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Assessment of Knowledge of Farmers on Market-Led Extension Practices in Northern Karnataka

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Authors' contributions

This work was carried out in collaboration between both authors. Author VC designed interview schedule conducted the survey, involved in data collection, analysis, tabulation and writing the research paper. Author AJG is the chairman of the advisory committee involved in planning, constant monitoring throughout the study, analyzing and interpreting the results. Both authors read and approved the final manuscript.

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ABSTRACT

With a significant increase in agricultural production, India has achieved self-reliance in food. However, the focus has now shifted from mere production increases to maximizing returns on investments. Liberalization, privatization and globalization have transformed the world into a global village, requiring Indian farmers to compete internationally. The extension system must evolve to equip farmers with market-oriented knowledge and skills. In this regard, the present study assessed farmers' knowledge of market-led extension practices in five districts of Northern Karnataka. The

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study sample comprised 240 respondents selected through simple random sampling. The results revealed that around forty per cent of grape growers belonged to the high knowledge category, followed by 52.50 per cent of areca nut growers and 42.50 per cent of maize growers who had a medium level of knowledge on market-led extension practices. Nearly ninety per cent of grape farmers had knowledge of production practices, followed by 75.63 per cent with knowledge of post-harvest practices. Regarding areca nut, 92.50 per cent had knowledge of post-harvest practices and 83.52 per cent of production practices. The majority of maize growers (86.25%) had knowledge of production practices, with 68.75 per cent knowledgeable about post-harvest practices. The study highlighted significant gaps in farmers' knowledge regarding export and brand management. Addressing these gaps through tailored extension interventions like technology adoption and market-focused training, is crucial for enhancing farmers' competitiveness and promoting sustainable agricultural enterprises in the region.

Keywords: Areca nut; branding; export; grapes; maize; market-led extension; post-harvest practices.

1. INTRODUCTION

In India, agriculture has traditionally been rooted in age-old practices, with extension systems primarily focused on increasing crop productivity. However, due to technological advancements and globalization, farmers are now driven to reassess agricultural strategies [1]. Moving beyond subsistence farming, they aim to transition their agricultural activities into profitable ventures capable of navigating contemporary challenges[2-4]. This shift sets a broader goal of utilizing agriculture as a means of securing sustainable livelihoods and fostering economic development [5].

With information readily available and markets evolving rapidly, farmers are adopting a pragmatic approach that prioritizes market dynamics in agricultural decision-making. Market-led extension emerges as a pivotal paradigm in agricultural extension services, aimed at equipping farmers with the knowledge and tools necessary to thrive in a competitive agricultural landscape [6]. By bridging the gap between traditional farming practices and modern market realities, market-led extension enables farmers to make informed decisions and optimize their agricultural enterprises [7].

Fundamentally, market-led extension identifies that agriculture extends beyond production; it involves understanding and responding to consumer demands and the broader agribusiness environment. Leveraging technology, market-led extension provides farmers with timely market information, facilitating strategic decision-making regarding crop selection, cultivation techniques, post-harvest activities, market information, export prospects, and brand positioning[8]. By fostering a market-oriented mindset, market-led extension empowers farmers to adapt to changing market conditions, diversify revenue streams, and maximize returns on investment.

In the context of North Karnataka, grapes, areca nut and maize are prominent crops that present both unique challenges and significant opportunities for farmers [9,10,11]. Grape cultivation in North Karnataka benefits from favorable climatic conditions but faces challenges such as pest infestations, quality control issues, and market fluctuations [9]. Areca nut, a significant cash crop in the region, is susceptible to price volatility and disease outbreaks [10]. Maize, a staple crop with diverse applications, requires careful management to ensure both food security and economic viability [11]. Market-led extension plays a crucial role in addressing these challenges by providing farmers with real-time market information, pest and disease management strategies, and quality enhancement techniques. By leveraging market insights, farmers can make informed decisions about crop varieties, timing of harvest, and post-harvest handling to meet market demands and maximize profits.

