



# Constraints Perceived in Using Livestock-based Mobile Applications by Dairy Farmers in Uttar Pradesh

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## Abstract

*The present study was conducted in the Mathura district of Uttar Pradesh to identify the farmers' constraints in using livestock-oriented mobile applications for getting animal husbandry information and the perceived need for mobile applications to overcome these constraints. 150 dairy farmers were randomly chosen from 10 villages across five blocks. Information was gathered through a pre-designed interview schedule and focus group discussions aligned with the study objectives. The collected data were analyzed using appropriate statistical tools. The study revealed that lack of updated technology ranked first among infrastructure constraints. The inability to operate applications and their complexity is the most perceived constraint among technical constraints. Inadequate awareness of applications is the highest constraint, followed by a lack of encouragement and unwillingness to learn socio-personal constraints.*

**Keywords:** Dairy farmers, ICTs, Mobile phone, Mobile applications, Constraints.

## Introduction

Animal husbandry plays a pivotal role in the Indian economy, serving as a crucial source of supplementary income, enhancing household nutritional security, and providing gainful employment opportunities for millions of individuals. Despite India being the highest milk-producing country globally (FAOSTAT-2023), indigenous animals' production potential falls short compared to their population. Therefore, improving the productivity of dairy animals has become imperative to prevent economic losses for farmers and to meet the increasing food demand of the nation. In this context, Information and Communication Technology (ICT) emerges as a promising avenue for connecting knowledge seekers with knowledge sources, as highlighted by Warthi *et al.* (2017). ICTs, especially mobile phones, significantly narrow the gender digital divide and information gap among farmers (Surabhi *et al.* 2016). The evolution of mobile phones and advancements in the telecommunication sector has facilitated the development of numerous mobile applications, some specifically tailored to the animal husbandry sector (Fu *et al.* 2016). These applications aid in maintaining records, diagnosing diseases, developing breeds, ensuring healthcare, and facilitating the marketing of livestock and their products. However, despite the considerable potential of modern ICT tools in bridging the information gap, several constraints hinder their effective utilization by the farming community, as noted by Singh *et al.* (2015). Hence, this study aims to delve into the constraints faced by farmers in utilizing livestock-oriented mobile applications in the Mathura district of Uttar Pradesh, as well as their perceived needs regarding mobile application usage in the livestock sector.

## Materials and Methods

This study was conducted in the purposively selected Mathura district of Uttar Pradesh. 150 dairy farmers were selected randomly for the study from 10 district villages. Within each block, one village that the university had not adopted was randomly selected, while another village that the university had adopted was chosen. Information was collected from 15 randomly selected respondents from each village who possessed smartphones, resulting in 150 respondents for the study. Information was gathered through a pre-designed interview schedule and focus group discussions aligned with the study objectives. The collected data were tabulated for analysis using appropriate statistical tools, and ranks were assigned accordingly. Statistical tools like descriptive statistics, weighted mean score, standard deviation, frequency, percentage, correlation, and the relevant test were used to draw meaningful interpretations.

## Results and Discussion

### *Constraints Perceived*

Constraints faced by farmers in the use of livestock-oriented mobile applications are further divided into infrastructure constraints, technical constraints, economic constraints, socio-personal constraints, and miscellaneous constraints.

### **Infrastructure Constraint**

The data presented in Table 1 indicate that the lack of application update technology among infrastructure constraints is ranked first, followed by the non-availability of the Kisan Call Centre on holidays. Regular updates are necessary as many institutions, after developing mobile applications, do not give proper attention to the applications. Poor mobile networks and inadequate demonstration of app usage techniques are ranked third and fourth, respectively. Lack of proper technical knowledge on the rural side causes problems in fixing network issues. These findings were consistent with the study of Singh *et al.* (2017). High data consumption is the fifth-ranked constraint among infrastructure constraints. Some applications consume high data and leave the farmers with no data, which causes problems for the farmer in further communication or using mobile phones. Poor power supply is ranked sixth in non-adopted villages, whereas university-adopted villages rank fifth. Similar results were also found in the study of Naqvi and Siddiqui (2020) and Singh *et al.* (2015).

**Table 1:** Infrastructural constraints faced by the respondents

n=150

S. No.	Constraints	Non-Adopted	Rank	University Adopted	Rank
1.	Lack of app update technology	76.67	1	75.67	1
2.	Non-availability of KCC services on holidays	64.67	2	62.67	2
3.	Poor mobile network	58.67	3	59.00	3
4.	Inadequate demonstration of app usage techniques	57.00	4	58.33	4
5.	High consumption of data	47.67	5	46.00	5
6.	Poor power supply	44.67	6	46.00	5
7.	Inadequate information from the radio	40.67	7	40.00	7

### Technical Constraint

Among the technical constraints observed by the respondents, the inability to operate applications is ranked first, followed by the complexity of applications, which is ranked second among technical constraints as they are not aware of the functioning of the application due to lack of demonstration. Inadequate time to practice applications ranked third, and memory occupied by the mobile applications ranked fourth in both non-adopted and university-adopted villages as YouTube has the solution to all queries, so when the problem of storage arises in the smartphone, it is the livestock-oriented mobile applications are the first, one to be deleted from the mobile. Inadequate access to extension services is a ranked constraint. Difficulty in using the theoretical information from the application and problems understanding information through robo calls equalize with rank sixth. Unable to read is ranked ninth in non-adopted villages and sixth in university-adopted villages. These observations are by Falola and Adewumi (2011), Singh *et al.* (2018), and Singh *et al.* (2015).

