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Cultivation challenges: Farmers realities in mango production and marketing with an agro-eco-tourism twist

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Abstract

This study explores the intersection of mango production and marketing with agro-eco-tourism in Karnataka, India. Agro-eco-tourism, defined as the amalgamation of rural settings, agricultural operations, and tourism experiences, has gained prominence as a means for farmers to augment income. The Karnataka State Mango Development and Marketing Corporation (KSMDMC) has initiated mango agro-eco-tourism, aiming to enhance mango growers' economic conditions and foster a connection between urban consumers and rural agriculture. The socio-economic characteristics of mango farmers participating in agro-eco-tourism reveal diverse factors influencing their engagement, including age, education, family size, and landholding. Despite challenges such as non-availability of literature, small land holdings, and funding constraints, farmers have embraced agro-eco-tourism for diversification and supplementary income. The study highlights the significant impact of agro-eco-tourism on the ecosystem, with farmers acknowledging contributions to maintaining green and clean farms, reducing chemical fertilizer usage, and balancing with other crops. However, challenges like plastic waste disposal need attention for sustainable practices. Consumer preferences indicate a preference for better price realization, on-farm sale, and low marketing costs, emphasizing the direct connection with farmers and the freshness of produce. Yet, challenges in mango production and marketing persist, including lack of irrigation facilities, natural calamities, and price fluctuations, exacerbated by the complexities of agro-eco-tourism. In conclusion, while mango agro-eco-tourism offers promise for Karnataka's farmers, comprehensive efforts are needed to address challenges. Government support, improved infrastructure, and focused interventions in irrigation, marketing, and education are crucial for sustaining and expanding the positive impacts of agro-eco-tourism. By doing so, the agricultural sector can thrive, and farmers can emerge as stewards of both their land and unique rural experiences.

Keywords: Mango agro-eco-tourism, ecosystem, on-farm sale, price fluctuations, government support

Introduction

Agro-eco-tourism is defined as travel, which combines agricultural or rural settings with products of agricultural operations all within a tourism experience. The product can be "experience itself". Gannon (1994) [3], defined Agro-eco-tourism as A range of activities, services and amenities provided by farmers and rural people to attract tourist to their area in order to generate extra income for their businesses. Vijay (2010) [10], had given three basic principles of Agro-eco-tourism: Have something for visitors to see – Have something for visitors to do - Have something for visitors to buy, these three should be ensured. According to Karri (2016) [5], combination of farmer, village and agriculture creates a marvellous situation which provides boundless satisfaction to the tourist especially from urban areas.

Rich resources bringing diversity and generating interest are distinct from place to location. Each area is peculiar that adds to tourist attraction. The way of agriculture and the numerous field operations are a great draw for the urban population. Awareness of rural people is prosperity which adds to the urban population's novelty and curiosity. Although Karnataka has made rapid progression in the field of information technology, agriculture has remained the backbone of the State. Karnataka is one of the prominent agriculturally important States of the country with its conducive environmental conditions, innovations in farming, crop patterns and research.

Agriculture is the means of livelihood for nearly 65 percent of the state's population (Prasannakumar and Neepa, 2014) ^[9]. The fact that the State has 10 different agro-climate zones coupled with fertile soil has led to a variety of crops being cultivated. Karnataka contributes seven percent of the country's agricultural production. What is significant is that the share of agriculture in the State GDP is about 16 percent, which is higher than national average of 12-13 percent. Several policy measures taken by the Government have supported agricultural growth in the State (Prasannakumar and Neepa, 2014) ^[9].

Karnataka was the first in the country to bring out an agricultural policy for the holistic development of the farm sector and to provide the status of industry to agriculture (Deepa, 2015) ^[2]. The State has been making efforts to turn agriculture into a business venture in a bid to increase the income of farmers and to boost the rural economy. Enterprises under the Department of Horticulture, Government of Karnataka has established the Karnataka State Mango Development and Marketing Corporation (KSMDMC) in 2011 with an objective of overall development of the Mango industry. The main intention of Mango Corporation is to facilitate mango growers for quality mango production, post-harvest management, direct marketing (Mango tourism), export and processing. KSMDMC has taken up an initiative to improve the social and economic standards of mango farmers of Karnataka by helping them to become producer-exporter and in turn, become a part of the national initiative to double the income of farmers by 2022 not only by increasing the productivity but also by opening an overseas market for them to generate higher income independently.

