

Farmer Perceptions and Adoption of Voice- Based AI in Agricultural Advisory: A case Study of “Govi Mithuru” by Dialog Axiata in Sri Lanka

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Abstract: Agriculture can be introduced as an important sector in Sri Lanka with the approximate contribution of 7% to the national GDP and ensuring employment opportunities to over 30% of the population in Sri Lanka. Smallholder farmers who cultivate less than two hectares can be considered vital in ensuring food security by contributing the major rice, fruits and vegetables production. To help these farmers, Dialog Axiata launched Govi Mithuru (“Farmer’s Friend”), a mobile based voice AI advisory service providing tailored agricultural guidance on land preparation, pest control, harvesting and family nutrition. This study was conducted to analyze the small holder farmers’ use, satisfaction and experience with Govi Mithuru voice AI in the Galle district. A quantitative descriptive research design was developed to collect the data using a structured questionnaire in Sinhala. Out of 88 targeted farmers, 35 respondents completed the survey within the given time. Data was analyzed using descriptive statistics and cross tabulation in SPSS. According to the results of the study, 91.4% of farmers agreed that the service was attractive, 82.9% were satisfied with the speed of responses, and 68.6% perceived the information as accurate and trustworthy. Overall, farmers reported positive experiences with 100 % of farmers recommending the Govi Mithuru Voice AI service to other farmers. There were minor network and language issues reporting only by six respondents. Farmers indicated the importance of Govi Mithuru

Voice AI service in enhancing agricultural knowledge and accessibility, especially for less experienced farmers. This study suggests the significance of Govi Mithuru Voice AI in improving agricultural knowledge among communities and improving agricultural productivity.

Keywords: Agriculture, Digital Advisory Service, Govi Mithuru, Small holder farmers, Sri Lanka, Voice AI

INTRODUCTION

Sri Lankan agricultural sector is an important economic sector contributing to approximately 7% of the GDP and giving employment opportunities over 30% of the Sri Lankan population. Major crops growing in Sri Lanka are paddy, tea, rubber, coconut and different types of fruits and vegetables. Agriculture sector plays a vital role in assuring food security and poverty reduction in Sri Lanka [1].

Small holder farmers are important to Sri Lankan agriculture since they produce most rice, fruits and vegetables on less than 2 hectares of land and contribute majorly to food security. Mithuru voice AI system small holder farmers were aimed at in this study (Ministry of Agriculture) [2].

Eighty-eight farmers were selected for the study. Only 35 percent farmers were completed the survey. Phone call interviews were conducted to collect the data.

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Govi Mithuru, which translates from Sinhala to "Farmer's Friend," is a mobile-based agricultural advisory service launched by Dialog Axiata in 2015 to empower farmers across Sri Lanka with critical, timely information. Initially, the service operated on Interactive Voice Response (IVR) technology, delivering pre-recorded, customized voice messages on topics such as land preparation, sowing schedules, pest control, harvesting, and family nutrition. Upon registration, users could select their crops and location, prompting the system to automatically send personalized voice calls with step-by-step guidance throughout the crop cycle.

A key design principle was inclusivity; by using IVR, the service remained accessible to individuals with basic mobile phones, overcoming barriers related to smartphone ownership and literacy. To cater to Sri Lanka's diverse population, all content was provided in Sinhala, Tamil, and English.

In 2025, the service was significantly upgraded with the launch of the Govi Mithuru Voice AI (beta version), transforming it from a one-way information-push system to a fully interactive advisory platform. This evolution is driven by an integrated AI system built on a Retrieval-Augmented Generation (RAG) architecture and a speech-to-speech Large Language Model (LLM).

This advanced approach allows a farmer to ask a question in their natural spoken language; the system then searches a curated agricultural knowledge base for relevant facts and uses the generative model to synthesize a precise and contextually appropriate verbal response.

The RAG framework is crucial as it grounds the AI's answers in factual data, mitigating the risk of inaccurate "hallucinations" and ensuring reliable advice. By offering a fully conversational voice interface, Govi Mithuru Voice AI is designed to completely overcome literacy barriers, empowering any farmer to receive instant, tailored advice whenever they need it [3].

