



ROLES OF ECOTOURISM IN HOUSEHOLD INCOME IMPROVEMENT AND NATURAL RESOURCES PROTECTION IN TAM GIANG LAGOON OF QUANG LOI COMMUNE, QUANG DIEN DISTRICT, THUA THIEN HUE PROVINCE

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Abstract. This study was conducted to reinforce that ecotourism in Quang Loi commune's lagoon creates differences in income and lagoon resource protection from different beneficiary groups. The data were collected from secondary sources, three key informant interviews, and 62 households in three groups: tourism service, fishery, and aquaculture. The results reveal that ecotourism services in Quang Loi commune started in 2010 and have thrived since 2017, relying on the advantages of the local natural resources. The local community organizes and provides tourism services such as sightseeing on the lagoon, fishing experiences, dining and accommodation, and other services. By joining such services, labourers in ecotourism service households earn 39.07 million VND a year, significantly improving the household's income. The ecotourism service households, therefore, have a higher income than the other groups (85.15 compared with 72.29 and 60 million VND). The lagoon environmental protection activities, such as lagoon night patrol, waste collection, and propaganda and advocating for lagoon environmental protection, receive more attention from the local community. Similarly, there is significantly longer participation of tourism service households in the above activities in comparison with the rest groups. The lagoon environment and resources are improved by residents. This result implies that ecotourism development is a suitable strategy for improving the local people's livelihood and protecting Tam Giang lagoon resources.

Keywords: ecotourism, Tam Giang lagoon, tourism service

1 Introduction

Ecotourism is a relatively new concept, but it has quickly attracted the attention of people from different fields. Until now, the concept of ecotourism has been understood from different angles and names. Generally, ecotourism is a type of nature-based tourism that supports conservation activities and ecologically sustainable management [3, 8].

Most studies have shown that ecotourism plays an essential role in creating more economic benefits for the community. As a service provider, ecotourism involves diverse activities, such as opening restaurants, operating family inns, selling goods to tourists, and offering transportation

rental services [12, 20]. Some other jobs, like porter, taxi driver, translator, and tourist guide are also available [9, 10]. Beyond direct job creation, ecotourism contributes to developing required infrastructures, such as buildings, roads, parks, hotels, and airports. These infrastructures create more jobs besides the service and hospitality sectors [14]. Roe and Elliott found that through ecotourism, poor people use natural resources in different ways that help them to diversify their livelihoods, such as trading (e.g., wood, wild fruits) and supplying inputs (e.g., craft making), and for formal or informal employment [17]. By the way, ecotourism contributes to creating jobs and income for communities in and around the area where ecotourism activities are taking place [2, 6, 8, 12] and reduces the migration rate to urban areas [11].

Previous research frequently argued that ecotourism is a component of the green economy and has a significant role in natural resource protection [1]. It is believed that employment in ecotourism operations enhances people's awareness of the importance of conservation [9, 19, 21], and local people generally hold positive attitudes toward the environment in the protected areas [13, 21, 23]. Therefore, ecotourism is spurred as a strategy to promote local people's involvement in conservation activities. Also, ecotourism development is considered a solution to stem the activities that undermine conservation, such as forest degradation, expanding agricultural frontiers, illegal hunting, logging, firewood collection, and uncontrolled burning [15].

The Tam Giang lagoon is located in the Tam Giang – Cau Hai lagoon system with an area of around 52 km². The lagoon stretches for about 24 km in the Northwest-Southeast direction, from the O Lau estuary to the Huong river estuary, in four districts of Phong Dien, Quang Dien, Phu Vang and Huong Tra town of Thua Thien Hue province. The Tam Giang lagoon is the largest in Vietnam, accounting for about 11% of the country's coastal lagoon area. It provides abundant and rich aquatic resources for the fishery communities living in the area [4]. However, with increasing fishing pressure, the aquatic resources in the lagoon system are becoming scarce, raising the need for sustainable and effective protection and exploitation of the lagoon resources.

Quang Loi commune, one of the localities benefiting from Tam Giang lagoon resources, possesses a water surface area of approximately 900 hectares and numerous converging factors to develop ecotourism. In addition to its highly diversified fisheries resources, the lagoon area of Quảng Loi commune stands out with its mangrove ecosystem with an area of about 70 hectares, along with a 40 ha Vung Me Aquatic Protection area [6, 16]. This is not only the habitat for aquatic species but also an exciting destination for visitors to explore the lagoon. Services, fishing experiences, dining, and accommodation are all offered by residents. These services are operated by the Tourism Service Group and local authority, with the participation of tour agencies. The services have attracted more and more tourists over the past few years. In addition, the visit to the Ngu My Thanh fresco village, the lagoon floating market, the Con Toc wharf, the Tam Giang lagoon creature gallery, etc., has also drawn tourists to the commune.