In Karnataka, Mango farmers face economic challenges due to large-scale commodity production, price instability, increasing land values and agricultural input costs, lack of storage and processing or value addition activities. These have resulted in abandoning agriculture/farming by farmers. To retain farmers/rural youths, KSMDMC has developed to take up off-farm employment and non-farm enterprises. On-farm entrepreneurial diversification especially in the form of agro-tourism has been suggested to create a more stable and higher income for the producer or to supplement farm income. Agro-tourism paves a way for the direct market of farm produce and helps to vie the distress situation. Considering this, KSMDMC has started mango picking tourism (Mango agro-eco-tourism), in times of economic distress, such as a poor harvest or depressed prices. So, the mango board has started mango tourism, which has been frequently promoted as a means to face this ever-challenging agricultural environment. Mango agro-eco-tourism supplements the farm income provides pleasure, serves as an excursion for the urban people. The visitors get an opportunity to pluck mangoes directly from the trees of their interesting variety. With this, present research was undertaken to study the socio-economic condition of farmers, reasons for opting agro-eco-tourism and the problems faced by farmers, impact of tourism as well.

Materials and Methods

Selection of the study area: Kolar, Chikkaballapura, Ramanagara and Tumakuru, of the eastern dry zone of Karnataka were purposively selected for the present study as

mango agro-eco-tourism is taken up by Karnataka State Mango Development and Marketing Corporation (Mango Board) in these four districts.

Selection of the respondents and data collection: Snowball sampling technique was employed to select the respondents. The total sample size was 90 respondents comprising of 15 farmers who are practicing mango agro-eco-tourism, 20 farmers who are not practicing mango tourism (five farmers from each study districts), 30 consumers. The list of farmers who are practicing mango tourism is collected from the Karnataka State Mango Development and Marketing Corporation (KSMDMC), Bangalore. The primary data required for the present study was collected from the sample farmers during the month of January- February 2020 with the help of well-structured schedule.

Nature and Sources of Data: The primary data were collected regarding socio-economic status, size of land holdings, livestock inventory, cost and returns of mango crop, yield, the price realized for the product, initial investment requirement, maintenance, the pattern of sale, factors influencing mango tourism, constraints in mango production and marketing and other relevant data required for evaluating objectives of the study were collected from 15 sample farmers practicing tourism and 20 farmers who were not practicing tourism (five farmers from each study districts in eastern dry zone of Karnataka). In the study FPT is used to indicate the farmers who are practicing tourism and FNPT is used for farmers who were not practicing tourism.

Analytical tools and Techniques Employed: The data on socio-economic characteristics were analysed using descriptive statistics like percentages, averages and ratios and results are presented in tabular form.

Garrett Ranking Technique: This technique was used to study problem faced by the farmers in production and marketing of mango and to rank those constraints faced by the farmers in the study area. Farmer respondents were asked to rank the constraints listed. In this analysis, rank one means most important constraint and last rank means less constraint. In the next stage, rank assigned to each constraint by each individual farmer was converted into percent position using the following formula, Garrett's formula for converting ranks into percent was given by.

$$\text{Percent position} = 100 \frac{(R_{ij} - 0.5)}{N_j} \quad (1)$$

Where,

R_{ij} = rank given for i^{th} factor by j^{th} individual

N_j = number of factors ranked by j^{th} individual

The percent position of each rank then converted into scores referring to the table given by Garret and Woodsworth (1969) ^[12]. For each factor, the scores of individual respondents were added together and divided by the total number of the respondents for whom scores were added. These mean scores for all the factors were arranged in descending order, ranks were given and most important factors were identified.

