Factors affecting the sharing of information on quality durian production by farmers in Rayong Province, Thailand

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Abstract This study examined the factors influencing information exchange among durian farmers in Rayong Province, Thailand, regarding high-quality production practices. A survey of 54 farmers, equally distributed by gender, revealed an average age of 44.52 years, with most being married and holding at least a bachelor's degree. The majority cultivated Monthong durian on plots of five rai or larger and had over five years of experience. Farmers applied their knowledge of water and maintenance systems, among other practices. The study findings revealed that motivation levels correlated with the farmers' propensity to share information. Factors influencing information exchange, ranked from the highest to the lowest average value, were knowledge promotion and development ($\bar{x} = 4.24$), marketing ($\bar{x} = 4.00$), along with social relations and acceptance ($\bar{x} = 3.46$), resulting in a high overall level ($\bar{x} = 3.90$). Multiple regression analysis revealed traditional water management wisdom as the sole significant predictor of information-sharing behavior among the 11 variables tested, influencing both knowledge promotion ($\beta = 0.573$, $p = 0.002$) and marketing information sharing ($\beta = 0.467$, $p = 0.011$). Demographic characteristics, farming practices, and other production knowledge had no significant impact on farmers' sharing motivations.

Keywords: Farmers, Information sharing, Quality durian

Introduction

Thailand leads global fresh durian exports, with 827,090 tonnes valued at 110,114 million baht in 2022. The Monthong variety is prevalent among consumers (Office of Agricultural Economics, 2024). Aligning with the National Economic and Social Development Plan No. 12 (2017–2024), efforts focus on enhancing quality and adding value to agricultural products to meet market demand (National Science and Technology Development Agency, 2017). Quality produce is crucial, necessitating farmers' access to information on elements and skills, contributing to high-quality yields (Thailand Science Research and Innovation, 2020). In 2022, Rayong Province led Thailand's durian

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production with 149,234 tonnes, averaging 2,099 kilograms per rai (Rayong Provincial Office of Agriculture and Cooperatives, 2023).

Durian production in the area under study faces challenges, including diseases, pests, and worm infestations (Chueasamut *et al.,* 2018). Farmers are encouraged to adopt technological innovations for improved production efficiency, utilising data-driven market analysis and pest management strategies (Agricultural Economic Development Agency, 2024). Production processes have resulted in suboptimal yields and quality (Department of Agriculture, 2024). Sathirakosolawong and Triwankul (2020) propose five fundamental approaches to enhance durian production: reducing output, increasing yield, improving quality, and enhancing management and marketing practices. Recommended cultivation techniques include post-harvest canopy pruning for better air circulation, the application of bat fertiliser to strengthen root systems, regular monitoring for pests and diseases, and vigilant oversight during the fruiting period (Department of Agricultural Extension, 2017).

Farmers' acquired knowledge is crucial for productive and sustainable agriculture (Qui *et al.,* 2021). Data sharing among farmers can significantly improve garden management and agricultural productivity. However, concerns about data security often hinder this exchange (Intellecap Advisory Services Private Limited, 2024). Collaborative data management enables analyses that identify areas for improvement and enhance preparedness for production challenges. Knowledge sharing, particularly with novice farmers, facilitates skill acquisition and increases agricultural efficiency (Swanson, 2020). The exchange of traditional and innovative farming practices remains essential for sustainable agriculture. Knowledge networks enable farmers to share vital information, boosting climate resilience through local expertise exchange (Adamaagashi *et al.,* 2023). Knowledge exchange between farmers and academics allows farmers to develop sustainable farming methods to reduce chemical use while enhancing their ability to utilise local resources (Somkuna and Somkuna, 2018).

Cultivation calendars are essential tools for adapting to environmental challenges, optimising resources, and building agricultural resilience. Farmers can utilize crop calendars as strategic tools to enhance agricultural productivity, reduce exposure to climatic and pest-related hazards, and systematically organize farm activities across different seasons (Mondo *et al*., 2023). For durian cultivation specifically, the calendar documents the annual farming cycle while preserving generations of knowledge and local wisdom. Figure 1 illustrates the complete cycle: post-harvest restoration (October), leaf development (November), pre-bloom (December–April), fruit (May–June), fruit development (July–August), and harvest (September). Such integration of traditional

