farmers generally appreciated the government app, but some mentioned occasional technical problems while using it. A few experienced slow loading or temporary freezing, especially during busy periods. Mr. Anil Chaudhary from Kinoni shared, "Occasionally, the app crashes or freezes, especially during peak usage times." Farmers understood that such issues are common in digital platforms and felt that these problems are likely to improve with regular updates. Poor internet connectivity in some villages was also mentioned, which often affects access to digital services beyond this app as well.

Need for Better Offline Support

Many farmers felt that the app would be even more useful if some features worked without internet access. In areas where network connectivity is weak, offline access could help farmers check basic information more easily. Mr. Sunil Pal from Lalukheri explained, "It would be helpful if there were more offline capabilities. It could make the app more accessible and reliable in areas with limited internet access." Farmers viewed this as a possible improvement rather than a limitation of the initiative.

Importance of Training and Handholding

Some farmers, especially older users, shared that they find it difficult to use all the features of the app confidently. They suggested that simple training sessions or demonstrations at the village level would be helpful. Rajveer Singh noted, "It would be great if the government could organize training sessions to help us understand all the features of the app." Farmers felt that such support would encourage wider and more effective use of the app.

Strengthening Grievance Resolution

The grievance feature was seen as a positive step, as it provides a direct way to communicate problems. However, a few farmers felt that faster responses would make the system more effective. Mr. Deepak Pawar from Pinna said, "Quicker resolutions would definitely improve the experience." Farmers expressed confidence that with time and better coordination, this system would become more responsive.

Discussion and Conclusion

The findings from the interviews with sugarcane farmers in Muzaffarnagar highlight the substantial benefits of the e-Ganna app, particularly in terms of payment transparency and administrative efficiency. Farmers reported that real-time payment tracking reduced uncertainties and stress related to delayed payments, improving their financial management. The digital crop registration and electronic supply tickets streamlined administrative tasks, enabling farmers to concentrate more on their agricultural activities. However, challenges such as technical issues and limited internet connectivity hindered the full utilization of the app's features. Addressing these issues is essential for maximizing the app's potential benefits.

Finally, the e-Ganna app has had a positive impact on the livelihoods of sugarcane farmers in Muzaffarnagar by promoting transparency and efficiency in the supply chain. The app has improved operational efficiencies and fostered trust in the system, but addressing technical and infrastructural challenges remains essential. Ensuring reliable internet connectivity and providing technical support will enhance the app's effectiveness and ensure equitable access for all farmers. By tackling these challenges, the e-Ganna app can significantly support the sustainable growth of the agricultural sector, ultimately benefiting farmers and contributing to broader economic development goals in the region.

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