Table 1: Age, literacy, family size and land holding details of sample farmers

Sl. No.	Particulars	FPT (n=15)	FNPT (n=20)
I Age of Head of the family (No.)			
1	Below 35 years	1 (6.66)	03 (15.00)
2	35 to 50 years	7 (46.66)	06 (30.00)
3	Above 50 years	7 (46.66)	11 (55.00)
	Average age (years)	48	50
	Chi square value (X^2)	0.22 ^{NS}	
II Literacy level of Head of the family (No.)			
1	Illiterate	0 (0.00)	1 (5.00)
2	Primary School	4 (26.66)	4 (20.00)
3	High School	3 (20.00)	7 (35.00)
4	PU College	3 (20.00)	2 (10.00)
5	Degree and above	5 (33.33)	6 (30.00)
	Chi square value (X^2)	0.24 ^{NS}	
III Family size average			
	t value	6.73	5.35
		1.07 ^{NS}	
IV Size of land holding (acre)			
1	Rainfed	1.07	6.40
2	Irrigated land	21.96	4.28
V Farm size category			
1	Small farmers (< 5 acres)	6 (40.00)	13 (65.00)
2	Medium farmers (5 to 10 acres)	6 (40.00)	6 (30.00)
3	Large farmers (> 10 acres)	3 (20.00)	1 (5.00)

Note: 1. Figures in parentheses indicate percentage to the respective total

2. NS: Non significant

Socio-economic characteristics of the sample farmers

The socio-economic characteristics of sample farmers play a crucial role in comprehending their impact on mango orchard development and engagement in tourism activities on the farm. Consequently, details were collected and analyzed from 15 farmers practicing mango tourism and 20 farmers not involved in tourism. The general characteristics of the sample farmers, as presented in Table 1, indicate that an equal percentage of sample farmers (46.66%) fall within the age group of 35-50 years and above 50 years among farmers practicing tourism (FPT). However, in the case of farmers not practicing tourism (FNPT), the majority of farmers (55%) are aged above 50 years. The average age of FPT was 48 years, while it was 50 years for FNPT. The age of the sample respondents in the study area is an important factor influencing the adoption of innovations and farm technologies. It is generally believed that aged respondents are less likely to embrace innovations, respond less to innovative ideas, and are typically late adopters. The dominance of individuals above 50 years of age in FNPT might be a reason for not engaging in tourism. However, there was no significant difference in the age groups of both categories of sample farmers.

The classification of sample farmers based on education level in both categories revealed that all farmers in the tourism farm category were literate, with the majority having completed a degree or higher education (33.33%). This suggests that

education has played a role in promoting mango tourism practices. For farmers not practicing tourism (FNPT), the majority had high school education (35%), and only five percent were illiterate. Education status correlates with farmers' involvement in social organizations and active participation in tourism activities. All farmers in the tourism category were literate and had completed high school, graduation, or higher qualifications, enabling them to organize mango tourism on their farms. However, there was no significant difference in the education level between the two categories of sample farmers.

It is evident that 50 percent of FPT have family sizes ranging from six to ten members, while 60 percent of non-tourism farmers (FNPT) have smaller families of three to five members. This family size dynamic enables tourism farmers to make collective decisions about agricultural activities and engage in various social organizations, including milk cooperatives. In both categories, the majority of family members are involved in farming activities. Regarding landholding, FPT predominantly have irrigated land (21.96 acres) compared to dry land (1.07 acres). For FNPT, rainfed land (6.40 acres) surpasses irrigated land (4.28 acres). This indicates that tourism-practicing farmers possess a larger proportion of irrigated land (93.33%), while the majority of FNPT land is rainfed (60%). More FPT farmers shifted from rainfed to irrigated cultivation to enhance yields. The majority of farmers in both categories are small scale, with 65 percent in FNPT and 40 percent in FPT. Additionally, 20 percent of FPT and 5 pe of FNPT possess more than 10 acres of land.

Reasons for opting, problems and impact of agro-eco-tourism

Table 2: Reasons for opting mango agro-eco-tourism

Sl. No.	Factors	Garrett score	Rank
1	Better price realization	71.67	I
2	On farm sale	64.60	II
3	Low marketing cost	49.33	III
4	Transportation facility, accessibility	48.27	IV
5	Low labour and time requirement	42.73	V
6	Less risky	41.53	VI
7	Inadequate market information	34.87	VII

The results presented in the Table 2 showed that, better price realization was ranked first with a mean score of 71.67 for opting mango agro-eco-tourism against other marketing channels. It was followed by on-farm sale (64.60), low marketing cost (49.33), transportation facility and accessibility (48.27), low labour and time requirement (42.73), less risky (41.53) and finally inadequate market information (34.87). These findings are in confirmatory with the results of Karri (2016) [5] and Krishna (2019) [6]. This enabled to accept the hypothesis that better price realization and on farm sale were the main reasons to opt agro-eco-tourism.