After developing partnership with the Ministry of Agriculture, Ministry of Health and CABI, this service was tailored to each farmer's crop, location cultivation stage. Govi Mithuru is important to bridge the information gap in rural farming communities, empowering smallholder farmers to improve productivity, protect crops and enhance household well-being.

It can be seen a growing integration of voice-based AI technologies in agriculture. However, there is a significant gap in understanding how farmers, particularly smallholders in developing regions- interact with these systems. While platforms like Govi Mithuru aim to democratize access to agricultural knowledge through voice interfaces, empirical research on user experience, trust, and behavioral adoption is limited.

Most studies focus on technical feasibility or system architecture, rather than farmer-centric usability and engagement [4]. Hence this research study was conducted to identify the farmer centric usability and engagement of the Govi Mithuru Voice AI in Galle district Southern Province in Sri Lanka. In here, the ease of use of the system, the level of satisfaction with its speed, relevance, and usefulness, and the accuracy and trustworthiness of the responses were evaluated.

The study also explored the extent to which the language and style of the service are relatable to farmers and network and language barriers.

METHODOLOGY

This study used a quantitative descriptive research design to analyze the user perceptions and experiences with the Govi Mithuru Voice AI service. The approach was selected to systematically collect the measurable data on usability, accuracy and adoption factors of Govi Mithuru Voice AI among Sri Lankan small holder farmers.

A structured questionnaire was used to collect the primary data, and a comprehensive literature review was conducted to collect the secondary data. The target population was registered small holder farmers in Galle district, southern Province in Sri Lanka. A purposive sampling technique was used to identify participants who actively engage with the Govi Mithuru Voice AI service.

A sample of 35 small holder farmers in Galle district was selected for the study.



Figure 1: Area of research study- Galle district

A structured questionnaire was used to collect the primary data. The questionnaire was developed in English and Sinhala to ensure linguistic accessibility. Questionnaire was divided into 8 sections, and first section was used to gather data on general information about the farmers. Second section was developed to gather data on ease of use of the Govi Mithuru Voice AI. Third section was used to collect data on user experience. Other sections were used to collect data on accuracy of the responses, familiarity of the model, usefulness, willingness to pay and potential problems, issues of using voice AI. Most items were measured using a 5-point Likert scale (1= Strongly Disagree to 5= Strongly Agree), along with multiple –choice and open-ended questions to capture qualitative insights.

Data was collected through telephone interviews and in-person surveys depending on the respondents' location and accessibility. Respondents were assured of confidentiality and the academic purpose of the study. Quantitative data were analyzed using descriptive statistics (mean, frequency, percentage) and cross tabulation to identify patterns across demographic groups. Statistical software named SPSS was used to analyze the data.

RESULTS AND DISCUSSION

A. General information of the respondents

A total of 88 farmers in Galle district were contacted for the study, and 35 respondents completed the survey. Majority of the participants of this study were smallholder farmers cultivating mainly paddy. Besides paddy most of the farmers were in the cultivation process of vegetables, cereals, Plantation crops (tea, coconut, rubber, oil palm, and sugarcane), fruit crops, mushroom, leafy vegetables, ornamental plants and medicinal plants for subsistence and local market. When considering farming experience, most of the farmers had more than 15 years of farming experience highlighting a sample composed largely of experienced cultivators. 96.4% of farmers agreed that they use any agricultural advisory service to get cultivation related advice. From that, 87.6% farmers considered government services as their current agricultural advisory service provider. Other farmers were using private consultancy, online platforms (websites, apps and social media) to get agricultural advice. 96.6% of farmers agreed that they are satisfied with their current agricultural advisory service provider.

B. Ease of use of the Govi Mithuru Voice AI

Table 1: Ease of use Govi Mithuru Voice AI. (n=35)

Scale	Percentage of Respondent				Mean	Standard Deviation
	D	N	A	SA		
It is easy to start the Govi Mithuru Voice AI	5.7	2.9	71.4	20	4.05	0.68
The Voice AI language is familiar and relatable	8.6	5.7	80	5.7	3.82	0.66
Interacting with voice AI helps to think and stay mentally active	20	8.6	68.6	2.9	3.54	0.85
Overall, the voice AI is good and attractive	0	2.9	91.4	5.7	4.028	0.29

Source: Author compile (2025)

(D-Disagree, N-Neutral, A - Agree, SA-Strongly Agree)

As presented in Table 1, Most farmers reported that the Govi Mithuru Voice AI was easy to start (71.4% agreed, 20% strongly agreed, $M=4.06$, $SD=0.66$).