Ecotourism activities in Quang Loi commune are a model of positive livelihood transformation, attracting the attention of local authorities and communities. However, there have been no specific assessments on the role and contributions of ecotourism to the local community. Therefore, this paper provides scientific information on the contributions of ecotourism to natural resource protection and income improvement for people living along the Tam Giang lagoon. The results will be an important reference for communities and stakeholders in convincing investment projects for ecotourism development in the lagoon.

2 Methods

2.1 Sampling

The samples were classified into three target groups: tourism service households (households providing tourism services but still maintaining fishery activities), fishing households, and aquaculture households. Twenty-four household members of the tourism service group were selected for interview. A corresponding number of households in the aquaculture and fishing groups was also randomly selected for interview.

2.2 Data collection

Information and data were collected through secondary and primary sources. The secondary sources were reports on local ecotourism performance, district and commune community ecotourism development projects, and so on. The primary data were collected through key informant interviews (two commune officials and one village head) and household interviews with semi-structured questionnaires. The contents of the household interviews focused on people's participation in ecotourism activities and the role of ecotourism in household income and lagoon resource protection.

2.3 Data analysis

After assessing the quality of answered questionnaires, 62 were synthesized and analyzed in this study. The information and data were coded and analyzed with the SPSS software. The processed data included two basic groups: descriptive statistics and statistical significance test (one-factor ANOVA analysis).

The ANOVA aims to test the two hypotheses of the study: i) There is a difference in average income between the tourism service households group and the remaining groups; ii) There is a difference in the degree of participation in lagoon resource protection activities between the tourism service households group and the remaining groups.

3 Results and discussions

3.1 Ecotourism in Tam Giang lagoon of Quang Loi commune

Ecotourism services in Quang Loi commune started in 2010 under the support of a livelihood development project funded by a NGO. However, until 2017 they truly thrived thanks to the introduction of tours and advertisement programs. Ecotourism has attracted the participation of stakeholders such as the Department of Tourism of Thua Thien Hue province, the People's Committee of Quang Dien district and Quang Loi commune, travel agencies, non-governmental projects, and especially local communities.

State management agencies play a crucial role in planning, orienting the development of tourism activities (cultural activities, lagoon resource protection, tourism services, etc.), and representing local people to connect with tourism companies and other stakeholders. In 2018, the People's Committee of Quang Loi Commune issued decisions to establish Community Tourism Management Board and Tourism Service Group to better manage and organize service activities in the area. Some NGO projects assisted the community in training local people and supporting livelihood conversion from fisheries to tourism services, etc.

Along with that, travel companies have cooperated with local tourism management and operation agencies to form tours and bring tourists to Quang Loi commune. Some noticeable tours include "Tam Giang water wave" (a community eco-tour, in the first nine months of 2018, welcomed 40 tourist groups, with about 1,000 tourists, including 46 foreigners), "One day on Tam Giang lagoon" by An Thanh Company (welcomed 335 tourists, including 304 foreigners), and "Sunset on Tam Giang Lagoon" by Dai Bang Tourism and Advertising Communication Joint Stock Company (welcomed 14,000 visitors).

Households, with the support and cooperation of stakeholders, have transitioned from fisheries to tourism or expanded existing services, such as cafes, dining, and accommodation. Some remarkable services served by households include carrying travellers to visit the lagoon by boat, boat and basket rental services for tourists to paddle (tourists from tours or solo travellers rent boats or baskets to row by themselves), experimental services (travellers pay for fishing with fishing nets, traps, etc.), vehicle rental service (travellers rent bicycles or motorbikes to travel around the village and along the lagoon). In addition, other activities have been paid more attention by the local community, such as lagoon environmental protection (mangrove planting, lagoon night patrol, waste collection), operating cultural activities and festivals for tourism, and constructing a fresco village.

Ecotourism development has opened up opportunities to create more jobs and income for local people and also contributed to protecting the lagoon resources in Quang Loi commune by reducing fishing pressure from the local community. More importantly, when participating in

ecotourism activities, local people gradually increase their awareness of waste collection on the lagoon and participate in activities such as mangrove planting, constructing, and managing fisheries protected area, thereby creating a green, clean, and beautiful lagoon.