observations with modern practices creates a holistic approach that respects ancestral knowledge while enhancing productivity.
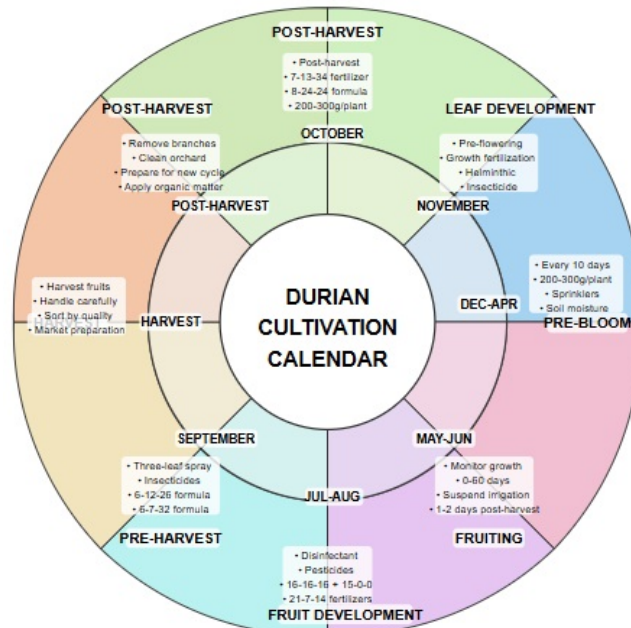
Figure 1. Durian Cultivation Calendar: wisdom from Rayong's model farmers

While cultivation calendars represent just one example of valuable durian production knowledge, the effective sharing of such information among farmers depends on various factors that remain to be fully understood. Hence, this study examined the relationship between durian farmers' characteristics and their motivation to share information on quality production practices, investigating the factors influencing information-sharing behaviour among durian farmers in Rayong Province, and identified the aspects of traditional wisdom and farming practices predict farmers' willingness to exchange agricultural knowledge.

Materials and methods

Population and sample

The population used in this study consisted of community innovators involved in the research project on innovation in data management for production and marketing to improve the quality of durian products in Rayong Province. The sample used in this study consisted of farmers involved in the Innovation Research Project on production and marketing data management aimed at

improving the quality of durian products for market entry. Yamane's (1973) formula was used to calculate the appropriate population sample size, given the clearly defined population. The sample calculated for the study consisted of 54 farmers.

Data collection

The data were collected through self-administered questionnaires distributed to durian farmers during their participation in training activities organised as part of the project: Production and Marketing Information Management Innovation for Enhancing the Quality of Durian Production Entering into Premium Markets.

The questionnaire consisted of two main sections. The first section covered the general characteristics of farmers including demographics, farming details, information sources on durian production, and knowledge of water management, maintenance systems, and other production aspects. The second section measured the motivation to share information using a 5-point Likert scale across three dimensions: promotion and knowledge development motivation, social relationships and acceptance motivation, and marketing-related motivation.

Interpretation of mean scores (5-point Likert scale): 4.21–5.00: The highest level of information-sharing desire 3.41–4.20: High level 2.61–3.40: Moderate level 1.81–2.60: Low level 1.00–1.80: Lowest level.

Data analysis

Descriptive statistics were calculated to describe the demographic characteristics of the respondents and summarise the responses to the questionnaire items.

Multiple regression analysis was applied to examine the relationship between farmers' general characteristics (independent variables) and their motivation to share information (dependent variables.

The regression models took the following form:

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + ... + b_nX_n + e$

Where:

Y = Motivation to share information (on promotion and knowledge development, social relationships and social acceptance, or marketing)

a = Constant

$b_1, b_2, b_3, ..., b_n$ = Regression coefficients

$X_1, X_2, X_3, ..., X_n$ = Independent variables (farmers' general characteristics)

e = Error term

Results

Demographic characteristics of the respondents

The study of 54 community innovators in durian cultivation revealed an equal gender distribution with an average age of 44.52 years (Table 1). Most participants (72.2%) were married, and 53.7% held bachelor's degrees or higher. Monthong was the primary durian variety grown (57.4%), with most farmers (79.6%) having plantations larger than five rai and considerable experience (70.4% farming for over five years). Knowledge dissemination occurred primarily through lectures (94.4%) rather than social media. High implementation rates were observed for water management techniques (92.6%), maintenance practices (79.6%), and another relevant knowledge (96.3%). Statistical analysis identified water system wisdom as a significant predictor of information-sharing behaviour, particularly regarding promotion, knowledge development, and the marketing aspects of durian production.

Table 1. Demographic characteristics of the respondents

Item	Number of People (n = 54)	Percentage
Gender		
Male	27	50.0
Female	27	50.0
Average age (year)	44.5	100
Status		
Unmarried	15	27.8
Married	39	72.2
Education		
Below a bachelor's degree	25	46.3
Higher than a bachelor's degree	29	53.7
Planting Species of Durian		
Monthong	31	57.4
Gibbon	23	42.6
Planting Area		
Less than five rai	11	20.4
More than five rai	43	79.6
Durian Growing Experience		
Less than five years	16	29.6
More than five years	38	70.4
Obtaining Production Data on Durian		
Social media	3	5.6
Orators	51	94.4

Table 1. (Continues)

Item	Number of People (n = 54)	Percentage
Water System Wisdom in Durian Production		
Practice	4	7.4
No practice	50	92.6
Wisdom Maintenance System for Durian Production		
Practice	11	20.4
No practice	43	79.6
Other Aspects of Durian Production Wisdom		
Practice	2	3.7
No practice	52	96.3
Total	**54**	**100.0**

Motivation levels for information sharing among durian farmers

It indicated that durian farmers possessed high motivation to share information across all categories (overall mean = 3.90) (Table 2). The strongest motivating factor was the advancement and growth of knowledge (mean = 4.24), followed by promotion-related motivations (mean = 4.00). Social interactions and approval factors demonstrated the lowest motivation scores (mean = 3.46), though they still maintained a relatively high level.