**Table 2:** Technical constraints faced by the respondents

n=150

S. No.	Constraints	Non-Adopted	Rank	University Adopted	Rank
1.	Inability to operate apps	76.00	1	78.33	1
2.	Apps are too complex	75.00	2	76.33	2
3.	Inadequate time to practice the use of apps	72.67	3	75.00	3
4.	Memory occupied	60.00	4	60.00	4
5.	Inadequate access to extension services	49.67	5	49.00	5
6.	Problems in understanding information through robocalls	26.67	6	24.33	6
7.	Difficulty in making use of given theoretical information	26.67	6	24.33	6
8.	Linguistic barrier	26.67	6	24.33	6
9.	Unable to read	27.67	9	24.33	6
10.	Insufficient availability of ICT services in rural	14.00	10	15.33	10

### Socio-Personal Constraints

Results presented in Table 3 revealed that inadequate awareness of livestock-oriented mobile applications ranked first because of the lack of advertisements on popular platforms like social media. Race for rank second is a tie between lack of encouragement and unwillingness to learn among socio-personal factors as they consider surroundings more credible sources of information due to regular face-to-face contact. Socio-religious values ranked third, and actions of association or group ranked fourth in non-adopted villages. In contrast, actions of association or group and Socio-religious values ranked third and fourth, respectively. Peer influence plays a crucial role in any technology adoption and usage. These findings are in line with the results of Brar *et al.* (2020), Singh *et al.* (2018), and Singh *et al.* (2015).

**Table 3:** Socio-personal constraints faced by the dairy farmers

n=150

S. No.	Constraints	Non-Adopted	Rank	University Adopted	Rank
1.	Unwillingness to learn	26.67	2	24.33	2
2.	Lack of encouragement	26.67	2	24.33	2
3.	Socio-religious values	18.00	3	17.00	4
4.	Actions of association/group	16.00	4	21.00	3
5.	Inadequate social interaction	14.00	5	14.00	5
6.	Inadequate awareness of apps	76.00	1	79.00	1

### Economic Constraint

Economic constraints faced by the dairy farmers' state that practices recommended by the mobile application to follow are expensive, are ranked first among economic constraints, followed by the high cost of data and mobile phones, as the cost of data pack has increased daily in the last few months. Singh *et al.* (2015) and Singh *et al.* (2018) in their studies found that the high cost of services provided was a major constraint. Kanasiya *et al.* (2018) also found that financial crises were one of the serious constraints.

**Table 4:** Economic constraints faced by dairy farmers

n=150

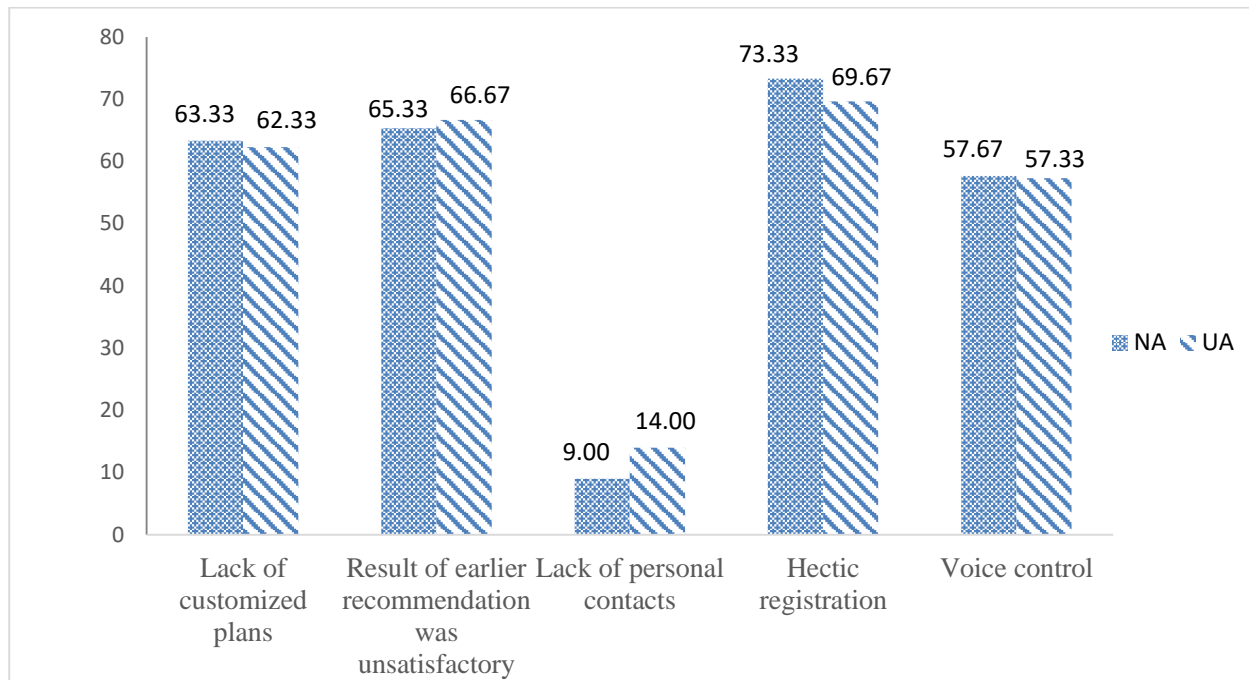
S. No.	Constraints	Non-Adopted	Rank	University Adopted	Rank
1.	High cost of mobile phones	26.67	2	24.33	2
2.	High cost of data pack	26.67	2	24.33	2
3.	Recommended practices are very expensive	72.67	1	75.00	1