3.2 Human resources of households

Table 1 describes the human resources of households in the commune. The lowest education level of the household head is in fishing households (5.86 years in school), followed by the tourism service group and aquaculture group (7.4 and 7.67 years). The average age of the household head in the fishing group is much higher than that of the other groups (53.14 years old in comparison with 48.9 and 46.52 in the tourism service and aquaculture groups). High values of standard deviations of household head age in the group indicate a significant difference among household heads in the same group.

The average household size is 4.31 members (± 1.53 members), and more than half of them are principal labourers (2.47 ± 1.18 people) who work mainly in the locality (2.21 ± 0.68 people). This result reflects that the household's labour force is relatively abundant and largely relies on on-site jobs related to fisheries.

3.3 The participation of community in Tam Giang lagoon ecotourism

Table 2 reports the households' participation in the services and activities that promote ecotourism development. Generally, tourism service households have better involvement in tourism services and activities than the other groups.

Table 1. Human resource characteristics of household groups

Characteristic	Tourism service household		Fishing household		Aquaculture household		Total	
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.
Education of household head (year in school)	7.40	2.35	5.86	2.67	7.67	2.18	6.97	2.50
Age of household head (year)	48.90	11.16	53.14	12.92	46.52	5.71	49.53	10.58
Households size (people)	4.40	1.98	4.38	1.43	4.14	1.15	4.31	1.53
Labour size (people)	2.60	1.60	2.67	0.73	2.14	1.06	2.47	1.18
Labour work at locality (people)	2.25	0.64	2.43	0.68	1.95	0.67	2.21	0.68

Note: Std. stands for standard deviation.

Source: Household survey, 2020

The highest proportion of household participation (79.03%) is in environmental protection activities, such as mangrove planting, waste collection, and patrolling and protecting lagoon resources. Other households take part in activities that contribute to promoting ecotourism development in the study area: cultural activities and festivals (46.77%), public works (37.10), and fresco village construction (30.65%). Notably, ecotourism service households have higher involvement in the mentioned activities. This is in line with the findings of Tessema et al. and Snyman [23], who explained that by involving in ecotourism, local people increase their awareness. As a result, they are often more responsible for protecting and improving their surroundings for ecotourism development.

Ecotourism services for travellers in Quang Loi commune are provided only by ecotourism service households. The most prominent service is boating and boat rental, with a participation rate of 80 and 60%. These services are easy to provide thanks to the high demand of tourists and low investment costs (households can use the existing fishing baskets and boats). Meanwhile, other services have a lower participation rate (less than 30%) because of their high requirement of investment and labour force (dining services) or low returns.

Table 2. The proportion of households participated in ecotourism (%)

No.	Activity	Tourism service household	Fishing household	Aquaculture household	Total
1.	Carrying travellers to visit the lagoon by boat and basket	80.00	0.00	0.00	25.81
2.	Boat and basket rental service	60.00	0.00	0.00	19.35
3.	Dining services (serving tourists on boat or at the restaurant)	30.00	0.00	0.00	9.68
4.	Fishing experimental services (fishing by fishing nets, traps, etc.)	25.00	00.00	0.00	8.06
5.	Vehicle rental service (bicycle, motorbike)	5.00	0.00	0.00	1.61
6.	Participating in public works for tourism	55.00	33.33	23.81	37.10
7.	Participate in environmental protection activities	85.00	80.95	71.43	79.03
8.	Participate in cultural activities and festivals for tourism	55.00	47.62	38.10	46.77
9.	Participate in fresco village construction	50.00	28.57	14.29	30.65
10.	Other activities	5.00	0.00	0.00	1.67

Source: Household survey, 2020

3.4 Role of ecotourism in household income improvement

The role of ecotourism in household income is shown in its contribution to labour income and household income structure. Table 3 reports the contribution of ecotourism services to the total working days and income of labourers in the ecotourism service households. On average, a labourer works 184.25 ± 54.99 days in the ecotourism sector. The monthly income of a labourer is estimated at approximately 5.02 ± 2.33 million VND, equivalent to around 39.07 ± 31.02 million VND a year. About 78% of the total yearly income of labourers comes from their participation in ecotourism services.

The difference in annual income among household groups is presented in Table 4. Generally, the yearly income of tourism service households is much higher than that of fishing

Table 3. Characteristics of tourism service labour income in 2019 ($n = 28$)

No.	Characteristic	Mean	Std.
1.	Number of working day in ecotourism services (day)	184.25	54.99
2.	Average income/month of labour (million VND)	5.02	2.33
3.	Average income/year of labour (million VND)	39.07	31.02
4.	Ratio of income from services to total income /year of labour	78.14	14.15

Note: Std. stands for standard deviation.