To utilize market-led extension practices effectively, farmers must possess adequate knowledge about these practices. Recognizing this need, the current study aims to assess the knowledge of farmers regarding market-led extension practices. By evaluating their awareness and understanding, the study seeks to identify gaps and provide insights into how extension services can be tailored to better support farmers in transforming their agricultural activities into profitable and sustainable ventures.

2. METHODOLOGY

The present study was conducted in Bagalkot, Belagavi, Haveri, Uttara Kannada and Vijayapura districts of Karnataka in 2020-21. Keeping in view, the highest area under the crop in Northern Karnataka, Bagalkot and Vijayapura districts were selected for grapes, Uttara Kannada district for areca nut and Belagavi and Haveri districts for maize. Two taluks each from Bagalkot, Vijayapura, Belagavi, and Haveri districts, and four from Uttara Kannada were identified based on crop cultivation areas. Four villages were randomly chosen from each taluk, totaling 48 villages. Subsequently, five farmers were randomly selected from each village using simple random sampling, resulting in the final sample size of 240 respondents. Ex-post-facto research design was followed for carrying out the study.

Knowledge level of farmers on market-led extension practices was assessed through knowledge scale developed for the study. Knowledge statements of the scale were administered to the farmers in the form of multiple choice questions that had four alternatives of which one was correct and others were incorrect. A score of one was assigned to correct answer and zero for the incorrect.

Analysis of variance (ANOVA) measure was used to test the significance of means among the variables. In this study, two way analysis of variance technique was used to test the significance of means of farmers growing different crops and their level of knowledge and utilization of market-led extension practices. When the value of F was significant in ANOVA, to determine which pairs of means are significantly different, and which are not, Tukey's HSD multiple comparison method was used.

3. RESULTS AND DISCUSSION

3.1 Overall Knowledge Regarding Market-Led Extension Practices

The results in Table 1 provided an overview of the overall knowledge of farmers on market-led extension practices.

It was found that 38.75 per cent of grape growers had a high level of knowledge on market-led extension practices. Grape cultivation was economically lucrative and farmers involved in its production had accumulated knowledge over the years through experience and various information sources. These farmers were well-versed in post-harvest activities, regularly practicing grading, processing, storage, and value addition. Educated grape growers had often explored unconventional marketing avenues to enhance the value of their produce. Managing different stages of crop cultivation entailed various risks, necessitating farmers to stay updated to effectively handle challenges. The collaborative efforts of line departments, along with easy access to information through e-tools and the educational level of farmers, had further expanded their knowledge base.

Additionally, 52.50 per cent of areca nut farmers fell into the medium knowledge category. These farmers maintained regular contact with cooperative societies, which provided valuable information on production and post-harvest aspects. Access to market and information is facilitated through well established cooperative societies in the study area and online channels. However, areca nut growers lacked knowledge of export markets

Furthermore, 42.50 per cent of maize growers also belonged to the medium knowledge category. While these farmers possessed comprehensive knowledge of production techniques and post-harvest practices, they had limited knowledge of market services, particularly regarding export and branding aspects. The absence of export opportunities and branding initiatives for the crop in the study area further contributed to these results.

3.2 Component-Wise Knowledge Regarding Market-Led Extension Practices

The study also assessed component-wise knowledge of farmers regarding market-led extension practices across three crops: grapes, areca nut and maize. The findings are presented in Table 2.

3.2.1 Production practices

Farmers across all three crops exhibited a high level of knowledge regarding production practices. Grape farmers showed the highest level (86.70%), followed closely by maize farmers (86.25%) and areca nut farmers (83.52%). These findings indicated a strong comprehension of production practices among all three categories of farmers, who have been cultivating crops for generations and benefit from

local expertise passed down through the years. Consequently, they possessed comprehensive knowledge regarding various cultivation aspects, including land preparation, nutrient management, pest and disease control, harvesting, and understanding favorable agro-climatic conditions essential for optimal crop growth. Moreover, their proficiency in adopting best practices is strengthened by access to resources such as agricultural extension services, government initiatives promoting crop cultivation, and incentives driven by market demand. These results are consistent with the findings of Adityan et al. [12], Kasinath et al. [13] but contradicted the finding of Rufaida and Singh [14].