This is further illustrated in Figure 2.

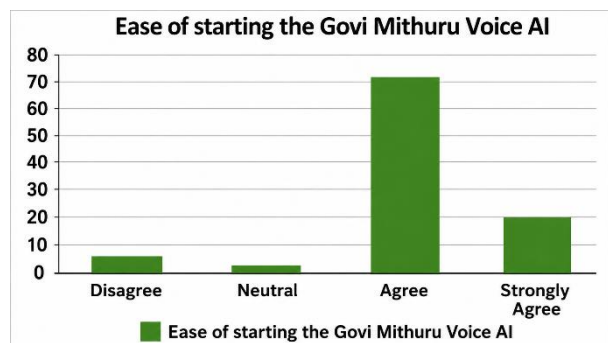


Figure 2: Ease of starting Govi Mithuru Voice AI

This high level of acceptance indicates the service is user-friendly and accessible.

Similarly, 80% agreed that the system was familiar and relatable ($M=3.83$, $SD=0.66$). However, responses were more mixed regarding whether interacting with Voice AI helped them stay mentally active, with 20% disagreeing and 68.6% agreeing ($M=3.54$, $SD=0.84$). 91.4% of farmers agreed that they felt that the voice AI is good and attractive, and 5.7% strongly agreed with the statement.

These findings indicate that the system is accessible and linguistically relatable to rural users.

These findings are aligned with the research finding that discusses the importance of localized content in agricultural extension services [5].

C. User experience of the Govi Mithuru Voice AI

As shown in Table 2, 82.9% of farmers expressed satisfaction with the speed of responses by the Govi Mithuru Voice AI. 74.3% agreed that the information provided was relevant and useful ($M=3.77$, $SD=0.69$). 91.4% agreed that, according to their opinion, it was very desirable and worthwhile to use the Voice AI for farming and related purposes. Furthermore, 97.1% showed positive feelings towards the Voice AI ($M=4.14$, $SD=0.43$).

Table 2: User Experience of the Govi Mithuru Voice AI

Scale	Percentage of Respondents				Mean	Standard Deviation
	D	N	A	SA		
Satisfaction with the speed of the Voice AI responses for queries	5.7	11.4	82.9	0	3.77	0.54
The voice AI provides relevant and useful information to queries	8.6	11.4	74.3	5.7	3.77	0.68
It is very desirable and worthwhile to use Voice AI for farming and related purposes	5.7	2.9	80	11.4	3.97	0.61
Overall, there are positive feelings towards the Voice AI	0	2.9	80	17.1	4.14	0.42

Source: Author Compile (2025)

(D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree)

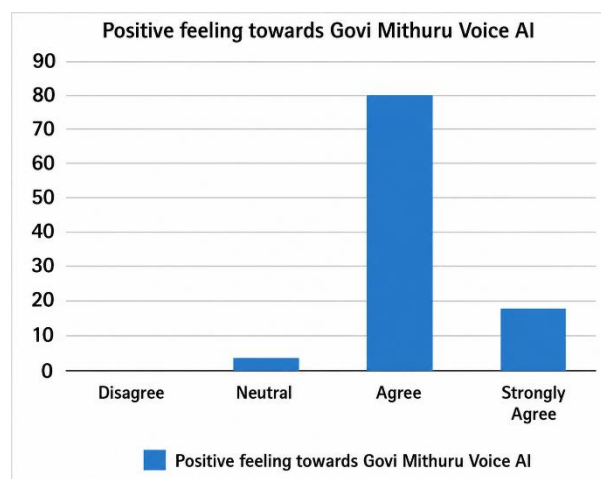


Figure 3: Positive feeling towards the voice AI

According to these results, the service is perceived as efficient and valuable aligning with evidence regarding mobile based advisory tools that enhance knowledge dissemination and decision- making among smallholders [6].

