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Harvesting prosperity: Exploring the economic potential of agro-ecotourism for farm households

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Abstract

Agro-ecotourism, a novel concept in the Indian tourism industry, is characterized by the collaborative engagement of the farming sector, tourism industry, and agricultural businesses, in conjunction with ecosystem services. This study was conducted in the Chikkamagaluru and Kodagu districts of Karnataka, employing purposive random sampling to select respondents. The research revealed that the annual income generated from agro-ecotourism (Rs. 18,72,820) surpassed that from agriculture (Rs. 8,21,667). The establishment cost of agro-ecotourism units was Rs. 32,55,440, with working costs amounting to Rs. 5,67,371 and fixed costs at Rs. 3,22,008. Despite this investment, the net returns amounted to Rs. 9,83,441, exceeding those from farming activities. The study underscores the significant contribution of agro-ecotourism initiatives in providing employment and additional income to rural communities through both forward and backward linkages. Strengthening these linkages is essential to mitigate rural youth migration.

Keywords: Agro-ecotourism, employment, forward and backward linkage

Introduction

Agro-ecotourism is on the rise within India's tourism sector, fostering a mutually beneficial bond between farming, tourism, and agricultural enterprises, while leveraging ecosystem services (Barbuddhe and Singh, 2014) ^[3]. This concept invites visitors to immerse themselves in farm activities for leisure, education, or participation, providing a refreshing break from the urban hustle and bustle to indulge in local cuisine and gain insights into diverse farming practices.

In Karnataka, celebrated for its ecological richness, destinations like Chikkamagaluru, Madikeri, and Mysuru allure eco-tourism enthusiasts. Agro-ecotourism offers a distinctive chance to boost employment in both agriculture and tourism, nurturing local hiring practices and fostering tourism experiences rooted in indigenous culture and natural landscapes.

This niche sector holds promise in uplifting local communities, including marginalized groups, by integrating them into the tourism value chain. This integration involves supplying local goods, labor, and services, propelling grassroots economic development. Moreover, it underscores the importance of conserving natural ecosystems, elevating farmers' livelihoods through additional income and job opportunities, and enhancing overall community well-being. Despite its advantages, the expansion of agro-ecotourism brings challenges like environmental degradation and pollution. Recognizing the significance of environmental preservation, it is vital to mitigate these adverse effects while maximizing the socio-economic benefits of agro-

ecotourism. Therefore, this study aims to delve into the economic aspects of Agro-ecotourism among farm households.

Methodology

The study was carried out in Chikkamagaluru and Kodagu districts of Karnataka during the year of 2020-21. Purposive proportionate sampling technique was employed for selection of farm households. Data was collected from 40 farmers using pre-tested well-structured schedule through personal interview method. Tabular method of presentation was employed to compile the socio-economic characteristics and economics of agro-ecotourism. In order to assist the interpretation of findings, descriptive statistical measures like percentages, averages and ratios were worked out wherever necessary.

Estimation of cost and returns

The economics of agro-ecotourism, was worked out on a per farm basis using averages and percentages.

Cost concepts

I. Establishment Cost: Cost incurred by the farmers till the agro-ecotourism generates income. The costs incurred under this comprises construction of building, infrastructure facilities like pathways and area preparation for sports and recreation and materials required to construct them *etc.*

Fixed cost: These are the cost which do not varies with the level of activity. The different items of fixed costs

considered in the study are explained below:

a) Depreciation: Depreciation means decline in the value of machinery and farm implements over time due to use, wear and tear. Depreciation on each capital equipment and machinery owned by farmers were calculated separately using straight line method. By considering average life of the asset as indicated by each farmer.