Table 3: Problems faced by the farmers practicing mango agro-eco-tourism

Sl. No.	Statement	Yes
1	Non-availability of literature related to agri-tourism practices	13 (86.66)
2	Small size of land holding	11 (73.33)
3	Lack of fund for publicity and advertisement of mango tourism.	10 (66.66)
4	Complexity in getting license from the Mango board	9 (60.00)
5	Harsh weather conditions with a smaller number of visitors.	8 (53.33)
6	Lack of government support and training for Mango tourism	8 (53.33)
7	Inadequate price for farm products and activities.	7 (46.66)

8	Non willingness of the tourist to purchase farm products.	6 (40.00)
9	Lack of mindset for commercial approach.	4 (26.66)

Note: Figures in parentheses indicate percentage of sample farmers responded

The problems faced by the farmers practicing mango agro-eco- tourism are given in Table 3. About 87 percent of farmers stated that the non-availability of literature related to agro-eco-tourism practices was the main problem, followed by small size of landholding (86.66%), lack of funds for publicity and advertisement of mango tourism (66.66%),

Complexity in getting license from the Mango Board (60%), harsh weather conditions with smaller number of visitors (53.33%) and lack of government support and training for mango tourism (53.33%). These findings are corroborated by the results of Karri (2016) [5] and Krishna (2019) [6].

Table 4: Impact of agro-eco-tourism activity on ecosystem

Sl. No.	Factors	SA	A	N	DA	SD
1	Application of chemical fertilizers has been reduced because of Eco- tourism activity in farm	8 (53.33)	5 (33.33)	2 (13.33)	-	-
2	Eco-tourism activity affecting the farm and eco system because of increased usage of plastic and other wastes	5 (33.33)	6 (40.00)	3 (20.00)	1 (6.66)	-
3	Tourists visits affecting the other crops by damaging the seedlings, buds and flowers <i>etc.</i>	-	-	9 (60.00)	4 (26.66)	2 (13.33)
4	Care given to the other crops was reduced because of more concentration on Eco-tourism activity.	-	-	1 (6.66)	6 (40.00)	8 (53.33)
5	Eco-tourism activity greenish and clean urges to keep farm	9 (60.00)	3 (20.00)	3 (20.00)	-	-

Note: 1. SA-Strongly Agree, A-Agree, N-Neutral, DA- Disagree, SD- Strongly Disagree

2. Figures in parentheses indicate percentage of sample farmers

The impact of agro-eco-tourism activity on ecosystem presented in table 4 showed that, 60 percent of farmers strongly agreed that, the eco-tourism activity will keep the farm greenish and clean, 53.33 percent of the farmers strongly agreed that, the application of chemical fertilizers has been reduced because of eco-tourism activity on farms and 33.33 percent of the farmers opined that, the eco-tourism activity affecting the farm and ecosystem because of increased usage of plastic and other wastes. On the contrary, 53.33 percent strongly disagreed that, the care given to other crops reduced because of more concentration on Eco-tourism activity.

sample farmers in mango production is presented in Table 5. Lack of irrigation facilities was ranked first with a mean score of 75.73 in tourism farm and 70.60 in non-tourism farm followed by occurrence of natural calamities which scores of 64.47 and 60.30 in FPT and FNPT, respectively. Lack of high-quality plants showed score of 56.60 and 51.85 in FPT and FNPT, respectively. Shortage and high cost of labour with less efficiency, lack of technical know-how, perishable nature of fruits, high initial investment, inadequate finance and theft were the other production constraints faced by producers in the study area. These findings are in confirmatory with the outcome of Vishnugouda *et al.* (2011) [11].