Table 2. Motivation levels for information sharing among durian farmers

Item	$\bar{x}$	S.D.	Motivation Level
Advancement and growth of knowledge	4.24	0.02	Most
Social interactions and approval from others	3.46	0.10	More
Promotion	4.00	1.70	More
Grand	**3.90**	**0.67**	**More**

Relationship between the general characteristics of farmers and motivation to share information on promotion and knowledge development

All the examined characteristics found only water system wisdom in durian production emerged as a statistically significant predictor (β = 0.573, p = 0.002) of farmers' motivation to share information on promotion and knowledge development (Table 3). The regression model explained 30.5% of the variance (R^2 = 0.305) in information-sharing motivation. Other factors, including demographics (gender, age, status, education), farming practices (durian species, planting area, growing experience), and other wisdom aspects, showed no significant influence on farmers' information-sharing behaviour in this domain.

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Table 3. Relationship between the general characteristics of farmers and their motivation to share information on promotion and knowledge development

Independent Variable	B	S.E.	Beta	t	Sig.
A (Constant)	22.828	5.000		4.565	0.000
Gender	0.286	0.959	0.042	0.298	0.767
Age	-0.008	0.064	-0.019	-0.129	0.898
Status	-0.575	1.039	-0.081	-0.554	0.583
Education	1.470	1.262	0.215	1.165	0.250
Planting species of durian	0.067	0.573	0.018	0.118	0.907
Planting area	-0.374	0.667	-0.082	-0.560	0.578
Durian growing experience	-0.931	0.734	-0.217	-1.269	0.211
Obtaining production data on durian	-0.143	0.089	-0.235	-1.594	0.118
Water system wisdom in durian production	0.685	0.206	0.573	3.323	0.002*
Maintenance system wisdom for durian production	-0.133	0.127	-0.179	-1.053	0.298
Other aspects of durian production wisdom	-0.020	0.074	-0.044	-0.269	0.789

Note: Statistically significant at the .05 level, R = 0.533, R^2 = 0.305.
Sig < 0.01**, Sig < 0.05*

Relationship between the farmers' characteristics and their motivation to share information on social relationships and social acceptance

The relationship between farmers' characteristics and their motivation to share information on durian production in Rayong Province is shown in Table 4. The regression model yielded R = 0.282 and R^2 = 0.079, explaining only 7.9% of the variance in information-sharing motivation. None of the eleven variables tested, including demographics (gender, age, status, education) and farming practices (durian varieties, planting area, experience, information exposure, water management, maintenance systems, and production wisdom) showed statistical significance ($p > 0.05$).

Table 4. The relationship between the general characteristics of farmers and their motivation to share information on social relationships and social acceptance

Independent Variable	B	S.E.	Beta	t	Sig.
A (Constant)	17.424	9.072		1.921	0.062
Gender	0.301	1.702	0.030	0.177	0.860
Age	-0.029	0.111	-0.045	-0.262	0.795
Status	2.670	1.860	0.248	1.435	0.159
Education	1.712	2.206	0.166	0.776	0.442
Planting species of durian	-0.230	1.008	-0.040	-0.228	0.821
Planting area	0.650	1.179	0.094	0.551	0.584
Durian growing experience	0.550	1.294	0.086	0.425	0.673

Table 4. (Continues)

Independent Variable	B	S.E.	Beta	t	Sig.
Obtaining production data on durian	-0.114	0.155	-0.126	-0.737	0.465
Water system wisdom in durian production	0.183	0.357	0.103	0.513	0.611
Maintenance system wisdom for durian production	0.069	0.219	0.062	0.315	0.755
Other aspects of durian production wisdom	-0.006	0.130	-0.008	-0.043	0.966

Note: Statistically significant at the 0.05 level, R = 0.282, R^2 = 0.079.
Sig < 0.01**, Sig < 0.05*

Relationship between the general characteristics of farmers and their motivation to share information on marketing

Analysis of the relationship between the farmers' characteristics and their motivation to share information on durian quality marketing in Rayong Province is shown in Table 5. The regression model yielded R = 0.526 and R^2 = 0.277, explaining 27.7% of the variance in marketing information-sharing motivation. Among all 11 variables tested, only the farmers' wisdom regarding water management systems for durian production demonstrated statistical significance (B = 0.763, Beta = 0.467, p = 0.011). The remaining variables had not significantly influenced on marketing information-sharing behaviour (all p > 0.05).