Annual depreciation = (Present value – Salvage value) ÷ (Useful years of life)

b) Rental value of land: The prevailing rental value of the land in the study area was considered.

c) Land revenue and taxes: This was considered according to the actual payments made by the farmers for different categories of land.

d) Managerial cost: Cost accounted for the management of farm by the farmer-owner. Farmer as an owner plays a multiple role in the production system with his mental and physical involvement. Hence, 10 per cent of the working capital has been taken as managerial cost.

e) Interest on fixed capital: Interest on fixed capital was computed at the rate of ten per cent per annum (commercial bank rate for fixed deposits). The interest was worked out on the values of fixed assets, after deducting depreciation for the year.

f) Amortized cost of establishment: Amortization is an accounting technique that reduces cumulative establishment cost at a discount rate over the economic life of the agro-ecotourism. To arrive at amortized establishment cost, the following formula was used: Amortization was calculated by using formula:

$$A = P \frac{r(r+1)^n}{((1+r)^n)-1} \quad (2)$$

Where,

A = Annual amortized cost

P = Establishment cost

n = Economic life of agro-ecotourism unit (taken as 35 years)

r = interest rate (2%)

2). Maintenance Cost/ Working capital: After the establishment of the agro-ecotourism farm, the cost incurred by the farmer to maintain the agro-ecotourism annually was worked out considering both variable and fixed costs. The maintenance cost was calculated by taking the average annual maintenance cost of the agro-ecotourism unit after establishment.

Variable cost: Those costs vary with the level of agro-ecotourism activities are considered as a variable cost. The items included in this category of cost are given below.

Labour cost: The actual expenditure incurred on hired

human labour, bullock labour and machine labour were recorded. In case of owned family labour (human, bullock and machine labour), the imputed value was considered at the market prices. Women days were converted into mandays by multiplying it with ratio of wages given to women labour to that of men labour (0.75). Machine labour was measured in hours and valued at prevailing hourly rates in the study area.

- Wage rate for men labour: Rs.500/manday
- Wage rate of women labour: Rs.300/manday
- Wage rate of machine labour: Rs. 800/hour

Material cost: The cost on purchased inputs *viz.*, food and snacks, materials required for packing the products and others for direct sale, electricity and miscellaneous (all the input materials purchased on payment) and for farm produced and owned inputs were also imputed at market prices.

Irrigation cost: Irrigation water cost was accounted at Rs. 200 per acre inch of water (Rohit *et al.*, 2015) ^[4].

Interest on working capital: The prevailing bank rate of ten per cent (commercial bank lending rate for plantation) is taken to work out the interest on working capital.

3). Returns

a) Gross return

Gross return is the value of payment calculated at prevailing prices at which farmers earn from agro-ecotourism in the study area. This includes the payment made by tourists and earnings from the direct sale of products.

Gross return of agro-ecotourism= (Number of visitors x Amount charged per visitor) + (Average sale price x total output sold)

b) Net return

Net return is calculated by value the returns after deducting the variable cost *i.e.*, the amount of money received from an investment activity after all costs have been paid.

Net return = Gross return - Total cost

c) Returns over variable cost: Calculated by subtracting total variable cost from gross return.

d) Returns per rupee of variable cost: It was calculated by dividing gross return by variable cost.

$$\text{Returns per rupee of expenditure} = \frac{\text{Gross return}}{\text{Total variable cost}}$$

Partial Budgeting Technique

Partial budgeting technique was used to estimate the relative profitability of technologies in the study area. Partial budgeting technique is most often used to estimate relative profitability for a minor change in the existing technology. Partial budgeting considers only the changes in income and expenses that would result from an alternative technology. Consequently, all other components which do not change by the decision can be ignored.

The format of partial budgeting is as follows,

Debit	Credit
Increase in the cost due to a particular technology = A	Savings or reduction in cost due to particular technology in the farm = C
Decrease in returns due to a particular technology = B	Increase in gross return due to a particular technology = D
Total Debit = A+B	Total Credit = C+D
Credit minus debit = Net gain / loss	

In the current study, profitability of agro-ecotourism over only agriculture was evaluated using the partial budgeting approach. The technique considers the additional costs, reduced returns, reduced cost and increased returns realized

by farmers.

Results

Table 1: Establishment Cost to create agro-ecotourism unit/infrastructure (Rs. / unit)

Sl. No.	Particulars	Unit	Quantity	Value (Rs.)	Percent
1	Building	-	-	31,45,670	96.62
2	Infrastructure	-	-	75,450	2.31
3	Sports and recreation	-	-	24,320	0.74
4	Others	-	-	10,000	0.30
	Total establishment cost	-	-	32,55,440	100

Note: Infrastructure includes construction of building, pool, furniture, equipment, road etc.