D. Accuracy of Responses

Table 3: Accuracy of responses of the Govi Mithuru Voice AI

Scale	Percentage of Respondents					Mean	Standard Deviation
	SD	D	N	A	SA		
The voice AI provide accurate and trustworthy information	2.9	11.4	8.6	68.6	8.6	3.68	0.90
The answers of the Voice AI correspond to the question asked.	2.9	11.4	8.6	71.4	5.7	3.65	0.87
Satisfaction with the Voice AI responses for my queries as a farmer.	0	11.4	5.7	82.9	0	3.71	0.66

Source: Author compile (2025)

(SD-Strongly disagree, D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree)

According to the above table 3, Perception of accuracy was largely favorable with 68.6% agreeing that the information was accurate and trustworthy (M=3.69, SD=0.90). Similarly, 82.9% were satisfied with the responses to their queries (M=3.71, SD= 0.67) while these findings indicate high levels of trust in the Govi Mithuru Voice AI service, a small proportion of respondents (11.4%) expressed dissatisfaction, suggesting occasional mismatches between queries and system responses. This can be due to contextual limitations of AI driven advisory systems as also notes in previous ICT4D studies [7].

E. Familiarity of the model

Table 4: Familiarity of the model (n = 35)

Statement	Percentage of Respondents				Mean	Standard Deviation
	D	N	A	SA		
The Voice AI language aligns with communication pattern of farmer	11.4	5.7	80	2.9	3.74	0.70
Voice AI is relatable and understands farmer context as the farmer.	11.4	5.7	80	2.9	3.74	0.70
The Voice AI answer style meets farmer expectations and preferences	14.3	5.7	74.3	5.7	3.71	0.78

Source: Author compile (2025)

(D-Disagree, N-Neutral, A-Agree, SA-Strongly Agree)

According to table 4, most respondents agreed that the language and communication style aligned with their expectations (M=3.74, SD=0.70).

F. Usefulness Of the Service

Table 5: Usefulness of the Govi Mithuru Voice AI (n=35)

Statement	Percentage of Respondents				Mean	Standard Deviation
	D	N	A	SA		
Voice AI provides service and information very useful in farming activities	17.1	8.6	71.4	2.9	3.60	0.81
Using voice AI would improve performance in farming activities	14.3	8.6	77.1	0	3.62	0.73
Voice AI adds value to farming activities	14.3	5.7	77.1	2.9	3.68	0.75

Source: Author compile (2025)

(Disagree, N-Neutral, A-Agree, SA-Strongly Agree)

According to the above table 5, 71.4% agreed that the service is valuable for farming activities, and 77.1% believed it improved performance. Hence it is clear that Govi Mithuru Voice AI has the capacity to supply traditional extension services and improve decision making in rural environments.

G. Challenges and Recommendations

When considering the challenges, six respondents reported challenges, five related to network connectivity and another one related to language barriers. Farmers also highlighted the need for regular content updates for the better knowledge updates among farmers on different topics such as emerging crop diseases, fertilizer use and water management.

H. Willingness to pay

None of the farmers currently paid for advisory services, yet 57.6% of farmers indicated their willingness to pay a small fee for the regular usage of the Govi Mithuru Voice AI service. This is further illustrated in figure 4.

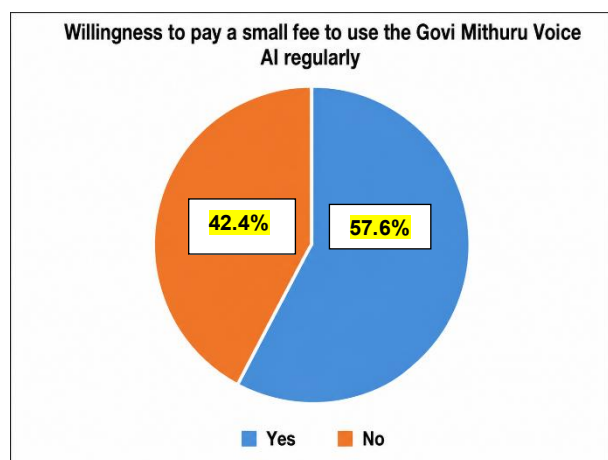


Figure 4: Willingness to pay for Govi Mithuru Voice AI service

Following figure 4 shows the amount that farmers are willing to pay for the Govi Mithuru Voice AI service.