Source: Household survey, 2020

Table 4. Household income of research groups (million VND/year)

Income source	Tourism service household		Fishing household		Aquaculture household		Total		p value
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	
Tourism service	50.55 ^(a)	18.69	0.00 ^(b)	–	0.00 ^(b)	–	16.55	25.86	0.000***
Fishing	21.50 ^(a)	24.89	49.33 ^(b)	21.58	21.57 ^(a)	31.02	30.95	28.93	0.001***
Aquaculture	5.35 ^(a)	10.68	6.86 ^(a)	18.46	50.71 ^(b)	24.15	21.23	28.14	0.000***
Other sources	2.50	7.86	3.81	17.46	0.00	0.00	2.10	11.03	0.532
Total income	85.15 ^(a)	29.26	60.00 ^(b)	35.45	72.29 ^(b)	23.81	72.27	31.15	0.033***

Note: Letters a and b represent the statistically significant difference between groups; *** means that the value is significant at the 1% probability level; Std. stands for standard deviation.

Source: Household survey, 2020

and aquaculture households. Tourism service households earn 85.15 ± 29.26 million VND per year; meanwhile, the figures for aquaculture households and fishing households are 72.29 and 60.00 million VND. This difference comes from the income source of ecotourism services and accounts for 60% of the income structure of the ecotourism service households.

There is no doubt that lagoon ecotourism has brought opportunities for local labourers and households to get a better income in Quang Loi commune. This result is consistent with the findings reported in the literature [1, 4, 9, 10, 22]. Accordingly, Stern [22] and Clifton and Benson [4] found that ecotourism provides economic benefits by creating direct employment, rental of accommodation for visitors, and food and other services. Meanwhile, Khanal [10] concluded that ecotourism is an additional but significant environmentally friendly source of income and better-paid jobs for local communities. Anup [1] also confirmed that ecotourism brings a high economic income for villagers. The tourism service households in Quang Loi commune also confirm the contribution of ecotourism to household income. The households in this group believe their income has significantly increased since they participated in the tourism services. More importantly, they have an additional income from tourism services and still can maintain their income from fishing and aquaculture.

The ANOVA analysis results reveal that the difference in average income between the tourist service households and the other two groups is statistically significant ($p < 0.05$). This finding is a reliable basis for accepting the hypothesis that there is a difference in income between the tourist service households and the fishing and aquaculture households. Hunt et al. [9] also came to similar findings, indicating that ecotourism benefited tourism service households by providing a higher income for their family members than their non-tourism neighbours in the study area. However, Hunt and coworkers did not test the significance of household income between the research groups.

3.5 Role of ecotourism in Tam Giang lagoon resource protection

The role of ecotourism in lagoon resource protection can be seen through the participation of local people in nature conservation activities. Table 5 describes the involvement of household groups in lagoon resource protection activities. It is clear that the participation frequency of ecotourism service households is significantly different from that of the other groups.

The waste collection was the most popular activity in the study area. On average, a household gets involved around 22.26 ± 10.23 times in this activity. The tourism service households are dominant in the participation with 27.5 ± 11.04 times, much higher than that in the aquaculture group (16.90 times) and the fishing group (22.67 times) ($p < 0.05$). In other activities, the tourism service households also show better participation than the other groups. However, the participation frequency is relatively low, only fluctuating around 1–3 times a year.

A significant difference in the participation frequency for the night patrol in protecting resources, propaganda and advocating for lagoon environmental protection, and meeting and training on livelihood change exists between the tourism service households and the other groups.

Degang and Xiaoting [5] and Hunt [9] explained the difference in the participation level between the ecotourism service households and the two other groups. Accordingly, ecotourism was credited with shifting local attitudes toward positive perceptions on environmental protection and involving them in protecting natural resources. Hunt et al. [9] also found that ecotourism actively promoted nature conservation and offered increased access to information-related resources. In the case of Quang Loi commune, the residents enhance their understanding through training courses, consultation with stakeholders (local authority, tour managers, livelihood development project workers, etc.), and even with knowledgeable visitors. The low participation in lagoon resource protection activities, such as night patrol in protecting the lagoon resources, propagating and persuading fishermen not to exploit illegally, mainly comes from external factors. In 2019, Quang Loi commune and its villages organized these activities because they realized that lagoon resources became better-protected thanks to the improved awareness