Table 5. The relationship between the general characteristics of farmers and their motivation to share information on marketing

Independent Variable	B	S.E.	Beta	t	Sig.
A (Constant)	3.523	6.973		0.505	0.616
Gender	1.002	1.337	0.108	0.750	0.458
Age	0.038	0.090	0.062	0.418	0.678
Status	1.978	1.449	0.203	1.366	0.179
Education	2.867	1.760	0.306	1.629	0.111
Planting species of durian	-0.203	0.800	-0.038	-0.253	0.801
Planting area	0.679	0.931	0.109	0.729	0.470
Durian growing experience	-0.014	1.023	-0.002	-0.014	0.989
Obtaining production data on durian	-0.166	0.125	-0.200	-1.332	0.190
Water system wisdom in durian production	0.763	0.287	0.467	2.656	0.011*
Maintenance system wisdom for durian production	0.038	0.177	0.037	0.213	0.832
Other aspects of durian production wisdom	0.013	0.103	0.021	0.127	0.899

Note: Statistically significant at the 0.05 level, R = 0.526, R^2 = 0.277.
Sig < 0.01**, Sig < 0.05*

Discussion

The demographic analysis revealed a balanced sample of durian farmers with an average age of 44.5 years. The majority were married (72.2%) and held a bachelor's degree or higher (53.7%), indicating a relatively educated farming community. Most cultivated the commercially popular Monthong durian variety (57.3%), managed areas of five rai or larger (79.5%), and possessed over five years' experience (70.4%), suggesting an established farming population. This demographic profile aligns with Nimkingrat *et al.* (2017) observation that Monthong durian is preferred due to its sweet flavour and high market demand.

Notable practices among respondents included sourcing information predominantly from academic expertise (94.4%), implementing water management techniques (92.6%), applying care and conservation practices (79.5%), and utilising traditional water system wisdom (92.6%). Yamalae *et al.* (2022) corroborated these findings, noting that irrigation practices aligned with plant physiological needs, with farmers commonly documenting gardening data to track yields and productivity.

This study examined the factors influencing information sharing on high-quality durian production among farmers in Rayong Province. The investigation focused on three primary dimensions: marketing, social dynamics, and knowledge development. Across the 11 variables analysed—including demographic characteristics, agricultural factors, and production practices—water management wisdom emerged as the single most significant predictor of information-sharing behaviour.

Contrary to Sanprasit *et al.* (2024), who identified multiple influencing factors in agricultural knowledge sharing, the findings of the present study revealed that only one independent variable significantly affected information sharing: the application of traditional wisdom in water management systems for durian production. This finding is consistent with that reported by Vongwannakul (2024), who highlighted the critical role of local knowledge in farmer participation in water distribution networks. Similarly, Kong *et al.* (2020) emphasised the positive impact of community-based water management approaches on overall agricultural development and productivity.

Regarding social interactions and community acceptance, this study found no statistically significant relationships between the 11 tested variables and the farmers' motivation to share information. This contrasts with previous studies emphasising social factors in agricultural knowledge exchange. This discrepancy may stem from the specific context of durian farming in Rayong Province, where technical expertise may take precedence over social dynamics in information-sharing decisions.

In the marketing domain, the findings of this study align with those of Maikaensarn and Chantharat (2022), who stressed the importance of farmers' knowledge and experience in cost management and marketing for adaptability in changing market conditions. Udpuang (2023) noted that insufficient water management knowledge could lead to higher crop production costs, consequently affecting market competitiveness and pricing strategies. Matthawarat *et al.* (2021) found that most durian farmers in Chanthaburi Province preferred spray irrigation methods for their cost-effectiveness and precision, potentially reducing production expenses and increasing profit margins.

The significant relationship between water system wisdom and information-sharing behaviour highlights the central importance of water management in successful durian cultivation. This finding suggests that farmers who possess and apply traditional water management knowledge are more motivated to share information with peers, potentially recognising the critical value of this knowledge for the entire farming community. As noted by Qui *et al.* (2021), farmers' acquired knowledge forms the foundation for productive and sustainable agriculture, with water management being particularly essential for high-value crops like durian.

Water management wisdom emerged as the sole significant predictor of information-sharing among Rayong's durian farmers. With a high overall motivation to share information ($\bar{x} = 3.90$), particularly regarding knowledge promotion ($\bar{x} = 4.24$), the findings suggest that agricultural extension services should prioritise water management in training programmes and establish dedicated knowledge-sharing platforms, integrating traditional wisdom with modern techniques to enhance durian production quality and sustainability.

Acknowledgements

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