### Miscellaneous Constraints

Figure 1 revealed that the lengthy registration process for login or sign-up process causes impatience and insecurity among dairy farmers, becoming one of the major barriers to using livestock-oriented mobile applications in non-adopted and university-adopted villages. Unsatisfactory results of earlier practices break the trust of the dairy farmers, which is in line with the famous saying by Andrew Grant: "You never get a second chance to make the first impression". According to dairy farmers, the lack of customized plans and voice control to applications like Google and YouTube to remove language barriers is ranked third, with nearly 63 WMS, and fourth, with WMS 57.00, respectively. Lack of personal contact was the least concern constraint for the dairy farmers as everyone is connected closely in a rural framework. Kumar *et al.* (2018) and Singh *et al.* (2018) observed similar constraints in their studies.

**Table 5:** Miscellaneous constraints faced by dairy farmers

S. No.	Constraints	Non-Adopted	Rank	University Adopted	Rank
1.	Lack of customized plans	63.33	3	62.33	3
2.	The result of the earlier recommendation was unsatisfactory	65.33	2	66.67	2
3.	Lack of personal contacts	9.00	5	14.00	5
4.	Hectic registration	73.33	1	69.67	1
5.	Voice control	57.67	4	57.33	4



**Figure 1:** Miscellaneous constraints faced by the dairy farmers in using mobile applications.

### ***Perceived Need of the Dairy Farmers Regarding Mobile Applications***

The weighted mean of the perceived need is calculated from the frequency and percentage table, and ranks were assigned based on the result.

**Table 6:** Distribution of respondents according to perceived need for mobile application

(n=150)

S. No.	Need	WMS	Rank
1.	Training reminders	72.33	3
2.	Feed formulation software	75.45	2
3.	Updated content	80.70	1
4.	Voice command	75.45	2
5.	Offline mode of working	53.00	8
6.	Multi-user collaboration	55.66	7
7.	Good quality of audio-video content	47.00	9
8.	Feedback submission	70.67	4
9.	Location-specific content	64.40	5
10.	Practicable content	58.60	6

WMS: Weighted Mean Score

Updated content and regular updates of mobile applications were the urgent needs of the dairy farmers as it enhanced their efficiency of decision making, followed by feed formulation software and voice command to overcome the language barrier. Feed is the most important pillar of livestock management. Hence, feeding the right proportion of feed to the livestock is necessary for proper growth and production, which can be achieved with the help of feed formulation software. Training reminders in mobile applications are necessary so they cannot miss the opportunity to attend the training to build capacity. The feature of feedback from the farmers in the mobile application helps build trust and better bonding. Mobile applications should provide content that is local and applicable in the fields. A multi-collaboration platform allows farmers to extend their reach, engage in peer-to-peer learning, and help achieve the goal of farmer-to-farmer extension. Mobile applications' ability to operate offline is becoming increasingly necessary because continuous connectivity is inadequate.

## Conclusion

This study highlights the utilization of Smartphone's and their applications by dairy farmers for animal husbandry activities in the study area. To capitalize on this potential, it is essential to raise awareness among dairy farmers about the benefits of mobile applications through platforms like WhatsApp groups and other social media channels. Introducing voice command features in these applications can help overcome language barriers while enabling offline mode functionality can address challenges related to network connectivity. Moreover, extension agencies and government officials should organize training programs to bridge the knowledge gap to enhance dairy farmers' digital literacy. These initiatives would empower farmers to utilize livestock-oriented mobile applications for their needs easily.

Additionally, there is a pressing need to develop localized applications in the regional language, prioritizing the specific requirements of dairy farmers. By implementing these recommendations, we can ensure the effective adoption and utilization of mobile technology to enhance productivity and efficiency in the dairy sector.

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## Conflict of Interests

There is no conflict of interest.

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