3.2.2 Post-harvest practices

Areca nut farmers demonstrated the highest knowledge in post-harvest practices (92.50%), followed by grape farmers (75.63%). Both areca nut and grape farmers exhibited high knowledge due to capacity-building programs by agricultural extension services, farmer cooperatives, and government initiatives, which equiped farmers with essential skills. The adoption of modern technologies enhanced processing efficiency and ensured the quality of produce. The economic importance of both crops encouraged farmers to invest in expertise, thereby enhancing their proficiency in post-harvest activities. These results are consistent with Dadkhwah and Demiryürek [15].

However, maize farmers exhibited a relatively lower level of knowledge (68.75%). They primarily engaged in basic practices such as threshing, milling, and grading. Their understanding of advanced post-harvest methods, including scientific storage procedures and storage pest management, as well as the production of value-added maize products such as maize starch and fiber was limited. These findings are in line with those of Pelemo et al. [16].

3.2.3 Market information services

Two-thirds of grape farmers (66.11%) and areca nut farmers (61.04%) had knowledge of market information services. Grape farmers were aware of various sources of market information such as the kisan call center and online portals. However, they lacked knowledge about using online marketing channels and were unfamiliar with the workings of e-NAM, including the sampling procedures and quality parameters. Areca nut farmers primarily gathered market service information on pricing, crop insurance schemes, and marketing loans from cooperative societies. However, they lacked knowledge about futures trading. These results are consistent with Kasinath et al. [13]

Table 1. Distribution of farmers according to their overall knowledge regarding market-led extension practices

(N=240)

Sl. No.	Category	Grapes (n_1=80)		Areca nut (n_2=80)		Maize (n_3=80)	
		f	%	f	%	f	%
1	Low	23	28.75	20	25.00	18	22.50
2	Medium	26	32.50	42	52.50	34	42.50
3	High	31	38.75	18	22.50	28	35.00
		Mean: 70.26		Mean: 61.88		Mean:61.13	
		SD: 7.06		SD: 7.17		SD: 6.13	

SD – Standard Deviation

Table 2. Component wise knowledge regarding market-led extension practices

(N=240)

Sl. No.	Component	Knowledge index (%)		
		Grapes (n_1=80)	Areca nut (n_2=80)	Maize (n_3=80)
1	Production practices	86.70	83.52	86.25
2	Post harvest practices	75.63	92.50	68.75
3	Market information services	66.11	61.04	51.07
4	Export orientation	58.21	18.96	26.56
5	Brand establishment	52.00	50.25	30.94

Table 3. Analysis of variance between farmers growing different crops and their knowledge level

(N=240)

Source	Sum of square	d.f	Mean square	F
Between crops	1625.32	2	812.69	649.467**
Between categories	1069.76	2	534.88	427.468**
Error	289.04	231	1.25	
Total	3157.90	239		

*** – Significant at 1 % level*

Table 4. Multiple comparison between farmers growing different crops and their knowledge level

(N=240)

Statistical test	Crop	Mean Difference	Std. Error
Tukey HSD	Grapes and areca nut	5.663**	0.1769
	Areca nut and maize	0.213	0.1769
	Maize and grapes	5.875**	0.1769

*** – Significant at 1 % level*

More than half (51.07%) of maize farmers had knowledge of market information services, aware of the minimum support price and how to claim it, but had limited knowledge about online marketing portals like 'agmarknet' and 'Krishi Maarata Vahini,' which provided extensive information on maize market prices. Additionally, they lacked knowledge of e-trading and futures trading. This indicated a reliance on a limited number of sources for accessing information and highlights the need for improved dissemination of market information services through multiple channels, especially among maize farmers.