Table 5. Participation of households on lagoon resource protection

Unit: time per year

Activity	Tourism service household		Fishing household		Aquaculture household		Total		<i>p</i>
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.	
Night patrol in protecting lagoon resources	2.20 ^(a)	1.79	1.52	2.40	0.71 ^(b)	0.96	1.47	1.89	0.039***
Planting and taking care of mangroves	0.40	0.52	0.24	0.54	0.48	0.81	0.31	0.64	0.330
Waste collection	27.50 ^(a)	11.04	22.62	9.82	16.90 ^(b)	7.00	22.26 ^(c)	10.23	0.003***
Propaganda and advocating for lagoon environmental protection	1.70 ^(a)	2.18	1.38	1.20	0.57 ^(b)	0.81	1.21	1.55	0.052*
Meeting and training on livelihood change (to tourism services)	0.90 ^(a)	0.72	0.48 ^(b)	0.68	0.52	0.60	0.63	0.68	0.094*
Contributing other resources to protect lagoon environment	0.55	0.69	0.57	0.60	0.67	0.73	0.60	0.66	0.839

Note: Letters a, b, and c represent the statistically significant difference between groups; * and *** means that the value is significant at the 1 and 10% probability level; Std. stands for standard deviation.

Source: Household survey, 2020

of the local people. Besides, in many activities, instead of mobilizing the whole community to participate, they encouraged the rotating participation of households.

Table 6 illustrates how the households' points of view on the lagoon environment have changed since ecotourism thrived during the past three years. A 5-point Likert scale, ranging from "very bad" to "very good", was used for the assessment.

The households in all groups appreciate the positive changes in the lagoon environment. The regulation of waste and environmental pollution in the lagoon has the highest score (4.23), followed by lagoon landscape improvement, restriction of illegal fishing, and the development of seaweed and aquatic plants, with an average score of over 3.7. Meanwhile, the lower score belongs to fishery and aquaculture, with an average score of under 3.5.

This finding is consistent with the above discussion when the people's active participation in resource protection activities contributes to the improvement of the lagoon environment. However, households' opinions on the lagoon environmental improvement are still different, reflected in the high standard deviation of the mean score (around ± 1). This can be explained by the fact that ecotourism has only thrived in the past few years, so households did not see all the positive effects of this type of tourism, leading to a different opinion.

Table 6. Household assessment on the results of lagoon resource protection

Indicator	Mean	Std.
Lagoon landscape improvement	3.84	1.01
Restricting illegal fishing	3.82	1.00
Restricting waste and environmental pollution in the lagoon	4.23	0.66
Seaweed and aquatic plants development	3.77	0.95
Mangroves development	3.73	1.15
Exploited fishery production	3.34	0.70
Aquaculture on the lagoon	3.32	0.86

Note: Std. stands for standard deviation.

Source: Household survey, 2020

4 Conclusions and recommendations

4.1 Conclusions

Ecotourism in Quang Loi commune started in 2010 and has thrived since 2017, relying on the advantages of the local natural resources. The development of lagoon ecotourism significantly contributes to the income of households. The local community should organize and provide tourism services, such as sightseeing on the lagoon, fishing experience, dining and accommodation, and other services. By joining such services, labourers in ecotourism service households earn 39.07 million VND a year, significantly contributing to improving the household's income. Ecotourism service households, therefore, have a higher income than the fishing and aquaculture groups.

The statistical difference in the average income between household groups is a basis to reject the hypothesis that there is no difference in income between the tourism service household group and the other groups. In addition, the results regarding employment generation, increasing income of workers, etc., prove that ecotourism plays an essential role in the income and livelihood improvement of the local community.

The lagoon environmental protection activities are improved. Ecotourism has also enhanced residents' awareness, leading to a change in the community's behaviour regarding lagoon resource protection. The participation of the tourism service households in the above activities is more frequent than that of the other groups. The lagoon environment and resources are significantly improved.

4.2 Recommendations

From the advantages of ecotourism on community livelihoods and resource protection on Tam Giang lagoon, we suggest the following:

Tourism service households should maintain, expand, and improve their existing ecotourism services. Local authorities should encourage and adopt supporting policies to involve fishing and aquaculture households in tourism services to reduce pressure on lagoon resources.

The community should continue to organize and implement activities such as waste collection, night patrol in protecting lagoon resources and planting and protecting mangroves to engage people in the protection of lagoon resources. This is a decisive factor for the sustainable development of the community's livelihoods (including the livelihoods of the ecotourism group of households) and the lagoon resources in the future.

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