Establishment cost

The establishment cost of agro-ecotourism unit is presented in Table 1. The results showed that 96.62 per cent of establishment cost was incurred on building followed by infrastructure (32.31%) and sports and recreation (0.74%).

On an average the total establishment cost per unit was Rs. 32,55,440. This revealed that, to start the agro-ecotourism unit more capital is required to the construction of building and infrastructure.

Table 2: Annual fixed cost incurred on agro-ecotourism (Rs. / unit)

Sl. No.	Particulars	Unit	Quantity	Value (Rs.)	Percent
1	Depreciation	-	-	633.45	0.29
2	Rental value of land	-	-	18,000	8.43
3	Land revenue	-	-	35	0.01
4	Managerial cost @ 10% of working capital	-	-	66,702.79	31.27
5	Interest on fixed capital @ 10% per annum	-	-	19,388.59	9.09
6	Amortized establishment cost	-	-	1,08,514.66	50.88
7	Total fixed cost			2,13,274.49	100

Fixed cost

The average annual fixed cost of agro-ecotourism unit was Rs. 2,13,274.49 (Table 2). The major portion of fixed cost was occupied by the amortized establishment cost (50.88%) i.e., Rs. 1,08,514.66. This was followed by managerial cost

of 31.27 per cent (Rs. 66,702.79), interest on fixed capital @ 10% per annum (9.09%), rental value of land was 8.43 per cent (i.e., Rs. 18,000) and depreciation with 0.29 per cent (Rs. 633.45). The least among was land revenue with 0.01 per cent (Rs. 35).

Table 3: Annual working cost incurred on agro-ecotourism (Rs. / unit)

Sl. No.	Particulars	Unit	Quantity	Value (Rs.)	Percent
1	Human labour	man days	2880	5,47,500	82.08
2	Machine labour	hrs	16	11,168	1.67
3	Water	acre inch	3.80	742	0.11
4	Electricity	-	-	1,345	0.20
5	Food and snacks	-	-	31,254	4.68
6	On farm direct sale	-	-	5,800	0.86
7	Miscellaneous	-	-	8,570	1.28
8	Interest on working capital @ 10% per annum	-	-	60,638.90	9.09
	Total working cost			6,67,027.90	100

Working capital

The annual working capital of agro-ecotourism unit is represented in Table 3. The results revealed that the average working capital was about Rs. 6,67,027.90 for agro-ecotourism unit. Human labour took the considerable allocation (82.08%) with 2880 man days including male and female labourers which accounted for Rs. 5,47,500. After

this, food and snacks (4.68%) took a cost of Rs. 31,254 followed by machine labour with 16 hrs of work (1.67%) with Rs. 11168 and miscellaneous (1.28%). On contrary to this, the study by Visser (2003) [6] showed the relatively low levels of capital investment.

Table 4: Returns from agro-ecotourism (Rs. /unit)

Sl. No.	Particulars	Income/year (Rs.)
1	Amount paid by tourists	15,44,280.00
2	Direct sale of products*	3,28,540.00
3	Gross returns	18,72,820.00
4	Net returns	9,92,517.61

Note: * Products include Pepper, Butter fruit, Honey, Jack fruit, Chilli, Wine, Coffee powder, Coffee beans *etc.*

Returns from agro-ecotourism

The returns from agro-ecotourism unit in a year are mentioned in the Table 4. As indicated in the table the returns comprised of two components *i.e.*, amount paid by the tourists and from the direct sale of products. It is observed that the amount paid by tourists constituted the major portion of returns with Rs. 15,44,280 followed by the direct sale of products with Rs. 3,28,540. In total the amount received by the farmer was Rs. 18,72,820 and after deducting the cost, farmer left with the amount of Rs. 9,92,517.61 as profit from agro-ecotourism unit. This is the additional returns added to the income of farmers. According to the study conducted by Ahire (2018) ^[1] the farmers were carrying out agro-ecotourism on 8 acres of land without taking financial aid. They had engaged 8 people to work for tourism and farming activities and out of tourism activities he was able to get net income of

Rs.1,30,000.