3.2.4 Export orientation

Grape farmers were the most knowledgeable about export orientation (58.21%) among the surveyed farmers due to the lucrative international market for grapes, driving better dissemination of export-related information and frequent interactions with export agencies. Support from tailored extension services, well-developed infrastructure like cold storage, and significant economic incentives further enhance their awareness. However, they lacked knowledge on import-export codes required for export and export facilitating organizations like APEDA. Similar findings were reported by Patil et al. [17]

In contrast, maize farmers (26.56%) and areca nut farmers (18.96%) had significantly lower knowledge levels. These crops primarily cater to domestic markets, leading to less emphasis on export-related information and training. The infrastructure for exporting maize and areca nut was less developed, reducing access to export markets. Government policies focused more on local market support and food security, resulted in lower levels of export orientation knowledge among maize and areca nut farmers.

3.2.5 Brand establishment

More than half the number of grape farmers (52.00%) and areca nut farmers (50.25%) had knowledge of brand establishment due to the efforts of FPOs and cooperative societies in raising awareness about branding. The presence of processing industries and the production of branded, value-added products in these localities also enhanced farmers' knowledge. High market demand and consumer preferences for branded products incentivized farmers to focus on brand development.

In contrast, only 30.94 per cent of maize farmers had knowledge of brand establishment. Maize is typically sold in bulk, reducing the focus on branding. Extension services for maize prioritized yield improvement over marketing, contributing to lower branding knowledge. Additionally, maize farmers were often unaware of e-governance assistance for brand promotion, food product licensing, and the role of organizations like FSSAI in branding, which further limited their knowledge.

3.3 Analysis of Variance between Farmers Growing Different Crops and Their Knowledge Level

The results of the analysis of variance in Table 3 indicated that there was a significant difference (F = 649.467) among the farmers growing various crops and their knowledge on market-led

extension practices at one per cent level of significance. Further, it was also found that there was a significant difference (F = 427.468) between the various knowledge categories at one per cent level of significance.

3.4 Multiple Comparisons between Farmers Growing Different Crops and Their Knowledge Level

As the F value for difference between the crops was significant, post hoc multiple comparisons were made. In this study, Tukey's HSD test was used. From Table 4, it was inferred that there was a significant difference in knowledge on market-led extension practices between the farmers growing grapes and areca nut (MD = 5.663), and grapes and maize (MD = 5.875) at one per cent level of significance. There was no significant difference in knowledge between farmers growing areca nut and maize (MD = 0.213).

The significant disparity in farmers' knowledge levels rooted from several factors. Grape farmers, who were relatively younger, more educated and possessed larger land holdings, demonstrated a proactive approach in seeking information beyond traditional channels. They often utilized e-tools, such as the internet, to stay updated with the latest technologies and trends in the competitive market. Conversely, areca nut and maize farmers in the study area relied heavily on cooperatives, FPOs and line departments, limiting their exposure to alternative sources of information. They typically perceived the information obtained from these entities as sufficient for successful crop cultivation, inadvertently constraining the expansion of their knowledge base.

4. CONCLUSION

The study highlights the knowledge of farmers of market-led extension on cultivating grapes, areca nut, and maize in North Karnataka. Grape farmers, who demonstrated the highest knowledge levels, benefit from a proactive approach in leveraging e-tools and diverse information sources, while areca nut and maize farmers tend to rely more on cooperatives and traditional extension services. This reliance on limited information channels restricts their exposure to comprehensive market insights and advanced agricultural practices. Consequently, while farmers across all crops exhibit strong knowledge in production practices, significant gaps exist in market information services, export orientation, and brand establishment.

Addressing these gaps through tailored extension interventions that incorporate advanced technologies and innovative methods is essential. As farmers' participation is high in FPOs and cooperatives, they can be involved in organizing capacity building programmes periodically. Further by improving access to comprehensive market information, fostering export orientation, and encouraging brand establishment, extension services can significantly enhance the market competitiveness of farmers. This transformation of traditional farming into economically viable and sustainable enterprises will not only boost farmers' profitability but also contribute to broader economic development and sustainable livelihoods.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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