Constraints faced by farmers in production and marketing of mango: The production constraints faced by

Table 5: Production constraints in mango cultivation

Factors	FPT (n=15)		FNPT (n=20)	
	Garrett score	Rank	Garrett score	Rank
Lack of Irrigation facilities	75.73	I	70.60	I
Natural calamities	64.47	II	60.30	II
Lack of high-quality plants	56.60	III	51.85	V
Shortage and high cost of labour with less efficiency	52.60	IV	51.40	VI
Lack of technical know – how	49.60	V	53.50	IV
Perishable nature of fruits	47.07	VI	45.70	VII
High initial investment	46.33	VII	58.60	III
Inadequate finance	31.40	VIII	27.65	IX
Theft	27.20	IX	31.40	VIII

Table 6: Marketing constraints in mango trade

Factors	FPT (n=15)		FNPT (n=20)	
	Garrett score	Rank	Garrett score	Rank
Price fluctuation	73.80	I	73.70	I
More number of middlemen	68.20	II	63.10	II
Lack of organized marketing system	58.60	III	59.40	III
Inadequate market information	58.26	IV	49.95	V
High marketing cost	50.53	V	58.05	IV
High handling cost due to costly packing material	38.73	VI	38.60	VI
Lack of storage facility	38.16	VII	26.40	VIII
Shortage of labour	26.13	VIII	38	VII

The marketing constraints faced by the sample farmers in mango production (Table 6) indicated that price fluctuation was the major constraint with a mean score of 73.80 in tourism farm and 73.70 in non-tourism farm followed by greater number of middlemen with mean score of 68.20 and 63.10 in FPT and FNPT, respectively, lack of an organized marketing system 58.60 and 59.40 in FPT and FNPT, respectively. Inadequate market information, high marketing cost, high handling cost due to costly packing material, lack of storage facility and shortage of labour are the other marketing constraints faced by producers in the study area. But the extent of marketing constraints was more in tourism farmers compared to non-tourism farmers. These findings were in accordance with the results of Mavi and Sidhu (2012)^[7], Golappanavarand Patil (2016)^[4] and Mohit *et al.* (2017)^[8].

Conclusion

In the realm of mango production and marketing in Karnataka, the integration of agro-eco-tourism adds a unique dimension to the agricultural landscape. The state, known for its agricultural significance, has made strides in leveraging agro-eco-tourism to bolster the income of farmers and promote rural development. The Karnataka State Mango Development and Marketing Corporation (KSMDMC) has played a pivotal role in spearheading initiatives like mango picking tourism, aimed at not only enhancing the economic conditions of mango farmers but also fostering a direct connection between urban consumers and rural agricultural practices. The socio-economic characteristics of mango farmers participating in agro-eco-tourism reveal a diverse landscape, with factors such as age, education, family size, and landholding influencing their engagement in this innovative approach. Despite challenges such as non-availability of literature, small land holdings, and funding constraints, farmers have embraced agro-eco-tourism as a means of diversification and supplementary income.

The study also sheds light on the significant impact of agro-eco-tourism on the ecosystem. Farmers strongly agree that such activities contribute to keeping farms green and clean, reducing the use of chemical fertilizers, and maintaining a balance with other crops. However, challenges like plastic waste disposal need attention to ensure sustainable practices. Consumer preferences and behaviors play a crucial role in the success of mango agro-eco-tourism. The emphasis on better price realization, on-farm sale, and low marketing costs indicates that consumers appreciate the direct connection with farmers and the freshness of produce. Nevertheless, the challenges faced by mango farmers in both production and marketing cannot be overlooked. Lack of irrigation facilities, natural calamities, price fluctuations, and the prevalence of middlemen pose significant hurdles. These challenges are not only intrinsic to mango cultivation but are exacerbated by the complexities of agro-eco-tourism. In conclusion, while mango agro-eco-tourism presents a promising avenue for the farmers of Karnataka, it is imperative to address the identified challenges comprehensively. Government support, improved infrastructure, and focused interventions in irrigation, marketing, and education are crucial to sustaining and expanding the positive impacts of agro-eco-tourism. By doing so, the agricultural sector can continue to thrive, and farmers can emerge as stewards of both their land and unique rural experiences.

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