Majority of the farmers (95.2%) mentioned their willingness to pay RS 250-RS 500 per month and only 4.8% of farmers indicated that they are willing to pay RS 500 - RS 750 per month. 100% of the farmers indicated willingness to recommend Govi Mithuru Service to others, mentioning its ability to provide timely knowledge, especially for less experienced farmers.

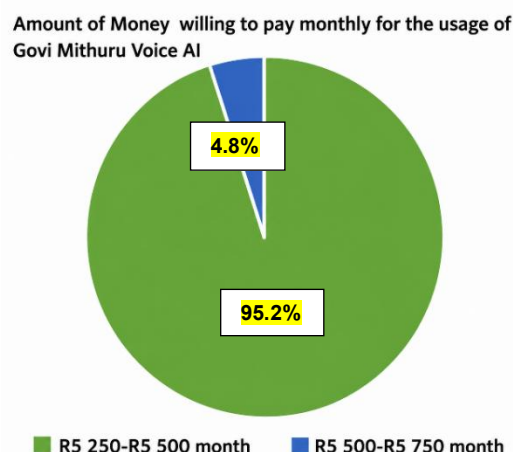


Figure 5: Amount of money that farmers are willing to pay for the Govi Mithuru Voice AI service.

I. Relationships Between Farmer Characteristics and Govi Mithuru Voice AI Usage

Table 6: Cross tabulation of Farming Experience and Satisfaction with Voice AI responses

Farming Experience	Disagree	Neutral	Agree	Total
< 5 years	0	0	3	3
5-10 years	0	0	3	3
10-15 years	0	1	4	5
>15 years	4	1	19	24
Total	4	2	29	35

Source: Author's survey data (2025)

Cross tabulation (Table 6) shows that all farmers with less than 10 years of experience agreed with the Voice AI satisfaction. Among those with 10-15 years of experience, four agreed while one was neutral. Farmers with more than 15 years' experience showed mixed responses. 19 agreed, one neutral and four disagreed. Overall, the majority across all experience groups reported satisfaction with the service. This shows the broad applicability of the Govi Mithuru Voice AI regardless of the user farming experience.

Table 7: Cross tabulation of Age range and ease of use Govi Mithuru Voice AI.

Age range	Disagree	Neutral	Agree	Strongly Agree	Total
25-35	0	0	2	0	2
35-45	0	0	3	1	4
45-55	0	0	8	4	12
>55	2	1	12	2	17
Total	2	1	25	7	35

Source: Authors survey data (2025)

According to Table 7, it can be seen a clear pattern between age range and the ease of starting the Govi Mithuru Voice AI. Younger farmers (25-35 years) all agreed that the system was easy to start, while older farmers (> 55 years) showed more mixed responses, with two disagreeing and 1 reporting neutral views. Most respondents across all age groups, however, agreed or strongly agreed that system was easy to start (91.4% in total), indicating that age had little negative impact on usability. Overall, the study indicates that the Govi Mithuru Voice AI is widely accepted, accessible, and trusted among Sri Lankan smallholder farmers. It addresses information gaps in agriculture, particularly where access to extension officers is limited. These results confirm prior evidence on the role of mobile-based advisory systems in enhancing productivity, reducing knowledge asymmetry, and contributing to food security [8]. For the sustainable use of the Govi Mithuru Voice AI among farmers, it is important to overcome the challenges such as limited technical infrastructure and the need for updated content.

CONCLUSION

This study analyzed how smallholder farmers in Galle district interact with and experience the Govi Mithuru Voice AI as an agricultural advisory service. According to the results of the study farmers indicate the service as highly valuable and practical, especially for providing timely and relevant farming advice. The results of the study show that most of the farmers in Galle district had positive experiences with the Govi Mithuru Voice AI service. Most farmers (71.4% agree, 20% strongly agree) agreed that the service is easy to start, and 80% reported that the language was familiar and relatable. 82.9% of farmers considered the information relevant and 74.3% of farmers indicated that the service is useful. A large majority (91.4%) agreed that the system was attractive, while 80% expressed positive feelings towards using it.

Even though this research findings confirm the usefulness and acceptance of the Govi Mithuru Voice AI, study was limited to a small sample in one district. Future research should be expanded into other regions and explore long-term impacts on productivity and income. This service is a useful digital advisory tool and can be used to strengthen the food security and support the smallholder farmers in Sri Lanka.

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