Table 5: Economics of Agro-ecotourism unit (Rs. /unit)

Sl. No.	Particulars	Rupees per year
1	Fixed cost	2,13,274.49
2	Working cost	6,67,027.90
3	Total cost	8,80,302.39
4	Gross returns	18,72,820.00
5	Net returns	9,92,517.61
6	Return over variable cost	12,05,792.10
7	Returns per rupee of variable cost	2.80
8	Return on investment (%)	30.48

Economics of agro-ecotourism

From Table 5, it can be observed that the fixed cost and working cost were Rs. 2,13,274.49 and 6,67,027.90, respectively which sum up to Rs. 8,80,302.39 total cost agro-ecotourism unit. From this amount of investment, farmers had gained Rs. 18,72,820.00 and Rs. 9,92,517.61 as gross and net returns, respectively. The return over variable cost was about Rs. 12,05,792.10 and the return per rupee of variable cost was Rs. 2.80. The investment on agro-ecotourism had given the 30.48 per cent return on investment implying that per rupee of investment is profitable for farmers who adopted agro-ecotourism.

Table 6: Estimation of profitability of agro-ecotourism over agriculture

Debit/Expenses		Credit/Savings	
Added Cost	Amount (Rs.)	Reduced cost	Amount (Rs.)
Working cost	6,67,027.90	-	-
Total added cost (A)	6,67,027.90	Total reduced cost (B)	0
Reduced returns		Added returns	
-	-	a. Gross returns	18,72,820.00
Total reduced return (C)	0	Total added return (D)	18,72,820.00
Total debit (A+C)	6,67,027.90	Total credit (B+D)	18,72,820.00
Net gain (Rs. per unit)	12,05,792.10		

Modern agriculture is driven by continuous improvements in digital tools and data as well as collaborations among farmers. As time passed, more technological advances appeared in agriculture. The additional technology aims at improving yield, efficiency and profitability. In the view of profitability, the agro-ecotourism has provided additional returns among farmers who adopted this new innovation in the study area. Partial budgeting technique was employed to assess the role of agro-ecotourism in terms of realizing the increase in net returns or cost reduction.

The profitability of agro-ecotourism technology over agriculture was assessed using the partial budgeting technique (Table 6). The results revealed that, the net gain per unit was about Rs. 12,05,792.10 which was higher than following only agriculture. According to the results the total added cost was Rs. 6,67,027.90. On the other hand net returns formed the total credit of Rs. 18,72,820.00 without any reduction in cost. This implies that there is increase in both the cost and returns among farmers who adopted agro-ecotourism. But the increase in returns is higher compared to cost which in turn strengthens the economic status of farmers. This is in line with results of study conducted by Schilling *et al.* (2014) ^[5] where they found that agro-tourism had statistically significant and positive effects on farm

profitability. Similarly, the study by Barbieri and Tew (2010) ^[2] showed that agro-tourism was perceived as having a positive impact on farm profits, with the majority reporting at least some increase after adding agro-tourism activities and nearly one-fourth reporting a two-fold or more profit increase. The results support the acceptance of hypothesis that, returns generated was more from agro-ecotourism.

Conclusion

It is evident that agro-ecotourism emerges as a lucrative venture for farmers, offering higher annual income compared to traditional agriculture. Despite the lower number of days employed in agro-ecotourism, the return on investment is substantial, with a notable return over variable cost and a high return per rupee of investment. The establishment cost for agro-ecotourism units is relatively high, primarily allocated towards building infrastructure. However, this initial investment seems to pay off well, as the net gain per unit is significantly higher than that of agriculture alone. Furthermore, agro-ecotourism not only generates income from tourists but also allows for direct sales of products, adding to the overall profitability. After deducting costs, farmers are left with substantial profits,

indicating the financial viability of agro-ecotourism units. Overall, agro-ecotourism presents a promising avenue for rural economic development, offering farmers an opportunity to diversify their income sources and enhance their livelihoods. With its favorable returns on investment and significant net gains, agro-ecotourism stands as a viable option for sustainable economic growth in rural communities. The Government and other line departments should advertise and support small and marginal farmers to adopt agro-ecotourism through co-operative basis and commodity-based associations.

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